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UTILITY PATENT APPLICATION TRANSMITTAL

(ONLY FOR NEW NONPROVISIONAL APPLICATIONS UNDER 37 CFR 1.53(B))

Attorney Docket No.	21370/0212577-US0
First Inventor	Wenfu Wu
Title	A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
Express Mail Label No.	

APPLICATION ELEMENTS

See *MPEP chapter 600 concerning utility patent application contents.*

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1. [ ] **Fee Transmittal Form** (e.g., PTO/SB/17)
2. [ ] **Applicant claims small entity status.** See 37 CFR 1.27.
3. [X] **Specification** [*Total Pages* 50]
   Both the claims and abstract must start on a new page
   (For information on the preferred arrangement, see MPEP 608.01(a))
4. [X] **Drawing(s)** *(35 U.S.C. 113)* [*Total Sheets* 18]
5. **Oath or Declaration** [*Total Sheets* 4]
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   b. [ ] A copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional with Box 18 completed)*
      i. [ ] DELETION OF INVENTOR(S)
      Signed statement attached deleting inventor(s) name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
6. [X] **Application Data Sheet**. See 37 CFR 1.76
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ACCOMPANYING APPLICATION PARTS

9. [ ] **Assignment Papers** (cover sheet & document(s))
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11. [ ] **English Translation Document** *(if applicable)*
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18. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:*

[X] Continuation [ ] Divisional [ ] Continuation-in-part (CIP) of prior application No.: PCT/CN2008/070909

Prior application information: Examiner Not Yet Assigned *Art Unit:* N/A

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A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of International Application No. PCT/CN2008/070909, filed on May 8, 2008, which claims the benefit of Chinese Patent Application Nos. 200710104400.7, filed on May 11, 2007; 200710181758.X, filed on October 24, 2007; 200710165540.5, filed on November 2, 2007; and 200810085729.8, filed on March 13, 2008; all of which are hereby incorporated by reference in their entireties.

FIELD OF THE INVENTION

[0002] The present invention relates to the communication field, and in particular, to a registration processing method, a handover processing method, a system, and an apparatus.

BACKGROUND

[0003] In order to enhance the competitiveness of the future networks, the Third Generation Partnership Project (3GPP) is researching a new evolved network. A requirement of the evolved network is to implement handover between a 3GPP access system (such as GERAN, UTRAN, or E-UTRAN) and a non-3GPP access system (such as a WLAN or WiMax). In the existing protocol, the handover procedure is implemented via Attach or Tracking Area Update (TAU) procedure by the UE in a new access system.

[0004] In the process of developing the present invention, the inventor finds that the processing mechanism of an Attach or TAU process caused by handover differs sharply from the processing mechanism of a normal Attach/TAU process: In a normal Attach process, the network needs to delete all bearers previously created by the user, create a default bearer between the UE and the Packet Data Network Gateway (PDN GW), and register the PDN GW address used by the UE into a Home Subscriber Server (HSS); but in an Attach process caused by handover, the network needs to re-create all bearers previously created by the user. In the normal TAU process, the network does not handle the bearers of the user, but in the TAU process caused by handover, the network needs to re-create all bearers previously created by the user.

[0005] In the normal handover between a 3GPP system and a non-3GPP system, the UE is disconnected from the source Access Network (AN) first, and then the UE accesses the target access network through an Attach process. Consequently, the interruption of the UE service is long, which influence the service experience of the user. Therefore, an optimized handover mechanism is adopted for handover between an Evolved UMTS Terrestrial Radio Access Network (E-UTRAN) network and a High Rate Packet Data (HRPD) access networks in Code

Division Multiple Access (CDMA) network. In the optimized handover mechanism, the user plane path hands over to the target access network first before the UE hands over to the target access network (namely, while the UE is in the source access network).

[0006] In the process of developing the present invention, the inventor finds that the UE may hand over from an HRPD network to an E-UTRAN network in either idle state or active state. When the UE performs handover in an active state, the access network may be notified to create the bearer on the access network side in the handover process in order to speed up service recovery time after the UE hands over to the target access network. However, in the idle state, the UE runs no service and is not sensitive to handover delay. Creating bearers on the access network side when the UE is idle is a waste of the access network resources. In a pre-handover mechanism, once the UE handover fails, the UE needs to notify the PDN GW to switch the downlink path back to the source access network. Therefore, the pre-handover mechanism makes the system more complicated.

SUMMARY

[0007] A registration processing method, a handover processing method, a system, and an apparatus are disclosed in an embodiment of the present invention to enable the network to distinguish between different access processing types.

[0008] A registration processing method is disclosed in an embodiment of the present invention. The method includes:

receiving information about a processing type of registering a UE into a network, where the information is reported by the UE in the process of the registration; and

identifying the processing type of the registration according to the information about the processing type.

[0009] A handover method is disclosed in an embodiment of the present invention. The method includes:

receiving an Access Request of a UE; and

identifying the handover processing type of the Access Request according to the Access Request of the UE.

[0010] Another registration processing method is disclosed in an embodiment of the present invention. The method includes:

receiving information about a processing type of registering a UE, where the information is reported by an HSS or an Authentication Authorization Accounting (AAA) server; and

identifying the processing type of the registration according to the information about the

processing type.

[0011] A system is disclosed in an embodiment of the present invention. The system includes:

a UE, adapted to report information about the processing type of registering the UE into a network in the process of the registration; and

a network, adapted to identify the processing type of the registration according to the received registration processing type information reported by the UE.

[0012] A UE is disclosed in an embodiment of the present invention. The UE includes:

an identifying unit, adapted to identify the type of registration when the UE initiates the registration;

a registration initiating unit, adapted to initiate registration, and send a registration triggering signal; and

a reporting unit, adapted to receive the registration triggering signal from the registration initiating unit, and report the processing type information in the process of registering the UE into the network, where the processing type information corresponds to the registration type identified by the identifying unit.

[0013] A network-side network element is disclosed in an embodiment of the present invention. The UE includes:

an obtaining unit, adapted to obtain the processing type information reported by the UE in the process of registering the UE into a network; and

an identifying unit, adapted to identify the processing type of the registration according to the processing type information obtained by the obtaining unit.

[0014] In the embodiments of the present invention, the UE reports the registration processing type information to the network in the process of registering into the network, and therefore, the network distinguishes between different registration processing types accordingly.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] FIG. 1 shows system architecture of an evolved network in an embodiment of the present invention;

[0016] FIG. 2 shows system architecture of optimized handover between an HRPD access system and an E-UTRAN access system in an embodiment of the present invention;

[0017] FIG. 3 is a flowchart of a method in an embodiment of the present invention;

[0018] FIG. 4 shows a structure of a system in an embodiment of the present invention;

[0019] FIG. 5 shows a structure of a UE in an embodiment of the present invention;

[0020] FIG. 6 shows a structure of a network-side network element in an embodiment of the

present invention.

[0021] FIG. 7 is a flowchart of the first embodiment of the present invention;

[0022] FIG. 8 is a flowchart of the second embodiment of the present invention;

[0023] FIG. 9 is a flowchart of the third embodiment of the present invention;

[0024] FIG. 10 is a flowchart of the fourth embodiment of the present invention;

[0025] FIG. 11 is a flowchart of the fifth embodiment of the present invention;

[0026] FIG. 12 is a flowchart of the sixth embodiment of the present invention;

[0027] FIG. 13 is a flowchart of the seventh embodiment of the present invention;

[0028] FIG. 14 is a flowchart of the eighth embodiment of the present invention;

[0029] FIG. 15 is a flowchart of the ninth embodiment of the present invention;

[0030] FIG. 16 is a flowchart of the 10^{th} embodiment of the present invention;

[0031] FIG. 17 is a flowchart of the 11^{th} embodiment of the present invention;

[0032] FIG. 18 is a flowchart of the 12^{th} embodiment of the present invention; and

[0033] FIG. 19 is a flowchart of the 13^{th} embodiment of the present invention.

DETAILED DESCRIPTION

[0034] FIG. 1 shows system architecture of an evolved network in an embodiment of the present invention. The architecture includes:

an E-UTRAN, adapted to implement all radio-related functions in the evolved network;

a Mobility Management Entity (MME), responsible for control plane mobility management, including user context and Mobility state management, and allocation of temporary mobile subscriber identifiers;

a serving gateway (GW), which is a user plane anchor between 3GPP access systems and is adapted to terminate the interface to the E-UTRAN;

a PDN GW, which is a user plane anchor between a 3GPP access system and a non-3GPP access system, and is adapted to terminate the interface to the external Packet Data Network (PDN);

a Policy and Charging Rule Function (PCRF), responsible for policy control decision and flow based charging control;

an HSS, adapted to store subscriber data;

a UMTS Terrestrial Radio Access Network (UTRAN) and a GSM/EDGE Radio Access Network (GERAN), adapted to implement all radio-related functions in the existing GPRS/UMTS network;

a Serving GPRS Supporting Node (SGSN), adapted to implement route forwarding,

mobility management, session management, and subscriber data storage in a GPRS/UMTS network;

a non-3GPP IP access system, an access network defined by a non-3GPP organization, for example, Wireless Local Area Network (WLAN), and Worldwide Interoperability for Microwave Access (WiMAX); and

an AAA server, adapted to perform access authentication, authorization and accounting for the UE.

[0035] The foregoing architecture does not mean the ultimate System Architecture Evolution (SAE), and the ultimate architecture may differ from the foregoing architecture, as is not limited by the present invention.

[0036] FIG. 2 shows system architecture of optimized handover between an HRPD access system and an E-UTRAN access system in an embodiment of the present invention. An S101 interface is added between the MME and the HRPD Access Network (HRPD AN) which is responsible for mobility management and radio resource management in the HRPD network. This interface transmits the signaling between the MME and the HRPD AN. A Packet Data Serving Node (PDSN) is a user plane processing network element in an HRPD network, and performs user plane processing in the HRPD network.

[0037] The registration processing method, the handover processing method, the system, and the apparatus disclosed herein are based on the foregoing two types of system architecture, and are elaborated below:

[0038] In order to enable the network to distinguish between different registration processing types, a registration processing method is disclosed in an embodiment of the present invention. As shown in FIG. 3, the method includes the following steps:

[0039] S1. The network receives information about the processing type of registering the UE into the network, where the information is reported by the UE in the process of the registration.

[0040] Before this step, the UE may identify the type of the registration when registering into the network. The UE reports the information about the processing type corresponding to the identified registration type to the network in the process of registering into the network.

[0041] S2. The network identifies the processing type of the registration according to the information about the processing type.

[0042] Another registration processing method is disclosed in an embodiment of the present invention. The method includes: The network receives information about a processing type of registering a UE, where the information is reported by an HSS or an AAA server; and the

network identifies the processing type of the registration according to the information about the processing type.

[0043] A registration processing system is disclosed in an embodiment of the present invention. As shown in FIG. 4, the system includes a UE and a network.

[0044] The UE is adapted to report information about the processing type of registering the UE into a network in the process of the registration. The UE identifies the processing type of the registration in the process of registering into the network and then reports the registration processing type information.

[0045] The network is adapted to identify the processing type of the registration according to the received registration processing type information reported by the UE. Specifically, the network-side MME (in an evolved network), SGSN (in a 2G/3G network), or non-3GPP GW (in a non-3GPP network) identifies the processing type information reported by the UE.

[0046] A UE is disclosed in an embodiment of the present invention. As shown in FIG. 5, the UE includes:

an identifying unit, adapted to identify the type of registration when the UE initiates the registration;

a registration initiating unit, adapted to initiate registration, and send a registration triggering signal; and

a reporting unit, adapted to receive the registration triggering signal from the registration initiating unit, and report the processing type information in the process of registering the UE into the network, where the processing type information corresponds to the registration type identified by the identifying unit. The reporting modes include but are not limited to: The reporting unit includes the processing type information in an information element (IE) of an Attach Request message; or the reporting unit includes the processing type information in an IE of a TAU request message; or the reporting unit includes the processing type information in an IE of a Routing Area Update (RAU) request message; or the reporting unit includes the processing type information in an IE of an Access Request message; or the reporting unit includes the processing type information in an IE of an Access Authentication message or an Authentication message; or the reporting unit includes the processing type information in an IE of an Internet Key Exchange Protocol Version 2 (IKEv2) or IP Security Protocol Security Association (IPsec SA) Setup request message.

[0048] The detailed reporting process of the reporting unit is: The reporting unit sends different Attach Request messages to the network based on different registration types; or the reporting

unit sends different TAU request messages to the network based on different registration types; or the reporting unit sends different RAU request messages to the network based on different registration types; or the reporting unit sends different Access Request messages to the network based on different registration types.

[0049] A network-side network element is disclosed in an embodiment of the present invention. The network element is an MME (evolved network), SGSN (2G/3G network), or non-3GPP gateway (non-3GPP network). As shown in FIG. 6, the network element includes an obtaining unit and an identifying unit.

[0050] The obtaining unit is adapted to obtain the registration processing type information reported by the UE in the process of registering the UE into the network. Specifically, the obtained processing type information is reported by the UE, the HSS or the AAA server.

[0051] The identifying unit is adapted to identify the processing type of the registration according to the processing type information obtained by the obtaining unit.

[0052] The network element further includes a first processing unit, which is adapted to initiate a network-initiate bearer create procedure to create the bearer resources for the UE after the identifying unit identifies that the registration processing type is a handover registration processing type.

[0053] The network element further includes a second processing unit, which is adapted to not initiate resource release procedure to release the source access network resources after the identifying unit identifies that the registration processing type is an active-mode handover registration processing type.

[0054] The network element further includes a third processing unit, which is adapted to initiate a procedure of creating a data forwarding tunnel between a network element of the target network and a network element of the source network after the identifying unit identifies that the registration processing type is an active-mode handover registration processing type.

[0055] The present invention is elaborated through several embodiments below:

Embodiment 1

[0056] When the UE sends a registration request message to the MME, the UE reports the registration processing type information to the MME. The MME identifies the processing type of the registration according to the information, and performs the corresponding procedure according to registration processing type to complete the registration. The MME reports the registration processing type to the HSS. For the registration caused by handover, the network initiates a bearer creation procedure to create resources in the 3GPP network used by the UE in

the source non-3GPP network. For initialization registration, if the HSS stores the PDN GW address used by the UE in the non-3GPP network, the HSS notifies the AAA server to cancel the UE registration in the non-3GPP network. The AAA server notifies the non-3GPP network to release the resource used by the UE. As shown in FIG. 7, the process includes the following steps:

1. The UE accesses the non-3GPP AN through the non-3GPP GW and the PDN GW.

2. The non-3GPP network element sends a Handover Command (HO Command) to the UE, notifying the UE to hand over to the evolved network; or the UE discovers the evolved network and decides to initiate handover.

3. Before initiating registration into the evolved network, the UE identifies the type of the registration. Afterward, the UE sends a registration request message to the MME, and reports the registration processing type to the MME.

The registration processing type may be reported in one of the following ways:

(1) An Attach Type IE is added in the Attach Request message. For example, the values of the Attach Type IE are 0 and 1. The value "0" corresponds to Normal Attach (also known as Initial Attach), and indicates that the Attach Request message is a normal Attach Request message (also known as initial Attach Request message); and the value "1" corresponds to Handover Attach, and indicates that the Attach Request message is caused by handover. Alternatively, the UE adds an indication bit in the Attach Request message to indicate that the Attach Request message is caused by handover. The original Attach Request message indicates a normal Attach Request message (also known as initial Attach Request message). The indication bit may be:

(a) a Handover Indication IE;

(b) a Cause IE. The UE sets the Cause IE to "Attach due to Handover"; or

(c) an Attach Type IE. The UE sets this IE to "Handover Attach".

(2) A new message is defined. For example, a new Handover Attach Request message is defined. This message indicates an Attach Request message caused by handover. The old Attach Request message indicates a normal Attach Request message (also known as an initial Attach Request message). In this way, the UE can send different Attach Request messages to the network to indicate the corresponding registration processing type information. Alternatively, a new message corresponding to the normal Attach Request message (also known as initial Attach Request message) is defined, and the original Attach Request message corresponds to the Attach Request message caused by handover. Alternatively, both the Attach Request message caused by handover and the normal Attach Request message (also known as initial Attach Request message)

are redefined.

(3) An Update Type IE is added in the TAU request message. For example, the values of the Update Type IE are 0 and 1. The value "0" corresponds to Normal TAU (also known as Initial TAU), and indicates that the TAU request message is a normal TAU request message (also known as initial TAU request message); and the value "1" corresponds to Handover TAU, and indicates that the TAU request message is caused by handover. Alternatively, the UE adds an indication bit in the TAU request message to indicate that the TAU request message is caused by handover. The original TAU request message indicates a normal TAU request message (also known as initial TAU request message). The indication bit may be:

(a) a Handover Indication IE;

(b) a Cause IE. The UE sets the Cause IE to "TAU due to Handover"; or

(c) an Update Type IE. The UE sets this IE to "Handover TAU".

(4) A new message is defined. For example, a new Handover TAU Request message is defined. This message indicates a TAU request message caused by handover. The old TAU request message indicates a normal TAU request message (also known as an initial TAU request message). In this way, the UE can send different TAU request messages to the network to indicate the corresponding registration processing type information. Alternatively, a new message corresponding to the normal TAU request message (also known as initial TAU request message) is defined, and the original TAU request message corresponds to the TAU request message caused by handover. Alternatively, both the TAU request message caused by handover and the normal TAU request message (also known as initial TAU request message) are redefined.

4. An authentication procedure is performed between the UE, the MME, and the HSS to obtain the PDN GW address used by the UE. In this step, the MME may report the registration processing type of the UE to the HSS. If the registration processing type is a handover processing type, the HSS may provide the MME with the PDN GW address used by the UE in the non-3GPP AN.

5. The MME sends an Update Location message to the HSS, and registers the address of the MME into the HSS. In this step, the MME may report the registration processing type of the UE to the HSS.

6. The HSS inserts the subscriber data into the MME.

7. The HSS returns an Update Location Ack message to the MME. In this step, the HSS may provide the MME with the PDN GW address used by the UE in the non-3GPP AN.

In the UE registration process, if the HSS identifies the UE registration processing type

(for example, the HSS finds that it stores the PDN GW address used by the UE in the non-3GPP AN, the HSS determines that the UE registration processing type is registration caused by handover. Otherwise, the HSS determines that the UE registration processing type is a normal registration processing type), the HSS adds an indication bit into the message to notify MME of the UE registration processing type information. The indication bit may be:

a) a Handover Indication IE. If the UE registration processing type is registration caused by handover, the HSS adds a Handover Indication IE. For a normal registration processing type, the HSS does not add this IE;

b) a Cause IE. For the registration caused by handover, the HSS sets the Cause IE to "Update due to Handover Attach". For normal registration, the HSS sets the Cause IE to "Update due to Initial Attach", or does not add the Cause IE; or

c) an Update Type IE. For the registration caused by handover, the HSS sets this IE to "Handover Attach". For normal registration, the HSS sets this IE to "Initial Attach", or does not add this IE.

8. The MME identifies the processing type of the registration according to the registration processing type information reported by the UE or the HSS.

Now the MME succeeds in distinguishing between different registration processing types.

Further, if the processing type is normal registration, the MME performs the normal registration procedure, and steps 11–18 are performed.

If the processing type is registration caused by handover, the MME sends a Create Bearer Request message to the obtained PDN GW address, requesting the network to initiate bearer creation procedure. In this way, the service used by the UE in the non-3GPP AN is re-created in the new access system. The process proceeds to step 9.

9. If it is necessary to obtain the Policy and Charging Control (PCC) rules applied by the user from the PCRF, the PDN GW sends a Request PCC Rules message to the PCRF to obtain the PCC rules applied by the user. The PCRF provides the PDN GW with the PCC rules applied by the user.

10. The PDN GW initiates a network-initiate bearer creation procedure to create the bearer of the user, and then the process proceeds to step 18.

11. If the UE registration processing type is normal registration and the HSS stores the registered PDN GW addresses, and if such PDN GW addresses are the PDN GW addresses used by the UE when the UE accesses the non-3GPP AN and are registered into the HSS through the

AAA server, the HSS sends a Cancel Register message to the AAA server, requesting to cancel the UE registration in the non-3GPP AN. The AAA server returns a Cancel Register Ack message to the HSS.

12. The AAA server sends a Cancel Register message to the PDN GW, requesting to cancel the UE registration in the non-3GPP AN. The PDN GW returns a Cancel Register Ack message to the AAA server.

13. If the interface protocol between the PDN GW and the non-3GPP GW is a Proxy Mobile Internet Protocol (PMIP), the PDN GW sends a Binding Revocation Indication message to the non-3GPP GW to cancel the PMIP binding between the non-3GPP GW and the PDN GW. The non-3GPP GW returns a Binding Revocation Acknowledge message to the PDN GW.

14. The AAA server may also send a Session Abort message to the non-3GPP GW. The non-3GPP GW returns a Session Abort Ack message to the AAA server.

15. After receiving the Binding Revocation Indication message or the Session Abort message, the non-3GPP GW initiates a resource release procedure to release the resource used by the UE in the non-3GPP AN.

16. If the registration processing type of the UE is normal registration, the MME initiates a default bearer creation procedure to create a default bearer between the UE and the PDN GW.

17. The MME registers the PDN GW address used by the UE into the HSS. This operation may also be handled through a location update procedure. The MME sends an Update Location message including the PDN GW address to the HSS.

18. The MME returns an Attach Accept message or a TAU Accept message to the UE.

Embodiment 2

[0057] The foregoing mechanism is also applicable to a 2G system and a 3G system. When the UE sends a registration request message to the SGSN, the UE reports the registration processing type information to the SGSN. The SGSN identifies the registration processing type according to the information. Further, the SGSN performs the corresponding operations according to the registration processing type to complete the registration. The SGSN reports the registration processing type to the HSS. For the registration caused by handover, the network initiates a bearer creation procedure to create resources in the 3GPP network used by the UE in the source non-3GPP network. For initialization registration, if the HSS stores the PDN GW address used by the UE in the non-3GPP network, the HSS notifies the AAA server to cancel the UE registration in the non-3GPP network. The AAA server notifies the non-3GPP network to release the resource used by the UE. As shown in FIG. 8, the process includes the following steps:

1. The UE accesses the non-3GPP AN through the non-3GPP GW and the PDN GW.

2. The non-3GPP network element sends an HO Command to the UE, notifying the UE to hand over to the 2G or 3G network; or the UE discovers the 2G or 3G network and decides to initiate handover.

3. Before initiating registration into the 2G or 3G network, the UE identifies the type of the registration. Afterward, the UE sends a registration request message to the SGSN, and reports the registration processing type to the SGSN.

The registration processing type may be reported in one of the following ways:

(1) An Attach Type IE is added in the Attach Request message. For example, the values of the Attach Type IE are 0 and 1. The value "0" corresponds to Normal Attach (also known as Initial Attach), and indicates that the Attach Request message is a normal Attach Request message (also known as initial Attach Request message); and the value "1" corresponds to Handover Attach, and indicates that the Attach Request message is caused by handover. Alternatively, the UE adds an indication bit in the Attach Request message to indicate that the Attach Request message is caused by handover. The original Attach Request message indicates a normal Attach Request message (also known as initial Attach Request message). The indication bit may be:

a) a Handover Indication IE;

b) a Cause IE. The UE sets the Cause IE to "Attach due to Handover"; or

c) an Attach Type IE. The UE sets this IE to "Handover Attach".

(2) A new message is defined. For example, a new Handover Attach Request message is defined. This message indicates an Attach Request message caused by handover. The old Attach Request message indicates a normal Attach Request message (also known as an initial Attach Request message). In this way, the UE can send different Attach Request messages to the network to indicate the corresponding registration processing type information. Alternatively, a new message corresponding to the normal Attach Request message (also known as initial Attach Request message) is defined, and the original Attach Request message corresponds to the Attach Request message caused by handover. Alternatively, both the Attach Request message caused by handover and the normal Attach Request message (also known as initial Attach Request message) are redefined.

(3) An Update Type IE is added in the RAU request message. For example, the values of the Update Type IE are 0 and 1. The value "0" corresponds to Normal RAU (also known as Initial RAU), and indicates that the RAU request message is a normal RAU request message (also

known as initial RAU request message); and the value "1" corresponds to Handover RAU, and indicates that the RAU request message is caused by handover. Alternatively, the UE adds an indication bit in the RAU request message to indicate that the RAU request message is caused by handover. The original RAU request message indicates a normal RAU request message (also known as initial RAU request message). The indication bit may be:

a) a Handover Indication IE;

b) a Cause IE. The UE sets the Cause IE to "RAU due to Handover"; or

c) an Update Type IE. The UE sets this IE to "Handover RAU".

(4) A new message is defined. For example, a new Handover RAU Request message is defined. This message indicates an RAU request message caused by handover. The old RAU request message indicates a normal RAU request message (also known as an initial RAU request message). In this way, the UE can send different RAU request messages to the network to indicate the corresponding registration processing type information. Alternatively, a new message corresponding to the normal RAU request message (also known as initial RAU request message) is defined, and the original RAU request message corresponds to the RAU request message caused by handover. Alternatively, both the RAU request message caused by handover and the normal RAU request message (also known as initial RAU request message) are redefined.

4. An authentication procedure is performed between the UE, the SGSN, and the HSS. In this step, the SGSN may report the registration processing type of the UE to the HSS. If the registration processing type is a handover processing type, the HSS may provide the SGSN with the PDN GW address used by the UE in the non-3GPP AN.

5. The SGSN sends an Update Location message to the HSS, and registers the address of the SGSN into the HSS. In this step, the SGSN may report the registration processing type of the UE to the HSS.

6. The HSS inserts the subscriber data into the SGSN.

7. The HSS returns an Update Location Ack message to the SGSN. In this step, the HSS may provide the SGSN with the PDN GW address used by the UE in the non-3GPP AN. In the UE registration process, if the HSS identifies the UE registration processing type (for example, the HSS finds that it stores the PDN GW address used by the UE in the non-3GPP AN, the HSS determines that the UE registration processing type is registration caused by handover. Otherwise, the HSS determines that the UE registration processing type is a normal registration processing type), the HSS adds an indication bit into the message to notify SGSN of the UE registration processing type information. The indication bit may be:

a) a Handover Indication IE. If the UE registration processing type is registration caused by handover, the HSS adds a Handover Indication IE. For a normal registration processing type, the HSS does not add this IE;

b) a Cause IE. For the registration caused by handover, the HSS sets the Cause IE to "Update due to Handover Attach". For normal registration, the HSS sets the Cause IE to "Update due to Initial Attach", or does not add the Cause IE; or

c) an Update Type IE. For the registration caused by handover, the HSS sets this IE to "Handover Attach". For normal registration, the HSS sets this IE to "Initial Attach", or does not add this IE.

8. The SGSN identifies the processing type of the registration according to the registration processing type information reported by the UE or the HSS.

Now the SGSN succeeds in distinguishing between different registration processing types.

Further, if the processing type is normal registration, the SGSN performs the normal registration procedure, and steps 11–16 are performed.

If the processing type is registration caused by handover, the SGSN sends a Create Bearer Request message to the obtained PDN GW (namely, the current Gateway GPRS Supporting Node (GGSN)) address, requesting the network to initiate bearer creation procedure. In this way, the service used by the UE in the non-3GPP network is re-created in the new access system. The process proceeds to step 9.

9. If it is necessary to obtain the PCC rules applied by the user from the PCRF, the PDN GW sends a Request PCC Rules message to the PCRF to obtain the PCC rules applied by the user. The PCRF provides the PDN GW with the PCC rules applied by the user.

10. The PDN GW initiates a network-initiate bearer creation procedure to create the bearer of the user, and then the process proceeds to step 16.

Steps 11–15 are the same as the counterpart in the first embodiment, and are not repeated here any further.

16. The SGSN returns an Attach Accept message or an RAU Accept message to the UE.

Embodiment 3

[0058] The foregoing mechanism is also applicable to a trusted non-3GPP system. When the UE sends a registration request message to the non-3GPP GW, the UE reports the registration processing type information to the non-3GPP GW. The non-3GPP GW identifies the processing type of the registration according to the information, and creates a bearer for the UE according to

registration processing type to complete the registration. The non-3GPP GW reports the registration processing type to the AAA server, and the AAA server reports the registration processing type to the HSS. For the registration caused by handover, the network initiates a bearer creation procedure to create resources in the non-3GPP network used by the UE in the source 3GPP network. For initialization registration, if the AAA server stores the PDN GW address used by the UE in the 3GPP network, the AAA server notifies the HSS to cancel the UE registration in the 3GPP network, and the AAA server notifies the PDN GW to release the resource used by the UE in the 3GPP network. As shown in FIG. 9, the process includes the following steps:

1. The UE accesses the 3GPP network through the serving GW and the PDN GW.

2. The MME or the SGSN sends an HO Command to the UE, notifying the UE to hand over to the non-3GPP network; or the UE discovers the non-3GPP network and decides to initiate handover.

3. Before initiating registration into the non-3GPP network, the UE identifies the type of the registration. Afterward, the UE sends an Access Request message to the non-3GPP GW, and reports the registration processing type to the non-3GPP GW.

The registration processing type may be reported in one of the following ways:

(1) An Access Type IE is added in the Access Request message. For example, the values of the Access Type IE are 0 and 1. The value "0" corresponds to Normal Access (also known as Initial Access), and indicates that the Access Request message is a normal Access Request message (also known as initial Access Request message); and the value "1" corresponds to Handover Access, and indicates that the Access Request message is caused by handover. Alternatively, the UE adds an indication bit in the Access Request message to indicate that the Access Request message is caused by handover. The original Access Request message indicates a normal Access Request message (also known as initial Access Request message). The indication bit may be:

a) a Handover Indication IE;

b) a Cause IE. The UE sets the Cause IE to "Access due to Handover"; or

c) an Access Type IE. The UE sets this IE to "Handover Access".

(2) A new message is defined. For example, a new Handover Access Request message is defined. This message indicates an Access Request message caused by handover. The old Access Request message indicates a normal Access Request message (also known as an initial Access Request message). In this way, the UE can send different Access Request messages to the

network to indicate the corresponding registration processing type information. Alternatively, a new message corresponding to the normal Access Request message (also known as initial Access Request message) is defined, and the original Access Request message corresponds to the Access Request message caused by handover. Alternatively, both the Access Request message caused by handover and the normal Access Request message (also known as initial Access Request message) are redefined.

4. An authentication procedure is performed between the UE, the non-3GPP GW, the AAA server, and the HSS. In this step, the UE may report the registration processing type to the non-3GPP GW. The UE puts an Access Type cell in the message of the authentication procedure. For example, the values of the Access Type IE are 0 and 1. The value "0" corresponds to Normal Access (also known as Initial Access), and indicates that the Access Request message is a normal Access Request message (also known as initial Access Request message); and the value "1" corresponds to Handover Access, and indicates that the Access Request message is caused by handover.

Alternatively, the UE puts an Attach Type cell in the message of the authentication procedure. For example, the values of the Attach Type IE are 0 and 1. The value "0" corresponds to Normal Attach (also known as Initial Attach), and indicates that the registration processing type of the UE is normal registration (also known as initial registration); and the value "1" corresponds to Handover Attach, and indicates that the registration processing type of the UE is registration caused by handover.

Alternatively, the UE adds an indication bit in the message of the authentication procedure to indicate that the registration processing type of the UE is registration caused by handover. The original message of the authentication procedure indicates normal registration (also known as initial registration). The indication bit may be:

a) a Handover Indication IE;

b) a Cause IE. The UE sets the Cause IE to "Attach due to Handover"; or

c) an Attach Type IE. The UE sets this IE to "Handover Attach".

In this step, the non-3GPP GW reports the registration processing type of the UE to the AAA server.

In the UE registration process, if the AAA server identifies the UE registration processing type (for example, the AAA server finds that it stores the PDN GW address used by the UE in the 3GPP AN, the AAA server determines that the UE registration processing type is registration caused by handover. Otherwise, the AAA server determines that the UE registration

processing type is a normal registration processing type), the AAA server adds an indication bit in the message to notify the registration processing type information to non-3GPP GW. The indication bit may be:

a) a Handover Indication IE. If the UE registration processing type is registration caused by handover, the AAA server adds a Handover Indication IE. For a normal registration processing type, the AAA server does not add this IE;

b) a Cause IE. For the registration caused by handover, the AAA server sets the Cause IE to "Update due to Handover Attach". For normal registration, the AAA server sets the Cause IE to "Update due to Initial Attach", or does not add the Cause IE; or

c) an Update Type IE. For the registration caused by handover, the AAA server sets this IE to "Handover Attach". For normal registration, the AAA server sets this IE to "Initial Attach", or does not add this IE.

5. The non-3GPP GW identifies the processing type of the registration according to the registration processing type information reported by the UE.

Now the non-3GPP GW succeeds in distinguishing between different registration processing types.

Further, if the processing type is normal access, the non-3GPP GW performs the normal access procedure, and steps 7–13 are performed.

If the processing type is access caused by handover, the non-3GPP GW sends a Request PCC Rules message to the PCRF to obtain the PCC rules applied by the user. The PCRF provides the non-3GPP GW with the PCC rules applied by the user, and then the process proceeds to step 6.

6. The non-3GPP GW initiates a network-initiate bearer creation procedure to create the bearer of the user, and then the process proceeds to step 13.

7. If the UE registration processing type is normal registration and the AAA server stores the registered PDN GW addresses, and if such PDN GW addresses are the PDN GW addresses used by the UE when the UE accesses the 3GPP AN and are registered into the AAA server through the HSS, the AAA server sends a Cancel Register message to the PDN GW, requesting to cancel the UE registration in the 3GPP AN. The PDN GW returns a Cancel Register Ack message to the AAA server.

8. If the interface protocol between the PDN GW and the serving GW is a PMIP, the PDN GW sends a Binding Revocation Indication message to the serving GW to cancel the PMIP binding between the serving GW and the PDN GW. The serving GW returns a Binding

Revocation Acknowledge message to the PDN GW.

9. After receiving the Binding Revocation Indication message, the serving GW initiates a resource release procedure to release the resource used by the UE in the 3GPP AN.

10. If the interface protocol between the PDN GW and the serving GW is a GPRS Tunneling Protocol (GTP), the PDN GW initiates a resource release procedure to release the resource used by the UE in the 3GPP AN.

11. A session abort procedure is performed between the PDN GW and the PCRF, and the PCRF is notified to release the PCC rules applied by the UE in the 3GPP AN.

12. The AAA server sends a Cancel Register message to the HSS to cancel the UE registration in the HSS. The HSS returns a Cancel Register Ack message to the AAA server.

13. The non-3GPP GW returns an Access Accept message to the UE.

Embodiment 4

[0059] The foregoing mechanism is also applicable to a trusted non-3GPP system. When the UE sends a registration request message to the non-3GPP GW, the UE reports the registration processing type information to the non-3GPP GW. The non-3GPP GW identifies the processing type of the registration according to the information, and creates a bearer for the UE according to registration processing type to complete the registration. The non-3GPP GW reports the registration processing type to the AAA server, and the AAA server reports the registration processing type to the HSS. For the registration caused by handover, the network initiates a bearer creation procedure to create resources in the non-3GPP network used by the UE in the source 3GPP network. For initialization registration, if the AAA server stores the PDN GW address used by the UE in the 3GPP network, the AAA server notifies the HSS to cancel the UE registration in the 3GPP network, and the HSS notifies the MME/SGSN to release the resource used by the UE in the 3GPP network. As shown in FIG. 10, the process includes the following steps:

Steps 1–6 are the same as the counterpart in the third embodiment, and are not repeated here any further.

7. If the UE registration processing type is normal registration and the AAA server stores the registered PDN GW addresses, and if such PDN GW addresses are the PDN GW addresses used by the UE when the UE accesses the 3GPP AN and are registered into the AAA server through the HSS, the AAA server sends a Cancel Register message to the HSS, requesting to cancel the UE registration in the HSS. The HSS returns a Cancel Register Ack message to the AAA server.

8. The HSS sends a Cancel Location message to the MME/SGSN. The MME/SGSN returns a Cancel Location Ack message to the HSS.

9. The MME/SGSN separates the UE to release the resource used by the UE in the 3GPP AN.

10. A session abort procedure is performed between the PDN GW and the PCRF, and the PCRF is notified to release the PCC rules applied by the UE in the 3GPP AN.

11. The non-3GPP GW returns an Access Accept message to the UE.

Embodiment 5

[0060] The foregoing mechanism is also applicable to an untrusted non-3GPP system. When the UE sends an access authentication request or IKEv2/IPsec SA creation request message to an Evolved Packet Data Gateway (ePDG, a type of non-3GPP GW), the UE reports the registration processing type information to the ePDG. The ePDG identifies the registration processing type according to the information, creates a bearer for the UE according to the registration processing type, and completes the registration. The ePDG reports the registration processing type to the AAA server, and the AAA server reports the registration processing type to the HSS. For the registration caused by handover, the network initiates a bearer creation procedure to create resources in the non-3GPP network used by the UE in the source 3GPP network. For initialization registration, if the AAA server stores the PDN GW address used by the UE in the 3GPP network, the AAA server notifies the HSS to cancel the UE registration in the 3GPP network, and the AAA server notifies the PDN GW to release the resource used by the UE in the 3GPP network. As shown in FIG. 11, the process includes the following steps:

1. The UE accesses the 3GPP AN through the serving GW and the PDN GW.

2. The MME or the SGSN sends an HO Command to the UE, notifying the UE to hand over to the non-3GPP network; or the UE discovers the non-3GPP network and decides to initiate handover.

3. An authentication procedure is performed between the UE, ePDG, AAA server, and HSS. In this step, the UE may report the registration processing type of the UE to the ePDG. The UE puts an Access Type cell in the message of the access authentication procedure. For example, the values of the Access Type IE are 0 and 1. The value "0" corresponds to Normal Access (also known as Initial Access), and indicates that the Access Request message is a normal Access Request message (also known as initial Access Request message); and the value "1" corresponds to Handover Access, and indicates that the Access Request message is caused by handover.

Alternatively, the UE puts an Attach Type IE in the message of the access authentication

procedure. For example, the values of the Attach Type IE are 0 and 1. The value "0" corresponds to Normal Attach (also known as Initial Attach), and indicates that the registration processing type of the UE is normal registration (also known as initial registration); and the value "1" corresponds to Handover Attach, and indicates that the registration processing type of the UE is registration caused by handover.

Alternatively, the UE adds an indication bit in the message of the access authentication procedure to indicate that the registration processing type of the UE is registration caused by handover. The original message of the access authentication procedure indicates normal registration (also known as initial registration). The indication bit may be:

a) a Handover Indication IE;

b) a Cause IE. The UE sets the Cause IE to "Attach due to Handover"; or

c) an Attach Type IE. The UE sets this IE to "Handover Attach".

In this step, the ePDG may report the registration processing type of the UE to the AAA server, and the AAA server reports the registration processing type of the UE to the HSS.

In the UE registration process, if the AAA server identifies the UE registration processing type (for example, the AAA server finds that it stores the PDN GW address used by the UE in the 3GPP AN, the AAA server determines that the UE registration processing type is registration caused by handover. Otherwise, the AAA server determines that the UE registration processing type is a normal registration processing type), the AAA server adds an indication bit in the message to notify the registration processing type information to ePDG. The indication bit may be:

a) a Handover Indication IE. If the UE registration processing type is registration caused by handover, the AAA server adds a Handover Indication IE. For a normal registration processing type, the AAA server does not add this IE;

b) a Cause IE. For the registration caused by handover, the AAA server sets the Cause IE to "Update due to Handover Attach". For normal registration, the AAA server sets the Cause IE to "Update due to Initial Attach", or does not add the Cause IE; or

c) an Update Type IE. For the registration caused by handover, the AAA server sets this IE to "Handover Attach". For normal registration, the AAA server sets this IE to "Initial Attach", or does not add this IE.

4. An IKEv2/IPSec SA creation procedure is performed between the UE, ePDG, and AAA server. In this step, the UE may report the registration processing type of the UE to the ePDG. The UE puts the Access Type IE or the Attach Type IE in the message of the IKEv2/IPSec

SA creation procedure to indicate the registration processing type of the UE. Alternatively, the UE adds an indication bit in the message of the IKEv2/IPSec SA creation procedure to indicate that the registration processing type of the UE is registration caused by handover. The original message of the IKEv2/IPSec SA creation procedure indicates normal registration (also known as initial registration). The indication bit may be:

a) a Handover Indication IE;

b) a Cause IE. The UE sets the Cause IE to "Access due to Handover"; or

c) an Access Type IE. The UE sets this IE to "Handover Access".

In this step, the ePDG may report the registration processing type of the UE to the AAA server, and the AAA server reports the registration processing type of the UE to the HSS.

5. The ePDG identifies the processing type of the registration according to the registration processing type information reported by the UE.

Now the ePDG succeeds in distinguishing between different registration processing types.

Further, if the processing type is normal access, the ePDG performs the normal access procedure, and steps 7–13 are performed.

If the processing type is access caused by handover, the ePDG sends a Request PCC Rules message to the PCRF to obtain the PCC rules applied by the user. The PCRF provides the non-3GPP GW with the PCC rules applied by the user, and then the process proceeds to step 6.

6. The ePDG initiates a network-initiate bearer creation procedure to create the bearer of the user, and then the process proceeds to step 13.

Steps 7–13 are the same as the counterpart in the third embodiment, and are not repeated here any further.

[0061] To sum up, in the embodiments of the present invention, the UE reports the registration processing type information to the network in the process of registering into the network, and therefore, the network distinguishes between different registration processing types accordingly.

[0062] Further, the network may perform the corresponding procedure according to the identified processing type. Moreover, a mode of the UE reporting the registration processing type information by means of adding an IE or defining a new message is disclosed in an embodiment of the present invention.

[0063] Further, in addition to the Initial Attach and the Handover Attach processing types mentioned above, the registration processing types reported by the UE, HSS, and AAA server in this embodiment may include other registration processing types such as Pre-Registration

(namely, the UE pre-registers into the target access network), Idle Mode Handover (namely, the UE hands over in the idle mode), and Active Mode Handover (namely, the UE hands over in the active mode). For a multi-mode or dual-mode UE (namely, the UE can access multiple networks simultaneously), possible registration processing types include: Power On Attach (namely, the UE is powered on), Normal Attach (namely, the UE accesses the network normally), Handover Attach (namely, the UE performs handover). This embodiment does not restrict the value of the registration processing type. Other registration processing types are described below, taking the Idle Mode Handover and the Active Mode Handover as examples:

Embodiment 6

[0064] When the UE hands over from an HRPD network to an E-UTRAN network in the active mode, the MME obtains the handover processing type of the UE. If determining that the handover processing type is handover of the UE in the active mode, the MME notifies the eNodeB to create resource on the access network side and use the preliminary path handover mechanism. As shown in FIG. 12, the process includes the following steps:

1. The UE accesses the system at the HRPD network.

2. The UE or the HRPD Access Network (AN) decides to perform handover to the 3GPP network.

3. The UE sends an Attach Request message to the MME through the HRPD network. The MME obtains the processing type information. The MME may obtain the processing type information in one of the following ways:

(1) The UE reports the processing type information: The Attach Request message sent by the UE to the MME indicates whether the Attach procedure is handover in the idle state or handover in the active state. The specific mode of notifying the processing type may be:

✓ The UE adds an Attach Type IE in the Attach Request message to indicate the MME the handover processing type. Different values of the Attach Type indicate different processing types:

0 indicates Idle Mode Handover (handover in the idle mode); and

1 indicates Active Mode Handover (handover in the active mode).

✓ The UE adds a Cause IE in the Attach Request message to indicate the cause for the Attach Request message. The UE may set the following Cause values:

Idle Mode Handover: This cause value indicates that the Attach Request is caused by handover in the idle state; and

Active Mode Handover: This cause value indicates that the Attach Request is caused by

handover in the active state.

✓ The UE adds a UE State IE in the Attach Request message to report the state of the UE. According to the state of the UE, the MME knows whether the UE hands over in the idle state or in the active state. The UE may set the following UE State values:

0: indicates that the UE is in the idle state; and

1: indicates that the UE is in the active state.

✓ When the UE hands over in the active state, the UE adds an "active flag" IE in the Attach Request message to indicate the need of creating bearer on the access network side; and when the UE hands over in the idle state, the UE adds no "active flag" cell into the Attach Request message to indicate no need of creating bearer on the access network side. Alternatively, when the UE hands over in the active state, the UE sets the "active flag" IE to "True(1)" to indicate the need of creating bearer on the access network side; and when the UE hands over in the idle state, the UE sets the "active flag" IE to "False(0)" to indicate no need of creating bearer on the access network side.

✓ When the UE hands over in the idle state, the UE adds an "Non-active flag" IE in the Attach Request message to indicate no need of creating bearer on the access network side; and when the UE hands over in the active state, the UE adds no "Non-active flag" cell into the Attach Request message to indicate the need of creating bearer on the access network side. Alternatively, when the UE hands over in the idle state, the UE sets the "Non-active flag" IE to "True(1)" to indicate no need of creating bearer on the access network side; and when the UE hands over in the active state, the UE sets the "Non-active flag" IE to "False(0)" to indicate the need of creating bearer on the access network side.

(2) The HRPD AN reports the processing type information: The S101 interface message sent by the HRPD AN to the MME indicates whether the Attach procedure is handover in the idle state or handover in the active state. The specific mode of notifying the processing type may be:

✓ The HRPD AN adds an Attach Type IE in the S101 interface message to indicate the MME the handover processing type Different values of the Attach Type indicate different processing types:

0 indicates Idle Mode Handover (handover in the idle mode); and

1 indicates Active Mode Handover (handover in the active mode).

✓ The HRPD AN adds a Cause IE in the S101 interface message to indicate the cause for the Attach Request message. The HRPD AN may set the following Cause values:

Idle Mode Handover: This cause value indicates that the Attach Request is caused by

handover in the idle state; and

Active Mode Handover: This cause value indicates that the Attach Request is caused by handover in the active state.

✓ The HRPD AN adds a "UE State" IE into the S101 interface message to report the state of the UE. According to the state of the UE, the MME knows whether the UE hands over in the idle state or in the active state. The UE may set the following UE State values:

0: indicates that the UE is in the idle state; and

1: indicates that the UE is in the active state.

✓ When the UE hands over in the active state, the HRPD AN adds an "active flag" IE in the S101 interface message to indicate the need of creating bearer on the access network side; and when the UE hands over in the idle state, the HRPD AN adds no "active flag" IE in the S101 interface message to indicate no need of creating bearer on the access network side.

✓ When the UE hands over in the idle state, the HRPD AN include an "Non-active flag" IE in the S101 interface message to indicate no need of creating bearer on the access network side; and when the UE hands over in the active state, the HRPD AN adds no "Non-active flag" IE in the S101 interface message to indicate the need of creating bearer on the access network side.

4. The authentication procedure is performed.

5. The MME sends an Update Location message to the HSS to obtain the subscriber data of the UE. The HSS returns the subscriber data of the UE, including the PDN GW address used by the UE.

6. The MME selects a serving GW, and sends a Create Default Bearer Request message to the serving GW. According to the information included in the Attach Request message, the MME knows whether the UE hands over in the idle state or in the active state. If the MME finds that the UE hands over in the active state, the Create Default Bearer Request message sent by the MME requests the serving GW to perform "preliminary path handover".

7. After receiving the Create Default Bearer Request message, the serving GW initiates a preliminary path handover procedure if finding that the message requests the serving GW to perform "preliminary path handover". The serving GW sends a Proxy BU message to the PDN GW. After receiving the foregoing message, the PDN GW switches the user plane route to the serving GW. That is, the PDN GW sends the received downlink data to the serving GW.

8. The serving GW returns a Create Default Bearer Response message to the MME.

9. According to the information included in the Attach Request message, the MME

knows whether the UE hands over in the idle state or in the active state. If the MME finds that the UE hands over in the active state, the MME sends a Relocation Request message to the eNodeB, requesting the eNodeB to create the resource on the access network side. The eNodeB finishes creating the resource on the access network side, and then returns a Relocation Request Acknowledge message to the MME.

10. The MME sends an Update Bearer Request message to the serving GW, requesting to update the downlink user plane path of the serving GW to the eNodeB. The serving GW returns an Update Bearer Response message to the MME.

11. If finding that the UE hands over in the active state, the MME sends a S101 HO Command message to the HRPD AN. The message includes an Attach Accept message and an HO Command message.

12. The HRPD AN sends an HRPD AN L2 message to the UE. The message includes an Attach Accept message and an HO Command message.

13. The UE hands over to the E-UTRAN network, and sends an HO Complete message to the eNodeB.

14. The eNodeB sends a Relocation Complete message to the MME, indicating that the UE has handed over to the E-UTRAN network.

It is worthy of attention that in this embodiment, step 6 may occur before, during or after step 9.

Embodiment 7

[0065] When the UE hands over from an HRPD network to an E-UTRAN network in the idle mode, the MME obtains the handover processing type of the UE. If determining that the handover processing type is handover in the idle mode, the MME neither notifies the eNodeB to create resource on the access network side nor uses the preliminary path handover mechanism. As shown in FIG. 13, the process includes the following steps:

1. The UE accesses the system at the HRPD network.

2. The UE or the HRPD Access Network (AN) decides to perform handover to the 3GPP network.

3. The UE sends an Attach Request message to the MME through the HRPD network. The handover processing type needs to be notified to the MME. The operations are the same as the counterpart in the sixth embodiment, and are not repeated here any further.

4. The authentication procedure is performed.

5. The MME sends an Update Location message to the HSS to obtain the subscriber data

of the UE. The HSS returns the subscriber data of the UE, including the PDN GW address used by the UE.

6. The MME selects a serving GW, and sends a Create Default Bearer Request message to the serving GW. According to the information included in the Attach Request message, the MME knows whether the UE hands over in the idle state or in the active state. If the MME finds that the UE hands over in the idle state, the Create Default Bearer Request message sent by the MME does not require the serving GW to perform "preliminary path handover". The serving GW returns a Create Default Bearer Response message to the MME.

7. According to the information included in the Attach Request message, the MME knows whether the UE hands over in the idle state or in the active state. If finding that the UE hands over in the idle state, the MME does not notify the eNodeB to create resource on the access network side, but sends an Attach Accept message to the UE directly through the HRPD network.

8. The UE hands over to the E-UTRAN network, and sends a TAU Request message to the MME, indicating that the UE has handed over to the E-UTRAN network.

9. After finding that the UE has handed over to the E-UTRAN network in the idle state, the MME sends an Update Bearer Request message to the serving GW. The MME adds an indication bit in the Update Bearer Request to require the serving GW to perform user plane path handover.

10. When the serving GW discovers the requirement of user plane path handover after receiving the Update Bearer Request message, the serving GW sends a Proxy BU message to the PDN GW to update the downlink user plane path of the PDN GW. The PDN GW switches the downlink user plane path to the serving GW, and then returns a Proxy BA message to the serving GW.

11. The serving GW returns an Update Bearer Response message to the MME.

12. The MME returns a TAU Accept message to the UE.

Embodiment 8

[0066] The method of notifying the handover processing type is also applicable to the normal handover from a non-3GPP network to a 3GPP network. Through an Attach Request message, the UE notifies the handover processing type information to the MME or SGSN. According to the handover processing type information, the MME or SGSN decides whether to notify the access network to create the resource on the access network side. As shown in FIG. 14, the process includes the following steps:

1. The UE accesses the system at a non-3GPP network (such as WiMax or WLAN).

2. The UE decides to perform handover to the 3GPP network, and initiates a handover procedure.

3. The UE sends an Attach Request message to a network element of the core network through a 3GPP AN. If the 3GPP AN is a GERAN/UTRAN, the network element of the core network is SGSN; or, if the 3GPP AN is an E-UTRAN, the network element of the core network is MME. The Attach Request message sent by the UE to the MME/SGSN indicates whether the Attach procedure is handover in the idle state or handover in the active state. The MME/SGSN obtains the processing type information. The specific mode of notifying the processing type may be:

✓ The UE adds an Attach Type IE in the Attach Request message to indicate the processing type of the MME/SGSN handover. Different values of the Attach Type indicate different processing types:

0 indicates Idle Mode Handover (handover in the idle mode); or

1 indicates Active Mode Handover (handover in the active mode).

✓ The UE adds a Cause IE in the Attach Request message to indicate the cause for the Attach Request message. The UE may set the following Cause values:

Idle Mode Handover: This cause value indicates that the Attach Request is caused by handover in the idle state; and

Active Mode Handover: This cause value indicates that the Attach Request is caused by handover in the active state.

✓ The UE adds a "UE State" IE in the Attach Request message to report the state of the UE. According to the state of the UE, the MME/SGSN knows whether the UE hands over in the idle state or in the active state. The UE may set the following UE State values:

0: indicates that the UE is in the idle state; or

1: indicates that the UE is in the active state.

✓ When the UE hands over in the active state, the UE adds an "active flag" IE in the Attach Request message to indicate the need of creating bearer on the access network side; and when the UE hands over in the idle state, the UE adds no "active flag" IE in the Attach Request message to indicate no need of creating bearer on the access network side. Alternatively, when the UE hands over in the active state, the UE sets the "active flag" IE to "True(1)" to indicate the need of creating bearer on the access network side; and when the UE hands over in the idle state, the UE sets the "active flag" IE to "False(0)" to indicate no need of creating bearer on the access network side.

✓ When the UE hands over in the idle state, the UE adds an "Non-active flag" IE in the Attach Request message to indicate no need of creating bearer on the access network side; and when the UE hands over in the active state, the UE adds no "Non-active flag" IE in the Attach Request message to indicate the need of creating bearer on the access network side. Alternatively, when the UE hands over in the idle state, the UE sets the "Non-active flag" IE to "True(1)" to indicate no need of creating bearer on the access network side; and when the UE hands over in the active state, the UE sets the "Non-active flag" IE to "False(0)" to indicate the need of creating bearer on the access network side.

4. The authentication procedure is performed.

5. The MME/SGSN sends an Update Location message to the HSS to obtain the subscriber data of the UE. The HSS returns the subscriber data of the UE, including the PDN GW address used by the UE.

6. The MME/SGSN selects a serving GW, and sends a Create Default Bearer Request message to the serving GW.

7. The serving GW sends a Proxy BU message to the PDN GW to update the downlink user plane path of the PDN GW. The PDN GW switches the downlink user plane path to the serving GW, and then returns a Proxy BA message to the serving GW.

8. The serving GW returns a Create Default Bearer Response message to the MME/SGSN.

9. According to the information included in the Attach Request message, the MME/SGSN knows whether the UE hands over in the idle state or in the active state. If the MME/SGSN finds that the UE hands over in the active state, steps 9–12 are performed. If the MME/SGSN finds that the UE hands over in the idle state, steps 13–14 are performed.

The MME/SGSN sends an Initial Context Setup Request message to the 3GPP AN, requesting the 3GPP AN to create resource on the access network side. The message includes an Attach Accept message.

10. Radio bearer is created between the 3GPP AN and the UE.

11. The 3GPP AN returns an Initial Context Setup Complete message to the MME/SGSN. This message also includes the Attach Complete message.

12. The MME/SGSN sends an Update Bearer Request message to the serving GW, requesting to update the downlink user plane path to the eNodeB. The serving GW updates the downlink user plane path to the 3GPP AN, and then returns an Update Bearer Response message to the MME/SGSN.

13. If the MME/SGSN finds that the UE hands over in the idle state, the MME/SGSN sends an Attach Accept message to the UE.

14. The UE returns an Attach Complete message to the MME/SGSN.

Embodiment 9

[0067] When the UE sends a registration request message to the non-3GPP GW, the UE reports the registration processing type information to the non-3GPP GW. The non-3GPP GW identifies the processing type of the registration according to the information, and creates bearer for the UE according to registration processing type to complete the registration. The non-3GPP GW reports the registration processing type to the AAA server, and the AAA server reports the registration processing type to the HSS. For the registration caused by handover, the network initiates a bearer creation procedure to create bearer in the non-3GPP network used by the UE in the source 3GPP network. For initialization registration, if the HSS stores the PDN GW address used by the UE in the 3GPP network, the HSS notifies the AAA server to cancel the UE registration in the 3GPP network, and the AAA server notifies the PDN GW to release the resource used by the UE in the 3GPP network. As shown in FIG. 15, the process includes the following steps:

1. The UE accesses the 3GPP AN through the serving GW and the PDN GW.

2. The MME or the SGSN sends an HO Command to the UE, notifying the UE to hand over to the non-3GPP network; or the UE discovers the non-3GPP network and decides to initiate handover.

3. Before initiating registration into the non-3GPP network, the UE identifies the type of the registration. Afterward, the UE sends an Access Request message to the non-3GPP GW, and reports the registration processing type to the non-3GPP GW.

4. An authentication procedure is performed between the UE, the non-3GPP GW, the AAA server, and the HSS. In this step, the UE may report the registration processing type to the non-3GPP GW.

In this step, the non-3GPP GW reports the registration processing type to the AAA server and the HSS. If the registration processing type is a handover processing type, the AAA server or HSS may provide the non-3GPP GW with the PDN GW address used by the UE in the 3GPP AN.

In the UE registration process, if the AAA server or HSS identifies the UE registration processing type (for example, the AAA server or HSS finds that it stores the PDN GW address used by the UE in the 3GPP AN, the AAA server or HSS determines that the UE registration processing type is registration caused by handover. Otherwise, the AAA server or HSS

determines that the UE registration processing type is a normal registration processing type), the AAA server or HSS adds an indication bit in the message to notify the registration processing type information to the non-3GPP GW. The indication bit may be:

a) a Handover Indication IE. If the UE registration processing type is registration caused by handover, the AAA server or HSS adds a Handover Indication IE. For a normal registration processing type, the AAA server or HSS does not add this IE;

b) a Cause IE. For the registration caused by handover, the AAA server or HSS sets the Cause IE to "Update due to Handover Attach". For normal registration, the AAA server or HSS sets the Cause IE to "Update due to Initial Attach", or does not add the Cause IE; or

c) an Update Type IE. For the registration caused by handover, the AAA server or HSS sets this IE to "Handover Attach". For normal registration, the AAA server or HSS sets this IE to "Initial Attach", or does not add this IE.

5. The non-3GPP GW identifies the processing type of the registration according to the registration processing type information reported by the UE, AAA server, or HSS.

Now the non-3GPP GW succeeds in distinguishing between different registration processing types.

Further, if the processing type is normal access, the non-3GPP GW performs the normal access procedure, and steps 7–13 are performed.

If the processing type is access caused by handover, the non-3GPP GW sends a Request PCC Rules message to the PCRF to obtain the PCC rules applied by the user. The PCRF provides the non-3GPP GW with the PCC rules applied by the user, and then the process proceeds to step 6.

6. The non-3GPP GW initiates a network-initiate bearer creation procedure to create the bearer for the user, and then the process proceeds to step 13.

7. If the registration processing type is normal registration and the HSS stores the registered PDN GW addresses, and if such PDN GW addresses are the PDN GW addresses used by the UE when the UE accesses the 3GPP AN, the HSS sends a Cancel Register message to the AAA server, requesting to cancel the UE registration in the AAA server. The AAA server returns a Cancel Register Ack message to the HSS.

8. The AAA server sends a Cancel Register message to the PDN GW, requesting to cancel the UE registration in the 3GPP AN. The PDN GW returns a Cancel Register Ack message to the AAA server.

9. If the interface protocol between the PDN GW and the serving GW is a PMIP, the

PDN GW sends a Binding Revocation Indication message to the serving GW to cancel the PMIP binding between the serving GW and the PDN GW. The serving GW returns a Binding Revocation Acknowledge message to the PDN GW.

10. After receiving the Binding Revocation Indication message, the serving GW initiates a resource release procedure to release the resource used by the UE in the 3GPP AN.

11. If the interface protocol between the PDN GW and the serving GW is a GTP, the PDN GW initiates a resource release procedure to release the resource used by the UE in the 3GPP AN.

12. A session abort procedure is performed between the PDN GW and the PCRF, and the PCRF is notified to release the PCC rules applied by the UE in the 3GPP AN.

13. The non-3GPP GW returns an Access Accept message to the UE.

Embodiment 10

[0068] When the UE sends a registration request message to the non-3GPP GW, the UE reports the registration processing type information to the non-3GPP GW. The non-3GPP GW identifies the processing type of the registration according to the information, and creates bearer for the UE according to registration processing type to complete the registration. The non-3GPP GW reports the registration processing type to the AAA server, and the AAA server reports the registration processing type to the HSS. For the registration caused by handover, the network initiates a bearer creation procedure to create bearer in the non-3GPP network used by the UE in the source 3GPP network. For initialization registration, if the HSS stores the PDN GW address used by the UE in the 3GPP network, the HSS notifies the AAA server to cancel the UE registration in the 3GPP network, and the HSS notifies the MME/SGSN to release the resource used by the UE in the 3GPP network. As shown in FIG. 16, the process includes the following steps:

Steps 1–6 are the same as the counterpart in the ninth embodiment, and are not repeated here any further.

7. If the UE registration processing type is normal registration and the HSS stores the registered PDN GW addresses, and if such PDN GW addresses are the PDN GW addresses used by the UE when the UE accesses the 3GPP AN, the HSS sends a Cancel Register message to the AAA server, requesting to cancel the UE registration in the AAA server. The AAA server returns a Cancel Register Ack message to the HSS.

8. The HSS sends a Cancel Location message to the MME/SGSN. The MME/SGSN returns a Cancel Location Ack message to the HSS.

9. The MME/SGSN separates the UE to release the resource used by the UE in the 3GPP

AN.

10. A session abort procedure is performed between the PDN GW and the PCRF, and the PCRF is notified to release the PCC rules applied by the UE in the 3GPP AN.

11. The non-3GPP GW returns an Access Accept message to the UE.

Embodiment 11

[0069] When the UE hands over from a non-3GPP network to a 3GPP network in the active mode, the first network element of the 3GPP network obtains the handover processing type. If determining that the handover processing type is handover in the active mode, the first network element of the 3GPP network notifies the PDN GW not to initiate the resource release procedure in the source non-3GPP network, and notifies the serving GW to create a data forwarding tunnel between the serving GW and the non-3GPP GW. As shown in FIG. 17, the process includes the following steps:

1. The UE accesses the system at the non-3GPP network.

2. The UE or the non-3GPP access network element (for an HRPD network, the non-3GPP access network element is an HRPD Radio Network Controller (RNC)) decides to perform handover to the 3GPP network.

3. Through the non-3GPP network, the UE sends an Attach Request message to the first network element of the 3GPP network (for the E-UTRAN network, the first network element of the 3GPP network is an MME; for the GERAN/UTRAN network, the first network element of the 3GPP network is an SGSN). The first network element of the 3GPP network obtains the processing type information. The first network element of the 3GPP network may obtain the processing type information in one of the following ways:

(1) The UE reports the processing type information: The Attach Request message sent by the UE to the first network element of the 3GPP network indicates whether the Attach procedure is handover in the idle state or handover in the active state. The specific mode of notifying the processing type may be:

✓ The UE adds an Attach Type IE into the Attach Request message to indicate the handover processing type to the MME. Different values of the Attach Type indicate different processing types:

0 indicates Idle Mode Handover (handover in the idle mode); or

1 indicates Active Mode Handover (handover in the active mode); or

For optimized handover or pre-registration in the active state, the UE sets the Attach Type IE in the Attach Request message to "Optimized Handover" or "Pre-registration" or

"Handover". After receiving the Attach Type, the first network element of the 3GPP network believes that the Attach procedure is handover in the active state by default.

✓ The UE adds a Cause IE in the Attach Request message to indicate the cause for the Attach Request message. The UE may set the following Cause values:

Idle Mode Handover: This cause value indicates that the Attach Request is caused by handover in the idle state; or

Active Mode Handover: This cause value indicates that the Attach Request is caused by handover in the active state.

✓ The UE adds a UE State" IE in the Attach Request message to report the state of the UE. According to the state of the UE, the MME knows whether the UE hands over in the idle state or in the active state. The UE may set the following UE State values:

0: indicates that the UE is in the idle state; or

1: indicates that the UE is in the active state.

✓ When the UE hands over in the active state, the UE adds an "active flag" IE in the Attach Request message to indicate the need of creating bearer on the access network side; and when the UE hands over in the idle state, the UE adds no "active flag" IE in the Attach Request message to indicate no need of creating bearer on the access network side. Alternatively, when the UE hands over in the active state, the UE sets the "active flag" IE to "True(1)" to indicate the need of creating bearer on the access network side; and when the UE hands over in the idle state, the UE sets the "active flag" IE to "False(0)" to indicate no need of creating bearer on the access network side.

✓ When the UE hands over in the idle state, the UE adds an "Non-active flag" IE in the Attach Request message to indicate no need of creating bearer on the access network side; and when the UE hands over in the active state, the UE adds no "Non-active flag" IE in the Attach Request message to indicate the need of creating bearer on the access network side. Alternatively, when the UE hands over in the idle state, the UE sets the "Non-active flag" IE to "True(1)" to indicate no need of creating bearer on the access network side; and when the UE hands over in the active state, the UE sets the "Non-active flag" IE to "False(0)" to indicate the need of creating bearer on the access network side.

(2) The non-3GPP access network element or the non-3GPP GW reports the processing type information: The non-3GPP access network element or the non-3GPP GW sends an interface message to the first network element of the 3GPP network to indicate whether the Attach procedure is handover in the idle state or handover in the active state. The specific mode of

notifying the processing type may be:

✓ The non-3GPP access network element or the non-3GPP GW adds an Attach Type IE into the interface message sent to the first network element of the 3GPP network to indicate the handover processing type. Different values of the Attach Type indicate different processing types:

0 indicates Idle Mode Handover (handover in the idle mode); or

1 indicates Active Mode Handover (handover in the active mode); or

For optimized handover or pre-registration in the active state, the non-3GPP access network element or the non-3GPP GW sets the Attach Type IE to "Optimized Handover" or "Pre-registration" or "Handover". After receiving the Attach Type, the first network element of the 3GPP network believes that the Attach procedure is handover in the active state by default.

✓ The non-3GPP access network element or the non-3GPP GW adds a Cause IE in the interface message sent to the first network element of the 3GPP network to indicate the cause for the Attach Request message. The non-3GPP access network element or the non-3GPP GW may set the following Cause values:

Idle Mode Handover: This cause value indicates that the Attach Request is caused by handover in the idle state; or

Active Mode Handover: This cause value indicates that the Attach Request is caused by handover in the active state.

✓ The non-3GPP access network element or the non-3GPP GW adds a "UE State" IE in the interface message sent to the first network element of the 3GPP network to report the UE state. According to the state of the UE, the first network element of the 3GPP network knows whether the UE hands over in the idle state or in the active state. The UE may set the following UE State values:

0: indicates that the UE is in the idle state; or

1: indicates that the UE is in the active state.

✓ When the UE hands over in the active state, the non-3GPP access network element or the non-3GPP GW adds an "active flag" IE in the interface message sent to the first network element of the 3GPP network to indicate the need of creating bearer on the access network side. When the UE hands over in the idle state, the non-3GPP access network element or the non-3GPP GW adds no "active flag" IE in the interface message sent to the first network element of the 3GPP network to indicate no need of creating bearer on the access network side.

✓ When the UE hands over in the idle state, the non-3GPP access network element or

the non-3GPP GW adds a "Non-active flag" IE in the interface message sent to the first network element of the 3GPP network to indicate no need of creating bearer on the access network side. When the UE hands over in the active state, the non-3GPP access network element or the non-3GPP GW adds no "Non-active flag" IE into the interface message sent to the first network element of the 3GPP network to indicate the need of creating bearer on the access network side.

4. The authentication procedure is performed.

5. The first network element of the 3GPP network sends an Update Location message to the HSS to obtain the subscriber data of the UE. The HSS returns the subscriber data of the UE, including the PDN GW address used by the UE.

6. The first network element of the 3GPP network selects a serving GW, and sends a Create Default Bearer Request message to the serving GW.

7. If the interface protocol between the serving GW and the PDN GW is a GTP, the serving GW sends a Create Default Bearer Request message to the PDN GW. If the interface protocol between the serving GW and the PDN GW is a PMIP, the serving GW sends a Proxy BU message to the PDN GW. The PDN GW returns a Create Default Bearer Response message or a Proxy BA message to the serving GW.

8. The serving GW returns a Create Default Bearer Response message to the first network element of the 3GPP network.

9. If finding that the UE hands over in the active state, the first network element of the 3GPP network sends a Create Forwarding Tunnels Request to the serving GW, requesting the serving GW to create a forwarding tunnel. The serving GW returns a Create Forwarding Tunnels Response message to the first network element of the 3GPP network. The message includes the forwarding tunnel information (including a serving GW address and Generic Routing Encapsulation (GRE) Keys).

10. If finding that the UE hands over in the active state, the first network element of the 3GPP network sends an HO Command message to the non-3GPP access network element or the non-3GPP GW. The message includes an Attach Accept message, an HO Command message, and forwarding tunnel information (including a serving GW address and GRE Keys).

11. After receiving the HO Command message, the non-3GPP access network element sends a Create Forwarding Tunnels Request message to the non-3GPP GW, notifying the non-3GPP GW of the obtained forwarding tunnel information. The non-3GPP GW returns a Create Forwarding Tunnels Response message to the non-3GPP access network element.

Subsequently, the non-3GPP GW forwards the received downlink data to the serving

GW through the forwarding tunnel (including a serving GW address and GRE keys).

12. The non-3GPP access network element or the non-3GPP GW sends an HO Command message to the UE. The message includes an Attach Accept message and an HO Command message.

13. The UE hands over to the 3GPP network, and sends an HO Complete message to the 3GPP access network element.

14. The 3GPP access network element sends a Relocation Complete message to the first network element of the 3GPP network, indicating that the UE has handed over to the 3GPP network.

15. The first network element of the 3GPP network sends an Update Bearer Request message to the serving GW. If finding that the UE hands over in the active state, the first network element of the 3GPP network adds an indication bit in the Update Bearer Request message to indicate the PDN GW not to initiate a resource release procedure to release the resource used by the UE in the source non-3GPP AN. This indication bit may be: Optimized Handover Indication, Pre-registration Indication, or Resource not Release Indication. Specifically, the indication bit may be:

(1) an Update Type indication bit. The first network element on the network side sets the Update Type indication bit to "Pre-registration" or "Optimized Handover";

(2) a Cause value. The first network element on the network side sets the Cause value to "Pre-registration", "Optimized Handover" or "Resource not Release"; or

(3) a Pre-registration Indication, or Optimized Handover Indication, or Resource not Release Indication.

16. If the interface protocol between the serving GW and the PDN GW is GTP, the serving GW sends an Update Bearer Request message to the PDN GW. If the interface protocol between the serving GW and the PDN GW is PMIP, the serving GW sends a Proxy BU message to the PDN GW. The serving GW adds an indication bit in the Update Bearer Request message or the Proxy BU message to indicate the PDN GW not to initiate a resource release procedure to release the resource used by the UE in the source non-3GPP AN. This indication bit may be: Optimized Handover Indication, Pre-registration Indication, or Resource not Release Indication. Specifically, the indication bit may be:

(1) an Update Type indication bit, or a Binding Type indication bit. The serving GW sets the Update Type indication bit or the Binding Type indication bit to "Pre-registration" or "Optimized Handover";

(2) a Cause value. The serving GW sets the Cause value to "Pre-registration", "Optimized Handover", or "Resource not Release"; or

(3) a Pre-registration Indication, or Optimized Handover Indication, or Resource not Release Indication.

After receiving the foregoing message, the PDN GW does not initiate the resource release procedure to release the resource used by the UE in the source non-3GPP AN (namely, the resource release procedure to release the resource used by the UE in the source non-3GPP AN is not triggered by the PDN GW). The PDN GW returns an Update Bearer Response message or a Proxy BA message to the serving GW.

17. The serving GW returns an Update Bearer Response message to the first network element of the 3GPP network.

18. After receiving the Relocation Complete message from the eNodeB, the first network element of the 3GPP network returns an HO Complete message to the non-3GPP access network element or the non-3GPP GW.

19. After receiving the HO Complete message from the first network element of the 3GPP network, the non-3GPP access network element or the non-3GPP GW initiates a resource release procedure to release the resource in the source non-3GPP AN.

Note:

1. In this embodiment, step 6 may occur before, during or after step 9; and

2. This embodiment does not limit the message in step 9 and step 11. For example, for the HRPD network, the message in step 11 may also be an A11-Registration Request message.

Embodiment 12

[0070] When the UE hands over from a 3GPP network to a non-3GPP network in the active mode, the network element in the non-3GPP network obtains the handover processing type. If determining that the handover processing type is handover in the active mode, the network element in the non-3GPP network creates access network resource and a data forwarding resource, and notifies the PDN GW not to initiate resource release procedure to release the resource on the source side. As shown in FIG. 18, the process includes the following steps:

1. The UE accesses the 3GPP network through the serving GW and the PDN GW.

2. Through the 3GPP network, the UE performs the Attach procedure and the authentication procedure which are specific to the non-3GPP network.

3. Through the 3GPP network, the UE triggers a layer-3 Attach procedure in the non-3GPP network. The access network (for example, RNC in the HRPD network) or the

non-3GPP GW (for example, PDSN in the HRPD network) in the non-3GPP network obtains the handover processing type information. The access network or the non-3GPP GW in the non-3GPP network obtains the handover processing type information in one of the following ways:

(1) The UE reports the processing type information: The message of the layer-3 Attach procedure sent by the UE to the access network or the non-3GPP GW in the non-3GPP network indicates whether the procedure is handover in the idle state or handover in the active state. The specific mode of notifying the processing type may be:

✓ The UE adds an Attach Type IE in the message of the layer-3 Attach procedure sent to the access network or the non-3GPP GW in the non-3GPP network, and this IE indicates the handover processing type. Different values of the Attach Type indicate different processing types:

0 indicates Idle Mode Handover (handover UE in the idle mode); or

1 indicates Active Mode Handover (handover in the active mode); or

For optimized handover or pre-registration in the active state, the UE sets the Attach Type IE in the message of the layer-3 Attach procedure to "Optimized Handover", or "Pre-registration", or "Handover". After receiving the Attach Type, the access network or the non-3GPP GW in the non-3GPP network believes that the layer-3 Attach procedure is handover of the UE in the active state by default.

✓ The UE adds a Cause IE in the message of the layer-3 Attach procedure to indicate the cause for the message of the layer-3 Attach procedure. The UE may set the following Cause values:

Idle Mode Handover: This cause value indicates that the message of the layer-3 Attach procedure is caused by handover in the idle state; or

Active Mode Handover: This cause value indicates that the message of the layer-3 Attach procedure is caused by handover in the active state.

✓ The UE adds a "UE State" IE in the message of the layer-3 Attach procedure message to report the state of the UE. According to the state of the UE, the access network or the non-3GPP GW in the non-3GPP network knows whether the UE hands over in the idle state or in the active state. The UE may set the following UE State values:

0: indicates that the UE is in the idle state; or

1: indicates that the UE is in the active state.

✓ When the UE hands over in the active state, the UE adds an "active flag" IE in the message of the layer-3 Attach procedure message to indicate the need of creating bearer on the

access network side; and when the UE hands over in the idle state, the UE adds no "active flag" IE in the message of the layer-3 Attach procedure message to indicate no need of creating bearer on the access network side. Alternatively, when the UE hands over in the active state, the UE sets the "active flag" IE to "True(1)" to indicate the need of creating bearer on the access network side; and when the UE hands over in the idle state, the UE sets the "active flag" IE to "False(0)" to indicate no need of creating bearer on the access network side.

✓ When the UE hands over in the idle state, the UE adds a "Non-active flag" IE in the message of the layer-3 Attach procedure message to indicate no need of creating bearer on the access network side; and when the UE hands over in the active state, the UE adds no "Non-active flag" IE in the message of the layer-3 Attach procedure message to indicate the need of creating bearer on the access network side. Alternatively, when the UE hands over in the idle state, the UE sets the "Non-active flag" IE to "True(1)" to indicate no need of creating bearer on the access network side; and when the UE hands over in the active state, the UE sets the "Non-active flag" IE to "False(0)" to indicate the need of creating bearer on the access network side.

(2) The first network element of the 3GPP network reports the processing type: The interface message sent by the first network element of the 3GPP network to the access network or the non-3GPP GW in the non-3GPP network indicates whether the layer-3 Attach procedure is handover in the idle state or handover in the active state. The specific mode of notifying the processing type may be:

✓ The first network element of the 3GPP network adds an Attach Type IE in the interface message sent to the access network or the non-3GPP GW in the non-3GPP network. This IE indicates the handover processing type. Different values of the Attach Type indicate different processing types:

0 indicates Idle Mode Handover (handover in the idle mode); or

1 indicates Active Mode Handover (handover in the active mode).

For optimized handover or pre-registration of the UE in the active state, the first network element of the 3GPP network sets the Attach Type IE to "Optimized Handover", or "Pre-registration", or "Handover". After receiving the Attach Type, the access network or the non-3GPP GW in the non-3GPP network believes that the layer-3 Attach procedure is handover in the active state by default.

✓ The first network element of the 3GPP network adds a Cause IE in the interface message sent to the access network or the non-3GPP GW in the non-3GPP network to indicate the cause for the layer-3 Attach procedure message. The first network element of the 3GPP

network may set the following Cause values:

Idle Mode Handover: This cause value indicates that the message of the layer-3 Attach procedure is caused by handover in the idle state; or

Active Mode Handover: This cause value indicates that the message of the layer-3 Attach procedure is caused by handover in the active state.

✓ The first network element of the 3GPP network adds a UE State" IE in the interface message sent to the access network or the non-3GPP GW in the non-3GPP network to report the UE state. According to the state of the UE, the access network or the non-3GPP GW in the non-3GPP network knows whether the UE hands over in the idle state or in the active state. The UE may set the following UE State values:

0: indicates that the UE is in the idle state; or

1: indicates that the UE is in the active state.

✓ When the UE hands over in the active state, the first network element of the 3GPP network adds an "active flag" IE in the interface message sent to the access network or the non-3GPP GW in the non-3GPP network to indicate the need of creating bearer on the access network side. When the UE hands over in the idle state, the first network element of the 3GPP network adds no "active flag" IE in the interface message sent to the access network or the non-3GPP GW in the non-3GPP network to indicate no need of creating bearer on the access network side.

✓ When the UE hands over in the idle state, the first network element of the 3GPP network adds a "Non-active flag" IE in the interface message sent to the access network or the non-3GPP GW in the non-3GPP network to indicate no need of creating bearer on the access network side. When the UE hands over in the active state, the first network element of the 3GPP network adds no "Non-active flag" IE in the interface message sent to the access network or the non-3GPP GW in the non-3GPP network to indicate the need of creating bearer on the access network side.

It is worthy of attention that:

The access network or the non-3GPP GW in the non-3GPP network may also obtain the handover processing type information in step 2. The specific processing mode is the same as that in step 3.

4. If finding that the UE hands over in the active state, the non-3GPP AN sends a Create Forwarding Tunnels Request message to the non-3GPP GW to request data forwarding resources.

5. The non-3GPP GW returns a Create Forwarding Tunnels Response message to the

non-3GPP AN. The message includes the data forwarding tunnel information (for example, for the HRPD network, the data forwarding tunnel information is a PDSN address and a PDSN GRE key) of the non-3GPP GW.

6. If finding that the UE hands over in the active state, the non-3GPP GW sends a Create Resource Request message to the non-3GPP access network element, requesting to create resource on the access network side. The non-3GPP access network element allocates the resource on the access network side, and returns a Create Resource Response message to the non-3GPP GW.

7. If finding that the UE hands over in the active state, the non-3GPP access network element or the non-3GPP GW sends an HO Command message to the first network element of the 3GPP network. The message includes the data forwarding tunneling information of the non-3GPP GW.

8. After receiving the HO Command, the first network element of the 3GPP network sends a Create Forwarding Tunnels Request message to the serving GW, requesting the serving GW to create data forwarding tunnel. The message includes the data forwarding tunnel information of the non-3GPP GW. The serving GW creates data forwarding tunnel, and returns a Create Forwarding Tunnels Response message to the first network element of the 3GPP network.

9. The first network element of the 3GPP network sends a Relocation Command message to the 3GPP access network element.

The 3GPP access network element forwards the received downlink data packet to the serving GW, and the serving GW forwards the received packet to the non-3GPP GW.

10. The 3GPP AN sends an HO Command message to the UE, requesting the UE to hand over to the non-3GPP network.

11. The UE hands over to the non-3GPP network, and sends an access message to notify the network element in the non-3GPP network that the UE has handed over to the non-3GPP network. The specific access message depends on the non-3GPP network. For example, for an HRPD network, the access message is HRPD Traffic Channel Complete (TCC) message.

12. If the interface protocol between the non-3GPP GW and the PDN GW is PMIP, the non-3GPP GW sends a Proxy BU message to the PDN GW. If finding that the UE hands over in the active state, the non-3GPP GW adds an indication bit in the Proxy BU message to indicate the PDN GW not to initiate a resource release procedure to release the resource used by the UE in the source 3GPP network. This indication bit may be: Optimized Handover Indication, Pre-registration Indication, or Resource not Release Indication. The specific processing mode of

the indication bit is the same as that in the 11th embodiment.

After receiving the foregoing message, the PDN GW does not initiate the resource release procedure to release the resource used by the UE in the source 3GPP AN (namely, the resource release procedure to release the resource used by the UE in the source 3GPP AN is not triggered by the PDN GW). The PDN GW returns a Proxy BA message to the non-3GPP GW.

13. If the interface protocol between the UE and the PDN GW is host-based mobility protocol such as Dual Stack MIPv6 (DSMIPv6), the UE sends a Binding Update (BU) message to the PDN GW. If finding that the UE hands over in the active state, the UE adds an indication bit in the BU message to indicate the PDN GW not to initiate a resource release procedure to release the resource used by the UE in the source 3GPP AN. This indication bit may be: Optimized Handover Indication, Pre-registration Indication, or Resource not Release Indication. The specific processing mode of the indication bit is the same as that in the 11th embodiment.

After receiving the foregoing message, the PDN GW does not initiate the resource release procedure to release the resource used by the UE in the source 3GPP AN (namely, the resource release procedure to release the resource used by the UE in the source 3GPP AN is not triggered by the PDN GW). The PDN GW returns a Binding Ack (BA) message to the UE.

14. The non-3GPP access network element or the non-3GPP GW sends an HO Complete message to the first network element of the 3GPP network.

15. After receiving the HO Complete message, the first network element of the 3GPP network initiates the resource release procedure to release the resource used by the UE in the source 3GPP network.

It is worthy of attention that:

This embodiment does not limit the message in step 5 and step 8. For example, for the HRPD network, the message in step 5 may also be an A11-Registration Request message.

Embodiment 13

[0071] The method of notifying the handover processing type is also applicable to the normal handover from a 3GPP network to a non-3GPP network. Through an Access message of the non-3GPP network, the UE notifies the handover processing type information to the non-3GPP GW. According to the handover processing type, the non-3GPP GW decides whether to notify the access network to create the resource on the access network side. As shown in FIG. 19, the process includes the following steps:

1. The UE accesses the 3GPP network through the serving GW and the PDN GW.

2. The UE hands over to the non-3GPP network, and performs the Attach procedure and

the authentication procedure which are specific to the non-3GPP network.

3. Through the access network element of the non-3GPP network, the UE triggers a layer-3 Attach procedure in the non-3GPP network. The non-3GPP GW (such as the PDSN in the HRPD network) obtains the handover processing type information. The non-3GPP GW may obtain the processing type information in the following way:

The UE reports the processing type information: The message of the layer-3 Attach procedure sent by the UE to the non-3GPP GW indicates whether the procedure is handover in the idle state or handover in the active state. The specific mode of notifying the processing type information is the same as that in the 6th embodiment.

It is worthy of attention that:

The non-3GPP GW may also obtain the handover processing type information in step 2. The specific processing mode is the same as that in step 3.

4. If finding that the UE hands over in the active state, the non-3GPP GW sends a Create Resource Request message to the non-3GPP access network element, requesting to create resource on the access network side. The non-3GPP access network element allocates the resource on the access network side, and returns a Create Resource Response message to the non-3GPP GW.

5. If the interface protocol between the non-3GPP GW and the PDN GW is PMIP, the non-3GPP GW sends a Proxy BU message to the PDN GW. The PDN GW returns a Proxy BA message to the non-3GPP GW.

6. If the interface protocol between the UE and the PDN GW is Client Mobile Internet Protocol (CMIP), the UE sends a BU message to the PDN GW. The PDN GW returns a BA message to the UE.

7. The non-3GPP GW returns a layer-3 Attach Complete message to the UE.

[0072] To sum up, through the embodiments of the present invention, the network-side network element can perform discriminative processing after obtaining the UE registration processing type information, thus overcoming the inability of processing discriminatively according to different registration procedures in the prior art.

[0073] It is apparent that those skilled in the art can make modifications and variations to the present invention without departing from the spirit and scope of the present invention. The present invention is intended to cover the modifications and variations provided that they fall in the scope of protection defined by the following claims or their equivalents.

CLAIMS

What is claimed is:

1. A registration processing method, comprising:

receiving registration processing type information reported by a User Equipment, UE; and

identifying a processing type of the registration according to the processing type information.

2. The method of claim 1, wherein the registration processing type information reported by a User Equipment is a handover registration processing type when the UE finds that the registration is caused by handover to a different network or by a need of handover to a different network..

3. The method of claim 1, wherein the UE may report the processing type information in one of the following:

an Attach Request message sent by the UE to the network in the process of registering the UE into the network includes the registration processing type information;

the Attach Request message sent by the UE to the network in the process of registering the UE into the network includes an indication bit IE which indicates the handover registration processing type;

the Attach Request message sent by the UE to the network in the process of registering the UE into the network includes the indication bit IE which indicates an idle-mode handover registration processing type;

the Attach Request message sent by the UE to the network in the process of registering the UE into the network includes the indication bit IE which indicates an active-mode handover registration processing type;

a Tracking Area Update, TAU, Request message sent by the UE to the network in the process of registering the UE into the network includes the registration processing type information;

the TAU Request message sent by the UE to the network in the process of registering the UE into the network includes the indication bit IE which indicates the handover registration processing type;

a Routing Area Update, RAU, Request message sent by the UE to the network in the process of registering the UE into the network includes the registration processing type information;

the RAU Request message sent by the UE to the network in the process of registering the UE into the network includes the indication bit IE which indicates the handover registration

processing type;

an Access Request message sent by the UE to the network in the process of registering the UE into the network includes the registration processing type information;

the Access Request message sent by the UE to the network in the process of registering the UE into the network includes the indication bit IE which indicates the handover registration processing type;

a message sent by the UE to the network in the process of access authentication or authentication includes the registration processing type information;

the message sent by the UE to the network in the process of access authentication or authentication includes the indication bit IE which indicates the handover registration processing type;

the message sent by the UE to the network in the process of setting up an Internet Key Exchange Protocol Version 2, IKEv2, or IP Security Protocol Security Association, IPsec SA, includes the registration processing type information; and

the message sent by the UE to the network in the process of setting up an IKEv2 or IPsec SA includes the indication bit IE which indicates the handover registration processing type.

4. The method of claim 1, wherein the identifying the registration processing type according to the processing type information comprises:

notifying, by a network-side network element, the received registration processing type information to a Home Subscriber Server, HSS, or an Authentication Authorization Accounting, AAA, server; and

identifying, by the HSS or the AAA server, the registration processing type according to the processing type information, and then performing proper operations.

5. The method of claim 4, wherein the network-side network element is a Mobility Management Entity, MME, or a Serving GPRS Supporting Node, SGSN; and the operations performed by the HSS or the AAA server after identifying the registration processing type according to the processing type information comprise:

notifying, by the HSS, the AAA server to cancel the registration of the UE in a non-3rd Generation Partnership Project, non-3GPP, network if the HSS finds that the registration processing type is initialization registration and the HSS stores a Packet Data Network Gateway, PDN GW, address used by the UE in the non-3GPP network after receiving the registration processing type information for the UE sent by the MME or the SGSN; and

notifying, by the AAA server, the non-3GPP network to release resource used by the UE in

the non-3GPP network.

6. The method of claim 4, wherein the network-side network element is a non-3rd Generation Partnership Project, 3GPP, Gateway, GW; and the operations performed by the HSS or the AAA server after identifying the registration processing type according to the processing type information comprise one of the following:

notifying, by the HSS, the AAA server to cancel the registration for the UE in a 3GPP network if the HSS finds that the registration processing type is initialization registration and the HSS stores a Packet Data Network, PDN, GW address used by the UE in the 3GPP network after receiving the registration processing type information for the UE sent by the non-3GPP GW, and notifying, by the AAA server, the PDN GW to release resource used by the UE in the 3GPP network;

sending, by the AAA server or the HSS, a Packet Data Network Gateway, PDN GW, address to the non-3GPP GW if the AAA server or the HSS finds that the registration processing type is handover registration and the AAA server or the HSS stores a PDN GW address used by the UE in a 3GPP network after receiving the registration processing type information for the UE sent by the non-3GPP GW;

notifying, by the AAA server, the HSS to cancel the registration for the UE in a 3GPP network if the AAA server finds that the registration processing type is initialization registration and the AAA server stores a Packet Data Network, PDN, GW address used by the UE in the 3GPP network after receiving the registration processing type information of the UE sent by the non-3GPP GW; and

notifying, by the HSS, the AAA server to cancel the registration for the UE in the 3GPP network if the HSS finds that the registration processing type is initialization registration and the HSS stores a PDN GW address used by the UE in the 3GPP network after receiving the registration processing type information for the UE sent by the non-3GPP GW, and notifying, by the HSS, a Mobility Management Entity, MME, or a Serving GPRS Supporting Node, SGSN, to release a resource used by the UE in the 3GPP network.

7. A handover processing method, comprising:

receiving an Access Request for a User Equipment, UE; and

identifying a handover processing type of the Access Request according to the Access Request for the UE.

8. The method of claim 7, further comprising one of the following:

notifying, by a Mobility Management Entity, MME, or a Serving GPRS Supporting Node,

SGSN, a Packet Data Network, PDN, Gateway, GW, to initiate a network-side bearer creation procedure to create bearer resource for the UE if the identified handover processing type is a handover registration processing type and a network-side network element is the MME or the SGSN; and

initiating, by a non-3rd Generation Partnership Project, 3GPP, Gateway, GW, a network-side bearer creation procedure to create bearer resource for the UE if the identified handover processing type is a handover registration processing type and a network-side network element is the non-3GPP GW.

9. The method of claim 7, further comprising:

setting up a data forwarding tunnel between a network element of a target network and a network element of a source network according to data forwarding tunnel resource information of the target network if the identified handover processing type is an active-mode handover registration processing type.

10. The method of claim 9, wherein if the target network is a 3rd Generation Partnership Project, 3GPP, network and the source network is a non-3GPP network, the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network comprises:

sending, by a first network element of the 3GPP network, the data forwarding tunnel resource information obtained from a serving Gateway, serving GW, to a non-3GPP GW either directly or through a non-3GPP access network element after receiving information about the active-mode handover registration processing type; and

creating, by the non-3GPP GW, the data forwarding tunnel with the serving GW.

11. The method of claim 9, wherein if the target network is a non-3rd Generation Partnership Project, 3GPP, network and the source network is a 3GPP network, the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network comprises:

sending, by an access network element or a non-3GPP Gateway, GW, of the non-3GPP network, the data forwarding tunnel resource information of the non-3GPP GW to a serving GW through a first network element of the 3GPP network after receiving information about the active-mode handover registration processing type; and

creating, by the serving GW, the data forwarding tunnel with the non-3GPP GW.

12. A registration processing method, comprising:

a User Equipment, UE, adapted to report information about a processing type of registering the UE into a network in the process of the registration; and

a network, adapted to identify the processing type of the registration according to the received registration processing type information reported by the UE.

13. The system of claim 12, wherein the reporting, by the UE, of the registration processing type information in the process of registering into the network comprises:

identifying, by the UE, the processing type of the registration in the process of registering into the network and then reporting the registration processing type information.

14. A User Equipment, UE, comprising:

an identifying unit, adapted to identify a type of registration when the UE initiates the registration;

a registration initiating unit, adapted to initiate the registration, and send a registration triggering signal; and

a reporting unit, adapted to receive the registration triggering signal from the registration initiating unit, and report processing type information in the process of registering the UE into a network, wherein the processing type information corresponds to the type of registration identified by the identifying unit.

15. The UE of claim 14, wherein the reporting unit reports in one of the following:

including the processing type information in a IE of an Attach Request message and reporting the message;

including the processing type information in a IE of a Tracking Area Update, TAU, Request message and reporting the message;

including the processing type information in a IE of a Routing Area Update, RAU, Request message and reporting the message;

including the processing type information in a IE of an Access Request message and reporting the message;

including the processing type information in a IE of an Access Authentication message or an Authentication message and reporting the message; or

including the processing type information in a IE of an Internet Key Exchange Protocol Version 2, IKEv2, or IP Security Protocol Security Association, IPsec SA, Setup request message and reporting the message.

16. A network-side network element, comprising:

an obtaining unit, adapted to obtain registration processing type information for a User Equipment, UE, in the process of registration; and

an identifying unit, adapted to identify a processing type of the registration according to the processing type information obtained by the obtaining unit.

17. The network element according to claim16, further comprising:

a first processing unit, adapted to initiate a network-side bearer creation procedure to create bearer resource for the UE after the identifying unit identifies that the processing type is a handover registration processing type.

ABSTRACT

A registration processing method, a handover processing method, a system, and an apparatus are disclosed herein to enable the network to distinguish between different registration processing types. The method includes: receiving information about a processing type of registering a UE into a network, where the information is reported by the UE in the process of the registration; and identifying the processing type of the registration according to the information about the processing type. The system includes: a UE, adapted to report information about the processing type of registering the UE into a network in the process of the registration; and a network, adapted to identify the processing type of the registration according to the received registration processing type information reported by the UE.

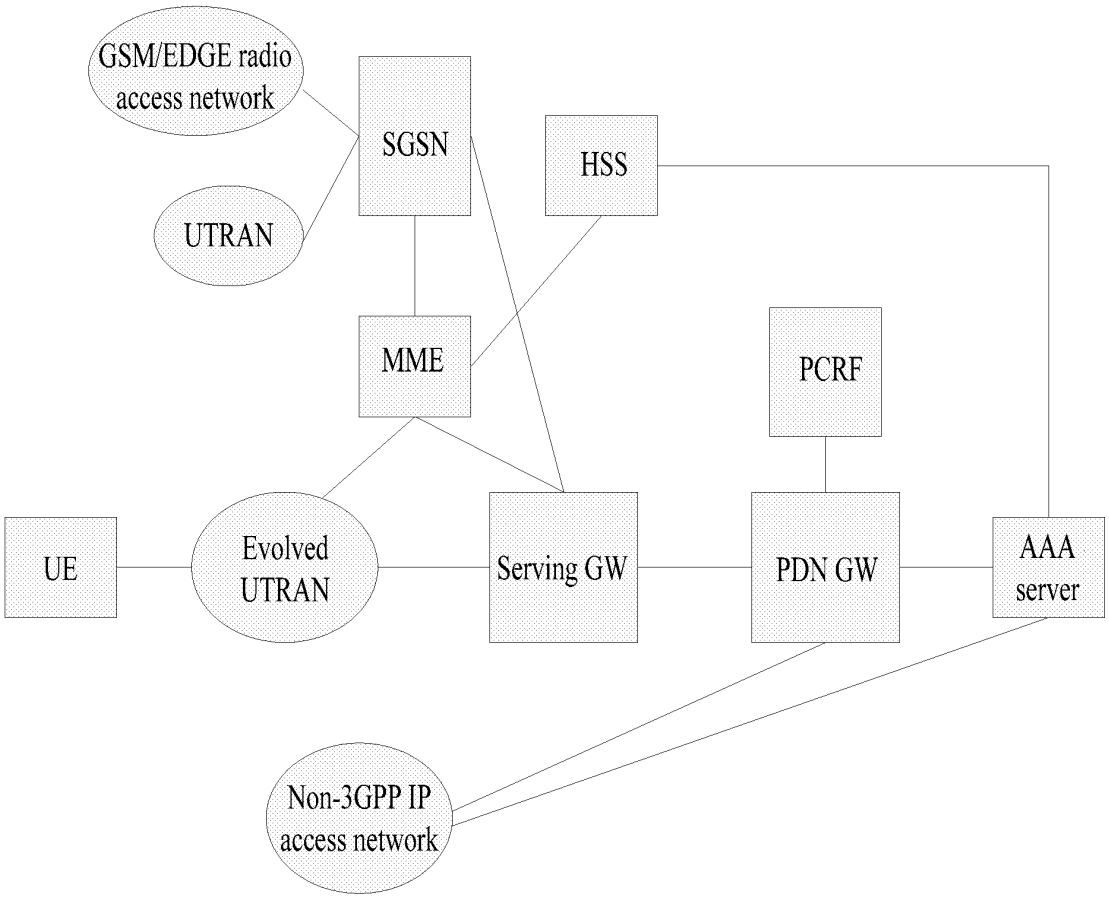
GSM/EDGE radio access network
SGSN
HSS
UTRAN
MME
PCRF
UE
Evolved UTRAN
Serving GW
PDN GW
AAA server
Non-3GPP IP access network

FIG. 1

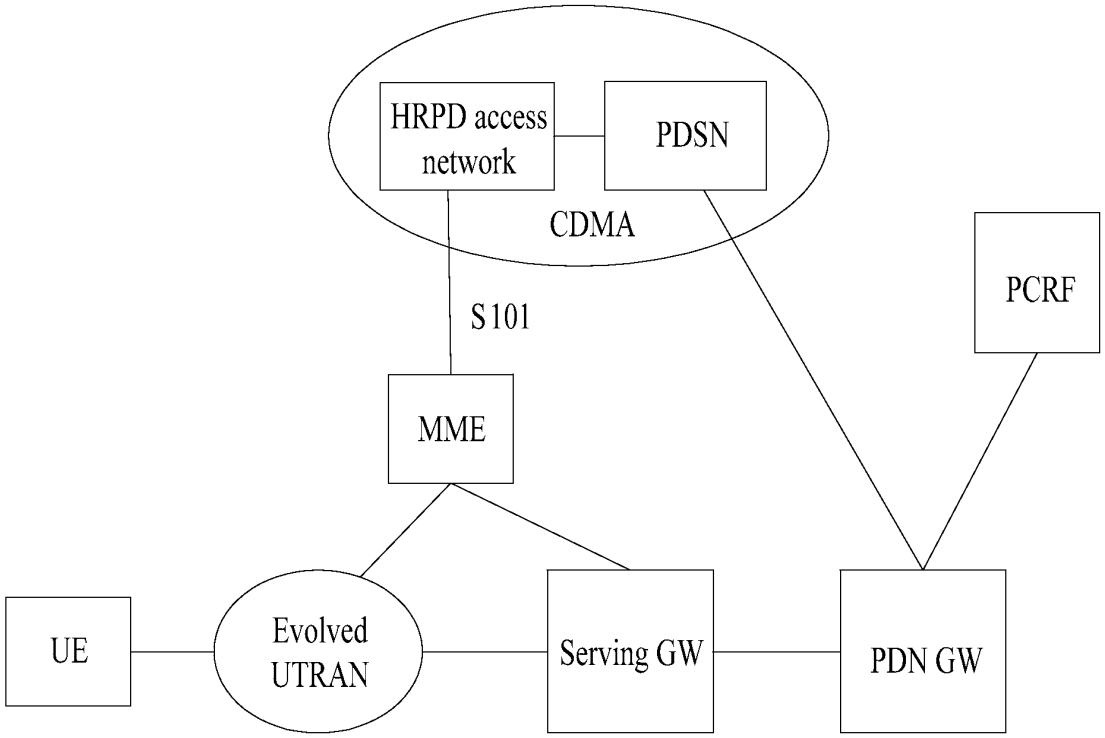
HRPD access network
PDSN
CDMA
PCRF
S101
MME
UE
Evolved UTRAN
Serving GW
PDN GW

FIG. 2

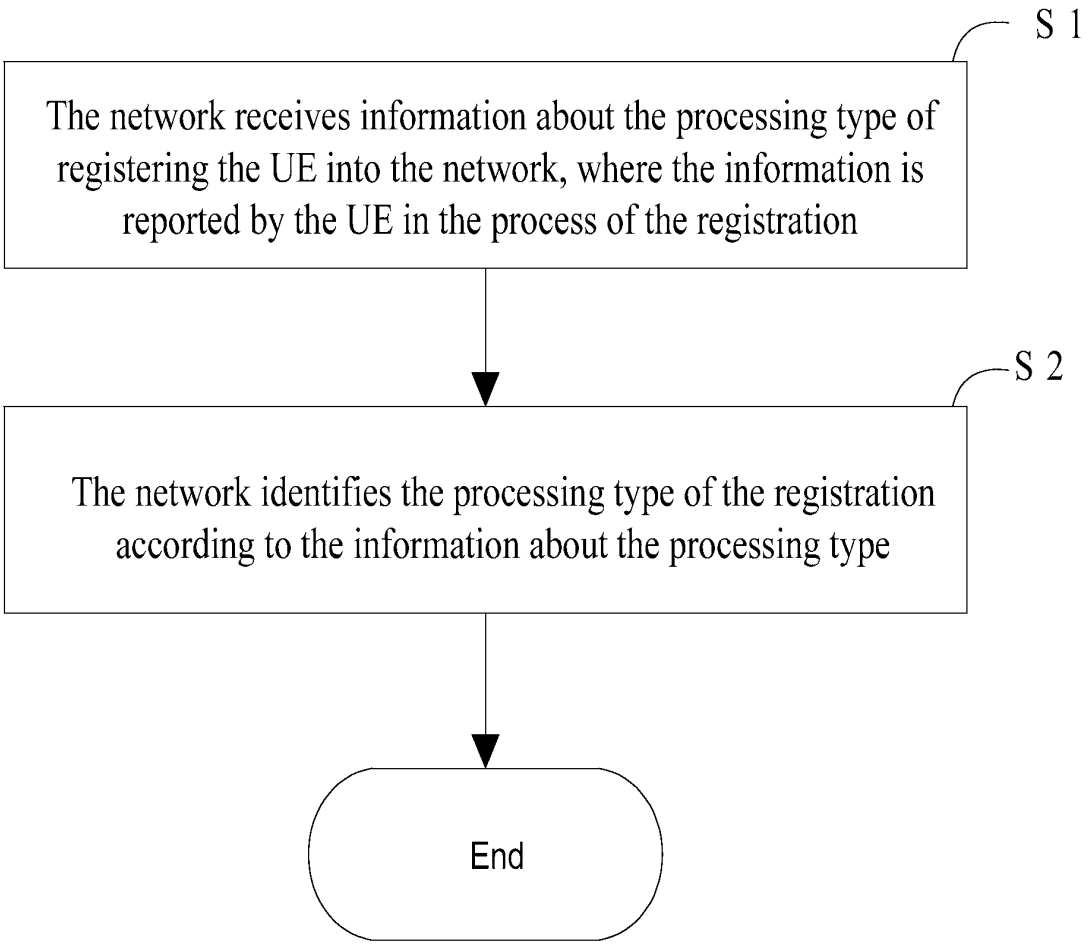
S 1
The network receives information about the processing type of registering the UE into the network, where the information is reported by the UE in the process of the registration
S 2
The network identifies the processing type of the registration according to the information about the processing type
End

FIG. 3

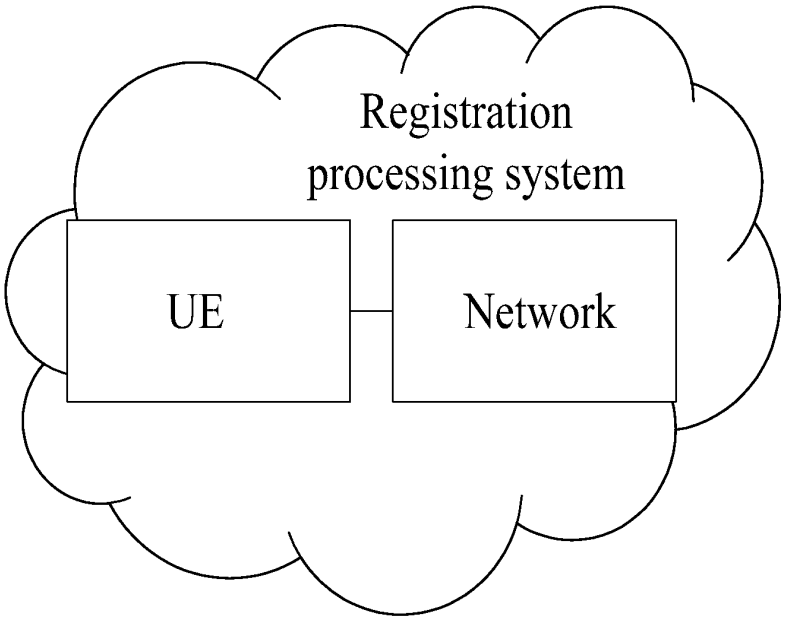
Registration
processing system
UE
Network

FIG. 4

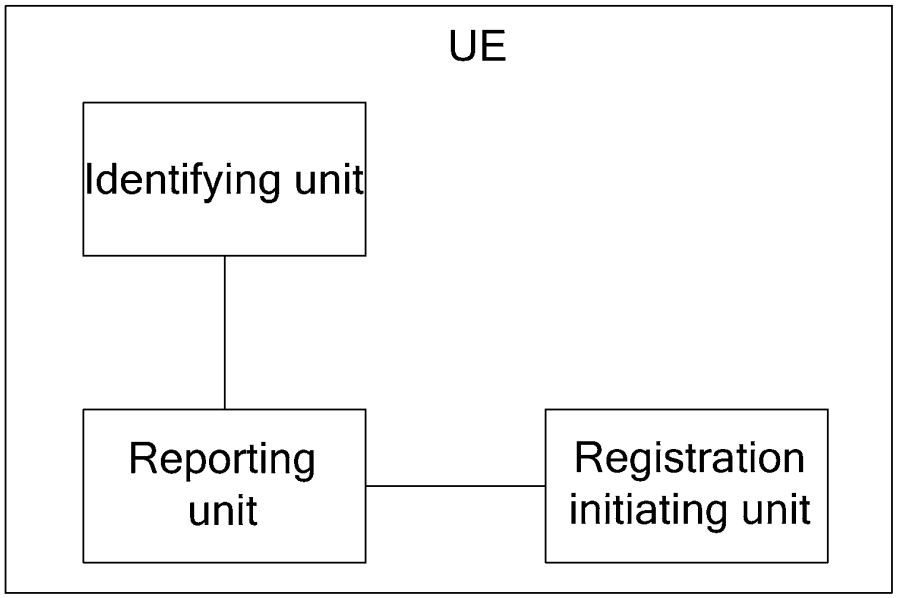
UE
Identifying unit
Reporting
unit
Registration
initiating unit

FIG. 5

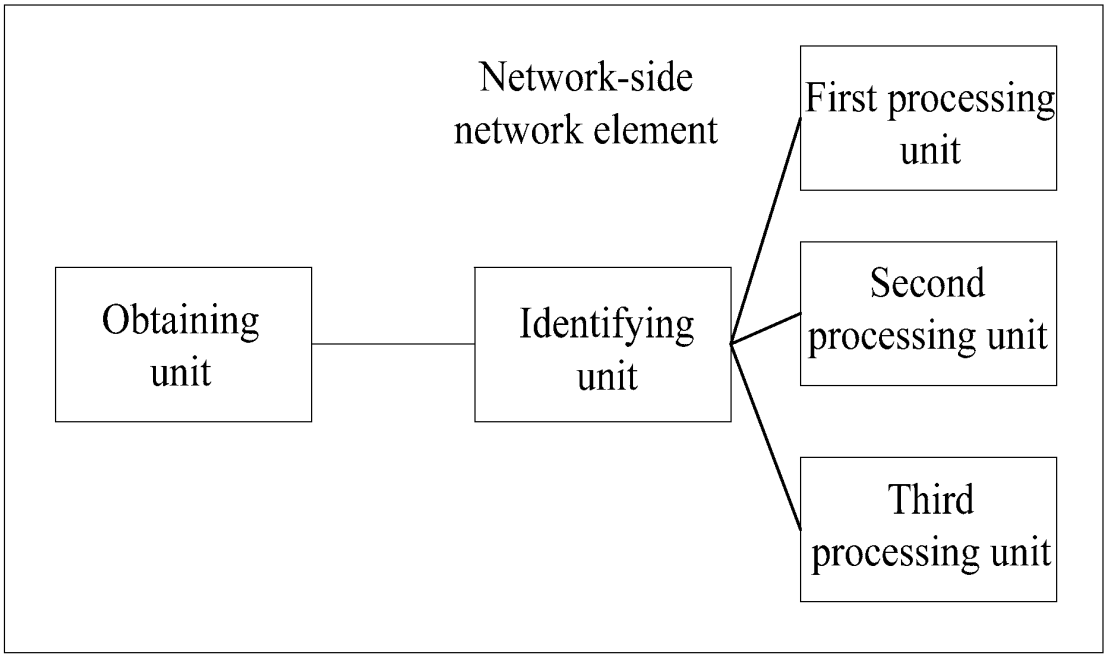
Network-side
network element
First processing
unit
Second
processing unit
Third
processing unit
Obtaining
unit
Identifying
unit

FIG. 6

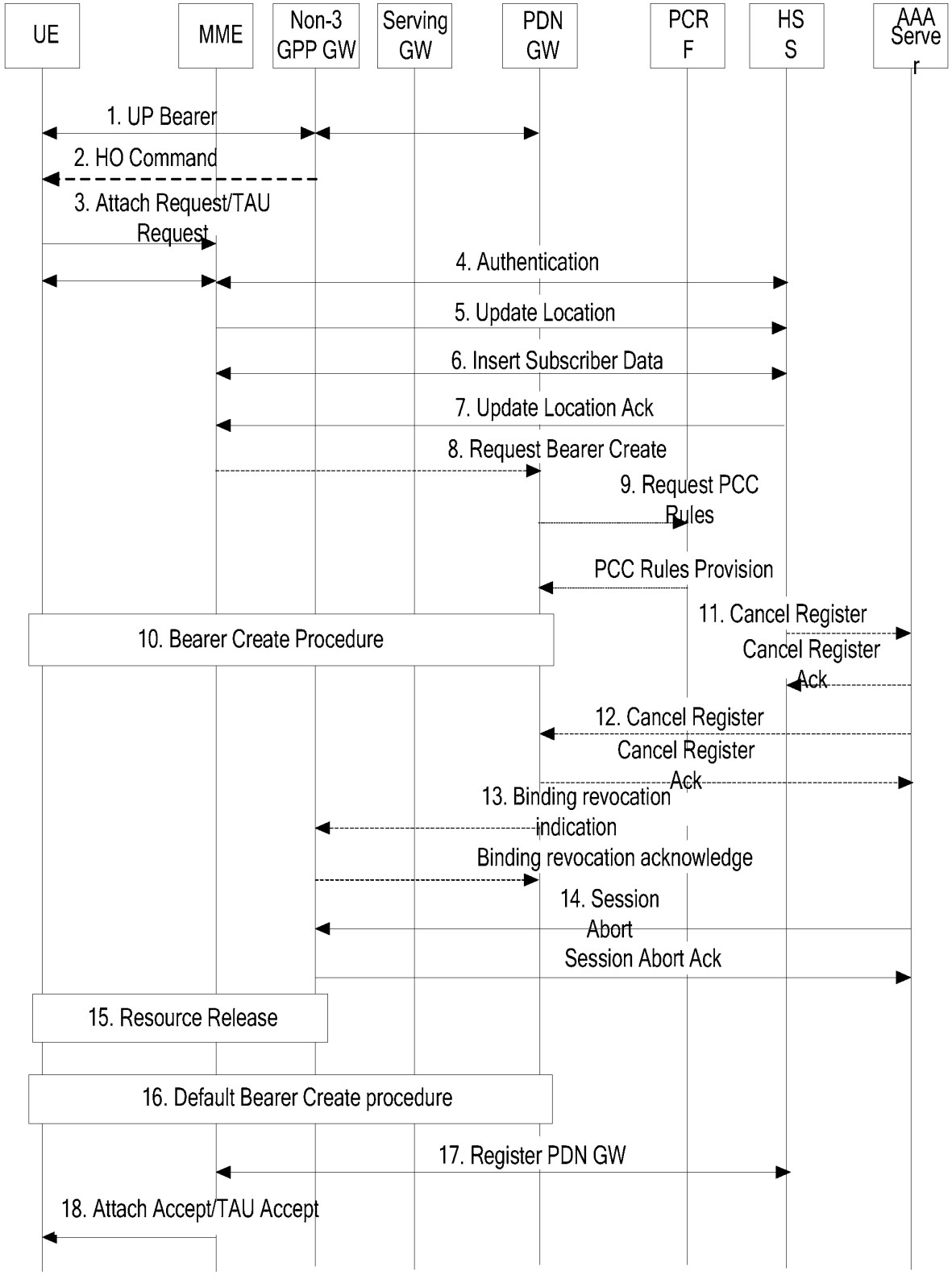

FIG. 7

4405294.1 0212577-US0

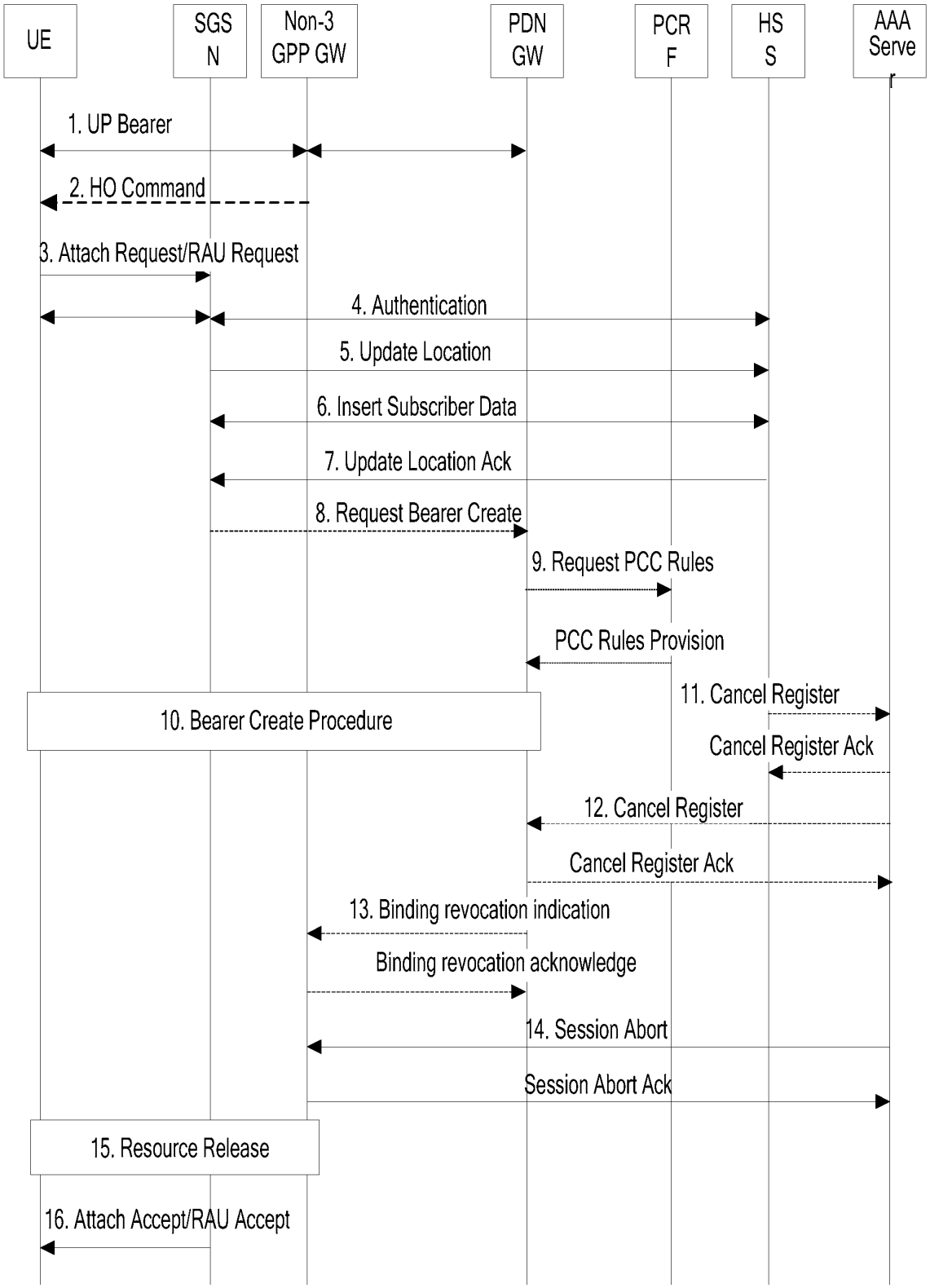

FIG. 8

4405294.1 0212577-US0

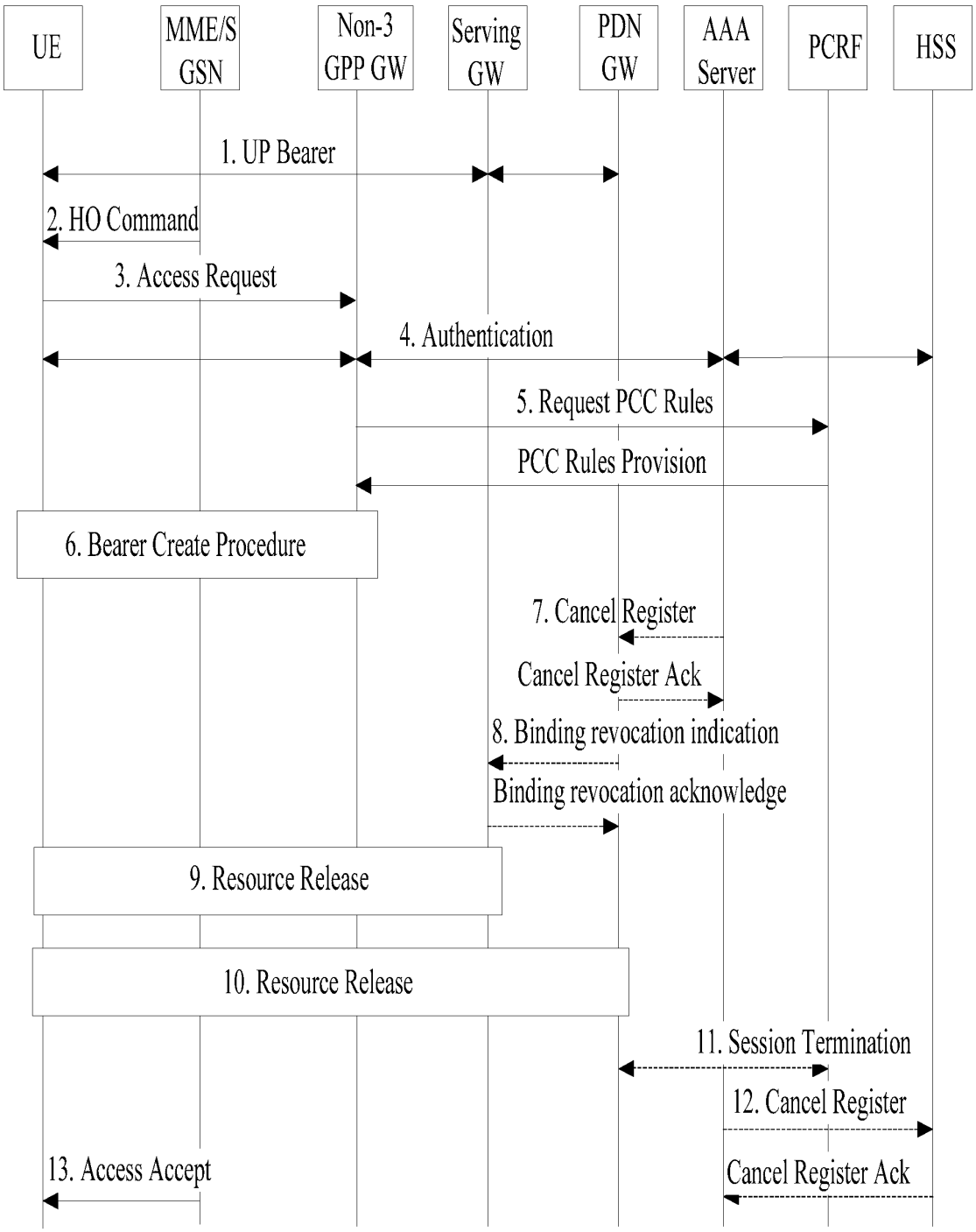
UE
MME/S GSN
Non-3 GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. UP Bearer
2. HO Command
3. Access Request
4. Authentication
5. Request PCC Rules
PCC Rules Provision
6. Bearer Create Procedure
7. Cancel Register
Cancel Register Ack
8. Binding revocation indication
Binding revocation acknowledge
9. Resource Release
10. Resource Release
11. Session Termination
12. Cancel Register
13. Access Accept
Cancel Register Ack

FIG. 9

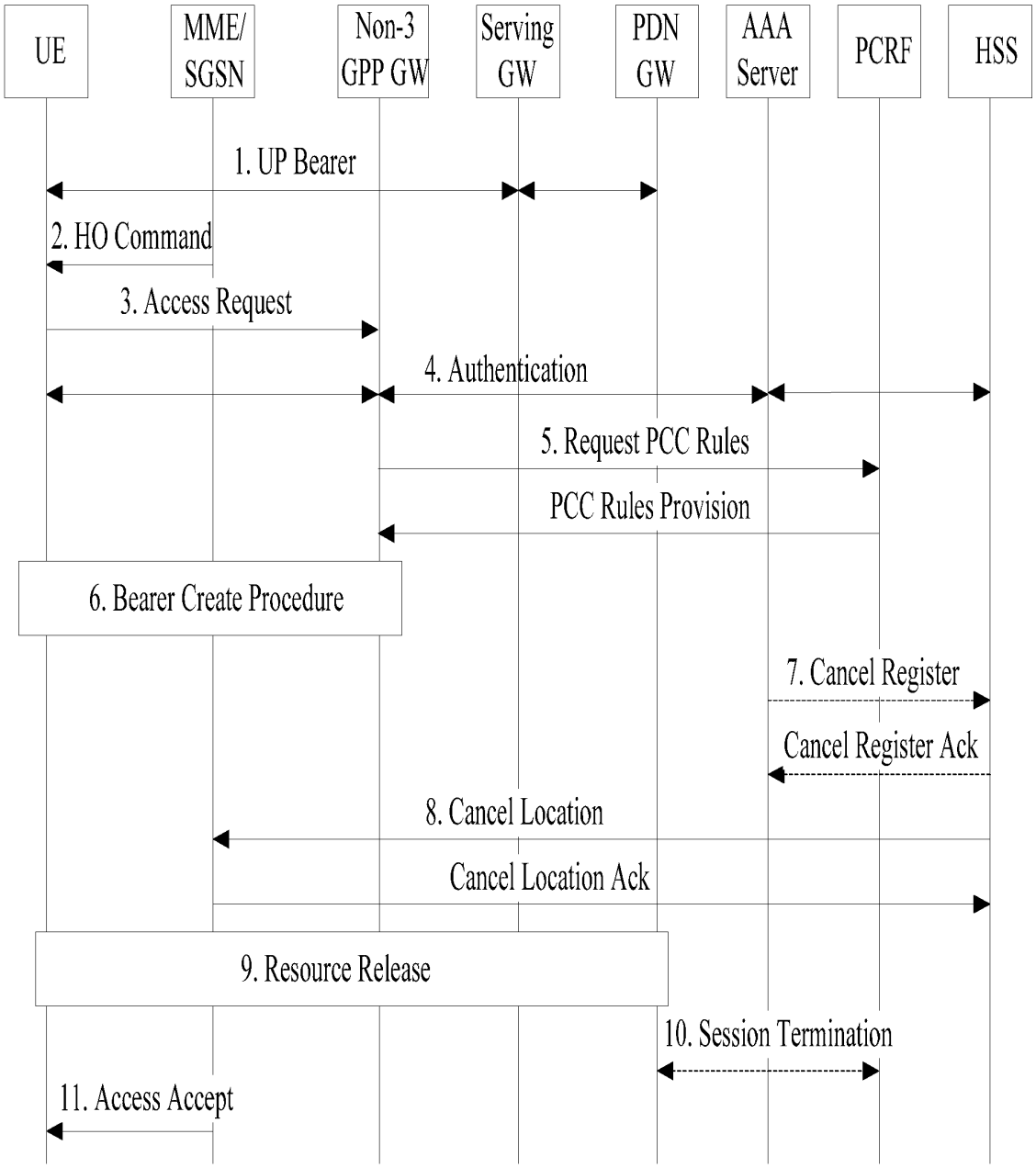
UE
MME/ SGSN
Non-3 GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. UP Bearer
2. HO Command
3. Access Request
4. Authentication
5. Request PCC Rules
PCC Rules Provision
6. Bearer Create Procedure
7. Cancel Register
Cancel Register Ack
8. Cancel Location
Cancel Location Ack
9. Resource Release
10. Session Termination
11. Access Accept

FIG. 10

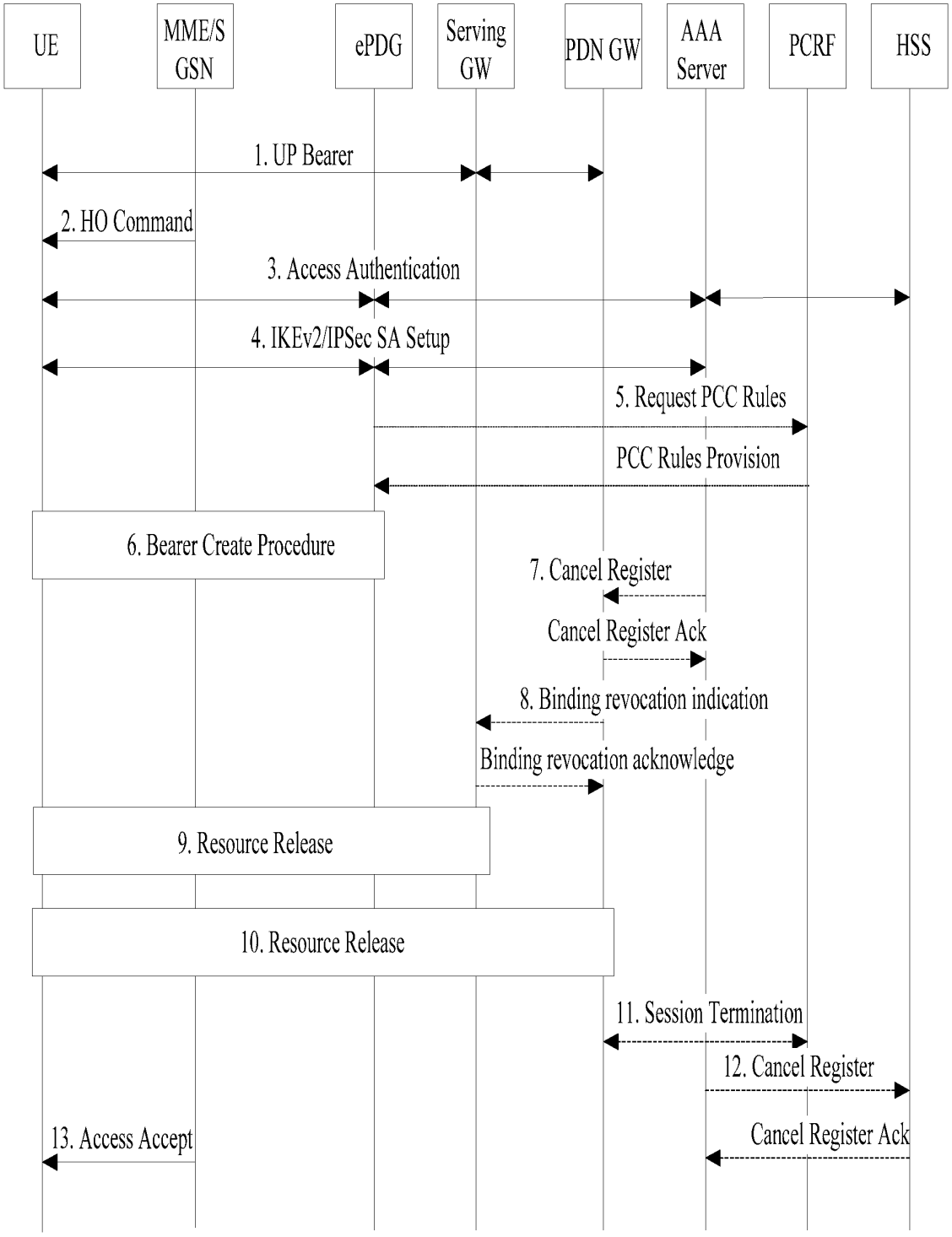
UE
MME/S GSN
ePDG
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. UP Bearer
2. HO Command
3. Access Authentication
4. IKEv2/IPSec SA Setup
5. Request PCC Rules
PCC Rules Provision
6. Bearer Create Procedure
7. Cancel Register
Cancel Register Ack
8. Binding revocation indication
Binding revocation acknowledge
9. Resource Release
10. Resource Release
11. Session Termination
12. Cancel Register
13. Access Accept
Cancel Register Ack

FIG. 11

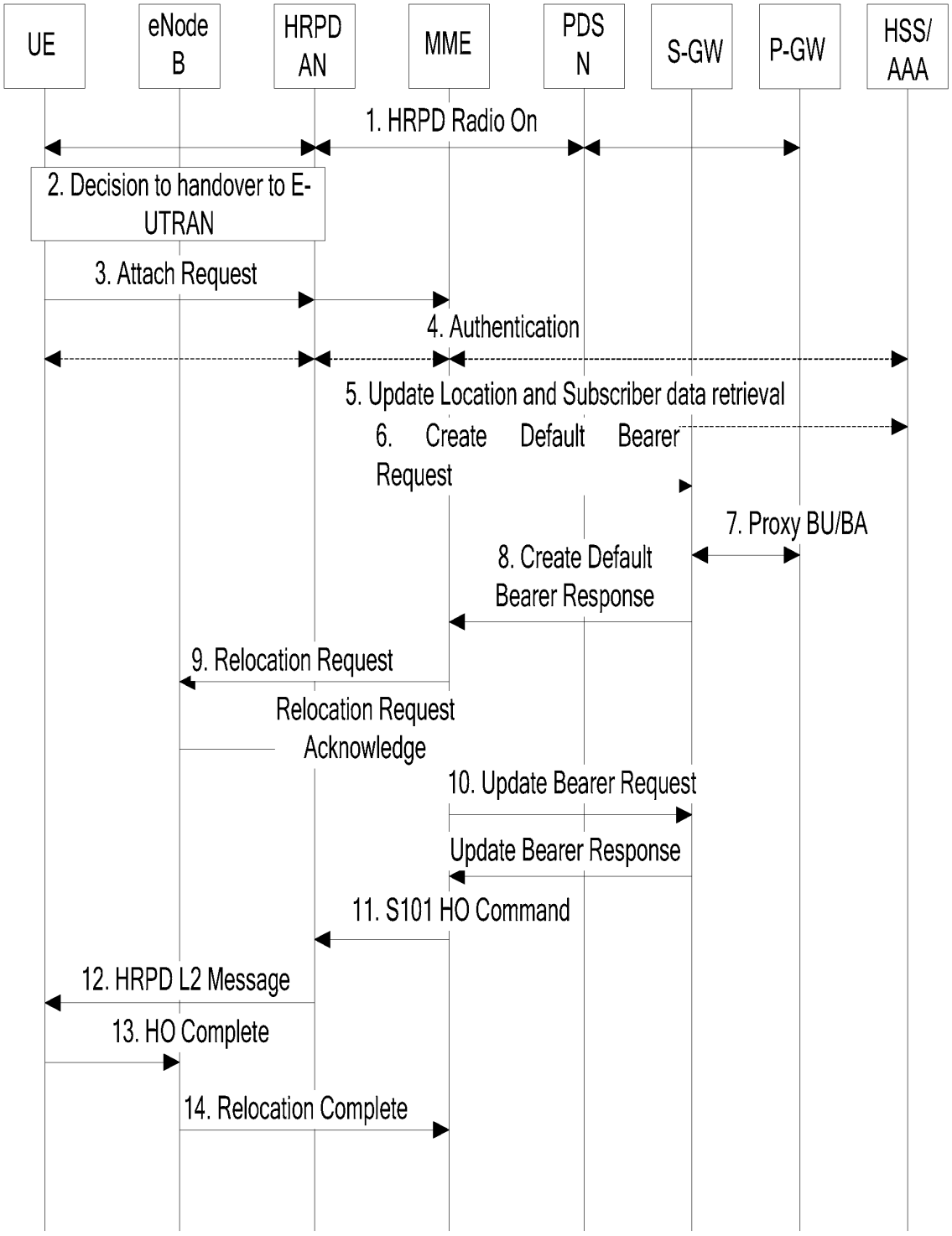
UE
eNode B
HRPD AN
MME
PDS N
S-GW
P-GW
HSS/ AAA
1. HRPD Radio On
2. Decision to handover to E-UTRAN
3. Attach Request
4. Authentication
5. Update Location and Subscriber data retrieval
6. Create Default Bearer Request
7. Proxy BU/BA
8. Create Default Bearer Response
9. Relocation Request
Relocation Request Acknowledge
10. Update Bearer Request
Update Bearer Response
11. S101 HO Command
12. HRPD L2 Message
13. HO Complete
14. Relocation Complete

FIG. 12

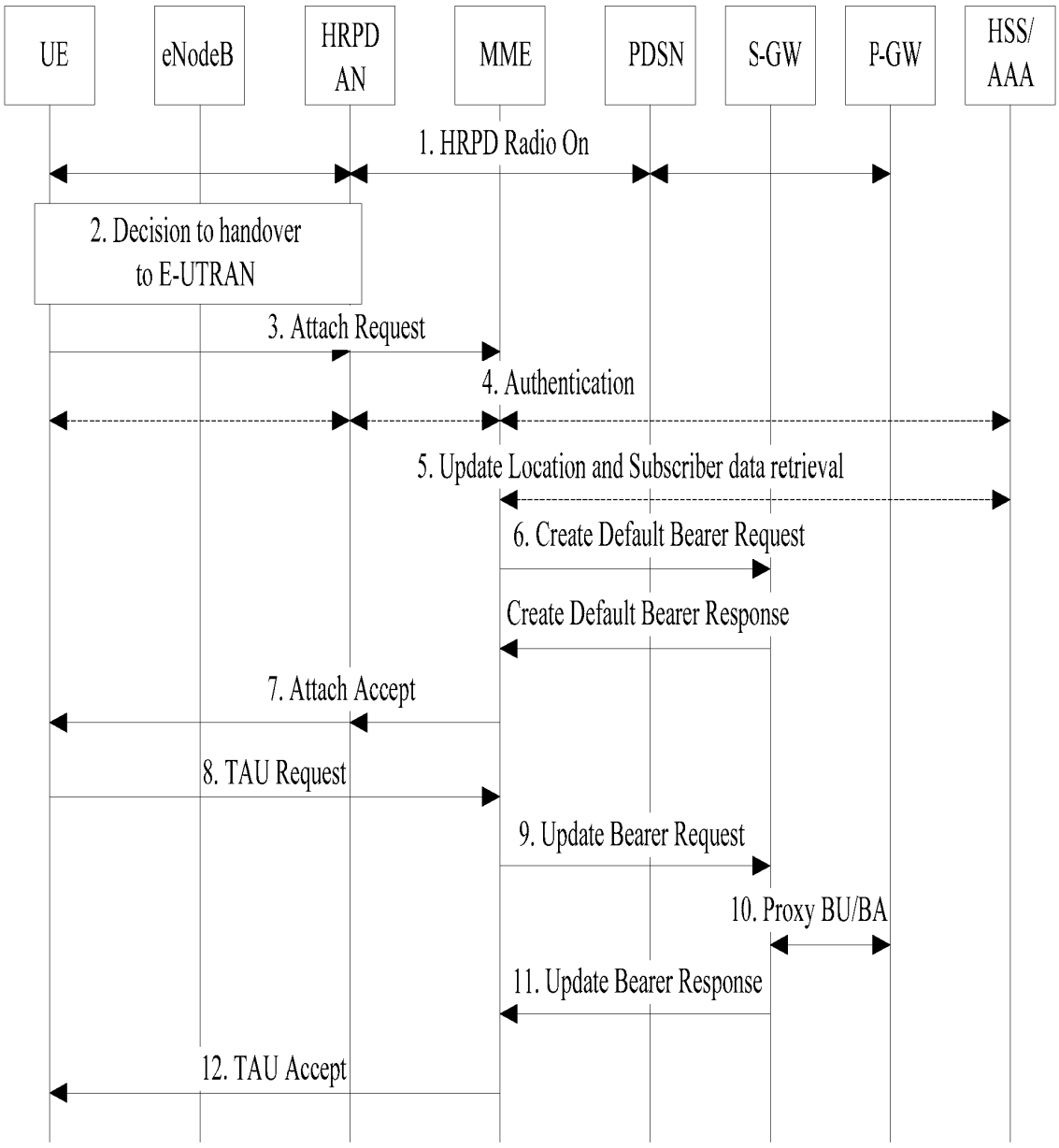
UE
eNodeB
HRPD AN
MME
PDSN
S-GW
P-GW
HSS/ AAA
1. HRPD Radio On
2. Decision to handover to E-UTRAN
3. Attach Request
4. Authentication
5. Update Location and Subscriber data retrieval
6. Create Default Bearer Request
Create Default Bearer Response
7. Attach Accept
8. TAU Request
9. Update Bearer Request
10. Proxy BU/BA
11. Update Bearer Response
12. TAU Accept

FIG. 13

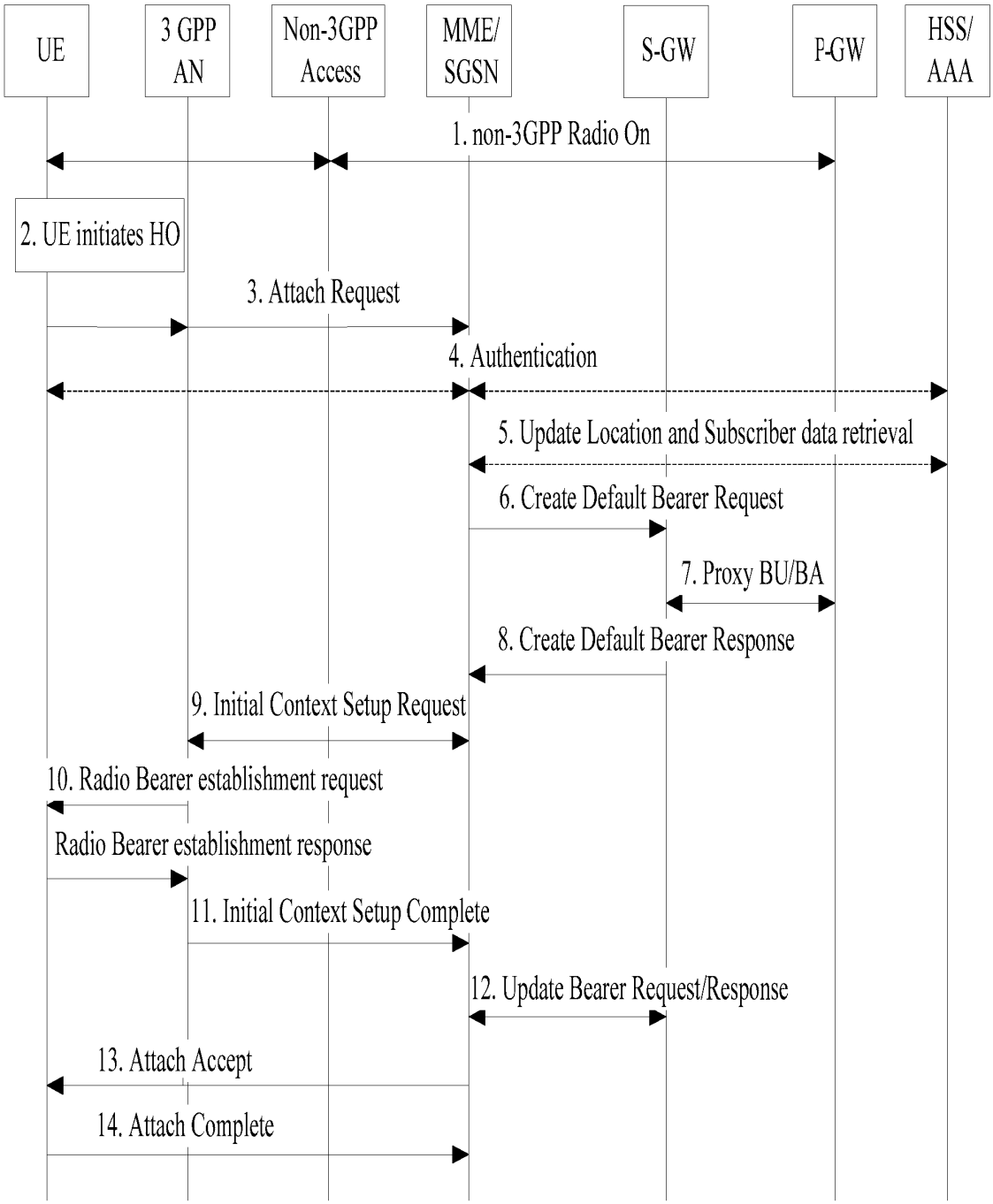
UE
3 GPP AN
Non-3GPP Access
MME/ SGSN
S-GW
P-GW
HSS/ AAA
1. non-3GPP Radio On
2. UE initiates HO
3. Attach Request
4. Authentication
5. Update Location and Subscriber data retrieval
6. Create Default Bearer Request
7. Proxy BU/BA
8. Create Default Bearer Response
9. Initial Context Setup Request
10. Radio Bearer establishment request
Radio Bearer establishment response
11. Initial Context Setup Complete
12. Update Bearer Request/Response
13. Attach Accept
14. Attach Complete

FIG. 14

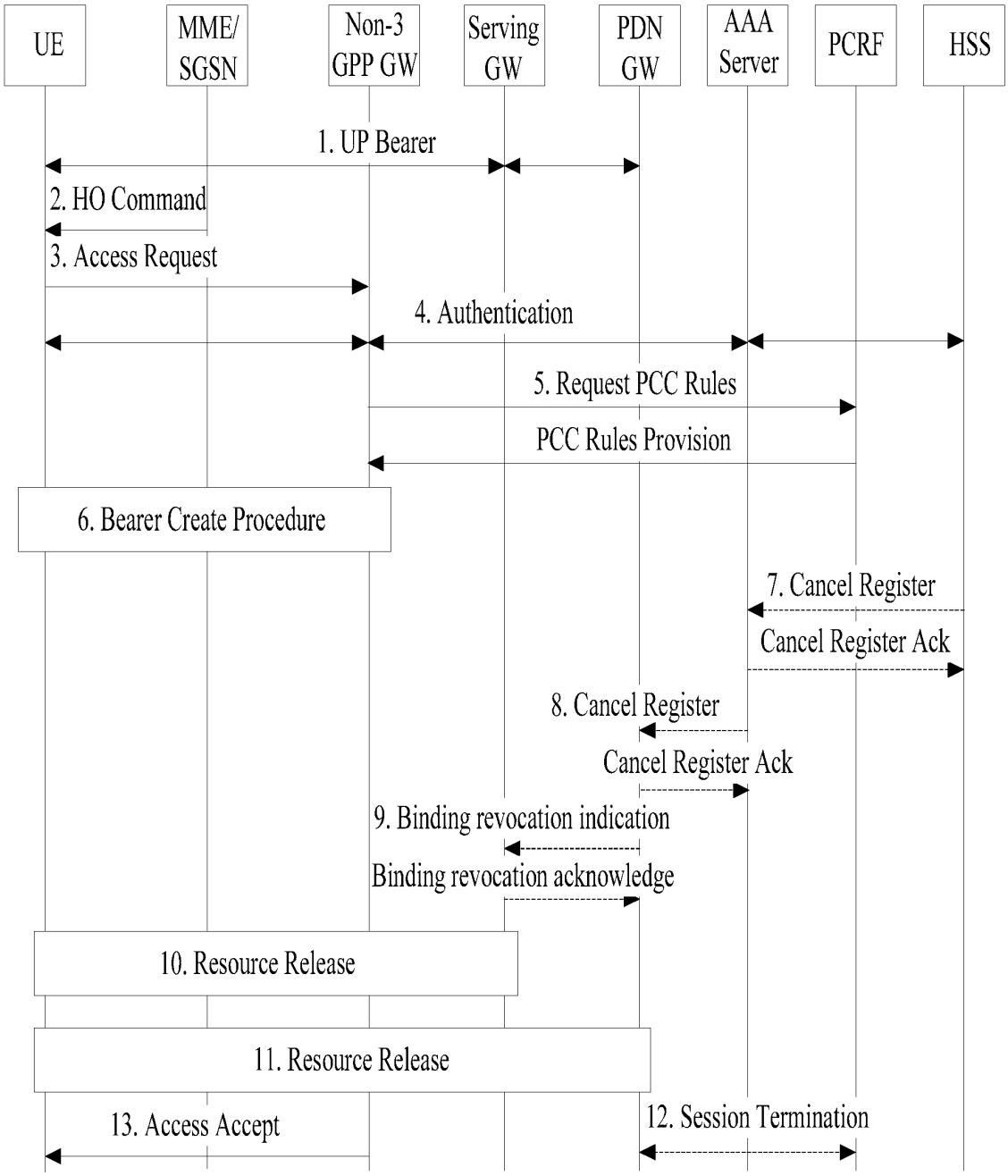
UE
MME/ SGSN
Non-3 GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. UP Bearer
2. HO Command
3. Access Request
4. Authentication
5. Request PCC Rules
PCC Rules Provision
6. Bearer Create Procedure
7. Cancel Register
Cancel Register Ack
8. Cancel Register
Cancel Register Ack
9. Binding revocation indication
Binding revocation acknowledge
10. Resource Release
11. Resource Release
13. Access Accept
12. Session Termination

FIG. 15

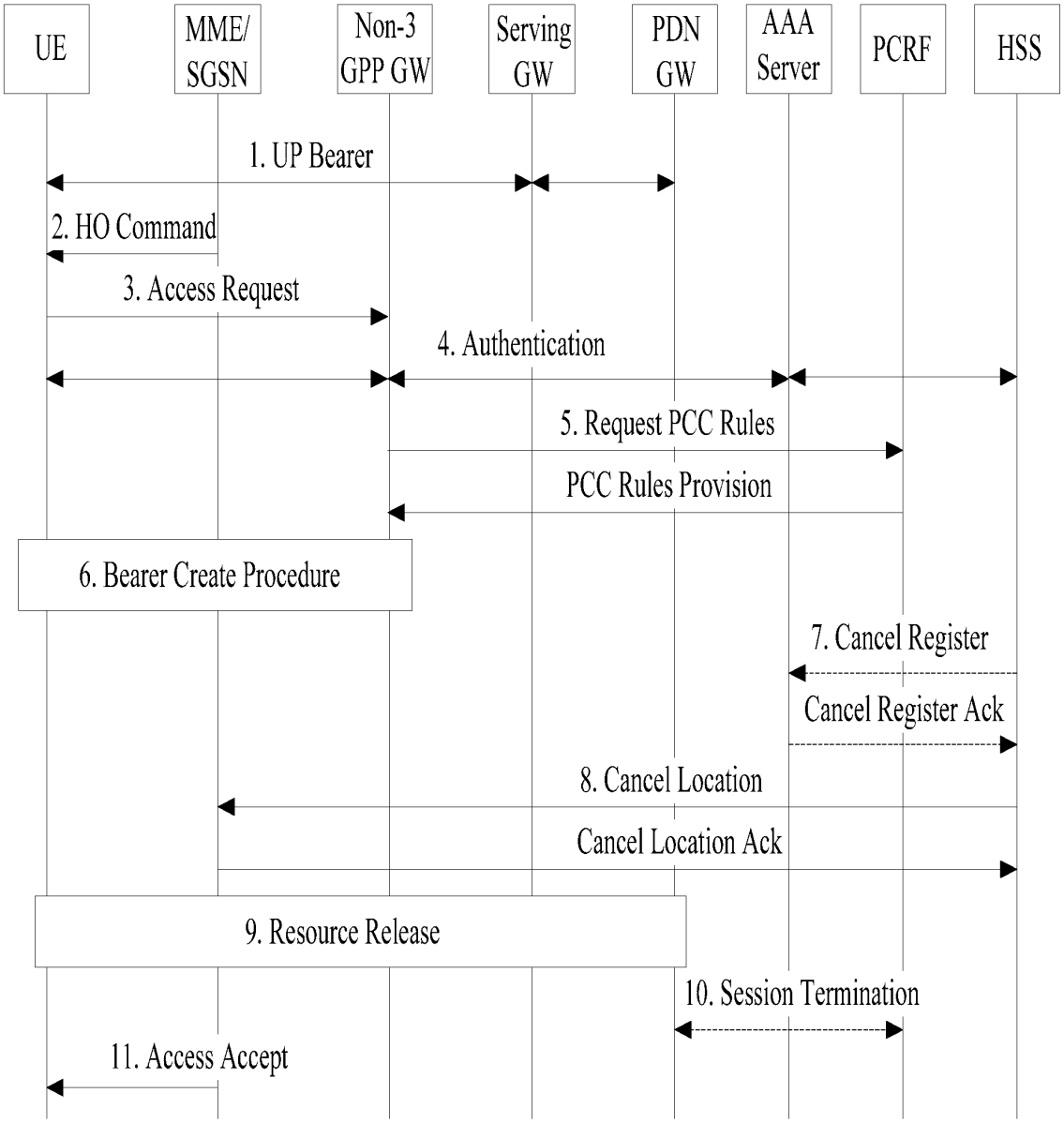
UE
MME/ SGSN
Non-3 GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. UP Bearer
2. HO Command
3. Access Request
4. Authentication
5. Request PCC Rules
PCC Rules Provision
6. Bearer Create Procedure
7. Cancel Register
Cancel Register Ack
8. Cancel Location
Cancel Location Ack
9. Resource Release
10. Session Termination
11. Access Accept

FIG. 16

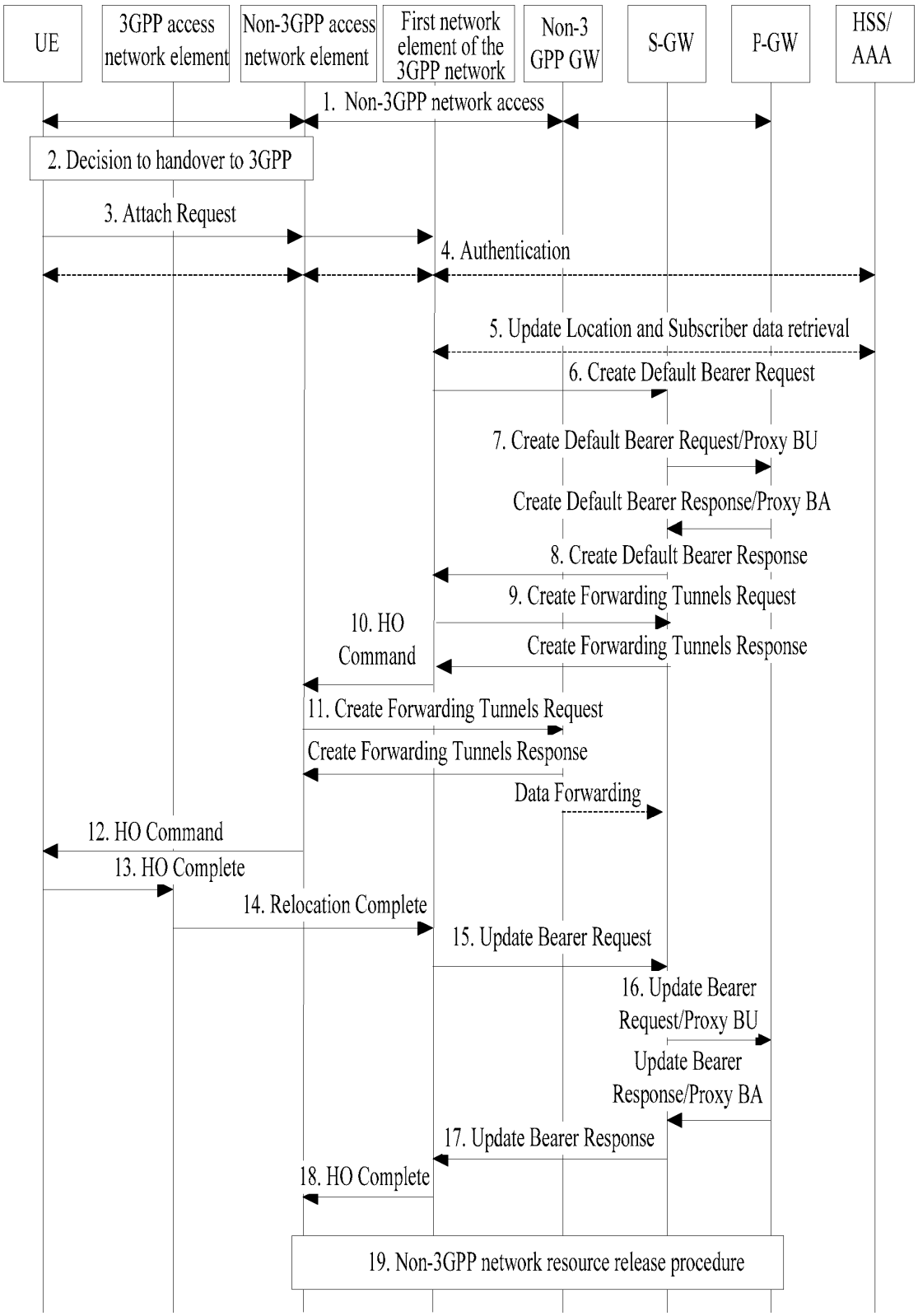
UE
3GPP access network element
Non-3GPP access network element
First network element of the 3GPP network
Non-3 GPP GW
S-GW
P-GW
HSS/ AAA
1. Non-3GPP network access
2. Decision to handover to 3GPP
3. Attach Request
4. Authentication
5. Update Location and Subscriber data retrieval
6. Create Default Bearer Request
7. Create Default Bearer Request/Proxy BU
Create Default Bearer Response/Proxy BA
8. Create Default Bearer Response
9. Create Forwarding Tunnels Request
10. HO Command
Create Forwarding Tunnels Response
11. Create Forwarding Tunnels Request
Create Forwarding Tunnels Response
Data Forwarding
12. HO Command
13. HO Complete
14. Relocation Complete
15. Update Bearer Request
16. Update Bearer Request/Proxy BU
Update Bearer Response/Proxy BA
17. Update Bearer Response
18. HO Complete
19. Non-3GPP network resource release procedure

FIG. 17

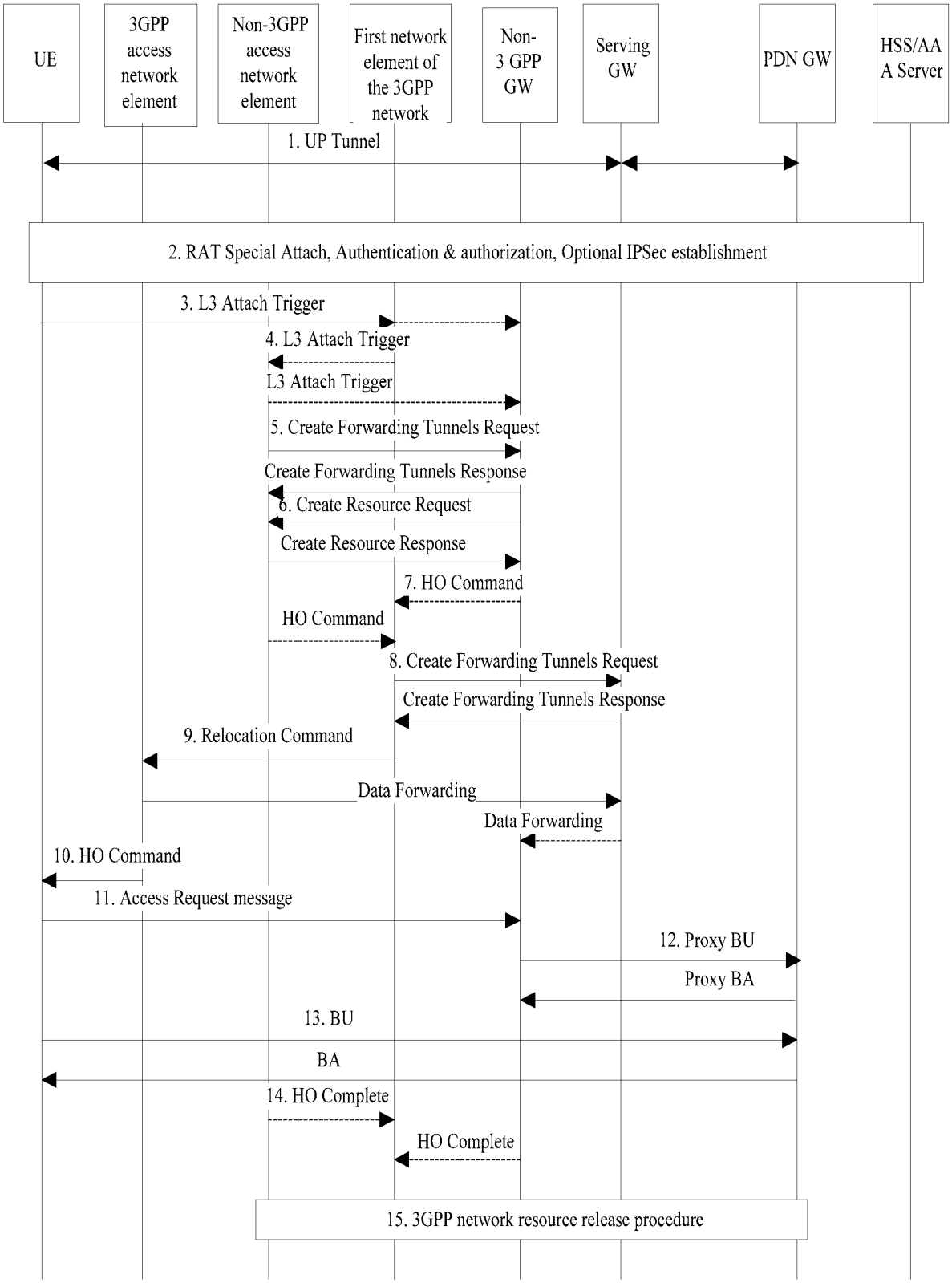

FIG. 18

4405294.1 0212577-US0

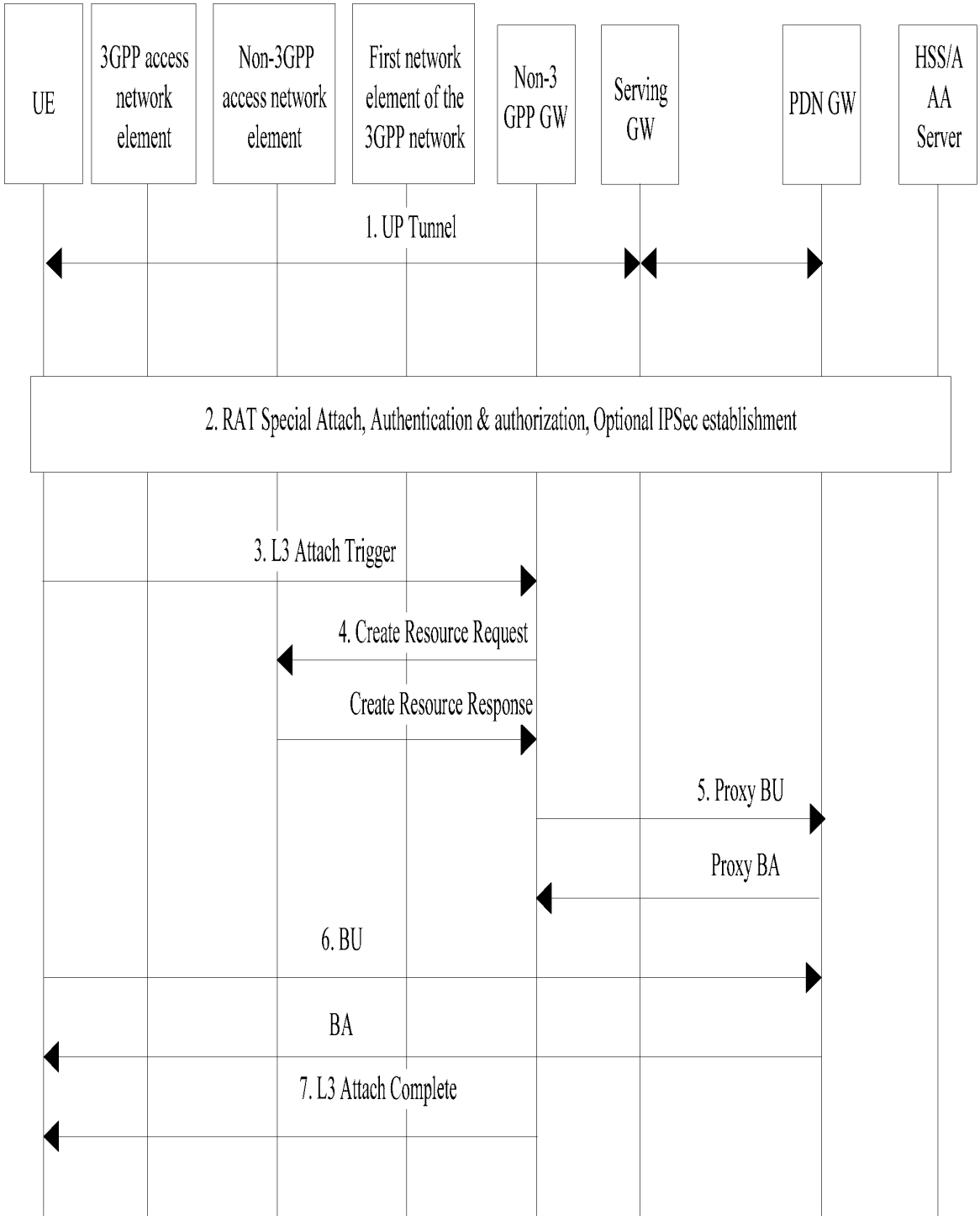
UE
3GPP access network element
Non-3GPP access network element
First network element of the 3GPP network
Non-3 GPP GW
Serving GW
PDN GW
HSS/AAA Server
1. UP Tunnel
2. RAT Special Attach, Authentication & authorization, Optional IPSec establishment
3. L3 Attach Trigger
4. Create Resource Request
Create Resource Response
5. Proxy BU
Proxy BA
6. BU
BA
7. L3 Attach Complete

FIG. 19

PTO/SB/101 (5-95)
Approved for use through 9/30/98. OMB 0651-0032
Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Declaration and Power of Attorney for Patent Application

專利申請聲明及委託書

Chinese Language Declaration

中文聲明

作爲下述發明者，我在此宣告：

As a below named inventor, I hereby declare that:

我的住址、郵局地址和國籍均列在我名下，

My residence, post office address and citizenship are as stated next to my name.

我相信我是首創的、第一個和唯一的發明者（如只列出一人姓名）或是首創的、首位共同發明者（如列出數人姓名）。我提出作爲專利申請要求的題目如下

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

	A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

如不在下面小方格中打叉則須將說明書附此：

the specification of which is attached hereto unless the following box is checked:

☐ 以美國申請號碼或 PCT 國際申請號碼

_____

_____ 立案于

_____ 修正于(如適用)

☐ was filed on _____

as United States Application Number or PCT International Application Number

_____ and was amended on

_____ (if applicable).

我在此聲明我已閱畢并理解上述說明書的內容，包括上述任何修正案所修正的權利要求。

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

按照聯邦法規第三十七節第一・五六條，我有責任提供支持專利權的實質性資料。

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

Chinese Language Declaration

我申請享受按照美國法規第三十五節第一百一十九條(a)-(b)項或第 365 條(b)項列出的以下任何外國專利申請書或發明者證書或第 365 條(a)項列出任何 PCT 國際申請指定至少在美國以外的任何一個國家的外國優先權，具有優先權申請前立案日期的、任何外國專利申請書或發明者證書或是 PCT 國際申請書。

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365 (a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s) 國外優先申請書			Priority Not Claimed 不要求優先權
200710104400.7 (Number) (號碼)	China (Country) (國名)	11 May 2007 (Day/Month/Year Filed) (申請日/月/年)	☐
200710181758.X (Number) (號碼)	China (Country) (國名)	24 October 2007 (Day/Month/Year Filed) (申請日/月/年)	☐
200710165540.5 (Number) (號碼)	China (Country) (國名)	2 November 2007 (Day/Month/Year Filed) (申請日/月/年)	☐

我申請享受被美國法規第 35 節 119(e)列出的以下任何美國臨時申請書的利益。

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

(Application No.) (申請順序號碼)	(Filing Date) (申請日期)	(Application No.) (申請順序號碼)	(Filing Date) (申請日期)

我申請享受按照美國法規第三十五節第一百二十條或第 365 條(c)項列出任何 PCT 國際申請所指定的美國列出的以下任何美國申請書的利益。如果此申請書中提出的每項權利要求的題目按美國法規或 PCT 國際申請第三十五節第一百二十條第一段的要求在以前的美國申請書中披露，則我有責任按照聯邦法規第三十五節第一、五六條(甲)條提供支持專利權的實質性資料，這一法規條文生效于以前申請的立案日期之後、但在美國或 PCT 國際申請立案日期之前。

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(Application No.) (申請順序號碼)	(Filing Date) (申請日期)	(Status) (patented, pending, abandoned) (狀況)(已獲專利權、申請中、取消)
PCT/CN2008/070909	08 May 2008	Pending

我在此聲明根據我所知而作的所有聲明都真實無誤，所有有關資料和信息的聲明也真實無誤；我還知道，按照美國法規第十八節第一千零一項，任何蓄意僞造的聲明都將受到罰款或監禁，或同時受到兩種懲罰。這類蓄意僞造的聲明將危及此申請書或任何已頒發專利的效力。

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application of any patent issued thereon.

PTO/SB/101 (5-95)
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Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
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I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365 (a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s) 國外優先申請書			Priority Not Claimed 不要求優先權
200810085729.8 (Number) (號碼)	China (Country) (國名)	13 March 2008 (Day/Month/Year Filed) (申請日/月/年)	☐
(Number) (號碼)	(Country) (國名)	(Day/Month/Year Filed) (申請日/月/年)	☐
(Number) (號碼)	(Country) (國名)	(Day/Month/Year Filed) (申請日/月/年)	☐

我申請享受被美國法規第 35 節 119(e)列出的以下任何美國臨時申請書的利益。

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

(Application No.) (申請順序號碼)	(Filing Date) (申請日期)	(Application No.) (申請順序號碼)	(Filing Date) (申請日期)

我申請享受按照美國法規第三十五節第一百二十條或第 365 條(c)項列出任何 PCT 國際申請所指定的美國列出的以下任何美國申請書的利益。如果此申請書中提出的每項權利要求的題目按美國法規或 PCT 國際申請第三十五節第一百二十條第一段的要求在以前的美國申請書中披露，則我有責任按照聯邦法規第三十五節第一、五六條(甲)條提供支持專利權的實質性資料，這一法規條文生效于以前申請的立案日期之後、但在美國或 PCT 國際申請立案日期之前。

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Application No.) (申請順序號碼)	(Filing Date) (申請日期)	(Status) (patented, pending, abandoned) (狀況)(已獲專利權、申請中、取消)
PCT/CN2008/070909	08 May 2008	Pending

我在此聲明根據我所知而作的所有聲明都真實無誤，所有有關資料和信息的聲明也真實無誤；我還知道，按照美國法規第十八節第一千零一項，任何蓄意偽造的聲明都將受到罰款或監禁，或同時受到兩種懲罰。這類蓄意偽造的聲明將危及此申請書或任何已頒發專利的效力。

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application of any patent issued thereon.

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委託書：
以列名發明者的身份，我在此指定下列律師和/或代理人執行此申請並能專與專利商標公署有關的所有業務(列出姓名和註冊號碼)：

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: (list name and registration number)

PTO Customer Number 85854

通訊地址

Darby & Darby P.C.
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直接電話(姓名及電話號碼)

Direct Telephone Calls to: *(name and telephone number)*

Pierre R. Yanney, 212-527-7700

第一個或唯一的發明者全名	Full name of sole or first inventor Wenfu WU
發明者簽字 日期	Inventor's signature Date Wenfu WU 28th Sept 2007
地址	Residence Shenzhen, China
國籍	Citizenship China
郵寄地址	Post Office Address Huawei Administration Building Bantian, Longgang District Shenzhen 518129, Guangdong P.R. China

第二個共同發明者全名(如有)	Full name of second joint inventor, if any
第二個發明者簽字 日期	Second inventor's signature Date
地址	Residence Shenzhen, China
國籍	Citizenship China
郵寄地址	Post Office Address Huawei Administration Building Bantian, Longgang District Shenzhen 518129, Guangdong P.R. China

(第三個和其他共同發明者需提供相同資料和簽字。)

(Supply similar information and signature for third and subsequent joint inventors.)

Electronic Patent Application Fee Transmittal	
Application Number:	
Filing Date:	
Title of Invention:	A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Filer:	Kenneth B. Ma/Lillian Garcia
Attorney Docket Number:	21370/0212577-US0
Filed as Large Entity	

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility application filing	1011	1	330	330
Utility Search Fee	1111	1	540	540
Utility Examination Fee	1311	1	220	220
Pages:				
Claims:				
Independent claims in excess of 3	1201	2	220	440
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1530**

Electronic Acknowledgement Receipt	
EFS ID:	6287333
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	85854
Filer:	Kenneth B. Ma/Lillian Garcia
Filer Authorized By:	Kenneth B. Ma
Attorney Docket Number:	21370/0212577-US0
Receipt Date:	19-OCT-2009
Filing Date:	
Time Stamp:	17:16:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1530
RAM confirmation Number	2979
Deposit Account	040100
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	Fillable_ADS.PDF	838760 5c303b602e3cec558818c578fb8ef30df5108970	no	4
Warnings:					
Information:					
2		New_App.PDF	2860297 e6dda669ff69d64d60d76c9ee37e8a178f1d72c6	yes	73

Multipart Description/PDF files in .zip description

Document Description	Start	End
Transmittal of New Application	1	1
Specification	2	44
Claims	45	50
Abstract	51	51
Drawings-only black and white line drawings	52	69
Oath or Declaration filed	70	73

Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	36396 958537ab3dbce51ed7fdb402cafbcdb44b1b0603	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3735453		

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Electronic Acknowledgement Receipt	
EFS ID:	6287333
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	85854
Filer:	Kenneth B. Ma/Lillian Garcia
Filer Authorized By:	Kenneth B. Ma
Attorney Docket Number:	21370/0212577-US0
Receipt Date:	19-OCT-2009
Filing Date:	
Time Stamp:	17:16:37
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$1530
RAM confirmation Number	2979
Deposit Account	040100
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	Fillable_ADS.PDF	838760 5c303b602e3cec558818c578fb8ef30df5108970	no	4
Warnings:					
Information:					
2		New_App.PDF	2860297 e6dda669ff69d64d60d76c9ee37e8a178f1d72c6	yes	73

Multipart Description/PDF files in .zip description

Document Description	Start	End
Transmittal of New Application	1	1
Specification	2	44
Claims	45	50
Abstract	51	51
Drawings-only black and white line drawings	52	69
Oath or Declaration filed	70	73

Warnings:					
Information:					
3	Fee Worksheet (PTO-875)	fee-info.pdf	36396 958537ab3dbce51ed7fdb402cafbcdb44b1b0603	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	3735453		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/14 (07-07)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	21370/0212577-US0
	Application Number	
Title of Invention	A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

Applicant 1 Remove

Applicant Authority ◉ Inventor ○ Legal Representative under 35 U.S.C. 117 ○ Party of Interest under 35 U.S.C. 118

Prefix	Given Name	Middle Name	Family Name	Suffix
	Wenfu		Wu	

Residence Information (Select One) ○ US Residency ◉ Non US Residency ○ Active US Military Service

City	Shenzhen	Country Of Residence[i]	CN
Citizenship under 37 CFR 1.41(b) [i]	CN		

Mailing Address of Applicant:

Address 1	Huawei Administration Building		
Address 2	Bantian, Longgang District; Guangdong		
City	Shenzhen	State/Province	
Postal Code	518129	Country[i]	CN

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	85854		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING		
Attorney Docket Number	21370/0212577-US0	Small Entity Status Claimed	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)	N/A		
Total Number of Drawing Sheets (if any)	18	Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	21370/0212577-US0
	Application Number	
Title of Invention	A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)
☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S. C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	85854		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.

Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	PCTCN2008070909	2008-05-08
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button.			Add

Foreign Priority Information:

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).

			Remove
Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
200710104400.7	CN	2007-05-11	◉ Yes ○ No
			Remove
Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
200710181758.X	CN	2007-10-24	◉ Yes ○ No
			Remove
Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
200710165540.5	CN	2007-11-02	◉ Yes ○ No

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	21370/0212577-US0
	Application Number	
Title of Invention	A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	

Remove

Application Number	Country [i]	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
200810085729.8	CN	2008-03-13	(•) Yes ( ) No

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Assignee Information:

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.

Remove

Assignee 1

If the Assignee is an Organization check here. [X]

Organization Name	Huawei Technologies Co., Ltd.		
Mailing Address Information:			
Address 1	Huawei Administration Building		
Address 2	Bantian, Longgang District; Guangdong		
City	Shenzhen	**State/Province**	
Country [i]	CN	Postal Code	518129
Phone Number		Fax Number	
Email Address			

Additional Assignee Data may be generated within this form by selecting the **Add** button. Add

Signature:

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/Kenneth Ma 63,839/			Date (YYYY-MM-DD)	2009-10-19
First Name	Kenneth	Last Name	Ma	Registration Number	63839

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

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SCORE Placeholder Sheet for IFW Content

Application Number: 12581575 Document Date: 10/19/09

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions developed by SIRA.

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Form Revision Date: February 8, 2006

PTO/SB/06 (12-04)
Approved for use through 7/31/2006. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Filing Date: 10/19/09

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD
Substitute for Form PTO-875

Application or Docket Number: 12/581,575

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY FEE ($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	330
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	540
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	220
TOTAL CLAIMS (37 CFR 1.16(i))	17 minus 3 =		x$26		OR	x$52	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	5 minus 3 =	* 2	x$110			x$220	440
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $270 ($135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR						
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))			195			390	
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1530

APPLICATION AS AMENDED – PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE ($)	SMALL ENTITY ADDI-TIONAL FEE ($)	OR	OTHER THAN SMALL ENTITY RATE ($)	OTHER THAN SMALL ENTITY ADDI-TIONAL FEE ($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDI-TIONAL FEE ($)	OR	RATE ($)	ADDI-TIONAL FEE ($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					N/A		OR	N/A	
						TOTAL ADD'T FEE		OR	TOTAL ADD'T FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
12/581,575	10/19/2009	2617	1530	21370/0212577-US0	17	5

CONFIRMATION NO. 2875

85854
Huawei Technologies Co., Ltd.
c/o Darby & Darby P.C.
P.O. Box 770
Church Street Station
New York, NY 10008-0770

FILING RECEIPT

OC00000038567603

Date Mailed: 11/06/2009

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Applicant(s)

Wenfu Wu, Shenzhen, CHINA;

Assignment For Published Patent Application

Huawei Technologies Co., Ltd., Shenzhen, CHINA

Power of Attorney: The patent practitioners associated with Customer Number 85854

Domestic Priority data as claimed by applicant

This application is a CON of PCT/CN2008/070909 05/08/2008

Foreign Applications

CHINA 200710104400.7 05/11/2007
CHINA 200710181758.X 10/24/2007
CHINA 200710165540.5 11/02/2007
CHINA 200810085729.8 03/13/2008

If Required, Foreign Filing License Granted: 11/02/2009

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/581,575**

Projected Publication Date: 02/18/2010

Non-Publication Request: No

Early Publication Request: No

Title

METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Preliminary Class

455

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

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For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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PTO/SB/08a (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	12581575
Filing Date	2009-10-19
First Named Inventor	Wenfu Wu
Art Unit	2617
Examiner Name	Not Yet Assigned
Attorney Docket Number	21370/0212577-US0

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6725039		2004-04-20	Parmar et al.	

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U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20030114158		2003-06-19	Soderbacka et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	1605222	CN	A	2005-04-06	Nokia Corp		☒
	2	1275872	CN	A	2000-12-06	Nippon Electric Co		☒
	3	1882160	CN	A	2006-12-20	Zte Corp		☒

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12581575
	Filing Date	2009-10-19
	First Named Inventor	Wenfu Wu
	Art Unit	2617
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	21370/0212577-US0

If you wish to add additional Foreign Patent Document citation information please click the Add button [Add]

NON-PATENT LITERATURE DOCUMENTS [Remove]

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	12581575
	Filing Date	2009-10-19
	First Named Inventor	Wenfu Wu
	Art Unit	2617
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	21370/0212577-US0

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Flynn Barrison 53,970/	Date (YYYY-MM-DD)	2010-01-27
Name/Print	Flynn Barrison	Registration Number	53970

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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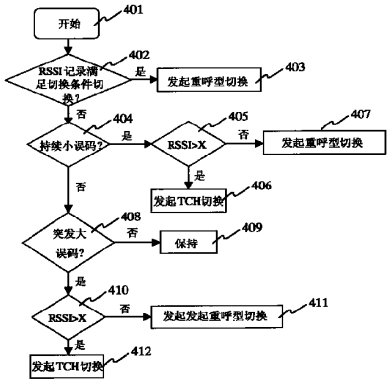
权利要求书 4 页 说明书 10 页 附图 4 页

[54] 发明名称

一种 PHS 基站切换方法及其装置

[57] 摘要

本发明涉及一种 PHS 基站切换方法及其装置，其中，方法包括：步骤 A、检测 PHS 系统的误帧率和接收信号场强的信息；步骤 B、根据步骤 A 检测出的信息，按照由不同的切换原因预先确定的基站发起切换判断优先级对 PHS 系统将要发起的切换类型进行判断，并发起相应的切换请求。 该装置包括用于检测信息的 FER 检测器和 RSSI 检测器；用于根据切换判断优先级进行切换类型判断，并发起相应切换请求的基站切换发起控制器；及用于响应切换请求并对切换进行相应控制的基站切换控制器。本发明的方法和装置通过对切换出现的不同原因进行了相应处理，从而提升了系统的切换性能。



1、一种 PHS 基站切换方法，其特征在于，包括：

步骤 A，检测 PHS 系统的误帧率和接收信号场强的信息；及

步骤 B，根据步骤 A 检测出的信息，按照由不同的切换原因预先确定的基站发起切换判断优先级对 PHS 系统将要发起的切换类型进行判断，并发起相应的切换请求。

2、根据权利要求 1 所述的方法，其特征在于，基站发起切换判断的优先级由不同的切换原因对 PHS 系统切换的影响程度来确定。

3、根据权利要求 1 所述的方法，其特征在于，当所述基站满足所述不同的切换类型中的其中一种类型，并发起相应的切换请求时，不对所述基站进行其他切换类型的判断，以免重新开始切换判断。

4、根据权利要求 1、2 或 3 所述的方法，其特征在于，步骤 B 进一步包括：

步骤 B1，根据接收信号场强的信息，判断是否满足接收信号场强触发的切换条件；如是，则发起重呼型切换；如否，则继续步骤 B2；

步骤 B2，根据误帧率信息，判断是否满足误帧率触发的切换条件。

5、根据权利要求 4 所述的方法，其特征在于，步骤 B2 进一步包括：

步骤 B21，根据误帧率信息，判断是否满足持续小误码切换条件；如是，则发起持续小误码切换；如否，则继续步骤 B22；及，

步骤 B22，根据误帧率信息，判断是否满足突发大误码切换条件；如是，则发起大误码切换；如否，则保持，不切换。

6、根据权利要求 5 所述的方法，其特征在于，步骤 B21 和/或步骤 B22 进一步包括一根据接收信号场强判断切换为信道切换还是重呼型切换的步骤；当接收信号场强高于设定门限时，触发信道切换；当接收信号场强低于设定门限时，触发重呼型切换。

7、根据权利要求 1、2、3、5 或 6 所述的方法，其特征在于，步骤 A 通过滑动窗来检测误帧率和接收信号场强的变化信息。

8、根据权利要求 7 所述的方法，其特征在于，滑动窗检测进一步包括常规变化滑动窗检测和快速变化滑动窗检测；快速变化滑动窗用于在信号快速变

化时，对接收信号场强进行检测，其检测窗口的大小和检测步长根据切换速度的要求通过外场测试来确定。

9、根据权利要求 8 所述的方法，其特征在于，利用快速变化滑动窗检测的接收信号场强信息来判断 PHS 系统是否满足接收信号场强触发的切换条件；利用常规变化滑动窗检测的接收信号场强信息来判断的切换为信道切换还是重呼型切换。

10、根据权利要求 1、2、3、5、6、8 或 9 所述的方法，其特征在于，进一步包括一根据检测的接收信号场强所获取的上行信道信息来判断上行信道是否允许发起信道切换的步骤。

11、根据权利要求 10 所述的方法，其特征在于，进一步包括一利用定时器控制信道切换时间间隔的步骤，以从而控制信道切换的频度。

12、根据权利要求 11 所述的方法，其特征在于，进一步包括对手机和基站切换综合控制的步骤，具体包括：

步骤一，接收切换请求，并判断切换请求为手机切换请求还是基站切换请求；如为手机切换请求，转入步骤二；如为基站切换请求，转入步骤三；

步骤二，判断是否有空闲信道；如有，则分配新的信道，并发送信道切换指示，指令手机切换到新信道，再转入步骤四；如无新信道，则发重呼型切换指示；

步骤三，判断当前检测的接收信号的场强值是否大于设定的门限值；如是，则分配新的信道，并发送信道切换指示，指令手机切换到新的信道，再转入步骤四；如无新信道，则发重呼型切换指示；

步骤四，释放旧的信道，在新的信道进行通话，并进一步设置信道切换控制定时器；

步骤五，判断信道切换控制定时器是否超时；如是，进行信道切换；如否，则不进行信道切换。

13、一种 PHS 基站切换装置，其特征在于，包括：

误帧率检测器，用于检测 PHS 系统的误帧率信息；

接收信号场强检测器，用于检测 PHS 系统接收信号的场强信息；

基站切换发起控制器，用于根据误帧率检测器和接收信号场强检测器上报的信息，按照由不同的切换原因预先确定的基站发起切换判断优先级对 PHS

系统将要发起的切换类型进行判断，并发起相应的切换请求；及

基站切换控制器，用于接收切换请求并进行切换控制。

14、根据权利要求 13 所述的装置，其特征在于，基站发起切换判断的优先级由不同的切换原因对 PHS 系统切换的影响程度来确定。

15、根据权利要求 13 或 14 所述的装置，其特征在于，基站切换发起控制器进一步包括：

接收信号场强触发切换判断模块，用于根据接收信号场强的装置，判断是否满足接收信号场强触发的切换条件；

误帧率触发切换判断模块，用于根据误帧率信息，判断是否满足误帧率触发的切换条件；

其中，接收信号场强触发切换判断模块较误帧率触发切换判断模块优先级更高。

16、根据权利要求 15 所述的装置，其特征在于，误帧率触发切换判断模块进一步包括：

持续小误码切换判断模块，用于根据误帧率信息，判断是否满足持续小误码切换条件；及，

大误码切换判断模块，用于根据误帧率信息，判断是否满足突发大误码切换条件；

其中，持续小误码切换判断模块较大误码切换判断模块优先级更高。

17、根据权利要求 16 所述的装置，其特征在于，持续小误码切换判断模块和/或大误码切换判断模块进一步包括具体切换类型判断模块，用于根据接收信号的场强判断切换为信道切换还是重呼型切换；其中，当接收信号场强高于设定门限时，为信道切换；当接收信号场强低于设定门限时，为重呼型切换。

18、根据权利要求 13、14、16 或 17 所述的装置，其特征在于，误帧率检测器和/或接收信号场强检测器进一步包括滑动窗检测装置。

19、根据权利要求 18 所述的装置，其特征在于，滑动窗检测进一步包括常规变化滑动窗检测和快速变化滑动窗检测；快速变化滑动窗用于在信号快速变化时，对接收信号场强进行检测，其检测窗口的大小和检测步长根据切换速度的要求通过外场测试来确定。

20、根据权利要求 19 所述的装置，其特征在于，基站切换控制器进一步

包括一上行信道信息获取模块，通过接收信号场强得出，用于判断上行信道是否允许发起信道切换。

21、根据权利要求 19 或 20 所述的装置，其特征在于，基站切换控制器进一步包括一信道切换控制定时器，用于控制信道切换时间间隔，从而控制信道切换的频度。

22、根据权利要求 21 所述的装置，其特征在于，基站切换控制器进一步包括：

一切换综合控制模块，用于接收手机和/或基站发出的切换请求，并控制进行相应的手机和/或基站的切换；

其中，切换综合控制模块进一步包括：

一手机切换控制模块，判断是否有空闲信道，若有则切换至新信道；

一基站切换控制模块，用于在进行基站切换时判断接收信号场强是否满足切换条件；如是，则切换至新信道；

一信道切换频度控制模块，用于判断信道切换控制定时器是否超时，如是则进行信道切换。

一种 PHS 基站切换方法及其装置

技术领域

本发明涉及一种 PHS (Personal Handyphone System 个人手持机系统)基站切换方法及其装置，特别是一种能对切换出现的各种原因进行相应处理，从而提升切换性能的基站切换方法及其装置。

背景技术

PHS 系统国内又称无线市话，能够提供廉价的移动服务，在国内获得了迅速发展。一方面，PHS 基站工作在 1900 兆赫频段，该频段无线传播具有信号波动比较大穿透性差的特点，容易引起切换。另一方面 PHS 基站功率小，覆盖范围小，用户移动中容易走出基站覆盖范围，引发切换。这两方面原因导致了 PHS 系统切换较多，只能通过切换性能改进改善通话质量。

PHS 系统切换有 TCH（Traffic Channel，业务信道）切换、重呼型切换两种。重呼型切换需要基站指示手机进行重呼型切换，手机从通话 TCH 信道切换到控制信道，重新发起呼叫，在新的 TCH 信道建立话路后，由网络通知基站释放原通话 TCH 信道，切换时间较长约 1 秒，切换可在不同基站间进行。TCH 切换时，基站在通话 TCH 信道下发切换指示，指令手机切换到目标 TCH 信道，释放旧的 TCH 信道，在新的 TCH 信道进行通话，切换只能在同一基站内进行，切换时间很短约 300 毫秒。

PHS 系统切换通过检测误帧率 FER（Frame Error Rate）和接收信号场强 RSSI（Received Signal Strength Indication）的特性进行，其中 FER 是影响通话的直接因素，目前切换算法也是主要考虑 FER 特性判断，根据 FER 特性判断是否要进行切换，根据 RSSI 决定切换类型。

现有算法没有专门针对 PHS 系统出现的切换原因进行分类处理，容易引起切换时间长、切换掉话等问题，原因如下：1）PHS 系统工作在 1900 兆赫，信号穿透性比较差，信号波动比较大，且某些情况下会引发信号波动加剧（如，移动过程中建筑物遮挡，快速移动等），导致接收性能快速恶化。根据 PHS

空中接口协议，FER 检测以 1.2 秒为单位，检测时间比较长，不能进行快速切换，导致切换时间长，通话质量下降，甚至出现掉话。2）没有区分持续小误码和突发大误码两种情况，针对不同情况 FER 检测做不同处理，加快切换速度。3）手机发起 TCH 切换时没有综合判断基站上行信息，判断信息不全面；没有对 TCH 切换频度控制。可能导致短时间内，手机在一个基站下连续进行 TCH 切换，可通话时间很短，通话质量低。

发明内容

本发明所要解决的技术问题在于提供一种 PHS 基站切换方法及其装置，其通过对切换出现的不同原因进行了相应处理，从而提升了系统的切换性能。

为了实现上述目的，本发明提供了一种 PHS 基站切换方法，其中，包括：

步骤 A，检测 PHS 系统的误帧率和接收信号场强的信息；及

步骤 B，根据步骤 A 检测出的信息，按照由不同的切换原因预先确定的基站发起切换判断优先级对 PHS 系统将要发起的切换类型进行判断，并发起相应的切换请求。

所述的方法，其中，基站发起切换判断的优先级由不同的切换原因对 PHS 系统切换的影响程度来确定。

所述的方法，其中，当所述基站满足所述不同的切换类型中的其中一种类型，并发起相应的切换请求时，不对所述基站进行其他切换类型的判断，以免重新开始切换判断。

所述的方法，其中，步骤 B 进一步包括：

步骤 B1，根据接收信号场强的信息，判断是否满足接收信号场强触发的切换条件；如是，则发起重呼型切换；如否，则继续步骤 B2；

步骤 B2，根据误帧率信息，判断是否满足误帧率触发的切换条件。

所述的方法，其中，步骤 B2 进一步包括：

步骤 B21，根据误帧率信息，判断是否满足持续小误码切换条件；如是，则发起持续小误码切换；如否，则继续步骤 B22；及，

步骤 B22，根据误帧率信息，判断是否满足突发大误码切换条件；如是，则发起大误码切换；如否，则保持，不切换。

所述的方法，其中，步骤 B21 和/或步骤 B22 进一步包括一根据接收信号场强判断切换为信道切换还是重呼型切换的步骤；当接收信号场强高于设定门

限时，触发信道切换；当接收信号场强低于设定门限时，触发重呼型切换。

所述的方法，其中，步骤 A 通过滑动窗来检测误帧率和接收信号场强的变化信息。

所述的方法，其中，滑动窗检测进一步包括常规变化滑动窗检测和快速变化滑动窗检测；快速变化滑动窗用于在信号快速变化时，对接收信号场强进行检测，其检测窗口的大小和检测步长根据切换速度的要求通过外场测试来确定。

所述的方法，其中，利用快速变化滑动窗检测的接收信号场强信息来判断 PHS 系统是否满足接收信号场强触发的切换条件；利用常规变化滑动窗检测的接收信号场强信息来判断的切换为信道切换还是重呼型切换。

所述的方法，其中，进一步包括一根据检测的接收信号场强所获取的上行信道信息来判断上行信道是否允许发起信道切换的步骤。

所述的方法，其中，进一步包括一利用定时器控制信道切换时间间隔的步骤，以从而控制信道切换的频度。

所述的方法，其中，进一步包括对手机和基站切换综合控制的步骤，具体包括：

步骤一，接收切换请求，并判断切换请求为手机切换请求还是基站切换请求；如为手机切换请求，转入步骤二；如为基站切换请求，转入步骤三；

步骤二，判断是否有空闲信道；如有，则分配新的信道，并发送信道切换指示，指令手机切换到新信道，再转入步骤四；如无新信道，则发重呼型切换指示；

步骤三，判断当前检测的接收信号的场强值是否大于设定的门限值；如是，则分配新的信道，并发送信道切换指示，指令手机切换到新的信道，再转入步骤四；如无新信道，则发重呼型切换指示；

步骤四，释放旧的信道，在新的信道进行通话，并进一步设置信道切换控制定时器；

步骤五，判断信道切换控制定时器是否超时；如是，进行信道切换；如否，则不进行信道切换。

本发明还提供了一种 PHS 基站切换装置，其中，包括：

误帧率检测器，用于检测 PHS 系统的误帧率信息；

接收信号场强检测器，用于检测 PHS 系统接收信号的场强信息；

基站切换发起控制器，用于根据误帧率检测器和接收信号场强检测器上报的信息，按照由不同的切换原因预先确定的基站发起切换判断优先级对 PHS 系统将要发起的切换类型进行判断，并发起相应的切换请求；及

基站切换控制器，用于接收切换请求并进行切换控制。

所述的装置，其中，基站发起切换判断的优先级由不同的切换原因对 PHS 系统切换的影响程度来确定。

所述的装置，其中，基站切换发起控制器进一步包括：

接收信号场强触发切换判断模块，用于根据接收信号场强的装置，判断是否满足接收信号场强触发的切换条件；

误帧率触发切换判断模块，用于根据误帧率信息，判断是否满足误帧率触发的切换条件；

其中，接收信号场强触发切换判断模块较误帧率触发切换判断模块优先级更高。

所述的装置，其中，误帧率触发切换判断模块进一步包括：

持续小误码切换判断模块，用于根据误帧率信息，判断是否满足持续小误码切换条件；及，

大误码切换判断模块，用于根据误帧率信息，判断是否满足突发大误码切换条件；

其中，持续小误码切换判断模块较大误码切换判断模块优先级更高。

所述的装置，其中，持续小误码切换判断模块和/或大误码切换判断模块进一步包括具体切换类型判断模块，用于根据接收信号的场强判断切换为信道切换还是重呼型切换；其中，当接收信号场强高于设定门限时，为信道切换；当接收信号场强低于设定门限时，为重呼型切换。

所述的装置，其中，FER 检测器和/或 RSSI 检测器进一步包括滑动窗检测装置。

所述的装置，其中，滑动窗检测进一步包括常规变化滑动窗检测和快速变化滑动窗检测；快速变化滑动窗用于在信号快速变化时，对接收信号场强进行检测，其检测窗口的大小和检测步长根据切换速度的要求通过外场测试来确定。

所述的装置，其中，基站切换控制器进一步包括一上行信道信息获取模块，通过接收信号场强得出，用于判断上行信道是否允许发起信道切换。

所述的装置，其中，基站切换控制器进一步包括一信道切换控制定时器，用于控制信道切换时间间隔，从而控制信道切换的频度。

所述的装置，其中，基站切换控制器进一步包括：

一切换综合控制模块，用于接收手机和/或基站发出的切换请求，并控制进行相应的手机和/或基站的切换；

其中，切换综合控制模块进一步包括：

一手机切换控制模块，判断是否有空闲信道，若有则切换至新信道；

一基站切换控制模块，用于在进行基站切换时判断接收信号场强是否满足切换条件；如是，则切换至新信道；

一信道切换频度控制模块，用于判断信道切换控制定时器是否超时，如是则进行信道切换。

本发明通过综合考虑不同切换原因，对于 FER 检测机制进行改进，引入 RSSI 快速检测机制，加快切换响应速度。针对不同切换原因影响程度，确定基站发起切换判断的优先级，防止切换掉话，改善 PHS 系统的切换性能。综合判断上下行信息，对手机和基站切换进行统一管理，控制 TCH 切换频度，防止短时间内连续 TCH 切换，目前还没有类似的处理算法公开。在现有的 PHS 系统基站中，只需要将软件升级就能够实现本发明提出的方法，对于目前 PHS 系统网络的切换性能的提升有非常积极的现实意义。

以下结合附图和具体实施例对本发明进行详细描述，但不作为对本发明的限定。

附图说明

图 1 为本发明的 FER 和 RSSI 常规变化检测滑动窗口示意图；

图 2 为本发明的 RSSI 快速变化检测滑动窗口示意图；

图 3 为本发明的基站切换装置组成示意图；

图 4 为本发明的基站发起切换算法示意图；

图 5 为本发明的基站切换发起控制器的模块示意图；

图 6 为本发明的基站切换控制器的模块示意图。

具体实施方式

本发明的方法及其装置的实现包括下面各个方面：

（1）FER 和 RSSI 变化滑动窗检测；

（2）基站切换发起算法；

（3）基站呼叫控制算法。

下面对本发明做进一步的详细说明：

（1）FER 和 RSSI 变化滑动窗检测

由于信号存在一定波动性，为保证上行信号检测的及时性好及有效性高，采用滑动窗方式检测 RSSI 和 FER 变化。滑动窗口滑动是一个连续过程（如图 1、图 2 所示）。窗口持续滑动，通过判断可以获得信号变化过程，并根据变化过程对信号变化规律进行判断，更好的为切换判断提供依据。其中，图 1 为本发明的 FER 和 RSSI 常规变化检测滑动窗口示意图。图 2 为本发明的 RSSI 快速变化检测滑动窗口示意图。

影响语音质量 FER 判决时间通常为 1.2 秒，为了综合处理 FER 和 RSSI 信息，我们将 RSSI 和 FER 常规滑动窗口大小定为 1.2 秒（如图 1 所示），采用 100 毫秒的滑动步长，相邻两个窗口有 1.1 秒的重叠。

图 3 为本发明的基站切换装置组成示意图。如图 3 所示，本发明的基站切换装置包括：FER(误帧率)检测器 1、RSSI(接收信号场强)检测器 2、基站切换控制器 3、基站切换发起控制器 4。其中，RSSI 监测器 2 读取原始 RSSI 值，利用滑动窗口（如图 1、2 所示）对 RSSI 进行处理，上报处理过 RSSI 值给基站切换发起控制器 4。FER 检测器 1 利用滑动窗计算 FER 值，上报给基站切换发起控制器 4。基站切换发起控制器 4 对 FER 检测器 1 和 RSSI 检测器 2 上报 FER 值和 RSSI 值进行处理，按照图 4 所示基站切换发起算法进行 RSSI 切换、持续小误码、突发大误码检测判断处理，实现基站切换发起策略。切换控制器按照基站切换控制算法，对基站和手机切换信息进行综合处理，对切换类型进行控制，对于 TCH 切换频度进行管理，实现基站切换管理。

图 3 中所示 RSSI 检测器 2 每 100 毫秒记录一次 RSSI 值，滑动窗口每滑动一次，计算该次滑动对应 1.2 秒窗口对应的 12 个 RSSI 的平均值，并上报给基站切换发起控制器 4。

图 1 所示的 1.2 秒窗口滑动时，图 3 所示的 FER 检测器 1 计算 1.2 秒窗口时间段内误帧数，误帧数与 240（根据协议 1.2 秒内共有 240 帧）相比获得误帧率，上报误帧率到基站切换发起控制器 4。

在信号快速变化时，需要根据 RSSI 进行切换处理，而信号快速变化采用 1.2 秒窗口检测时间长，为此引入启动小窗口检测机制即快速变化窗口检测机制，如图 2 所示的快速变化滑动窗的窗口大小为 S1 毫秒，滑动窗口 RSSI 检测步长为 S2 毫秒。每 S2 毫秒 RSSI 检测器 2 记录一次 RSSI 值，每滑动一次，计算该次滑动窗口内的 S1/S2 个 RSSI 平均值，上报平均值到基站切换发起控制器 4。其中 S1 和 S2 根据切换速度要求，通过外场测试确定，S2 要求可以被 S1 整除。

（2）基站发起切换算法

为了缩短切换时间，改善语音质量，除了引入滑动窗口机制提高 FER 和 RSSI 变化检测性能外，我们还引入了新的基站 TCH 信道切换发起算法，如图 4 所示。为了加快切换发起速度，根据切换原因及其影响，切换算法按照 RSSI 切换、持续小误码切换、突发大误码切换的优先级顺序进行切换判断处理。

RSSI 切换优先判断是为防止信号快速衰减，在信号很差时进行切换引发切换换时间长、切换掉话。此类切换因素影响大，切换速度相应速度要快，要求优先判断。

FER 切换通过滑动窗口判断 FER 进行切换，通过信号强度确定切换类型：强信号干扰时（当前 1.2 秒 RSSI 平均值高于某一门限）TCH 切换（信道切换）、弱信号干扰（当前 1.2 秒 RSSI 平均值低于某一门限）触发 HO 切换（重呼型切换）。如图 4 所示，FER 触发的切换分为持续小误码和突发大误码两种，区别在于启动判断的 FER 门限值和滑动时长不同，小误码一般随信号恶化率先出现，为加快切换反应速度，持续小误码切换判断优先处理。

新的切换算法引入了以下切换参考变量：RSSI 切换电平门限 W、TCH 切换电平门限 X、突发大误码误帧率门限 Y、持续小误码误帧率门限 Z。门限设置值与基站性能有关，可以通过外场测试切换速度、切换对语音质量影响来确定，其中突发大误码率高，因此要求 Y 大于 Z。

基站切换发起控制器 4 接收 FER 和 RSSI 检测器上报的 RSSI 和 FER 后，记录 FER 和 RSSI 到缓存，按照如图 4 所示流程，进行切换判断处理：

步骤 401，开始切换流程；

步骤 402，判断缓存的小窗口 RSSI 平均值是否满足 RSSI 切换条件；

步骤 403，如满足 RSSI 切换条件，即如缓存的小窗口 RSSI 平均值满足连续 M 个 RSSI 记录低于 W，则发起重呼型切换，并发送切换请求到切换控制器；此时，小窗口 RSSI 切换记录值、持续小误码和突发大误码 FER 值全部设置为无效，初始化防止满足其它条件时，连续发送切换请求，重新开始切换判断，影响上层处理。

步骤 404，如不满足 RSSI 切换条件，则进一步判断是否满足持续小误码切换的条件；

步骤 405，如满足持续小误码切换的条件，即如果 K1 秒内连续 L1 次 FER 大于 Z，则发起持续小误码切换，并进一步判断最近 1.2 秒窗口 RSSI 平均值是否高于门限 X，如是，则转入步骤 406，如否，即如最近 1.2 秒窗口 RSSI 平均值低于 X 则转入步骤 407；如不满足持续小误码切换的条件，则转入步骤 408；

步骤 406，发起 TCH 切换；

步骤 407，则发起重呼型切换；

当满足持续小误码切换的条件时，将相应的切换请求发送到切换控制器；此时，小窗口 RSSI 切换记录值、持续小误码和突发大误码 FER 值全部设置为无效，防止满足其它条件，连续发送切换请求，重新开始切换判断。

步骤 408，判断是否满足突发大误码切换的条件；如是，即如果 K2 秒内连续 L2 次 FER 大于 Y，转入步骤 410；如否，转入步骤 409；

步骤 409，保持，不切换；

步骤 410，进一步判断最近 1.2 秒窗口 RSSI 是否高于 X；若是，则转入步骤 412；如否，即如最近 1.2 秒窗口 RSSI 低于 X，则转入步骤 411；

步骤 411，发起 TCH 切换；

步骤 412，发起重呼型切换；

当满足突发大误码切换条件后，发送切换请求到切换控制器，此时，小窗口 RSSI 切换记录值、持续小误码和突发大误码 FER 值全部设置为无效，防止满足其它条件，连续发送切换请求，重新开始切换判断。

其中，M、K1、K2、L1、L2 与基站性能有关，可根据基站外场切换性能

测试确定。由于，突发大误码检测时间短，要求 K2 小于 K1，L2 小于 L1。

图 5 为本发明的基站切换发起控制器 4 的模块示意图。如图 5 所示，本发明的基站切换发起控制器 4 通过设置在其内的 RSSI 触发切换判断模块 41、FER 触发切换判断模块 42，及 FER 触发切换判断模块 42 内部又设置的持续小误码切换判断模块 421、大误码判断模块 422，及其内设置的用于判断信道切换还是重呼型切换的具体切换类型判断模块 4211、4221，来具体实现上述的基站切换发起算法。

（3）基站切换控制算法

手机依据下行信号状况进行切换处理，手机发起 TCH 切换时上行信号质量不一定适合做 TCH 切换，由图 3 所示切换控制器 3 综合处理才能做出最佳判断，处理方法如下：切换控制器 3 通过向 RSSI 检测器 2 获取当前 1.2S 窗口的 RSSI 平均值，获取上行信道信息，与基站发起 TCH 切换 RSSI 门限 X 比较，判断上行信道是否允许发起 TCH 切换。

连续 TCH 切换时正常通话时间很短，通话质量下降，切换控制器 3 为保证通话质量，引入信道切换（TCH 切换）控制定时器 31，控制 TCH 切换频度，防止连续 TCH 切换。TCH 切换控制定时器 31 设置超时时长为 D 秒，TCH 切换以后，在定时器超时前禁止新的 TCH 切换，超时后才可以，这样就把 TCH 切换时间间隔控制在了 D 秒以上，D 的具体值可以根据基站性能测试获得。

切换控制器 3 对手机和基站切换综合管理，其处理过程如下：

A）切换控制器 3 接收基站和手机切换请求进行处理：接收手机 TCH 切换请求到以后进行 B)；接收到基站切换发起控制器的 TCH 切换请求进行 C)，接收到手机或基站重呼型切换请求进行 D）；

B）切换控制器 3 判断是否有空闲信道：如果有空闲信道分配新的信道发送 TCH 切换指示，指令手机切换到新的信道，进行 E）；如果没有有空闲信道进行 D）；

C）切换控制器 3 向 RSSI 检测器 2 获取当前 1.2 秒窗口 RSSI 平均值，如果 RSSI 大于 X，分配新的信道发送 TCH 切换指示，指令手机切换到新的信道，进行 E），否则进行 D）；

D）切换控制器 3 下发重呼型切换指示。

E）释放老的 TCH，在新的 TCH 进行通话，设置 TCH 切换控制定时器 31，

进行 F）；

F）TCH 切换控制定时器 31 超时，进行 A）；TCH 切换控制定时器 31 超时前，切换控制器 3 收到基站或手机发起 TCH 切换请求、重呼型切换请求，都进行 D）。

图 6 为本发明的基站切换控制器 3 的模块示意图。如图 6 所示，本发明的基站切换控制器 3 通过其内设置的信道切换控制定时器 31、上行信道信息获取模块 32、切换综合控制模块 33，其中切换综合控制模块 33 进一步包括手机切换控制模块 331、基站切换控制模块 332 及信道切换频度控制模块 333，来实现其综合判断上下行信息，对手机和基站切换进行统一管理，控制 TCH 切换频度，防止短时间内连续 TCH 切换的功能。

本发明公开了一种 PHS 系统中效率极高的切换处理算法与装置，能够改善网络切换性能，防止切换掉话，对 PHS 网络的建设与发展有十分积极的意义。

当然，本发明还可有其他多种实施例，在不背离本发明精神及其实质的情况下，熟悉本领域的技术人员当可根据本发明作出各种相应的改变和变形，但这些相应的改变和变形都应属于本发明所附的权利要求的保护范围。

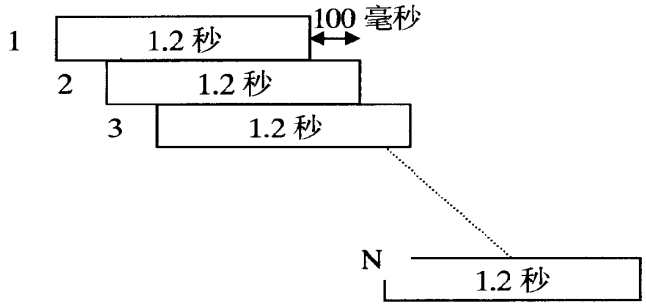


图 1

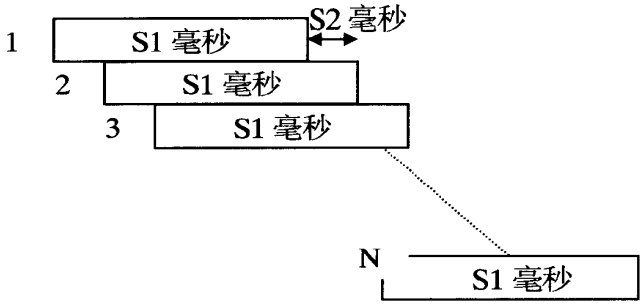


图 2

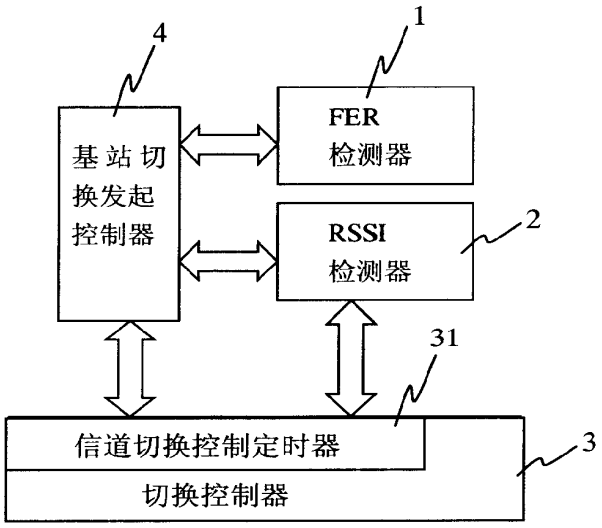


图 3

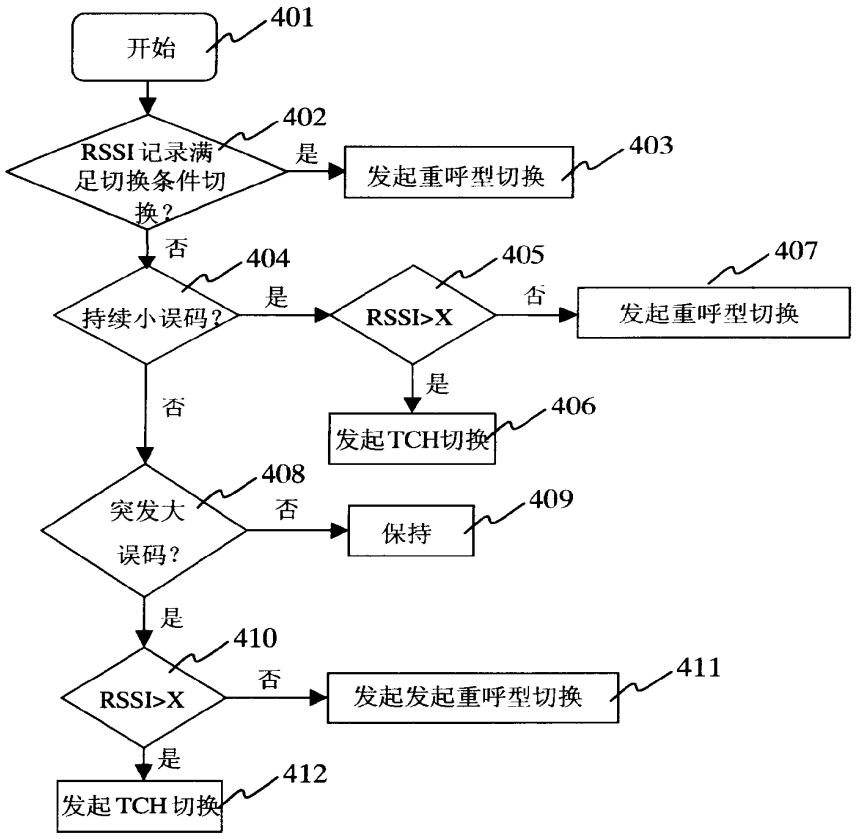

401
开始
402
RSSI记录满足切换条件切换?
是
403
发起重呼型切换
否
404
持续小误码?
是
405
RSSI>X
否
407
发起重呼型切换
是
406
发起TCH切换
否
408
突发大误码?
否
409
保持
是
410
RSSI>X
否
411
发起发起重呼型切换
是
412
发起TCH切换

图 4

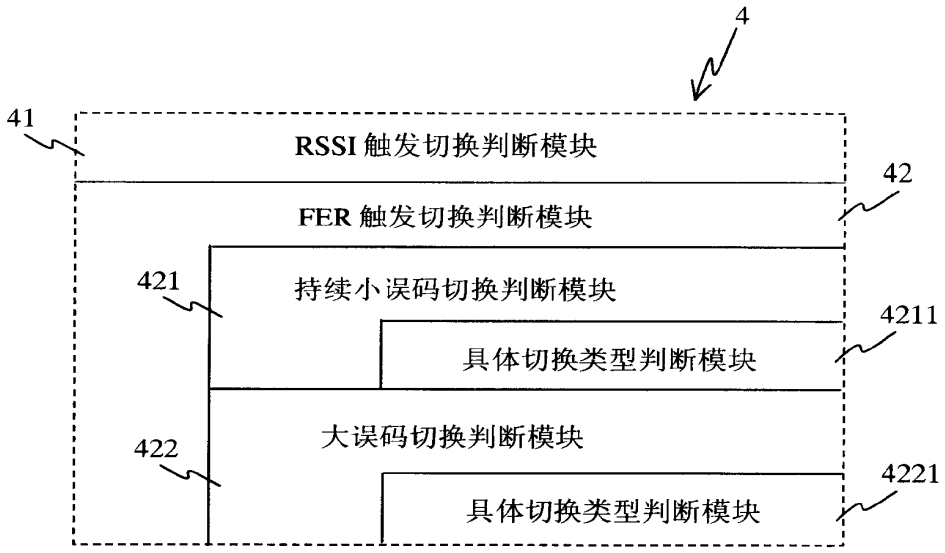


图 5

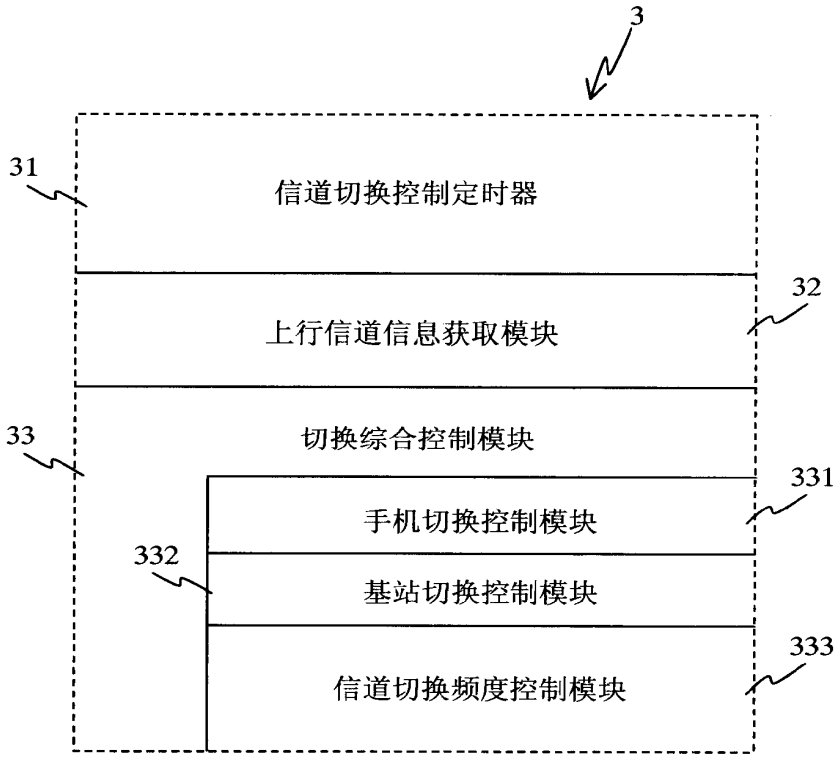


图 6

PHS base station switching method and its device

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Inventor(s): LIU SHAOLONG SHEN [CN]
Applicant(s): ZTE CORP [CN]
Classification:
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- European:
Application number: CN20051011935 20050615
Priority number(s): CN20051011935 20050615

Abstract of **CN 1882160 (A)**

The invention relates to a PHS base station switch method and a relative device, wherein it comprises: A, checking the error frame code of PHS system and receiving the information of signal field strength; B, based on the checked information and the different switch reasons, the first confirmed base station initializes the switch priority judge to judge the switch type of PHS system and initializes the relative switch request. Said device comprise: a FER detector and a RSSI detector for detecting the information; a base station switch initialize controller for judging the switch type and initializing the switch request based on the switch priority; and a base station switch controller for responding the switch request and controlling the switch. The invention can improve the switch property of system.

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H04Q 7/38

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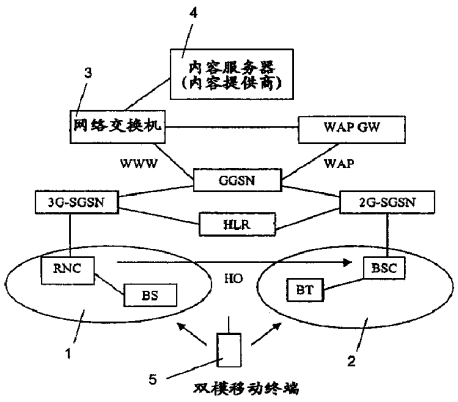
权利要求书 7 页 说明书 29 页 附图 17 页

[54] 发明名称 移动终端的系统间切换

[57] 摘要

本发明涉及用于执行经由第一类型的无线电接入网(1)接入通信网络的移动终端(5)的系统间切换的方法。 通信网络包括这个第一类型的至少这个无线电接入网(1)和第二类型的无线电接入网(2)。为了通过移动终端(5)所需或预期的无线电接入技术实现对通信网络的接入，系统间切换由移动终端(5)向通信网络的传输来发起，该传输包含指明应当执行从第一类型的无线电接入网(1)到所述第二类型的无线电接入网(2)的系统间切换的信息。 本发明同样涉及相应的移动终端、相应的通信网络、相应的通信系统、通信网络的网元以及通信系统的网络交换机。



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1. 一种用于执行经由第一类型的无线电接入网(1)接入通信网络的移动终端(5)的系统间切换的方法，其中所述通信网络至少包括所述第一类型的所述无线电接入网(1)以及第二类型的无线电接入网(2)，以及其中所述系统间切换由所述移动终端(5)向所述通信网络的传输来发起，该传输包含表明应当执行从所述第一类型的所述无线电接入网(1)到所述第二类型的所述无线电接入网(2)的系统间切换的信息。

2. 如权利要求 1 所述的方法，其特征在于，表明应当执行系统间切换的所述信息是对特定类型的无线电接入网(1,2)的直接请求。

3. 如权利要求 2 所述的方法，其特征在于，所述移动终端(5)存储具有至少一个优选类型的无线电接入网的列表，从该列表中选择所述特定类型的无线电接入网。

4. 如权利要求 3 所述的方法，其特征在于，所述至少一个优选类型的无线电接入网被分配给特定类型的内容或业务或者内容或业务的特定特征，以及根据预期的内容或业务来选择所述特定类型的无线电接入网。

5. 如权利要求 1 所述的方法，其特征在于，表明应当执行系统间切换的所述信息使所述通信网络能够得出所述移动终端(5)应当连接到的无线电接入网的类型。

6. 如权利要求 5 所述的方法，其特征在于，表明应当执行系统间切换的所述信息是所请求的内容、所请求的业务、所请求的接入点号码、所请求的统一资源定位符(URL)以及所请求的目标因特网协议(IP)地址其中之一。

7. 如权利要求 5 或 6 所述的方法，其特征在于，为了根据表明应当执行系统间切换的所述信息来得出所述移动终端(5)应当连接到的无线电接入网的所述类型，所述通信网络包括为所述移动终端存储

具有至少一个优选类型的无线电接入网的列表的网元。

8. 如以上权利要求其中之一所述的方法，其特征在于，表明应当执行系统间切换的所述信息在连接建立信令中的专用信元中传送。

9. 如权利要求 1 至 7 其中之一所述的方法，其特征在于，表明应当执行系统间切换的所述信息在连接建立信令中的专用消息中传送。

10. 如以上权利要求其中之一所述的方法，其特征在于，所述第一类型的所述无线电接入网(1)因第一标准而成为所述移动终端(5)的优选类型的无线电接入网，以及所述第二类型的所述无线电接入网(2)因第二标准而成为所述移动终端(5)的优选类型的无线电接入网。

11. 如以上权利要求其中之一所述的方法，其特征在于，每当所请求的内容仅可经由所述第二类型的无线电接入网从特定运营商获得时，要求系统间切换。

12. 如权利要求 11 所述的方法，其特征在于，在所述移动终端(5)中，不同的接入点名称和/或不同的目标因特网协议(IP)地址被分配给不同的内容，这些内容可经由不同类型的无线电接入网获得，以及表明应当执行系统间切换的所述信息包含分配给所请求的内容的所述接入点名称和/或所述目标 IP 地址。

13. 如权利要求 12 所述的方法，其特征在于，所述通信网络为所述移动终端存储一个列表，在所述列表中，不同的接入点名称和/或不同的目标 IP 地址被分配给相应类型的无线电接入网，以及所述通信网络根据在来自所述移动终端(5)的表明应当执行系统间切换的所述信息中所接收的所述接入点名称和/或所述目标 IP 地址，从所述列表中选择将要向其进行切换的一种无线电接入网。

14. 如权利要求 11 所述的方法，其特征在于，连接所述通信网络与内容服务器(4)的网络交换机(3)为仅可经由所述第二类型的无线电接入网获取的内容存储统一资源定位符(URL)列表，以及如果所述

移动终端(5)通过发送所述存储的URL列表中包含的URL向所述内容服务器(4)请求内容，则所述网络交换机(3)触发切换。

15. 如权利要求 11 所述的方法，其特征在于，连接所述通信网络与内容服务器(4)的业务认知网关通用分组无线电系统支持节点(GGSN)(6)为仅可经由所述第二类型的无线电接入网获取的内容存储统一资源定位符(URL)列表，以及如果所述移动终端(5)通过发送所述存储的 URL 列表中包含的 URL 向所述内容服务器(4)请求内容，则所述业务认知 GGSN(6)触发切换。

16. 如以上权利要求其中之一所述的方法，其特征在于，每当对于特定业务要求所述第二类型的无线电接入网时，应当执行系统间切换。

17. 如以上权利要求其中之一所述的方法，其特征在于，每当所述移动终端(5)对于特定连接优选所述第二类型的无线电接入网时，应当执行系统间切换。

18. 如权利要求 17 所述的方法，其特征在于，表明应当执行系统间切换的所述信息由所述移动终端(5)在建立消息中发送到所述通信网络。

19. 如以上权利要求其中之一所述的方法，其特征在于，所述通信网络允许由所述移动终端(5)的传输所发起的系统间切换，或者如果所述系统间切换不可行，则阻塞为之发起所述系统间切换的所请求的呼叫或上下文激活。

20. 如以上权利要求其中之一所述的方法，其特征在于，所述通信网络通过新的信元触发到所述第一类型的无线电接入网的切换。

21. 如以上权利要求其中之一所述的方法，其特征在于，所述系统间切换在呼叫建立时发生。

22. 如权利要求 1 至 20 其中之一所述的方法，其特征在于，所述系统间切换在分组数据协议(PDP)上下文激活时发生。

23. 如以上权利要求其中之一所述的方法，其特征在于，所述系

统间切换在分组交换域中执行。

24. 如权利要求 1 至 22 其中之一所述的方法，其特征在于，所述系统间切换在电路交换域中执行。

25. 一种移动终端(5)，包括：用于经由至少两个不同类型的无线电接入网接入通信网络的装置；以及发送装置，用于发送表明应当执行从所述通信网络的第一类型的无线电接入网(1)到所述通信网络的第二类型的无线电接入网(2)的系统间切换的信息。

26. 如权利要求 25 所述的移动终端(5)，其特征在于还包括：存储装置，用于存储具有至少一个优选类型的无线电接入网的列表；以及选择装置，用于从所述列表中为预期连接选择一种无线电接入网，其中所述发送装置发送所述选择的无线电接入网类型，作为表明应当执行系统间切换的所述信息。

27. 如权利要求 25 或 26 所述的移动终端(5)，其特征在于还包括：存储装置，用于存储与至少两个不同内容或业务类型相关的至少两个不同接入点名称和/或至少两个不同目标因特网协议(IP)地址；以及选择装置，用于选择与预期内容或业务类型相关的接入点名称和/或目标 IP 地址，其中所述发送装置发送所述选择的接入点名称和/或所述选择的目标 IP 地址，作为表明应当执行系统间切换的所述信息。

28. 如权利要求 25 至 27 其中之一所述的移动终端(5)，其特征在于还包括用户接口，用于使用户能够选择要用于特定连接的至少两个不同接入点名称其中之一和/或至少两个不同目标因特网协议(IP)地址其中之一，其中所述发送装置发送所述选择的接入点名称和/或所述选择的目标 IP 地址，作为表明应当执行系统间切换的所述信息。

29. 一种通信网络，包括至少两个不同类型的无线电接入网(1,2)以及装置(RNC, BSC, 3G-SGSN, 2G-SGSN, MSC1)，所述装置用于根据从所述移动终端(5)接收的、表明应当执行从第一类型的无线电接入网(1)到第二类型的无线电接入网(2)的系统间切换的信息，执行经

由所述第一类型的所述无线电接入网(1)接入所述通信网络的移动终端(5)到所述第二类型的无线电接入网(2)的系统间切换。

30. 如权利要求 29 所述的通信网络，其特征在于还包括：存储装置(HLR)，用于为移动终端(5)存储具有至少一个优选类型的无线电接入网的列表；以及选择装置(3G-SGSN)，用于根据从所述移动终端(5)接收的、表明应当执行系统间切换的信息从所述列表中选择一种无线电接入网，以及其中如果所述移动终端(5)目前正经由与所述选择的无线电接入网类型不同的另一类型的无线电接入网接入所述通信网络，则用于执行系统间切换的所述装置(RNC, BSC, 3G-SGSN, 2G-SGSN)执行所述切换。

31. 如权利要求 29 或 30 所述的通信网络，其特征在于包括具有网元(3G-SGSN)的核心网，其中网元(3G-SGSN)包括：用于分析由移动终端(5)接收的表明应当执行系统间切换的信息、以便确定所述移动终端(5)应当连接到的无线电接入网的类型的装置；以及用于在所述移动终端(5)目前连接到的所述无线电接入网(1)中触发系统间切换的装置。

32. 如权利要求 29 至 31 其中之一所述的通信网络，其特征在于，所述通信网络的至少一个无线电接入网(1)包括用于根据所述通信网络的核心网的网元(3G-SGSN)发出的请求、执行到所述通信网络的另一类型的无线电接入网(2)的系统间切换的装置(RNC)。

33. 如权利要求 29 至 32 其中之一所述的通信网络，其特征在于，所述第一类型的所述无线电接入网(1)是 3G(第三代)无线电接入网，以及所述第二类型的所述无线电接入网(2)是 2G(第二代)无线电接入网。

34. 如权利要求 29 至 33 其中之一所述的通信网络，其特征在于，所述第一类型的所述无线电接入网(1)是 WCDMA(宽带码分多址)无线电接入网，以及所述第二类型的所述无线电接入网(2)是 GSM(全球移动通信系统)和/或 GPRS(通用分组无线电系统)无线电接入网。

35. 一种用于通信网络的网元(3G-SGSN)，其中网元(3G-SGSN)包括：用于分析由通过第一类型的无线电接入网连接到所述通信网络的移动终端(5)所接收的信息的装置；以及用于在所述分析的信息表明应当执行所述移动终端(5)到第二类型的无线电接入网的系统间切换时、触发所述移动终端(5)的系统间切换的装置。

36. 一种网络交换机(3)，用于连接通信网络和内容服务器(4)，所述网络交换机(3)包括：存储装置，用于存储与仅可经由特定类型的无线电接入网从所述内容服务器(4)获得的内容相对应的统一资源定位符(URL)的列表；用于把由移动终端(5)经由所述通信网络向所述内容服务器(4)请求的 URL 与所述存储的 URL 列表进行比较的装置；以及用于在所述移动终端(5)经由与所述特定类型的无线电接入网不同的另一类型的无线电接入网连接到所述通信网络时、以及在所述请求的 URL 包含在所述存储的 URL 列表中时、在所述通信网络中触发所述移动终端(5)的切换的装置。

37. 一种通信系统，包括用于实现如权利要求 1 至 24 其中之一所述的方法的装置。

38. 一种通信系统，它包括通信网络，所述通信网络具有至少两个不同类型的无线电接入网以及装置(RNC, BSC, 3G-SGSN, MSC1)，所述装置用于在由移动终端(5)的传输发起时执行所述移动终端(5)从第一类型的无线电接入网(1)到第二类型的无线电接入网(2)的系统间切换，所述通信系统还包括至少一个移动终端(5)，所述移动终端(5)具有：用于经由所述第一类型的所述无线电接入网(1)和所述第二类型的所述无线电接入网(2)接入所述通信网络的装置；以及发送装置，用于发送表明应当执行从所述通信网络的第一类型的无线电接入网(1)到所述通信网络的第二类型的无线电接入网(2)的系统间切换的信息。

39. 如权利要求 38 所述的通信系统，其特征在于还包括连接所述通信网络与内容服务器(4)的网络交换机(3)或业务认知网关通用分

组无线电系统支持节点(GGSN)(6)，其中网络交换机(3)或 GGSN(6)包括：存储装置，用于存储与仅可经由所述第二无线电接入技术从所述内容服务器(4)获得的内容相对应的统一资源定位符(URL)的列表；用于把由所述移动终端(5)经由所述通信网络向所述内容服务器(4)请求的 URL 与所述存储的 URL 列表进行比较的装置；以及用于在所述移动终端(5)经由所述第一类型的无线电接入网连接到所述通信网络时、以及在所述请求的 URL 包含在所述存储的 URL 列表中时、由所述通信网络触发所述移动终端(5)的切换的装置。

移动终端的系统间切换

发明领域

本发明涉及用于执行经由第一类型的无线电接入网接入通信网络的移动终端的系统间切换的方法。通信网络包括这种第一类型的无线电接入网和第二类型的无线电接入网。本发明同样涉及相应的移动终端、相应的通信网络以及相应的通信系统。此外，本发明还涉及通信网络的网元以及连接通信网络与内容服务器的网络交换机。

发明背景

从现有技术水平知道，在提供不同的无线电接入技术(RAT)的通信系统中支持移动终端在这些技术之间的系统间切换。这种切换例如可在 3G(第 3 代)无线电接入网与 2G(第 2 代)无线电接入网之间进行，或者在 3G 系统内在采用 WCDMA(宽带码分多址)的 UTRAN(通用移动电信业务地面无线电接入网)与 GSM(全球移动通信系统)无线电接入网之间进行。作为系统间切换的前提，移动终端必须能够经由所有所涉及类型的无线电接入网接入通信系统。这些移动终端称作多模终端。多模终端的一个实例是 2G/3G 双模终端。

例如，在技术规范 3GPP TS 23.060 V3.6.0(2001-01): “通用分组无线电业务(GPRS); 业务描述; 阶段 2(1999 年发布)”中说明了用于执行 UMTS(通用移动电信业务)与 GMS 之间的系统间切换的网络信令。

实现无线电接入技术的变更存在若干原因。

系统间切换的最重要原因是通信系统中覆盖范围和质量的差异。在一些情况下，某个正移动的移动终端当前所连接到的第一无线电接入系统的覆盖范围可能终止。此外，这个第一无线电接入系统所

提供的无线电连接质量可能降低到给定门限值以下。如果同时，另一个无线电接入系统仍然提供覆盖范围和/或更好的无线电连接质量，则系统间切换能够保证移动终端的连续且令人满意的供给。第一无线电接入系统通常是 WCDMA 系统，而第二无线电接入系统是 GSM/GPRS 系统。

系统间切换的另一个主要原因是不同无线电接入系统中的负荷、即当前业务量。当第一无线电接入系统中的负荷超过预定义的门限值时，移动终端的超出业务量会被切换到另一个无线电接入系统。在这种情况下，第一无线电接入系统通常是 GSM/GPRS，而第二无线电接入系统是 WCDMA。

系统间切换的第三个原因是所请求业务的 QoS(服务质量)要求。通信系统的运营商根据其喜好来定义基于业务的切换标准。然后将这些标准存储在发起切换的核心网中的业务优先级表中。另外，相同的表还保存在通信系统的 UTRAN 的无线网络控制器(RNC)中。如果 RNC 没有从核心网接收到任何切换信息，则可使用 RNC 中的表。在对不同无线电接入技术的业务的示例分配中，GSM 可能更适合于语音而 WCDMA 更适合于分组数据，而电路数据必须采用 WCDMA 来传送。基于业务的切换的附加标准是负荷，因此基于负荷和业务的切换是比基于业务的切换更为准确的术语。

例如，如在技术规范 3GPP TS 25.413 V3.4.0(2000-12): “UTRAN Iu 接口 RANAP 信令(1999 年发布)”中所规定的那样，从 3G UTRAN 到 2G GSM 无线电接入网的基于业务的切换是通过核心网与 UTRAN 之间的 Iu 接口上的 RANAP(无线电接入网应用部分)消息“RAB 分配请求”和“重定位请求”中称作“业务切换”的可选参数来实现的。为此参数定义了三个值，即“HO 到 GSM 应该被执行”、“HO 到 GSM 不应被执行”以及“HO 到 GSM 将不被执行”。这样，核心网无法迫使 RNC 执行从 3G 到 2G 无线电接入网的切换，而只能建议切换。RNC 根据诸如负荷、覆盖以及无线电连接质量等附加标准来作

出最终决定。此外，在基于负荷和业务的切换中，RNC 以定期及成组方式把移动终端切换到基站子系统(BSS)，而不是直接地逐个进行。

所有已知的系统间切换由网络决定，这阻止通信系统在几种情况下利用系统间切换的可能优点。

当前的 3GPP 规范同等地对待 UTRAN、GSM 和 GERAN 无线电接入小区，也就是说，没有强有力的手段让网络运营商或用户把移动终端引向最适合的无线电接入技术。大家知道，根据所定义的标准，偏向于一个或另一个公用陆地移动网(PLMN)、位置区(LA)、路由选择区(RA)或小区。但是，不同无线电接入技术的小区可能混合在单个 PLMN、LA 或 RA 中，迄今为止没有提出任何方法用于迫使移动终端采用特定的无线电接入技术，甚至不偏向某种无线电接入技术。只有在当前正服务小区中无法提供所请求的业务，呼叫才可能由网络切换到另一个小区，或者呼叫可能被清除。

通过当前已知的方法无法解决的另一个问题涉及到许可。在媒体领域，常见方式是为仅通过某种途径分发特定内容提供许可，例如，为经由电缆、经由地面接入、即模拟、数字、AM、FM、HF、UHF 和/或 VHF 或者经由卫星系统的 TV 和无线电广播提供许可。但在移动通信中，内容许可却比较新。可是，一些内容提供商已经向移动网运营商和服务提供商出售了专有许可证，用于在有限的无线电接入频谱、如 GSM 和 UMTS 频带或技术上提供某种内容。运营商通常具有 2G 和 3G 两种网络，并且能够经由 3G 无线电接入向 3G/2G 双模终端用户提供许多内容。但是，如果该运营商对某种内容只有 2G 许可证，而它的竞争对手却有相同内容的专有 3G 许可证，则它将尝试找出技术解决方案，以便在 2G 频带上向其双模用户提供许可内容。因此，需要能够向双模终端提供特定无线电接入技术。

此外，可能出现移动终端希望使用移动终端向其登记的系统中不可用的业务的情况。例如，2G/3G 移动终端可在 3G WCDMA 系统或

者在 2G GSM 系统中工作。WCDMA 系统则通常是首选系统。但是，GSM 具有 3G 中不存在的某些业务、例如透明传真。同时，切换必须由网络发起，移动终端在建立所请求的呼叫之前无法通知网络它必须要切换。如果移动终端处于 WCDMA 覆盖区内，则无法无延迟地使用这种透明传真业务。

发明概述

本发明的一个目的是使通信系统中的移动终端能够发起向所需或所希望类型的无线电接入网的切换。

通过用于执行经由第一类型的无线电接入网接入通信网络的移动终端的系统间切换的方法来实现这个目的。所述通信网络包括这种第一类型的至少这个无线电接入网和第二类型的无线电接入网。建议系统间切换通过移动终端向通信网络的传输来发起。这种传输将包括表明应该执行从第一类型的无线电接入网到第二类型的无线电接入网的系统间切换的信息。

应当指出，术语“切换”意在也包含小区再选。

通过包括用于实现所建议方法的部件的移动终端和通信网络同样实现本发明的目的。此外，通过包含用于分析移动终端所需或所要求的系统间切换的指示以及用于触发这种切换的部件的网元或网络交换机来实现该目的。最后，通过包括这种移动终端和这种通信网络的通信系统来实现本发明的目的。

本发明源于以下概念：在某些情况下，最有利的无线电接入技术是移动终端相关的，并且在移动终端作出相应指示之后仅在网络上是已知的。因此，建议对移动终端从一种无线电接入技术切换到另一种的决定基于由移动终端的传输发起。

本发明的一个优点在于，系统间切换可根据移动终端的个别要求立即执行。

根据本发明，在建立所请求的呼叫或上下文激活之前或之后，如

果需要切换，则使移动电话专门能够发起这种切换请求。在呼叫建立或上下文激活之后，例如当用户浏览运营商的门户站点并点击表示他/她所需内容的仅 2G 的统一资源定位符(URL)时，切换可能是符合需要的。

本发明的优选实施例通过从属权利要求变得十分清楚。

表明应该执行系统间切换的信息可存在于特定无线电接入技术的移动终端的直接请求中，或者存在于一个信息中，根据该信息在网络中可间接得出切换的必要性。

为了实现直接请求，例如，优选无线电接入技术可存储在移动终端中的列表中。这个列表可表明哪个业务或内容将通过哪种无线电接入技术来请求。移动终端对于各个所需内容或业务则发出相应的指示。移动终端能够特别在添加到现有的连接建立信令中的新信元中或者在添加到信令序列中的新消息中向网络传递优选无线电接入技术。

为了实现间接请求，优选无线电接入技术的列表可保存在通信网络的网元中，具体来讲，是在移动终端的归属位置寄存器(HLR)中，在业务认知网关 GPRS(通用分组无线电系统)支持节点(GGSN)中，或者在网络交换机中。如果无线电接入技术在该列表中例如与特定内容、业务、内容或业务类型或者接入点名称(APN)相关，则移动终端所请求的内容、业务或接入点名称可用于从 HLR、业务认知 GGSN 或网络交换机中所存储的列表中选择无线电接入技术。

除 APN 之外，由移动终端所请求的 URL 或目标 IP 地址也可用作所需或所要求的无线电接入技术的指示。

可具体在通信系统的核心网的 SGSN 中估计 APN，同时，在通信系统的核心网的 GGSN 中，或者在提供核心网与内容服务器之间连接的网络交换机中，也可分析 URL 或目标 IP 地址。目前，这种网络交换机用于各种业务量管理任务。

在所有情况中，网络可从所接收信息中确定对于切换的需要，而

且基于这一点，允许没有切换的内容传递，准许切换以及允许成功切换之后的内容传递，或者阻塞所请求的内容传递。当用户已经利用PDP(分组数据协议)上下文或数据呼叫进行浏览时，将利用已经存在的 PDP 上下文或数据呼叫把内容传递到终端。

在本发明的第一优选实施例中，切换取决于移动终端所请求的内容。因此，这种方式把内容和无线电接入联系起来，它们从系统设计的观点来看构成两个远程方面。根据移动终端的内容相关信息，执行切换或网络控制的小区再选。本发明的这个特定实施例的优点在于，内容提供商可把对其内容的访问权限制到某个网络，并且例如根据这个限制来控制计费。

本发明的这个实施例特别适用于以下情况：当用户正在浏览运营商的门户网站且尝试访问运营商仅对第二类型的无线电接入网具有许可证的内容时，运营商希望把双模移动终端从第一类型的无线电接入网切换到第二类型的无线电接入网。第一网络可把用户以用户几乎察觉不到的方式切换到第二网络，然后用户还可经由第二网络使用业务。这种双模终端可以是例如 3G/2G 移动终端，第一无线电接入网可以是 3G 无线电接入网，第二无线电接入网可以是 2G 无线电接入网。通常不要求从 2G 到 3G 系统的切换，因此不一定需要提供。

有利的是，内容检测点设置为与切换控制点尽量接近，以便使受影响的接口数量最少。

对于基于内容的切换，表明所需切换的信息可以例如由内容本身提供，或者由移动终端发送到网络的 APN、目标 IP 地址或 URL 来提供。如果为不同的无线电接入技术提供了两个不同的接入点名称或目标 IP 地址，则网络可根据所提供的接入点名称或目标 IP 地址来确定必须采用哪种技术，从而确定是否要求切换。移动终端可包括用于使终端的用户能够在两个不同接入点名称或目标 IP 地址之间手动转换的部件，以便访问经由两个不同类型的无线电接入网提供的业务。如果内容检测是例如在存储了仅通过特定无线电技术可用的内容的

URL 列表以便比较的业务认知 GGSN 或网络交换机中、基于所传送的 URL 实现的，则与采用基于 APN 或目标 IP 地址的解决方案相比，能够实现更好的用户友好性以及更灵活的业务设计，因为它允许把单个 APN 和单个目标 IP 地址用于不同类型的内容，例如仅 2G 和无线电接入无关的内容。另一方面，例如在不同 APN 之间选择的可能性对用户而言可能是有益的，因为它为用户提供对其终端的更多控制。例如，如果计费类型在 GPRS 和 3G 中不同，则用户能够通过选择 APN 来选择一种适宜的计费类型。通过业务认知 GGSN，这种灵活性可仅由一个覆盖多个业务 APN 的上下文 AP 来提供。

在本发明的第二优选实施例中，切换取决于预期业务，例如因为这种业务仅经由特定类型的无线电接入网才可用。根据移动终端在呼叫开始时所提供的业务相关信息，如果对于这种业务需要切换，则切换移动终端。因此，这种方法使移动终端能够访问某种业务、例如建立呼叫，而这种业务仅经由移动终端目前未向其登记的一种无线电接入网才可用。本发明的这个特定实施例的另一个优点在于，移动终端的实现能够被简化，因为可从提供所请求业务的网络中立即请求业务。

如果第二实施例在 3G 系统中实现，则最好是把新的信元添加到移动终端发给通信网络的“建立”消息中。这个新的信元则可用来通知通信网络关于移动终端想要用于所请求业务的无线电接入技术。

在本发明的第三优选实施例中，切换取决于移动终端为特定连接对特定无线电接入技术的选择，例如因为移动终端所请求的业务是采用这种特定无线电接入技术会更有效地或者更经济地工作的业务。本发明的这个特定实施例的一个优点是，业务可以是基于移动终端的灵活分配的网络资源，它允许把网管扩展到终端。

根据本发明的系统间切换可以具体在呼叫建立过程中或者在 PDP 上下文激活时发生。

对于 WCDMA 到 GSM 的切换，通过为 Iu 接口上的 RANAP 消

息“RAB 分配请求”和“再定位请求”中的可选“业务切换”信元引入新的可能值“HO 到 GSM 将被执行”，实际切换可实现为例如基于已知负荷和业务的切换的扩展。与已知的 3G 系统相比，通过这种新值，RNC 不再具有完全的切换控制，尽管最终决定仍然由 RNC 作出。这个新值适合于实现所建议的基于内容的切换以及所建议的基于新业务的切换。或者，可为实现根据本发明的一种或多种切换定义新的参数。

对于以下情况本发明尤为受关注：特定无线电接入技术因某些技术原因、如接收信号的场强或者 2G/3G 双频带移动终端的 3G 系统的优点而更适合于多频带移动终端。在可行的情况下，本发明允许根据新的原因、如预期内容或业务的可用性来转换到另一个非优选无线电接入技术。

有利的是，本发明的一个实施例能够在提供例如 WAP(无线应用协议)、HTTP(超文本传输协议)和 FTP(文件传输协议)业务的多业务环境下工作。

显然，在通信系统中可实现不同种类的系统间切换，本发明仅要求实现至少一种由移动终端发起的系统间切换。

因此，本发明的系统间切换不仅能够对 WCDMA 和 GSM/GPRS 来实现，而且能够对其间可能对这种系统间切换感兴趣的任何系统实现，例如对于移动台从 WLAN(无线局域网)到 GSM 的切换。

此外，本发明也可对分组交换业务以及电路交换业务来实现。

通过以下结合附图的详细说明，本发明的其它目的和特征将变得非常明显。但是，应当理解，附图仅用于举例说明而不是对本发明的限制的定义，该定义应当参照所附权利要求书。还应当理解，附图没有按比例绘制，它们仅用于从概念上说明本文所述的结构和步骤。

附图简介

图 1 说明一种通信系统，其中可采用本发明的第一和第二实施

例；

图 2 是消息序列图，说明在第一情况下的本发明的第二实施例；

图 3 是消息序列图，说明在第二情况下的本发明的第二实施例；

图 4 是消息序列图，说明在第三情况下的本发明的第二实施例；

图 5 是消息序列图，说明在第四情况下的本发明的第二实施例；

图 6 说明另一种通信系统，其中可类似地采用本发明的第二实施例；

图 7 说明一种通信系统，其中可采用本发明的第三实施例；

图 8 是消息序列图，说明本发明的第三实施例；

图 9 说明另一种通信系统，其中可类似地采用本发明的第三实施例；

图 10 说明一种通信系统，其中可采用本发明的第四实施例；

图 11 是消息序列图，说明本发明的第四实施例；以及

图 12 说明另一种通信系统，其中可类似地采用本发明的第四实施例；以及

图 13 是消息序列图，说明根据本发明的方法的第五实施例。

发明的详细说明

图 1 说明一种通信系统，其中可对分组交换连接采用实现基于内容的系统间切换的本发明的一个实施例。

应当指出，术语“NCCRS(网络控制的小区再选)到 3G”也意味着如规范中所述的“到 UTRAN 的网络发起的小区改变命令程序”。

通信系统包括 3G UTRAN 1 和 2G GSM 无线电接入网 2。UTRAN 1 又包括连接到无线电网络控制器 RNC 的基站 BS，而 GSM 接入网包括连接到基站控制器 BSC 的基站 BS。

UTRAN 的 RNC 还经由 3G-SGSN 连接到归属位置寄存器 HLR 和网关 GPRS 支持节点 GGSN。GSM 接入网的 BSC 还经由 2G-SGSN 连接到 HLR 和 GGSN。

SGSN、HLR 和 GGSN 属于通信系统的核心网。SGSN 是交换机，在其当前位置为分组交换业务服务于移动终端。GGSN 是核心网的交换机，为分组交换业务提供到外部网络的连接。为了此功能，GGSN 一方面为了图中用“WWW”表示的 html(超文本标记语言)业务，经由网络交换机 3 连接到内容提供商的内容服务器 4。另一方面，GGSN 为了 WAP 业务，经由 WAP GW(网关)和网络交换机 3 连接到内容提供商的内容服务器 4。2G 和 3G 无线电接入网 1、2 以及核心网也将共同称作通信网络。

所述通信网络还包括移动终端 5。这个终端 5 是 2G/3G 双模终端，支持 GSM/GPRS 和 WCDMA。因此，移动终端 5 能够接入 UTRAN 1 以及 GSM 接入网 2。

通信网络的运营商仅具有经由 2G 系统而非 3G 系统提供特定内容的许可证。

现在将说明能够在图 1 的系统中实现的根据本发明的方法的第一实施例。

在示例初始状态中，移动终端 5 在 UTRAN 1 中具有非实时(NRT)分组交换(PS)连接，当用户浏览门户站点时处于已连接模式。另一个初始连接可能是例如实时分组交换连接。

移动终端现在请求特定内容时，必须在通信网络中确定移动终端进行的请求是否暗含切换请求，因为仅允许这个内容经由 2G 系统提供。

为此，首先必须知道 3G/2G 移动终端目前正使用的无线电接入技术。当 3G-SGSN 接收对内容的请求时，无线电接入技术本来就是已知的，因为 3G-SGSN 连接到 UTRAN 1，它是一个仅 3G 网元。

随后，必须确定终端 5 请求哪种类型的内容，即 3G/2G 内容类型还是仅 2G 内容类型。在本发明的这个实施例中，根据接入点名称、移动终端 5 所请求的接入点名称以及内容来确定所请求内容的类型。

APN 是标识符，用于业务设计中标识送往终端 5 的用户的业务。用于 APN 的格式为“my.isp.com.myoperator.fi.gprs”，其中 my.isp.com 为网络标识符，myoperator.fi.gprs 为运营商标识符。网络标识符链接到某个业务，以及运营商标识符表明 GGSN 处于哪个运营商网络中。

这样，APN 区分各业务，并使得能够限制某个用户可访问的业务集合。APN 可表明所请求业务的类型，例如 WAP、HTML 或电子邮件。APN 还可表明预期子网，例如公司、ISP(因特网服务提供商)等等，和/或表明预期 IP(因特网协议)版本，例如归属 GGSN 中的 IPv6 支持。在物理上，APN 与 GGSN 中的接入点对应。在 GPRS 中，APN 是 PDP 上下文的一部分，以及用户的当前 APN 对于终端 5、SGSN、GGSN 和 HLR 是已知的。

APN 一方面存储在 HLR 中，另一方面由移动终端 5 在 PDP 上下文激活中请求。SGSN 使用 APN，通过把所请求 APN 与存储在 HLR 中的用户数据进行比较来检查所请求业务是否经过授权。根据 APN 和 DNS(域名系统)，SGSN 进一步确定支持所请求业务的 GGSN。

在本发明的第一实施例中，不同的 APN 被分配给 3G/2G 内容业务而不是仅 2G 内容业务。当 3G/2G 内容和仅 2G 内容从两个不同的 APN 中可用时，SGSN 可通过分析所请求 APN 来检测所请求内容的类型，并根据需要引起切换。

为了引起切换，SGSN 向 RNC 发送切换触发信号。切换触发信号包含在送往 RNC 的“RAB 分配请求”RANAP 消息中的新信元“将进行向 SGN 的切换”中。根据这个无条件请求，RNC 执行向 2G 接入网 2 的切换。SGSN 和 RNC 的所建议的新功能性仅分别要求对现有 SGSN 和 RNC 功能性的较小变更。因此，移动终端 5 能够访问预期的仅 2G 内容。从 UTRAN 1 到 GSM 接入网 2 的切换在图 1 中采用标号“HO”来表示。

作为预防措施，还应该有一种处理仅 3G 用户、即采用单模 3G 终端的那些用户的方法，这些用户尝试访问仅 2G 内容，尽管在一些

情况下，他们在 HLR 中的预订已经防止这种操作。在所建议的基于 APN 的解决方案中，仅 2G APN 可从仅 3G 用户的 HLR 中所允许 APN 的列表中排除。这样，提供两个独立的 APN 用于 3G/2G 双模业务以及仅 2G 业务另外还允许从仅 3G 用户中排除仅 2G 业务。

在移动终端 5 向 GSM 接入网切换之后，通过在从核心网到 BSC 的 A 接口上把参数“HO 到 UMTS 将不被执行”包含在切换消息中，将移动终端 5 保持在 2G 端。其它两个可能的参数是“HO 到 UMTS 应该被执行”和“HO 到 UMTS 不应被执行”。

当移动终端 5 再次转换为空闲模式时，它将连接到最强的 3G 或 2G 小区，除非运营商在 WCDMA 邻域列表中赋予 GSM 小区高优先级。即使接收到来自 WCDMA 小区的较强信号，只要它们保持在预定最大门限等级以下，GSM 小区的这种高优先级也将把空闲移动终端 5 保持在 GSM 中。

在根据本发明的方法的第二实施例中，可根据移动终端 5 所请求的 URL 在图 1 的网络交换机 3 中检测内容类型。网络交换机一方面存储对应于仅 2G 内容的 URL 列表。另一方面，网络交换机 3 分析流经它的全部 http 业务量，并检测由用户所请求的、对应于仅 2G 内容的 URL。

下面参照图 2 至 5 说明在网络交换机中基于 URL 的内容检测的四种基本情况。各图从左到右包括与对应于图 1 的移动终端 5 的移动台 MS 相关的、以及与图 1 的 RNC、BSC、3G-SGSN、2G-SGSN、GGSN、网络交换机 3、内容服务器 4 相关的相应垂直线。另外，在这些要素之间传送的消息的相应序列在图 2 至 5 中由带标号的箭头来表示。

作为图 2a-2c 分布在三页上的图 2 说明第一情况下所传送的消息序列，其中，当连接到 UTRAN 1 的 2G/3G 双模移动台 5 尝试访问仅 2G 内容时，网络交换机触发切换。

在第一消息 1 中，移动台向 3G-SGSN 发送 PDP 上下文激活请求。

结果，在 3G-SGSN 与 RNC 之间以消息 2 和 3 交换 RAB(无线电接入承载)分配请求和响应。

接下来，3G-SGSN 确定用户的 RAT+MS 类型，即所用移动台的类型和当前使用的无线电接入类型。根据移动台的无线电接入功能、SIM(用户身份模块)的 IMSI(国际移动用户身份码)范围和/或从 HLR 接收的认证矢量来确定 RAT+MS 类型。MS+RAT 类型可能具有四个值：访问 3G 无线电接入网的 3G 单模移动台；如本例中访问 3G 无线电接入网的 2G/3G 双模移动台；访问 2G 无线电接入网的 2G/3G 双模移动台；或者访问 2G 无线电接入网的 2G 单模移动台。在移动终端连接到 3G-SGSN 的情况下，无线电接入类型显然为 3G。3G-SGSN 把所确定的 RAT+MS 类型插入从 3G-SGSN 以消息 4 发送到 GGSN 的创建 PDP 上下文请求的个人扩充字段中。

通过消息 5，GGSN 向网络交换机转发包含 RAT+MS 类型和用户的源 IP 地址的用户信息。应当指出，同一个用户的不同 PDP 上下文具有不同的 IP 地址。网络交换机把所接收的 RAT+MS 类型和源 IP 地址存储到其数据库中。这样，网络交换机这时能够根据已存储的用户 IP 地址对其进行识别。网络交换机通过消息 6 向 GGSN 确认用户信息的接收。

然后，通过从 GGSN 发送到 3G-SGSN 的消息 7“创建 PDP 上下文响应”以及通过从 3G-SGSN 发送到移动台的消息 8“激活 PDP 上下文接受”来激活所请求的 PDP 上下文。

移动台通过发送给 GGSN 的消息 9 请求属于仅 2G 内容的 URL。

该请求经由网络交换机以消息 10 转发给内容服务器。网络交换机检测到所接收的 URL 在对应于仅 2G 内容的所存储 URL 列表中存在。网络交换机向内容服务器请求 URL，并以消息 10b 接收所请求的 URL。由于请求移动台由网络交换机根据用户的源 IP 地址识别为当前连接到 3G 的 2G/3G 双模移动台，因此网络交换机则向 GGSN 发送基于内容的系统间网络控制小区再选(CB IS NCCRS)触发信号。

CB IS NCCRS 触发信号在更新 PDP 上下文请求消息、即消息 12 的可选字段中被进一步传递给 3G-SGSN。3G-SGSN 根据可选字段内容把该消息解释为 CB IS NCCRS 触发信号，并通过消息 13 在 RNC 中触发基于业务的小区再选(SB IS NCCRS)。对于 RNC，基于业务的小区再选与基于内容的小区再选相同，因为两者都采用相同的业务切换信元参数在 RNC 中触发小区再选。

通过消息 14，RNC 命令移动台在 2G 中执行小区再选。RAB 分配响应作为消息 15 被发送到 3G-SGSN，以及更新 PDP 上下文响应还作为消息 16 发送到 GGSN。

移动台能够自己找到 2G 小区，并在 2G 端以消息 17 向 2G-SGSN 发送路由选择区更新请求。

通过 2G-SGSN 与 3G-SGSN 之间在消息 18 和 19 中的 SGSN 上下文请求和响应，2G-SGSN 从 3G-SGSN 获得移动台的旧 SGSN 上下文。3G-SGSN 在消息 19 的可选字段中包含信息，表明该移动台已经因基于内容的接入原因而移动到 2G。

在 3G-SGSN 上从 HLR 接收到取消定位消息时，通过 3G-SGSN 与 RNC 之间的消息交换、即消息 20 和 21，释放 Iu 接口。来自 HLR 的取消定位消息在图中的第一个矩形中表示。在附图上的第二个矩形中表示的后续 BSS 分组流上下文过程中，2G-SGSN 以 CREATE-BSS-PFC 消息向 BSC 表明将不执行到 UTRAN 的切换。采用这个值的原因在于，当经由 2G 无线电接入下载仅 2G 内容时，移动台不会直接返回到 3G，因为这将违反内容许可。

通过消息 22，移动台的消息 17 的路由选择区更新请求被 2G-SGSN 接受。

消息 23 和 24 用于 2G-SGSN 与 GGSN 之间的请求/响应消息交换，以便更新 GGSN 中的 PDP 上下文。2G-SGSN 在请求中包含表明正在进行切换的切换(CB IS NCCRS)信息。

通过消息 25，GGSN 通知网络交换机，网络交换机通过消息 11

为其触发切换的用户已经完成切换(CB IS NCCRS)。

网络交换机从其高速缓存中检索用户在3G端时以消息9向内容服务器请求的URL。然后，网络交换机把URL作为消息26以http发送到移动台。

移动台在2G端至少停留一段时间，直到它通过消息27和28向2G-SGSN以及经由2G-SGSN向GGSN请求去活用于下载的PDP上下文为止。GGSN识别PDP上下文的IP地址，并在后续请求消息29中请求网络交换机从其存储器中删除相关用户的这个特定IP地址。网络交换机删除IP地址，并通过消息30进行响应。通过送往2G-SGSN的消息31并进一步通过送往移动台的消息32，一直到移动台完成PDP上下文的去活。

保持用户的所有其它可能的PDP上下文，直到它们被去活为止。用户可采用其它PDP上下文访问仅2G内容，因为他/她这时处于2G系统中，而且没有任何内容许可证限制施加于2G中。稍后，移动台可自动移动到3G。

图3说明第二种情况的消息的序列，其中仅2G用户在2G中请求仅2G内容，以及绕过网络交换机3。

与第一种情况对应，移动台在第一消息中向2G-SGSN发送激活PDP上下文请求，以及2G-SGSN如前述3G-SGSN一样确定RAT+MS类型。在消息2中，把所确定的RAT+MS类型再次发送到GGSN。

GGSN从所接收的RAT+MS类型参数中了解到该用户为仅2G的。与第一种情况相比，GGSN不向网络交换机提供该用户的IP地址，因为用户可以只经由2G访问任何内容。因此，该用户的IP地址不存储在网络交换机的存储器中。

在消息3至5中，发送创建PDP上下文响应，执行“BSS分组流上下文”过程，并且发送“激活PDP上下文接受”。这些消息与第一种情况中的消息对应，只不过这里涉及到2G-SGSN而不是3G-SGSN。在消息6中，移动台向GGSN请求仅2G URL，GGSN则在

消息 7 中经由网络交换机向内容服务器转发“获取所请求 URL”消息。GGSN 在消息 8 中经由网络交换机接收所请求的 URL。

当网络交换机识别所请求 http 流中的仅 2G URL 时，它检查 http 流的源 IP 地址是否在其用户数据库中。

由于没有找到 IP 地址，因此网络交换机在这种情况下不采取行动。

因此，所请求的仅 2G 内容可由 GGSN 直接转发到移动台。

图 4 说明第三种情况的消息序列，其中网络交换机当仅 3G 用户在 3G 系统中请求仅 2G 内容传送时对其进行拒绝。

消息 1 至 9 基本上对应于第一种情况的消息 1 至 9，通过这些消息，激活 PDP 上下文，以及由移动台请求仅 2G URL。网络交换机同样再次存储所接收的 RAT+MS 类型以及从 GGSN 接收的用户的 IP 地址。

但是，当 GGSN 尝试在消息 10 中经由网络交换机向内容服务器发送“获取所请求 URL”消息时，网络交换机认识到仅 3G 用户尝试访问仅 2G 内容。仅 3G 移动台无法移动到 2G，因此网络交换机拒绝向该用户传递内容。网络交换机能够在消息 11 中向该用户发送适当的 html 页面，作为通知用户该内容无法访问的一种方式。

图 5 作为图 5a 和 5b 分布在两页中，最后描述第四种情况的消息序列，其中在 2G 系统中的 2G/3G 用户的仅 2G 内容下载过程中阻止切换。

对于激活新 PDP 上下文，在这种情况中的消息 1 到 7 基本上对应于第一和第三种情况中的消息，除了消息交换中涉及到 2G-SGSN 而不是 3G-SGSN。因此，3G-SGSN 与 RNC 之间的 RAB 分配请求和响应消息没有包括在内。相反，在从 GGSN 到 2G-SGSN 的“创建 PDP 上下文响应”之后，如第二种情况那样，在 2G-SGSN 与 BSC 之间执行“BSS 分组流上下文”过程。

然后，2G/3G 用户通过消息 8 请求仅 2G 内容。网络交换机在请

求作为消息 9 进入内容服务器之前捕捉该请求。

网络交换机检测 RAT+MS 类型，并且认识到该用户在下载所请求的仅 2G 内容期间可能移动到 3G。为了防止这种移动而违反内容许可，网络交换机在消息 10 中的更新 PDP 上下文请求的个人扩充字段中向 GGSN 发送信息。该信息表明将不允许该移动台切换(IS NCCRS)，直到从网络交换机接收到相反的指示为止。信息由 GGSN 以消息 11 在更新 PDP 上下文请求中传递到 2G-SGSN，并以 DL UNITDATA 消息、即消息 12 进一步传递到 BSC。更新 PDP 上下文请求由 2G-SGSN 通过发到 GGSN 的消息 13 中的更新 PDP 上下文响应进行响应。

此外，网络交换机在消息 10b 中接收所请求的 URL，并在消息 14 中将其转发到移动台。

在这个特定内容下载之后、即当已经从网络交换机的高速缓存中完全转存了内容时，以及经过运营商所定义的可能的附加时间(例如通过 2G-SGSN 中的就绪计时器)，网络交换机以消息 15 通知 GGSN，下载已经完成，以及可以对这个移动台执行切换(IS NCCRS)。这种切换也可基于除所请求内容之外的其它标准。应当指出，关于完成下载的信息仅与消息 8 中所请求的下载有关，即使用户可在这个请求之后不久开始其它下载。

与禁止切换的指示相似，允许切换的指示以消息 16 在更新 PDP 上下文请求中转发给 2G-SGSN。另外还以包含 “NCCRS 到 3G 不应被执行” 指示的 DL UNITDATA 消息 17 通知 BSC 关于这种允许。这个指示解除了之前由消息 12 所设定的系统间切换限制。消息 16 中的请求最后由从 2G-SGSN 发送到 GGSN 的消息 18 中的更新 PDP 上下文响应来进行响应。因此，允许 2G/3G 移动台再次切换到 3G，在图 5 中以矩形表示。

图 6 说明一种通信系统，其中能够以类似于图 1 的通信系统的方式来使用实现分组交换通信的基于内容的切换的本发明的所述第二

实施例。图 6 的通信系统主要包括与图 1 的通信系统相同配置的同样单元，即，具有基站 BS 和无线网络控制器 RNC 的 3G UTRAN 1、具有基站 BS 和 BSC 的 2G GSM 无线电接入网 2、3G-SGSN、2G-SGSN、归属位置寄存器 HLR、WAP GW、内容提供商的内容服务器 4 以及移动终端 5。

但是，图 6 的系统包括业务认知 GGSN 6 而不是图 1 的系统的非业务认知 GGSN。由于业务认知 GGSN 6 实现常规 GGSN 的功能以及网络交换机的功能，因此能够直接地或者仅通过 WAP GW 访问内容服务器 4。因此，在本系统中不需要图 1 的系统的网络交换机 3。业务认知 GGSN 6 还存储对应于仅 2G 内容的 URL 的列表，并执行参照图 2 至 5 所述的、由 GGSN 和网络交换机 3 所执行的功能。

图 7 说明一种通信系统，其中可采用实现基于内容的系统间切换的本发明的第三实施例，但这里是针对电路交换通信。对于图 7 中与图 1 的单元对应的那些单元分配相同的参考标号。

通信系统同样包括图 1 的移动终端 5、3G UTRAN 1、2G GSM 无线电接入网 2、网络交换机 3 以及内容服务器 4。

但是，与图 1 相比，说明 UTRAN 1 的 RNC 以及 GSM 接入网 2 的 BSC 到第一移动交换中心 MSC1 的连接。MSC1 还连接到 HLR 以及连接到第二移动交换中心 MSC2。或者，MSC1 和 MSC2 可通过单个移动交换中心来实现。MSC1 和 MSC2 都包括也可作为独立单元实现的 MSC 服务器(MSS)和媒体网关(MGW)。MSC2 经由网络接入服务器 NAS 和网络交换机 3 连接到内容服务器 4。

在图 7 中，MSC1、MSC2、HLR 以及 NAS 属于通信系统的核心网。

支持 2G 和 3G 的 MSC1 是在其当前位置为电路交换业务服务于移动台的交换机。从 3G 移动到 2G 时，用户通常保持在相同的移动交换中心控制下，只要移动交换中心同时支持 2G 和 3G。因此，图 7 中仅表示了单个第一移动交换中心 MSC1。或者，RNC 和 BSC 可连

接到两个不同的第一移动交换中心，因为 MSC 间切换也由系统实现。但是，通常只有几个第一移动交换中心与一个 NAS 相关。

MSC2 是提供到 NAS 的连接的交换机。

NAS 提供从 PLMN 到 IP 网络的直接接入，从而允许到达预期的因特网服务提供商(ISP)号码。为此，NAS 把电路交换域信令转换成因特网信令，反之亦然。或者，可经由连接到核心网的 PSTN/ISDN 网络的 ISUP(ISDN 用户部分)互联到达 ISP 号码。在任何情况下，MSC2 与网络交换机 3 之间的通信基于以上对于 GGSN 与网络交换机 3 之间的通信所述的相同原理。

通信网络的运营商同样仅具有经由 2G 系统而非 3G 系统提供特定内容的许可。

如对于根据本发明的方法的第二实施例所述，可根据移动终端 5 所请求的 URL 在网络交换机 3 中检测内容类型。

下面参照图 8 说明在图 7 的系统的网络交换机 3 中基于 URL 的内容检测的情况。移动台 5 目前连接到 UTRAN 1，并尝试以电路交换呼叫来访问仅 2G 内容。大体上，整个过程与参照图 2 对分组交换业务所述的过程相同。

图 8 从左到右包括与对应于图 7 的移动终端 5 的移动台 MS 相关的、以及与图 7 的 RNC、BSC、MSC1、MSC2、NAS、网络交换机 3 和内容服务器 4 相关的相应垂直线。另外，在这些单元之间传送的消息的相应序列在图中由带标号的箭头表示。

在第一消息 1 中，移动台 MS 向正服务 MSC1 发送“建立”请求，用于建立呼叫。

因此，MSC1 确定用户的 RAT+MS 类型，即所用移动台类型和当前使用的无线电接入类型。为此，MSC1 评估所用的当前无线电、移动台 MS 本身所提供的移动台 MS 的接入能力的指示以及从 HLR 接收的认证数据。当前情况下的无线电接入类型为 3G，而移动台 MS 为 2G/3G 双模移动台。另外，MSC1 可从 HLR 接收用于这个移动台

的预订类型信息 SUBS。预订类型表明用户是预订 2G/3G、仅 2G 还是仅 3G。所述移动台 MS 的用户预订了 2G/3G。

接下来，MSC1 通过 BICC(承载无关呼叫控制)接口、在作为消息 2 的 IAM(初始地址消息)中向 MSC2 发送所确定的 RAT+MS+SUBS 信息。

当电路交换数据呼叫建立时，MSC2 通过 DSS.1(数字用户 1 号信令系统)接口在“建立”消息 3 中向 NAS 转发 RAT+MS+SUBS 信息。

NAS 把所接收的信息转换为 NAS 与网络交换机之间的专有消息 4，把用户的 IP 地址添加到消息中，并把消息发送到网络交换机。网络交换机存储所接收的 RAT+MS+SUBS 信息以及所接收的用户 IP 地址，并以消息 5 确认对该信息的接收。

作为备选或附加方案，NAS 本身可存储 RAT+MS+SUBS 信息。但是，如果网络交换机同时存储了分组交换以及电路交换域相关的 RAT+MS+SUBS 信息，则不需要区分将向哪个网元、即 NAS 还是 WAP GW 要求 RAT+MS+SUBS 信息。另一方面，网络交换机必须知道将向哪个网元、即 NAS 还是 GGSN 发送所需切换触发信号，因此网络交换机必须知道用户尝试在电路交换域还是在分组交换域中访问仅 2G 内容。在 NAS 中存储用户信息与 PS 域中 RADIUS Id 代理的使用相似。

然后，“连接”消息 6、7 从 NAS 发送到 MSC2 以及进一步发送到 MSC1，产生从 MSC1 到移动台 MS 的“呼叫进行”消息 8。

接下来，RAB 分配请求和响应在 MSC1 与 RNC 之间以消息 9 进行交换，此后，通过 RNC 与移动台 MS 之间的消息交换 10 建立无线电承载。

移动台 MS 可在这时以消息 11a 向网络交换机发送对仅 2G URL 的请求。

网络交换机检测到所接收的 URL 在对应于仅 2G 内容的所存储 URL 列表中存在。因此，它首先检查关于用户的存储信息，以便决

定是否应该进行基于内容的系统间切换(CB IS HO)以及这种系统间切换是否完全可行。由于请求移动台由网络交换机识别为当前连接到3G并且具有2G/3G预订的2G/3G双模移动台，因此系统间切换对于传递所请求内容是需要的，并且是可行的。因此，网络交换机以专有消息12向NAS发送基于内容的系统间切换触发信号。虽然参照用于分组交换连接的CB IS NCCRS没有提到对用户类型SUBS的检索、转发和评估，但这个参数显然也能够类似地用于该情况中。

需要基于内容的切换的信息还以消息13进一步传送到MSC2，以及以消息14从MSC2传送到MSC1。MSC1解释作为切换触发信号的消息，并在无线电接入网中触发普通的基于业务的切换15。因具体原因而对切换进行的唯一调整在于，本上下文中在A接口上从MSC1发送到BSC的切换请求(A-HO请求)包含业务切换信元“ISHO到UTRAN将不被执行”。这个信元确保BSC在仅2G内容下载期间将不对这个用户发起返回到2G的系统间切换。实际上，该用户必须保持在2G中，直到完成数据呼叫。对于切换，不需要对MSC1与RNC之间的Iu-CS接口进行任何变更。

在用于基于内容的切换的消息交换12-15中，网络交换机向内容服务器发送消息16，用于获取所请求的URL。内容服务器以消息17向网络交换机提供所请求的URL，网络交换机在执行切换时在高速缓存中存储所接收的URL。

当基于内容的系统间切换已经完成时，MSC1向MSC2发送“CB IS HO执行确认/否认”消息18。MSC2以消息19向NAS转发确认，NAS将其以消息20进一步传送到网络交换机。在收到切换确认时，网络交换机以消息21经由2G BSC开始向用户下载缓存的仅2G内容。用户可能保持其电路交换连接，直到他/她已经把全部内容剪辑下载到他/她的终端为止。当下载完成时，Iu释放命令由MSC1以消息22发送到RNC，以及RNC返回Iu释放完成消息23。然后，释放在MSC中终止。

在用户已经结束电路交换数据呼叫之后，移动台 MS 再次根据传统标准、如信号强度等来选择对 2G 还是 3G 系统的接入。

在第三实施例中，为了 MSC1、MSC2 和 NAS 之间传送附加信息，可采用 BICC 的标准化用户到用户信令(UUS)以及 DSS.1 或 ISUP。目前 UUS 仅用于很少的用途。在基于内容的接入概念中，能够以专有方式使用一些 UUS 消息。UUS 在电路交换域中的使用与用于在分组交换域中在 SGSN 与 GGSN 之间传送 RAT+MS+SUBS 信息和 NCCRS 触发信号的 GTP-C 消息的个人扩充字段的使用相似。

对电路交换域中 UUS 的备选方案是创建新的 ASE(应用业务单元)，它将通过包含 APP(应用传输参数)的 APM(应用传输机制)消息在 MSC1 与 MSC2 之间、以及通过包含信元的设备消息在 MSC2 与 NAS 之间的 DSS.1 接口上进行通信。

都要求改变成呼叫控制协议的 UUS 和 ASE 用户机制是仅适合于 PLMN 内业务的“修改程序”。一种与转接网无关的解决方案可基于例如“呼叫不相关”信令通路，使得没有任何信息添加到现有消息中。

可对透明的和非透明的电路交换数据呼叫支持 3G 到 2G 的系统间切换。

只有 GSM 和 UMTS 两种接入都支持相同数据率，才支持透明数据呼叫的系统间切换，因为在透明呼叫中，数据率必须保持恒定。对于高于 9600 千比特/秒的比特率、例如 28.8 千比特/秒，只有 GSM 无线电接入通过高速电路交换数据(HSCSD)功能支持相同的数据率，才可支持系统间切换。

如果 GSM 无线电接入不支持相同的数据率，则也可支持非透明数据呼叫的系统间切换。在该情况下，数据率将下降到 GSM 无线电接入所支持的等级。应该指出，如果 GSM 无线电接入支持 HSCSD，则数据率也可保持不变。

由于 MSC1 和 SGSN 不知道关于彼此的业务优选级表的任何情况，因此 RNC 是用于分别来自 MSC、SGSN 的基于业务和基于内容

的系统间切换或 NCCRS 触发的最佳协调点。在这种情况下，RNC、SGSN 和 MSC 中的业务优选级表必须以一致的方式来配置。

图 9 说明一种基于业务认知 GGSN 的通信系统，其中能够以类似于图 7 的通信系统的方式来使用实现电路交换通信的基于内容的系统间切换的本发明的所述第三实施例。

图 9 的通信系统主要包括与图 7 的通信系统相同配置的同样单元，即具有基站 BS 和无线网络控制器 RNC 的 3G UTRAN 1、具有基站 BS 和 BSC 的 2G GSM 无线电接入网 2、第一移动交换中心 MSC1、归属位置寄存器 HLR、第二移动交换中心 MSC2、网络接入服务器 NAS、内容提供商的内容服务器 4 以及移动台 5。

但是，在图 9 的系统中，图 7 的系统的网络交换机 3 由业务认知 GGSN 6 所取代。业务认知 GGSN 6 还存储对应于仅 2G 内容的 URL 的列表，以及执行参照图 8 所述的、由网络交换机 3 所执行的功能。

图 10 说明一种通信系统，其中可采用实现用于电路交换通信的基于内容的系统间切换的本发明的第四实施例。对于图 10 中与图 1、6、7 或 9 的单元对应的那些单元指定相同的参考标号。

图 10 的通信系统包括与图 7 的通信系统相同配置的同样单元，即 3G UTRAN 1、2G GSM 无线电接入网 2、第一移动交换中心 MSC1、第二移动交换中心 MSC2、网络接入服务器 NAS、归属位置寄存器 HLR、网络交换机 3、内容服务器 4 以及移动终端 5。

但是，另外还提供业务路由选择寄存器 SRR。SRR 连接到 HLR、第二移动交换中心 MSC2 以及网络交换机 3。

通信网络的运营商同样仅具有经由 2G 系统而非 3G 系统提供特定内容的许可证。

如对于根据本发明的方法的第二和第三实施例所述，可根据移动终端 5 所请求的 URL 在网络交换机 3 中检测内容类型。但是，在这种情况下，切换的必要性不是在网络交换机 3 中确定的，而是在第二移动交换中心 MSC2 中确定的。

下面参照图 11 说明图 10 的通信系统中基于内容的切换，其中图 11 作为图 11a 和 11b 分布在两页上。移动台 5 目前连接到 UTRAN 1，并尝试以电路交换呼叫来访问仅 2G 内容。

图 11 从左到右包括与对应于图 10 的移动终端 5 的移动台 MS 相关的、与图 10 的 RNC 和 BSC、与图 10 的 MSC1 的 MGW1 和 MSS1、与图 10 的 MSC2 的 MSS2、以及与图 10 的 HLR、SRR、NAS、网络交换机 3、内容服务器 4 相关的相应垂直线。另外，在这些单元之间传送的消息的相应序列在图中由带标号的箭头表示。

在第一消息 1 中，移动台 MS 向正服务 MSS1 发送用于相干数据呼叫的“建立”请求，用于建立呼叫。

因此，MSS1 为此用户确定该用户的 RAT+MS 类型以及预订类型信息 SUBS，如参照图 8 所述。当前情况下的无线电接入类型为 3G，移动台 MS 为 2G/3G 双模移动台，以及移动台 MS 的用户预订 2G/3G。

随后，MSS1 在作为消息 2 的 IAM 中向 MSS2 发送所确定的信息以及国际用户呼叫号 MSISDN(移动用户综合业务数字网)或 IMSI。MSS2 存储与该用户的 MSISDN 相关或者与 IMSI 相关的所接收 RAT+MS+SUBS 信息。或者，数据可存储在 HLR 中。

如果用户在数据呼叫期间执行到另一个无线电接入(2G 或 3G)的 MSS 内切换，则所存储的 RAT+MS+SUBS 信息必须由正服务 MSS1 相应地更新。如果用户在呼叫期间执行 MSS 间切换，则锚定 MSS 向新的正服务 MSS 发送 RAT+MS+SUBS 信息，其中新的正服务 MSS 根据新的无线电接入更新该信息并存储。

然后，MSS2 以“建立”消息 3 向 NAS 转发 MSISDN 信息。

NAS 把用户的 IP 地址添加到 MSIDSN 信息中，并在数据呼叫开始时以基于安全协议 RADIUS(IP)的 MSISDN(RADIUS)消息 4 向网络交换机发送该信息。网络交换机存储所接收的 MSISDN 与所接收的 IP 地址之间的映射，并以消息 5 确认对信息的接收。

NAS 把相应的“连接”消息 6、7 发送到 MSS2 以及进一步发送到 MSS1，产生从 MSS1 到移动台 MS 的“呼叫进行”消息 8。接下来，RAB 分配请求和响应在 MSS1 与 RNC 之间以消息交换 9 进行交换，此后，通过 RNC 与移动台 MS 之间的消息交换 10 建立无线电承载。

移动台 MS 可在这时以消息 11 向网络交换机发送用于仅 2G URL 的“HTTP 获取”请求。

网络交换机检测到所请求的 URL 在对应于仅 2G 内容的所存储 URL 列表中存在。这时，网络交换机挂起“HTTP 获取”请求，并经由 SRR 通知 MSS2，与所接收的 MSISDN 相关的用户已经尝试访问仅 2G 内容。更具体来讲，网络交换机知道属于集中网元的 SRR 的地址，并向 SRR 发送消息 12，表明检测到由特定 MSISDN 对仅 2G 内容的访问。SRR 以消息交换 13、14 从 HLR 获取正服务 MSS2 的符合 E.164 的地址。SRR-HLR 接口基于现有的 MAP(移动应用协议)。这时，SRR 以消息 15 向正确的 MSS2 转发关于检测到由特定 MSISDN 对仅 2G 内容的访问的指示。

MSS2 分析存储在其存储器中、与从 SRR 接收的 MSISDN 相关的 RAT+MS+SUBS 信息。如果这些参数表明应该执行基于内容的系统间切换 CBISHO，例如在当前情况下，则 MSS2 以“RAB 分配请求”消息 16 请求 RNC 执行到 GSM 的业务切换。为此，消息包含业务切换 IE“到 GSM 的业务切换应该被执行”。

另外，MSS2 经由 SRR 以消息 17 和 18 向网络交换机发送相应的信息。当基于内容的系统间切换进行时，网络交换机通过消息交换 19、20 从内容服务器检索所请求的内容，并将该内容存储在其高速缓存中。

同时，消息 16 触发常规业务切换。更具体来讲，RNC 向 MSS2 发送用于保留电路并改变流向的“RAB 分配响应”消息 21 以及“要求 Iu 重新定位”消息 22。在 MSS2 与 MGW1 之间的包含“ADD.请

求/应答和 MOD.请求/应答”的消息交换 23 之后，MSS2 以消息 24 向 BSC 发送“A-HO 请求”。仅与常规业务切换不同，这个消息包含业务切换信元“ISHO 到 UTRAN 将不被执行”，用于确保在仅 2G 内容下载期间将不执行返回到 2G 的系统间切换。消息 24 由 BSC 通过消息 25 向 MSS2 进行确认。下面，在可行的情况下，以 MSS2 与 MGW1 之间的消息交换 26 来修改承载特性。然后，“Iu 重新定位命令”由 MSS2 以消息 27 发送到 RNC，在送往移动台 MS 的消息 28 中产生“RRC-HO 命令”。因此，移动台向 BSC 发送“R1-HO-接入”消息 29，用于接入 2G 接入网，以及 BSC 向 MSS2 发送“A-HO-检测”消息 30。在 MSS2 与 MGW1 之间的另一个消息交换 31 中，流向被改变。

当基于内容的系统间切换完成时，移动台 MS 向 BSC 发送相应的“R1-HO-完成”消息 32，BSC 向 MSS2 发送相应的“A-HO-完成”消息 33，MSS2 向 SRR 发送相应的“CB IS HO 已执行”消息 34，以及 SRR 把这个消息作为消息 35 转发给网络交换机。在接收到切换的确认时，网络交换机以消息 36 开始下载缓存的仅 2G 内容到用户。当下载完成时，“Iu 释放命令”由 MSS2 以消息 37 发送到 RNC，以及 RNC 返回“Iu 释放完成”消息 38。然后，释放通过 MSS2 与 MGW1 之间的消息交换 39 来终止。

必须指出，在一个备选方法中，MSS2 本身能够确定要存储的 RAT+MS+SUBS 信息。另一种备选方案是，不是 MSS2 而是 MSS1 可根据检测到对仅 2G 内容的访问的指示执行对所存储信息的分析，并根据需要发起切换，其方式与以上针对 MSS2 所述相似。在该情况下，MSS1 最好是本身存储所确定的 RAT+MS+SUBS 信息或者将其存储在 HLR 中。

另外，本发明的所述第四实施例可类似地用于基于业务认知 GGSN 的通信系统中。这种系统如图 12 所示。

图 12 的通信系统主要包括与图 10 的通信系统相同配置的同样单

元，即具有基站 BS 和无线网络控制器 RNC 的 3G UTRAN 1、具有基站 BS 和 BSC 的 2G GSM 无线电接入网 2、第一移动交换中心 MSS1、归属位置寄存器 HLR、第二移动交换中心 MSS2、网络接入服务器 NAS、业务路由选择寄存器 SRR、内容提供商的内容服务器 4 以及移动终端 5。

但是，在图 12 的系统中，图 10 的系统的网络交换机 3 由业务认知 GGSN 6 所取代。业务认知 GGSN 6 还存储对应于仅 2G 内容的 URL 的列表，以及执行参照图 11 所述的、由网络交换机 3 所执行的功能。

应当指出，利用基于 APN 的系统间切换的本发明的第一所述实施例也可类似地用于图 6、7、9、10 和 12 的通信系统中。

本发明的第五所述实施例通过图 13 的消息序列图来说明。第五实施例实现移动终端所请求的基于业务的切换。

图 13 从左到右包括与用户、移动台、WCDMA 系统的 UTRAN 的 RNC、GSM 接入网的 BSC、RNC 和 BSC 都连接到的核心网的 3G/GSM MSC(移动交换中心)相关的相应垂直线。连接相应垂直线的箭头和横线表示涉及到用户和网元的不同动作和步骤。移动终端在 WCDMA 系统中登记，但也能够在 GSM 中工作。MSC 是交换机，在其当前位置为电路交换业务服务于移动终端。

在图 13 的初始状态中，移动终端在 WCDMA 系统中工作。然后，用户经由移动终端请求在 WCDMA 系统中不可用、而只能在 GSM 系统中可用的透明传真业务。

移动终端向它所登记的 UMTS 系统请求该业务。在正服务蜂窝系统与终端之间的消息交换开始时，发送信息，表明向另一个蜂窝系统、即向 GSM 请求预期业务。更具体来讲，呼叫创建请求由移动终端经由 RNC 发送到 3G/GSM MSC，以该消息在新单元中指明预期系统。

根据移动终端在呼叫建立开始时所提供的信息，正服务蜂窝系统的 MSC 通过向 RNC 和 BSC 发送系统间切换请求来发起到优选系统

的系统间切换。因而，执行从 WCDMA 到 GSM 的切换。另外，业务建立请求被转发到 GSM 蜂窝系统。

当切换完成时，呼叫建立在移动终端与 GSM 之间进行，与正常的单系统情况中一样。在会话已经结束之后，呼叫中断，如果 WCDMA 系统仍然可用，则 GSM 发起返回到 WCDMA 系统的系统间切换。

如果在第一系统间切换、即从 WCDMA 系统到 GSM 的切换中业务建立失败，则业务建立由 WCDMA 系统终止，就象 WCDMA 系统中的任何业务建立一样。如果在 GSM 中业务协商过程中业务建立失败，则业务建立由 GSM 终止，就象单系统情况中所进行的任何业务建立一样，以及移动终端返回到 WCDMA 系统。

通过本发明的第五实施例的方法，GSM 透明传真业务可在整个 GSM 覆盖区上与 GSM-WCDMA 多系统终端配合使用。

在本发明的第五实施例中，当移动终端对特定业务需要特定无线电接入技术时，执行系统间切换，因为该业务在利用这种无线电接入技术的系统中更有效或更经济地工作。

移动终端是双频带终端，它能够利用两种不同技术经由无线电接入网接入通信网络。移动终端还包括存储器，其中存储优选无线电接入技术的指示。这个存储器分别在移动设备中或者在移动终端的 SIM(用户身份模块)或 USIM(UMTS SIM)中提供。所存储的优选无线电接入技术还被映射到业务所需的特定数据率。或者，优选无线电接入技术可被映射到业务的其它某些特征上、例如映射到所请求的媒体、即语音、视频、数据或传真。另外，优选者可以仅应用于某些类型的连接。映射确保所存储的无线电接入技术只对于所选业务才是优选的，因为优选无线电接入技术可能仅对这些业务才具有优势。

移动终端还包括用于以添加到当前连接建立信令中的信元向通信网络发送对于优选无线电接入技术的请求的部件。或者，新消息可被添加到信令序列中。

通信网络包括用于接收这个请求以及用于在判定移动终端的系

统间切换时对该请求进行考虑的部件。

如果移动终端希望某个特定业务，则首先检查是否对这个业务存储了优选的无线电接入技术。如果对该业务存储了优选的无线电接入技术，则建立业务的请求在连接建立信令中与优选无线电接入技术的请求一起被发送到通信网络。

通信网络经由移动终端当前连接到的无线电接入网接收这个请求，如果这个无线电接入网没有采用所请求的无线电接入技术，则通信网络检查该终端是否可切换到采用所请求技术的小区。因此，最终判定由通信网络进行，另外还取决于移动终端不了解的其它相关因素，如网络配置和当前负荷情况。如果可行，则通信网络将把移动终端切换到采用优选无线电接入技术的小区。因此，通信网络能够尽早分配采用最适合的无线电接入技术的小区。此后，通信网络保持所提供的对优选无线电接入技术的了解，以便使移动终端能够在连接的持续时间中利用这种技术。

虽然将本发明应用于优选实施例来说明、描述并指出其新颖的基本特征，但应该理解，只要不背离本发明的精神，本领域的技术人员可以对装置和方法的形式和细节进行各种省略、替换和更改。例如，显然，以实质上相同的方式执行实质上相同的功能以获得同样结果的这些元件和/或方法步骤的所有组合在本发明的范围之内。另外，应当理解，结合本发明的任何公开形式或实施例所说明和/或描述的结构和/或元件和/或方法步骤可作为设计选择的一般问题结合到其它任何公开或描述或建议的形式或实施例中。因此，本意是按照所附权利要求书的范围所指明的来限定。

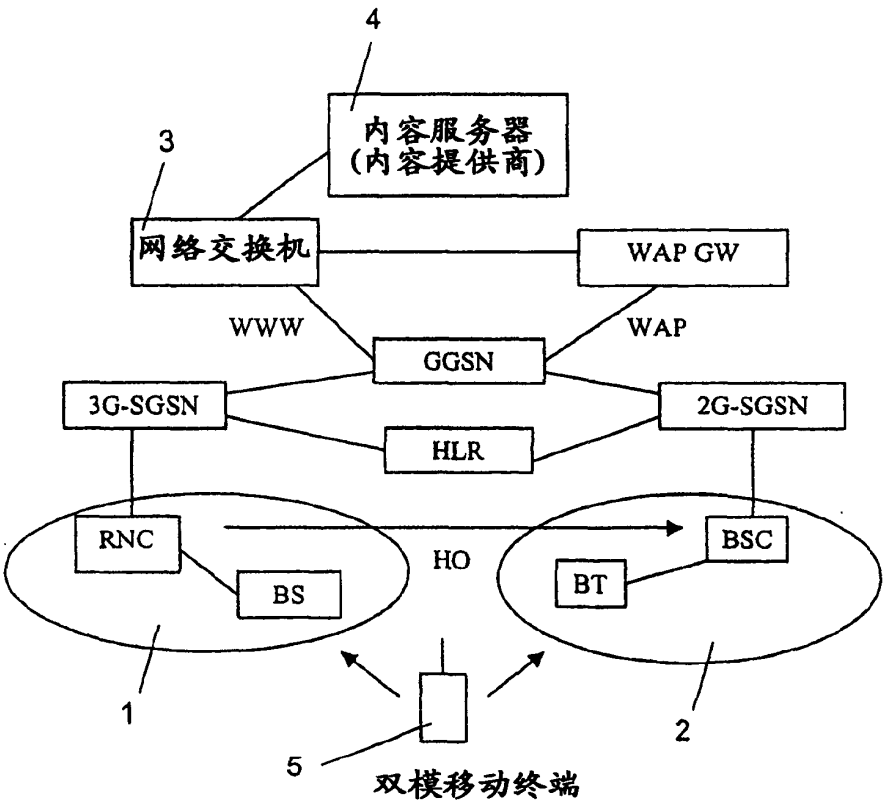

图 1

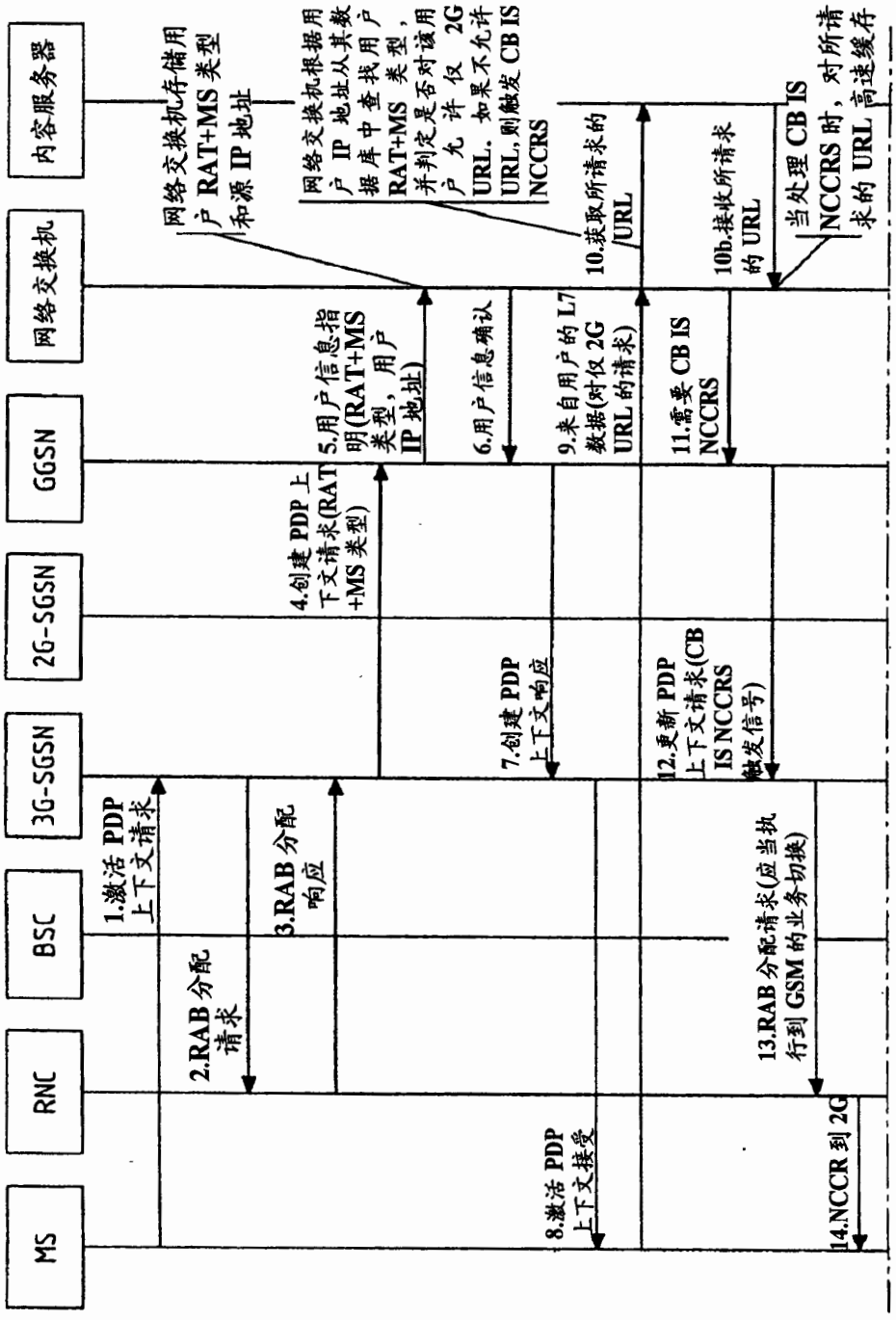

图 2A

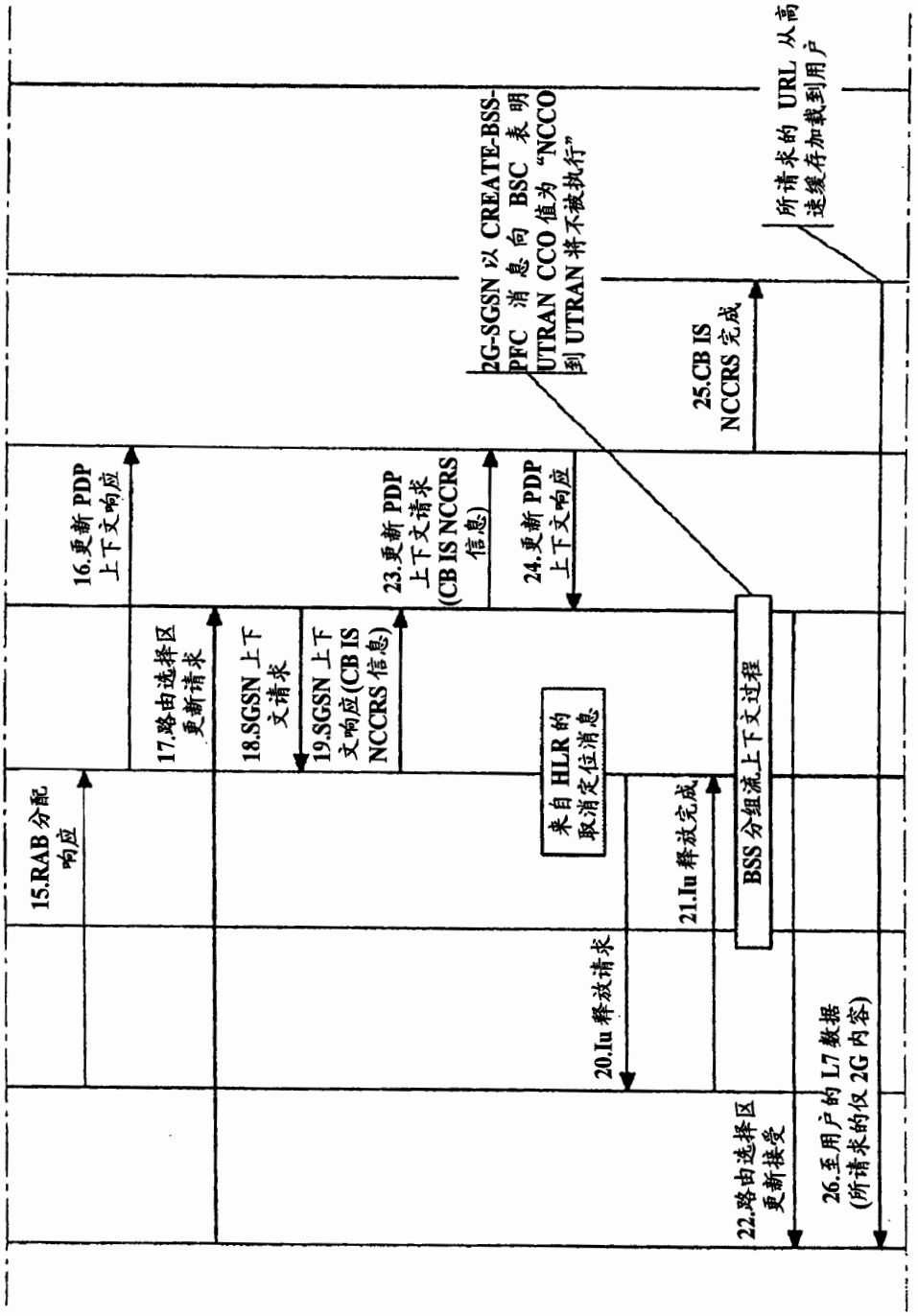

图 2B

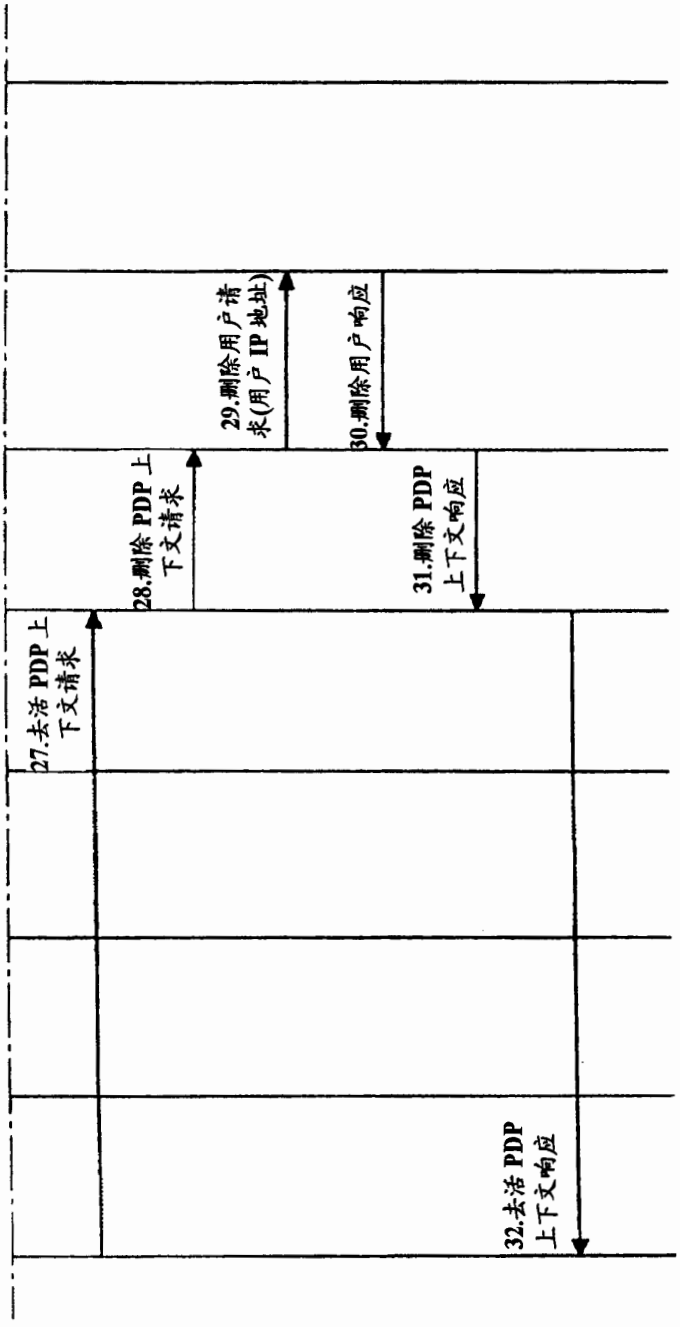

图 2C

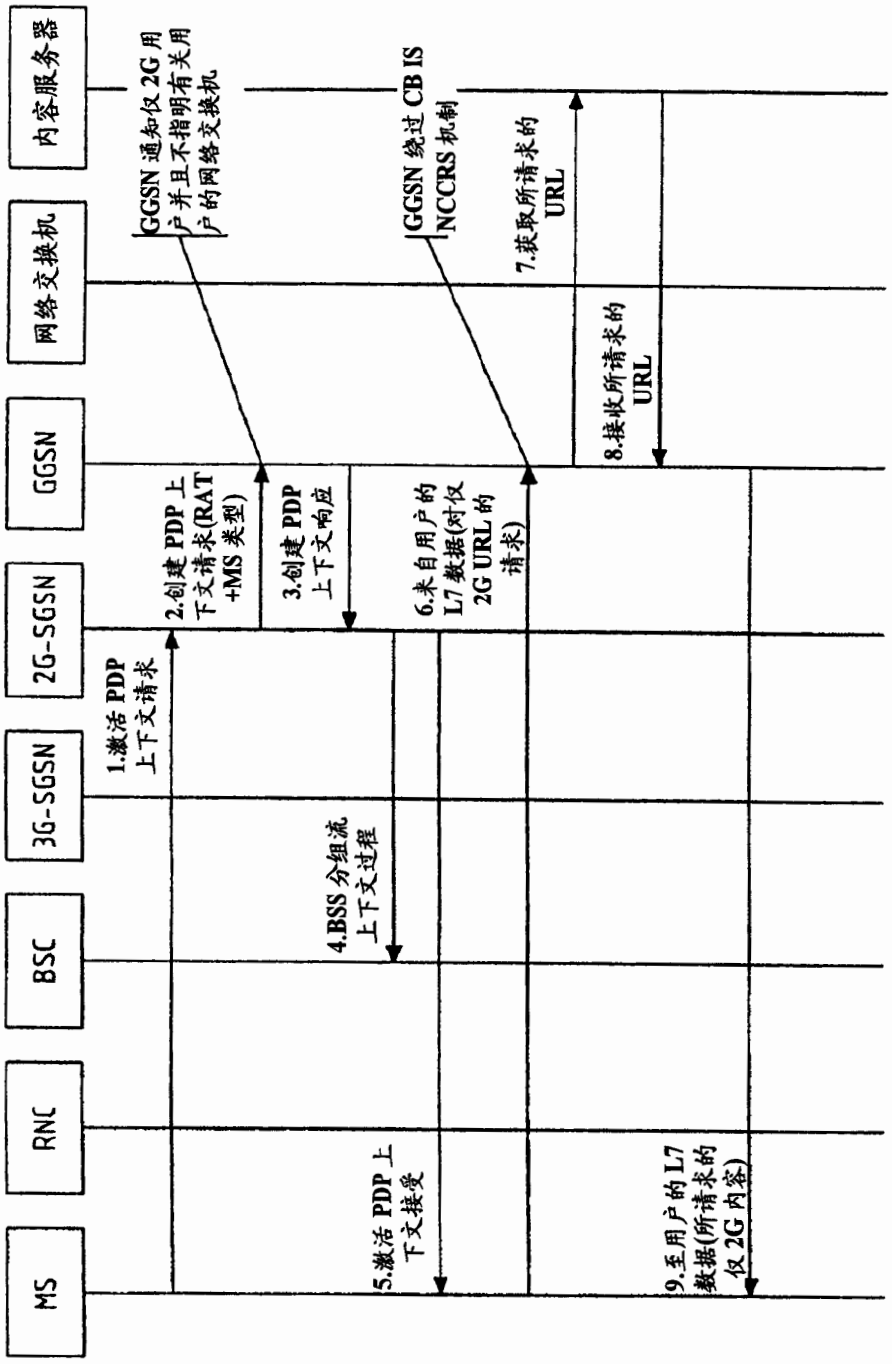

图 3

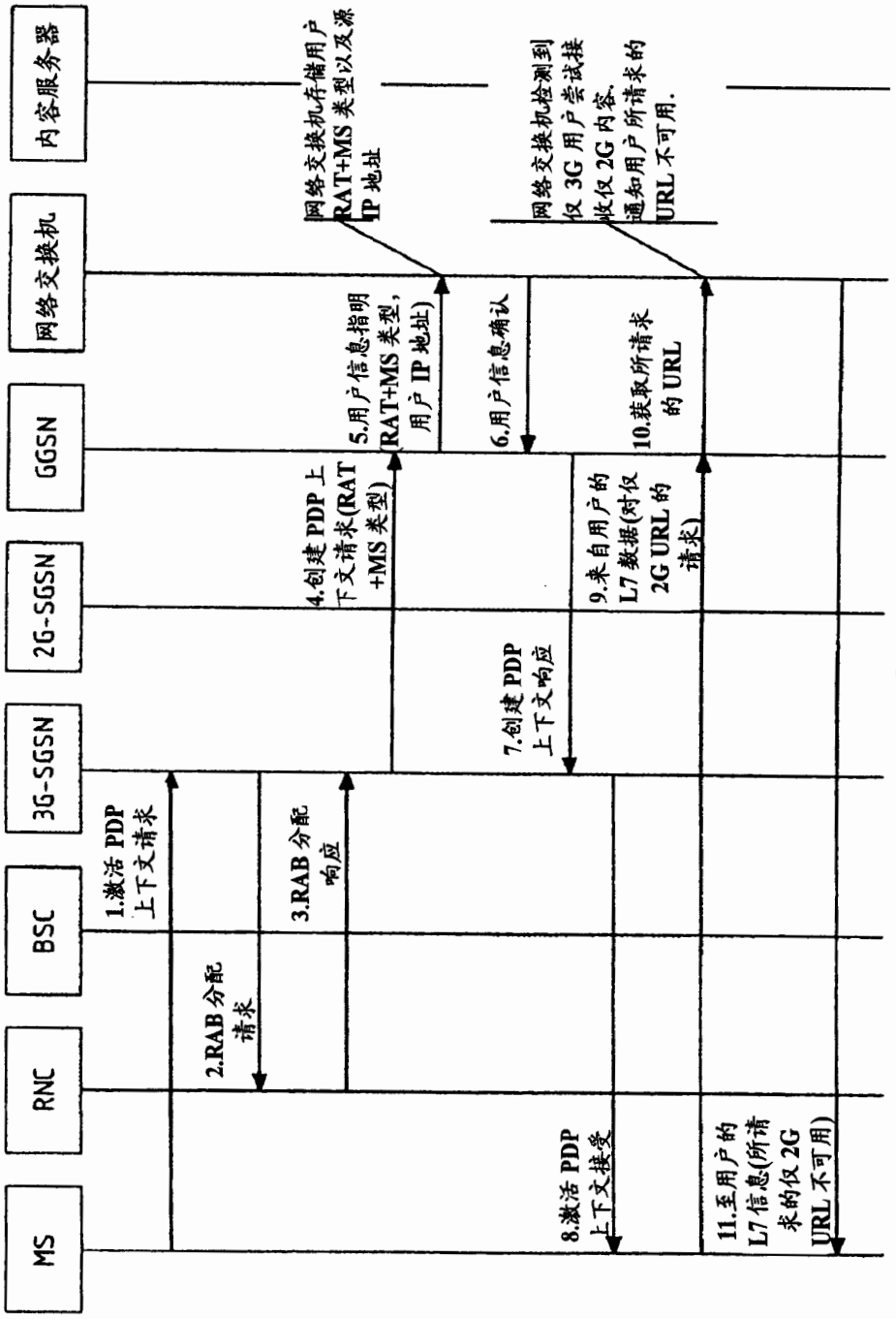

图 4

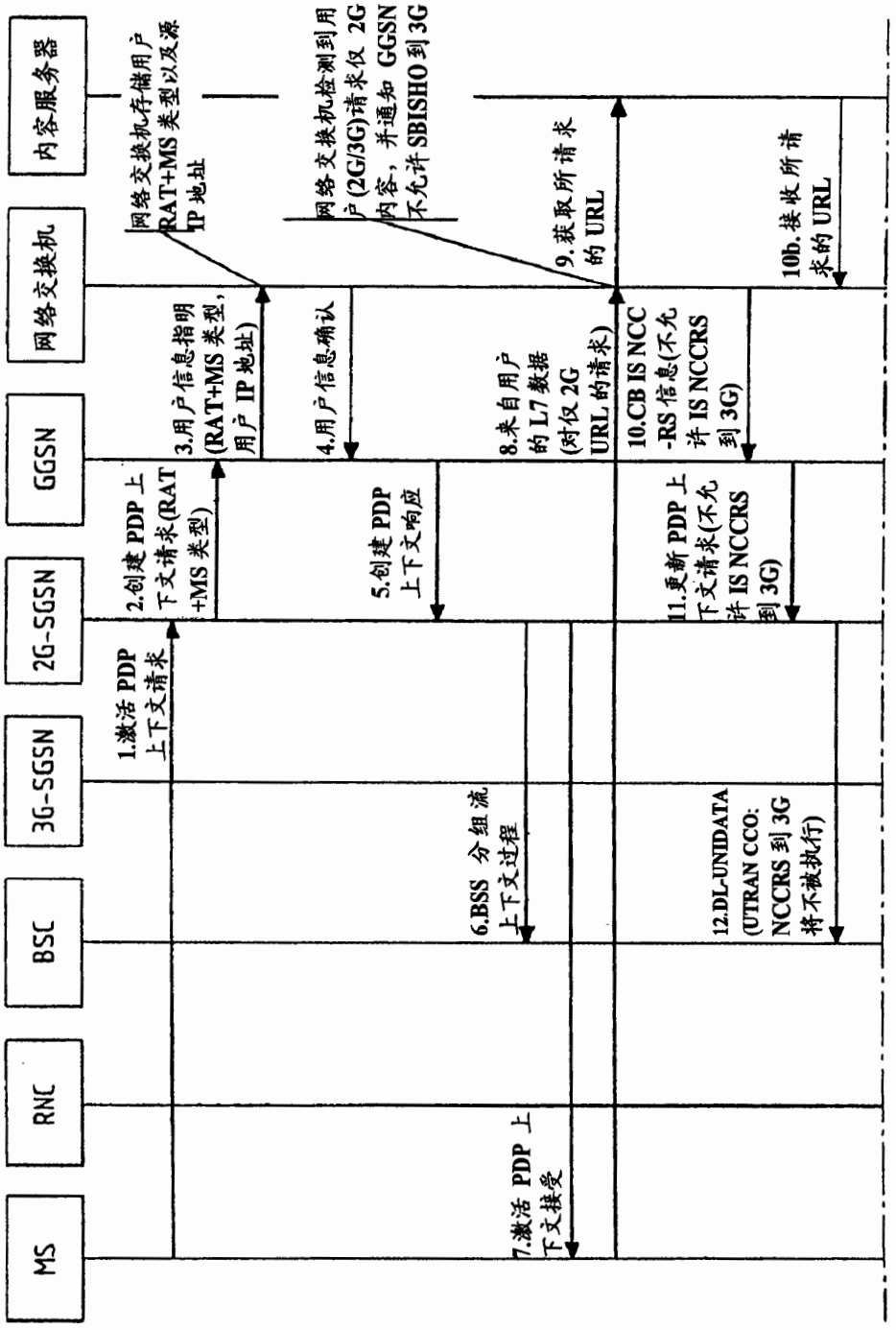

图 5A

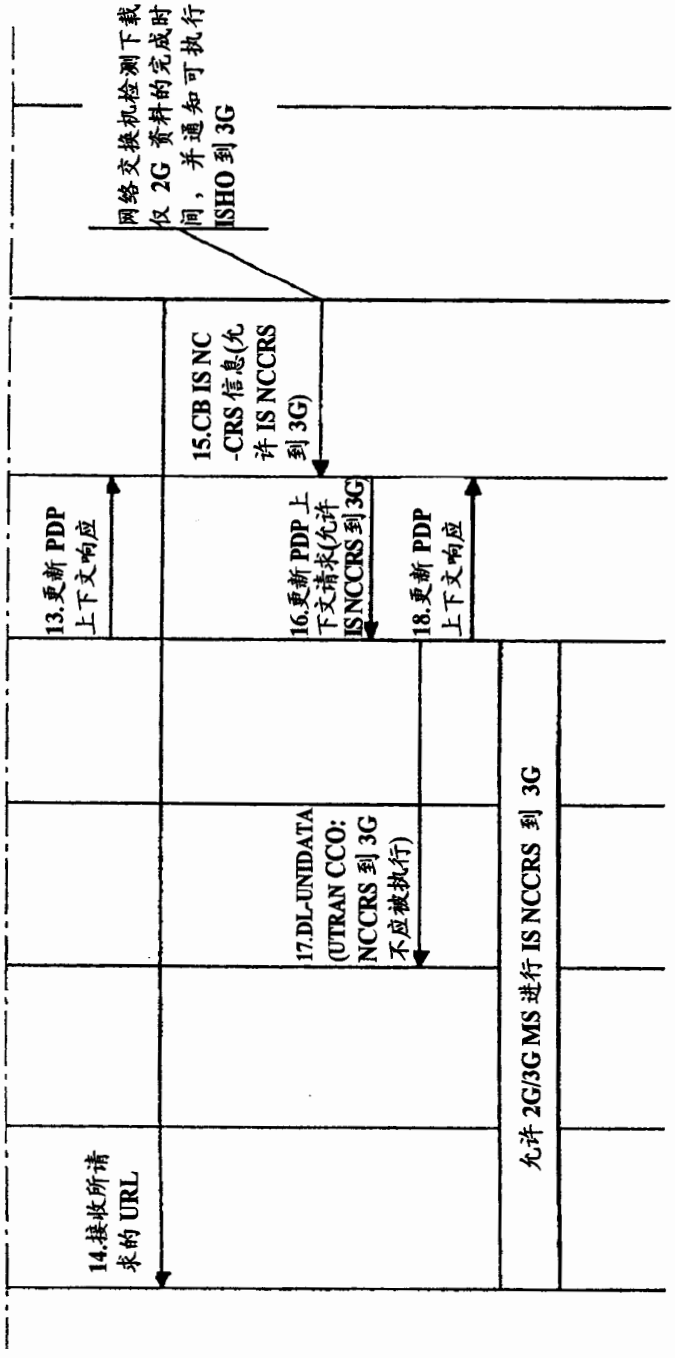

图 5B

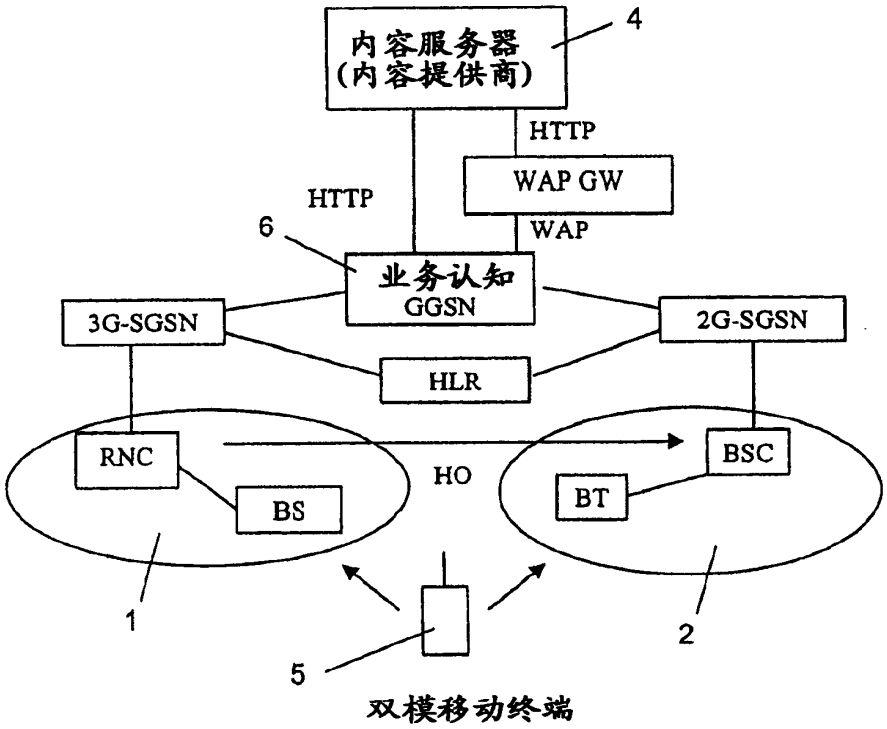

图 6

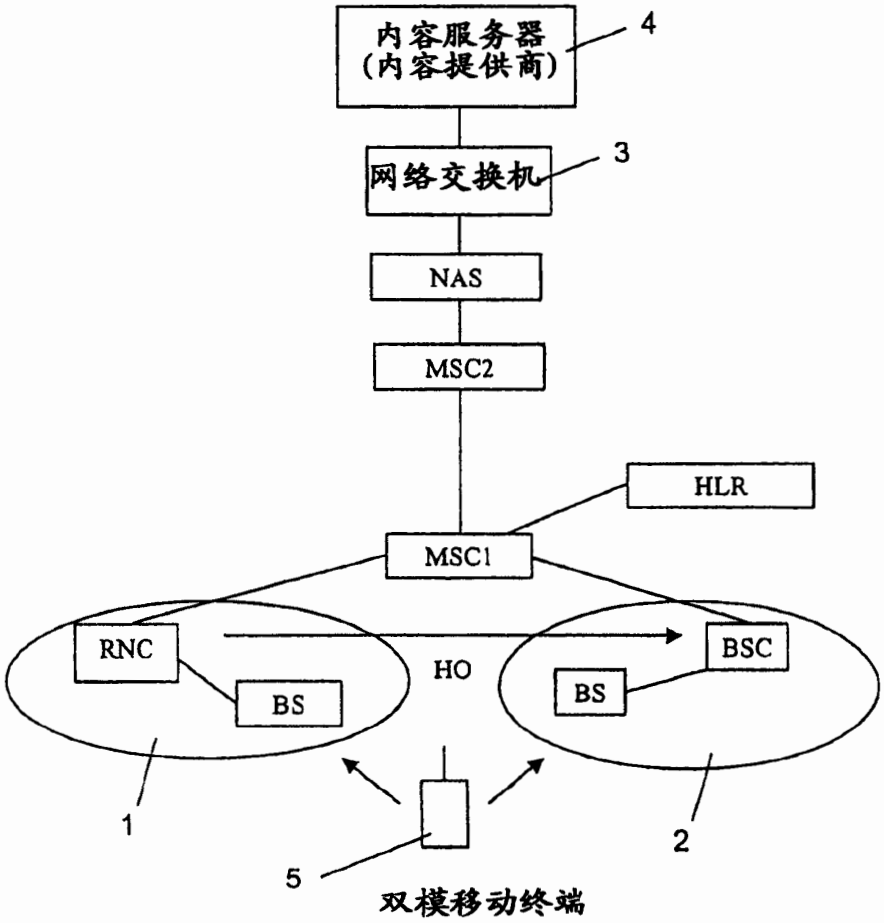

图 7

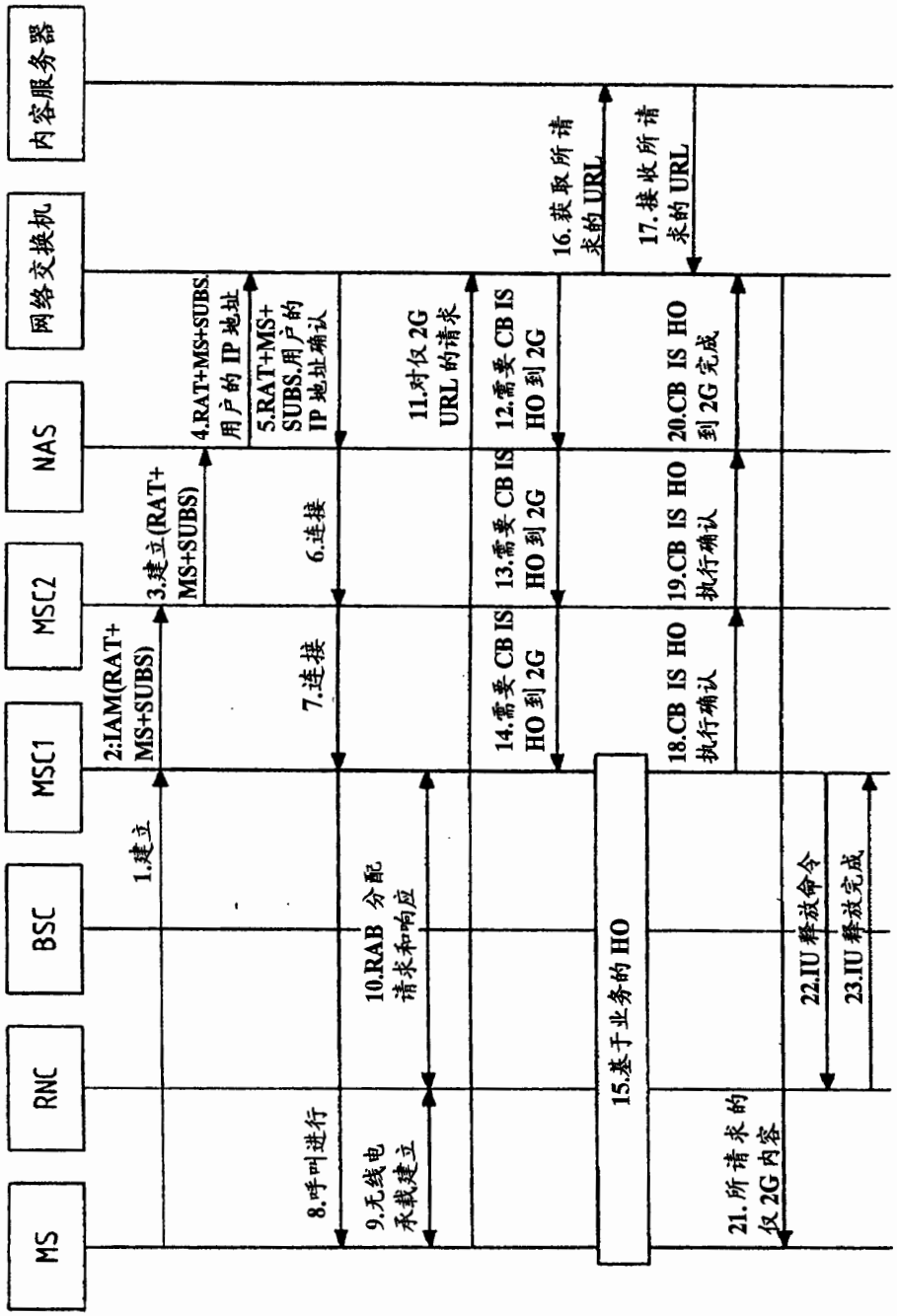

图 8

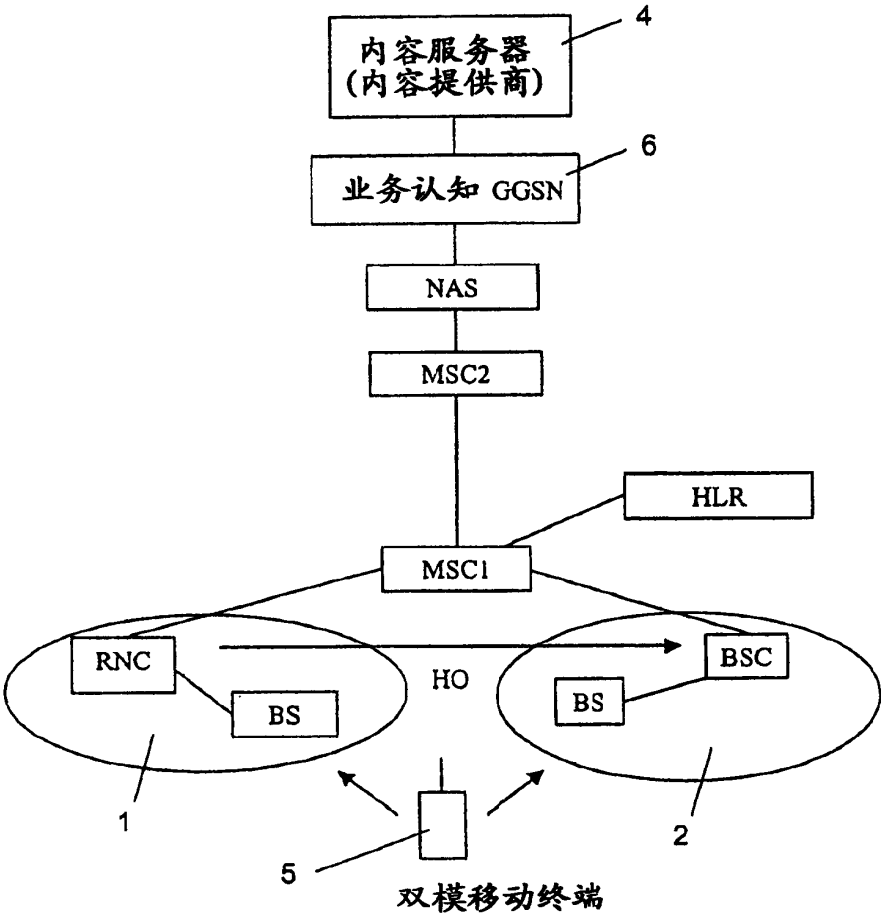

图 9

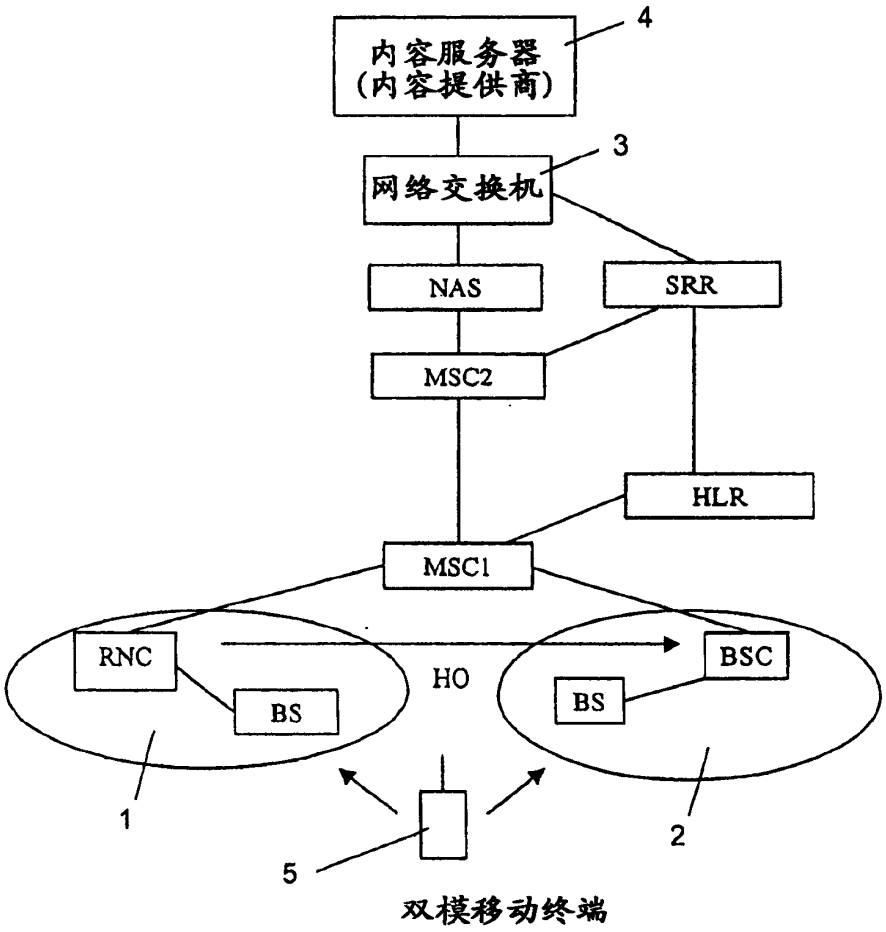

图 10

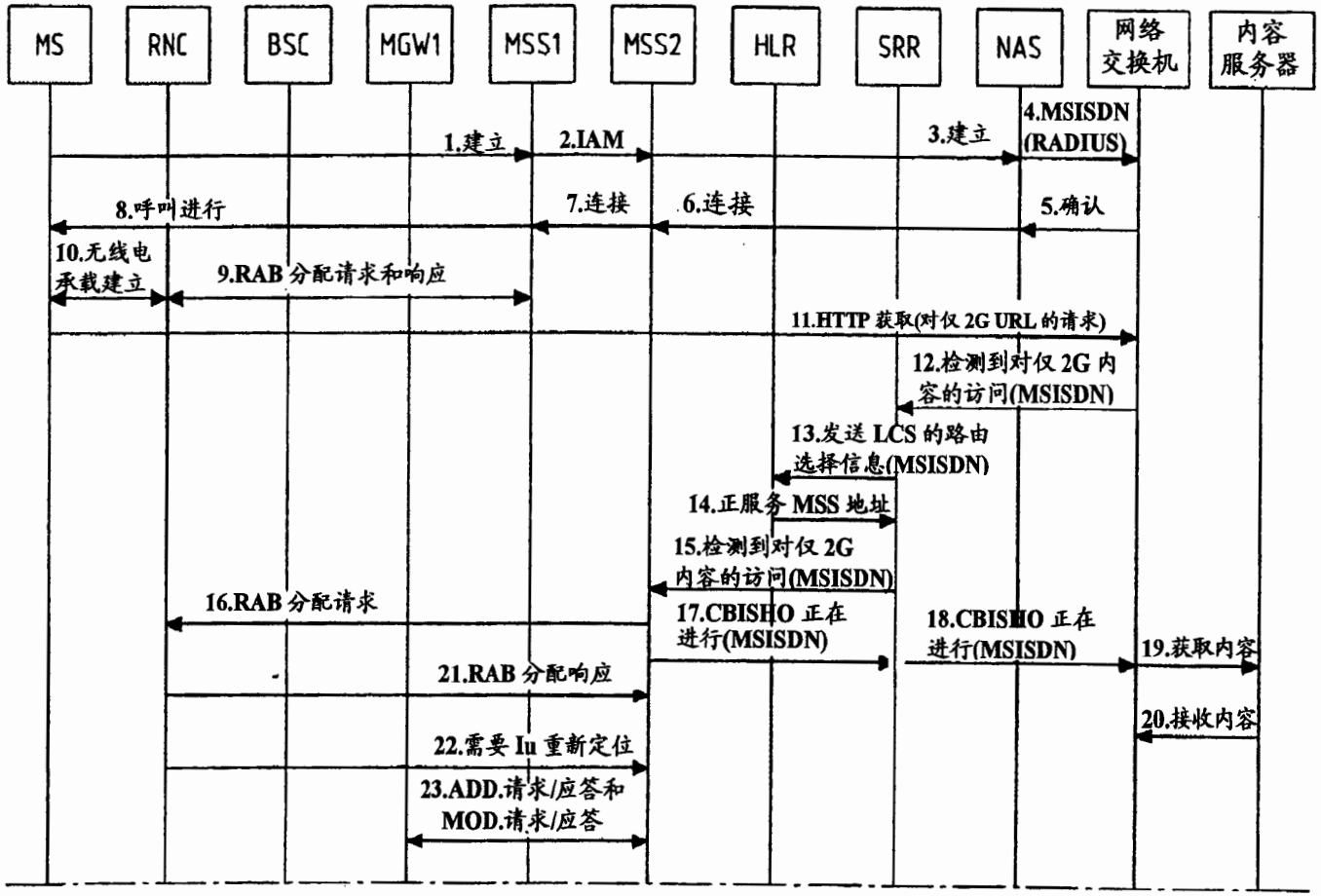
MS
RNC
BSC
MGW1
MSS1
MSS2
HLR
SRR
NAS
网络交换机
内容服务器
1.建立
2.IAM
3.建立
4.MSISDN (RADIUS)
5.确认
6.连接
7.连接
8.呼叫进行
9.RAB 分配请求和响应
10.无线电承载建立
11.HTTP 获取(对仅 2G URL 的请求)
12.检测到对仅 2G 内容的访问(MSISDN)
13.发送 LCS 的路由选择信息(MSISDN)
14.正服务 MSS 地址
15.检测到对仅 2G 内容的访问(MSISDN)
16.RAB 分配请求
17.CBISHO 正在进行(MSISDN)
18.CBISHO 正在进行(MSISDN)
19.获取内容
20.接收内容
21.RAB 分配响应
22.需要 Iu 重新定位
23.ADD.请求/应答和 MOD.请求/应答

图 11A

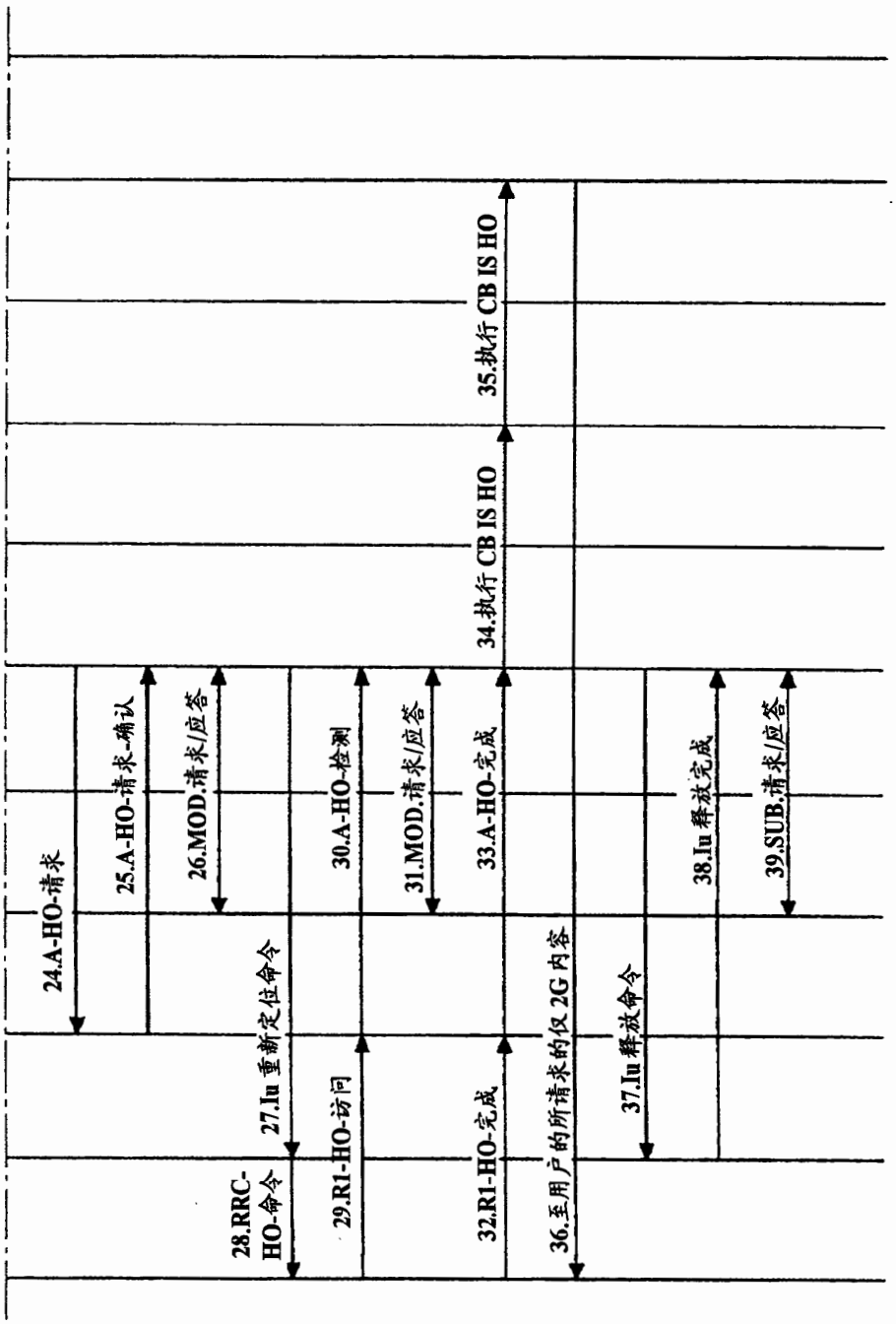

图 11B

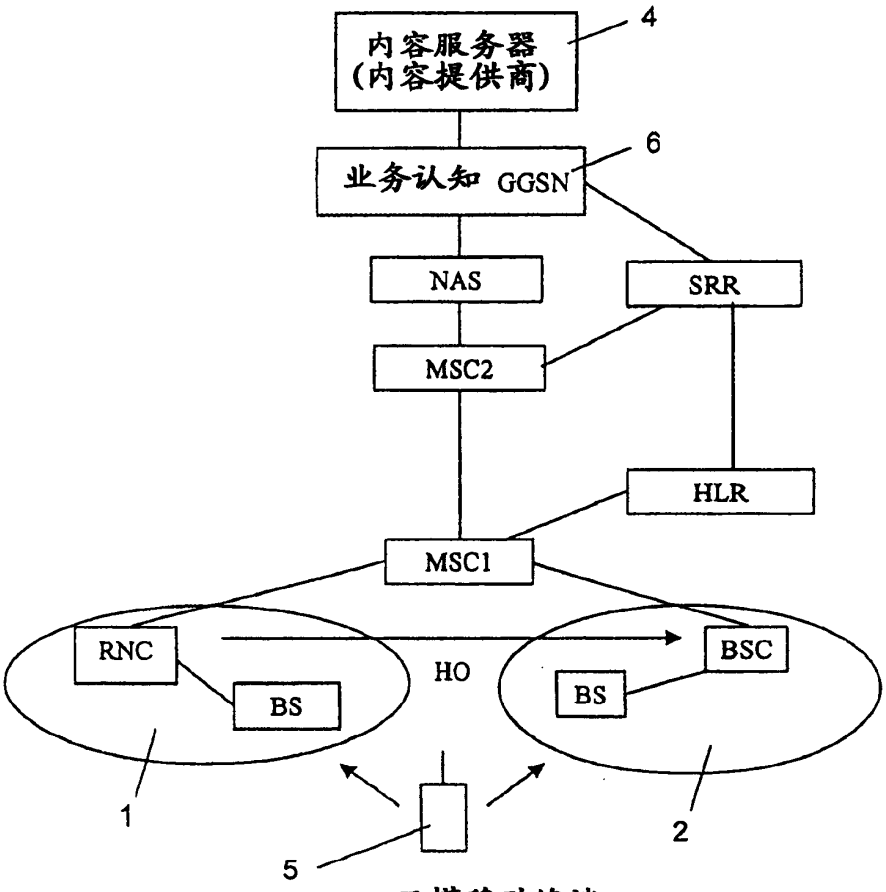

图 12

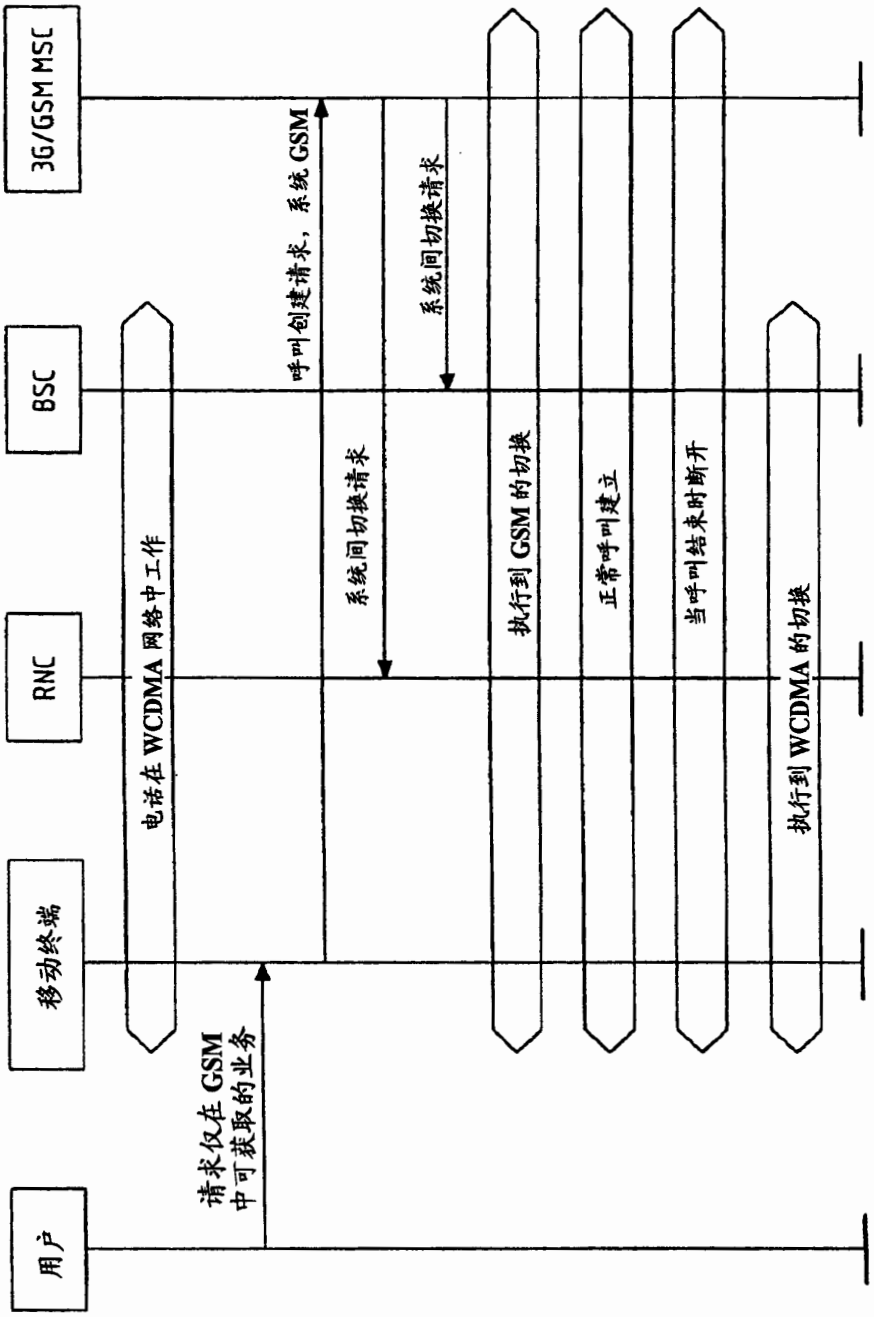

图 13

Intersystem handover of a mobile terminal

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Applicant(s): NOKIA CORP [FI]

Classification:

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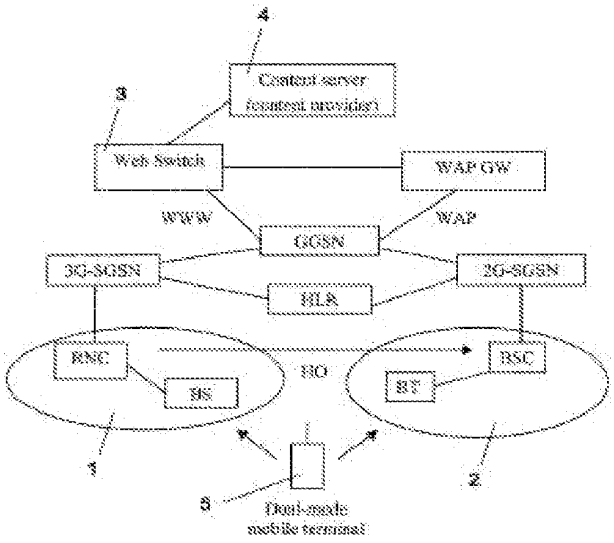
Abstract of corresponding document: **US 2003114158 (A1)**

The invention relates to a method for performing an intersystem handover of a mobile terminal accessing a communication network via a radio access network of a first type. The communication network comprises at least this radio access network of this first type and a radio access network of a second type. In order to enable an access to the communication network with a radio access technology required or desired by the mobile terminal, the intersystem handover is initiated by a transmission of the mobile terminal to the communication network, which transmission comprises information indicating that an intersystem handover from the radio access network of the first type to the radio access network of said second type should be performed. The invention equally relates to a corresponding mobile terminal, to a corresponding communication network, to a corresponding communication system, to a network element of a communication network and to a web switch of a communication system.



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[51]Int.Cl[7]
H04Q 7/20

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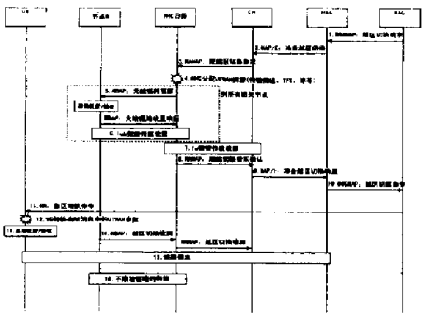
代理人 朱海波

权利要求书3页 说明书15页 附图页数1页

[54]发明名称 移动电信系统

[57]摘要

一种处理来自GSM型网络的基站控制器(BSC)的越区切换请求的方法，该方法包括把具有GSN类型参数的越区切换请求从基站控制器(BSC)通过GSM类型的网络的主交换中心(MSC)传送到UMTS核心网络(CN)以及传送到UMTS网络的无线网络控制器(RNC)；在无线网络控制器中(RNC)，把GSM类型参数转换为UTRAN参数；以及响应所转换的参数分配UTRAN资源。



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权 利 要 求 书

1．一种处理来自GSM型网络的基站控制器(BSC)的越区切换请求的方法，该方法包括把具有GSN类型参数的越区切换请求从基站控制器（BSC）通过GSM类型的网络的主交换中心（MSC）传送到UMTS核心网络（CN）以及传送到UMTS网络的无线网络控制器（RNC）；在无线网络控制器中（RNC），把GSM类型参数转换为UTRAN参数；以及响应所转换的参数分配UTRAN资源。

2．根据权利要求1所述的方法，其特征在于，该参数包括一个或多个数据率、呼叫类型和服务质量。

3．根据权利要求1或2所述的方法，其特征在于，分配UTRAN资源包括：在无线网络控制器中，设置到达节点B的一条无线链路，并且在无线链路设置的确认之后，在无线网络控制器中，设置无线网络控制器与核心网络之间的数据传输。

4．一种在由无线网络控制器接收GSM类型的越区切换请求之后建立与用户设备的UMTS通信的方法，该方法包括，在无线网络控制器中，设置到达节点B的无线链路，并且在无线链路设置的确认之后，在无线网络控制器中，设置无线网络控制器与核心网络之间的数据传输。

5．根据上述任何一项权利要求所述的方法，其特征在于，无线网络控制器被设计为，最好在无线链路设置之后，把包含UTRAN参数的越区切换消息通过GSM网络传送到用户设备；该方法还包括在和户设备中转换UTRAN参数，并且响应该参数，启动用户设备与UMTS网络之间的通信。

6．根据权利要求5所述的方法，其特征在于越区切换消息被作为一条GSM类型的消息透明地通过核心网络传送到GSM主交换中心，并且通过GSM类型网络的基站控制器。

7．一种建立在用户设备与UMTS网络之间的UMTS通信的方法，其特征在于，用户设备与GSM类型网络进行通信，该方法包括把UTRAN

参数信息通过GSM类型网络向前传送到用户设备，在用户设备中，转换UTRAN参数信息，并且启动与UMTS网络的通信。

8．根据权利要求7所述的方法，其特征在于，UTRAN参数信息是由UMTS网络的无线网络控制器所提供的。

9．根据权利要求5、6、7或8所述的方法，其特征在于，UTRAN参数信息包括潜在UTRAN接入点的列表。

10．根据权利要求5至9中的任何一项所述的方法，其特征在于，UE被设计为建立一条通过UMTS网络的RNC到达GSM类型网络的MSC的链路。

11．根据权利要求5至9中的任何一项所述的方法，其特征在于，在一个提供给UE的列表中不可能获得满意通信的潜在链路被从可用链路的列表中删除。

12．一种执行从GSM类型网络到UMTS网络的软越区切换的方法，包括把一个潜在UTRAN接入点的列表提供给用户设备；建立UE与至少一个UTRAN接入点之间的通信；以及从所述列表中删除不可能获得满意通信的潜在接入点。

13．一种从GSM类型网络切换到UMTS网络的方法，其特征在于，直接从用户设备（UE）与GSM类型基站进行通信的模式切换到UMTS分集模式，在分集模式中，用户设备与多个UMTS接入点进行通信。

14．根据权利要求12或13所述的方法，其中包括配置UTRAN，使得多个接入点被准备与UE进行通信。

15．根据权利要求12、13或14所述的方法，其中包括把潜在接入点的列表提供给UE。

16．一种在用户设备与GSM类型UMTS网络之间通信的方法，其中包括在从一个网络到另一个网络的越区切换过程中，通过这两个网络同时或准同时的通信信息。

17．一种把GSM类型的呼叫切换到UMTS网络的方法包括：把一个来自GSM类型网络，最好来自BSC的越区切换请求，最好包括GSM类型呼叫参数，传送到UMTS网络的RNC；在RNC中转换该请求，并且启动呼叫设置，最好执行无线链路设置，并且最好在此之后，响应成功的设

置；执行到核心网络的数据链路的设置；把包含UTRAN参数，最好包括潜在接入点的列表的越区切换信息向前传送到用户设备，最好包括把UTRAN信息透明地通过GSM网络传送；在用户设备中，根据UTRAN参数设置UMTS呼叫。

18．一种UMTS网络的无线网络控制器，其被设计为执行根据上述任何一项权利要求所述的方法。

19．一种UMTS网络的无线网络控制器，其中包括一种装置，其用于把GSM呼叫参数转换为UTRAN参数，以根据GSM呼叫参数分配UTRAN资源，以允许从GSM网络到UMTS网络的呼叫的越区切换。

20．一种UMTS网络的无线网络控制器，其中包括用于响应来自GSM网络的切换呼叫的请求执行无线链路设置的装置。

21．根据权利要求20所述的UMTS网络的无线网络控制器，其中还包括用于在成功的无线设置之后设置与核心网络的通信的装置。

22．根据权利要求19、20或21所述的UMTS网络的无线网络控制器，其中包括用于把UTRAN参数通过GSM网络发送到用户设备（UE）的装置，以允许UE建立UMTS通信，以便于把呼叫从GSM网络转移到UMTS网络。

23．根据权利要求22所述的UMTS网络的无线网络控制器，其特征在于该参数包括一个潜在UMTS接入点的列表。

24．一种用于UMTS网络的用户设备，其被设计为通过GSM网络和所述UMTS网络进行通信，并且包括用于从GSM网络接收用于设置UMTS呼叫的UTRAN参数的装置，以及用于根据所述参数启动与UMTS网络的通信，以允许GSM呼叫切换到UMTS网络。

25．一种在GSM网络中的消息或数据包，其中包括UTRAN参数，其用于把GSM呼叫切换到UMTS网络，其被发送到参与GSM呼叫并且能够切换到UMTS呼叫的用户设备。

26．在此参数附图所描述的任何一种方法。

27．在此所描述的任何一种装置。

28．在此所描述的电信网络或其组成部件。

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说　　明　　书

移动电信系统

本发明涉及一种移动电信系统，特别涉及两种通信系统之间的呼叫的越区切换，特别是GSM和UMTS网络之间的越区切换。

通常建议最好在GSM网络和UMTS网络之间提供越区切换。但是，这不是一个容易完成的任务，并且在能够成功实现之前存在多个实践的问题；本发明关于这些问题。但是，本发明可更加一般地应用于在使用不同协议的网络之间的相互作用，在此所用的术语被解释为本发明所应用的网络的相关等价部件。尽管本发明的各个方面提供对GSM到UMTS的越区切换的各种问题的独立解决方案，所有这些关于该共同问题，并且特别关于一种特定的新解决方法，其中UMTS网络的RNC在相当大程度上控制越区切换。

本发明在GSM和UMTS网络的环境中进行描述，以便于理解，但是还可以应用于具有相同特性的其它网络之间的越区切换。相应地，所有关于GSM和UMTS的参考以及在此所用的技术术语被解释为包含其它网络的等价特征。特别地，当前日本PDC网络具有与GSM相似的结构，在本说明书和权利要求书中所用的术语GSM（或者GSM类型）意思是包含这样的一种网络。类似地，术语UMTS（以及相关术语）意思是包含根据当前标准和提案以及任何衍生产品或者等同物的UMTS系统。

在第一方面中，本发明提供一种处理来自GSM网络的基站控制器（BSC）的越区切换请求的方法，该方法包括用GSM参数把越区切换请求从基站控制器（BSC）通过GSM网络的主交换中心（MSC）传送到UMTS核心网络（CN），并且传送到UMTS网络的无线网络控制器（RNC）；在无线网络控制器中，把GSM参数转换为UTRAN参数；并且响应转换的参数分配UTRAN资源。因此，不是把GSM参数逐条转换到UMTS网络，而是GSM参数透明地通过至少一部分UMTS网络到达RNC。该参数

可以包括一个或多个数据率，呼叫类型（语音、数据、传真、其它如视频图像、IP），服务的质量等等。这减少了网络中的处理量，并且允许RNC为该呼叫分配最佳的UTRAN资源。

最好，RNC被设置为直接从GSM连接切换到软越区切换UMTS模式。这与仅仅从用户设备（UE）到单个UMTS接入节点建立一个连接相比具有优势。该优选特征可以独立的在本发明的第二方面中提供，在该方面中本发明提供一种从GSM网络到UMTS网络的切换方法，其特征在于，直接从用户设备（UE）与GSM基站进行通信的模式切换到UMTS分集模式，在该分集模式中用户设备与多个UMTS接入节点进行通信，最好包括配置UTRAN，使得多个接入节点被准备与UE进行通信和／或最好把潜在的接入节点的列表提供给UE。

最好，无线网络控制器（RNC）被设计为，在首先转换GSM模式越区切换请求以执行无线链路设置之后，在来自无线链路的一个响应之后，对无线网络控制器和核心网络之间的通信执行数据传输设置。这允许在成功地无线设置之后建立与核心网络的通信，而不是独立的建立通信，因此避免当无线链路设置不可能进行时，对CN到RNC（Iu接口）资源的不必要使用。该优选特征可以独立的在第三方面中提供，在该方面中本发明提供一种在由无线网络控制器接收GSM越区切换请求之后建立与用户设备的UMTS通信的方法，该方法包括，在无线网络控制器中设置到节点B的无线链路，在确认无线链路设置之后，在无线网络控制器中，设置无线网络控制器与核心网络之间的数据传输。

最好，无线网络控制器被设置为（最好在无线链路设置之后）把包含UTRAN参数的越区切换信息通过GSM网络传送（例如，作为一条消息），最好通过核心网络传送到GSM主交换中心，并且最好至少通过GSM网络的基站控制器传送到用户设备；该方法还包括在用户设备中转换UTRAN参数，并且响应该参数，开始用户设备与UMTS网络之间的通信。

这可以独立的提供于本发明的第四方面中，在该方面中本发明提供一种建立用户设备与UMTS网络之间的UMTS通信的方法，其中用户设备与GSM网络进行通信，该方法包括通过GSM网络向前传送UTRAN参数信息，最好包括潜在UMTS接入节点的列表，最好从UMTS网络的无

线网络控制器传送到用户设备，并且在用户设备中转换UTRAN参数信息，并且启动与UMTS网络的通信。

因此，与启动步骤相反，在GSM信息传送到UMTS网络并且在RNC中转换的位置，UTRAN信息通过GSM网络而没有被转换，并且由UE转换。则意味着GSM网络不需要包含处理该信息的智能特征，这简化了与现存的GSM网络的互连。

在通信启动之后，最好UE被设置为建立通过UMTS网络的RNC到达GSM网络的MSC（在此处发起GSM呼叫）的链路。然后完成建立从MSC通过UMTS网络到达UE的链路。

最好，在被提供给UE的一个列表中的，不可能建立满意通信的潜在链路被从可用链路的列表中删除；该步骤可以独立的在执行从GSM到UMTS网络的软越区切换的方法中提供，包括把一个潜在UMTS接入节点的列表提供给用户设备；建立UE与至少一个UMTS接入节点之间的通信；并且从所述列表中删除不可能进行满意通信的潜在节点。

最好，至少在越区切换过程中，用户设备（UE）被设置为同时或准同时地在GSM网络与UMTS网络上进行通信。该特点可以独立地提供于本发明的第五方面中，在该方面中，本发明提供一种在用户设备与GSM和UMTS网络之间通过的方法，包括在从一个网络到另一个网络的越区切换过程中通过这两个网络同时或准同时地交换信息。

所有上述方面可以独立地提供，但是可以方便地在一个系统中合并。因此，本发明提供一种把GSM呼叫切换到UMTS网络的方法，包括：把切换请求从GSM网络（最好从BSC，最好包含GSM呼叫参数）传送到UMTS网络；在RNC中转换该请求，并且启动呼叫设置（最好执行呼叫链路设置，并且最好在此之后响应成功的设置执行到核心网络的无线电设置）；把包含UTRAN参数的越区切换信息（最好包括一个潜在接入节点的列表）向前传送到UE（最好使UTRAN信息透明地通过GSM网络，例如作为一条消息，由该UE所转换）；在UE中，根据UTRAN参数设置UMTS呼叫。

本发明扩展到无线网络，或者网络的组合，无线网络部件，特别是所有适合于实现上述发明的任何方面的RNC和UE。

下面将参照附图描述本发明的一个实施例，其中：

图1示出在GSM到UMTS之间通过MAP／E接口进行越区切换的事件序列。这还可以通过IWU实现。

1. BSC把越区切换请求消息发送到GSM MSC。这包括GSM信息要素{服务信息率、服务类型，等等}以及可以获得良好无线电质量的UMTS小区／节点B信息。

2. GSM MSC把MAP／E消息**准备越区切换**发送到UMTS CN，其透明的向前传送UMTS小区标识。

3. CN把RANAP消息**越区切换请求**发送到目标RNC。该消息将包含表示从哪种网络类型进行越区切换的信息要素，例如“越区切换类型”＝“从GSM”。这还可以包含允许GSM参数透明地传送到RNC的信息要素，例如GSM载体容量、版本号以及其它与GSM呼叫有关的相关参数。另外由MS／UE所提供的相关UMTS小区／节点B信息还被透明地传送到RNC。

4. RNC把GSM适当的呼叫参数映射到相关的UMTS逻辑信道、传输信道，并且适当地分配无线电资源参数（例如，DL多路化代码、UL扩展因子、UL不规则码、无线电频率、无线电链路标识、链路参考、S－RNTI、传输格式集、传送格式组合集、初始DL功率）。由于仅仅RNC知道无线电资源的状态，因此该功能仅仅能够在该阶段完成。

5. 由于专用传输信道被选择，因此**GSM呼叫可以立即进行软越区切换**。

i) RNC把NBAP消息**无线电链路设置**发送到所有相关节点B。

ii) 所有相关节点B开始发送／接收。

iii) 所有相关节点B把NBSP消息**无线电链路设置响应**发送到RNC。

6. RNC把Iub传送载体设置到所有相关节点B。由于RNC知道UTRAN资源是否已经被成功设置，因此RNC处于一种状态，以设置跨过Iub的传送载体。

7. RNC设置Iu传送载体。由于RNC知道UTRAN资源是否已经被成功设置，因此RNC处于一种状态，以设置跨过Iub的传送载体。

8. RNC把**越区切换请求确认**通过适当的UMTS参数发送到CN（例如，DL多路化代码、UL扩展因子、UL不规则码，等等），UE 指定CN，以允许从UE到UMTS成功地进行越区切换。

9. CN把**准备越区切换响应**发送到GSM MSC（向前传送UMTS参数）。

10. GSM MSC把**越区切换命令**发送到BSC（向前传送UMTS参数）。

11. BSC把RR消息**越区切换命令**发送到UE。其中包含必要的UMTS参数。

12. UE转换在RR消息中的UMTS参数，并且能够利用在UMTS参数中所示的多个或单个分集支路把该呼叫从GSM呼叫切换到UMTS呼叫。在该阶段，移动单元利用GSM容量从GSM网络接收信息，并且使用该信息把通信切换到UMTS网络，或者利用UMTS和GSM容量与UMTS网络与GSM网络同时进行通信。

13. UE启动发送 / 接收。

14. 在同步的检测中，节点B把NBAP消息**越区切换检测**发送到RNC。

15. 如果至少一个无线链路已经被成功地设置，则RNC能够为DTCH建立到达UE的RLC链路，以及为DCCH建立到达UE的RRC链路。然后RNC能够把信号发送到CN，并且向前发送到MSC，即越区切换结束。MSC能够切换通过新的UTRAN分支的呼叫。

16. 在DL上已经分配多个无线链路的情况中，并且如果UL同步还没有被检测，则可以在节点B与RNC之间适当地发送信号，以释放未使用的无线电资源。

应当知道本发明可以应用于其它网络结构。为了有助于理解如何扩展本发明，在此提供属于UMTS系统的在本领域中使用的术语词汇表，任何技术术语可以由在非UMTS系统中的功能等价的部件所代替。如下文件被包含于此以供参考：

[1] 草案-ETR/SMG-50102,“用于通用移动电信系统的专用移动组（SMG）词汇”。

[2] ETSI DTR / SMG-0225xxU, “ 用于UTRAN的通信移动电信系统（UMTS）词汇”, UMTS 25.XX 版本 0.1.0。

术语和定义

活动集

同时在特定通信服务中涉及的在UE与UTRAN之间的无线链路的集合。

小区

小区是可以由UE从（小区）标识识别的地理区域，该标识从一个UTRAN接入点广播。

编码合成传输信道（CCTrCH）

从一个或几个传输信道的编码和多路复用中得出的数据流。

CCTrCH的数据流被馈送到一个数据分离器装置，其把CCTrCH数据流分享为一个或几个物理信道数据流。

争端解决

用于解决来自两个（或者更多的）UE的初始随机访问信息上同一性的冲突的功能或者程序。

前向越区切换

一种由UE发起的越区切换类型。UE发出用于在新的小区中建立新的无线链路的请求，即它不使用当前无线链路来执行越区切换，而使用新小区的无线链路。

网关UE_R / Seed

一种ODMA中继节点，它还利用TDD或FDD模式与UTRAN进行通信。

越区切换

越区切换是在一系列过程，即当存在RRC连接并且在UTRAN中在

小区级别上已知UE的位置时，在一个UE与UTRAN之间增加或除去一个或几个无线链路。

硬越区切换

硬越区切换是一类越区切换过程，其中在新的无线链路建立之前，在UE中除去所有旧的无线链路。

逻辑信道

逻辑信道是一种专用于在无线接口上传送特殊类型的信息的信息流。

ODMA中继节点

一种中继设备，例如UE_R或者Seed，它能够利用ODMA协议进行中继。

物理信道

在FDD模式中，物理信道由代码、频率以及在上行链路中的相关相位（I / Q）所定义。在TDD模式中，物理信道由代码、频率和时隙所定义。

物理信道数据流

在上行链路中，是一种在一条物理信道上发送的数据流。

在下行链路中，是一种在活动集的每个小区中的一条物理信道上发送的数据流。

无线接入载体

一种服务，即接入层级提供给非接入层级用于在UE与CN之间传输用户数据。

无线帧

无线帧是用于在无线物理信道上的数据传输的10毫秒时间段的标号的时间间隔。无线帧被分为0.625毫秒时间段的16个时隙。被映射到一个无线帧（10毫秒时间间隔）上的数据单位也被称为无线帧。

无线链路

包含在UE到一个UTRAN接入点之间的传输路径中的（无线）物理信道的接口。

无线链路添加

把新的无线链路添加到活动集中的过程。

无线链路去除

把一个无线链路从活动集中去除的过程。

无线网络暂时标识符（RNTI）

无线网络暂时标识符是一种当存在RRC连接时用于UE的标识符。它例如由在公共传送信道（RACH、FACH、PCH）上的MAC协议所使用。

中继器

一种能够接收和发送用于另一个用户的信息的设备。

中继

一种接收和发送用于另一个用户的信息的过程，例如由UE_R所执行。

中继链路

中继链路是在两个ODMA中继节点之间的通信线路。

根中继

发出或接收通信的ODMA中继节点。

RRC连接

在UE上的RRC对等实体分别与UTRAN方之间的点对点双向连接。UE具有零个或一个RRC连接。

Seed

一个ODMA中继节点，其由网络操作员所放置，并且通常是固定的、被稳定的提供能量、以及不具有显示器／键盘。

信令连接

在用户设备与核心网络之间的确认模式链接，以在非接入层级中的对等实体之间传送较高层信息。

信令链路

提供一种确认模式链路层，以传送UE－UTRAN信令信息，以及UE－核心网络信令信息（利用信令连接）。

软越区切换

软越区切换是一类越区切换过程，其中无线链路被按照这样一种方式添加和除去，该方式使得UE总是至少保持一个到达UTRAN的无线链路。

传输时间间隔

传输时间间隔被定义为传送块集合的到达时间的间隔，即发送一个传送块集合所花的时间。它总是10毫秒（一个无线帧的长度）的倍数。

传送块

传送块被定义为向下从MAC传送到L1用于L1处理的基本单元。传送块的等价术语是“MAC PDU”。

传送块集合

传送块集合被定义为在同一时刻利用相同传送信道从MAC传送到L1的传送块的集合。传送块集合的等价术语是“MAC PDU集合”。

传送块集合尺寸

传送块集合尺寸被定义为在传送块集合中的比特数。

传送块尺寸

传送块尺寸被定义为传送块的大小（比特数）。

传送信道

由物理层提供给层2用于对等L1实体之间的数据传送的信道被称为传送信道。

不同类型的传送信道由如何在物理层上传送数据以及传送具有何种特性的数据所确定，例如，是否使用专用或通用的物理信道。

传送格式

传送格式被定义为由L1提供给MAC用于在传送信道上在传输时间间隔过程中传输一个传送块集合的格式。该传送格式由两个部分构成——一个动态部分和一个半静态部分。

传送格式组合

传送格式组合被定义为在UE的所有传送信道上的当前有效传送格式的组合，即包含来自每个传送信道的一个传送格式。

传送格式组合集

传送格式组合集被定义为要由UE所使用的一组传送格式组合。

传送格式组合标识符（TFCI）

传送格式组合标识符是当前传送格式组合的一种表达形式。

传送格式标识符（TFI）

用于在传送格式集中的特定传送格式的标签。

传送格式集

传送格式集被定义为与传送信道相关的传送格式的集合

URA更新

URA更新是一系列过程，当存在RRC连接并且在UTRAN中在URA级别上已知UE的位置时，更新UE的UTRAN登记区域。

用户设备 / 启动中继（UE_R）

启动ODMA中继操作的UE。

URAN登记区域（URA）

URAN登记区域是由多个小区所覆盖的区域。URA仅仅在由UTRAN内部得知。

UTRAN接入点

在UTRAN中执行无线发送和接收的概念上的点。UTRAN接入点与一个特定小区相关联，即存在一个用于每个小区的UTRAN接入点。它是无线链路的UTRAN方的结束点。

00.05.26

缩写

ARQ	自动重复请求
BCCH	广播控制信道
BCH	广播信道
BPSK	二进制相移键控
BSS	基站系统
BTS	基收发站
C-	控制-
CC	呼叫控制
CCCH	共同控制信道
CCH	控制信道
CCTrCH	编码合成传送信道
CDMA	码分多路访问
CN	核心网络
CRC	循环冗余校验
DC	专用控制(SAP)
DCA	动态信道分配
DCCH	专用控制信道
DCH	专用控制
DHO	分集多路复用
DL	下行链路
DRNC	漂移无线网络控制器
DS-CDMA	直接序列码分多路访问
DSCH	向下链路共享信道
DTCH	专用业务信道
DTX	断续传输
FACH	向前链路接入信道
FAUSCH	快速上行链路接入信道
FCS	帧校验序列

FDD	频分双工
GC	一般控制(SAP)
HO	越区切换
HHO	硬越区切换
ITU	国际电信联盟
kbps	千位每秒
ksps	千符号每秒
L1	层1(物理层)
L2	层2(数据链路层)
L3	层3(网络层)
LAC	链路接入控制
MAC	媒体接入控制
MM	移动性管理
Mcps	兆码片每秒
Nt	通知(SAP)
OCCCH	ODMA公共控制信道
ODCCH	ODMA专用控制信道
ODCH	ODMA专用信道
ODMA	机会驱动多路接入
ORACH	ODMA随机接入信道
ODTCH	ODMA专用业务信道
PCCH	寻呼控制信道
PCH	寻呼信道
PDU	协议数据单元
PHY	物理层
PhyCH	物理信道
RACH	随机接入信道
RLC	无线链路控制
RNC	无线网络控制器
RNS	无线网络子系统

	RNTI	无线网络暂时标识符
	RRC	无线电资源控制
	SAP	服务接入点
	SCCH	同步控制信道
5	SCH	同步信道
	SDU	服务数据单元
	SIR	信噪比
	SRNC	服务无线网络控制器
	SRNS	服务无线网络子系统
10	TCH	业务信道
	TDD	时分双工
	TFCI	传送格式组合标识符
	TFI	传输格式标识符
	TN	终端节点
15	TPC	发射功率控制
	TRX	发射器/接收器
	U-	用户-
	UE	用户设备
	UE_R	启动ODMA中继操作的用户设备
20	UL	上行链路
	UMTS	通用移动电信系统
	URA	UTRAN登记区
	UTRA	UMTS地面无线电接入
	UTRAN	UMTS地面无线电接入网络

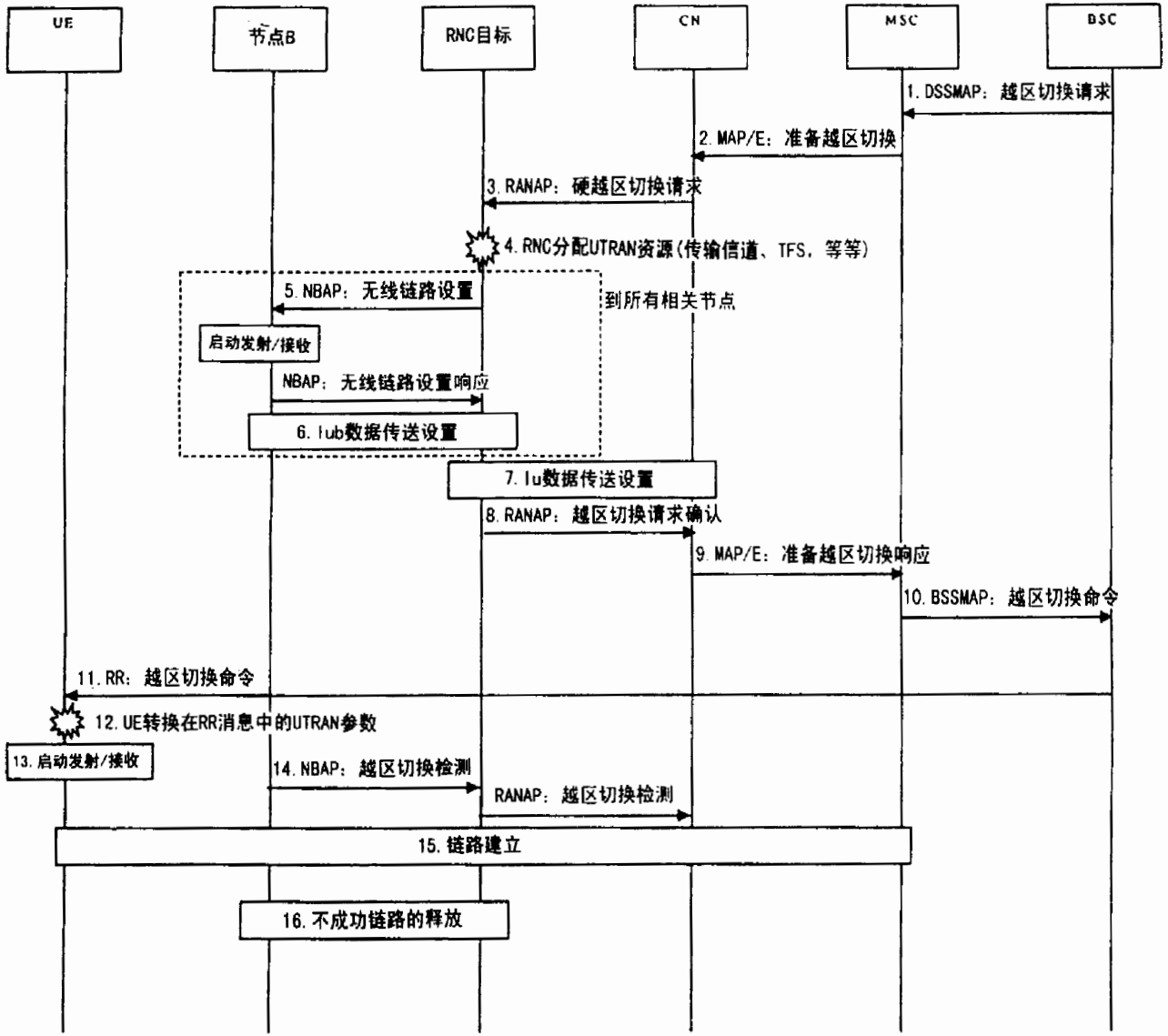

UE
节点B
RNC目标
CN
MSC
BSC
1. DSSMAP：越区切换请求
2. MAP/E：准备越区切换
3. RANAP：硬越区切换请求
4. RNC分配UTRAN资源(传输信道、TFS，等等)
5. NBAP：无线链路设置
到所有相关节点
启动发射/接收
NBAP：无线链路设置响应
6. Iub数据传送设置
7. Iu数据传送设置
8. RANAP：越区切换请求确认
9. MAP/E：准备越区切换响应
10. BSSMAP：越区切换命令
11. RR：越区切换命令
12. UE转换在RR消息中的UTRAN参数
13. 启动发射/接收
14. NBAP：越区切换检测
RANAP：越区切换检测
15. 链路建立
16. 不成功链路的释放

图 1

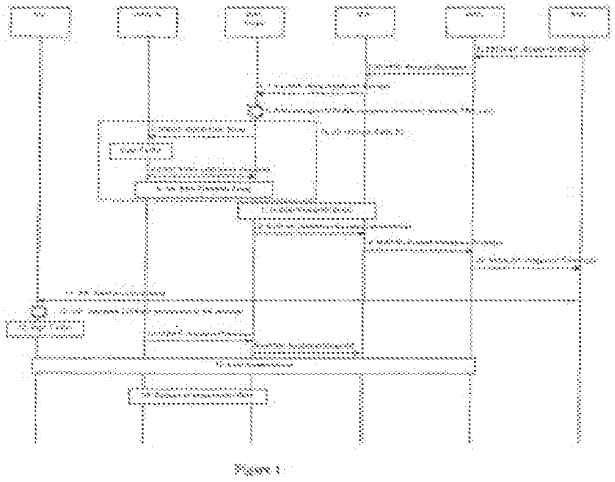
Mobile telecommunication system

Publication number: CN1275872 (A)
Publication date: 2000-12-06
Inventor(s): PAMA JINA [JP]; PATENSEN ROBERT [JP]
Applicant(s): NIPPON ELECTRIC CO [JP]
Classification:
- international: ***H04L12/28; H04L12/46; H04L12/56; H04W36/14;*** *H04W12/10; H04W36/00; H04W36/18; H04W72/04; H04W88/12; H04W88/14;* **H04L12/28; H04L12/46; H04L12/56; H04W36/00;** H04W12/00; H04W72/00; H04W88/00; (IPC1-7): H04Q7/20
- European: H04L12/56B; H04Q7/38H6; H04W36/14
Application number: CN20001007781 20000526
Priority number(s): GB19990012604 19990528

Also published as:
CN1171477 (C)
EP1058471 (A2)
EP1058471 (A3)
EP1058471 (B1)
US6725039 (B1)
more >>

Abstract not available for CN 1275872 (A)
Abstract of corresponding document: **EP 1058471 (A2)**

A method of processing a handover request from a base station controller (BSC) of a GSM (Global System for Mobile communication) -type network. The method comprises the steps of passing a handover request with GSM-type parameters from a base station controller (BSC) through a Master Switching Center (MSC) of the GSM-type network to a UMTS core network (CN) and to a Radio Network Controller (RNC) of the UMTS (Universal Mobile Telecommunications System) network, translating the GSM-type parameters to UTRAN parameters in the Radio Network Controller (RNC), and allocating UTRAN resources in response to the translated parameters.



Electronic Acknowledgement Receipt

EFS ID:	6892872
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	85854
Filer:	Flynn Barrison/Angelina Stantini
Filer Authorized By:	Flynn Barrison
Attorney Docket Number:	21370/0212577-US0
Receipt Date:	27-JAN-2010
Filing Date:	19-OCT-2009
Time Stamp:	16:09:57
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	IDS.PDF	235425 762758327e19d5562a9bcf60a3b07d7a91a3e72f	no	8
Warnings:					
Information:					

2	Information Disclosure Statement (IDS) Filed (SB/08)	SB08.PDF	607783 7851d59ea9285095e8a7f54636dce28c5bdb75c3	no	4
Warnings:					
Information:					
3	Foreign Reference	CN1882160A.PDF	988409 242cd9b50ec76a3895f8a1375a7f83b7f4a80ca4	no	19
Warnings:					
Information:					
4	Foreign Reference	AbstractCN1882160A.PDF	56584 57443b413dbec68cf06f0c2d5b66047e014e7cb1	no	1
Warnings:					
Information:					
5	Foreign Reference	CN1605222A.PDF	2536514 2bdc65795dcc764c74cce1a3c197e70ccbff1a4a	no	54
Warnings:					
Information:					
6	Foreign Reference	AbstractCN1605222A.PDF	363523 5bacf4a393cfd2115d150381210683de5892284c	no	1
Warnings:					
Information:					
7	Foreign Reference	CN1275872A.PDF	675118 c65f4340ef815ec99e09da76de77ee7ca1dbb66f	no	20
Warnings:					
Information:					
8	Foreign Reference	AbstractCN1275872A.PDF	336534 21db6627017cf4eb37667281c93037fd8fdfe625	no	1
Warnings:					
Information:					
		Total Files Size (in bytes):	5799890		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Docket No.: 21370/0212577-US0
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Wenfu Wu

Application No.: 12/581,575 Confirmation No.: 2875

Filed: October 19, 2009 Art Unit: 2617

For: A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING Examiner: Not Yet Assigned

INFORMATION DISCLOSURE STATEMENT (IDS)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This Information Disclosure Statement is submitted in accordance with 37 C.F.R. 1.97, 1.98, and it is requested that the information set forth in this statement and in the listed documents be considered during the pendency of the above-identified application, and any other application relying on the filing date of the above-identified application or cross-referencing it as a related application.

1. This IDS should be considered, in accordance with 37 C.F.R. 1.97, as it is filed: (Check one of the boxes A-D)

- [ ] A. within three months of the filing date of the above-identified national application or within three months of the entry into the national stage of the above identified national application
- [x] B. before the mailing date of a first office action on the merits, or a first office action after filing a request for continued examination.
- [ ] C. after (A) and (B) above, but before final rejection or allowance, and Applicants have made the necessary statement in box "i" below or paid the necessary fee in box "ii" below.

(check one of the boxes "i" and "ii" below:)

☐ i. Counsel states that, upon information and belief, each item of information listed herein was (check one of boxes (a) or (b))

☐ (a) first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS; or

☐ (b) not cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of undersigned after making reasonable inquiry, was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.

☐ ii. Payment in the amount of the fee set forth in 1. 17(p), presently believed to be $180, is enclosed.

☐ D. after (A), (B) and (C) above, but before payment of the issue fee: Applicant petitions under 37 C.F.R. 1.97(d) for the consideration of this IDS. Under 37 CFR 1.17(p) payment in the amount of $180.00 is enclosed. Counsel certifies that, upon information and belief, each item of information listed herein was

(check one of the boxes "a" and "b" below:)

☐ (a) first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this IDS; or

☐ (b) was not cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of undersigned after making reasonable inquiry, was not known to any individual designated in 1.56(c) more than three months prior to the filing of this IDS.

2. In accordance with 37 C.F.R. 1.98, this IDS includes a list (e.g., form PTO/SB/08) of all patents, publications, or other information submitted for consideration by the office, either incorporated into this IDS or as an attachment hereto. A copy of each document listed is attached, except as explained below.

(check boxes A, B and/or C and fill in blanks, if appropriate.)

[x] A. Pursuant to 37 C.F.R. § 1.98(a)(2)(ii), a copy/copies of the U.S. Patent(s) and/or U.S. Patent Application Publication(s) on PTO/SB/08 is/are not being submitted.

[ ] B. Document(s) _____is (are) deemed substantially cumulative to document(s) _____ , and, in accordance with 1.98(c), only a copy of each of the latter documents is enclosed.

[ ] C. Certain documents were previously cited by or submitted to the Office in the following prior applications, which are relied upon under 35 U.S.C. 120:

<<INSERT SERIAL NO. & FILING DATE>>

Applicant identifies these documents by attaching hereto copies of the forms PTO-892, PTO-1449 and/or PTO/SB/08 from the files of the prior application(s) or a fresh PTO/SB/08 listing these documents, and request that they be considered and made of record in accordance with 1.98(d). Per 37 CFR 1.98(d), copies of these documents need not be filed in this application.

[x] 3. Cite Nos. **1-3 under foreign documents** are not in the English language. In accordance with 1.98(b)(3), Applicant states:

[x] An English translation of each document (or of the pertinent portions thereof), or a copy of each corresponding English-language patent or application , or English-language abstract (or claim) is enclosed.

[ ] The requirement for a concise explanation of the relevance of any foreign language document is satisfied by the attached search report; citation of the documents cited in the search report shall not be construed as an admission that they are or are considered to be, material to patentability of the subject matter claimed herein (See MPEP §609).

[ ] A concise explanation of the relevance of document(s) _____ is set forth as follows: [Insert concise explanation of relevance]

[ ] A concise explanation of the relevance of document(s) _____ can be found on page(s) _____ of the specification.

[ ] A concise explanation of document(s) _____ can be found on the attached sheet.

☐ 4. No explanation of relevance is necessary for documents in the English language (see reply to Comments 67 in the preamble to the final rules; 1135 OG 13 at 20).

☒ 5. Other information being provided for the examiner's consideration follows:

An International Search Report mailed August 21, 2008 during prosecution of corresponding International Patent Application No. PCT/CN2008/070909.

6. In accordance with 37 C.F.R. 1.97(g) and (h), the filing of this IDS should not be construed as a representation that a search has been made or that information cited is, or is considered to be, material to patentability as defined in §1.56 (b), or that any cited document listed or attached is (or constitutes) prior art. Unless other-wise indicated, the date of publication indicated for an item is taken from the face of' the item and Applicant reserves the right to prove that the date of publication is in fact different.

Early and favorable consideration is earnestly solicited.

The Commissioner is authorized to charge any deficiency of up to $300.00 or credit any excess in this fee due with this submission to Deposit Account No. 04-0100.

Dated: January 27, 2010

Respectfully submitted,

Electronic signature: /Flynn Barrison 53,970/
Flynn Barrison
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Attorneys/Agents For Applicant

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2008/070909

A. CLASSIFICATION OF SUBJECT MATTER

H04Q7/38(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04Q7/-,H04L12/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC, PAJ: register+, switch+, request+, network, type, process, report, HSS, AAAServer, handover

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN1605222 A (NOKIA CORP) 6 Apr. 2005 (06.04.2005) see D1 abstract, claims and description page 13 line 5-page 15 line 13	1、2、4、5、13、25、30-38
A	idem	3、6-12、14-24、26-29、39-41
A	CN1275872 A (NEC CORP) 6 Dec.2000 (06.12.2000) see the whole document	1-41
A	CN1882160 A (ZTE CORP) 20 Dec.2006 (20.12.2006) see the whole document	1-41

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
06 Aug.2008 (06.08.2008)	**21 Aug. 2008 (21.08.2008)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer CAO,Yachun Telephone No. (86-10)62411427

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2008/070909

Patent Documents referred in the Report	Publication Date	Patent Family		Publication Date
CN1605222 A	06.04.2005	US2003114158	A1	19-06-2003
		WO03053091	A1	26-06-2003
		AU2002366423	A1	30-06-2003
		EP1457080	A1	15-09-2004
		KR20040063954	A	14-07-2004
CN1275872 A	06.12.2000	EP1058471	A2	06-12-2000
		GB2352585	A	31-01-2001
		JP2000358267	A	26-12-2000
		DE60003976	E	28-08-2003
		US6725039	B1	20-04-2004
		JP2004159370	A	03-06-2004
		US2004166841	A1	26-08-2004
		CN1541003	A	27-10-2004
		JP2006295964	A	26-10-2006
		US2007015500	A1	18-01-2007
		JP2007020229	A	25-01-2007
CN1882160 A	20.12.2006	NONE		

Form PCT/ISA/210 (patent family annex) (April 2007)

国际检索报告

国际申请号
PCT/CN2008/070909

A. 主题的分类

H04Q7/38(2006.01)i

按照国际专利分类表(IPC)或者同时按照国家分类和 IPC 两种分类

B. 检索领域

检索的最低限度文献(标明分类系统和分类号)

H04Q7/-, H04L12/-

包含在检索领域中的除最低限度文献以外的检索文献

在国际检索时查阅的电子数据库(数据库的名称，和使用的检索词（如使用）)

WPI, EPODOC, PAJ: register+, switch+, request+, network, type, process, report, HSS, AAAServer, handover

CPRS,CNKI:注册，登记，请求，网间，网络间，系统间，切换，移交，HSS，AAA server，预先，提前，空闲，激活，优化，类型

C. 相关文件

类　型*	引用文件，必要时，指明相关段落	相关的权利要求
X	CN1605222 A（诺基亚有限公司）6.4 月 2005（06.04.2005）参见摘要、权利要求书及说明书第 13 页第 5 行至第 15 页第 13 行	1、2、4、5、13、25、30-38
A	同上	3、6-12、14-24、26-29、
A	CN1275872 A（日本电气株式会社）6.12 月 2000（06.12.2000）参见全文	1-41
A	CN1882160 A（中兴通讯股份有限公司）20.12 月 2006（20.12.2006）参见全文	1-41

☐ 其余文件在 C 栏的续页中列出。　　☒ 见同族专利附件。

* 引用文件的具体类型：

"A" 认为不特别相关的表示了现有技术一般状态的文件

"E" 在国际申请日的当天或之后公布的在先申请或专利

"L" 可能对优先权要求构成怀疑的文件，或为确定另一篇引用文件的公布日而引用的或者因其他特殊理由而引用的文件

"O" 涉及口头公开、使用、展览或其他方式公开的文件

"P" 公布日先于国际申请日但迟于所要求的优先权日的文件

"T" 在申请日或优先权日之后公布，与申请不相抵触，但为了理解发明之理论或原理的在后文件

"X" 特别相关的文件，单独考虑该文件，认定要求保护的发明不是新颖的或不具有创造性

"Y" 特别相关的文件，当该文件与另一篇或者多篇该类文件结合并且这种结合对于本领域技术人员为显而易见时，要求保护的发明不具有创造性

"&" 同族专利的文件

国际检索实际完成的日期	国际检索报告邮寄日期
06.8 月 2008（06.08.2008）	**21.8 月 2008 (21.08.2008)**
中华人民共和国国家知识产权局(ISA/CN) 中国北京市海淀区蓟门桥西土城路 6 号 100088 传真号：　(86-10) 62019451	受权官员 曹雅春 电话号码：(86-10) **62411427**

PCT/ISA/210 表(第 2 页) (2008 年 7 月)

国际检索报告
关于同族专利的信息

国际申请号
PCT/CN2008/070909

检索报告中引用的专利文件	公布日期	同族专利		公布日期
CN1605222 A	06.04.2005	US2003114158	A1	19-06-2003
		WO03053091	A1	26-06-2003
		AU2002366423	A1	30-06-2003
		EP1457080	A1	15-09-2004
		KR20040063954	A	14-07-2004
CN1275872 A	06.12.2000	EP1058471	A2	06-12-2000
		GB2352585	A	31-01-2001
		JP2000358267	A	26-12-2000
		DE60003976	E	28-08-2003
		US6725039	B1	20-04-2004
		JP2004159370	A	03-06-2004
		US2004166841	A1	26-08-2004
		CN1541003	A	27-10-2004
		JP2006295964	A	26-10-2006
		US2007015500	A1	18-01-2007
		JP2007020229	A	25-01-2007
CN1882160 A	20.12.2006	无		

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/581,575	10/19/2009	Wenfu Wu	21370/0212577-US0

CONFIRMATION NO. 2875

85854
Huawei Technologies Co., Ltd.
c/o Darby & Darby P.C.
P.O. Box 770
Church Street Station
New York, NY 10008-0770

PUBLICATION NOTICE

Title:METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Publication No.US-2010-0040024-A1
Publication Date:02/18/2010

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

FW POA

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 87076

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 87076

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Huawei Technologies Co., Ltd.
Huawei Administration Building, Bantian, Longgang District, Shenzhen, Guangdong 518129, P. R. China

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature	[signature]	Date	14th Sep. 2009
Name	Sun Yafang	Telephone	+86-755-28356888
Title	President		

Electronic Acknowledgement Receipt

EFS ID:	7300221
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	85854
Filer:	Paul Christopher Hashim/LiQiong Tian
Filer Authorized By:	Paul Christopher Hashim
Attorney Docket Number:	21370/0212577-US0
Receipt Date:	27-MAR-2010
Filing Date:	19-OCT-2009
Time Stamp:	16:15:24
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73(b).	0810596US.pdf	90355 d6d3470abbe09609e5d82a1deefb192869e56338	no	2

Warnings:	
Information:	

2	Power of Attorney	POA_of_FW.pdf	41286 25a1efe281376fb9b28894e81acc9991783bae93	no	1

Warnings:	
Information:	
Total Files Size (in bytes):	131641

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

08105/8605

PTO/SB/96 (07-09)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Peperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Wenfu WU

Application No./Patent No.: 12/581,575 Filed/Issue Date: October 19, 2009

Titled: CROSS-REFERENCE TO RELATED APPLICATIONS

HUAWEI TECHNOLOGIES CO.,LTD. , a CORPORATION

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 023856, Frame 0942, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature	March 25 ,2010 Date
SUN Yafang Printed or Typed Name	President Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/581,575	10/19/2009	Wenfu Wu	21370/0212577-US0

CONFIRMATION NO. 2875

87076
FutureWei Technologies, Inc.
IPR & Standards Department
1700 Alma Drive, Suite 500
Plano, TX 75075

POA ACCEPTANCE LETTER

OC000000040953231

Date Mailed: 04/07/2010

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/27/2010.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/gbien-aime/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/581,575	10/19/2009	Wenfu Wu	21370/0212577-US0

CONFIRMATION NO. 2875

85854
Huawei Technologies Co., Ltd.
c/o Darby & Darby P.C.
P.O. Box 770
Church Street Station
New York, NY 10008-0770

POWER OF ATTORNEY NOTICE

OC000000040953181

Date Mailed: 04/07/2010

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/27/2010.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/gbien-aime/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: May 27, 2010 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Unknown
Filed:	October 19, 2009	Art Unit:	2617
For:	METHOD, SYSTEM AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.:	2875
Attorney Docket No.:	13674-213		
Client Ref. No.:	0810596US		

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Power of Attorney to Prosecute Applications Before the USPTO; Statement Under 37 CFR 3.73(b).

Fee calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

May 27, 2010
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 93823

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 93823

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

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SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	April 14,2010
Name	SUN Yafang	Telephone	+86-755-28357801
Title	President		

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PTO/SB/96 (07-09)
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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Wenfu Wu

Application No./Patent No.: 12/581,575 Filed/Issue Date: October 19, 2009

Titled: METHOD, SYSTEM AND APPARATUS FO REGISTRATION PROCESSING

Huawei Technologies Co., Ltd. , a coroporation
(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. [x] the assignee of the entire right, title, and interest in;

2. [ ] an assignee of less than the entire right, title, and interest in
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the patent application/patent identified above, by virtue of either:

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The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Gustavo Siller, Jr./ May 27, 2010
Signature Date

Gustavo Siller, Jr. Attorney for Applicant
Printed or Typed Name Title

Electronic Acknowledgement Receipt

EFS ID:	7700973
Application Number:	12581575
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Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	87076
Filer:	Gustavo Siller Jr./Magdalena Pieczonka
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213POA.PDF	189883 2ee424615bf8b880e9cadc578da68c5d70d22400	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Power of Attorney	2	3
Warnings:			
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	Total Files Size (in bytes):	189883	

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New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/581,575	10/19/2009	Wenfu Wu	21370/0212577-US0

CONFIRMATION NO. 2875

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POA ACCEPTANCE LETTER

OC000000041931663

Date Mailed: 06/04/2010

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/27/2010.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/mteklemichael/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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Date Mailed: 06/04/2010

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 05/27/2010.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

/mteklemichael/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 081596US
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REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	B1	2003/0114158 A1	June 19, 2003	Soderbacka et al.		

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	B2	2004/100403 A1	November 18, 2004	PCT		
	B3	2007/011638 A2	January 25, 2007	PCT		
	B4	2007/011638 A3	January 25, 2007	PCT		
	B5	2008/094419 A1	August 7, 2008	PCT		

EXAMINER INITIAL		OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.
	B6	3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3GPP System Architecture Evolution: GPRS Enhancements for E-UTRAN Access; Release 8" Global System for Mobile Communications. April 2007. (clean version)
	B7	3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3GPP System Architecture Evolution: GPRS Enhancements for E-UTRAN Access; Release 8" Global System for Mobile Communications. April 2007. (marked-up version)
	B8	Infineon Technologies "GPRS Attach Type While in DTM" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 21 February 2005.
	B9	Huawei "Refine Attach Procedure" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 18 April 2007.
	B10	Huawei "Handover from non 3GPP to 3GPP" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 18 April 2007.
	B11	CATT "TAU Procedure" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 18 April 2007.
	B12	Intel "Handover from 3GPP Access (UTRAN) to non-3GPP Access (TS 23.402)" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 19 April 2007.
	B13	Huawei "Attach Type in Attach Procedure" 3rd Generation Partnership Project (3GPP) Mobile Competence Centre. 19 June 2007.
	B14	International Preliminary Report on Patentability issued in corresponding PCT Application No. PCT/CN2008/070909; issued November 17, 2009.
	B15	Copy of Office Action issued in corresponding Chinese Patent Application No. 200810085729.8; issued April 2, 2010
	B16	Copy of Supplementary European Search Report issued in corresponding European Patent Application No. 08 73. 4264; issued February 19, 2010

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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(54) Title: METHOD FOR PROVIDING MULTI-LEVEL ACCESS SERVICES IN COMMON ACCESS CHANNEL

(57) Abstract: The present invention relates to a method for performing a ranging operation according to the priority order in a mobile communication system using a BWA (Broadcast Wireless Access) scheme. The method according to the invention for performing a range operation by a subscriber terminal in a mobile communication system using the BWA (Broadcast Wireless Access) scheme comprises steps of: receiving backoff domains having the start and end values of the backoff corresponding to each ranging operation, the backoff domains being determined from a base station according to the priority order of the ranging operations between the base station and subscriber terminals; performing a ranging operation and, if it is determined that the step of performing the ranging operation fails, selecting backoff domains among the received backoff domains according to the priority order of the performed ranging operations; and, re-performing the ranging operation according to the selected backoff domains.

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METHOD FOR PROVIDING MULTI-LEVEL ACCESS SERVICES IN COMMON ACCESS CHANNEL

1. Field of the Invention

The present invention relates generally to a mobile communication system employing a Broadband Wireless Access (BWA) scheme, and in particular, to an apparatus and method for performing a ranging operation in a BWA mobile communication system.

2. Description of the Related Art

In a 4th generation (4G) communication system which is a next generation communication system, active researches are being conducted on technology for providing users with services guaranteeing various qualities of service (QoSs) at a data rate of about 100 Mbps. The current 3rd generation (3G) communication system generally supports a data rate of about 384 Kbps in an outdoor channel environment having a relatively poor channel environment, and supports a data rate of a maximum of 2 Mbps even in an indoor channel environment having a relatively good channel environment.

Meanwhile, a wireless local area network (LAN) system and a wireless metropolitan area network (MAN) system generally support a data rate of 20 Mbps to 50 Mbps. Therefore, in the current 4G communication system, active researches are being carried out on a new communication system securing mobility and QoS for the wireless LAN system and the wireless MAN system supporting a relatively high data rate in order to support high-speed services that the 4G communication system aims to provide.

Due to its broad service coverage and high data rate, the wireless MAN system is suitable for high-speed communication services. However, because mobility of a user, or a subscriber station (SS), is not taken into consideration, handover caused by fast movement of the subscriber station is also not considered in the system. Therefore, an apparatus and scenario for supporting handover caused by fast movement of the subscriber station is being studied actively.

FIG. 1 is a diagram illustrating a configuration of an IEEE 802.16e communication system.

Referring to FIG. 1, the IEEE 802.16e communication system has a multicell configuration, i.e., has a cell 100 and a cell 150, and is comprised of a base station (BS) 110 controlling the cell 100, a base station 140 controlling the cell 150, and a plurality of subscriber stations 111, 113, 130, 151 and 153. Transmission/reception between the base stations 110 and 140 and the subscriber stations 111, 113, 130, 151 and 153 is achieved using an OFDM/OFDMA scheme. Among the subscriber stations 111, 113, 130, 151 and 153, the subscriber station 130 is located in a boundary area, or a handover area, of the cell 100 and the cell 150. Therefore, it is necessary to support handover for the subscriber station 130 in order to support mobility of the subscriber station 130.

The wireless MAN system is a Broadband Wireless Access (BWA) communication system, and a system employing an Orthogonal Frequency Division Multiplexing (OFDM) scheme and an Orthogonal Frequency Division Multiplexing Access (OFDMA) scheme to support a broadband transmission network for a physical channel of the wireless LAN system is called an IEEE 802.16a communication system. The IEEE 802.16a communication system is a broadband wireless access communication system employing OFDM/OFDMA scheme. Because the IEEE 802.16a communication system applies the OFDM/OFDMA scheme to the wireless MAN system, it can support high-speed data transmission by transmitting a physical channel signal using a plurality of sub-carriers.

Meanwhile, the IEEE 802.16c communication system is a system designed to consider mobility of subscriber stations in the IEEE 802.16a communication system. In conclusion, both the IEEE 802.16a communication system and the IEEE 802.16e communication system are a broadband wireless access communication system using the OFDM/OFDMA scheme.

A description will now be made of rangings, including Initial Ranging, Maintenance Ranging (or Periodic Ranging), and Bandwidth Request Ranging, all of which are used in the IEEE 802.16a communication system.

First, the initial ranging will be described.

The initial ranging is performed to acquire synchronization with a subscriber station by a base station. The initial ranging is performed to adjust a correct offset between the subscriber station and the base station and to control transmission power. That is, the subscriber station receives a DL_MAP message and a UL_MAP message upon power on to acquire synchronization with the base station, and then performs the initial ranging in order to adjust the time offset with the base station and transmission power. Because the IEEE 802.16a communicant system uses the OFDM/OFDMA scheme, sub-channels and ranging codes are required for the ranging procedure, and a base station assigns available ranging codes according to an object, or a type, of the rangings. This will be described in detail herein below.

The ranging code is generated by segmenting a pseudo-random noise (PN) sequence having a length of, for example, 2^{15}-1 bits into predetermined units. Generally, two ranging sub-channels having a length of 53 bits constitute one ranging channel, and a PN code is segmented through a ranging channel having a length of 106 bits to generate ranging codes. Of the formed ranging codes, a maximum of 48 ranging codes RC#1 to RC#48 can be assigned to subscriber stations, and as a default value, a minimum of 2 ranging codes per subscriber station are applied to the rangings of the 3 objects, i.e., initial ranging, periodic ranging and bandwidth request ranging. In this way, different ranging codes are assigned to the rangings of the 3 objects. For example, N ranging codes are assigned for the initial ranging (N RCs (Ranging Codes) for initial ranging), M ranging codes are assigned for the periodic ranging (M RCs for maintenance ranging), and L ranging codes are assigned for bandwidth request ranging (L RCs for BW-request ranging). The assigned ranging codes, as described above, are transmitted to subscriber stations through a DL_MAP message, and the subscriber stations perform a ranging procedure by using ranging codes included in the DL_MAP message according to their objects.

Second, the periodic ranging will be described.

The periodic ranging represents ranging periodically performed to adjust a channel status with a base station by a subscriber station that adjusted a time offset with the base station and transmission power through the initial ranging. The subscriber station performs the periodic ranging using ranging codes assigned for the periodic

ranging.

Third, the bandwidth request ranging will be described.

The bandwidth request ranging is ranging used to request bandwidth assignment to actually perform communication with a base station by a subscriber station that adjusted a time offset with the base station and transmission power through the initial ranging.

Meanwhile, the DL_MAP message is periodically broadcasted from a base station to all subscriber stations. When a subscriber station continuously receives the DL_MAP message, it is said that the subscriber station is synchronized with the base station. That is, subscriber stations receiving the DL_MAP message can receive all messages transmitted over a forward link.

When a subscriber station fails to access the base station, the base station transmits a UCD message including information indicating an available backoff value to the subscriber station.

When the ranging is performed, the subscriber station transmits a RNG_REQ message to the base station, and the base station receiving the RNG_REQ message transmits to the subscriber station an RNG_RSP message including information for correcting the above-mentioned frequency, time and transmission power.

As described above, the IEEE 802.16a communication system considers only a state in which a current subscriber station is fixed, i.e., mobility of the subscriber station is not considered, and a single-cell configuration. However, as described above, the IEEE 802.16e communication system is specified as a system that considers mobility of a subscriber station in the IEEE 802.16a communication system. Therefore, the IEEE 802.16e communication system must consider mobility of a subscriber station in a multicell environment. In order to provide mobility of a subscriber station in a multicell environment, modification of operations of the subscriber station and the base station is necessarily needed. In particular, in order to support mobility of the subscriber station, active research is being conducted on handover of the subscriber station considering the multicell environment.

In a broadband wireless mobile communication system, a subscriber station receives preambles transmitted from a plurality of base stations. The subscriber station measures CINRs of the received preambles. The subscriber station selects a base station having the highest CINR among the measured CINRs. That is, the subscriber station selects a base station having the best reception condition among a plurality of base stations transmitting preamble channels, thereby detecting its base station. Herein, a base station having the best reception condition, selected by the subscriber station, is called a "serving base station."

The serving base station transmits a neighbor base station advertisement (MOB_NBR_ADV) message to the subscriber station.

The MOB_NBR_ADV message includes a plurality of IEs, such as Management Message Type representing a type of a transmission message, Configuration Change Count representing the number of changes in configuration, N_NEIGHBORS representing the number of neighbor base stations, Neighbor BS-ID representing an identifiers (ID) of each of the neighbor base stations, Physical Frequency representing a physical channel frequency of the neighbor base station, and TLV Encoded Neighbor Information representing other information related to the neighbor base station. In addition, the MOB_NBR_ADV message includes Hysteresis threshold representing a reference CINR based on which a subscriber station can request handover, and MAHO report period information for periodic scanning report.

A subscriber station receiving the MOB_NBR_ADV message transmits a Scanning Interval Allocation Request (MOB_SCN_REQ) message to the serving base station when the subscriber station desires to scan CINRs of preamble signals transmitted from neighbor base stations. A time at which the subscriber station requests scanning is not directly related to an operation of scanning CINR of the preamble signal, so a detailed description thereof will be omitted.

The MOB_SCN_REQ message includes a plurality of IEs, such as Management Message Type representing a type of a transmission message, and Scan Duration representing scanning duration for which the subscriber station desires to scan CINRs of preamble signals transmitted from the neighbor base stations. The Scan

Duration is formed on a frame basis. The Management Message Type in which the MOB_SCN_REQ message is to be transmitted has not been defined yet (Management Message Type = undefined).

A serving base station receiving the MOB_SCN_REQ message transmits to the subscriber station a MOB_SCN_RSP message including information to be scanned by the subscriber station.

The MOB_SCN_RSP message includes a plurality of IEs, such as Management Message Type representing a type of a transmission message, connection ID (CID) of a subscriber station that transmitted the MOB_SCN_REQ message, and Scan Duration. The Management Message Type in which the MOB_SCN_RSP message is to be transmitted has not been defined yet (Management Message Type = undefined), and the Scan Duration represents duration for which the subscriber station performs pilot CINR scanning.

Upon receiving the MOB_SCN_RSP message including scanning information, a subscriber station scans CINRs for neighbor base stations detected through the MOB_NBR_ADV message according to the scanning information parameters.

In the IEEE 802.16e communication system, in order to support handover, a subscriber station must measure CINRs of preamble signals transmitted from its neighbor base stations and its current base station, i.e., a serving base station, and if CINR of a preamble signal transmitted from the serving base station is lower than CINRs of preamble signals transmitted from the neighbor base stations, the subscriber station sends a handover request to the active base station.

As described above, in a wireless communication system, information is exchanged between a plurality of subscriber stations and base stations. A communication system allowing a plurality of the subscriber stations to randomly access a base station supports at least one reverse common access channel.

That is, when the subscriber station intends to access the base station, the subscriber station initializes an access request in a selected reverse common access channel. In this case, the base station acquires access request information from the

subscriber station by detection in the reverse common access channel.

Due to an access environment provided by a reverse common access channel for media sharing, a subscriber station needs to adopt an appropriate random access method for avoiding or reducing collision between access requests from different subscriber stations.

The random access method is divided into an Additive Links Online Hawaii Area (ALOHA) method for detecting a channel before transmitting packet, and a slot ALOHA method for not performing channel detection before packet transmission.

Generally, the slot ALOHA technology for not detecting access requests from other subscriber stations before packet transmission cannot avoid collision between access requests from different subscriber stations. In such ALOHA technology, if it is determined that an access request from a subscriber station is collided, the access request from the subscriber station is reinitialized. In the re-initialization process, an access request occurring at a time after a backoff calculated and determined by a backoff algorithm is reinitialized.

The ALOHA technology is simple in its design because less inter-system control message requests occur in the system, but collision occurs between access requests from subscriber stations. For this reason, the ALOHA technology is applied to a system in an optical traffic environment where collision between access requests scarcely occurs.

Carrier Sense Multiple Access (CSMA) technology, a different random access method, requires channel detection before packet transmission. The CSMA protocol technology is different from the ALOHA technology in that it needs channel detection before packet transmission. Though the channel detection, the CSMA technology can further reduce collision compared with the ALOHA technology, thereby providing better traffic. However, as the CSMA protocol technology first performs channel detection, message requests increase according thereto, and the increase in message request increases complexity of system design and requires a control technology such as the channel detection, causing an increase in cost.

The ALOHA protocol, a random protocol well known in the communication network field, was originally studied by several researchers in University of Hawaii to connect multiple wireless packet terminals to each other. The ALOHA and slot ALOHA structure-based technology is suitable for an optical traffic environment, and is simple in design because it needs less system information.

The ALOHA technology has been popularly used in a wireless communication system. For example, the ALOHA technology has been applied to the IEEE 802.16a communication system which is a broadband wireless access communication system using a frequency between 2 and 11 GHz.

The IEEE 802.16a technology chiefly aims at providing fixed broadband access technology. The IEEE 802.16a technology provides three operation modes: single carrier, OFDM, and OFDMA modes.

The single carrier and OFDM operation modes initialize access request in a reverse access channel by a message request from a media access control (MAC) layer of a subscriber station. However, the OFDMA operation mode needs pseudo-random code information for performing access request by the subscriber station.

According to the IEEE 802.16a technology, when a subscriber station needs to access a network, the subscriber station performs a network entering procedure that should be performed under mutual cooperation between the subscriber station and the base station in the IEEE 802.16a technology. A brief description of the network entering procedure included in the IEEE 802.16a technology will now be made below.

The subscriber station includes channel assignment information for a reverse channel and a forward channel detected in a forward control channel transmitted from a base station, and performs synchronization with the base station. The subscriber station operates in cooperation with a network that performs an initial ranging procedure. The subscriber station negotiates with a network including such information as system service capacity of the subscriber station, authentication, and a registration step. Further, the subscriber station installs session connection and other operations. The network entering procedure is provided for a subscriber station using a random access method similar to the ALOHA protocol during the initial ranging measurement procedure.

Thereafter, when the subscriber station fails to perform correct access request from the base station due to collision, the subscriber station performs a backoff procedure.

The backoff procedure will be described in detail herein below.

When backoff occurs due to interruption of access request, a backoff time is calculated by a backoff algorithm previously designated on a backoff domain. For the backoff time calculated in this manner, the subscriber station suffers delay. When the backoff time expires, the subscriber station reinitializes information for entering a network through another access request.

Assignment information of the backoff domain is periodically provided by a system for subscriber stations within a common control channel. Commonly, various backoff time assignments and backoff algorithms are provided to enable all users to fairly access a system.

Meanwhile, in a multicell mobile communication system, inevitable mobility of a subscriber station brings about a call discontinuity problem during handover. This provides how to maintain a session when a subscriber station is located in an area where multiple cells overlap each other. Such a problem can be resolved by a hard handover method.

The hard handover procedure will now be described herein below.

A subscriber station first disconnects connection pre-connected to a base station for the hard handover time. Thereafter, the subscriber station accesses again the network system and establishes connection with a newly selected base station within a time period for which it is considered that the subscriber station can receive a service from the system. IEEE 802.16e was extended from IEEE 802.16a in order to support mobility of subscriber stations, and the IEEE 802.16e is so designed as to include IEEE 802.16a technology in order to provide fixed connection to the subscriber stations.

In the IEEE 802.16e, the hard handover method is performed through a method for initializing an access request for selecting a new base station by a subscriber station. In addition, a network entering procedure for maintaining compatibility with IEEE

802.16a is equal to a network entering procedure of IEEE 802.16a. In such a network entering procedure, a subscriber station first acquires channel assignment information for a reverse channel and a forward channel, detected from a forward control channel. Next, the subscriber station enters a corresponding network as it acquires synchronization with a base station.

The subscriber station operates in cooperation with a connection procedure of a newly selected base station. Here, the connection procedure includes performing partial authentication and subscriber station registration, and re-establishing session connection.

A description will now be made of a difference between handover in an initial ranging procedure of a subscriber station and handover requested by a network access procedure.

First, the handover in the network access procedure aims at continuously maintaining a session requesting an access service of a subscriber station, generally determined within a short time period. However, the handover in the initial ranging procedure of a subscriber station aims at making a network the subscriber station first accesses. Accordingly, in some cases, a maximum access delay of the subscriber station is shorter than a handover time for initial ranging of the subscriber station. Therefore, the initial ranging procedure of a subscriber station needs to make a handover time for network access to go in advance of that in the general initial ranging procedure of a subscriber station. However, in terms of a service provided to allow subscriber stations to fairly access a system, aimed by the IEEE 802.16a technology, an access request for averagely performing an access procedure for allowing all subscriber stations to enter the network must be made. In this case, for example, an actual IEEE 802.16a access service method is used in a common access channel disadvantageously. More specifically, a request for faster handover necessary for network access increases an access time for handover, causing the huge amount of collisions between handover access requests and other access requests. As a result, such a request cannot satisfy a fast access request for handover.

Further, in case of IEEE 802.16a having various access service requests for rapidly entering a network requested by the handover, a possible structure for a network entering procedure adopted by IEEE 802.16a provides an access channel assigned for an

access request for handover by the system. However, this method assigns network resource such as bandwidth, causing an unnecessary waste of resource.

In conclusion, a difference between the network entering procedure requested by handover and the initial ranging procedure requested by handover is as follows.

First, the network entering procedure requested by handover establishes connection between a subscriber station and a base station before handover occurs. Next, the subscriber station previously includes system information such as appropriate service capability of the system and a system time.

In order to improve handover efficiency, the network entering procedure requested by handover can disregard or skip several steps predefined in IEEE 802.16a. Moreover, in order to simplify a particular network entering step for handover and provide a fast access service requested by handover, it is necessary to provide a method for defining access request information by the system during handover.

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a method for defining a network access request during a handover time and supporting multilevel access service in a system using a common access channel for performing an access request service.

It is another object of the present invention to provide a method that can be conveniently used by IEEE 802.16e describing a handover request for fast network access using a common access channel.

It is further another object of the present invention to provide a method for supporting a system providing, on an on-demand basis or periodically, assignment information for each access channel corresponding to a multiple backoff domain and common access channel information of a subscriber station, and supporting multilevel access services using a common access channel, in order to avoid collision between an operation of calculating an access request capable of selecting a backoff domain by a subscriber station according to access type and an operation of determining a time for

reinitializing an access request from a corresponding backoff domain, in a system based on ALOHA or slot ALOHA technology.

It is yet another object of the present invention to provide an access service having at least two levels using the above method.

The above and other objects are achieved by providing a method for performing a ranging operation by a subscriber station in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of receiving, from a base station, backoff domains having a backoff start point and a backoff end point for each of rangings, determined according to priority levels of the rangings between the base station and subscriber stations; performing a ranging operation with the base station, and selecting a backoff domain corresponding to a priority level of the performed ranging among the received backoff domains if the ranging fails; and re-performing a ranging operation with the base station according to the selected backoff domain.

The priority level is determined according to a service quality level of data provided to the subscriber stations and whether handover of the subscriber stations is performed.

The step of re-performing a ranging operation with the base station according to the selected backoff domain comprises the step of re-performing a ranging operation with the base station at a particular time between the back start point and the backoff end point for the selected backoff domain.

The backoff domains are determined so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.

The above and other objects are achieved by providing a method for performing handover for an access service on a common access channel in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of: receiving backoff domains having a backoff start point and a backoff end point for each of subscriber stations, when handover between a base station and the subscriber stations

is performed; checking the received backoff domains, and selecting a backoff domain for handover among the backoff domains; and determining a backoff value corresponding to the selected backoff domain, and re-requesting ranging after waiting for the determined backoff value.

The above and other objects are achieved by providing a method for transmitting backoff values used for rangings between a base station and subscriber stations in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of: determining backoff domains having a backoff start point and a backoff end point according to a priority level of each of the rangings, for each of the rangings; and transmitting the backoff domains determined for each of the rangings to the subscriber stations.

The step of determining backoff domains according to a priority level of each of the rangings comprises the step of determining the backoff domains so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.

The above and other objects are achieved by providing a method for performing a ranging operation in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of: periodically receiving by a subscriber station a broadcasting message and uplink channel information (UL-MAP) from a base station by detecting on a common control channel; randomly selecting an access channel to be accessed through the uplink channel information, and then transmitting a ranging request message for an access in the selected access channel; comparing the number of retransmissions of the request message with a predefined value, if reception of a response message from the base station exceeds a response waiting time; comparing the number of retransmissions with an allowable access processing time if the number of retransmissions is smaller than the predefined value; selecting a backoff domain according to a priority level of a service level if the number of retransmissions does not exceed the allowable access processing time; and selecting a backoff value and calculating a backoff time from the selected backoff domain, and re-transmitting a ranging request message in the access channel if the calculated backoff time has passed.

The above and other objects are achieved by providing a handover apparatus for providing an access service on a common access channel in a mobile communication system, the apparatus comprising a subscriber station that requests ranging as it enters a network for handover; and a base station that transmits handover information to the subscriber station; wherein when the subscriber station requests ranging as it enters the network for handover, the subscriber station receives backoff start information and backoff end information from the base station and determines a backoff value for handover according to the received backoff start information and backoff end information.

The subscriber station re-requests ranging to the base station after waiting for the determined backoff value when the ranging fails.

The above and other objects are achieved by providing an apparatus for performing a ranging operation in a mobile communication system using a broadband wireless access scheme, the apparatus comprising a subscriber station for receiving and selecting, from a base station, backoff domains having a backoff start point and a backoff end point for each of rangings determined according to a priority level. If the subscriber station fails to perform ranging, the subscriber station selects a backoff domain corresponding to a priority level of the ranging among the received backoff domains and re-performs a ranging operation with the base station according to the selected backoff domain.

The above and other objects are achieved by providing an apparatus for performing an apparatus for transmitting backoff values used for rangings of subscriber stations in a mobile communication system using a broadband wireless access scheme, the apparatus comprising a base station for determining backoff domains having a backoff start point and a backoff end point according to a priority level of each of rangings, for each of the rangings, and transmitting the backoff domains determined for each of the rangings to the subscriber stations.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagram illustrating a configuration of a general IEEE 802.16e communication system;

FIG. 2 is a diagram illustrating a method for assigning forward and reverse channels according to an embodiment of the present invention;

FIG. 3 is a diagram illustrating frame control information and a channel mapping method for TDD according to an embodiment of the present invention;

FIG. 4 is a diagram illustrating frame control information and a channel mapping method for FDD according to an embodiment of the present invention;

FIG. 5 is a diagram illustrating a multiple backoff domain individually corresponding to each access channel and two mapping formats of a multiple access channel according to an embodiment of the present invention;

FIG. 6 is a diagram illustrating a format of an access request message used for handover according to an embodiment of the present invention;

FIG. 7 is a diagram illustrating a procedure for processing ranging when hard handover occurs according to an embodiment of the present invention; and

FIG. 8 is a diagram illustrating an access request procedure by a subscriber station according to an embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

A preferred embodiment of the present invention will now be described in detail with reference to the annexed drawings. In the following description, a detailed description of known functions and configurations incorporated herein has been omitted for conciseness.

Before a detailed description of the present invention is given, it should be noted that a base station performs broadcasting though a UCD message so that it can adjust a backoff value which is a waiting time until the next re-request, when subscriber stations fail to request ranging. For example, when a subscriber station fails to request ranging during handover, the subscriber station is allowed to select a backoff time of a previous time having a higher priority level, thereby enabling fast handover.

The present invention provides a method for defining a network access request for handover and providing a multilevel access service in a system using a common access service for performing an access service. This can be conveniently used by IEEE 802.16e technology that supplements a request for a fast network access service required by handover using a common access channel.

With reference to FIG. 2, a description will now be made of a method for assigning forward and reverse channels according to an embodiment of the present invention.

FIG. 2 is a diagram illustrating a method for assigning forward and reverse channels according to an embodiment of the present invention.

In a wireless communication system such as a broadband wireless access system defined by IEEE 802.16e technology, mutual information between a subscriber station and a base station is transmitted over a multiple logical channel. According to a transmission direction of data information, the logical channel can be divided into a forward channel transmitted from a base station to a subscriber station, and a reverse channel transmitted from a subscriber station to a base station.

Referring to FIG. 2, a forward channel between a subscriber station (SS) 12 and a base station (BS) 11 includes a forward pilot channel (F-PCH), a forward common control channel (F-CCH), and a forward traffic channel (F-TrCH).

The forward pilot channel is used for synchronization between the subscriber station 12 and the base station 11. The forward common control channel is used for transmitting common control information and a network parameter transmitted from the base station 11 to the subscriber station 12. The common control information includes channel assignment information for reverse and forward channels. Finally, the forward traffic channel is used for transmitting forward traffic information transmitted from the base station 11 to the subscriber station 12.

Next, a reverse channel between the base station 11 and the subscriber station 12 includes a reverse access channel (R_ACH) and a reverse traffic channel (R-TrCH).

The reverse access channel is used for an access service of the subscriber station 12, and the reverse traffic channel is used for transmitting reverse traffic information transmitted from the subscriber station 12 to the base station 11.

When a subscriber station intends to access a system in a wireless environment,

the subscriber station should trace information from a forward pilot channel and complete a synchronization process with a base station on a downlink, which can be performed by capturing. The subscriber station also needs a process of acquiring common control information and a network parameter transmitted over a forward common control channel. The common control information includes channel assignment information for reverse and forward channels as well as parameter information related to each channel, and the subscriber station can initialize an access request in a selected access channel based on the information.

With reference to FIG. 3, a description will now be made of frame formats of a downlink transmission signal and an uplink transmission signal in a time domain.

FIG. 3 is a diagram illustrating frame control information and a channel mapping method according to an embodiment of the present invention. Specifically, FIG. 3A is a diagram illustrating frame control information for a TDD mode and a channel mapping method according to a first embodiment of the present invention, and FIG. 3B is a diagram illustrating frame control information for the TDD mode and a channel mapping method according to a second embodiment of the present invention.

Referring to FIG. 3, frame control information 22 for a TDD mode is transmitted from a subscriber station 11 to a subscriber station over a forward control channel including mapping information of a downlink channel and an uplink channel. The downlink channel information, as shown in FIGs. 2A and 2B, reflects an assignment position of a downlink subframe 24 on a downlink channel. The uplink channel information reflects an assignment position of an uplink subframe 26 on an uplink channel.

Because it takes a certain time in defining assignment information of the uplink frame 26 on an uplink channel from a base station that starts transmitting the uplink information before transmitting the assignment information to the subscriber station, a system is needed in which a transmission time interval of a particular frame is longer than two times the maximum transmission delay of a signal transmitted from the base station to the subscriber station. In FIG. 3A, uplink channel information of a particular frame includes an assignment position of the same frame after a time period on an uplink channel.

FIG. 4 is a diagram illustrating frame control information and a channel mapping method according to an embodiment of the present invention. Specifically, FIG. 4A is a diagram illustrating frame control information for an FDD mode and a channel mapping method according to a first embodiment of the present invention, and FIG. 4B is a diagram illustrating frame control information for the FDD mode and a channel mapping method according to a second embodiment of the present invention.

Referring to FIG. 4, the FDD mode described below has a similar operation to that of the TDD mode of FIG. 4. That is, frame control information 32 can be transmitted from a base station 11 to a subscriber station 12 over a forward control channel for the FDD mode. The frame control information 32 includes mapping information for a downlink channel and an uplink channel. Further, the downlink channel information reflects an assignment position of a downlink subframe 34 on a downlink channel, and the uplink channel information reflects an assignment position of an uplink subframe 36 on an uplink channel.

In FIG. 4A, particular uplink channel information includes an assignment position of the same frame after a time period on an uplink channel. In addition, a base station receiving uplink or downlink broadcasting help can transmit parameter information on at least one channel defined for an access request of a subscriber station.

Meanwhile, it is necessary to invent a system for notifying multiple backoff domain assignment on an access channel to a subscriber station having separation information of a common access channel as well as information on a multiple backoff domain corresponding to each access channel.

A process of assigning a multiple backoff domain on an access channel will be described below with reference to FIG. 5.

FIG. 5 is a diagram illustrating a multiple backoff domain individually corresponding to each access channel and two mapping formats of a multiple access channel according to an embodiment of the present invention. Specifically, FIG. 5A is a diagram illustrating an example of a mapping format of an uplink access channel for providing a multiple backoff domain, and FIG. 5B is a diagram illustrating another

example of a mapping format of an uplink access channel for providing a multiple backoff domain.

As illustrated in FIG. 5, an uplink reverse access channel (UL-RACH-MAP) 400 represents other combined downlink broadcasting information or a parameter corresponding to an access channel on an uplink channel. A format of the uplink reverse access channel 400 represents positions of M backoff domains and N uplink access channels corresponding to each uplink access channel.

Referring to FIG. 5A, a parameter corresponding to each uplink access channel includes at least one uplink channel ID and backoff start values and backoff end values of M backoff domains. A parameter corresponding to an uplink (reverse) access channel having an ID#1 includes not only an uplink channel ID#1 4102, but also parameters defining M backoff domains.

The parameters of the M backoff domains are as follows.

That is, the parameters include parameters defining a first backoff domain, such as a backoff end value #1 4106 and a backoff start value #1 4104 of the first backoff domain, among values for an M^{th} backoff domain, such as a sequential backoff start value #M 4108 and a backoff end value #M 4110 of the M^{th} backoff domain.

The format of the uplink reverse access channel 400 also needs to represent assignment positions of parameters for other (N-1) uplink channels. An assignment format of parameters for each access channel is similar to that of an access channel having the ID#1. For example, an assignment format for N access channels includes different parameter fields 4114 to 4120 of M backoff domains, and an N^{th} access channel's ID (uplink channel ID#N) 4112.

A brief description will now be made of the handover ranging start value and the handover ranging end value.

That is, the handover ranging start value and the handover ranging end value include HO_ranging_start representing a start point of backoff using initial ranging, i.e., representing an initial backoff window size for initial ranging performed on a subscriber station during a handover processing time, and HO_ranging_end representing a final

backoff window size for initial ranging performed on the subscriber station during the handover processing time. The highest order bits of the HO_ranging_start should not be used, and their value is set to '0'. Also, the highest order bits of the HO_ranging_end should not be used, and their value is also set to '0'. The backoff value represents a kind of a waiting time value for which subscriber stations should wait when they fail to request ranging. At this moment, the base station transmits to the subscriber station the backoff value which is time information for which the subscriber station should wait for the next ranging when it fails to perform ranging.

Next, referring to FIG. 5B, parameters corresponding to each uplink channel include not only at least one uplink channel ID but also a backoff start value #1 of a first backoff domain and a backoff end value of every backoff domain corresponding to each uplink access channel ID.

Parameters corresponding to the uplink (reverse) access channel having an ID#1 include not only parameters defining M backoff domains but also an uplink channel ID#1 4202.

The parameters of the M backoff domains are as follows.

The M backoff domains include parameters that define a first backoff domain having a backoff end value #1 4206 and a backoff start value #1 4204 of an individual first backoff domain.

A start value of a second backoff domain can be obtained from an end value #1 of a backoff domain for the first backoff domain. Accordingly, end values of respective backoff domains need declaration from a backoff end value #2 4208 to a backoff end value #M 4210.

Meanwhile, in a format of the uplink reverse access channel 400, an assignment format for parameters of other (N-1) access channels is similar to that of parameters for an access channel having an ID#1. For example, N access channels have an uplink channel ID#N of an N^{th} access channel, and include parameter fields 4214 to 4220 for M backoff domains.

A description will now be made of a backoff algorithm for multilevel access services.

The multilevel backoff algorithm is used for providing multilevel access services on a common access channel, and the multilevel backoff algorithm includes a backoff algorithm on the ALOHA technology. That is, the multilevel backoff algorithm selects a backoff value on a domain selected by including the backoff algorithm of the ALOHA technology and selects a backoff domain according to an access type. An exponential backoff algorithm is popularly used in the ALOHA technology. Such an algorithm is used in, for example, IEEE 802.16a.

The multilevel backoff algorithm will be described with reference to a 2-level backoff domain.

A subscriber station 12 acquires information on a reverse access channel related to assignment information of a 2-level backoff domain on an access channel corresponding to assignment information of the 2-level backoff domain by detection in a forward common control channel. Such a 2-level backoff domain is defined as $[0,\beta]$ and $[\beta+1,\gamma]$ of M having two values of two backoff domains corresponding to a particular access channel, in the format of the uplink reverse access channel 400. Both of the γ ($\gamma>\beta$) and the β have a positive integer value. Such an access channel provides two types of access services including a common access service and a fast access service. Such two types of access services are provided by two selected domains $[0,2^{\beta}]$ and $[2^{\beta}+1,2^{\gamma}]$ that use a binary exponential backoff algorithm. For example, when a subscriber station needs a common access service, a backoff domain time is randomly selected from the second backoff domain $[2^{\beta}+1,2^{\gamma}]$. In addition, when the subscriber station needs a fast access service, a backoff time is randomly selected from the first backoff domain $[0,2^{\beta}]$.

Values of the γ and the β are selectively determined according to the number of subscriber stations and service execution. That is, the selection of γ and β should satisfy execution requests related to a fast access service, such as a collision rate between access requests and a parameter of an allowable access time. In addition, the selection of γ and β should consider a collision rate between fast access requests and common access requests and parameters for an allowable access time of the common access service. Commonly, it is guaranteed that the fast access service has a shorter access service time than the common access service.

Meanwhile, the multilevel backoff algorithm proposed in the present invention can be easily extended even when the M is larger than 2. That is, compared with a general exponential backoff algorithm, the multilevel backoff algorithm is advantageous in that it is easy to separate different types of access services and easy to relieve collision of access requests between a 2-level access service provided on a common access channel by separation of a backoff domain and other types of access services. Furthermore, compared with a method for providing a common access channel for another type of an access request, the multilevel backoff algorithm can save network resource and bandwidth. The multilevel backoff algorithm can be easily developed in IEEE 802.16e in order to satisfy requests that provide a fast access for hard handover using a common access channel.

A description will now be made of a method for defining a network access request for handover on a common access channel and providing a multilevel access service.

A subscriber station can obtain access information corresponding to each access channel by detecting other uplink broadcasting information and an uplink channel. In using common access channel for accessing a communication system and receiving a service, the subscriber station can initialize an access request to a selected base station on a common access channel. During a period for which a multilevel access service is provided on the common access channel, a communication system needs to cooperate with the subscriber station. Accordingly, the communication system can effectively provide a service corresponding to a request of the subscriber station and define an access request of the subscriber station.

A method for providing a multilevel access service on a common access channel will now be described together with an example of IEEE 802.16e.

The multilevel service includes processing a common access request initial value and handover. When the common access request initial value is considered, an access request for handover can be obtained by simplifying a network entering service.

In the method for providing a multilevel access service on a common access

channel, a subscriber station first performs an operation of detecting an uplink broadcasting message.

That is, in order to provide a multilevel access service on a common access channel, a base station broadcasts, periodically or on an on-demand basis, channel assignment information of cells, including mapping information of a multiple backoff domain on an uplink reverse access channel corresponding to the request of a subscriber station and assignment information of an uplink channel. After completing synchronization with the base station on a downlink, the subscriber station acquires parameter information of an access channel by detecting other downlink broadcasting information or an uplink channel.

Next, the subscriber station performs transmission request initialization.

That is, the subscriber station can initialize an access request of a base station selected on a selected uplink access channel. In order to provide handover on a common access channel, compatibility with IEEE 802.16a, and a different type of an access service including an access initial value, the subscriber station adopts the above-stated multilevel backoff algorithm, and determines and calculates a backoff time of a selected backoff domain. Such a method is used for providing a service having at least two levels and easily relieving collision between types of different access requests.

For handover of a subscriber station on the common access channel, an access request message is required. For a system used in defining such an access request message, an IEEE 802.16a access request message such as RNG-REQ can be continuously used as an original access initial value of the subscriber station in order to provide another access service for another type of an access request, together with an example of an IEEE 802.16e specification. The access request message for handover can be an access request message using previously assigned pseudo-random code information, adding a field for defining a handover request on an initial RNG-REQ access request message, or having a handover request ID.

The type of the access request message will be described herein below.

The access request message includes an access request message type of a MAC layer. That is, an access request message for handover is an access request message

including a field for defining a handover request, or can add a field for defining a handover request on an initial access request message RNG_REQ. For an OFDM operation mode or a single carrier on IEEE 802.16e, an access request for handover can use a previously assigned access request message. A format of the previously assigned access request message for handover will be described below with reference to FIG. 6.

FIG. 6 is a diagram illustrating a format of an access request message used for handover according to an embodiment of the present invention.

Referring to FIG. 6, a format of an access request message (REN-REQ-HO) 500 previously assigned for handover is illustrated. The previously assigned access request message includes a handover access request type ID 504 and a used uplink access channel ID 502. The access request message for handover can be implemented by adding the handover request type ID 504 to an initial RNG-REQ access request message.

A pseudo-random code-based access request process for handover will be described below.

In a common access channel, a subscriber station can initialize a network access request message for handover by a pseudo-random code. The initialization process will be described below.

First, the pseudo-random code is generated.

Such a pseudo-random code is defined as one of three types of pseudo-random codes previously used by a request of a subscriber station in an OFDM scheme defined in IEEE 802.16a, and the three types include a network service for initial ranging, periodic ranging, and an individual bandwidth.

The three types of pseudo-random codes are generated from a generator polynomial of Equation (1), and have a long pseudo-random code type output value.

$$1 + X^1 + X^4 + X^7 + X^{15} \quad \ldots\ldots\ldots (1)$$

A pseudo-random code used in the three types, i.e., initial ranging, periodic

ranging and bandwidth request ranging, has an output value of a long pseudo-noise code, but a clock generated at each pseudo-random code has a different value. In case of default, a size of each pseudo-random code is 106 bits.

In order to simplify a network entering procedure requested by a system managing hard handover, an IEEE 802.16e OFDMA scheme uses a system defining a network access request for hard handover. For such a system, an access request message for hard handover defined by a pseudo-random code can be used. In addition, for compatibility with IEEE 802.16a and convenient system design, an H pseudo-random code is required by an access request for handover. Although generation of the H pseudo-random code has a result value of a long pseudo-random code, selection of a clock can have a different result value from the three types of pseudo-random codes.

A method for generating H pseudo-random codes requested by an access request for handover will now be described below.

An output value of a long pseudo-noise code occurring at an output of the generator polynomial of Equation (1), i.e., first N codes, are used for initial ranging, and 0^{th} to $(106*N-1)^{th}$ clocks are selected.

Next, M codes are used for periodic ranging, and $(106*N)^{th}$ to $(106*(N+M)-1)^{th}$ clocks are selected.

Next, L codes are used for bandwidth request ranging, and $(106*(N+M))^{th}$ to $(106*(N+M+L)-1)^{th}$ clocks are selected.

Finally, H codes are used for an access request for hard handover, and $(106*(N+M+L)^{th}$ to $(106*(N+M+L+H)-1)^{th}$ clocks are selected.

The first N codes can be used for an access request for hard handover, the M codes can be used for initial ranging, the L codes can be used for periodic ranging, and the H codes can be used for bandwidth request ranging. In addition, each of the above codes can be arranged in several types.

A process of assigning the pseudo-random codes will be described herein below.

In order to make a system for defining an access request for hard handover, the H pseudo-random codes generated by a system can be generally assigned to each cell. Such a method for generating the H pseudo-random codes is equal to the method described above. When a particular subscriber station performs hard handover, pseudo-noise codes assigned by a base station newly selected for a fast access service are randomly used in each cell. Such an assignment method is simple in structure, and mutual messages exchanged between the subscriber station and the system are small in number, but its characteristic is poor in terms of mobility. Thus, this method is not suitable for irregularly distributed subscriber stations.

A system according to another embodiment of the present invention can dynamically assign H pseudo-random codes of cells at a request of the cells. Each cell sends, periodically or on an on-demand basis, identifiers or different signs on a forward common access channel. By detection on a common access channel, a subscriber station can acquire information on pseudo-noise codes assigned to a cell in a position of a newly selected base station. In this manner, it can be applied even to an environment where distribution of subscriber stations suffers irregular change. For example, a system can assign more pseudo-random codes to the cells having excessive handover traffic. Disadvantageously, however, the system must transmit assignment information of the pseudo-random codes periodically or on an on-demand basis.

A description will now be made of a MAC layer response message for an access request.

After correctly receiving an access request from a subscriber station, a base station assigns a unique connection identifier (CID) for the access request from the subscriber station. The base station handles the access request from the subscriber station by a handshake method. After receiving an RNG-REQ-HO or RNG-REQ access request message from the subscriber station, the base station checks a system capable of providing a service for initializing an access request by a subscriber station. When the system check is completed, the base station transmits an RNG-RSP access request response message to the subscriber station. Accordingly, the subscriber station includes information on the unique connection identifier CID set up for the access request.

A description will now be made of a method for providing a multilevel access service in a common access channel according to an embodiment of the present invention.

In IEEE 802.16e, when handover occurs, a subscriber station can initialize an access request of a newly selected base station. For compatibility with IEEE 802.16a, an access procedure of the subscriber station can maintain an IEEE 802.16a network entering procedure. An IEEE 802.16e network entering procedure, compared with the IEEE 802.16a network entering procedure, is advantageous in that a network entering procedure of a subscriber station for hard handover can be simply performed with several processes of exchanging information such as time and service capacity of the system.

The access procedure of a subscriber station for handover will be described herein below.

In the access procedure of a subscriber station for handover, the subscriber station first performs synchronization with the base station through detecting and tracing in a forward channel. Thereafter, the subscriber station acquires forward and reverse channel assignment information. In this case, the subscriber station operates in cooperation with a base station newly selected to perform access processing. Such an access procedure includes performing partial authentication and registration step of the subscriber station, and re-establishing session connection.

A ranging procedure including the occurrence of handover will now be described with reference to FIG. 7.

FIG. 7 is a diagram illustrating a procedure for processing ranging when hard handover occurs according to an embodiment of the present invention. Specifically, FIG. 7A is a diagram illustrating a ranging procedure when IEEE 802.16e hard handover occurs, and FIG. 7B is a diagram illustrating a ranging procedure when OFDMA hard handover occurs. It can be understood herein that when hard handover occurs, the ranging procedure is easily compatible with an IEEE 802.16a initial ranging procedure.

Referring to FIG. 7A, at a time t0, a base station 11 broadcasts an uplink

channel message of a cell on a common access request channel periodically or on an on-demand basis.

At a time t1, a particular subscriber station on the cell receives the uplink channel message. The uplink channel message includes related parameters representing an uplink reverse access channel as an access channel for M=2 shown in FIG. 4. In this way, the particular subscriber station selects an access channel.

At a time t2, the particular subscriber station initializes an RNG_REQ or RNG-REQ-HO access request to the base station on the selected access channel.

At a time t3, it is assumed that the base station receives an access request message. However, collisions occurring due to access request messages from other subscriber stations during the time t3 may cause a loss of the access request messages. If the subscriber station fails to correctly receive an access request response message corresponding to the access request of the particular subscriber station from the base station after waiting for several time periods, it is determined that the access request fails. Then the subscriber station selects a corresponding backoff domain according to an access service type. For example, this selects a first backoff domain for handover and selects a second backoff domain for a common access request, and each subscriber station can calculate a backoff time with a multilevel backoff algorithm for a time t2 at a time t4.

At the time t4, it is assumed that the subscriber station initializes an RNG-REQ or RNG-REQ-HO access request message.

At a time t5, the base station correctly receives the RNG-REQ or RNG-REQ-HO access request message form the subscriber station. The base station assigns an identifier for the access request and sends an access response message.

At a time t6, the response message includes ID information for the subscriber station, including several signs for response.

At a time t7, if the subscriber station has correctly received the RNG-RSP response message from the base station, the subscriber station initializes the RNG-REQ or RNG-REQ-HO access request message.

At a time t8, the base station should be informed that the subscriber station has correctly received transmission-related information from the base station. Accordingly, the subscriber station complies with a subscriber's request and transmits an identifier assigned by the base station.

At a time t9, while the base station receives the RNG-REQ or RNG-REQ-HO access request message from the subscriber station, it is determined whether the subscriber station has correctly received the response and the system continuously performs the next step.

Referring to FIG. 7B, a ranging procedure supporting occurrence of hard handover for an OFDMA mode in IEEE 802.16, proposed by the present invention, is illustrated. FIG. 8B is different from FIG. 7A in that an access request is completed by pseudo-random codes for ranging. In order to use a system for defining an access request for hard handover on a common access channel and simplify a network entering procedure at occurrence of hard handover, a subscriber station selects a previously assigned pseudo-random code to complete an access request on the common access channel. A cell assignment method and a pseudo-random code generation method are equal to the methods described above.

A procedure for implementing the ranging process by the subscriber station will be described herein below.

FIG. 8 is a diagram illustrating an access request procedure by a subscriber station according to an embodiment of the present invention.

Referring to FIG. 8, a subscriber station periodically receives a broadcasting message from a base station on a common control channel by detection (702). If reception of the broadcasting message is not achieved for a time t1 (704), the subscriber station detects an error and performs re-initialization (706). The t1 means a maximum time required for receiving the broadcasting message.

Meanwhile, if the subscriber station normally receives a broadcasting message from the base station and receives uplink channel information UL-MAP within the time

t1 (708), the subscriber station acquires assignment information of an access channel group from the received uplink channel information. The subscriber station randomly selects an access channel from the access channel group and transmits an access request message RNG-REQ-HO or RNG-REQ in the selected access channel (712). A format of the RNG-REQ-HO has been described with reference to FIG. 5. After transmitting the access request message, the subscriber station waits for a response message RNG-RSP from the base station (714).

If a time for which the subscriber station waits a response message RNG-RSP from the base station exceeds t2 (716), the subscriber station compares the number of retransmissions with a predefined value (718). The t2 represents a maximum time for which the subscriber station waits a response.

If the number of retransmissions is larger than the predefined value as a result of the comparison between the time for which the subscriber station waits a response message from the base station and the time t2, the subscriber station performs error indication and error processing (720). If the number of retransmissions is smaller than the predefined value as a result of the comparison, the subscriber station compares the number of retransmissions with an allowable access processing time (722). If the number of retransmissions exceeds the allowable access processing time, the subscriber station proceeds to step 720 and performs error processing (720). If the number of retransmissions does not exceed the allowable access processing time, the subscriber station selects a backoff domain according to a priority level of the service (724).

The priority level is selected at a start point and an end point of the backoff. For example, when hard handover occurs, the subscriber station selects a backoff domain according to a priority level of the hard handover.

After step 724, the subscriber station selects a backoff value from a backoff domain selected by a multilevel backoff algorithm (726). When the selection of a backoff value is completed, the subscriber station waits for a calculated backoff time (728). When the backoff time expires, the subscriber station retransmits an RNG-REQ-HO or RNG-REQ message at the access channel described above (730), and then proceeds to step 714 where it waits for a next response message RNG-RSP.

However, if the subscriber station receives a response message RNG-RSP from the base station for the response message reception waiting time t2 in step 714, the subscriber station adjusts local parameters according to the response message RNG-RSP (732). Subsequently, the subscriber station determines whether the local parameters were correctly adjusted (734). When the adjusted parameters are not normal, the subscriber station performs error processing (740). However, when the adjusted parameters are normal, the subscriber station retransmits an access request message RNG-REQ-HO or RNG-REQ on the selected access channel (736). Thereafter, the subscriber station proceeds to a next step and performs a next process (738).

The RNG-REQ or RNG-REQ-HO message includes an identifier of a base station, assigned for the access request, and the access request means a base station where the subscriber station successfully receives related information transmitted by the base station.

While the invention has been shown and described with reference to a certain preferred embodiment thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

EFFECTS OF THE INVENTION

According to the new method for providing multilevel access services in a common access channel, when subscriber stations fail ranging request, a backoff value representing a waiting time until a next re-request can be adjusted. That is, when ranging request fails during handover, a preceding backoff time having a high priority level is selected thereby enabling fast handover.

In addition, the present invention proposes a structure for defining a network access request for handover by using a common access channel to perform a multiple access request service, thereby reducing collisions occurring in a wireless communication system and saving network resource such as a bandwidth.

Further, the present invention can provide a fast access service for a subscriber station, being capable of contradicting a request for the fast access service by hard

handover and simplifying a network entering procedure requested by a handover process.

Moreover, a system compatible with IEEE 802.16a technology is simply designed through a method for generating pseudo-random codes using the same polynomial generator, and a method for assigning binary pseudo-random codes is easy to design a system for defining an access request for hard handover.

WHAT IS CLAIMED IS:

1. A method for performing a ranging operation by a subscriber station in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of:

receiving, from a base station, backoff domains having a backoff start point and a backoff end point for each of rangings, determined according to priority levels of the rangings between the base station and subscriber stations;

performing a ranging operation with the base station, and selecting a backoff domain corresponding to a priority level of the performed ranging among the received backoff domains if the ranging fails; and

re-performing a ranging operation with the base station according to the selected backoff domain.

2. The method of claim 1, wherein the priority level is determined according to a service quality level of data provided to the subscriber stations and whether handover of the subscriber stations is performed.

3. The method of claim 1, wherein the step of re-performing a ranging operation with the base station according to the selected backoff domain comprises the step of re-performing a ranging operation with the base station at a particular time between the back start point and the backoff end point for the selected backoff domain.

4. The method of claim 1, wherein the backoff domains are determined so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.

5. A method for performing handover for an access service on a common access channel in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of:

receiving backoff domains having a backoff start point and a backoff end point for each of subscriber stations, when handover between a base station and the subscriber stations is performed;

checking the received backoff domains, and selecting a backoff domain for handover among the backoff domains; and

determining a backoff value corresponding to the selected backoff domain, and re-requesting ranging after waiting for the determined backoff value.

6. A method for transmitting backoff values used for rangings between a base station and subscriber stations in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of:

determining backoff domains having a backoff start point and a backoff end point according to a priority level of each of the rangings, for each of the rangings; and

transmitting the backoff domains determined for each of the rangings to the subscriber stations.

7. The method of claim 6, wherein the priority level is determined according to a service quality level of data provided to the subscriber stations and whether handover of the subscriber stations is performed.

8. The method of claim 6, wherein the step of determining backoff domains according to a priority level of each of the rangings comprises the step of determining the backoff domains so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.

9. A method for performing a ranging operation in a mobile communication system using a broadband wireless access scheme, the method comprising the steps of:

periodically receiving by a subscriber station a broadcasting message and uplink channel information (UL-MAP) from a base station by detecting on a common control channel;

randomly selecting an access channel to be accessed through the uplink channel information, and then transmitting a ranging request message for an access in the selected access channel;

comparing the number of retransmissions of the request message with a predefined value, if reception of a response message from the base station exceeds a

response waiting time;

comparing the number of retransmissions with an allowable access processing time if the number of retransmissions is smaller than the predefined value;

selecting a backoff domain according to a priority level of a service level if the number of retransmissions does not exceed the allowable access processing time; and

selecting a backoff value and calculating a backoff time from the selected backoff domain, and re-transmitting a ranging request message in the access channel if the calculated backoff time has passed.

10. The method of claim 9, wherein the priority is determined according to a service quality level of data provided to the subscriber stations and whether handover of the subscriber stations is performed.

11. The method of claim 9, wherein the step of re-performing a ranging operation with the base station according to the selected backoff domain comprises the step of re-performing a ranging operation with the base station at a particular time between the back start point and the backoff end point for the selected backoff domain.

12. The method of claim 9, wherein the backoff domains are determined so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.

13. The method of claim 9, further comprising the steps of:

adjusting by the subscriber station a local parameter according to a response message, if the response message is received from the base station for the response message reception waiting time;

determining whether the adjusted parameter is normal, and performing error processing if the adjusted parameter is abnormal; and

re-transmitting an access request message on the selected access channel if the adjusted parameter is normal.

14. A handover method for requesting ranging when a subscriber station enters a network for handover in a mobile communication system, the method

comprising the steps of:

upon receiving the request, transmitting by a base station backoff start information and backoff end information for handover; and

determining a backoff value for handover according to the backoff start and end information by a subscriber station that received the backoff start and end information.

15. The method of claim 14, further comprising the step of re-requesting ranging after waiting for a predetermined backoff value, if ranging fails when the subscriber station enters a network for handover.

16. A method for performing handover on a common access channel in a mobile communication system, the method comprising the steps of:

broadcasting, by a base station, information to cells over a forward common control channel periodically or an on-demand basis;

wherein the broadcasting step comprises the steps of:

broadcasting channel assignment information for an access channel corresponding to the common access channel to the cells periodically or an on-demand basis; and

broadcasting separation information of at least two backoff domains in at least one common access channel to the cells periodically or an on-demand basis.

17. The method of claim 16, wherein the broadcasting step comprises the steps of:

receiving an access request message of the subscriber station;

determining whether the base station is a system capable of providing a corresponding access service for the subscriber station; and

transmitting an access request response message including a connection identifier (CID) authenticated by a system that transmits the access request from the subscriber station.

18. The method of claim 17, wherein the subscriber station corrects channel assignment information related to a received common access channel and assignment information of at least two backoff domains on at least one common access channel, and then performs access request on a common access channel.

19. The method of claim 18, wherein the step of performing access request comprises the steps of:

selecting a backoff domain according to an access type; and

calculating a time for re-transmitting an access request through an exponential backoff algorithm corresponding to the backoff domain.

20. The method of claim 18, wherein the subscriber station acquires information on pseudo-random codes assigned to the cells where a base station newly selected by detecting on the common access channel is located.

21. The method of claim 18, wherein after the base station correctly receives assignment information of a common access channel and assignment information of at least two backoff domains for at least one common access channel known to cells in service, if the subscriber station initializes an access request, a backoff value in a backoff domain corresponding to a backoff algorithm for determining a time for re-initializing an access request in a selected common access channel is randomly selected in a wireless network system,

22. The method of claim 17, wherein the access request message of the subscriber station includes:

an initialized access request message requested to the base station by the subscriber station for a handover processing time;

a network access request message for a field indicating a handover request type including handover; and

an access request response message transmitted to the subscriber station by the base station after normally receiving an access request message from the subscriber station and determining whether the base station can provide a corresponding access service for the subscriber station.

23. The method of claim 22, wherein the network access request message for handover is acquired by adding a field defining a handover request type to an initial access request message.

24. The method of claim 22, wherein the network access request message for handover is an access request message using information on previously assigned

pseudo-random codes.

25. The method of claim 22, wherein the access request response message is a message transmitting a particular connection identifier (CID) authenticated by an access request of the system.

26. The method of claim 22, wherein when the subscriber station initializes the access request message of the base station, the network access request message for handover is acquired by adding fields defining a developed uplink access channel and fields defining a handover request type of an initial access request message (RNG-REQ).

27. The method of claim 22, wherein the method of generating and assigning pseudo-random codes used by a system for defining a network access request for a handover time comprises the sep of acquiring a partial sequence of a long pseudo-noise code based on a result value of a ranging code generator as pseudo-random codes used by the system for defining a network access request for hard handover.

28. The method of claim 27, wherein the sep of acquiring a partial sequence of a long pseudo-noise code based on a result value of a ranging code generator as pseudo-random codes used by the system for defining a network access request for hard handover comprises any one of the steps of:

assigning pseudo-random codes used by the system defining the network access request for hard handover to each cell by the system; and

dynamically assigning pseudo-random codes used by the system defining the network access request for hard handover to each of the cells according to a request of each of the cells.

29. The method of claim 28, wherein the pseudo-random codes used by the system defining a network access request for hard handover are formed by a partial sequence of a long code.

30. The method of claim 29, wherein the long code is formed by a result of a polynomial generator of $1+X^1+X^4+X^7+X^{15}$ for a ranging code.

31. The method of claim 27, wherein H pseudo-random codes required according to the access request for handover are generated with a partial sequence of long pseudo-noise codes which are a result of a polynomial generator of $1+X^1+X^4+X^7+X^{15}$ for a ranging code under an OFDMA operation mode.

32. The method of claim 31, wherein codes formed by clocks of the H pseudo-random codes do not interwork with codes formed by the clocks of the pseudo-random codes.

33. The method of claim 31, wherein sets formed by the partial sequence of long pseudo-noise codes include:

a set A having N codes at a start point, a set B having M codes following the N codes, a set C having L codes following the M codes, and a set D having H codes following the L codes;

wherein pseudo-random codes used for initial ranging, periodic ranging and bandwidth request ranging, and access request functions for hard handover constitute an individual set for pseudo-random codes, and are used to individually select one set.

34. The method of claim 33, wherein a start of the N codes corresponding to the set A previously output from the long code is used for initial ranging and has one of 0^{th} to $(106*N-1)^{th}$ clocks according to a result of a generation equation;

wherein the M codes in the set B following the N codes are used for periodic ranging and $(106*N)^{th}$ to $(106*(N+M)-1)^{th}$ clocks are selected;

wherein the L codes in the set C following the M codes are used for bandwidth request ranging and $(106*(N+M))^{th}$ to $(106*(N+M+L)-1)^{th}$ clocks are selected;

wherein the H codes in the set D following the L codes are used for an access request function for hard handover and $(106*(N+M+L))^{th}$ to $(106*(N+M+L+H)-1)^{th}$ clocks are selected.

35. The method of claim 27, wherein the pseudo-random codes used by a system defining the network access request for handover statistically assign a system to cells of base stations.

36. The method of claim 27, wherein the system defining the network access request for handover transmits other identifier (ID) information in each of cells

and an identifier of pseudo-random codes assigned to the cells over a forward common control channel periodically or on an on-demand basis, and acquires at least one of information on pseudo-random codes assigned to the position-estimated cells of a base station newly selected by a subscriber station through detecting on a common control channel.

37. The method of claim 36, wherein the pseudo-random codes used for a system for defining the network access request for handover are dynamically assigned to the cells by the system according to requests of the cells, and each of the cells transmits at least one of an identifier of the pseudo-random codes assigned to the cell and another identifier information to the cell over a forward common control channel periodically or on an on-demand basis.

38. The method of claim 16, wherein if the subscriber station initializes an access request after receiving assignment information of the common access channel and separation information of at least two backoff domains for at least one common access channel, the subscriber station randomly selects a backoff value in a backoff domain corresponding to a backoff algorithm for determining a time for re-initializing an access request in the selected common access channel.

39. A handover apparatus for providing an access service on a common access channel in a mobile communication system, the apparatus comprising:

a subscriber station that requests ranging as it enters a network for handover; and

a base station that transmits handover information to the subscriber station;

wherein when the subscriber station requests ranging as it enters the network for handover, the subscriber station receives backoff start information and backoff end information from the base station and determines a backoff value for handover according to the received backoff start information and backoff end information.

40. The handover apparatus of claim 39, wherein the subscriber station re-requests ranging to the base station after waiting for the determined backoff value when the ranging fails.

41. The apparatus of claim 39, wherein the backoff start information is

formed with an initial backoff window size for performing initial ranging of the subscriber station for a handover processing time.

42. The apparatus of claim 39, wherein the backoff end information is formed with a final backoff window size for performing initial ranging of the subscriber station.

43. An apparatus for performing a ranging operation in a mobile communication system using a broadband wireless access scheme, the apparatus comprising:

a subscriber station for receiving and selecting, from a base station, backoff domains having a backoff start point and a backoff end point for each of rangings determined according to a priority level;

wherein if the subscriber station fails to perform ranging, the subscriber station selects a backoff domain corresponding to a priority level of the ranging among the received backoff domains and re-performs a ranging operation with the base station according to the selected backoff domain.

44. The apparatus of claim 43, wherein the priority level is determined according to a service quality level of data provided to the subscriber stations and whether handover of the subscriber stations is performed.

45. The apparatus of claim 43, wherein the operation of re-performing a ranging operation with the base station according to the selected backoff domain comprises re-performing a ranging operation with the base station at a particular time between the backoff start point and the backoff end point for the selected backoff domain.

46. The apparatus of claim 43, wherein the backoff domains are determined so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.

47. An apparatus for transmitting backoff values used for rangings of

subscriber stations in a mobile communication system using a broadband wireless access scheme, the apparatus comprising:

a base station for determining backoff domains having a backoff start point and a backoff end point according to a priority level of each of rangings, for each of the rangings, and transmitting the backoff domains determined for each of the rangings to the subscriber stations.

48. The apparatus of claim 47, wherein the priority level is determined according to a service quality level of data provided to the subscriber stations and whether handover of the subscriber stations is performed.

49. The apparatus of claim 47, wherein the backoff domains are determined according to a priority level of each of the rangings so that a time period occupied by a backoff domain having a highest priority level becomes a shortest time period and a time period occupied by a backoff domain having a high priority level is shorter than a time period occupied by a backoff domain having a low priority level.

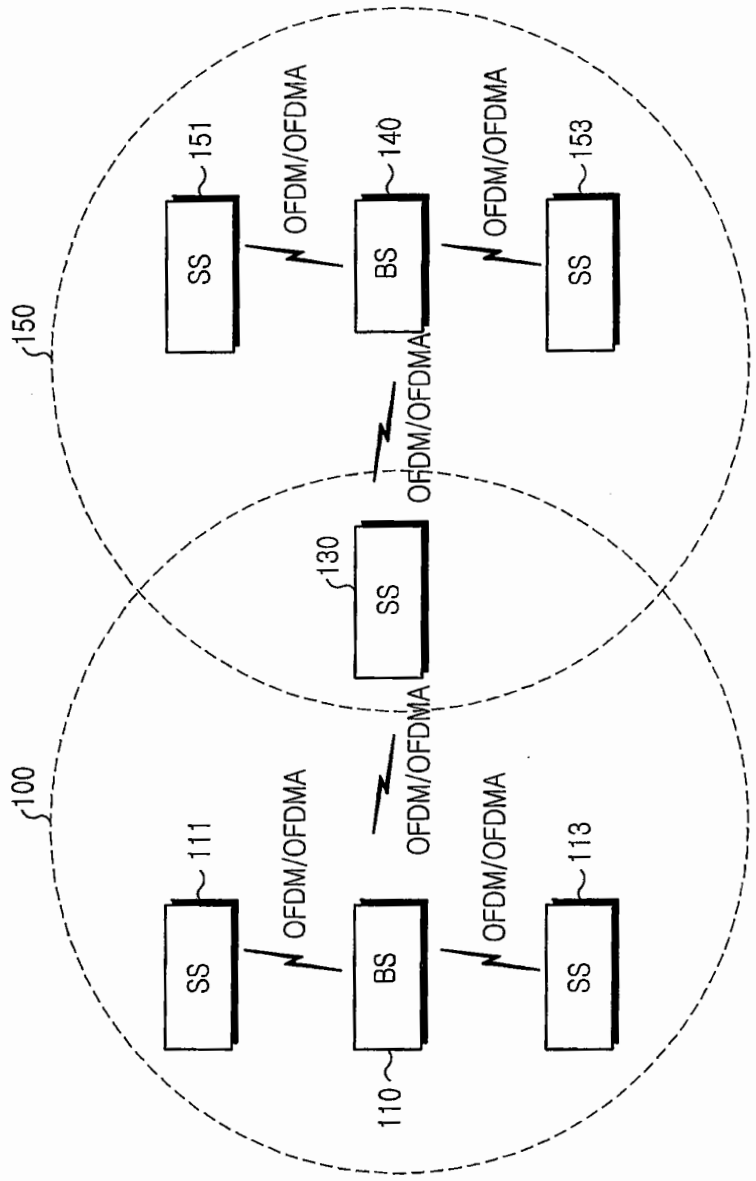


FIG.1

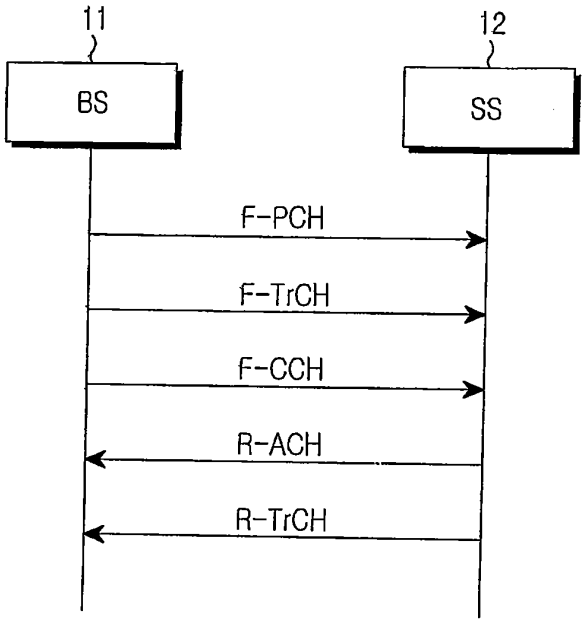


FIG.2

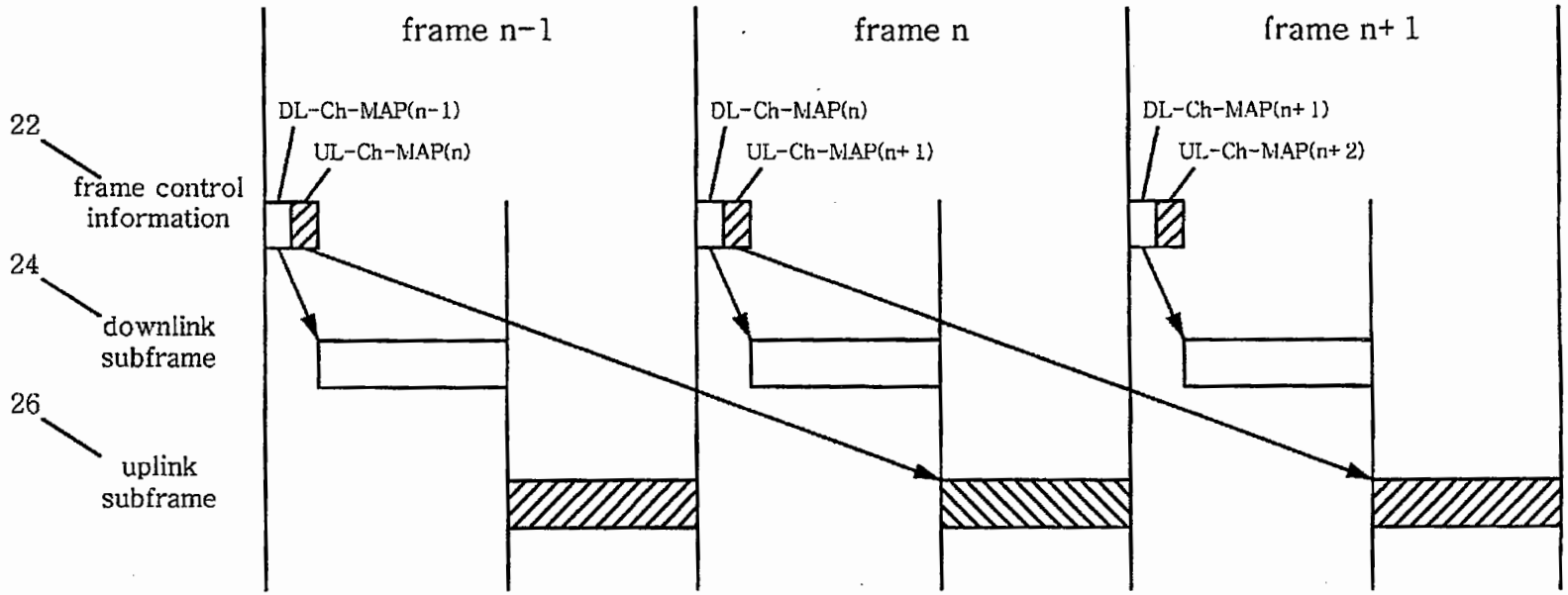
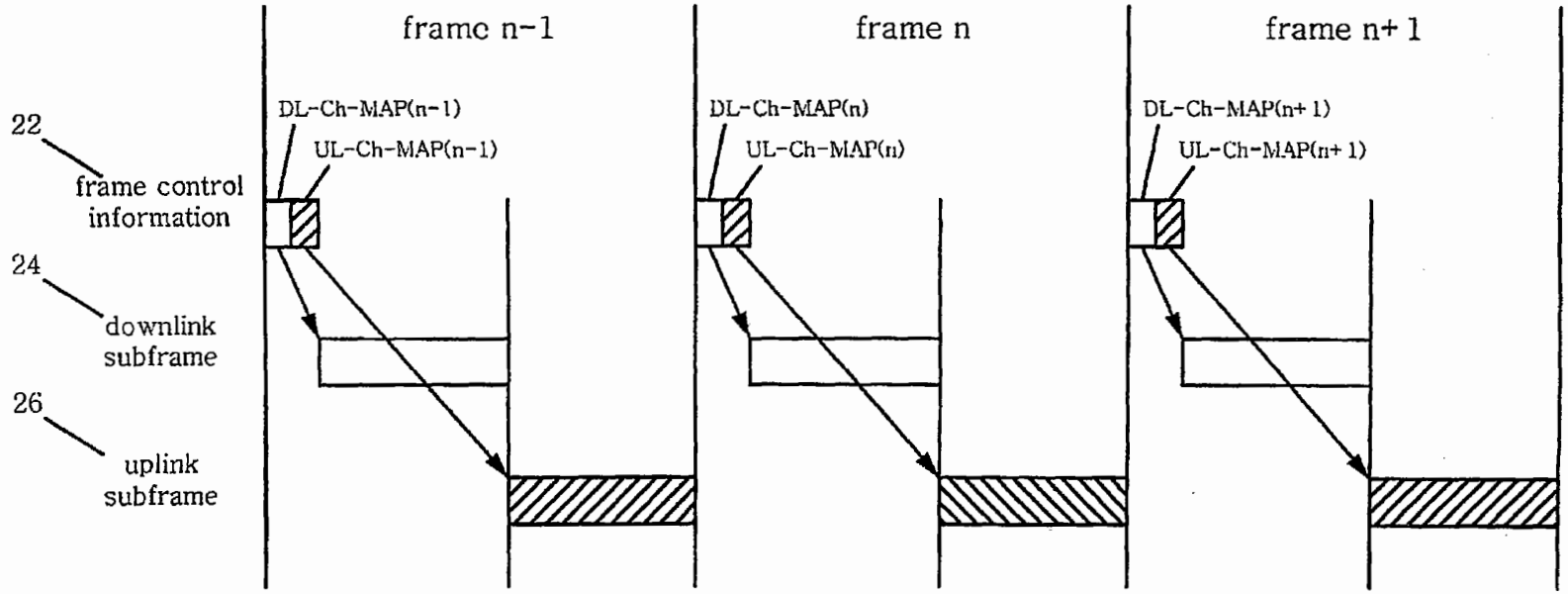

frame n-1
frame n
frame n+ 1
DL-Ch-MAP(n-1)
UL-Ch-MAP(n)
DL-Ch-MAP(n)
UL-Ch-MAP(n+ 1)
DL-Ch-MAP(n+ 1)
UL-Ch-MAP(n+ 2)
22
frame control information
24
downlink subframe
26
uplink subframe

FIG.3A

FIG.3B


frame n-1
frame n
frame n+1
DL-Ch-MAP(n-1)
UL-Ch-MAP(n-1)
DL-Ch-MAP(n)
UL-Ch-MAP(n)
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UL-Ch-MAP(n+1)
22
frame control information
24
downlink subframe
26
uplink subframe

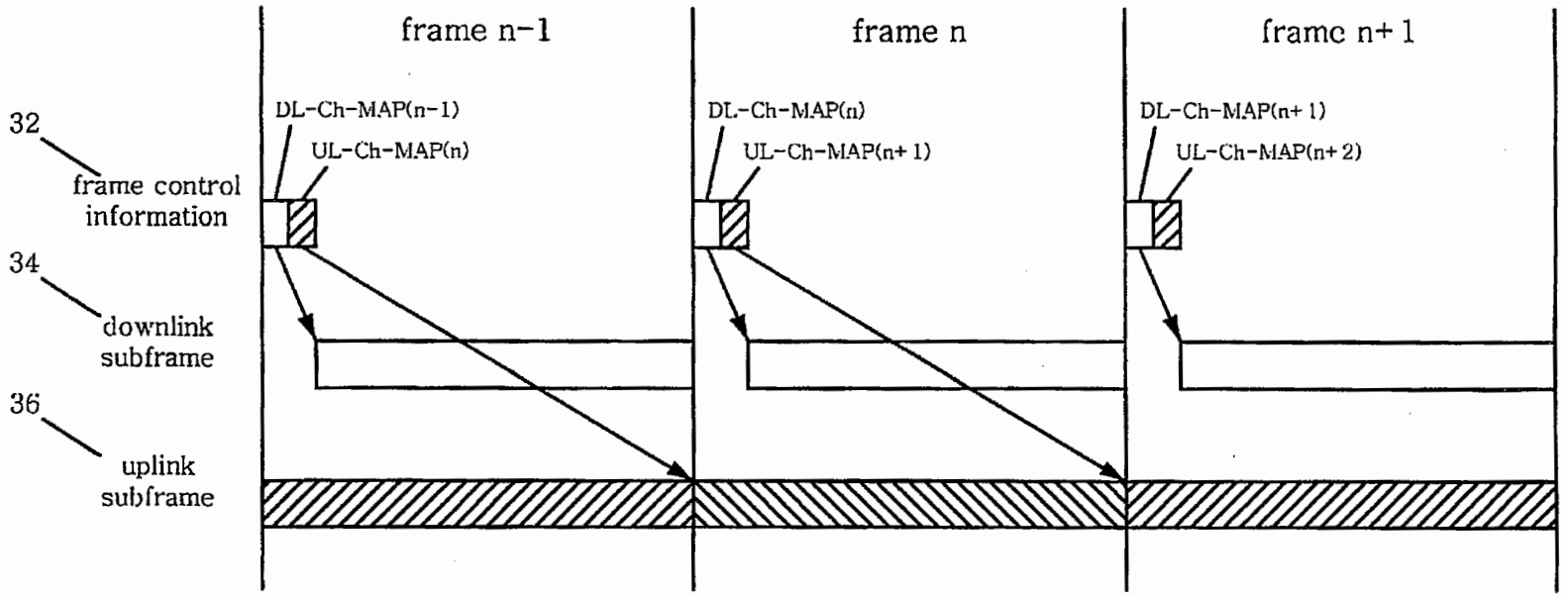
frame n-1
frame n
frame n+1
DL-Ch-MAP(n-1)
UL-Ch-MAP(n)
DL-Ch-MAP(n)
UL-Ch-MAP(n+1)
DL-Ch-MAP(n+1)
UL-Ch-MAP(n+2)
32
frame control information
34
downlink subframe
36
uplink subframe

FIG.4A

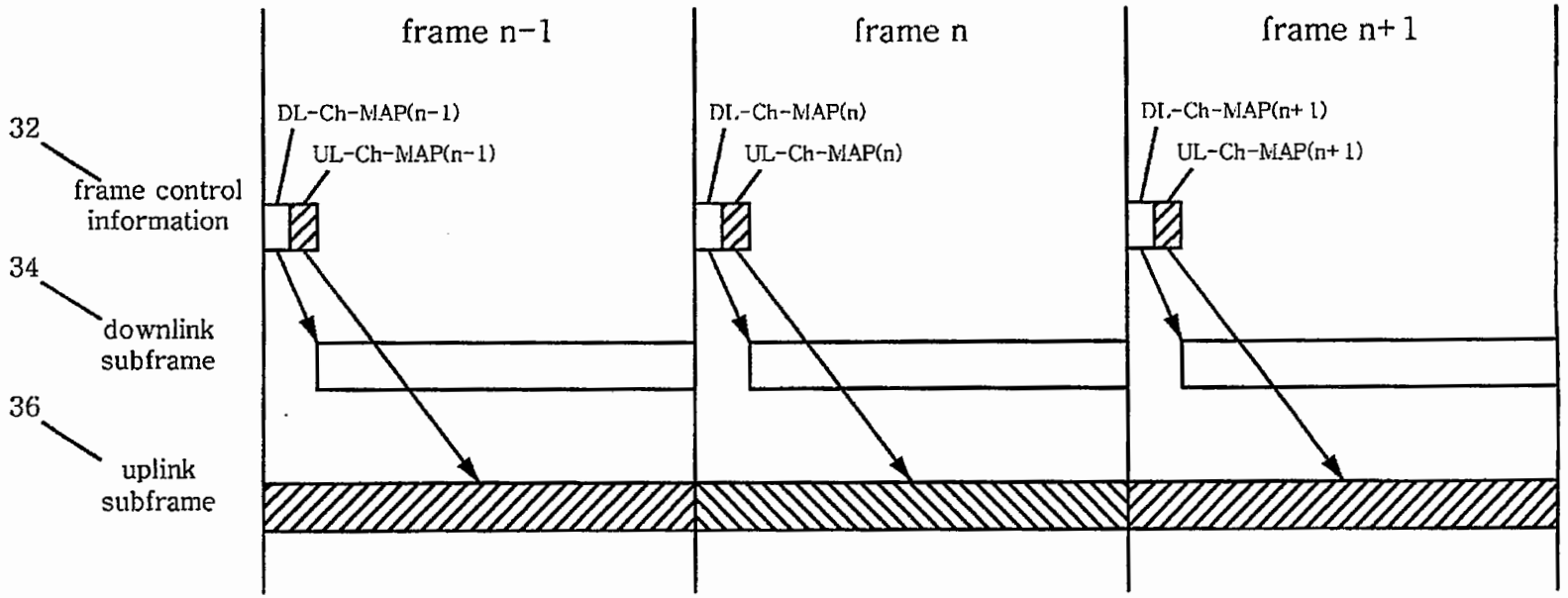
frame n-1
frame n
frame n+1
DL-Ch-MAP(n-1)
UL-Ch-MAP(n-1)
DL-Ch-MAP(n)
UL-Ch-MAP(n)
DL-Ch-MAP(n+1)
UL-Ch-MAP(n+1)
32
frame control information
34
downlink subframe
36
uplink subframe

FIG.4B

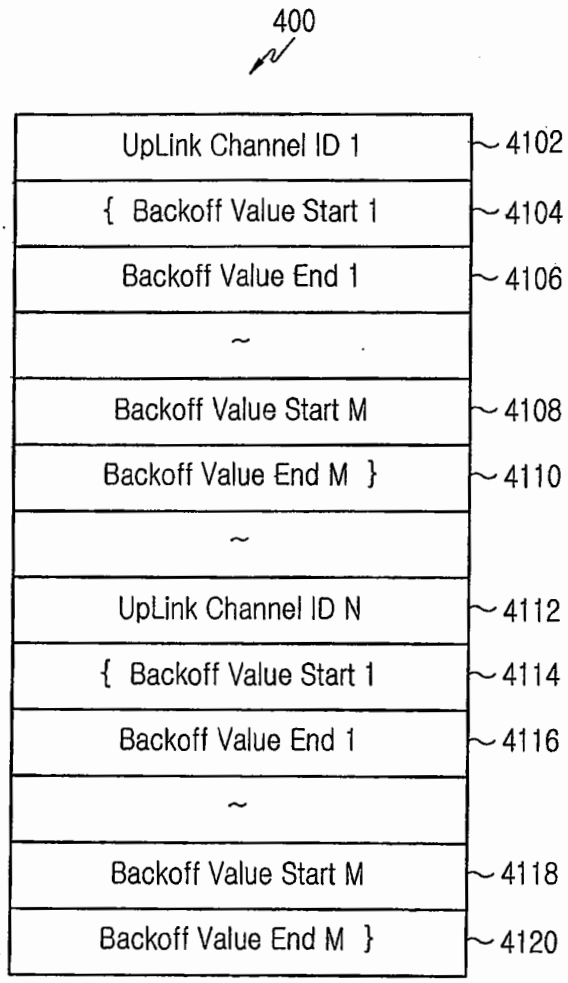
400
UpLink Channel ID 1
4102
{ Backoff Value Start 1
4104
Backoff Value End 1
4106
~
Backoff Value Start M
4108
Backoff Value End M }
4110
~
UpLink Channel ID N
4112
{ Backoff Value Start 1
4114
Backoff Value End 1
4116
~
Backoff Value Start M
4118
Backoff Value End M }
4120

FIG.5A

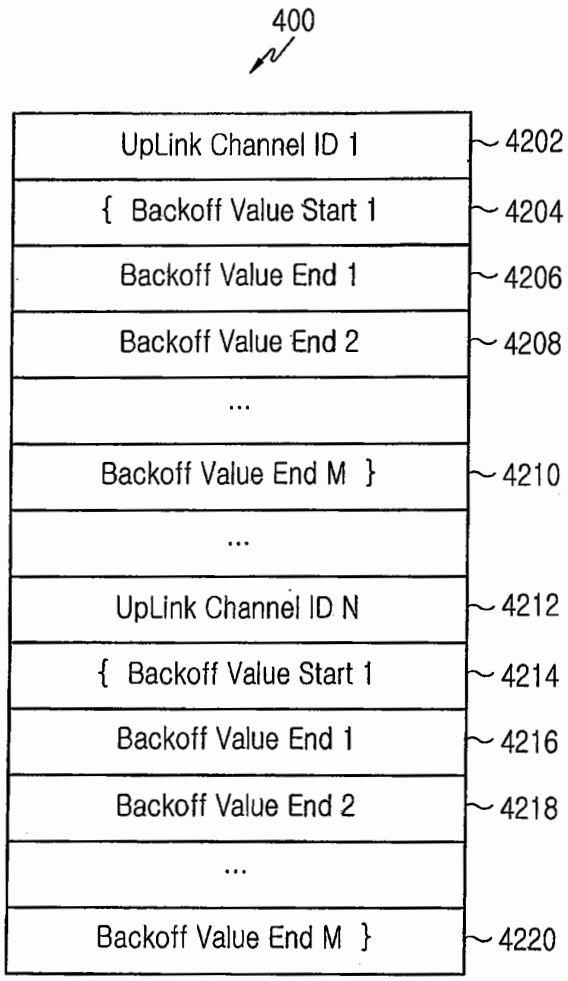
400
UpLink Channel ID 1
4202
{ Backoff Value Start 1
4204
Backoff Value End 1
4206
Backoff Value End 2
4208
...
Backoff Value End M }
4210
...
UpLink Channel ID N
4212
{ Backoff Value Start 1
4214
Backoff Value End 1
4216
Backoff Value End 2
4218
...
Backoff Value End M }
4220

FIG.5B

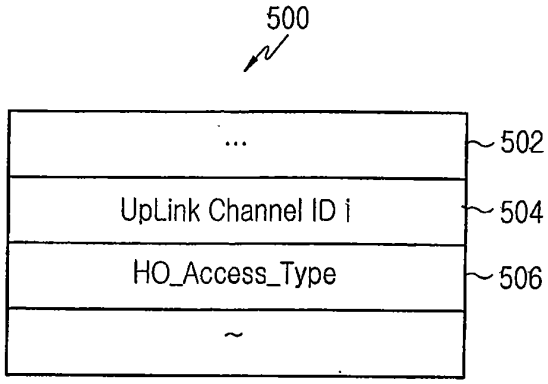

FIG.6

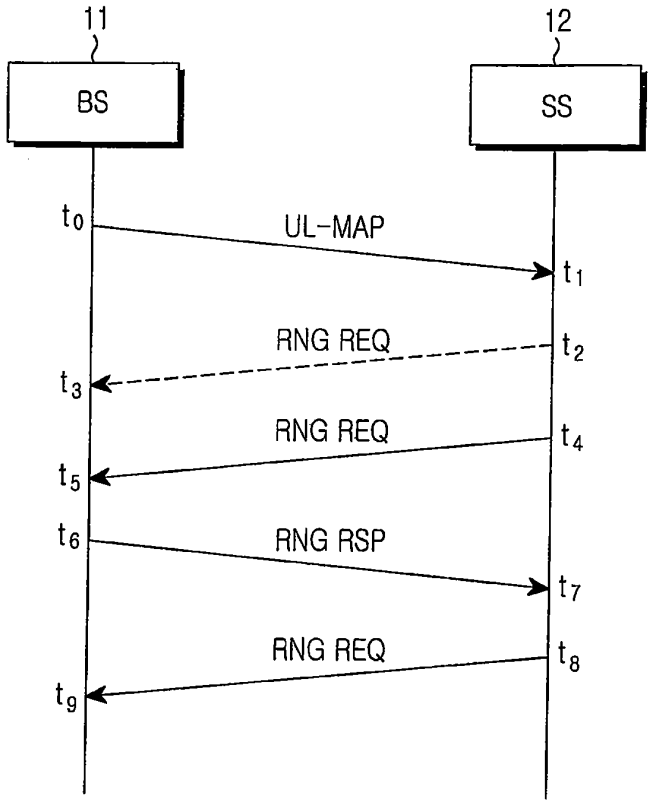
11
12
BS
SS
t0
UL-MAP
t1
RNG REQ
t2
t3
RNG REQ
t4
t5
t6
RNG RSP
t7
RNG REQ
t8
t9

FIG.7A

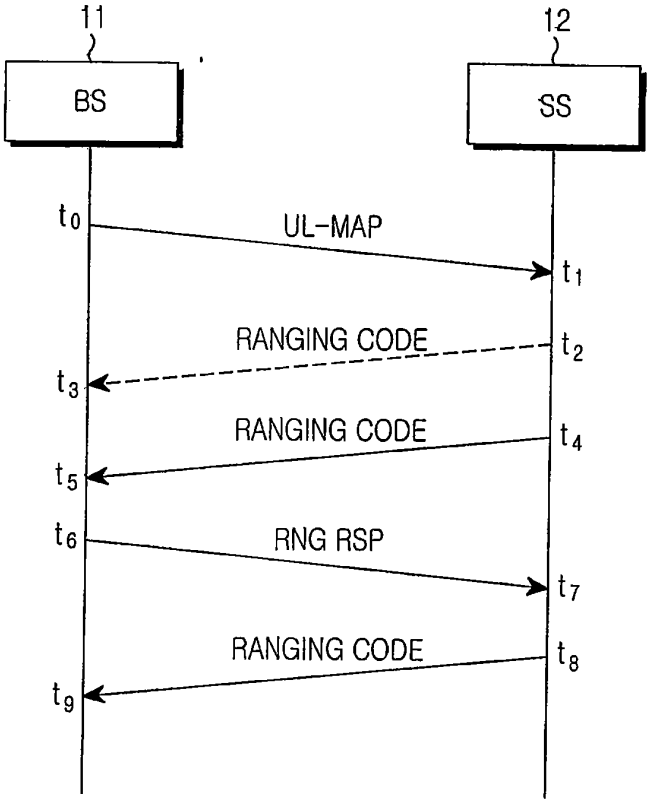
11
12
BS
SS
t0
UL-MAP
t1
RANGING CODE
t2
t3
RANGING CODE
t4
t5
t6
RNG RSP
t7
RANGING CODE
t8
t9

FIG.7B

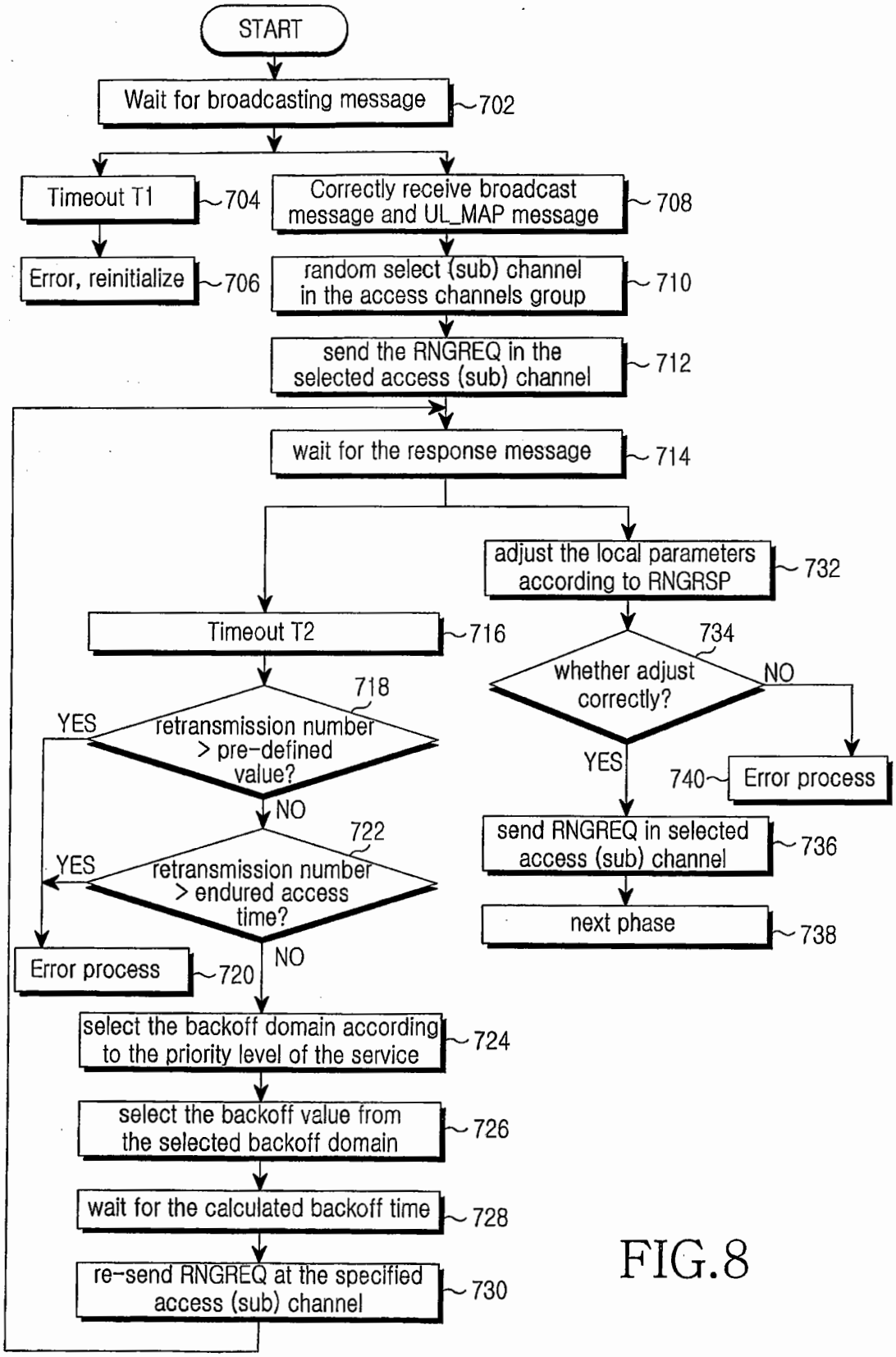
START
Wait for broadcasting message
702
Timeout T1
704
Error, reinitialize
706
Correctly receive broadcast message and UL_MAP message
708
random select (sub) channel in the access channels group
710
send the RNGREQ in the selected access (sub) channel
712
wait for the response message
714
Timeout T2
716
718
retransmission number > pre-defined value?
YES
NO
722
retransmission number > endured access time?
YES
NO
Error process
720
select the backoff domain according to the priority level of the service
724
select the backoff value from the selected backoff domain
726
wait for the calculated backoff time
728
re-send RNGREQ at the specified access (sub) channel
730
adjust the local parameters according to RNGRSP
732
734
whether adjust correctly?
NO
YES
740
Error process
send RNGREQ in selected access (sub) channel
736
next phase
738

FIG.8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2004/001077

A. CLASSIFICATION OF SUBJECT MATTER

IPC7 H04B 7/26

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC7 H04B, H04L, H04J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
KR, JP as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
KIPONET, DELPHION & Keyword : wireless, network, ranging, priority, backoff and similar terms

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	Inividual Backoff Time Allocation for Each Ranging Code Set; IEEE C802.16a-01/57; May 2002 * page 6, 11 * * retrieved at http://www.ieee802.org/16/tga/contrib/C80216a-02_57.pdf*	1, 6, 43, 47 2-5, 7-42, 44-46, 48, 49
Y A	A Priority Scheme for IEEE 802.11 DCF Access Method; Deng, Chang; IEICE TRANS. COMMUN., VOL.E82-B, NO.1 page 96-102; January 1999 * page 99 *	1, 6, 43, 47 2-5, 7-42, 44-46, 48, 49
A	Backoff-based priority schemes for IEEE 802.11 ; Yang Xiao; Communications, 2003. ICC '03. IEEE International Conference on , Volume: 3 , 11-15 May 2003 Pages:1568 - 1572	1 - 49
A	Concept of Ranging Code Set in BWA; IEEE C802.16aP-02/19r1; January 2002 * retrieved at http://www.ieee802.org/16/tga/contrib/C80216aP-02_19r1.pdf *	1 - 49
A	EP 1296484 A1 (Samsung Electronics Co., LTD.) 26 March 2003 * abstract, paragraph[0022]-[0029], figure 5-7 *	1 - 49

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents,such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 AUGUST 2004 (23.08.2004)	24 AUGUST 2004 (24.08.2004)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1296484 A1	2003-03-26	US 2003/053480 A1	2003-03-20
		KR 2003-025417 A	2003-03-29
		JP 2003-179610 A2	2003-06-27
		CN 1406029 A	2003-03-26

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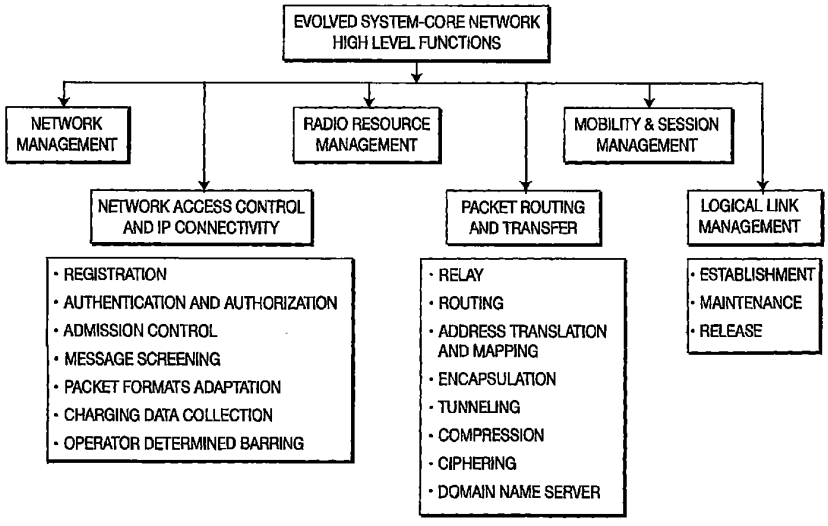
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: WIRELESS COMMUNICATION SYSTEM AND METHOD OF IMPLEMENTING AN EVOLVED SYSTEM ATTACHMENT PROCEDURE



(57) Abstract: A wireless communication system and method of implementing an evolved system attachment procedure are disclosed. The system includes a first core network and a second core network which is evolved from the first core network. A wireless transmit/receive unit (WTRU) sends an attach request message to the second core network. The second core network activates a packet data protocol (PDP) context and sends an attach accept message to the WTRU. The attach accept message includes information regarding the PDP context. The second core network constructs a session and mobility management (SMM) context for session management (SM) and mobility management (MM) for the WTRU.

WO 2007/011638 A2

[0001] WIRELESS COMMUNICATION SYSTEM AND METHOD OF IMPLEMENTING AN EVOLVED SYSTEM ATTACHMENT PROCEDURE

[0002] FIELD OF INVENTION

[0003] The present invention generally relates to an evolved wireless communication system, (e.g., evolved universal mobile telecommunication system (UMTS) terrestrial radio access network (E-UTRAN)). More particularly, the present invention is related to a wireless communication system and method of implementing evolved system attachment procedure.

[0004] BACKGROUND

[0005] Evolution of a third generation (3G) system is in progress to provide a higher data rate, lower latency, and support of multiple radio access technologies (RATs). The main features of the evolved 3G system include an enhanced air interface to handle higher data rates with more efficiency, optimization of conventional procedures to reduce the number of signaling procedures and reduce setup delay, and network design to permit interconnection and interoperation of any air interface, such as global standards for mobile communication (GSM), general packet radio services (GPRS), wideband code division multiple access (WCDMA), CDMA2000, IEEE 802.xx, or the like.

[0006] Figure 1 shows a conventional GPRS access interface and reference points. A mobile station (MS) 102, which includes a terminal equipment (TE) 104 and a mobile terminal (MT) 106, is attached to one of a plurality of GPRS packet domain networks 108a, 108b, which is further connected to a packet data network 110. The GPRS packet domain networks 108a, 108b perform a network access control function, a packet routing and transfer function, a mobility management function, a logical link management function, a radio resource management function, a network management function, or the like.

[0007] The network access control function includes registration, authentication and authorisation, admission control, message screening, packet formats adaptation, charging data collection, operator determined barring, or the like. The packet routing and transfer function includes relay, routing, address translation and mapping, encapsulation, tunnelling, compression, ciphering, domain name server, or the like. The logical link management function includes establishment, maintenance and release of a session.

[0008] Figures 2A and 2B show conventional state machines for mobility management (MM) of an MS and a serving GRPS support node (SGSN) in an Iu mode. The MS and the SGSN may be in one of a packet mobility management (PMM)-detached state, a PMM-connected state and a PMM-idle state. In the PMM-detached state, there is no communication between the MS and the SGSN. In order to establish MM contexts in the MS and the SGSN, the MS performs a GPRS attach procedure. Upon GPRS attach, the state changes to the PMM-connected state, and a packet switching (PS) signaling connection is established between the MS and the SGSN. A PS signaling connection release changes the state to the PMM-idle state. GPRS detach, PS attach reject or routing area update (RAU) reject causes the state to change to the PMM-detached state. In the PMM-idle and PMM-connected state, the session management (SM) state may be active or inactive.

[0009] Figures 3A, 3B and 3C, taken together, are a signaling diagram of an attach procedure 300 in a conventional GPRS system. As shown in Figure 3A, an MS 302 initiates the attach procedure 300 by the transmission of an attach request message to a new SGSN 306 (step 322). The attach request message includes an international mobile subscriber identity (IMSI) (alternatively, a packet-temporary mobile subscriber identity (P-TMSI) and an old routing area identity (RAI)), an attach type, or the like.

[0010] If the MS 302 identifies itself with the P-TMSI, the new SGSN 306 derives an old SGSN address from the RAI to request IMSI information of the MS 302 (step 324). The new SGSN 306 sends an identification request message to an

old SGSN 308 (step 326). The identification request message includes a P-TMSI, an old RAI, old P-TMSI signature, or the like. The old SGSN 308 checks the P-TMSI against record and sends an identification response message with the IMSI of the MS 302 to the new SGSN 306 (steps 328, 330). If the MS 302 is known in the old SGSN 308, the old SGSN 308 responds with an identification response message including the IMSI, authentication triplets or authentication quintets. If the MS 302 is not known in the old SGSN 308 or the old P-TMSI does not match the value stored in the old SGSN 308, the old SGSN 308 responds with an appropriate error cause in the identification response message at step 330.

[0011] If the MS 302 is unknown in the old SGSN 308, the new SGSN 306 sends an identity (ID) request (ID Type = IMSI) to the MS 302 (step 334). The MS 302 responds with an ID response including the IMSI of the MS 302 (step 336).

[0012] If no MM context for the MS exists anywhere in the network, an authentication procedure is performed by the MS 302, the new SGSN 306 and a home location register (HLR) 314 (step 338).

[0013] Referring to Figure 3B, based on operator configuration, an international mobile equipment identity (IMEI) checking procedure may optionally be performed by the MS 302, the new SGSN 306 and an equipment identity register (EIR) 310 (step 340). If the SGSN number has changed since the last GPRS detach, or if it is the very first attach, the new SGSN 306 updates the HLR 314 by sending an update location message to the HLR 314 (step 342). The update location message includes an SGSN number, an SGSN address, the IMSI, or the like.

[0014] The HLR 316 compares the SGSN number with records and sends a cancel location message (including IMSI, cancellation type) to the old SGSN 308 (steps 344, 346). The old SGSN 308 acknowledges with a cancel location acknowledgement (ACK) (step 348). The HLR 314 sends an insert subscriber data message including the IMSI and GPRS subscription data to the new SGSN 306 (step 350).

[0015] The new SGSN 306 checks if the MS 302 is not allowed in the new routing area (RA) (step 352). If due to regional subscription restrictions or access restrictions the MS 302 is not allowed to attach in the RA, the new SGSN 306 rejects the attach request with an appropriate cause, and may return an insert subscriber data ACK (including the IMSI, an SGSN area restricted message) to the HLR 314 (steps 354). If the subscription checking fails for other reasons, the new SGSN 306 also rejects the attach request with an appropriate cause and returns an insert subscriber data ACK (including the IMSI and a cause) to the HLR 314. If all checks are successful, the new SGSN 306 constructs an MM context for the MS 302 and returns an insert subscriber data ACK (including the IMSI) to the HLR 314 (steps 356, 358). The HLR 314 updates the MM context and sends an update location ACK to the new SGSN 306 (steps 360, 362).

[0016] Referring to Figure 3C, if the attach type indicated in the attach request indicates a combined GPRS/IMSI attach, a visitor location register (VLR) should be updated. The new SGSN 306 sends a location update request to a new VLR 312 (step 364). The location update request includes a new LAI, the IMSI, an SGSN number, a location update type, or the like.

[0017] The new VLR 312 creates an association with the new SGSN 306 by storing the SGSN number. If the location area (LA) update is inter-mobile switching center (MSC), the new VLR 312 sends an update location message (including the IMSI and a new VLR) to the HLR 314 (step 366). The HLR 314 sends a cancel location message to an old VLR 316 (step 368). The old VLR 316 acknowledges with a cancel location ACK (step 370).

[0018] The HLR 314 sends an insert subscriber data message (including the IMSI and subscriber data) to the new VLR 312 (step 372). The new VLR 312 acknowledges with an insert subscriber data ACK (step 374). After finishing the inter-MSC location update procedures, the HLR 314 responds with an update location ACK to the new VLR 312 (step 376). The new VLR 312 responds with a

location update accept message (including VLR TMSI) to the new SGSN 306 (step 378).

[0019] The new SGSN 306 sends an attach accept message to the MS 302 (step 380). The attach accept message includes a P-TMSI, a VLR TMSI, P-TMSI signature, and radio priority SMS. The MS 302 then returns an attach complete message to the new SGSN 306 and the new SGSN 306 sends a TMSI reallocation complete message to the new VLR 312 (steps 382, 384).

[0020] Figure 4 is a diagram of a conventional state machine for SM. A GPRS subscription contains the subscription of one or more packet data protocol (PDP) addresses. Each PDP address is an element of a PDP context. The PDP state indicates whether data transfer is enabled for that PDP address or not. The PDP state is moved from an inactive state to an active state when PDP context is activated. The active state is changed to the inactive state when the deactivation procedure is initiated, or when the MM state changes to the PMM-idle state or PMM-detached state.

[0021] In the inactive state, the data service for a certain PDP address of the MS is not activated and the PDP context contains no routing or mapping information to process PDP protocol data units (PDUs) related to that PDP address. In the active state, the PDP context for the PDP address in use is activated in the MS, SGSN and gateway GPRS support node (GGSN). The PDP context contains mapping and routing information for transferring PDP PDUs for that particular PDP address between the MS and the GGSN. The active state is permitted only when the MM state of the MS is PMM-idle state or PMM-connected state.

[0022] Figure 5 is a flow diagram of a conventional PDP context activation procedure 500. The MS 302 sends an activate PDP context request message to an SGSN 306 (step 502). The activate PDP context request message includes a PDP type, a PDP address, an access point name (APN), quality of service (QoS) requested, protocol configuration options, or the like. The SGSN 306 validates the activate PDP context request, selects an APN and maps the APN to a GGSN 310 (step 504).

[0023] The SGSN 306 sends a create PDP context request message to the GGSN 310 (step 506). The create PDP contest request message includes a PDP type, a PDP address, an APN, QoS negotiated, a TEID, charging characteristics, or the like. The GGSN 310 creates a new entry in its PDP context table and returns a create PDP context response to the SGSN 306 (step 508). The create PDP context response message includes a TEID, a PDP address, protocol configuration options, QoS negotiated, charging ID, or the like.

[0024] Radio access bearer (RAB) setup is performed among the MS 302, the RAN 304 and the SGSN 306 (step 510). In Iu mode and if basic service set (BSS) trace is activated, the SGSN 306 may send an invoke trace message to the RAN 304 (step 512). The SGSN 306 may inform the GGSN 310 about the downgraded QoS attributes by sending an update PDP context request (step 514). The GGSN 310 confirms the new QoS attributes by sending an update PDP context response to the SGSN 306 (step 516).

[0025] The SGSN 306 inserts the GGSN address in its PDP context (step 518). If the MS 302 has requested a dynamic address, the PDP address received from the GGSN 310 is inserted in the PDP context. The SGSN 306 selects radio priority and packet flow ID based on QoS negotiated, and returns an activate PDP context accept message to the MS 302 (step 520). The activate PDP context accept message includes a PDP type, a PDP address, a transaction identifier (TI), QoS negotiated, radio priority, a packet flow ID, protocol configuration options, or the like. If the MS 302 indicated in the MS network capability it does not support BSS packet flow procedures, the SGSN 306 then shall not include the packet flow ID.

[0026] SUMMARY

[0027] The present invention is related to a wireless communication system and method of implementing an evolved system attachment procedure. The wireless communication system includes a first core network, (i.e., conventional third generation partnership project (3GPP) core network), and a second core network,

(i.e., evolved core network), which is evolved from the first core network. An evolved wireless transmit/receive unit (WTRU) operating in the evolved system upon power up, sends a modified Attach Request message to the evolved core network. Upon reception, the evolved core network performs the same procedures specified in 3GPP TS23.060 PS attach procedure, (e.g., Authentication, Authorization, Mobility Management, or the like). The evolved core network then proceeds to activate the PDP context (allocation and configuration of default IP address for the WTRU). Upon successful completion of IP configuration procedures (PDP context activation), the evolved core network sends the new Attach Accept message to the WTRU. The new Attach Accept message includes information regarding the PDP context (e.g., IP address, IP version (i.e., v4 or v6), APN information, QoS, or the like). The evolved core network also constructs a session (SM) and mobility management (MM) (SMM) context for SM and MM for the WTRU. The SM and MM states in accordance with the present invention are different from conventional 3GPP-based MM and SM states (in the first core network). The SM and MM in accordance with the present invention adopts the allocation of the IP address for the entire operation of the WTRU. If the WTRU is connected, then the IP address is allocated. If no IP address is allocated then the WTRU is in a De-Attached state, (i.e., not reachable or OFF). In accordance with the present invention, the WTRU state (availability) depends on the allocation of IP address. The state transition between MM states are changed accordingly.

[0028] BRIEF DESCRIPTION OF THE DRAWINGS

[0029] Figure 1 is a diagram of conventional GPRS access interfaces and reference points.

[0030] Figures 2A and 2B show conventional state machines for mobility management.

[0031] Figures 3A-3C, taken together, are a flow diagram of a conventional PS-attach and registration procedure.

[0032] Figure 4 is a diagram of a conventional state machine for session management.

[0033] Figure 5 is a flow diagram of a conventional PDP Context activation procedure.

[0034] Figure 6 is a diagram of an exemplary evolved system architecture including E-UTRAN and an evolved core network (CN) in accordance with the present invention.

[0035] Figure 7 is a diagram of evolved system core network high-level functions in accordance with the present invention.

[0036] Figures 8A and 8B show state machines for session and mobility management (SMM) in accordance with the present invention.

[0037] Figures 9A-9C, taken together, are a flow diagram of an evolved system attachment and registration procedure in accordance with the present invention.

[0038] DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0039] When referred to hereafter, the terminology "WTRU" includes but is not limited to a user equipment (UE), an MS, a fixed or mobile subscriber unit, a pager, or any other type of device capable of operating in a wireless environment.

[0040] The features of the present invention may be incorporated into an integrated circuit (IC) or be configured in a circuit comprising a multitude of interconnecting components.

[0041] Figure 6 is a diagram of an exemplary evolved system 600 including an E-UTRAN and an evolved CN in accordance with the present invention. The evolved system 600 includes an access system stratum 610, a network stratum 620 and a multimedia stratum 630. The access system stratum 610 includes a plurality of radio access networks (RANs), a CN 616 and an evolved CN 617. The RANs include a generic access network (GAN) 611, a GSM/EDGE radio access network (GERAN) 612, a UTRAN 613, an E-UTRAN 614 and an interworking wireless local area network (I-WLAN) 615. The RANs 611-615 are connected to the CN 616 or the

evolved CN 617 to provide services, (such as multimedia services from an Internet protocol (IP) multimedia subsystem (IMS) 631), to one or more WTRUs while interacting with an authentication, authorization and accounting (AAA) server 621, a mobile IP (MIP) server 622, or other network entities in the network stratum 620 via a GGSN 618 or a packet data gateway (PDG) 619.

[0042] Figure 7 is a diagram of evolved system core network high-level functions in accordance with the present invention. The network access and IP connectivity control function controls registration, authentication and authorisation, admission, message screening, packet formats adaptation, charging data collection, operator determined barring, or the like. The packet routing and transfer function controls reay, routing, address translation and mapping, encapsulation, tunnelling, compression, ciphering, domain name server, or the like. The logical link management function controls establishment, maintenance and release of a session.

[0043] Figures 8A and 8B show state machines for session and mobility management (SMM) in accordance with the present invention. The WTRU and the evolved system core may be in one of an MM-detached and SM-inactive state, an MM-connected and SM-active state and an MM-idle and SM-active state. In the MM-detached and SM-inactive state, there is no communication between the WTRU and the evolved system core. After evolved system attachment, the SMM state changes from the MM-detached and SM-inactive state to the MM-connected and SM-active state. In the MM-connected and SM-active state, a PS signaling connection is established between the WTRU and the evolved system core. A PS signaling connection release while in the MM-connected and SM-active state changes the SMM state to the MM-idle and SM-active state. A PS signaling connection establishment while in the MM-idle and SM-active state changes the SMM state to the MM-connected SM-active state. Evolved system detach, PS attach reject or inter-RAT handover reject causes the SMM state to change to the MM-detached and SM-inactive state.

[0044] Figures 9A-9C are a flow diagram of a process 1000 for evolved system attachment and registration in accordance with the present invention. A WTRU 1002 initiates the attach procedure 1000 by the transmission of an attach request message to a new CN, (i.e., evolved CN), 1006 (step 1022). The attach request message includes an IMSI (or P-TMSI and an old RAI), an attach type, or the like. If the WTRU 1002 identifies itself with the P-TMSI, the new CN 1006 derives an old SGSN address from the RAI to request IMSI information of the WTRU 1002 (step 1024). The new CN 1006 sends an identification request message to the old SGSN 1008 (step 1026). The identification request message includes a P-TMSI, an old RAI, old P-TMSI signature, or the like.

[0045] The old SGSN 1008 checks the P-TMSI against record and sends an identification response message the new CN 1006 (steps 1028, 1030). If the WTRU 1002 is known in the old SGSN 1008, the old SGSN 1008 responds with the identification response message including the IMSI, authentication triplets or authentication quintets. If the WTRU 1002 is not known in the old SGSN 1008 or the old P-TMSI does not match the value stored in the old SGSN 1008, the old SGSN 1008 responds with an appropriate error cause in the identification response message at step 1030. If the WTRU 1002 is unknown in the old SGSN 1008, the new CN 1006 sends an ID request (ID Type = IMSI) to the WTRU 1002 (steps 1032, 1034). The WTRU 1002 then responds with an ID response including the IMSI of the WTRU 1002 (step 1036).

[0046] If no MM context for the WTRU 1002 exists anywhere in the network, an authentication procedure is performed by the WTRU 1002, the new CN 1006 and an HLR 1014 (step 1038). Based on operator configuration, an IMEI checking procedure may optionally be performed by the WTRU 1002, the new CN 1006 and an EIR 1010 (step 1040).

[0047] If the new CN number has changed since the last system attach, or if it is the very first attach, the new CN 1006 updates the HLR 1014 by sending an

update location message to the HLR 1014 (step 1042). The update location message includes a CN number, a CN address, the IMSI, or the like.

[0048] The HLR 1014 compares the CN number with records and sends a cancel location message (including the IMSI, a cancellation type) to the old SGSN 1008 (steps 1044, 1046). The old SGSN 1008 acknowledges with a cancel location ACK (step 1048). The HLR 1014 sends an insert subscriber data message, (including the IMSI, subscription data, a PDP type, a PDP address, an APN, QoS, visiting public land mobile network (VPLMN) allowed, or the like), to the new CN 1006 (step 1050).

[0049] The new CN 1006 checks if the WTRU 1002 is not allowed in the new RA (step 1052). If due to regional subscription restrictions or access restrictions the WTRU 1002 is not allowed to attach in the RA, the new CN 1006 rejects the attach request with an appropriate cause, and may return an insert subscriber data ACK (including the IMSI, CN area restricted message) to the HLR 1014 (steps 1054). If the subscription checking fails for other reasons, the new CN 1006 also rejects the attach request with an appropriate cause and returns an insert subscriber data ACK (including the IMSI and cause) to the HLR 1014. If all checks are successful, the new CN 1006 constructs an SMM context for the WTRU 1002 and returns an insert subscriber data ACK (including the IMSI, a PDP type, a PDP address, an APN, a TEID, or the like) to the HLR 1014 (steps 1056, 1058). The HLR 1014 updates the SMM context and sends an update location ACK to the new CN 1006 (steps 1060, 1062).

[0050] If the attach type indicated in the attach request indicates a combined E-UTRAN/IMSI attach, a VLR should be updated. The new CN 1006 sends a location update request to a new VLR 1012 (step 1064). The location update request includes a new LAI, the IMSI, a CN number, a location update type, or the like.

[0051] The new VLR 1012 creates an association with the new CN 1006 by storing the CN number. If the LA update is inter-mobile switching center (MSC), the new VLR 1012 sends an update location message (including the IMSI and a new

VLR) to the HLR 1014 (step 1066). The HLR 1014 sends a cancel location message to an old VLR 1016 (step 1068). The old VLR 1016 acknowledges with a cancel location ACK (step 1070).

[0052] The HLR 1014 sends an insert subscriber data message (including the IMSI and subscriber data) to the new VLR 1012 (step 1072). The new VLR 1012 acknowledges with an insert subscriber data ACK (step 1074). After finishing the inter-MSC location update procedures, the HLR 1014 responds with an update location ACK to the new VLR 1012 (step 1076). The new VLR 1012 responds with a location update accept message (including VLR TMSI) to the new CN 1006 (step 1078).

[0053] An RAB setup procedure is performed among the WTRU 1002, the UTRAN 1004 and the new CN 1006 (step 1080). In Iu mode and if BSS trace is activated, the new CN 1006 may send an invoke trace message to the UTRAN 1004 (step 1082).

[0054] The new CN 1006 sends an attach accept message to the WTRU 1002 (step 1084). The attach accept message includes a P-TMSI, a VLR TMSI, P-TMSI signature, a PDP type, a PDP address, a TI, QoS, radio priority, a packet flow ID, PDP configuration, or the like. The WTRU 1002 then returns an attach complete message to the new CN 1006 and the new CN 1006 sends a TMSI reallocation complete message to the new VLR 1012 (steps 1086, 1088).

[0055] The information elements (IEs) included in the attach accept message in accordance with the present invention are shown in Table 1. New IEs introduced in accordance with the present invention are shown in bold font in Table 1. The attach accept message is sent by the CN to the WTRU to indicate that the corresponding attach request has been accepted.

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator	M	V	1/2
	Skip indicator	Skip indicator	M	V	1/2
	Attach accept message identity	Message type	M	V	1
	Attach result	Attach result	M	V	1/2
	Force to standby	Force to standby	M	V	1/2
	Periodic RA update timer	GPRS Timer	M	V	1
	Radio priority for SMS	Radio priority	M	V	1/2
	Radio priority for TOM8	Radio priority 2	M	V	1/2
	Routing area identification	Routing area identification	M	V	6
19	P-TMSI signature	P-TMSI signature	O	TV	4
17	Negotiated READY timer value	GPRS Timer	O	TV	2
18	Allocated P-TMSI	Mobile identity	O	TLV	7
23	MS identity	Mobile identity	O	TLV	7-10
25	GMM cause	GMM cause	O	TV	2
2A	T3302 value	GPRS Timer 2	O	TLV	3
8C	Cell Notification	Cell Notification	O	T	1
4A	Equivalent PLMNs	PLMN List	O	TLV	5-47
B-	Network feature support	Network feature support	O	TV	1
34	Emergency Number List	Emergency Number List	O	TLV	5-50
A-	Requested MS Information	Requested MS Information	O	TV	1
	Negotiated LLC SAPI	**LLC service access point identifier**	**M**	**V**	**1**
	Negotiated QoS	**Quality of service**	**M**	**LV**	**13-15**
	Radio priority	**Radio priority**	**M**	**V**	**1/2**
	Spare half octet	**Spare half octet**	**M**	**V**	**1/2**
2B	**PDP address**	**Packet data protocol address**	**O**	**TLV**	**4-20**
27	**Protocol configuration options**	**Protocol configuration options**	**O**	**TLV**	**3-253**
34	**Packet Flow Identifier**	**Packet Flow Identifier**	**O**	**TLV**	**3**

Table 1

[0056] The PDP address IE is included in the attach accept message if the WTRU has requested the activation of a PDP context with the PDP type IPv4 or IPv6 and dynamic addressing. The protocol configuration options IE is included in the attach accept message when the CN wishes to transmit protocol data (e.g., configuration parameters, error codes or messages/events) to the WTRU. The packet

flow ID IE may be included if the CN wants to indicate the packet flow ID associated to the PDP context. The CN shall not include this IE if the WTRU has not indicated PFC procedure support in PFC feature mode field of WTRU network capability IE. If the WTRU has not indicated PFC procedure support, then it shall ignore this IE, if received.

[0100] The Negotiated LLC SAPI, Negotiated QoS, Radio priority and Spare half octet are IEs used to map the service to the right end point within the network with the right setting. The LLC SAPI, identifies the Service Access Point Identifier in both the WTRU, the E-UTRAN and the evolved CN. This ensures that the traffic flow of a particular service is routed via the same nodes for uplink and downlink. Negotiated QoS is the set of attributes for the traffic flow that specify the resources to be allocated, such as bit-rate, delay, bit-error rate, PDU sizes, or the like. Radio priority IE sets up the class of the data traffic for the RAN.

[0101] Embodiments.

[0102] 1. A method for system attachment in an evolved wireless communication system including a first core network and a second core network, the second core network being evolved from the first core network.

[0103] 2. The method of embodiment 1 comprising a step of a WTRU sending an attach request message to the second core network.

[0104] 3. The method of embodiment 2 comprising a step of the second core network activating a PDP context.

[0105] 4. The method as in any embodiments 2-3, comprising a step of the second core network sending an attach accept message to the WTRU, the attach accept message including information regarding the PDP context.

[0106] 5. The method as in any embodiments 2-4, wherein the attach request message includes an IMSI.

[0107] 6. The method as in any embodiments 2-4, wherein the attach request message includes a P-TMSI and a RAI with respect to the first core network.

[0108] 7. The method as in any embodiments 2-6, further comprising the step of the second core network sending an identification request to the first core network to obtain an IMSI from the first core network.

[0109] 8. The method of embodiment 7 further comprising the step of the first core network sending an identification response to the second core network including the IMSI if the WTRU is known in the first core network.

[0110] 9. The method as in any embodiments 7-8, wherein the second core network derives an address of the first core network using the RAI.

[0111] 10. The method as in any embodiments 8-9, further comprising the step of the first core network sending the identification response with an error message if the WTRU is not known in the first core network.

[0112] 11. The method of embodiment 10 further comprising the step of the second core network sending an ID request to the WTRU to obtain the IMSI.

[0113] 12. The method of embodiment 11 further comprising the step of the WTRU sending an ID response with the IMSI.

[0114] 13. The method as in any embodiments 8-12, further comprising the step of the first core network sending the identification response with an error message if the P-TMSI does not match the value stored in the first core network.

[0115] 14. The method of embodiment 13 further comprising the step of the second core network sending an ID request to the WTRU to obtain the IMSI.

[0116] 15. The method of embodiment 14 further comprising the step of the WTRU sending an ID response with the IMSI.

[0117] 16. The method as in any embodiments 2-15, further comprising the step of the WTRU and the second core network performing authentication procedure.

[0118] 17. The method as in any embodiments 2-16, further comprising the step of the WTRU and the second core network performing an IMEI checking procedure.

[0119] 18. The method as in any embodiments 2-17, wherein the attach request indicating an attach type.

[0120] 19. The method of embodiment 18 wherein the attach type indicates an E-UTRAN only attachment.

[0121] 20. The method of embodiment 18 wherein the attach type indicates an E-UTRAN and IMSI attachment.

[0122] 21. The method as in any embodiments 4-20, wherein the attach accept message includes at least one of a PDP type, a PDP address, a TI, QoS, radio priority, a packet flow identifier and PDP configuration.

[0123] 22. The method as in any embodiments 2-21, further comprising the step of the second core network constructing an SMM context for SM and MM for the WTRU.

[0124] 23. The method of embodiment 22 wherein a state of the SMM is defined as one of an MM-detached and SM-inactive state, an MM-connected and SM-active state and an MM-idle and SM-active state.

[0125] 24. The method as in any embodiments 22-23, wherein an SMM state of the WTRU changes depending on allocation of PDP address to the WTRU.

[0126] 25. The method as in any embodiments 2-24, further comprising the step of the second core network rejecting the attach request if the WTRU is not allowed in an RA with respect to the second core network.

[0127] 26. A wireless communication system comprising a first core network, a second core network evolved from the first core network and a WTRU configured to send an attach request message to the second core network

[0128] 27. The system of embodiment 26 wherein the second core network is configured to activate a PDP context for the WTRU and send an attach accept message to the WTRU including information regarding the PDP context.

[0129] 28. The system as in any embodiments 26-27, wherein the attach request message includes an IMSI.

[0130] 29. The system as in any embodiments 26-27, wherein the attach request message includes a P-TMSI and an RAI with respect to the first core network.

[0131] 30. The system as in any embodiments 26-29, wherein the second core network is configured to send an identification request to the first core network to obtain an IMSI from the first core network.

[0132] 31. The system of embodiment 30 wherein the first core network is configured to send an identification response to the second core network including the IMSI if the WTRU is known in the first core network.

[0133] 32. The system as in any embodiments 29-31, wherein the second core network derives an address of the first core network using the RAI.

[0134] 33. The system as in any embodiments 32 wherein the first core network is configured to send the identification response with an error message if the WTRU is not known in the first core network.

[0135] 34. The system as in any embodiments 26-29, wherein the second core network is configured to send an ID request to the WTRU to obtain the IMSI and the WTRU is configured to send an ID response with the IMSI.

[0136] 35. The system of embodiment 34 wherein the first core network is configured to send the identification response with an error message if the P-TMSI does not match the value stored in the first core network.

[0137] 36. The system as in any embodiments 26-35, wherein the second core network is configured to send an ID request to the WTRU to obtain the IMSI and the WTRU is configured to send an ID response with the IMSI.

[0138] 37. The system as in any embodiments 26-36, wherein the WTRU and the second core network are configured to perform authentication procedure.

[0139] 38. The system as in any embodiments 26-37, wherein the WTRU and the second core network are configured to perform an IMEI checking procedure with an EIR.

[0140] 39. The system as in any embodiments of 26-38, wherein the attach request indicating an attach type.

[0141] 40. The system of embodiment 39 wherein the attach type indicates an E-UTRAN only attachment.

[0142] 41. The system of embodiment 39 wherein the attach type indicates an E-UTRAN and IMSI attachment.

[0143] 42. The system as in any embodiments 27-41, wherein the attach accept message includes at least one of a PDP type, a PDP address, a TI, QoS, radio priority, a packet flow identifier and PDP configuration.

[0144] 43. The system as in any embodiments 26-42, wherein the second core network is configured to construct an SMM context for SM and MM for the WTRU.

[0145] 44. The system of embodiment 43 wherein a state of the SMM is defined as one of an MM-detached and SM-inactive state, an MM-connected and SM-active state and an MM-idle and SM-active state.

[0146] 45. The system as in any embodiments 43-44, wherein an SMM state of the WTRU changes depending on allocation of PDP address to the WTRU.

[0147] 46. The system as in any embodiments 27-45, wherein the second core network is configured to reject the attach request if the WTRU is not allowed in an RA with respect to the second core network.

[0148] 47. A state machine for SMM comprising a MM-detached and SM-inactive state indicating a WTRU is detached and PDP context is not activated.

[0149] 48. The state machine of embodiment 47 further comprising an MM-connected and SM-active state indicating the WTRU is attached and PDP context is activated and an SM connection is established.

[0150] 49. The state machine as in any embodiments 47-48, further comprising an MM-idle and SM-active state indicating the WTRU is attached, PDP context is activated and the SM connection is released.

[0151] Although the features and elements of the present invention are described in the preferred embodiments in particular combinations, each feature or element can be used alone without the other features and elements of the preferred embodiments or in various combinations with or without other features and elements of the present invention.

* * *

CLAIMS

What is claimed is:

1. In an evolved wireless communication system including a first core network and a second core network, the second core network being evolved from the first core network, a method for system attachment, the method comprising:

a wireless transmit/receive unit (WTRU) sending an attach request message to the second core network;

the second core network activating a packet data protocol (PDP) context; and

the second core network sending an attach accept message to the WTRU, the attach accept message including information regarding the PDP context.

2. The method of claim 1 wherein the attach request message includes an international mobile subscriber identity (IMSI).

3. The method of claim 1 wherein the attach request message includes a packet temporary mobile subscriber identity (P-TMSI) and a routing area identity (RAI) with respect to the first core network.

4. The method of claim 3 further comprising:

the second core network sending an identification request to the first core network to obtain an international mobile subscriber identity (IMSI) from the first core network; and

the first core network sending an identification response to the second core network including the IMSI if the WTRU is known in the first core network.

5. The method of claim 4 wherein the second core network derives an address of the first core network using the RAI.

6. The method of claim 4 further comprising:

the first core network sending the identification response with an error message if the WTRU is not known in the first core network.

7. The method of claim 6 further comprising:

the second core network sending an identity (ID) request to the WTRU to obtain the IMSI; and

the WTRU sending an ID response with the IMSI.

8. The method of claim 4 further comprising:

the first core network sending the identification response with an error message if the P-TMSI does not match the value stored in the first core network.

9. The method of claim 8 further comprising:

the second core network sending an identity (ID) request to the WTRU to obtain the IMSI; and

the WTRU sending an ID response with the IMSI.

10. The method of claim 1 further comprising:

the WTRU and the second core network performing authentication procedure.

11. The method of claim 1 further comprising:

the WTRU and the second core network performing an international mobile equipment identity (IMEI) checking procedure.

12. The method of claim 1 wherein the attach request indicating an attach type.

13. The method of claim 12 wherein the attach type indicates an evolved universal mobile telecommunication system (UMTS) terrestrial radio access network (E-UTRAN) only attachment.

14. The method of claim 12 wherein the attach type indicates an evolved universal mobile telecommunication system (UMTS) terrestrial radio access network (E-UTRAN) and IMSI attachment.

15. The method of claim 1 wherein the attach accept message includes at least one of a PDP type, a PDP address, a transaction identifier (TI), quality of service (QoS), radio priority, a packet flow identifier and PDP configuration.

16. The method of claim 1 further comprising:

the second core network constructing a session and mobility management (SMM) context for SM and MM for the WTRU.

17. The method of claim 16 wherein a state of the SMM is defined as one of an MM-detached and SM-inactive state, an MM-connected and SM-active state and an MM-idle and SM-active state.

18. The method of claim 16 wherein an SMM state of the WTRU changes depending on allocation of PDP address to the WTRU.

19. The method of claim 1 further comprising:

the second core network rejecting the attach request if the WTRU is not allowed in a routing area (RA) with respect to the second core network.

20. A wireless communication system comprising:

a first core network;

a second core network evolved from the first core network; and

a wireless transmit/receive unit (WTRU) configured to send an attach request message to the second core network, wherein the second core network is configured to activate a packet data protocol (PDP) context for the WTRU and send an attach accept message to the WTRU including information regarding the PDP context.

21. The system of claim 20 wherein the attach request message includes an international mobile subscriber identity (IMSI).

22. The system of claim 20 wherein the attach request message includes a packet temporary mobile subscriber identity (P-TMSI) and a routing area identity (RAI) with respect to the first core network.

23. The system of claim 22 wherein the second core network is configured to send an identification request to the first core network to obtain an international mobile subscriber identity (IMSI) from the first core network and the first core network is configured to send an identification response to the second core network including the IMSI if the WTRU is known in the first core network.

24. The system of claim 23 wherein the second core network derives an address of the first core network using the RAI.

25. The system of claim 23 wherein the first core network is configured to send the identification response with an error message if the WTRU is not known in the first core network.

26. The system of claim 25 wherein the second core network is configured to send an identity (ID) request to the WTRU to obtain the IMSI and the WTRU is configured to send an ID response with the IMSI.

27. The system of claim 23 wherein the first core network is configured to send the identification response with an error message if the P-TMSI does not match the value stored in the first core network.

28. The system of claim 27 wherein the second core network is configured to send an identity (ID) request to the WTRU to obtain the IMSI and the WTRU is configured to send an ID response with the IMSI.

29. The system of claim 20 wherein the WTRU and the second core network are configured to perform authentication procedure.

30. The system of claim 20 wherein the WTRU and the second core network are configured to perform an international mobile equipment identity (IMEI) checking procedure with an equipment identity register (EIR).

31. The system of claim 20 wherein the attach request indicating an attach type.

32. The system of claim 31 wherein the attach type indicates an evolved universal mobile telecommunication system (UMTS) terrestrial radio access network (E-UTRAN) only attachment.

33. The system of claim 31 wherein the attach type indicates an evolved universal mobile telecommunication system (UMTS) terrestrial radio access network (E-UTRAN) and IMSI attachment.

34. The system of claim 20 wherein the attach accept message includes at least one of a PDP type, a PDP address, a transaction identifier (TI), quality of service (QoS), radio priority, a packet flow identifier and PDP configuration.

35. The system of claim 20 wherein the second core network is configured to construct a session and mobility management (SMM) context for session management (SM) and mobility management (MM) for the WTRU.

36. The system of claim 35 wherein a state of the SMM is defined as one of an MM-detached and SM-inactive state, an MM-connected and SM-active state and an MM-idle and SM-active state.

37. The system of claim 35 wherein an SMM state of the WTRU changes depending on allocation of PDP address to the WTRU.

38. The system of claim 20 wherein the second core network is configured to reject the attach request if the WTRU is not allowed in a routing area (RA) with respect to the second core network.

39. A state machine for session and mobility management (SMM), comprising:

a mobility management (MM)-detached and session management (SM)-inactive state indicating a WTRU is detached and PDP context is not activated;

an MM-connected and SM-active state indicating the WTRU is attached and PDP context is activated and an SM connection is established; and

an MM-idle and SM-active state indicating the WTRU is attached, PDP context is activated and the SM connection is released.

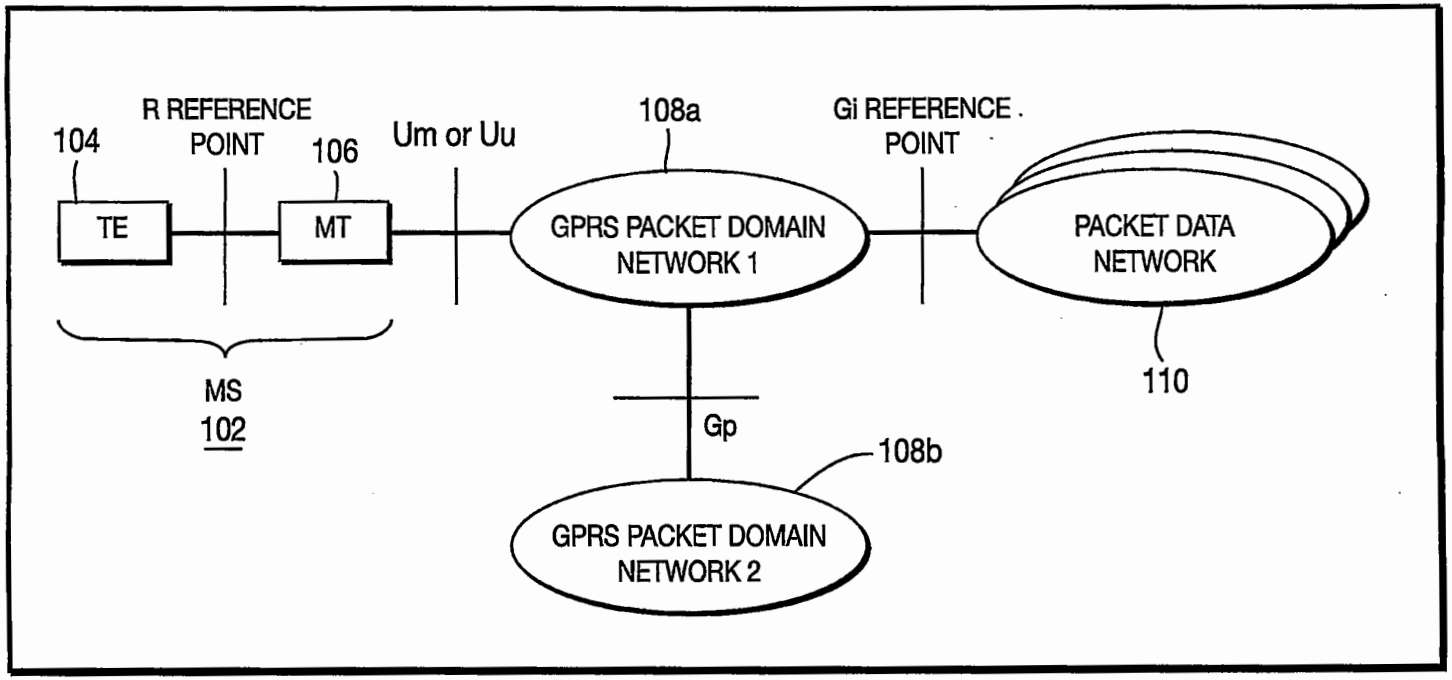


FIG. 1
PRIOR ART

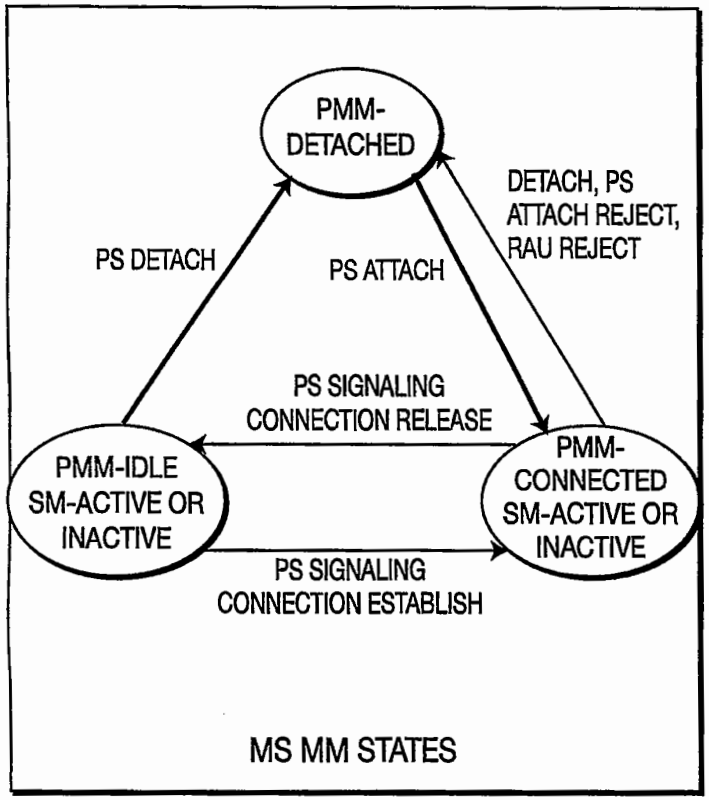


FIG. 2A
PRIOR ART

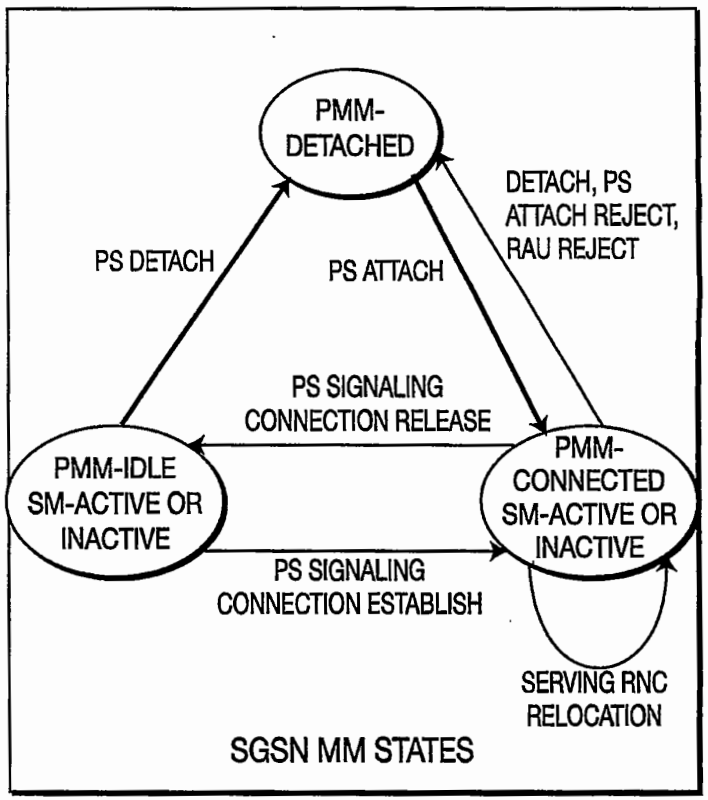


FIG. 2B
PRIOR ART

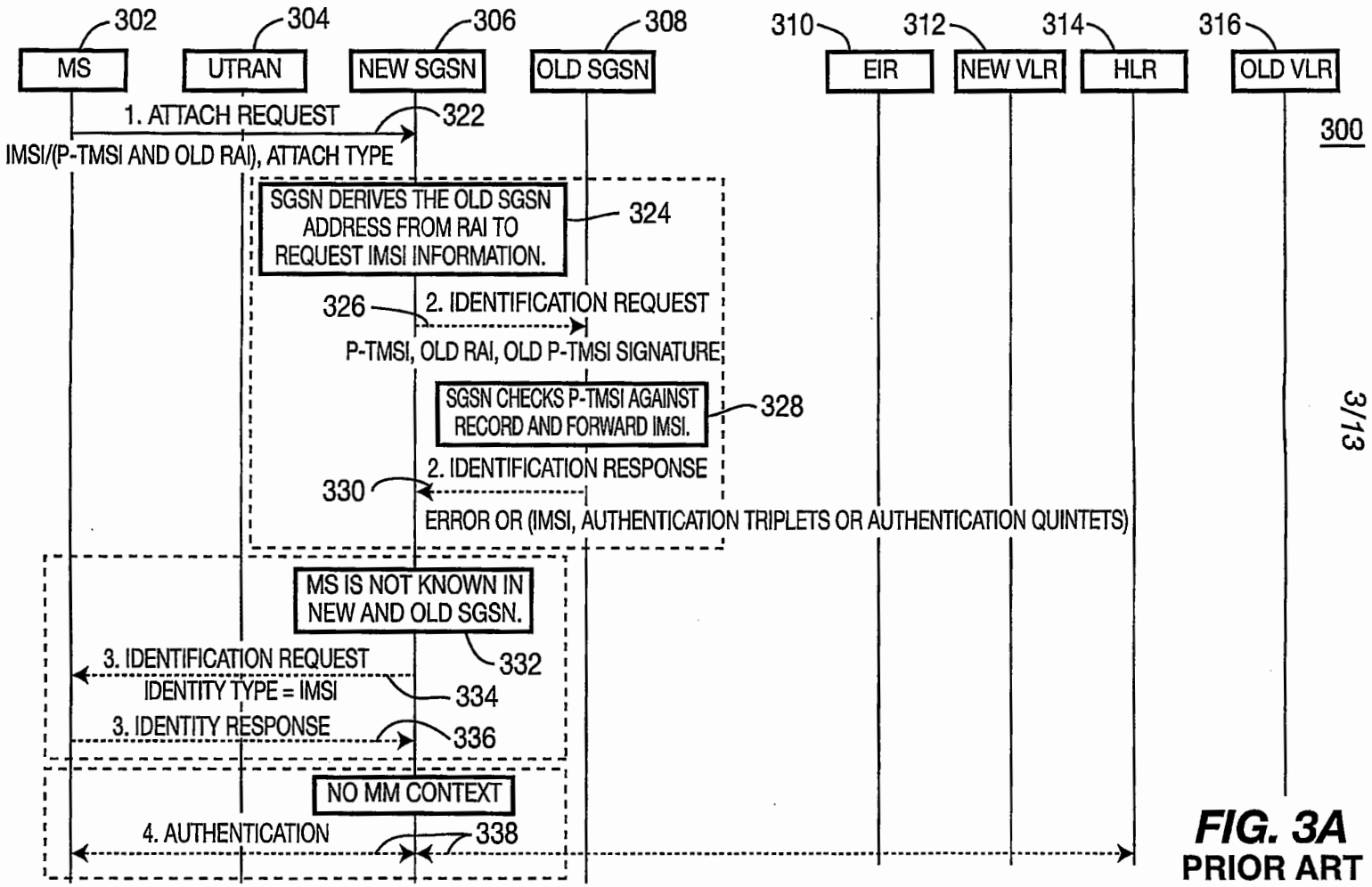


FIG. 3A
PRIOR ART

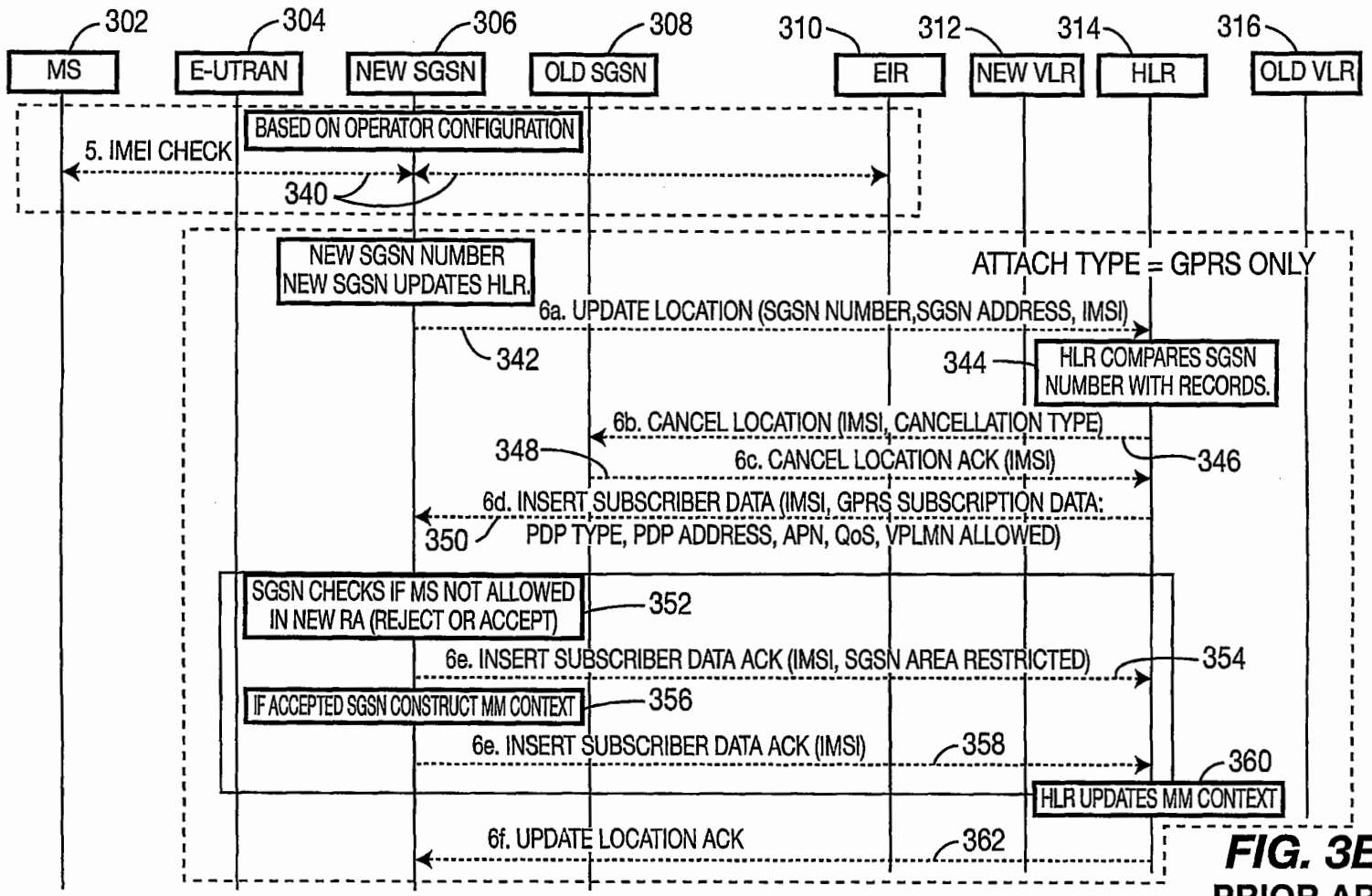


FIG. 3B
PRIOR ART

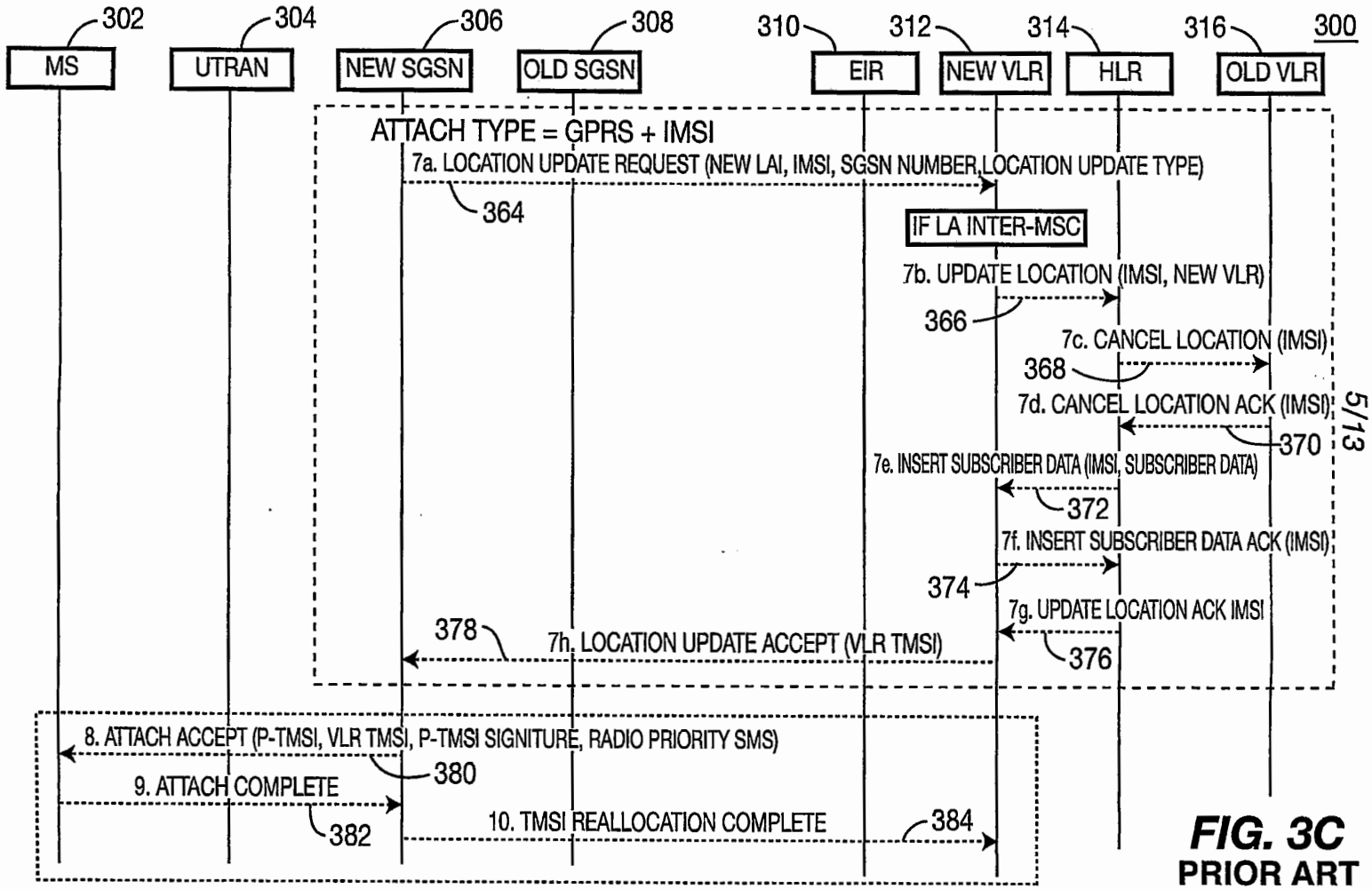


FIG. 3C
PRIOR ART

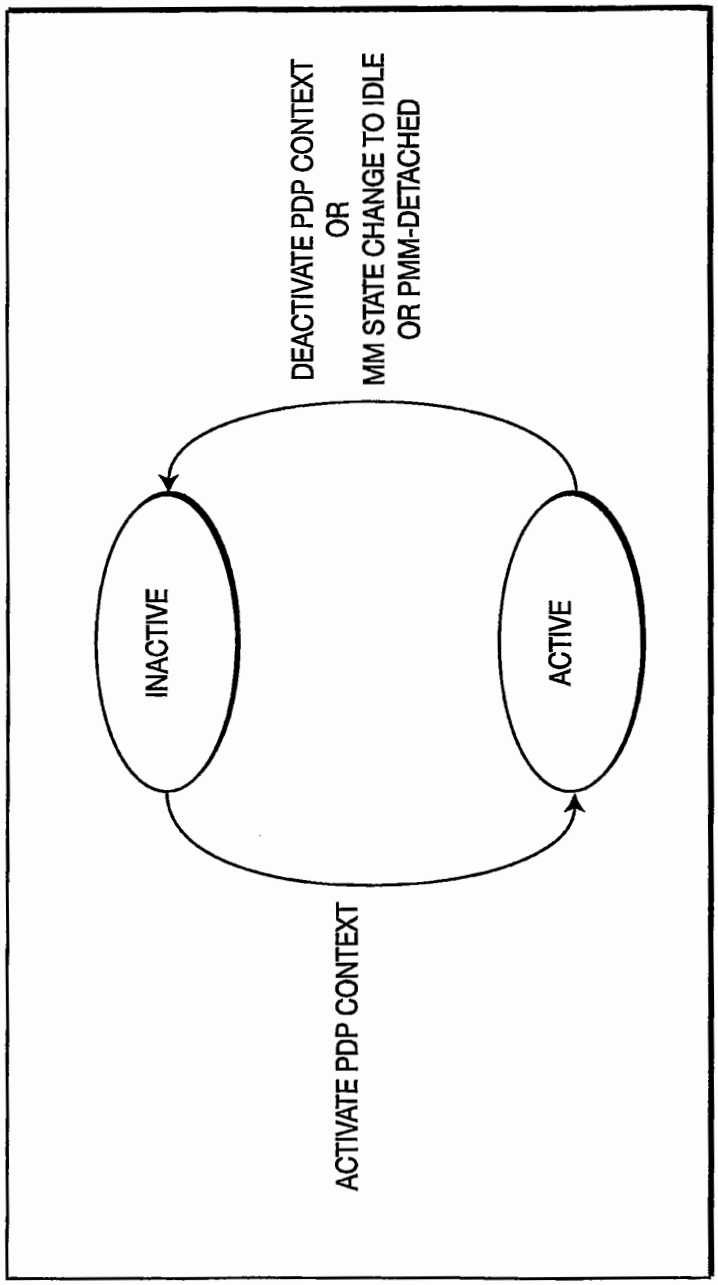


FIG. 4
PRIOR ART

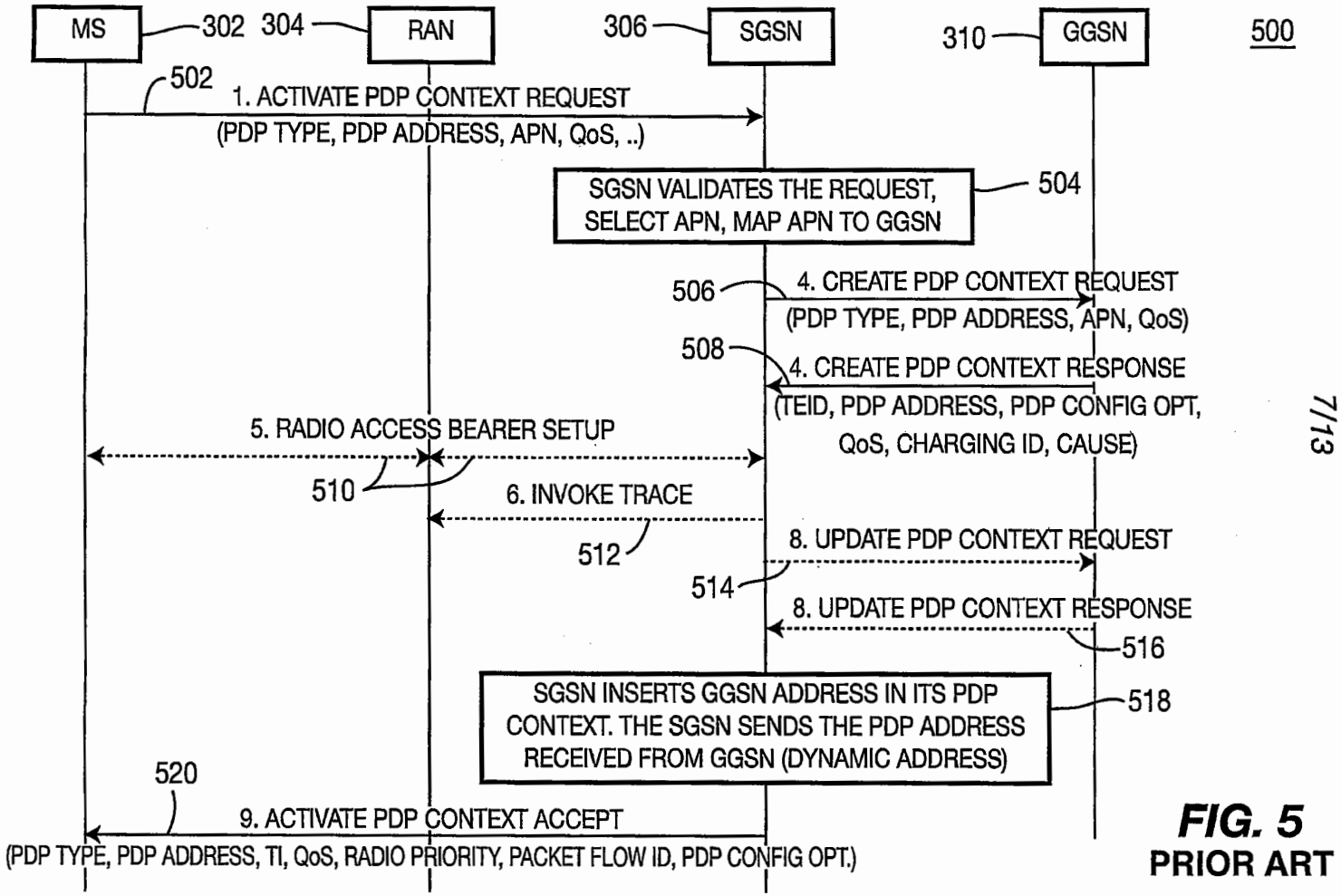


FIG. 5
PRIOR ART

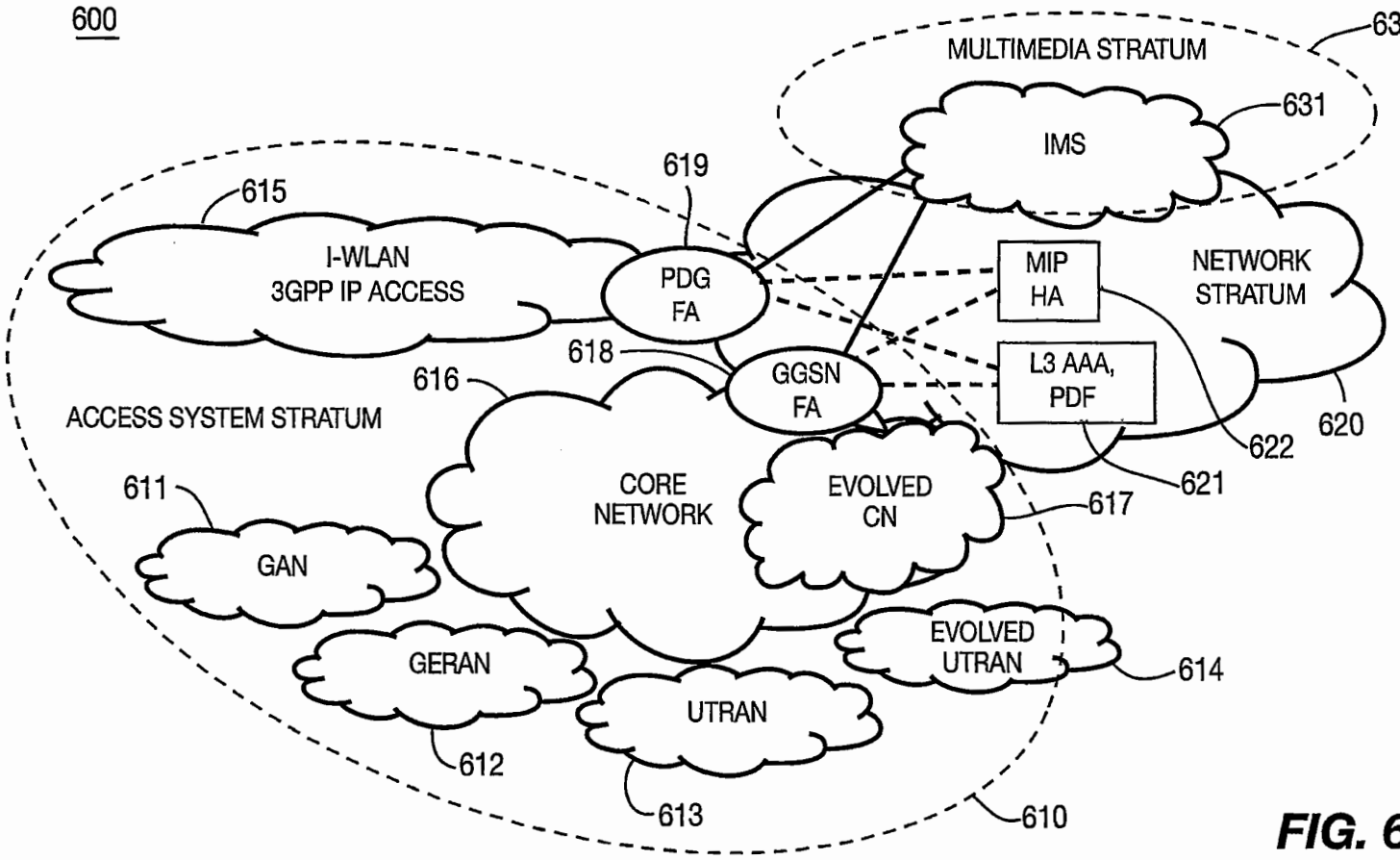

600
MULTIMEDIA STRATUM
630
631
IMS
619
615
I-WLAN
3GPP IP ACCESS
PDG
FA
MIP
HA
NETWORK
STRATUM
618
GGSN
FA
L3 AAA,
PDF
616
ACCESS SYSTEM STRATUM
620
622
621
CORE
NETWORK
EVOLVED
CN
617
611
GAN
EVOLVED
UTRAN
614
GERAN
UTRAN
612
613
610

FIG. 6

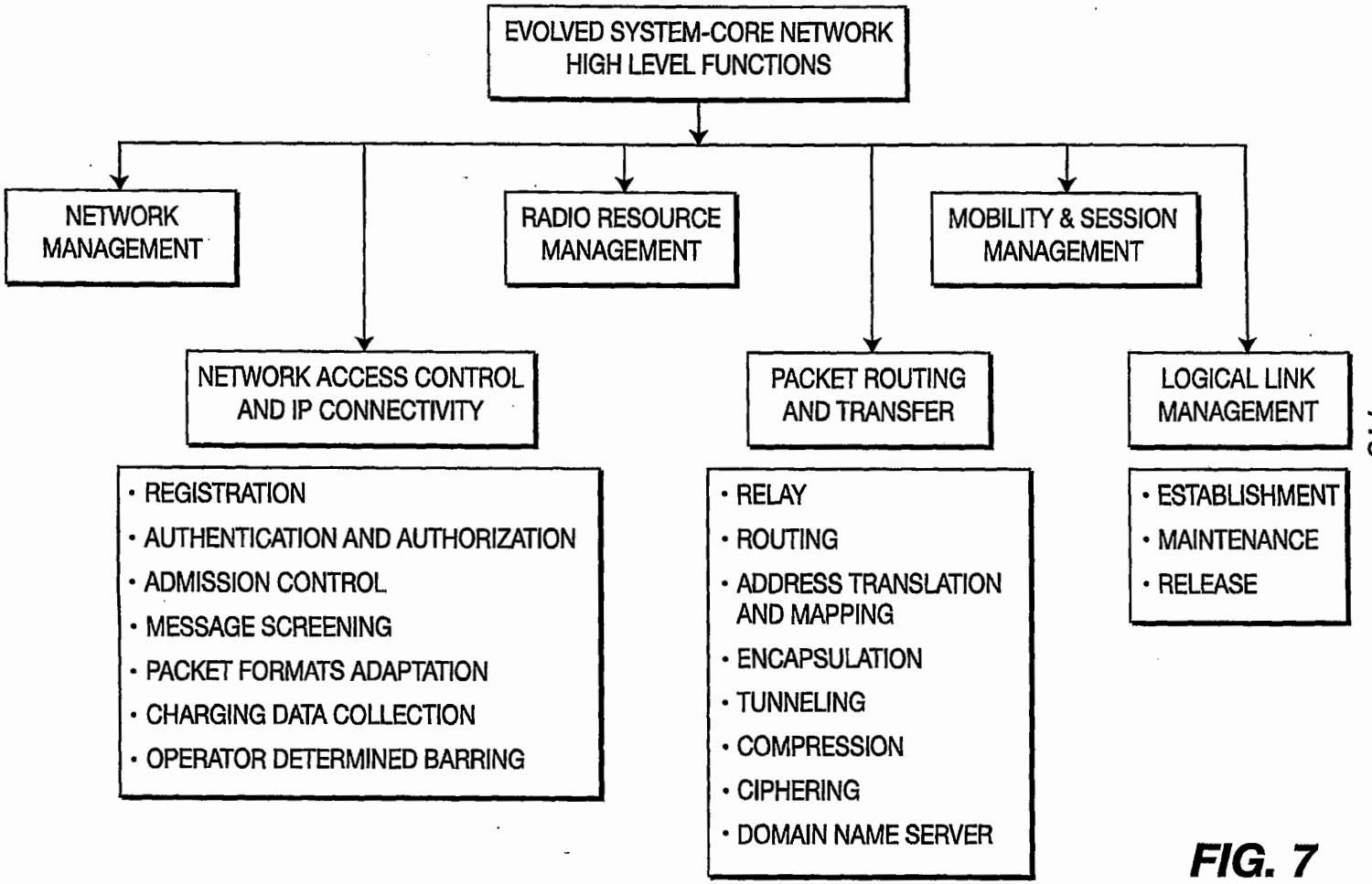
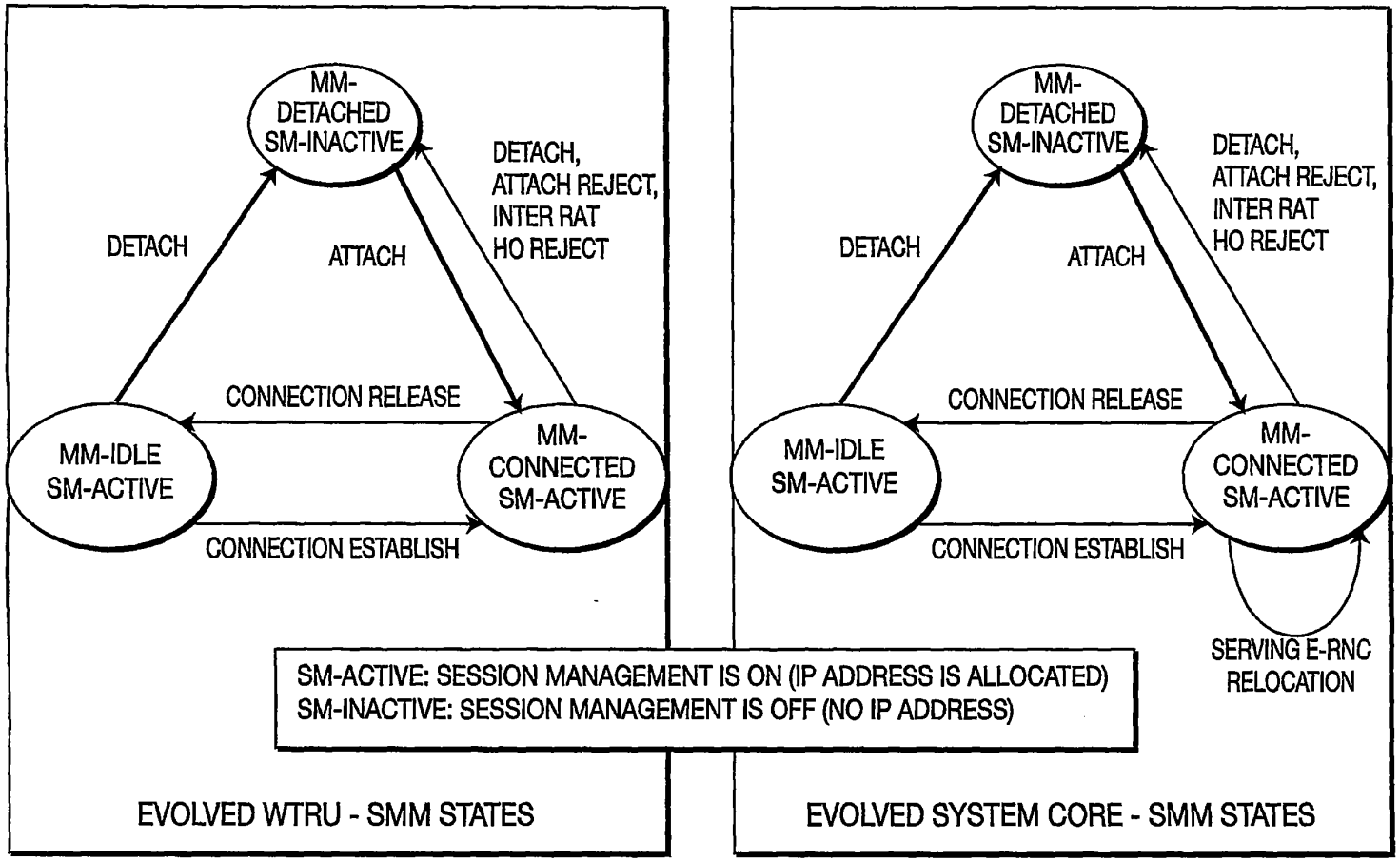

EVOLVED SYSTEM-CORE NETWORK HIGH LEVEL FUNCTIONS
NETWORK MANAGEMENT
RADIO RESOURCE MANAGEMENT
MOBILITY & SESSION MANAGEMENT
NETWORK ACCESS CONTROL AND IP CONNECTIVITY
PACKET ROUTING AND TRANSFER
LOGICAL LINK MANAGEMENT
• REGISTRATION
• AUTHENTICATION AND AUTHORIZATION
• ADMISSION CONTROL
• MESSAGE SCREENING
• PACKET FORMATS ADAPTATION
• CHARGING DATA COLLECTION
• OPERATOR DETERMINED BARRING
• RELAY
• ROUTING
• ADDRESS TRANSLATION AND MAPPING
• ENCAPSULATION
• TUNNELING
• COMPRESSION
• CIPHERING
• DOMAIN NAME SERVER
• ESTABLISHMENT
• MAINTENANCE
• RELEASE

FIG. 7


MM-
DETACHED
SM-INACTIVE
DETACH,
ATTACH REJECT,
INTER RAT
HO REJECT
DETACH
ATTACH
CONNECTION RELEASE
MM-IDLE
SM-ACTIVE
MM-
CONNECTED
SM-ACTIVE
CONNECTION ESTABLISH
SM-ACTIVE: SESSION MANAGEMENT IS ON (IP ADDRESS IS ALLOCATED)
SM-INACTIVE: SESSION MANAGEMENT IS OFF (NO IP ADDRESS)
EVOLVED WTRU - SMM STATES
MM-
DETACHED
SM-INACTIVE
DETACH,
ATTACH REJECT,
INTER RAT
HO REJECT
DETACH
ATTACH
CONNECTION RELEASE
MM-IDLE
SM-ACTIVE
MM-
CONNECTED
SM-ACTIVE
CONNECTION ESTABLISH
SERVING E-RNC
RELOCATION
EVOLVED SYSTEM CORE - SMM STATES

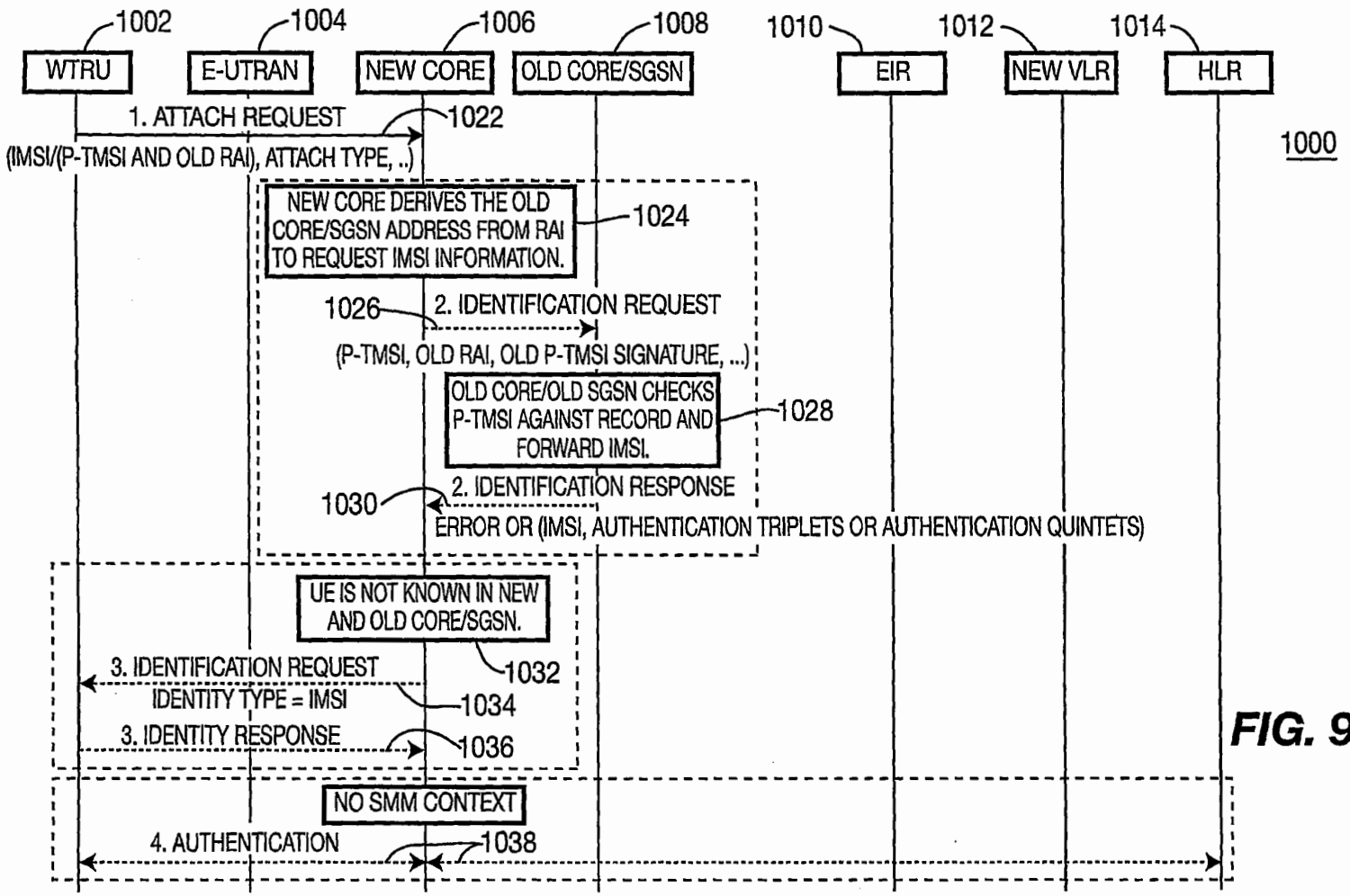

1002
1004
1006
1008
1010
1012
1014
WTRU
E-UTRAN
NEW CORE
OLD CORE/SGSN
EIR
NEW VLR
HLR
1000
1. ATTACH REQUEST
1022
(IMSI/(P-TMSI AND OLD RAI), ATTACH TYPE, ..)
NEW CORE DERIVES THE OLD CORE/SGSN ADDRESS FROM RAI TO REQUEST IMSI INFORMATION.
1024
1026
2. IDENTIFICATION REQUEST
(P-TMSI, OLD RAI, OLD P-TMSI SIGNATURE, ...)
OLD CORE/OLD SGSN CHECKS P-TMSI AGAINST RECORD AND FORWARD IMSI.
1028
1030
2. IDENTIFICATION RESPONSE
ERROR OR (IMSI, AUTHENTICATION TRIPLETS OR AUTHENTICATION QUINTETS)
UE IS NOT KNOWN IN NEW AND OLD CORE/SGSN.
1032
3. IDENTIFICATION REQUEST
IDENTITY TYPE = IMSI
1034
3. IDENTITY RESPONSE
1036
NO SMM CONTEXT
4. AUTHENTICATION
1038

FIG. 9A

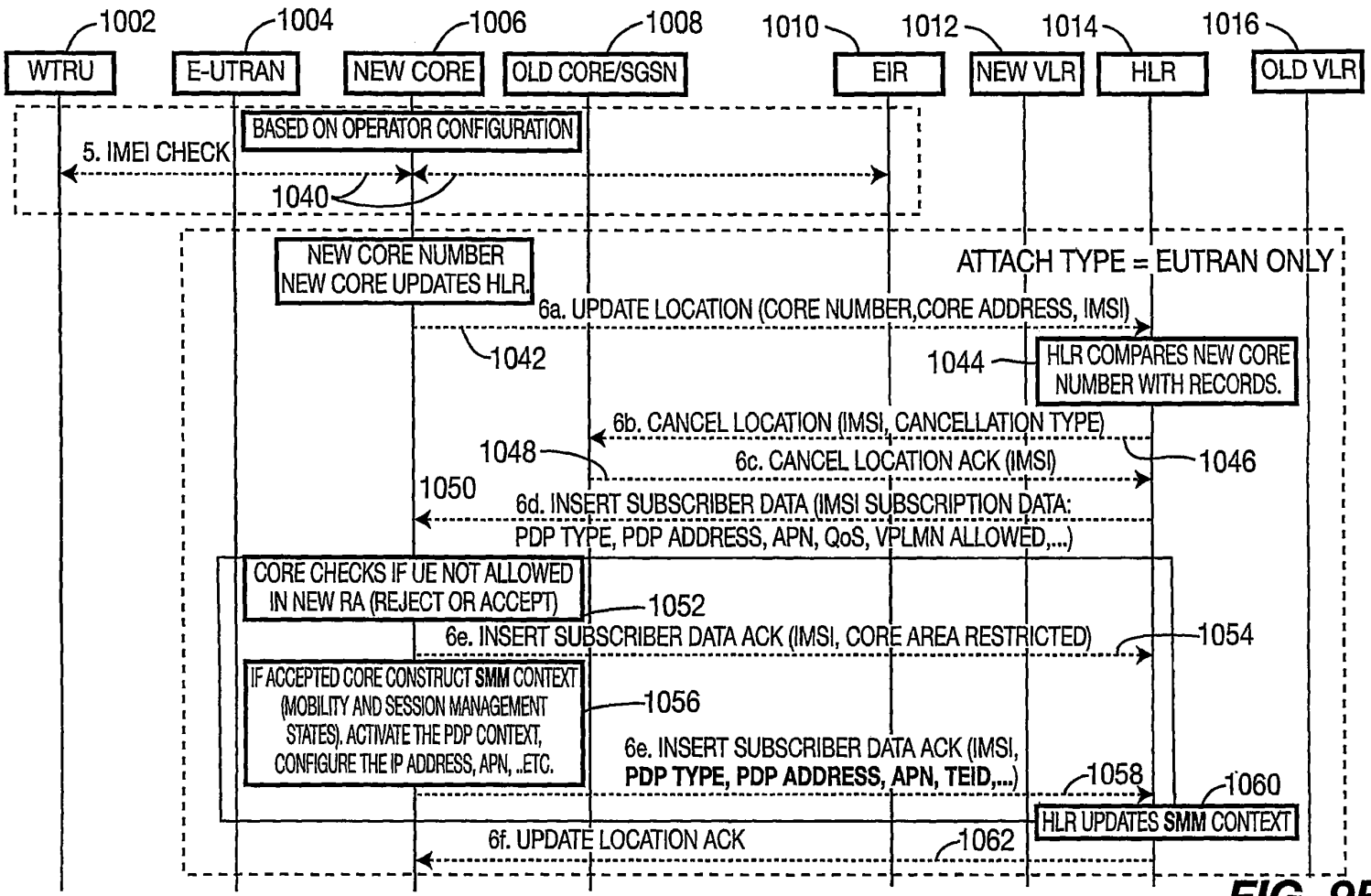

1002
1004
1006
1008
1010
1012
1014
1016
WTRU
E-UTRAN
NEW CORE
OLD CORE/SGSN
EIR
NEW VLR
HLR
OLD VLR
BASED ON OPERATOR CONFIGURATION
5. IMEI CHECK
1040
NEW CORE NUMBER
NEW CORE UPDATES HLR.
ATTACH TYPE = EUTRAN ONLY
6a. UPDATE LOCATION (CORE NUMBER,CORE ADDRESS, IMSI)
1042
1044
HLR COMPARES NEW CORE NUMBER WITH RECORDS.
6b. CANCEL LOCATION (IMSI, CANCELLATION TYPE)
1048
6c. CANCEL LOCATION ACK (IMSI)
1046
1050
6d. INSERT SUBSCRIBER DATA (IMSI SUBSCRIPTION DATA:
PDP TYPE, PDP ADDRESS, APN, QoS, VPLMN ALLOWED,...)
CORE CHECKS IF UE NOT ALLOWED IN NEW RA (REJECT OR ACCEPT)
1052
6e. INSERT SUBSCRIBER DATA ACK (IMSI, CORE AREA RESTRICTED)
1054
IF ACCEPTED CORE CONSTRUCT SMM CONTEXT (MOBILITY AND SESSION MANAGEMENT STATES). ACTIVATE THE PDP CONTEXT, CONFIGURE THE IP ADDRESS, APN, ..ETC.
1056
6e. INSERT SUBSCRIBER DATA ACK (IMSI, PDP TYPE, PDP ADDRESS, APN, TEID,...)
1058
1060
HLR UPDATES SMM CONTEXT
6f. UPDATE LOCATION ACK
1062

FIG. 9B

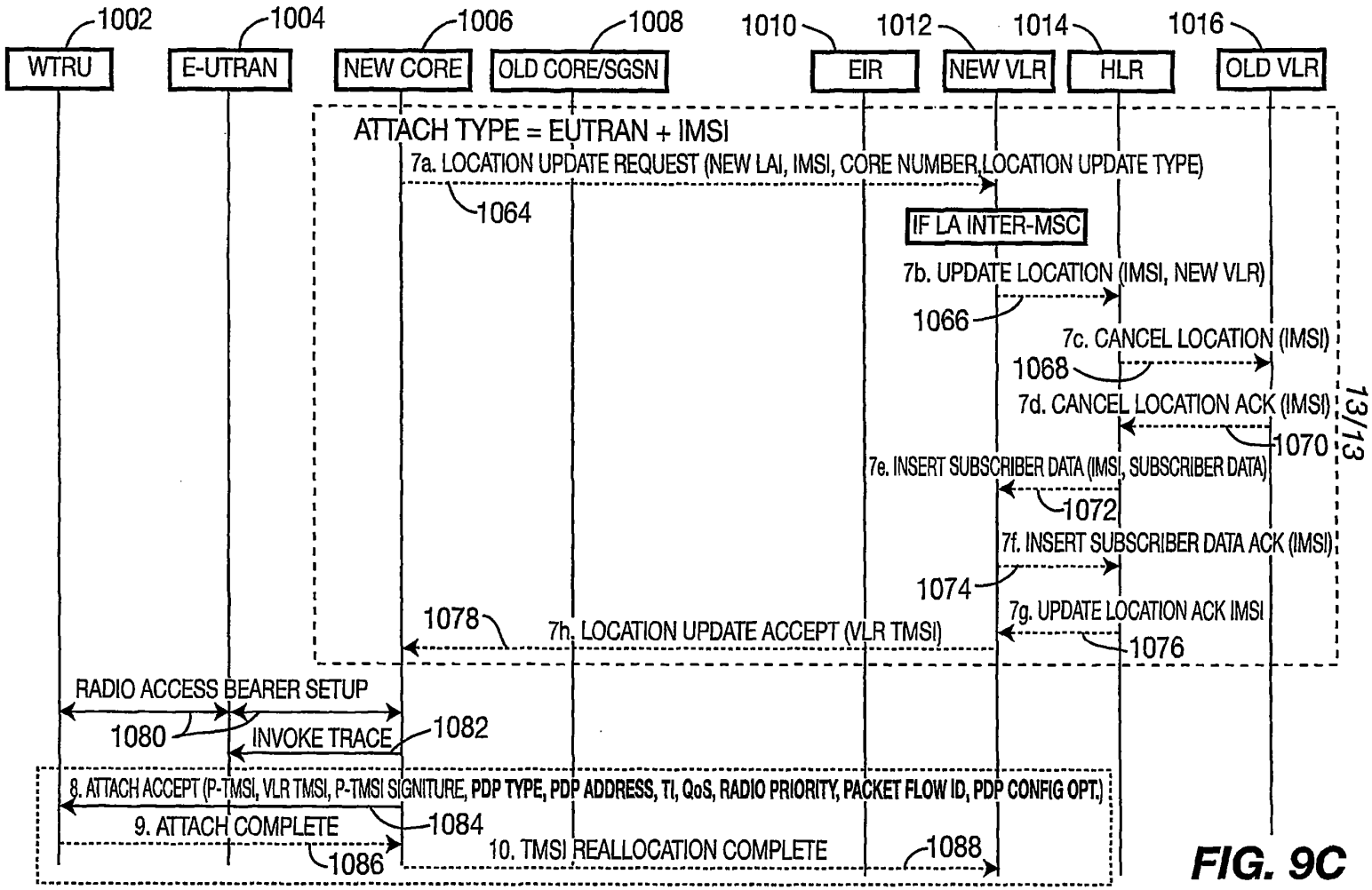

1002
1004
1006
1008
1010
1012
1014
1016
WTRU
E-UTRAN
NEW CORE
OLD CORE/SGSN
EIR
NEW VLR
HLR
OLD VLR
ATTACH TYPE = EUTRAN + IMSI
7a. LOCATION UPDATE REQUEST (NEW LAI, IMSI, CORE NUMBER, LOCATION UPDATE TYPE)
1064
IF LA INTER-MSC
7b. UPDATE LOCATION (IMSI, NEW VLR)
1066
7c. CANCEL LOCATION (IMSI)
1068
7d. CANCEL LOCATION ACK (IMSI)
1070
7e. INSERT SUBSCRIBER DATA (IMSI, SUBSCRIBER DATA)
1072
7f. INSERT SUBSCRIBER DATA ACK (IMSI)
1074
7g. UPDATE LOCATION ACK IMSI
1076
1078
7h. LOCATION UPDATE ACCEPT (VLR TMSI)
RADIO ACCESS BEARER SETUP
1080
INVOKE TRACE
1082
8. ATTACH ACCEPT (P-TMSI, VLR TMSI, P-TMSI SIGNITURE, PDP TYPE, PDP ADDRESS, TI, QoS, RADIO PRIORITY, PACKET FLOW ID, PDP CONFIG OPT.)
1084
9. ATTACH COMPLETE
1086
10. TMSI REALLOCATION COMPLETE
1088
13/13

FIG. 9C

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International Bureau

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11/485,082	12 July 2006 (12.07.2006)	US

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(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

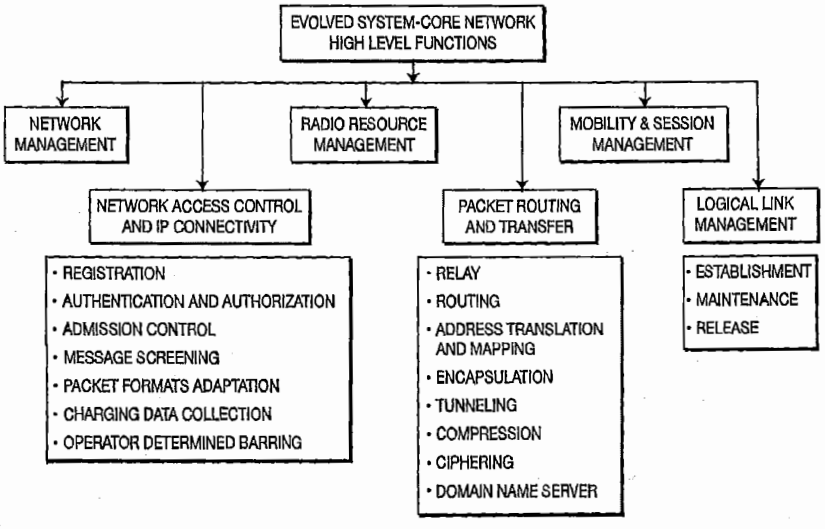
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(88) Date of publication of the international search report:
15 November 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: WIRELESS COMMUNICATION SYSTEM AND METHOD OF IMPLEMENTING AN EVOLVED SYSTEM ATTACHMENT PROCEDURE



(57) Abstract: A wireless communication system and method of implementing an evolved system attachment procedure are disclosed. The system includes a first core network and a second core network which is evolved from the first core network. A wireless transmit/receive unit (WTRU) sends an attach request message to the second core network. The second core network activates a packet data protocol (PDP) context and sends an attach accept message to the WTRU. The attach accept message includes information regarding the PDP context. The second core network constructs a session and mobility management (SMM) context for session management (SM) and mobility management (MM) for the WTRU.

WO 2007/011638 A3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US06/27183

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04L 12/28 (2007.01)
USPC - 370/395.21
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - H04L 12/28; H04L 12/56; H04J 3/16; H04J 3/22; H04Q 7/00; H04Q 7/24; H04L 12/66; H04B 7/005; H04M 1/66; H04M 1/88; H04M 3/16; H04Q 7/20 (2007.01)
USPC - 370/389, 401, 465, 328, 338, 352, 466, 278, 395.21, 469; 455/411, 422.1, 552.1, 334, 426.1, 445

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase, IP.com, DialogPro

Search Terms: WTRU, packet data protocol, mobility management, session management, core, network

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/0128963 A1 (GAZDA et al) 16 June 2006 (16.06.2005), entire document.	1-38
X	US 2005/0147061 A1 (FRANCOEUR et al) 07 July 2005 (07.07.2005), entire document.	39
X	US 2005/0009527 A1 (SHARMA) 13 January 2005 (13.01.2005), entire document.	39
A	US 2004/0240479 A1 (BOHNHOFF) 02 December 2004 (02.12.2004), entire document.	1-39
A	US 2004/0248615 A1 (PURKAYASTHA et al) 09 December 2004 (09.12.2004), entire document.	1-39

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 March 2007	29 AUG 2007
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US06/27183

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
See Extra Sheet (Page 10)

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims: it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US06/27183

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-38, drawn to a method/device for system attachment in an evolved wireless communication system.

Group II, claim 39, drawn to a state machine for session and mobility management.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical feature of the Group I invention, a wireless transmit/receive unit (WTRU) sending/receiving an attach request message to/from a second core network as claimed therein, is not present in Group II; and the special technical feature of the Group II invention, a mobility management (MM) and session management (SM) in various states as claimed therein, is not present in Group I.

Since none of the special technical features of the Group I and II inventions is found in more than one of the inventions, unity of invention is lacking.

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60/887,368 31 January 2007 (31.01.2007) US

(71) Applicant *(for all designated States except US)*: **INTERDIGITAL TECHNOLOGY CORPORATION** [US/US]; 3411 Silverside Road, Concord Plaza, Suite 105, Hagley Building, Wilmington, Delaware 19810 (US).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: **SHAHEEN, Kamel M.** [EG/US]; 429 Ashton Drive, King Of Prussia, Pennsylvania 19406 (US).

(74) Agent: **BALLARINI, Robert J.**; Volpe and Koenig, P.C., United Plaza, Suite 1600, 30 South 17th Street, Philadelphia, Pennsylvania 19103 (US).

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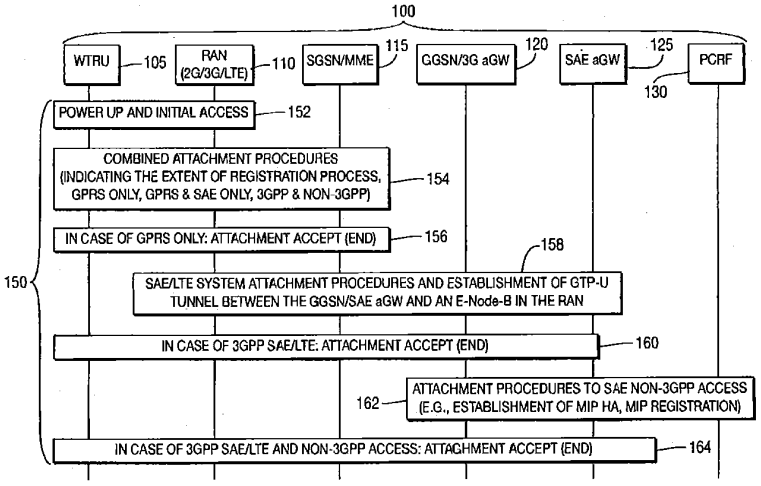
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(54) Title: METHOD AND APPARATUS FOR PERFORMING ATTACHMENT PROCEDURES



(57) Abstract: A method and apparatus for implementing an attachment procedure in multi-mode systems are disclosed. A wireless communication system includes at least one of a second generation (2G) system, a third generation (3G) system, a long term evolution (LTE) and system architecture evolution (SAE) of the 3G system and a non-3G system. For performing an attachment procedure, a wireless transmit/receive unit (WTRU) sends an attach request message to a new serving general packet radio service (GPRS) support node (SGSN) indicating an attach type. The new SGSN and the WTRU then perform an attachment procedure based on the attach type. The attach type may indicate a GPRS only attachment, a GPRS and SAE attachment, or a 3GPP and non-3GPP attachment.

WO 2008/094419 A1

[0001] # METHOD AND APPARATUS FOR PERFORMING ATTACHMENT PROCEDURES

[0002] ## FIELD OF INVENTION

[0003] This application is related to wireless communications.

[0004] ## BACKGROUND

[0005] Long term evolution (LTE) and system architecture evolution (SAE) of a third generation (3G) wireless communication system are being developed to provide higher data rates, lower latency, and support of multiple radio access technologies (RATs). The main features of the LTE include an enhanced air interface to handle higher data rates with more efficiency, optimization of conventional procedures to reduce the number of signaling procedures and reduce setup delay, and network design to permit interconnection and interoperation of any air interface, such as global system for mobile communications (GSM), general packet radio service (GPRS), wideband code division multiple access (WCDMA), code division multiple access 2000 (CDMA 2000), IEEE 802.xx, and the like.

[0006] ## SUMMARY

[0007] A method and apparatus for performing attachment procedures are disclosed. The attachment procedures are performed in a multi-mode wireless communication system including at least one of a second generation (2G) system, a 3G system, an LTE and SAE of the 3G system and a non-3G system. A wireless transmit/receive unit (WTRU) sends an attach request message to a new serving GPRS support node (SGSN) indicating an attach type. The new SGSN and the WTRU then perform an attachment procedure based on the attach type. The attach type may indicate a GPRS only attachment, a GPRS and SAE attachment, or third generation partnership project (3GPP) and non-3GPP attachment.

[0008] The new architecture disclosed herein allows for multiple mobility management for a data session at the core network and the interworking between a 3GPP network and other networks, (e.g., CDMA 2000, worldwide interoperability for microwave access (WiMAX), and the like).

[0009] BRIEF DESCRIPTION OF THE DRAWINGS

[0010] A more detailed understanding may be had from the following description, given by way of example in conjunction with the accompanying drawings wherein:

[0011] Figure 1 is a signaling diagram of a simplified attachment procedure;

[0012] Figures 2A-2D, taken together, are a signaling diagram of an attachment procedure implemented during a handover;

[0013] Figure 3 is a block diagram of a WTRU used to perform the attachment procedures of Figures 2A-2D;

[0014] Figure 4 is a block diagram of an SGSN/mobility management entity (MME) used to perform the attachment procedures of Figures 2A-2D;

[0015] Figure 5 is a block diagram of a gateway GPRS support node (GGSN)/3G access gateway (aGW) used to perform the attachment procedures of Figures 2A-2D; and

[0016] Figure 6 is a block diagram of an SAE aGW used to perform the attachment procedures of Figures 2A-2D.

[0017] DETAILED DESCRIPTION

[0018] When referred to hereafter, the terminology "WTRU" includes but is not limited to a user equipment (UE), a mobile station, a fixed or mobile subscriber unit, a pager, a cellular telephone, a personal digital assistant (PDA), a computer, or any other type of user device capable of operating in a wireless environment. When referred to hereafter, the terminology "base station" includes but is not limited to a Node-B, a site controller, an access point (AP), or any other type of interfacing device capable of operating in a wireless environment.

[0019] Figure 1 is a signaling diagram of a simplified attachment procedure 150 implemented in a wireless communication system 100 including a WTRU 105, a radio access network (RAN) 110, a SGSN/MME 115, a GGSN/3G aGW 120, an SAE aGW 125 and a policy and charging rules function (PCRF) unit 130. Upon power up, the WTRU 105 establishes an initial access to an evolved Node-B (eNB) in the RAN 110, (i.e., 2G, 3G or LTE RAN) (step 152). The WTRU 105, the RAN 110 and the SSGN/MME 115 perform combined attachment procedures (step 154). For the various combined attachment procedures presented in Figure 1, the extent of registration process, (i.e., GPRS only, GPRS and LTE/SAE only, and 3GPP and non-3GPP), is indicated.

[0020] The SGSN/MME 115 is configured to determine the type of registration by examining an information element (IE) included in the attach request message received from the WTRU 105. A legacy message format will identify the "GPRS only" registration. An SAE registration will be marked by the IE indicating the capability of the WTRU 105 as an SAE WTRU or an LTE WTRU. In the case of non-3GPP support, the WTRU 105 will indicate the type of mobility management required to support non-3GPP systems, (i.e., GPRS tunneling protocol (GTP) or mobile Internet protocol (MIP)). For MIP, the WTRU 105 indicates whether MIPv4, proxy MIP, or MIPv6 is being implemented. This may be either conveyed by indicating the IP version that is supported. For MIPv6, the WTRU 105 will indicate dual stack IPv6 support. In case of IPv4, the network may be configured to support proxy MIP.

[0021] In case of GPRS only, in response to an initial attach, the SGSN/MME 115 will send an attachment accept message (without the allocated IP address) to the WTRU 105. In case of the SAE, the GGSN/3G aGW 120 will send the attachment accept message to the SGSN/MME 115, which will forward it to the WTRU 105. This attachment accept message will include the IP address and the type of IP protocol (v4 or v6). In case of SAE and non-3GPP, the attachment accept message will indicate the successful home agent (HA) registration process so that the MIP client in the WTRU 105 is initiated. This is in response to the initial attach request message sent by the WTRU 105, which

indicates which mobility management it supports for interworking with non-3GPP systems, (i.e., 3GPP GTP, MIP (v4, v6).

[0022] If the registration is for GPRS only, the attachment procedure is performed between the WTRU 105 and the SGSN/MME 115. Once attachment is established, an attachment accept message is sent (step 156).

[0023] If the registration is for 3GPP SAE/LTE, a GTP-U tunnel is established between a GPRS gateway support node (GGSN)/3G access gateway (aGW) and an eNB of the RAN (step 158). Once an attachment is established, an attachment accept message is sent (step 160).

[0024] If the registration is for 3GPP SAE/LTE and non-3GPP access, the attachment procedure for the SAE non-3GPP and policy and charging rules function (PCRF) is performed at step 162, (e.g., for establishment of mobile Internet protocol (MIP) home agent (HA), MIP registration, or the like). Once attachment is established, an attachment accept message is sent at step 164.

[0025] Figure 2A is a signaling diagram of a simplified attachment procedure 250 implemented in a wireless communication system 200 including a WTRU 205, a RAN 210, a new SGSN/MME 215, an old SGSN/MME 220, a GGSN/3G aGW 225, an SAE aGW 230, a new visited location register (VLR) 235, a home location register (HLR) 240 and an old VLR 245. The WTRU 205 initiates the attach procedure by the transmission of an attach request message to the new SGSN/MME 215 (step 252). The attach request message includes an international mobile subscriber identity (IMSI), an attach type, or the like (step 254). Alternatively, instead of sending the IMSI, the attach request message may include a packet-temporary mobile subscriber identity (P-TMSI) and an old routing area identity (RAI). The attach type indicates the attachment type, such as 2G, 3G or SAE multimode attachment.

[0026] If the WTRU 205 identifies itself with the P-TMSI, the new SGSN/MME 215 derives an old SGSN address from the RAI to request IMSI information of the WTRU 205 (step 256). The new SGSN/MME 215 sends an identification request message to the old SGSN/MME 220 (step 258). The identification request message includes a P-TMSI, an old RAI, old P-TMSI

signature; and the like. The old SGSN/MME 220 checks the P-TMSI against a record (step 260), and sends an identification response message with the IMSI of the WTRU 205 to the new SGSN/MME (step 262). If the WTRU 205 is known in the old SGSN/MME 220, the old SGSN/MME 220 responds with an identification response message including the IMSI, authentication triplets or authentication quintets in step 262. If the WTRU 205 is not known in the old SGSN/MME 220 or the old P-TMSI does not match the value stored in the old SGSN/MME 220, the old SGSN/MME 220 responds with an appropriate error indication in the identification response message at step 262.

[0027] If the WTRU 205 is unknown in the new SGSN/MME 215 and the old SGSN/MME 220 (step 264), the new SGSN/MME 215 sends an identity (ID) request (setting an ID type to IMSI) to the WTRU 205 (step 266). The WTRU 205 responds with an ID response including the IMSI of the WTRU 205 (step 268).

[0028] If no multi-mode (MM) context for the WTRU is evident (step 270), an authentication procedure is performed by the WTRU, the new SGSN/MME 215 and the HLR 240 (steps 272A and 272B).

[0029] Referring to Figure 2B, an attachment procedure 350 for GPRS only is presented in further detail. Based on operator configuration (step 352), an international mobile equipment identity (IMEI) checking procedure may optionally be performed by the WTRU 205, the new SGSN/MME 215 and the GGSN/3G aGW 225 (steps 354A and 354B).

[0030] If the SGSN/MME number has changed since the last GPRS detach, or if it is the very first attach, the new SGSN/MME 215 updates the HLR 240 by sending an update location message to the HLR (steps 356 and 358). The update location message includes an SGSN/MME number, SGSN/MME address, the IMSI, and the like.

[0031] The HLR 240 compares the SGSN/MME number with records and sends a cancel location message (including IMSI and/or cancellation type) to the old SGSN/MME (steps 362 and 364). The old SGSN/MME 220 acknowledges with a cancel location acknowledgement (ACK) with IMSI (step 366). The HLR

240 then sends an insert subscriber data message to the new SGSN/MME 215 (step 368). The insert subscriber data message includes the IMSI, GPRS/SAE subscription data, packet data protocol (PDP) type, PDP address, access point name (APN), quality of service (QoS), virtual public land mobile network (VPLMN) allowed, and a multi-system registration accepted or rejected indication.

[0032] The new SGSN/MME 215 checks if the WTRU 205 is not allowed in the new routing area (RA) (step 370). If due to regional subscription restrictions or access restrictions the WTRU is not allowed to attach in the RA, the new SGSN/MME 215 rejects the attach request with an appropriate cause, and may return an insert subscriber data acknowledgement (ACK) (including the IMSI and/or an SGSN area restricted message) to the HLR 240 (step 372). If the subscription checking fails for other reasons, the new SGSN/MME also rejects the attach request with an appropriate cause and returns an insert subscriber data ACK (including the IMSI and/or an SGSN area restricted message) to the HLR (step 372). If all checks are successful, the new SGSN/MME 215 constructs an MM context for the WTRU 205 (step 374) and returns an insert subscriber data ACK (including the IMSI) to the HLR 240 (step 376). The HLR 240 then updates the MM context (step 378) and sends an update location ACK to the new SGSN/MME 215 (step 380).

[0033] Referring to Figure 2C, an attach procedure 450 for a GPRS with IMSI attach type is presented in greater detail. If the attach type indicated in the attach request indicates a combined GPRS/IMSI attach, the new VLR 235 should be updated. The new SGSN/MME 215 sends a location update request to the new VLR 235 (step 452). The location update request includes a new LAI, the IMSI, an SGSN number, a location update type and the like.

[0034] The new VLR 235 creates an association with the new SGSN/MME 215 by storing the SGSN number. If the location update is inter-mobile switching center (MSC), the new VLR 235 sends an update location message (including the IMSI and a new VLR address) to the HLR 240 (step 454). The HLR 240 then sends a cancel location message to an old VLR 245 (step 456). The

old VLR 245 acknowledges with a cancel location ACK (step 458). The HLR 240 sends an insert subscriber data message (including the IMSI and/or subscriber data) to the new VLR 235 (step 460). The new VLR 235 acknowledges with an insert subscriber data ACK with IMSI (step 462). After finishing the inter-MSC location update procedures, the HLR 240 responds with an update location ACK to the new VLR 235 with the IMSI (step 464). The new VLR 235 responds with a location update accept message (including VLR TMSI) to the new SGSN/MME 215 (step 466).

[0035] A second attach type is also shown in Figure 2C, which is an SAE/non-3GPP with IMSI attach procedure. In step 468, the new SGSN/MME 215 sends a create PDP context request message to the GGSN/3G aGW 225. The GGSN/3G aGW 225 responds with a create PDP context response message to the new SGSN/MME 215 (step 470). The new SGSN/MME 215 sends a message for establishing a tunnel to the GGSN/3G aGW (step 472) and a radio access bearer (RAB) to the RAN (step 474). An RAB then is established between the WTRU 205 and the RAN 210, and the RAN 210 sends a tunnel establishment and RAB setup ACK to the new SGSN/MME 215 (step 476) after a GTP-U tunnel is established between the RAN and the GGSN/3G aGW (step 478).

[0036] Referring to Figure 2D, an attach procedure 550 for an SAE with IMSI attach type is presented. The GGSN/3G aGW 225 recognizes the multimode registration and invokes non-3GPP registration and mobility protocol (step 552). The GGSN/3G aGW 225 sends a non-3GPP attach request message to an SAE aGW (step 554). The SAE aGW 230 establishes a session state for the WTRU 205 and inter system mobility registration, (e.g., MIP), (step 556). A QoS profile is then downloaded from a policy and charging rule function (PCRF) unit 250 (step 558). The SAE aGW 230 sends a non-3GPP attach accept message to the GGSN/3G aGW 225 (step 560). The GGSN/3G aGW 230 sends a 3GPP-based and non-3GPP-based attach accept message to the new SGSN/MME 215 (step 562).

[0037] The new SGSN/MME 215 forwards the attach accept message to the WTRU 205 indicating success or failure of the 3GPP and non-3GPP attachment

(step 564). The WTRU 205 then sends an attach complete message to the new SGSN/MME (step 266).

[0038] Figure 3 is a block diagram of a WTRU 300 configured to implement the attachment procedures of Figures 2A-2D. The WTRU 300 includes a transmitter 305, a receiver 310, a processor 315 and an antenna 320.

[0039] The processor 315 is configured to generate at least one IE that indicates at least one of the capability of the WTRU and the type of mobility management required to support the WTRU in a non- 3GPP system. The IE may indicate that the WTRU is SAE capable or LTE capable. The IE may indicate that GTP or MIP mobility management or is required to support the WTRU in a non-3GPP system. For MIP mobility management, the IE may further indicate whether MIPv4, proxy MIP or MIPv6 mobility management is required. The attach request message may include an IMSI and an attach type indicator. The attach type indicator may indicate a 2G multimode attachment, a 3G multimode attachment or an SAE multimode attachment.

[0040] The transmitter 305 is configured to transmit an attach request message including the at least one IE and an IMSI. Alternatively, the transmitter 305 may be configured to transmit an attach request message including a P-TMSI, an old RAI and an attach type indicator. The receiver 310 is configured to receive an attach accept message and an identity request message.

[0041] Figure 4 is a block diagram of an SGSN/MME 400 configured to implement the attachment procedures of Figures 2A-2D. The SGSN/MME 400 includes a transmitter 405, a receiver 410, a processor 415 and an antenna 420. The receiver 410 is configured to receive an attach request message including at least one of an attach type indicator and preferred mobility management information. The processor 415 is configured to determine an extent of a registration process based on the attach type indicator. The extent of the registration process may be GPRS only, GPRS and SAE/LTE only, or 3GPP and non-3GPP.

[0042] Figure 5 is a block diagram of a GGSN/3G aGW 500 configured to implement the attachment procedures of Figures 2A-2D. The GGSN/3G aGW

500 includes a transmitter 505, a receiver 510, a processor 515 and an antenna 520. The processor 515 is configured to recognize a multimode registration and invoke non-3GPP registration/mobility protocol. The transmitter 505 is configured to transmit a non-3GPP attach request message. The receiver 510 is configured to receive a non-3GPP attach accept message in response to the non-3GPP attach request message.

[0043] Figure 6 is a block diagram of an SAE aGW 600 configured to implement the attachment procedures of Figures 2A-2D. The SAE aGW 600 includes a transmitter 605, a receiver 610, a processor 615 and an antenna 620. The receiver 610 is configured to receive a non-3GPP attach request message and a quality of service (QoS) profile. The processor 615 is configured to establish a session state for a WTRU and inter-system mobility registration. The transmitter 605 is configured to transmit a non-3GPP attach accept message to indicate that the inter-system mobility registration has been completed. The inter-system mobility registration may be a MIP registration.

[0044] **Embodiments**

1. A wireless transmit/receive unit (WTRU) comprising:

a processor configured to generate at least one information element (IE) that indicates at least one of the capability of the WTRU and the type of mobility management required to support the WTRU in a non-third generation partnership project (3GPP) system;

a transmitter configured to transmit an attach request message including the at least one IE; and

a receiver configured to receive an attach accept message.

2. The WTRU of embodiment 1 wherein the IE indicates that the WTRU is system architecture evolution (SAE) capable.

3. The WTRU of embodiment 1 wherein the IE indicates that the WTRU is long term evolution (LTE) capable.

4. The WTRU of embodiment 1 wherein the IE indicates that general packet radio service (GPRS) tunneling protocol (GTP) mobility management is required to support the WTRU in a non-3GPP system.

5. The WTRU of embodiment 1 wherein the IE indicates that mobile Internet protocol (MIP) mobility management is required to support the WTRU in a non-3GPP system.

6. The WTRU of embodiment 5 wherein the IE indicates whether MIPv4, proxy MIP or MIPv6 mobility management is required.

7. The WTRU as in any one of embodiments 1-6 wherein the attach request message includes an international mobile subscriber identity (IMSI).

8. The WTRU as in any one of embodiments 1-6 wherein the attach request message includes a packet-temporary mobile subscriber identity (P-TMSI) and an old routing area identity (RAI).

9. The WTRU as in any one of embodiments 1-6 wherein the attach request message includes a request for a second generation (2G) multimode attachment.

10. The WTRU as in any one of embodiments 1-6 wherein the attach request message includes a request for a third generation (3G) multimode attachment.

11. The WTRU as in any one of embodiments 1-6 wherein the attach request message includes a request for a system architecture evolution (SAE) multimode attachment.

12. A serving general packet radio service (GPRS) support node (SGSN)/mobility management entity (MME) comprising:

a receiver configured to receive an attach request message including at least one information element (IE) that indicates at least one of the capability of the WTRU and the type of mobility management required to support the WTRU in a non-third generation partnership project (3GPP) system;

a processor configured to determine an extent of a registration process based on the at least one of the IE and the mobility management type; and

a transmitter configured to transmit instruction messages for performing an attachment procedure associated with the WTRU in accordance with at least one of the capability of the WTRU and the type of mobility management required to support the WTRU.

13. The SGSN/MME of embodiment 12 wherein the extent of the registration process is GPRS only.

14. The SGSN/MME of embodiment 12 wherein the extent of the registration process is GPRS and system architecture evolution (SAE)/long term evolution (LTE) only.

15. The SGSN/MME of embodiment 12 wherein the extent of the registration process is third generation partnership project (3GPP) and non-3GPP.

16. A wireless transmit/receive unit (WTRU) comprising:

a receiver configured to receive an identity request message; and

a transmitter configured to transmit an identity response message, and an attach request message including a packet-temporary mobile subscriber identity (P-TMSI), an old routing area identity (RAI) and an attach type indicator.

17. The WTRU of embodiment 16 wherein attach type indicator indicates a second generation (2G) multimode attachment.

18. The WTRU of embodiment 16 wherein attach type indicator indicates a third generation (3G) multimode attachment.

19. The WTRU of embodiment 16 wherein attach type indicator indicates a system architecture evolution (SAE) multimode attachment.

20. A gateway general packet radio service (GPRS) support node (GGSN)/mobility management entity (MME) comprising:

a processor configured to recognize a multimode registration and invoke non-third generation partnership project (3GPP) registration/mobility protocol;

a transmitter configured to transmit a non-3GPP attach request message; and

a receiver configured to receive a non-3GPP attach accept message in response to the non-3GPP attach request message.

21. A wireless transmit/receive unit (WTRU) comprising:

a receiver configured to receive an attach accept message indicating success or failure of a third generation partnership project (3GPP) and non-3GPP attachment;

a processor configured to generate an attach complete message indicating that the WTRU is ready for non-3GPP interworking mobility; and

a transmitter configured to transmit the attach complete message.

22. A system architecture evolution (SAE) access gateway (aGW) comprising:

a receiver configured to receive a non-third generation partnership project (3GPP) attach request message and a quality of service (QoS) profile;

a processor configured to establish a session state for a wireless transmit/receive unit (WTRU) and inter-system mobility registration; and

a transmitter configured to transmit a non-3GPP attach accept message to indicate that the inter-system mobility registration has been completed.

23. The SAE aGW of embodiment 22 wherein the inter-system mobility registration is a mobile Internet protocol (MIP) registration.

[0045] Although features and elements are described above in particular combinations, each feature or element can be used alone without the other features and elements or in various combinations with or without other features and elements. The methods or flow charts provided herein may be implemented in a computer program, software, or firmware incorporated in a computer-readable storage medium for execution by a general purpose computer or a processor. Examples of computer-readable storage mediums include a read only memory (ROM), a random access memory (RAM), a register, cache memory, semiconductor memory devices, magnetic media such as internal hard disks and removable disks, magneto-optical media, and optical media such as CD-ROM disks, and digital versatile disks (DVDs).

[0046] Suitable processors include, by way of example, a general purpose processor, a special purpose processor, a conventional processor, a digital signal processor (DSP), a plurality of microprocessors, one or more microprocessors in association with a DSP core, a controller, a microcontroller, Application Specific Integrated Circuits (ASICs), Field Programmable Gate Arrays (FPGAs) circuits, any other type of integrated circuit (IC), and/or a state machine.

[0047] A processor in association with software may be used to implement a radio frequency transceiver for use in a wireless transmit receive unit (WTRU), user equipment (UE), terminal, base station, radio network controller (RNC), or any host computer. The WTRU may be used in conjunction with modules, implemented in hardware and/or software, such as a camera, a video camera module, a videophone, a speakerphone, a vibration device, a speaker, a microphone, a television transceiver, a hands free headset, a keyboard, a Bluetooth® module, a frequency modulated (FM) radio unit, a liquid crystal display (LCD) display unit, an organic light-emitting diode (OLED) display unit, a digital music player, a media player, a video game player module, an Internet browser, and/or any wireless local area network (WLAN) module.

* * *

CLAIMS

What is claimed is:

1. A wireless transmit/receive unit (WTRU) comprising:

a processor configured to generate at least one information element (IE) that indicates at least one of the capability of the WTRU and the type of mobility management required to support the WTRU in a non-third generation partnership project (3GPP) system;

a transmitter configured to transmit an attach request message including the at least one IE; and

a receiver configured to receive an attach accept message.

2. The WTRU of claim 1 wherein the IE indicates that the WTRU is system architecture evolution (SAE) capable.

3. The WTRU of claim 1 wherein the IE indicates that the WTRU is long term evolution (LTE) capable.

4. The WTRU of claim 1 wherein the IE indicates that general packet radio service (GPRS) tunneling protocol (GTP) mobility management is required to support the WTRU in a non-3GPP system.

5. The WTRU of claim 1 wherein the IE indicates that mobile Internet protocol (MIP) mobility management is required to support the WTRU in a non-3GPP system.

6. The WTRU of claim 5 wherein the IE indicates whether MIPv4, proxy MIP or MIPv6 mobility management is required.

7. The WTRU of claim 1 wherein the attach request message includes an international mobile subscriber identity (IMSI).

8. The WTRU of claim 1 wherein the attach request message includes a packet-temporary mobile subscriber identity (P-TMSI) and an old routing area identity (RAI).

9. The WTRU of claim 1 wherein the attach request message includes a request for a second generation (2G) multimode attachment.

10. The WTRU of claim 1 wherein the attach request message includes a request for a third generation (3G) multimode attachment.

11. The WTRU of claim 1 wherein the attach request message includes a request for a system architecture evolution (SAE) multimode attachment.

12. A serving general packet radio service (GPRS) support node (SGSN)/mobility management entity (MME) comprising:

a receiver configured to receive an attach request message including at least one information element (IE) that indicates at least one of the capability of the WTRU and the type of mobility management required to support the WTRU in a non-third generation partnership project (3GPP) system;

a processor configured to determine an extent of a registration process based on the at least one of the IE and the mobility management type; and

a transmitter configured to transmit instruction messages for performing an attachment procedure associated with the WTRU in accordance with at least one of the capability of the WTRU and the type of mobility management required to support the WTRU.

13. The SGSN/MME of claim 12 wherein the extent of the registration process is GPRS only.

14. The SGSN/MME of claim 12 wherein the extent of the registration process is GPRS and system architecture evolution (SAE)/long term evolution (LTE) only.

15. The SGSN/MME of claim 12 wherein the extent of the registration process is third generation partnership project (3GPP) and non-3GPP.

16. A wireless transmit/receive unit (WTRU) comprising:

a receiver configured to receive an identity request message;

a processor configured to generate an identity response message, and an attach request message including a packet-temporary mobile subscriber identity (P-TMSI), an old routing area identity (RAI) and an attach type indicator; and

a transmitter configured to transmit the identity response message and the attach request message.

17. The WTRU of claim 16 wherein attach type indicator indicates a second generation (2G) multimode attachment.

18. The WTRU of claim 16 wherein attach type indicator indicates a third generation (3G) multimode attachment.

19. The WTRU of claim 16 wherein attach type indicator indicates a system architecture evolution (SAE) multimode attachment.

20. A gateway general packet radio service (GPRS) support node (GGSN)/mobility management entity (MME) comprising:

a processor configured to recognize a multimode registration and invoke non-third generation partnership project (3GPP) registration/mobility protocol;

a transmitter configured to transmit a non-3GPP attach request message; and

a receiver configured to receive a non-3GPP attach accept message.

21. A wireless transmit/receive unit (WTRU) comprising:

a receiver configured to receive an attach accept message indicating success or failure of a third generation partnership project (3GPP) and non-3GPP attachment;

a processor configured to generate an attach complete message indicating that the WTRU is ready for non-3GPP interworking mobility; and

a transmitter configured to transmit the attach complete message.

22. A system architecture evolution (SAE) access gateway (aGW) comprising:

a receiver configured to receive a non-third generation partnership project (3GPP) attach request message and a quality of service (QoS) profile;

a processor configured to establish a session state for a wireless transmit/receive unit (WTRU) and inter-system mobility registration; and

a transmitter configured to transmit a non-3GPP attach accept message to indicate that the inter-system mobility registration has been completed.

23. The SAE aGW of claim 22 wherein the inter-system mobility registration is a mobile Internet protocol (MIP) registration.

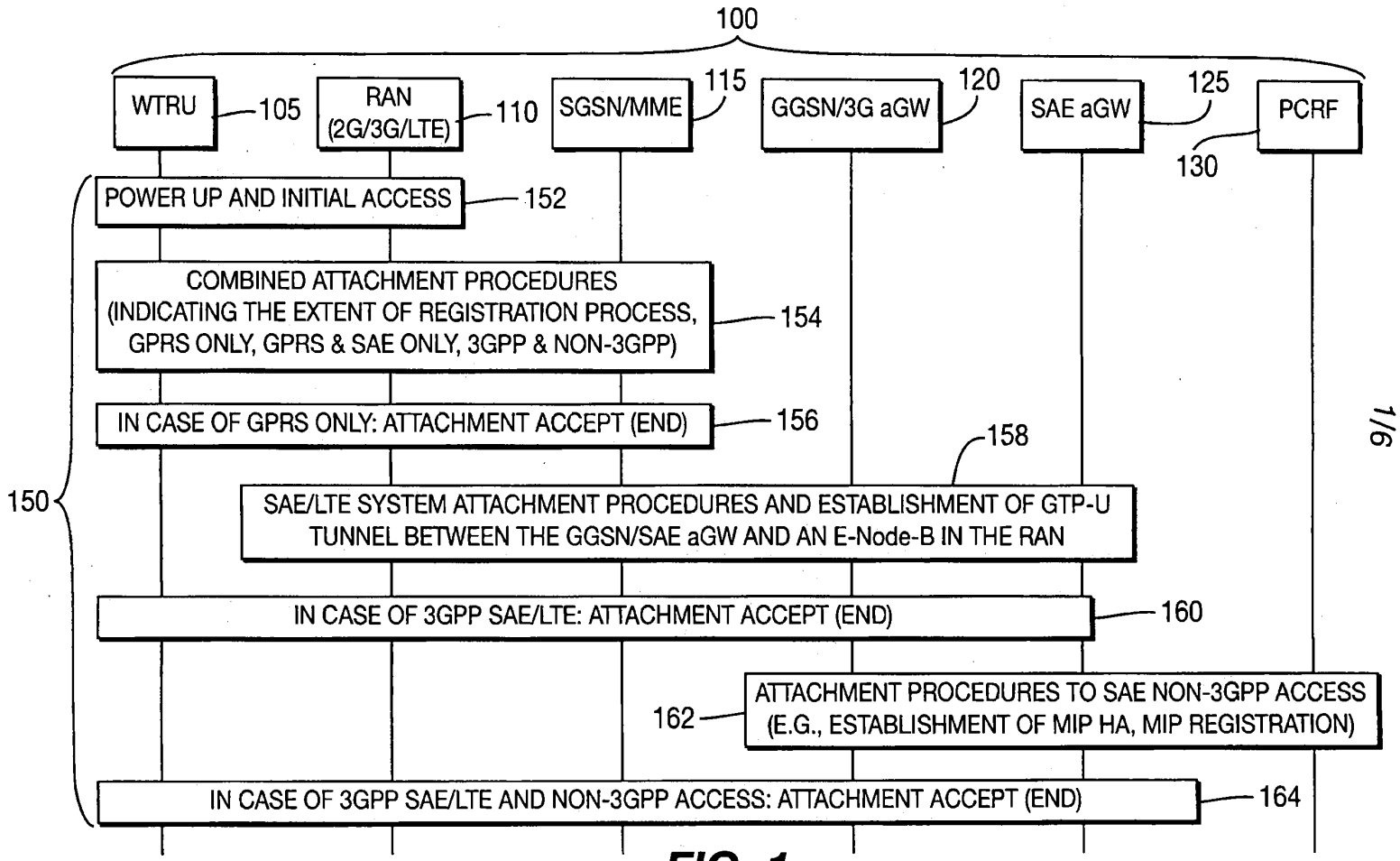

100
WTRU
105
RAN
(2G/3G/LTE)
110
SGSN/MME
115
GGSN/3G aGW
120
SAE aGW
125
PCRF
130
150
POWER UP AND INITIAL ACCESS
152
COMBINED ATTACHMENT PROCEDURES
(INDICATING THE EXTENT OF REGISTRATION PROCESS,
GPRS ONLY, GPRS & SAE ONLY, 3GPP & NON-3GPP)
154
IN CASE OF GPRS ONLY: ATTACHMENT ACCEPT (END)
156
158
SAE/LTE SYSTEM ATTACHMENT PROCEDURES AND ESTABLISHMENT OF GTP-U
TUNNEL BETWEEN THE GGSN/SAE aGW AND AN E-Node-B IN THE RAN
IN CASE OF 3GPP SAE/LTE: ATTACHMENT ACCEPT (END)
160
162
ATTACHMENT PROCEDURES TO SAE NON-3GPP ACCESS
(E.G., ESTABLISHMENT OF MIP HA, MIP REGISTRATION)
IN CASE OF 3GPP SAE/LTE AND NON-3GPP ACCESS: ATTACHMENT ACCEPT (END)
164

FIG. 1

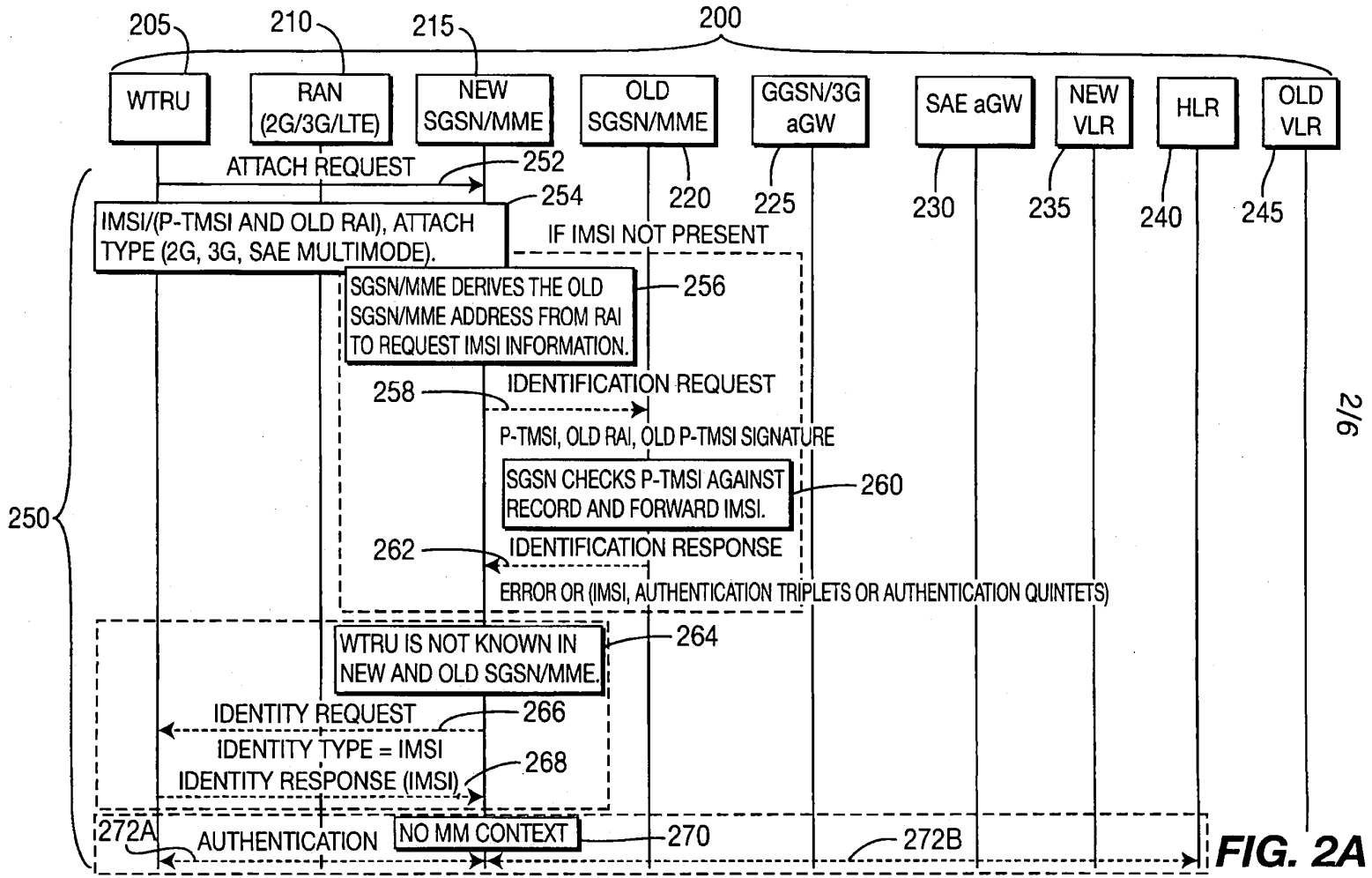

205
210
215
200
WTRU
RAN (2G/3G/LTE)
NEW SGSN/MME
OLD SGSN/MME
GGSN/3G aGW
SAE aGW
NEW VLR
HLR
OLD VLR
ATTACH REQUEST
252
254
220
225
230
235
240
245
IMSI/(P-TMSI AND OLD RAI), ATTACH TYPE (2G, 3G, SAE MULTIMODE).
IF IMSI NOT PRESENT
SGSN/MME DERIVES THE OLD SGSN/MME ADDRESS FROM RAI TO REQUEST IMSI INFORMATION.
256
IDENTIFICATION REQUEST
258
P-TMSI, OLD RAI, OLD P-TMSI SIGNATURE
SGSN CHECKS P-TMSI AGAINST RECORD AND FORWARD IMSI.
260
250
IDENTIFICATION RESPONSE
262
ERROR OR (IMSI, AUTHENTICATION TRIPLETS OR AUTHENTICATION QUINTETS)
WTRU IS NOT KNOWN IN NEW AND OLD SGSN/MME.
264
IDENTITY REQUEST
266
IDENTITY TYPE = IMSI
IDENTITY RESPONSE (IMSI)
268
272A
AUTHENTICATION
NO MM CONTEXT
270
272B

FIG. 2A

2/6

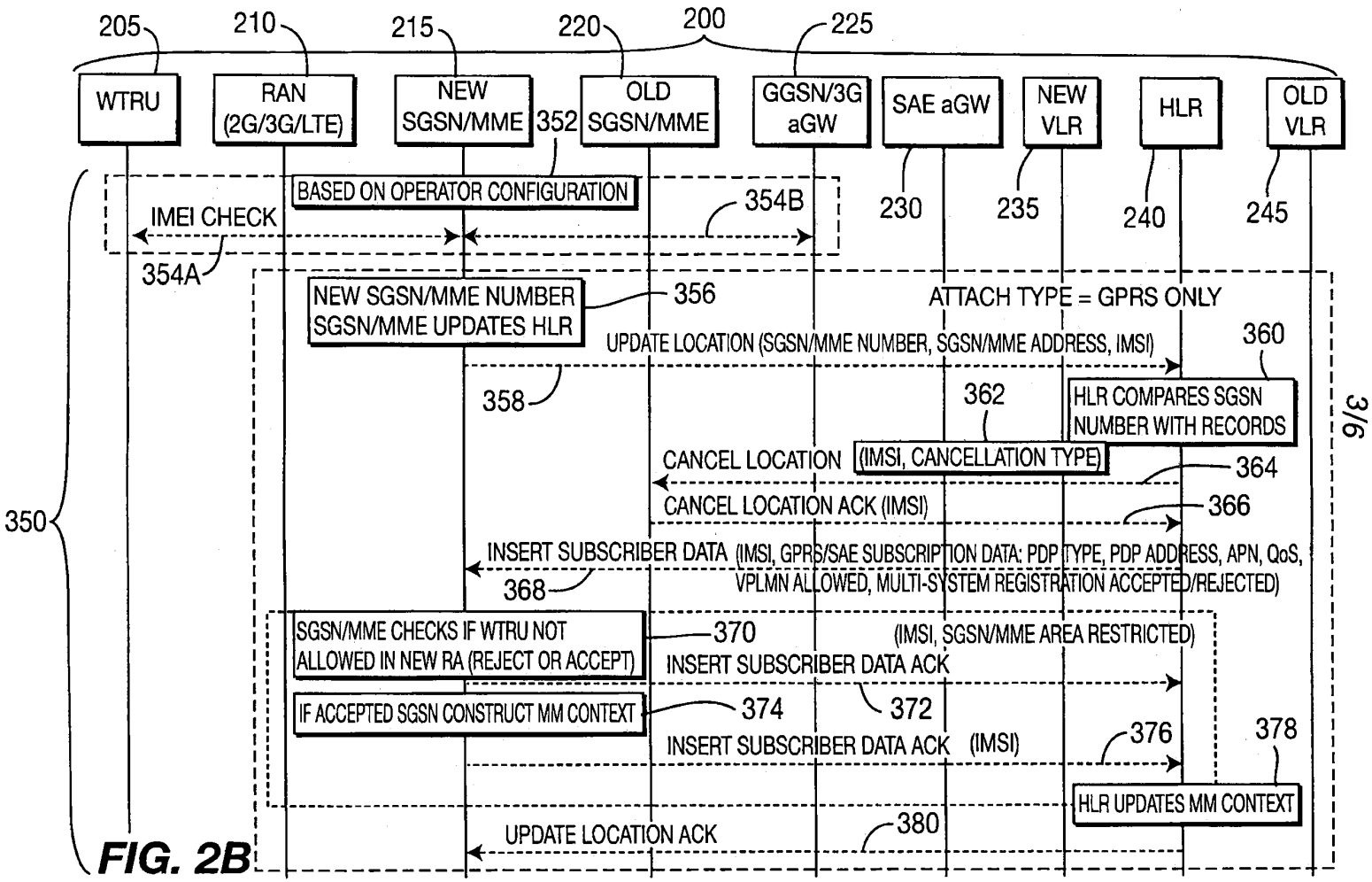

205
210
215
220
200
225
WTRU
RAN (2G/3G/LTE)
NEW SGSN/MME
352
OLD SGSN/MME
GGSN/3G aGW
SAE aGW
NEW VLR
HLR
OLD VLR
230
235
240
245
BASED ON OPERATOR CONFIGURATION
IMEI CHECK
354A
354B
NEW SGSN/MME NUMBER SGSN/MME UPDATES HLR
356
ATTACH TYPE = GPRS ONLY
UPDATE LOCATION (SGSN/MME NUMBER, SGSN/MME ADDRESS, IMSI)
360
358
362
HLR COMPARES SGSN NUMBER WITH RECORDS
CANCEL LOCATION
(IMSI, CANCELLATION TYPE)
364
CANCEL LOCATION ACK (IMSI)
366
INSERT SUBSCRIBER DATA (IMSI, GPRS/SAE SUBSCRIPTION DATA: PDP TYPE, PDP ADDRESS, APN, QoS, VPLMN ALLOWED, MULTI-SYSTEM REGISTRATION ACCEPTED/REJECTED)
368
350
SGSN/MME CHECKS IF WTRU NOT ALLOWED IN NEW RA (REJECT OR ACCEPT)
370
(IMSI, SGSN/MME AREA RESTRICTED)
INSERT SUBSCRIBER DATA ACK
372
IF ACCEPTED SGSN CONSTRUCT MM CONTEXT
374
INSERT SUBSCRIBER DATA ACK (IMSI)
376
378
HLR UPDATES MM CONTEXT
UPDATE LOCATION ACK
380
3/6

FIG. 2B

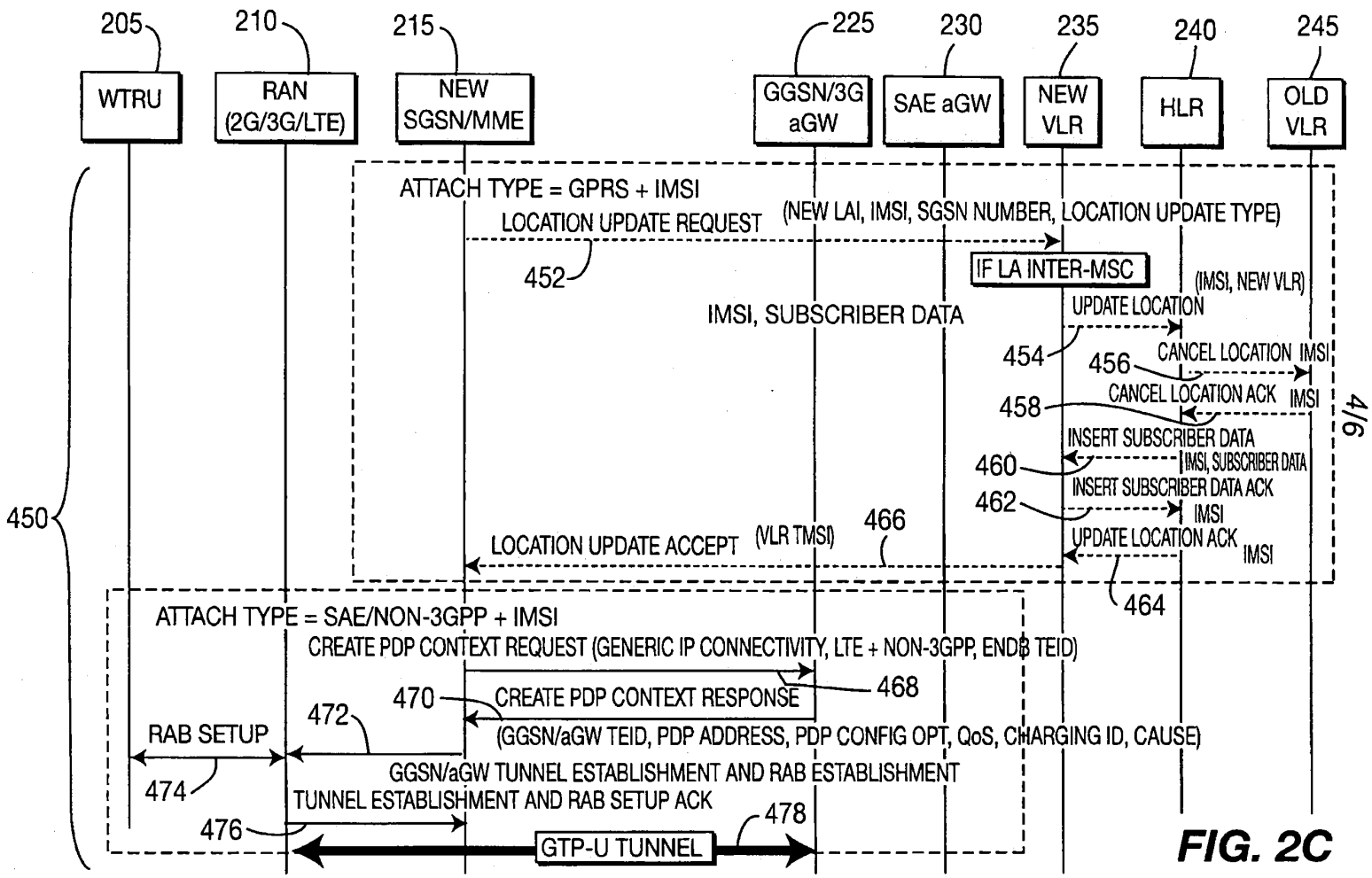

205
210
215
225
230
235
240
245
WTRU
RAN (2G/3G/LTE)
NEW SGSN/MME
GGSN/3G aGW
SAE aGW
NEW VLR
HLR
OLD VLR
450
ATTACH TYPE = GPRS + IMSI
LOCATION UPDATE REQUEST
(NEW LAI, IMSI, SGSN NUMBER, LOCATION UPDATE TYPE)
452
IF LA INTER-MSC
(IMSI, NEW VLR)
IMSI, SUBSCRIBER DATA
UPDATE LOCATION
454
456
CANCEL LOCATION IMSI
458
CANCEL LOCATION ACK IMSI
INSERT SUBSCRIBER DATA
460
IMSI, SUBSCRIBER DATA
INSERT SUBSCRIBER DATA ACK
462
IMSI
466
LOCATION UPDATE ACCEPT (VLR TMSI)
UPDATE LOCATION ACK
IMSI
464
ATTACH TYPE = SAE/NON-3GPP + IMSI
CREATE PDP CONTEXT REQUEST (GENERIC IP CONNECTIVITY, LTE + NON-3GPP, ENDB TEID)
468
470
CREATE PDP CONTEXT RESPONSE
472
(GGSN/aGW TEID, PDP ADDRESS, PDP CONFIG OPT, QoS, CHARGING ID, CAUSE)
RAB SETUP
474
GGSN/aGW TUNNEL ESTABLISHMENT AND RAB ESTABLISHMENT
TUNNEL ESTABLISHMENT AND RAB SETUP ACK
476
478
GTP-U TUNNEL
4/6

FIG. 2C

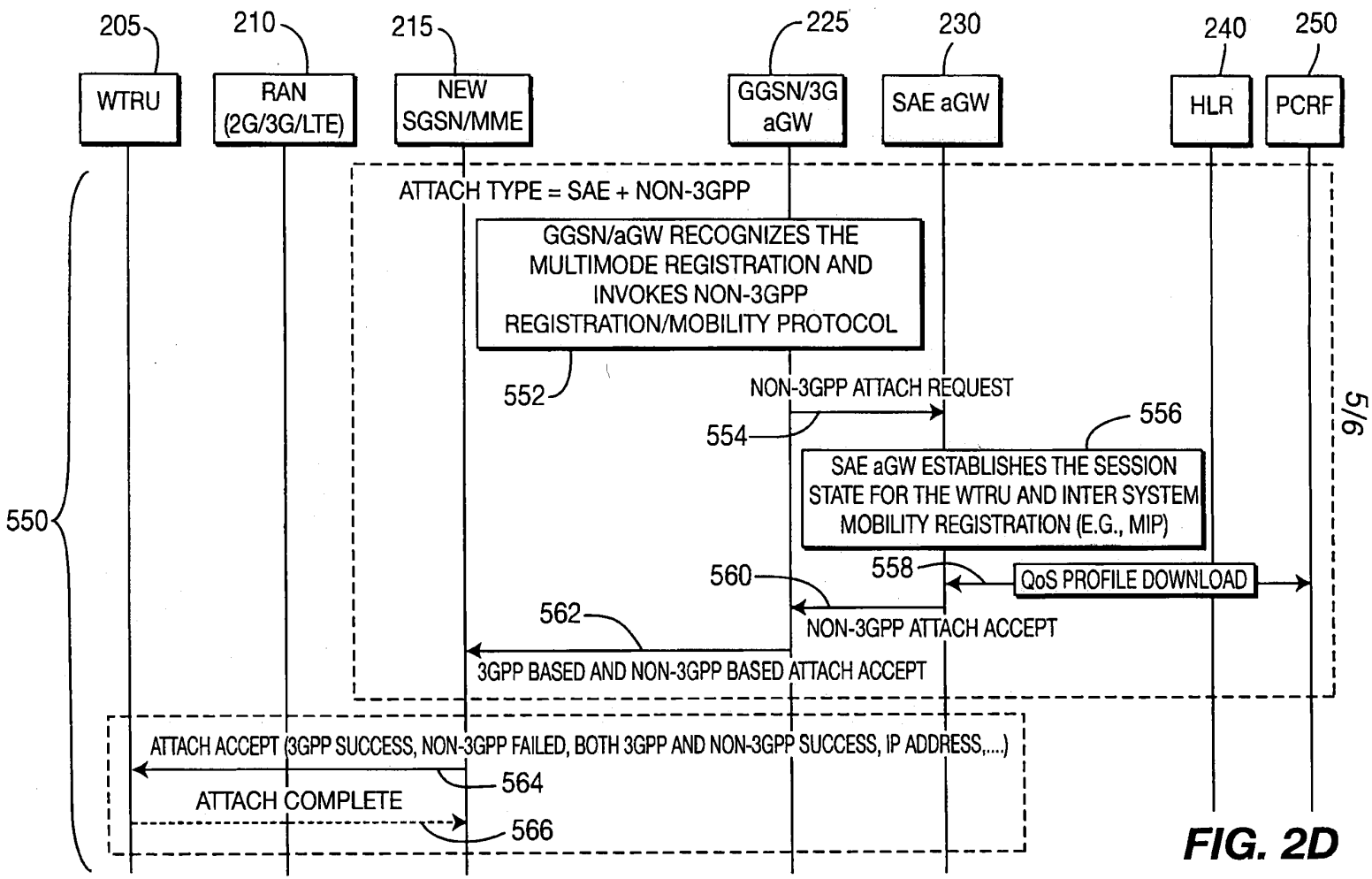

205
210
215
225
230
240
250
WTRU
RAN (2G/3G/LTE)
NEW SGSN/MME
GGSN/3G aGW
SAE aGW
HLR
PCRF
ATTACH TYPE = SAE + NON-3GPP
GGSN/aGW RECOGNIZES THE MULTIMODE REGISTRATION AND INVOKES NON-3GPP REGISTRATION/MOBILITY PROTOCOL
552
NON-3GPP ATTACH REQUEST
554
556
SAE aGW ESTABLISHES THE SESSION STATE FOR THE WTRU AND INTER SYSTEM MOBILITY REGISTRATION (E.G., MIP)
558
QoS PROFILE DOWNLOAD
560
NON-3GPP ATTACH ACCEPT
562
3GPP BASED AND NON-3GPP BASED ATTACH ACCEPT
550
ATTACH ACCEPT (3GPP SUCCESS, NON-3GPP FAILED, BOTH 3GPP AND NON-3GPP SUCCESS, IP ADDRESS,....)
564
ATTACH COMPLETE
566
5/6

FIG. 2D

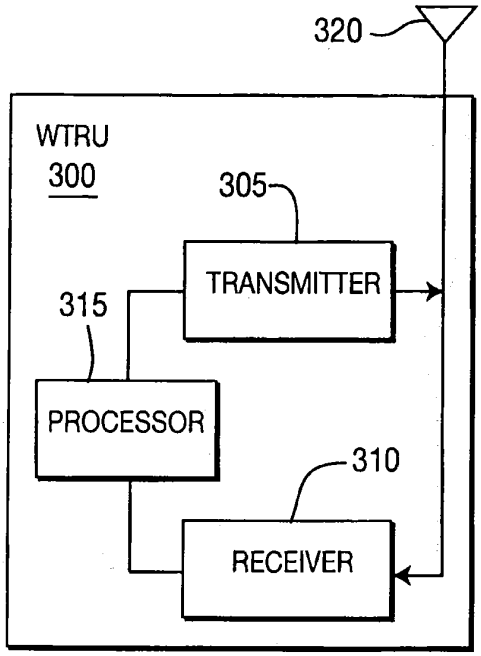


FIG. 3

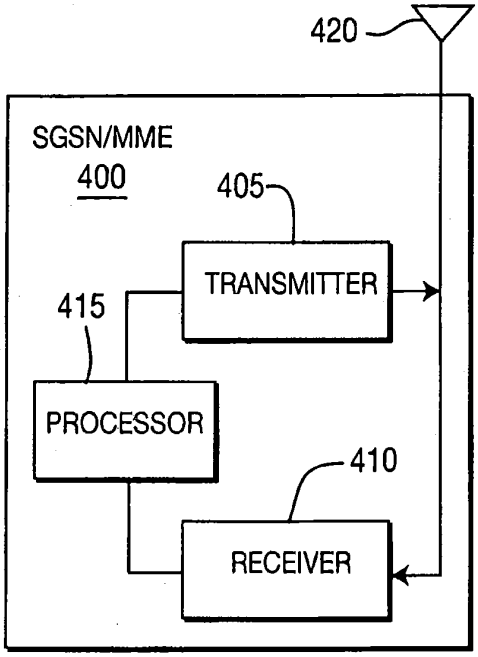


FIG. 4

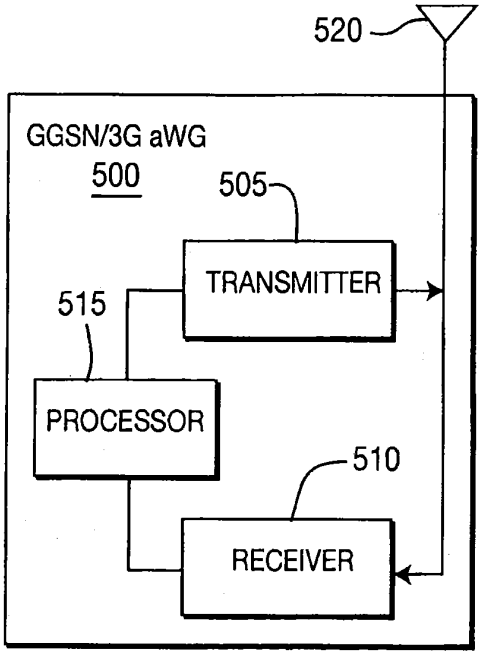


FIG. 5

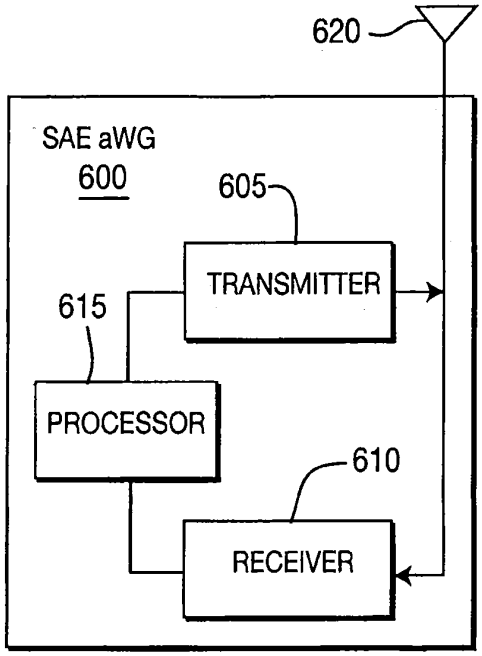


FIG. 6

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/000808

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04Q7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of dete base and, where practical, search terms used)
EPO-Internal, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2005/039201 A (INTERDIGITAL TECH CORP [US]; PURKAYASHTHA DEBASHISH [US]; SHAHEEN KAME) 28 April 2005 (2005-04-28) page 4, paragraph 23 - page 5, paragraph 24 page 7, paragraph 37 figure 2	1,9-13, 15,20,21
Y	page 7, paragraph 38 - page 8, paragraph 41 page 6, paragraph 34 figures 3-5	2-8,14, 17,18
	-/--	

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
26 June 2008	21/07/2008

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	López García, J

Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2006/124840 A (INTERDIGITAL TECH CORP [US]; SHAHEEN KAMEL M [US]) 23 November 2006 (2006-11-23) page 4, paragraph 21 page 5, paragraph 25 page 6, paragraph 28 - paragraph 29 page 7, paragraph 36 page 7, paragraph 14 - page 8, paragraph 17 page 8, paragraph 21 - paragraph 22 figures 3-5	2,3,14
Y	"Universal Mobile Telecommunications System (UMTS); 3G security; Wireless Local Area Network (WLAN) interworking security (3GPP TS 33.234 version 6.8.0 Release 6); ETSI TS 133 234" ETSI STANDARDS, LIS, SOPHIA ANTIPOLIS CEDEX, FRANCE, vol. 3-SA3, no. V6.8.0, 1 March 2006 (2006-03-01), XP014033965 ISSN: 0000-0001 page 16, paragraph 4.2.6 - page 17	4
Y	SIEMENS NETWORKS: "Solution Analysis for Mobility between 3GPP and non-3GPP Accesses"[Online] no. S2-070361, 15 January 2007 (2007-01-15), - 19 January 2007 (2007-01-19) XP002485831 Florence, Italy Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_56_Florence/Docs/> [retrieved on 2008-06-23] page 1, paragraph 2.1 - page 3, paragraph 2.2	5,6,23
Y	ZTE CORPORATION: "Attach to UMTS and RAT change to LTE"[Online] no. S2-064238, 14 November 2006 (2006-11-14), - 17 November 2006 (2006-11-17) XP002485832 Montreal, Canada Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg_sa/WG2_Arch/Ad-hoc_meetings/2006_11_SAE_Montreal/Docs/> [retrieved on 2008-06-23] page 2 - page 4; figures 1-3	7,8

-/--

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2008/000808

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	"Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Mobile radio interface Layer 3 specification; Core network protocols; Stage 3 (3GPP TS 24.008 version 7.6.0 Release 7); ETSI TS 124 008" ETSI STANDARDS, LIS, SOPHIA ANTIPOLIS CEDEX, FRANCE, vol. 3-CN1, no. V7.6.0, 1 December 2006 (2006-12-01), XP014039894 ISSN: 0000-0001 page 153, paragraph 4.7.8.1 - paragraph 4.7.8.2	16,19
Y	page 286, paragraph 9.4.1 - page 287; figure 9.4.1	17,18
X	SIEMENS NETWORKS: "Completion of SAE NW Attachment Procedures"[Online] no. S2-070231, 15 January 2007 (2007-01-15), - 19 January 2007 (2007-01-19) XP002485833 Florence, Italy Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg_sa/WG2_Arch/TSGS2_56_Florence/Docs/> [retrieved on 2008-06-23] page 2; table 1	22
Y	page 1, paragraph 1 - paragraph 2	23

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/US2008/000808

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005039201 A	28-04-2005	AU 2004306892 A1	28-04-2005
		BR PI0412608 A	26-09-2006
		CA 2534425 A1	28-04-2005
		DE 202004016127 U1	31-03-2005
		EP 1683376 A2	26-07-2006
		JP 2007509543 T	12-04-2007
		JP 2008061266 A	13-03-2008
		KR 20050037396 A	21-04-2005
		KR 20050089950 A	09-09-2005
		KR 20070000390 A	02-01-2007
		MX PA06004070 A	27-06-2006
		TW 258954 B	21-07-2006
		TW 285854 Y	11-01-2006
		US 2005163089 A1	28-07-2005
		US 2005083893 A1	21-04-2005
WO 2006124840 A	23-11-2006	AU 2006247390 A1	23-11-2006
		CA 2608646 A1	23-11-2006
		EP 1884126 A1	06-02-2008
		KR 20080015427 A	19-02-2008
		KR 20080007688 A	22-01-2008
		US 2006264217 A1	23-11-2006

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference OP080256	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/CN2008/070909	International filing date *(day/month/year)* 08 May 2008 (08.05.2008)	Priority date *(day/month/year)* 11 May 2007 (11.05.2007)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant HUAWEI TECHNOLOGIES CO., LTD.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 17 November 2009 (17.11.2009)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Ellen Moyse
Facsimile No. +41 22 338 82 70	e-mail: pt02.pct@wipo.int

Form PCT/IB/373 (Jauuary 2004)

Translation

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:

LU,Changming

UNITALEN ATTORNEYS AT LAW

7th Floor,Scitech Place,No.22 Jian Guo Men Wai Ave,Chao Yang District,Beijing 100004 China

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43 *bis*.1)

Date of mailing *(day/month/year)*	21 Aug. 2008 (21.08.2008)
Applicant's or agent's file reference	**FOR FURTHER ACTION** see paragraph 2 below
OP080256	

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/CN2008/070909	08 May. 2008(08.05.2008)	11 May. 2007(11.05.2007)

International Patent Classification (IPC) or both national classification and IPC

H04Q7/38(2006.01)i

Applicant

HUAWEI TECHNOLOGIES CO., LTD. et al.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No.II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i)with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No.VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No.VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/CN	Date of completion of this opinion	Authorized officer
The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	07 Aug. 2008 (07.08.2008)	CAO,Yachun Telephone No. (86-10)62411427

Form PCT/ISA/237(cover sheet)(April 2007)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/CN2008/070909

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed
   ☐ a translation of the international application into _____ , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91(Rule 43bis(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material
      ☐ a sequence listing
      ☐ table(s) related to the sequence listing

   b. format of material
      ☐ on paper
      ☐ in electronic form

   c. time of filing/furnishing
      ☐ contained in the international application as filed
      ☐ filed together with the international application in electronic form
      ☐ furnished subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/CN2008/070909

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement:

Novelty (N)	Claims	3、6-12、14-24、26-29、33-35、39-41	YES
	Claims	1、2、4、5、13、25、30-32、36-38	NO
Inventive step (IS)	Claims	3、6-12、14-24、26-29、39-41	YES
	Claims	1、2、4、5、13、25、30-38	NO
Industrial applicability (IA)	Claims	1-41	YES
	Claims	NONE	NO

2. Citations and explanations

The documents cited in the International Search Report include:
D1: CN1605222 A (NOKIA CORP) 6 Apr. 2005 (06.04.2005)
D2: CN1275872 A (NEC CORP) 6 Dec. 2000 (06.12.2000)
D3: CN1882160 A (ZTE CORP) 20 Dec. 2006 (20.12.2006)

The present invention discloses a method and system and device for registering process.

D1 is considered to represent the most relevant state of the art, and discloses (see D1 abstract, claims and description page 13 line 5-page 15 line 13) a method and system for handovering mobile equipment inter-networks. The method includes: A mobile equipment distinguishes and sends an information including a type to a communication network; the communication network distinguishes the type according to the information. Therein the different information corresponds with the different type. The system includes: the mobile equipment, is used for distinguishing and sending an information including a type to a communication network; the communication network, is used for distinguishing the type according to the information, therein the network unit can be non-3GPP gateway equipment. Therefore all features of independent claims 1 ,13 and 30 are explicitly disclosed by D1, the subject-matter of claims 1 ,13 and 30 not new in the sense of PCT Article 33(2).

The appendent features of claim 2,4,5,25,31 and 32 are explicitly disclosed by D1 too, the subject-matter of claims 2,4,5,25,31 and 32 not new in the sense of PCT Article 33(2).

The subject-matter of claims 3,6-12,14-24 is not disclosed or suggested individually by the available prior art, so claims 3,6-12,14-24 are considered to be novel in the sense of PCT Article 33(2).

The subject-matter of claims 3,6-12,14-24 is neither known from, nor rendered obvious by, the available prior art, and therefore meets the criteria set out in PCT Article 33(3) with respect to inventive step.

The subject-matter of claim 26 differs from the D1 in that the user equipment registered process type information is reported by HSS or AAA Server on the process of handovering inter-networks. Because D1 does not disclose or suggest all the features in claim 26, and D2, D3 do not also disclose or suggest all the features in claim 26, claim 26 has novelty under PCT Article 33(2).

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of :

The subject-matter of claim 26 is neither known from, nor rendered obvious by, the available prior art, and therefore meets the criteria set out in PCT Article 33(3) with respect to inventive step.

Claims 27-29 are dependent on claim 26, and as such also meet the requirements of PCT Article 33(2) with respect to novelty and PCT Article 33(3) with respect to inventive step.

D1 is considered to represent the most relevant state of the art, and discloses (see D1 abstract, claims and description page 13 line 5-page 15 line 13) devices for handovering mobile equipment inter-networks. The mobile equipment includes: a choosing equipment, is used for distinguishing type; a sending equipment, is used for sending an information including a type to a communication network. The network unit in network side includes: a receiving equipment, is used for receiving the information including a type sent by the mobile equipment, a distinguishing equipment, is used for distinguishing the type according to the information. Therefore all features of independent claim 36 is explicitly disclosed by D1, the subject-matter of claim 36 not new in the sense of PCT Article 33(2).

The appendent features of claim37 and 38 are explicitly disclosed by D1 too, the subject-matter of claims 37 and 38 does not new in the sense of PCT Article 33(2).

The subject-matter of claim 33 differs from the D1 only in that a registering spring unit used for springing registering and sending out register signal. Because D1 does not disclose or suggest all the features in claim 33, and D2, D3 do not also disclose or suggest all the features in claim 33, claim 33 has novelty under PCT Article 33(2).

However, for a skilled person, it is the common techniques that using the register unit to register an register signal. In order to solve the problem posed, it would be obvious for a skilled person to combine the common techniques within the normal range of options envisaged by a person skilled in the art on the basis of the disclosure of D1 to obtain the subject-matter of claim 33. Therefore claim 33 of the present application cannot be considered to involve an inventive step, and does not meet the criteria set out in PCT Article 33(3).

Claims 34 and 35 are dependent on claim 33, and as such also meet the requirements of PCT Article 33(2) with respect to novelty.

The appendent features of claim 34 and 35 are explicitly disclosed by D1 too, the subject-matter of claims 34 and 35 does not meet the criteria set out in PCT Article 33(3).

The subject-matter of claims 39-41 is not disclosed or suggested individually by the available prior art, so claims 39-41 are considered to be novel in the sense of PCT Article 33(2).

The subject-matter of claims 39-41 is neither known from, nor rendered obvious by, the available prior art, and therefore meets the criteria set out in PCT Article 33(3) with respect to inventive step.

The subject-matter of claims 1-41 can be produced industrially, so they are industrial applicable, meeting the provision of PCT Article 33(4).

Electronic Acknowledgement Receipt

EFS ID:	7988169
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Nkosi Harvey
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	09-JUL-2010
Filing Date:	19-OCT-2009
Time Stamp:	17:46:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213IDS.PDF	224472 2c595aa8dc479e3d154ffd0887aef100a500923a	yes	5

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Transmittal Letter	2	4
	Information Disclosure Statement (IDS) Filed (SB/08)	5	5

Warnings:					
Information:					
2	Foreign Reference	B2.PDF	2537362 187009a145d72701f6a5beb3f9c2f1ee5225880d	no	57
Warnings:					
Information:					
3	Foreign Reference	B3.PDF	1705971 8969dae2438e46f6863464b4ead074416f108265	no	39
Warnings:					
Information:					
4	Foreign Reference	B4.PDF	190899 721c655d9efad012c2a7294a02e4fd97d6fc3b98	no	4
Warnings:					
Information:					
5	Foreign Reference	B5.PDF	1211087 fd05f8f22e041444532032ce02a2cac56810818c	no	28
Warnings:					
Information:					
6	Foreign Reference	B6.PDF	1911744 10db6cf0a312f432ef616a7aec7aeed4ade2075f	no	41
Warnings:					
Information:					
7	Foreign Reference	B7.PDF	1974819 18595e9100edbf0fdb218618db2e99822a8f6e35	no	45
Warnings:					
Information:					
8	Foreign Reference	B8.PDF	288564 bed887f78812d5be3bedd424ddde964cf593989f	no	6
Warnings:					

Information:					
9	Foreign Reference	B9.PDF	408028 e84400dc7bb0254e6aadd433b0f8704d0e1b1554	no	6
Warnings:					
Information:					
10	Foreign Reference	B10.PDF	126207 a31be35af31bac814e0ab2498081f34977dfedac	no	2
Warnings:					
Information:					
11	Foreign Reference	B11.PDF	235577 b5448f510f386a3eb18b43c8c092e7048c6ed805	no	4
Warnings:					
Information:					
12	Foreign Reference	B12.PDF	128339 ce1b8fcb957b6df8b7f2cd2517ba17b08db98f41	no	4
Warnings:					
Information:					
13	Foreign Reference	B13.PDF	395774 b6531539917a5c0c7e8a5331aa1f57c5c5bf0293	no	6
Warnings:					
Information:					
14	Foreign Reference	B14.PDF	260989 f276b8ca5311be7fbcd98486fabb51ad890e402e	no	5
Warnings:					
Information:					
15	Foreign Reference	B15.PDF	826373 82960d91f881aeed7b3d0893cf24e40024dc06cd	no	14
Warnings:					
Information:					
16	Foreign Reference	B16.PDF	554285 821e48cbb07e0a71ed05d045565fcc960ef4c2b4	no	12
Warnings:					
Information:					
			Total Files Size (in bytes):	12980490	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: July 9, 2010 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu

Appln. No.: 12/581,575 Examiner: Unknown

Filed: October 19, 2009 Art Unit: 2617

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING Confirmation No.: 2875

Attorney Docket No: 13674-213
Client Ref. No.: 0810596US

TRANSMITTAL

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Supplemental Information Disclosure Statement; PTO-1449; Cited References B2-16.

Fee calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___)__ .

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

July 9, 2010
Date

Respectfully submitted,
/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

BRINKS HOFER GILSON & LIONE
NBC Tower – Suite 3600, 455 N. Cityfront Plaza Drive, Chicago, IL 60611-5599

BRINKS HOFER GILSON &LIONE

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
July 9, 2010
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
July 9, 2010
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu	
Appln. No.:	12/581,575	Examiner: Unknown
Filed:	October 19, 2009	Art Unit: 2617
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.: 2875
Attorney Docket No:	13674-213	
Client Ref. No.:	0810596US	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(b), Applicant hereby cites the following reference(s):

U.S. PATENT DOCUMENTS		
DOCUMENT NO.	**DATE**	**NAME**
2003/0114158 A1	June 19, 2003	Soderbacka et al.

BRINKS HOFER GILSON &LIONE

FOREIGN PATENT DOCUMENTS		
DOCUMENT NO.	DATE	COUNTRY
2004/100403 A1	November 18, 2004	PCT
2007/011638 A2	January 25, 2007	PCT
2007/011638 A3	January 25, 2007	PCT
2008/094419 A1	August 7, 2008	PCT

OTHER ART – NON PATENT LITERATURE DOCUMENTS
3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3GPP System Architecture Evolution: GPRS Enhancements for E-UTRAN Access; Release 8" Global System for Mobile Communications. April 2007. (clean version)
3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3GPP System Architecture Evolution: GPRS Enhancements for E-UTRAN Access; Release 8" Global System for Mobile Communications. April 2007. (marked-up version)
Infineon Technologies "GPRS Attach Type While in DTM" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 21 February 2005.
Huawei "Refine Attach Procedure" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 18 April 2007.
Huawei "Handover from non 3GPP to 3GPP" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 18 April 2007.
CATT "TAU Procedure" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 18 April 2007.
Intel "Handover from 3GPP Access (UTRAN) to non-3GPP Access (TS 23.402)" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 19 April 2007.
Huawei "Attach Type in Attach Procedure" 3rd Generation Partnership Project (3GPP) Mobile Competence Centre. 19 June 2007.
International Preliminary Report on Patentability issued in corresponding PCT Application No. PCT/CN2008/070909; issued November 17, 2009.
Copy of Office Action issued in corresponding Chinese Patent Application No. 200810085729.8; issued April 2, 2010
Copy of Supplementary European Search Report issued in corresponding European Patent Application No. 08 73. 4264; issued February 19, 2010

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). As each of the listed references is in English, no further commentary is believed to be necessary, 37 C.F.R §1.98(a)(3). Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

The Applicant or Applicants have calculated no fee to be due in connection with the filing of this Information Disclosure Statement. However, the Director is authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to a deposit account, as authorized in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

July 9, 2010
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

93823 7590 11/15/2010

Huawei/BHGL
P.O. Box 10395
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EXAMINER	
CHERY, DADY	
ART UNIT	PAPER NUMBER
2461	
MAIL DATE	DELIVERY MODE
11/15/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/581,575	WU, WENFU	
	Examiner	Art Unit	
	DADY CHERY	2461	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1- 17* is/are rejected.

7)☐ Claim(s) _ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

Claims 1, 12 and 16 are objected to because of the following informalities: Claims 1, 12 and 16 recite the limitation “a User Equipment UE, the term UE should be in parentheses. Appropriate correction is required.

Claim 2 is objected to because of the following informalities: the language of claim 2 is hard to understand, the applicant is advised to rewrite the claim in clear a concise form. Appropriate correction is required.

Claim 2 is objected to because of the following informalities: claim 2 contains an extra period, the applicant is advised to delete the extra period. Appropriate correction is required.

Claim 2 is objected to because of the following informalities: claim 2 recites the limitation a User equipment in line 2, it should be the "User equipment" by reference of the "User Equipment" discloses in claim 1. Appropriate correction is required.

Claim 3 is objected to because of the following informalities: claim 3 recites the limitation “the UE may report the processing type” in line 1, the word “may” introduces uncertainty, it not clear and effective in this case. Appropriate correction is required.

Claim 3 is objected to because of the following informalities: Claims 1, 12 and 16 recite the limitation “an indication bit IE, the term IE should be in parentheses. Appropriate correction is required.

Claim 12 is objected to because of the following informalities: the preamble of claim 12 recites a method; however the body of claim recites hardware with no method steps. Therefore, claim 12 is considered as a hybrid claim. Appropriate correction is required.

The above list is not an exhaustive list; therefore the applicant is required to correct any informalities in the present application.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3,5,6,13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "the handover registration processing type" in lines 6 -7. There is insufficient antecedent basis for this limitation in the claim. It appears that claim 3 is of improper dependency because Claim 3 contains a number of 112 problems which would not exist if the dependency was on claim 2. “The indication bit IE” (Paragraphs 4, 5, 7) appears to have no relationship with ‘the “an indication bit IE which indicates the handover registration”’. Appropriate correction is required.

Claim 13 recites the limitation "the system of claim 12" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claims 5 and 6 recites the limitations " notifying, by the HSS, the AAA server to cancel the registration of the UE in a non-3.sup.rd Generation Partnership Project, non-3GPP, network if the HSS finds that the registration processing type is initialization registration and the HSS stores a Packet Data Network Gateway, PDN GW, address used by the UE in the non-3GPP network after receiving the registration processing type information for the UE sent by the MME or the SGSN." The above limitations are unclear. In other word the condition for cancel the registration is not clear. Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 - 4, 7, 9, 10 and 12 - 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Madour et al. (US Application 2009/0073933, hereinafter Madour).

Regarding claim 1, Madour discloses a registration processing method, comprising: receiving registration processing type information reported by a User Equipment UE **(Page 1, [0009], which recites a gateway packet data serving node**

(GW-PDSN) that receives a registration request from a user equipment UE); and identifying a processing type of the registration according to the processing type information**(page 1, [0010], which recites the GW-PDSN includes a processor for processing type of registration such handover, A11 registration).**

Regarding claim 2, Madour discloses the method of claim 1, wherein the registration processing type information reported by a User Equipment is a handover registration processing type when the UE finds that the registration is caused by handover to a different network or by a need of handover to a different network **(Page 1, [0009], which recites the communicating information is associated with a handoff registration from ELTE network HRPD network).**

Regarding claim 3, Madour discloses the method of claim 1, wherein the UE may report the processing type information at least the following: an Attach Request message sent by the UE to the network in the process of registering the UE into the network includes the registration processing type information **(Page 1, [0010], where the A11 registration request to establish an A10 connection between a target node is considered as the attach request message).**

Regarding claim 4, Madour discloses the method of claim 1, wherein the identifying the registration processing type according to the processing type information comprises: notifying, by a network-side network element, the received registration processing type information to a Home Subscriber Server, HSS, or an Authentication Authorization Accounting, AAA, server; and identifying, by the HSS or the AAA server, the registration processing type according to the processing type information, and then

performing proper operations**(page 2, [0025] –[0027], which recites the SAE GW-UPE/PDSN 229 and SAE GW 223 considered the registration identifier type are connected to integrate home subscriber (HSS)/authentication authorization and accounting (AAA) server 224 to store the type information and process the information accordingly) .**

Regarding claim 7, Madour discloses a handover processing method**(Page 1, [0009], which recites a method for communicating information associated with handoff of user equipment UE),** comprising: receiving an Access Request for a User Equipment, UE**(Page 1, [009], which recites a gateway packet data serving node (GW-PDSN) that receives a registration request from a user equipment UE);** and identifying a handover processing type of the Access Request according to the Access Request for the UE**(Page 1, [0009] –[0010], Which recites prior to breaking of first radio connection between a user equipment UE and a long term evolution LTE , and A11 registration request to establish an A10 connection between the target network HRPD, where the A11 registration request is considered as the identifying a handover processing type disclosed by the instant application).**

Regarding claim 9, Madour discloses the method of claim 7, further comprising: setting up a data forwarding tunnel between a network element of a target network and a network element of a source network according to data forwarding tunnel resource information of the target network if the identified handover processing type is an active-mode handover registration processing type**(page 5, [0043], which recites an**

establishment of a tunnel between a eNB considered as a network element and a target network when a handover is an active mode) .

Regarding claim 10, Madour discloses the method of claim 9, wherein if the target network is a 3.sup.rd Generation Partnership Project, 3GPP), network **(Fig. 1, 20, where the HRPD is considered as a 3GPP network**) and the source network is a non-3GPP network**(30, where the LTE is considered as a non-3GPP network),** the setup of the data forwarding tunnel between the network element **(Fig. 2b, 212)** of the target network and the network element **(Fig. 2b, 213)** of the source network according to the data forwarding tunnel resource information of the target network **(page 5, [0043], which recites an establishment of a tunnel between a eNB considered as a network element and a target network when a handover is an active mode) .** comprises:

sending, by a first network element of the 3GPP network, the data forwarding tunnel resource information obtained from a serving Gateway, serving GW, to a non-3GPP GW either directly or through a non-3GPP access network element after receiving information about the active-mode handover registration processing type; and

creating, by the non-3GPP GW, the data forwarding tunnel with the serving GW**(page 5, [0043], which recites an establishment of a tunnel between a eNB considered as a network element and a target network when a handover is an active mode) .**

Regarding claim 12, Madour discloses a registration processing method **(Fig. 3),** comprising:

a User Equipment, UE**(214),** adapted to report information about a processing type of registering the UE into a network in the process of the registration**(Page 1, [0009]-[0011], which recites the UE is capable of report information about the processing type of registration such as handoff , A11)** ; and a network**(Fig. 2a, 202),** adapted to identify the processing type of the registration according to the received registration processing type information reported by the UE**(Page 1, [0009]-[0011], which recites the network is capable of identify the type of registration reported by the UE such as handoff , A11)**.

Regarding claim 13, Madour discloses the system of claim 12, wherein the reporting, by the UE, of the registration processing type information in the process of registering into the network comprises: identifying, by the UE, the processing type of the registration in the process of registering into the network and then reporting the registration processing type information**(Page 1, [009] –[0011] and page 3, [0032], which recites an A11 registration report message for processing type information) .**

Regarding claim 14, Madour discloses a User Equipment **(fig. 3, 214),** UE, comprising:

an identifying unit**(Page 3, [0031], where the inter-system source access network identifier),** adapted to identify a type of registration when the UE initiates the registration**(Page 3, [00311], where the inter-system source access network identifier is capable of identifying the type of registration request)** ;

registration initiating unit **(HRPDAN, 213),** adapted to initiate the registration, and send a registration triggering signal **(Page 3, [0031], which recites the HRPDAN 213 send or initiates the registration request);** and

reporting unit **(SAE GW/PDSN 220),** adapted to receive the registration triggering signal from the registration initiating unit**(Page 3, [0031], which recites the SAE GW/PDSN 220 receives the registration request from the HRPDAN 213),** and report processing type information in the process of registering the UE into a network, wherein the processing type information corresponds to the type of registration identified by the identifying unit**(page 3, [0031], which recites the SAE GW/PSDN take the appropriate action such as report the type information) .**

Regarding claim 15, Madour discloses the UE of claim 14, wherein the reporting unit reports in one of the following: including the processing type information in an IE **(page 3, [0031], which recites the SAE GW/PSDN take the appropriate action such as report the type information)** of an Attach Request message and reporting the message **(Page 1, [0010], where the A11 registration request to establish an A10 connection between a target node is considered as the attach request message).**

Regarding claim 16, Madour discloses a network-side network element **(Fig. 3),** comprising:

an obtaining unit **(SAE GW/PDSN 220),** adapted to obtain registration processing type information for a User Equipment, UE, in the process of registration**(Page 3, [0031],**

which recites the SAE GW/PDSN 220 receives the registration request from the HRPDAN 213), and

an identifying unit **(Page 3, [0031], where the inter-system source access network identifier)**, adapted to identify a processing type of the registration according to the processing type information obtained by the obtaining unit**(Page 3, [00311], where the inter-system source access network identifier is capable of identifying the type of registration request).**

Regarding claim 17, Madour discloses the network element according to claim 16, further comprising: a first processing unit **(GW-PDSN UPE 220),** adapted to initiate a network-side bearer creation procedure to create bearer resource for the UE after the identifying unit identifies that the processing type is a handover registration processing type **(page 2, [0011] and page 5, [0043], which recites a GW-PDSN UPE 220 adapted to process the type of registration such as handoff)**.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Madour in view of Faccin (US Application 2008/0320149, hereinafter Faccin).

Regarding claim 8, Madour discloses all the limitations of claim 8 as applied to claim 7, as addressed above, except the recited features of notifying, by a Mobility Management Entity, MME, or a Serving GPRS Supporting Node, SGSN, a Packet Data Network, PDN, Gateway, GW, to initiate a network-side bearer

creation procedure to create bearer resource for the UE if the identified handover processing type is a handover registration processing type and a network-side network element is the MME or the SGSN; and

initiating, by a non-3.sup.rd Generation Partnership Project, 3GPP, Gateway, GW, a network-side bearer creation procedure to create bearer resource for the UE if the

identified handover processing type is a handover registration processing type and a network-side network element is the non-3GPP GW.

However, Faccin teaches the method of claim 7, further comprising one of the following: notifying, by a Mobility Management Entity, MME **(Fig. 3, 134),** or a Serving GPRS Supporting Node, SGSN, a Packet Data Network, PDN, Gateway, GW, to initiate a network-side bearer creation procedure to create bearer resource for the UE if the identified handover processing type is a handover registration processing type and a network-side network element is the MME or the SGSN**(Page 1, [0007] –[0009], which recite a during the attachment , one or more bearer establishment procedures may be triggered to establish EPS, thereby initiate a network-side bearer creation procedure);** and

initiating, by a non-3.sup.rd Generation Partnership Project, 3GPP, Gateway, GW, a network-side bearer creation procedure to create bearer resource for the UE if the identified handover processing type is a handover registration processing type and a network-side network element is the non-3GPP GW **(Page 15, [0246], which recites handover processing type and a creation of a bearer for a UE in a 3GPP and non-3GPP networks) .**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Madour by using the above features such as notifying, by a Mobility Management Entity, MME, or a Serving GPRS Supporting Node, SGSN, a Packet Data Network, PDN, Gateway, GW, to initiate a network-side bearer creation procedure to create bearer resource for the

UE if the identified handover processing type is a handover registration processing type and a network-side network element is the MME or the SGSN; and initiating, by a non-3.sup.rd Generation Partnership Project, 3GPP, Gateway, GW, a network-side bearer creation procedure to create bearer resource for the UE if the identified handover processing type is a handover registration processing type and a network-side network element is the non-3GPP GW for the purpose of handing off user equipment between different access systems.

Regarding claim 11, Madour discloses all the limitations of claim 11 as applied to claims 7 and 9 addressed above, except recited limitations , wherein if the target network is a non-3.sup.rd Generation Partnership Project, 3GPP, network and the source network is a 3GPP network, the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network comprises: sending, by an access network element or a non-3GPP Gateway, GW, of the non-3GPP network, the data forwarding tunnel resource information of the non-3GPP GW to a serving GW through a first network element of the 3GPP network after receiving information about the active-mode handover registration processing type; and creating, by the serving GW, the data forwarding tunnel with the non-3GPP GW.

However, Faccin teaches the method of claim 9, wherein if the target network is a non-3.sup.rd Generation Partnership Project, 3GPP, network and the source network is a 3GPP network **(Page 15, [0246], which recites HSS – initiated a detach as a**

result of a SRD attachment via a non-3GPP in other a handover from 3GPP to a non-3GPP network), the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network **(Page 15, [0246], which recites the trusted non-3GPP network uses a network - based protocol such as PMIP over a S5 link and the 3GPP network uses a GPRS tunnel ling protocol GTP to set up the data forwarding tunnel between the networks)** comprises: sending, by an access network element or a non-3GPP Gateway, GW **(network-base protocol),** of the non-3GPP network, the data forwarding tunnel resource information**(Page 15, [0246], which recites set up the data forwarding tunnel between the networks)** of the non-3GPP GW to a serving GW through a first network element of the 3GPP network**(GPRS)** after receiving information about the active-mode handover registration processing type**(page 15, [0248], which recites GW 842 updates the data forwarding tunnel after the handover is active mode as disclosed by the instant application**; and creating, by the serving GW, the data forwarding tunnel with the non-3GPP GW**(page 15, [0248], which recites GW 842 updates the data forwarding tunnel after the handover is thereby create the data forwarding tunnel with the non-3GPP GW).**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Madour by using the above features such as wherein if the target network is a non-3.sup.rd Generation Partnership Project, 3GPP, network and the source network is a 3GPP network, the

setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network comprises: sending, by an access network element or a non-3GPP Gateway, GW, of the non-3GPP network, the data forwarding tunnel resource information of the non-3GPP GW to a serving GW through a first network element of the 3GPP network after receiving information about the active-mode handover registration processing type; and creating, by the serving GW, the data forwarding tunnel with the non-3GPP GW for the purpose of handing off user equipment between different access systems.

Allowable Subject Matter

9. Claims 5 and 6 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DADY CHERY whose telephone number is (571)270-1207. The examiner can normally be reached on Monday - Thursday 8 am - 4 pm ESt.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D. VU can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dady Chery/
Examiner, Art Unit 2461

Notice of References Cited	Application/Control No. 12/581,575	Applicant(s)/Patent Under Reexamination WU, WENFU	
	Examiner DADY CHERY	Art Unit 2461	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2009/0073933	03-2009	Madour et al.	370/331
*	B	US-2008/0320149	12-2008	Faccin, Stefano	709/228
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
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FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
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	Q					
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	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	**Art Unit**
	DADY CHERY	2461

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	10/27/2010								
	1	✓								
	2	✓								
	3	✓								
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	6	✓								
	7	✓								
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	12	✓								
	13	✓								
	14	✓								
	15	✓								
	16	✓								
	17	✓								

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	Art Unit
	DADY CHERY	2461

SEARCHED			
Class	Subclass	Date	Examiner
370	328,329,330,331,332,333,334	10/22/2010	DC
455	436,437,438,439	10/22/2010	DC
709	227,228,229	10/22/2010	DC

SEARCH NOTES		
Search Notes	Date	Examiner
Inventorship	10/22/2010	DC

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

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12/581,575	10/19/2009	455	2461	13674-213

APPLICANTS
Wenfu Wu, Shenzhen, CHINA;

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This application is a CON of PCT/CN2008/070909 05/08/2008

**** FOREIGN APPLICATIONS **************************
CHINA 200710104400.7 05/11/2007
CHINA 200710181758.X 10/24/2007
CHINA 200710165540.5 11/02/2007
CHINA 200810085729.8 03/13/2008

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Foreign Priority claimed ☑ Yes ☐ No 35 USC 119(a-d) conditions met ☐ Yes ☑ No Verified and Acknowledged /DADY CHERY/ Examiner's Signature	☐ Met after Allowance Initials	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
		CHINA	18	17	5

ADDRESS
Huawei/BHGL
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Chicago, IL 60610
UNITED STATES

TITLE
METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

FILING FEE RECEIVED		
1530	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

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EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S4	2	indication same (release near request near message) same (mobility near management near network near element MME)	US-PGPUB; USPAT	OR	ON	2010/04/13 17:57
S6	15050	(370/328,329,330,331,332,333,334).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 18:35
S7	5081	(455/436,437,438,439).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 18:37
S8	13008	(709/227,228,229).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 18:37
S9	1771	S6 and S7	US-PGPUB; USPAT	OR	ON	2010/04/13 18:38
S10	18	S8 and S9	US-PGPUB; USPAT	OR	ON	2010/04/13 18:38
S11	0	(release near request near message) same (mobility near management near network near element MME)same (mobile user UE phone terminal) same (packet near switching) same (circuit near switching)	US-PGPUB; USPAT	OR	ON	2010/04/13 18:57
S12	6	(release near request near message) same (mobility near management near network near element MME)	US-PGPUB; USPAT	OR	ON	2010/04/13 18:58
S17	89	(handoff hand-off handover hand-over) same bearer same (delet$3 suspend$3 preserv$3)	US-PGPUB; USPAT	OR	ON	2010/04/13 22:38
S18	15050	(370/328,329,330,331,332,333,334).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 22:38
S19	35	S17 and S18	US-PGPUB; USPAT	OR	ON	2010/04/13 22:38
S20	13008	(709/227,228,229).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 22:38
S21	0	S17 and S20	US-PGPUB; USPAT	OR	ON	2010/04/13 22:38
S22	5081	(455/436,437,438,439).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 22:39
S23	1771	S18 and S22	US-PGPUB; USPAT	OR	ON	2010/04/13 22:39
S24	16	S17 and S23	US-PGPUB; USPAT	OR	ON	2010/04/13 22:39

S25	32	S17 and S22	US-PGPUB; USPAT	OR	ON	2010/04/13 22:39
S26	16	S25 not S24	US-PGPUB; USPAT	OR	ON	2010/04/13 22:48
S27	19	S19 not S24	US-PGPUB; USPAT	OR	ON	2010/04/13 22:50
S28	7	(wu near2 wenfu).in.	US-PGPUB; USPAT	OR	ON	2010/04/14 14:57
S29	6	US-7359347-$.DID. OR US-20070010252-$.DID. OR US-1436435-$.DID. OR US-1545236-$.DID. OR KR-20040051328-$.DID. OR WO-2007007150-$.DID.	US-PGPUB; USPAT; USOCR; JPO	OR	ON	2010/04/14 17:15
S32	3036	(suspend$3 preserv$3 delet$3 cancel$3 releas$3) same bearer$3	US-PGPUB; USPAT	OR	ON	2010/06/02 09:59
S33	280	(handoff hand-off handover hand-over) same S32	US-PGPUB; USPAT	OR	ON	2010/06/02 09:59
S34	176	S33 and "26"	US-PGPUB; USPAT	OR	ON	2010/06/02 09:59
S35	15687	(370/328,329,330,331,332,333,334).ccls.	US-PGPUB; USPAT	OR	ON	2010/06/02 10:00
S36	101	S33 and S35	US-PGPUB; USPAT	OR	ON	2010/06/02 10:00
S37	5218	(455/436,437,438,439).ccls.	US-PGPUB; USPAT	OR	ON	2010/06/02 10:11
S38	86	S33 and S37	US-PGPUB; USPAT	OR	ON	2010/06/02 10:11

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S41	1	(wu near2 wenfu).in.	USPAT; UPAD	OR	ON	2010/07/31 10:10

10/27/2010 6:17:55 PM
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
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First Named Inventor	Wenfu Wu
Art Unit	2617
Examiner Name	Not Yet Assigned
Attorney Docket Number	21370/0212577-US0

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	6725039		2004-04-20	Parmar et al.	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20030114158		2003-06-19	Soderbacka et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1	1605222	CN	A	2005-04-06	Nokia Corp		☒
	2	1275872	CN	A	2000-12-06	Nippon Electric Co		☒
	3	1882160	CN	A	2006-12-20	Zte Corp		☒

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Art Unit	2617
	Examiner Name	Not Yet Assigned
	Attorney Docket Number	21370/0212577-US0

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 081596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE October 19, 2009	GROUP ART UNIT 2617
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	B1	2003/0114158 A1	June 19, 2003	Soderbacka et al.		

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	B2	2004/100403 A1	November 18, 2004	PCT		
	B3	2007/011638 A2	January 25, 2007	PCT		
	B4	2007/011638 A3	January 25, 2007	PCT		
	B5	2008/094419 A1	August 7, 2008	PCT		

EXAMINER INITIAL		OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.
	B6	3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3GPP System Architecture Evolution: GPRS Enhancements for E-UTRAN Access; Release 8" Global System for Mobile Communications. April 2007. (clean version)
	B7	3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3GPP System Architecture Evolution: GPRS Enhancements for E-UTRAN Access; Release 8" Global System for Mobile Communications. April 2007. (marked-up version)
	B8	Infineon Technologies "GPRS Attach Type While in DTM" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 21 February 2005.
	B9	Huawei "Refine Attach Procedure" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 18 April 2007.
	B10	Huawei "Handover from non 3GPP to 3GPP" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 18 April 2007.
	B11	CATT "TAU Procedure" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 18 April 2007.
	B12	Intel "Handover from 3GPP Access (UTRAN) to non-3GPP Access (TS 23.402)" 3rd Generation Partnership Project (3GPP), Mobile Competence Centre. 19 April 2007.
	B13	Huawei "Attach Type in Attach Procedure" 3rd Generation Partnership Project (3GPP) Mobile Competence Centre. 19 June 2007.
	B14	International Preliminary Report on Patentability issued in corresponding PCT Application No. PCT/CN2008/070909; issued November 17, 2009.
	B15	Copy of Office Action issued in corresponding Chinese Patent Application No. 200810085729.8; issued April 2, 2010
	B16	Copy of Supplementary European Search Report issued in corresponding European Patent Application No. 08 73. 4264; issued February 19, 2010

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	C1	WO 2007/011638 A2	01/25/2007	PCT		

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	C2	Copy of Extended European Search Report issued in corresponding European Patent Application No. 10167471.1, mailed October 12, 2010.
	C3	Wang et al., "A Mobile IPv6 Based Seamless Handoff Strategy for Heterogeneous Wireless Networks", 4th International Conference on Computer and Information Technology, 2004.
	C4	Huawei, "Handover From No 3GPP TO 3GPP Approval/Discussion", 3GPP TSG SA WG2 Architecture – S2#57. Beijing, China, April 23-27, 2007.
	C5	Huawei, "Attach Type in Attach Procedure Discussion /Approval", 3GPP TSG SA WG2 Architecture – S2#58. Orlando, Florida, June 25-29, 2007.
	C6	Change Request, 23.402 CR 0158. 3GPP TSG-SA WG2 Meeting #63. Athens, Greece, February 18-22, 2008.

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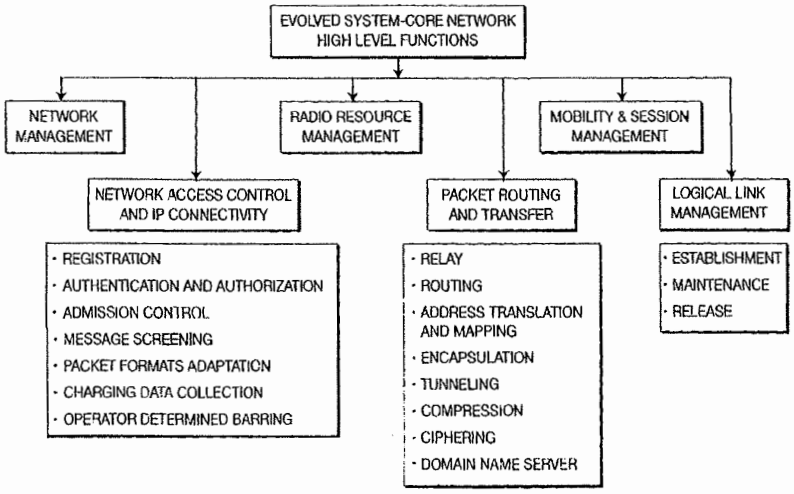
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: WIRELESS COMMUNICATION SYSTEM AND METHOD OF IMPLEMENTING AN EVOLVED SYSTEM ATTACHMENT PROCEDURE



(57) Abstract: A wireless communication system and method of implementing an evolved system attachment procedure are disclosed. The system includes a first core network and a second core network which is evolved from the first core network. A wireless transmit/receive unit (WTRU) sends an attach request message to the second core network. The second core network activates a packet data protocol (PDP) context and sends an attach accept message to the WTRU. The attach accept message includes information regarding the PDP context. The second core network constructs a session and mobility management (SMM) context for session management (SM) and mobility management (MM) for the WTRU.

WO 2007/011638 A2

[0001] WIRELESS COMMUNICATION SYSTEM AND METHOD OF IMPLEMENTING AN EVOLVED SYSTEM ATTACHMENT PROCEDURE

[0002] FIELD OF INVENTION

[0003] The present invention generally relates to an evolved wireless communication system, (e.g., evolved universal mobile telecommunication system (UMTS) terrestrial radio access network (E-UTRAN)). More particularly, the present invention is related to a wireless communication system and method of implementing evolved system attachment procedure.

[0004] BACKGROUND

[0005] Evolution of a third generation (3G) system is in progress to provide a higher data rate, lower latency, and support of multiple radio access technologies (RATs). The main features of the evolved 3G system include an enhanced air interface to handle higher data rates with more efficiency, optimization of conventional procedures to reduce the number of signaling procedures and reduce setup delay, and network design to permit interconnection and interoperation of any air interface, such as global standards for mobile communication (GSM), general packet radio services (GPRS), wideband code division multiple access (WCDMA), CDMA2000, IEEE 802.xx, or the like.

[0006] Figure 1 shows a conventional GPRS access interface and reference points. A mobile station (MS) 102, which includes a terminal equipment (TE) 104 and a mobile terminal (MT) 106, is attached to one of a plurality of GPRS packet domain networks 108a, 108b, which is further connected to a packet data network 110. The GPRS packet domain networks 108a, 108b perform a network access control function, a packet routing and transfer function, a mobility management function, a logical link management function, a radio resource management function, a network management function, or the like.

[0007] The network access control function includes registration, authentication and authorisation, admission control, message screening, packet formats adaptation, charging data collection, operator determined barring, or the like. The packet routing and transfer function includes relay, routing, address translation and mapping, encapsulation, tunnelling, compression, ciphering, domain name server, or the like. The logical link management function includes establishment, maintenance and release of a session.

[0008] Figures 2A and 2B show conventional state machines for mobility management (MM) of an MS and a serving GRPS support node (SGSN) in an Iu mode. The MS and the SGSN may be in one of a packet mobility management (PMM)-detached state, a PMM-connected state and a PMM-idle state. In the PMM-detached state, there is no communication between the MS and the SGSN. In order to establish MM contexts in the MS and the SGSN, the MS performs a GPRS attach procedure. Upon GPRS attach, the state changes to the PMM-connected state, and a packet switching (PS) signaling connection is established between the MS and the SGSN. A PS signaling connection release changes the state to the PMM-idle state. GPRS detach, PS attach reject or routing area update (RAU) reject causes the state to change to the PMM-detached state. In the PMM-idle and PMM-connected state, the session management (SM) state may be active or inactive.

[0009] Figures 3A, 3B and 3C, taken together, are a signaling diagram of an attach procedure 300 in a conventional GPRS system. As shown in Figure 3A, an MS 302 initiates the attach procedure 300 by the transmission of an attach request message to a new SGSN 306 (step 322). The attach request message includes an international mobile subscriber identity (IMSI) (alternatively, a packet-temporary mobile subscriber identity (P-TMSI) and an old routing area identity (RAI)), an attach type, or the like.

[0010] If the MS 302 identifies itself with the P-TMSI, the new SGSN 306 derives an old SGSN address from the RAI to request IMSI information of the MS 302 (step 324). The new SGSN 306 sends an identification request message to an

old SGSN 308 (step 326). The identification request message includes a P-TMSI, an old RAI, old P-TMSI signature, or the like. The old SGSN 308 checks the P-TMSI against record and sends an identification response message with the IMSI of the MS 302 to the new SGSN 306 (steps 328, 330). If the MS 302 is known in the old SGSN 308, the old SGSN 308 responds with an identification response message including the IMSI, authentication triplets or authentication quintets. If the MS 302 is not known in the old SGSN 308 or the old P-TMSI does not match the value stored in the old SGSN 308, the old SGSN 308 responds with an appropriate error cause in the identification response message at step 330.

[0011] If the MS 302 is unknown in the old SGSN 308, the new SGSN 306 sends an identity (ID) request (ID Type = IMSI) to the MS 302 (step 334). The MS 302 responds with an ID response including the IMSI of the MS 302 (step 336).

[0012] If no MM context for the MS exists anywhere in the network, an authentication procedure is performed by the MS 302, the new SGSN 306 and a home location register (HLR) 314 (step 338).

[0013] Referring to Figure 3B, based on operator configuration, an international mobile equipment identity (IMEI) checking procedure may optionally be performed by the MS 302, the new SGSN 306 and an equipment identity register (EIR) 310 (step 340). If the SGSN number has changed since the last GPRS detach, or if it is the very first attach, the new SGSN 306 updates the HLR 314 by sending an update location message to the HLR 314 (step 342). The update location message includes an SGSN number, an SGSN address, the IMSI, or the like.

[0014] The HLR 316 compares the SGSN number with records and sends a cancel location message (including IMSI, cancellation type) to the old SGSN 308 (steps 344, 346). The old SGSN 308 acknowledges with a cancel location acknowledgement (ACK) (step 348). The HLR 314 sends an insert subscriber data message including the IMSI and GPRS subscription data to the new SGSN 306 (step 350).

[0015] The new SGSN 306 checks if the MS 302 is not allowed in the new routing area (RA) (step 352). If due to regional subscription restrictions or access restrictions the MS 302 is not allowed to attach in the RA, the new SGSN 306 rejects the attach request with an appropriate cause, and may return an insert subscriber data ACK (including the IMSI, an SGSN area restricted message) to the HLR 314 (steps 354). If the subscription checking fails for other reasons, the new SGSN 306 also rejects the attach request with an appropriate cause and returns an insert subscriber data ACK (including the IMSI and a cause) to the HLR 314. If all checks are successful, the new SGSN 306 constructs an MM context for the MS 302 and returns an insert subscriber data ACK (including the IMSI) to the HLR 314 (steps 356, 358). The HLR 314 updates the MM context and sends an update location ACK to the new SGSN 306 (steps 360, 362).

[0016] Referring to Figure 3C, if the attach type indicated in the attach request indicates a combined GPRS/IMSI attach, a visitor location register (VLR) should be updated. The new SGSN 306 sends a location update request to a new VLR 312 (step 364). The location update request includes a new LAI, the IMSI, an SGSN number, a location update type, or the like.

[0017] The new VLR 312 creates an association with the new SGSN 306 by storing the SGSN number. If the location area (LA) update is inter-mobile switching center (MSC), the new VLR 312 sends an update location message (including the IMSI and a new VLR) to the HLR 314 (step 366). The HLR 314 sends a cancel location message to an old VLR 316 (step 368). The old VLR 316 acknowledges with a cancel location ACK (step 370).

[0018] The HLR 314 sends an insert subscriber data message (including the IMSI and subscriber data) to the new VLR 312 (step 372). The new VLR 312 acknowledges with an insert subscriber data ACK (step 374). After finishing the inter-MSC location update procedures, the HLR 314 responds with an update location ACK to the new VLR 312 (step 376). The new VLR 312 responds with a

location update accept message (including VLR TMSI) to the new SGSN 306 (step 378).

[0019] The new SGSN 306 sends an attach accept message to the MS 302 (step 380). The attach accept message includes a P-TMSI, a VLR TMSI, P-TMSI signature, and radio priority SMS. The MS 302 then returns an attach complete message to the new SGSN 306 and the new SGSN 306 sends a TMSI reallocation complete message to the new VLR 312 (steps 382, 384).

[0020] Figure 4 is a diagram of a conventional state machine for SM. A GPRS subscription contains the subscription of one or more packet data protocol (PDP) addresses. Each PDP address is an element of a PDP context. The PDP state indicates whether data transfer is enabled for that PDP address or not. The PDP state is moved from an inactive state to an active state when PDP context is activated. The active state is changed to the inactive state when the deactivation procedure is initiated, or when the MM state changes to the PMM-idle state or PMM-detached state.

[0021] In the inactive state, the data service for a certain PDP address of the MS is not activated and the PDP context contains no routing or mapping information to process PDP protocol data units (PDUs) related to that PDP address. In the active state, the PDP context for the PDP address in use is activated in the MS, SGSN and gateway GPRS support node (GGSN). The PDP context contains mapping and routing information for transferring PDP PDUs for that particular PDP address between the MS and the GGSN. The active state is permitted only when the MM state of the MS is PMM-idle state or PMM-connected state.

[0022] Figure 5 is a flow diagram of a conventional PDP context activation procedure 500. The MS 302 sends an activate PDP context request message to an SGSN 306 (step 502). The activate PDP context request message includes a PDP type, a PDP address, an access point name (APN), quality of service (QoS) requested, protocol configuration options, or the like. The SGSN 306 validates the activate PDP context request, selects an APN and maps the APN to a GGSN 310 (step 504).

[0023] The SGSN 306 sends a create PDP context request message to the GGSN 310 (step 506). The create PDP contest request message includes a PDP type, a PDP address, an APN, QoS negotiated, a TEID, charging characteristics, or the like. The GGSN 310 creates a new entry in its PDP context table and returns a create PDP context response to the SGSN 306 (step 508). The create PDP context response message includes a TEID, a PDP address, protocol configuration options, QoS negotiated, charging ID, or the like.

[0024] Radio access bearer (RAB) setup is performed among the MS 302, the RAN 304 and the SGSN 306 (step 510). In Iu mode and if basic service set (BSS) trace is activated, the SGSN 306 may send an invoke trace message to the RAN 304 (step 512). The SGSN 306 may inform the GGSN 310 about the downgraded QoS attributes by sending an update PDP context request (step 514). The GGSN 310 confirms the new QoS attributes by sending an update PDP context response to the SGSN 306 (step 516).

[0025] The SGSN 306 inserts the GGSN address in its PDP context (step 518). If the MS 302 has requested a dynamic address, the PDP address received from the GGSN 310 is inserted in the PDP context. The SGSN 306 selects radio priority and packet flow ID based on QoS negotiated, and returns an activate PDP context accept message to the MS 302 (step 520). The activate PDP context accept message includes a PDP type, a PDP address, a transaction identifier (TI), QoS negotiated, radio priority, a packet flow ID, protocol configuration options, or the like. If the MS 302 indicated in the MS network capability it does not support BSS packet flow procedures, the SGSN 306 then shall not include the packet flow ID.

[0026] SUMMARY

[0027] The present invention is related to a wireless communication system and method of implementing an evolved system attachment procedure. The wireless communication system includes a first core network, (i.e., conventional third generation partnership project (3GPP) core network), and a second core network,

(i.e., evolved core network), which is evolved from the first core network. An evolved wireless transmit/receive unit (WTRU) operating in the evolved system upon power up, sends a modified Attach Request message to the evolved core network. Upon reception, the evolved core network performs the same procedures specified in 3GPP TS23.060 PS attach procedure, (e.g., Authentication, Authorization, Mobility Management, or the like). The evolved core network then proceeds to activate the PDP context (allocation and configuration of default IP address for the WTRU). Upon successful completion of IP configuration procedures (PDP context activation), the evolved core network sends the new Attach Accept message to the WTRU. The new Attach Accept message includes information regarding the PDP context (e.g., IP address, IP version (i.e., v4 or v6), APN information, QoS, or the like). The evolved core network also constructs a session (SM) and mobility management (MM) (SMM) context for SM and MM for the WTRU. The SM and MM states in accordance with the present invention are different from conventional 3GPP-based MM and SM states (in the first core network). The SM and MM in accordance with the present invention adopts the allocation of the IP address for the entire operation of the WTRU. If the WTRU is connected, then the IP address is allocated. If no IP address is allocated then the WTRU is in a De-Attached state, (i.e., not reachable or OFF). In accordance with the present invention, the WTRU state (availability) depends on the allocation of IP address. The state transition between MM states are changed accordingly.

[0028] BRIEF DESCRIPTION OF THE DRAWINGS

[0029] Figure 1 is a diagram of conventional GPRS access interfaces and reference points.

[0030] Figures 2A and 2B show conventional state machines for mobility management.

[0031] Figures 3A-3C, taken together, are a flow diagram of a conventional PS-attach and registration procedure.

[0032] Figure 4 is a diagram of a conventional state machine for session management.

[0033] Figure 5 is a flow diagram of a conventional PDP Context activation procedure.

[0034] Figure 6 is a diagram of an exemplary evolved system architecture including E-UTRAN and an evolved core network (CN) in accordance with the present invention.

[0035] Figure 7 is a diagram of evolved system core network high-level functions in accordance with the present invention.

[0036] Figures 8A and 8B show state machines for session and mobility management (SMM) in accordance with the present invention.

[0037] Figures 9A-9C, taken together, are a flow diagram of an evolved system attachment and registration procedure in accordance with the present invention.

[0038] DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0039] When referred to hereafter, the terminology "WTRU" includes but is not limited to a user equipment (UE), an MS, a fixed or mobile subscriber unit, a pager, or any other type of device capable of operating in a wireless environment.

[0040] The features of the present invention may be incorporated into an integrated circuit (IC) or be configured in a circuit comprising a multitude of interconnecting components.

[0041] Figure 6 is a diagram of an exemplary evolved system 600 including an E-UTRAN and an evolved CN in accordance with the present invention. The evolved system 600 includes an access system stratum 610, a network stratum 620 and a multimedia stratum 630. The access system stratum 610 includes a plurality of radio access networks (RANs), a CN 616 and an evolved CN 617. The RANs include a generic access network (GAN) 611, a GSM/EDGE radio access network (GERAN) 612, a UTRAN 613, an E-UTRAN 614 and an interworking wireless local area network (I-WLAN) 615. The RANs 611-615 are connected to the CN 616 or the

evolved CN 617 to provide services, (such as multimedia services from an Internet protocol (IP) multimedia subsystem (IMS) 631), to one or more WTRUs while interacting with an authentication, authorization and accounting (AAA) server 621, a mobile IP (MIP) server 622, or other network entities in the network stratum 620 via a GGSN 618 or a packet data gateway (PDG) 619.

[0042] Figure 7 is a diagram of evolved system core network high-level functions in accordance with the present invention. The network access and IP connectivity control function controls registration, authentication and authorisation, admission, message screening, packet formats adaptation, charging data collection, operator determined barring, or the like. The packet routing and transfer function controls reay, routing, address translation and mapping, encapsulation, tunnelling, compression, ciphering, domain name server, or the like. The logical link management function controls establishment, maintenance and release of a session.

[0043] Figures 8A and 8B show state machines for session and mobility management (SMM) in accordance with the present invention. The WTRU and the evolved system core may be in one of an MM-detached and SM-inactive state, an MM-connected and SM-active state and an MM-idle and SM-active state. In the MM-detached and SM-inactive state, there is no communication between the WTRU and the evolved system core. After evolved system attachment, the SMM state changes from the MM-detached and SM-inactive state to the MM-connected and SM-active state. In the MM-connected and SM-active state, a PS signaling connection is established between the WTRU and the evolved system core. A PS signaling connection release while in the MM-connected and SM-active state changes the SMM state to the MM-idle and SM-active state. A PS signaling connection establishment while in the MM-idle and SM-active state changes the SMM state to the MM-connected SM-active state. Evolved system detach, PS attach reject or inter-RAT handover reject causes the SMM state to change to the MM-detached and SM-inactive state.

[0044] Figures 9A-9C are a flow diagram of a process 1000 for evolved system attachment and registration in accordance with the present invention. A WTRU 1002 initiates the attach procedure 1000 by the transmission of an attach request message to a new CN, (i.e., evolved CN), 1006 (step 1022). The attach request message includes an IMSI (or P-TMSI and an old RAI), an attach type, or the like. If the WTRU 1002 identifies itself with the P-TMSI, the new CN 1006 derives an old SGSN address from the RAI to request IMSI information of the WTRU 1002 (step 1024). The new CN 1006 sends an identification request message to the old SGSN 1008 (step 1026). The identification request message includes a P-TMSI, an old RAI, old P-TMSI signature, or the like.

[0045] The old SGSN 1008 checks the P-TMSI against record and sends an identification response message the new CN 1006 (steps 1028, 1030). If the WTRU 1002 is known in the old SGSN 1008, the old SGSN 1008 responds with the identification response message including the IMSI, authentication triplets or authentication quintets. If the WTRU 1002 is not known in the old SGSN 1008 or the old P-TMSI does not match the value stored in the old SGSN 1008, the old SGSN 1008 responds with an appropriate error cause in the identification response message at step 1030. If the WTRU 1002 is unknown in the old SGSN 1008, the new CN 1006 sends an ID request (ID Type = IMSI) to the WTRU 1002 (steps 1032, 1034). The WTRU 1002 then responds with an ID response including the IMSI of the WTRU 1002 (step 1036).

[0046] If no MM context for the WTRU 1002 exists anywhere in the network, an authentication procedure is performed by the WTRU 1002, the new CN 1006 and an HLR 1014 (step 1038). Based on operator configuration, an IMEI checking procedure may optionally be performed by the WTRU 1002, the new CN 1006 and an EIR 1010 (step 1040).

[0047] If the new CN number has changed since the last system attach, or if it is the very first attach, the new CN 1006 updates the HLR 1014 by sending an

update location message to the HLR 1014 (step 1042). The update location message includes a CN number, a CN address, the IMSI, or the like.

[0048] The HLR 1014 compares the CN number with records and sends a cancel location message (including the IMSI, a cancellation type) to the old SGSN 1008 (steps 1044, 1046). The old SGSN 1008 acknowledges with a cancel location ACK (step 1048). The HLR 1014 sends an insert subscriber data message, (including the IMSI, subscription data, a PDP type, a PDP address, an APN, QoS, visiting public land mobile network (VPLMN) allowed, or the like), to the new CN 1006 (step 1050).

[0049] The new CN 1006 checks if the WTRU 1002 is not allowed in the new RA (step 1052). If due to regional subscription restrictions or access restrictions the WTRU 1002 is not allowed to attach in the RA, the new CN 1006 rejects the attach request with an appropriate cause, and may return an insert subscriber data ACK (including the IMSI, CN area restricted message) to the HLR 1014 (steps 1054). If the subscription checking fails for other reasons, the new CN 1006 also rejects the attach request with an appropriate cause and returns an insert subscriber data ACK (including the IMSI and cause) to the HLR 1014. If all checks are successful, the new CN 1006 constructs an SMM context for the WTRU 1002 and returns an insert subscriber data ACK (including the IMSI, a PDP type, a PDP address, an APN, a TEID, or the like) to the HLR 1014 (steps 1056, 1058). The HLR 1014 updates the SMM context and sends an update location ACK to the new CN 1006 (steps 1060, 1062).

[0050] If the attach type indicated in the attach request indicates a combined E-UTRAN/IMSI attach, a VLR should be updated. The new CN 1006 sends a location update request to a new VLR 1012 (step 1064). The location update request includes a new LAI, the IMSI, a CN number, a location update type, or the like.

[0051] The new VLR 1012 creates an association with the new CN 1006 by storing the CN number. If the LA update is inter-mobile switching center (MSC), the new VLR 1012 sends an update location message (including the IMSI and a new

VLR) to the HLR 1014 (step 1066). The HLR 1014 sends a cancel location message to an old VLR 1016 (step 1068). The old VLR 1016 acknowledges with a cancel location ACK (step 1070).

[0052] The HLR 1014 sends an insert subscriber data message (including the IMSI and subscriber data) to the new VLR 1012 (step 1072). The new VLR 1012 acknowledges with an insert subscriber data ACK (step 1074). After finishing the inter-MSC location update procedures, the HLR 1014 responds with an update location ACK to the new VLR 1012 (step 1076). The new VLR 1012 responds with a location update accept message (including VLR TMSI) to the new CN 1006 (step 1078).

[0053] An RAB setup procedure is performed among the WTRU 1002, the UTRAN 1004 and the new CN 1006 (step 1080). In Iu mode and if BSS trace is activated, the new CN 1006 may send an invoke trace message to the UTRAN 1004 (step 1082).

[0054] The new CN 1006 sends an attach accept message to the WTRU 1002 (step 1084). The attach accept message includes a P-TMSI, a VLR TMSI, P-TMSI signature, a PDP type, a PDP address, a TI, QoS, radio priority, a packet flow ID, PDP configuration, or the like. The WTRU 1002 then returns an attach complete message to the new CN 1006 and the new CN 1006 sends a TMSI reallocation complete message to the new VLR 1012 (steps 1086, 1088).

[0055] The information elements (IEs) included in the attach accept message in accordance with the present invention are shown in Table 1. New IEs introduced in accordance with the present invention are shown in bold font in Table 1. The attach accept message is sent by the CN to the WTRU to indicate that the corresponding attach request has been accepted.

IEI	Information Element	Type/Reference	Presence	Format	Length
	Protocol discriminator	Protocol discriminator	M	V	1/2
	Skip indicator	Skip indicator	M	V	1/2
	Attach accept message identity	Message type	M	V	1
	Attach result	Attach result	M	V	1/2
	Force to standby	Force to standby	M	V	1/2
	Periodic RA update timer	GPRS Timer	M	V	1
	Radio priority for SMS	Radio priority	M	V	1/2
	Radio priority for TOM8	Radio priority 2	M	V	1/2
	Routing area identification	Routing area identification	M	V	6
19	P-TMSI signature	P-TMSI signature	O	TV	4
17	Negotiated READY timer value	GPRS Timer	O	TV	2
18	Allocated P-TMSI	Mobile identity	O	TLV	7
23	MS identity	Mobile identity	O	TLV	7-10
25	GMM cause	GMM cause	O	TV	2
2A	T3302 value	GPRS Timer 2	O	TLV	3
8C	Cell Notification	Cell Notification	O	T	1
4A	Equivalent PLMNs	PLMN List	O	TLV	5-47
B-	Network feature support	Network feature support	O	TV	1
34	Emergency Number List	Emergency Number List	O	TLV	5-50
A-	Requested MS Information	Requested MS Information	O	TV	1
	Negotiated LLC SAPI	**LLC service access point identifier**	**M**	**V**	**1**
	Negotiated QoS	**Quality of service**	**M**	**LV**	**13-15**
	Radio priority	**Radio priority**	**M**	**V**	**1/2**
	Spare half octet	**Spare half octet**	**M**	**V**	**1/2**
2B	**PDP address**	**Packet data protocol address**	**O**	**TLV**	**4-20**
27	**Protocol configuration options**	**Protocol configuration options**	**O**	**TLV**	**3-253**
34	**Packet Flow Identifier**	**Packet Flow Identifier**	**O**	**TLV**	**3**

Table 1

[0056] The PDP address IE is included in the attach accept message if the WTRU has requested the activation of a PDP context with the PDP type IPv4 or IPv6 and dynamic addressing. The protocol configuration options IE is included in the attach accept message when the CN wishes to transmit protocol data (e.g., configuration parameters, error codes or messages/events) to the WTRU. The packet

flow ID IE may be included if the CN wants to indicate the packet flow ID associated to the PDP context. The CN shall not include this IE if the WTRU has not indicated PFC procedure support in PFC feature mode field of WTRU network capability IE. If the WTRU has not indicated PFC procedure support, then it shall ignore this IE, if received.

[0100] The Negotiated LLC SAPI, Negotiated QoS, Radio priority and Spare half octet are IEs used to map the service to the right end point within the network with the right setting. The LLC SAPI, identifies the Service Access Point Identifier in both the WTRU, the E-UTRAN and the evolved CN. This ensures that the traffic flow of a particular service is routed via the same nodes for uplink and downlink. Negotiated QoS is the set of attributes for the traffic flow that specify the resources to be allocated, such as bit-rate, delay, bit-error rate, PDU sizes, or the like. Radio priority IE sets up the class of the data traffic for the RAN.

[0101] Embodiments.

[0102] 1. A method for system attachment in an evolved wireless communication system including a first core network and a second core network, the second core network being evolved from the first core network.

[0103] 2. The method of embodiment 1 comprising a step of a WTRU sending an attach request message to the second core network.

[0104] 3. The method of embodiment 2 comprising a step of the second core network activating a PDP context.

[0105] 4. The method as in any embodiments 2-3, comprising a step of the second core network sending an attach accept message to the WTRU, the attach accept message including information regarding the PDP context.

[0106] 5. The method as in any embodiments 2-4, wherein the attach request message includes an IMSI.

[0107] 6. The method as in any embodiments 2-4, wherein the attach request message includes a P-TMSI and a RAI with respect to the first core network.

[0108] 7. The method as in any embodiments 2-6, further comprising the step of the second core network sending an identification request to the first core network to obtain an IMSI from the first core network.

[0109] 8. The method of embodiment 7 further comprising the step of the first core network sending an identification response to the second core network including the IMSI if the WTRU is known in the first core network.

[0110] 9. The method as in any embodiments 7-8, wherein the second core network derives an address of the first core network using the RAI.

[0111] 10. The method as in any embodiments 8-9, further comprising the step of the first core network sending the identification response with an error message if the WTRU is not known in the first core network.

[0112] 11. The method of embodiment 10 further comprising the step of the second core network sending an ID request to the WTRU to obtain the IMSI.

[0113] 12. The method of embodiment 11 further comprising the step of the WTRU sending an ID response with the IMSI.

[0114] 13. The method as in any embodiments 8-12, further comprising the step of the first core network sending the identification response with an error message if the P-TMSI does not match the value stored in the first core network.

[0115] 14. The method of embodiment 13 further comprising the step of the second core network sending an ID request to the WTRU to obtain the IMSI.

[0116] 15. The method of embodiment 14 further comprising the step of the WTRU sending an ID response with the IMSI.

[0117] 16. The method as in any embodiments 2-15, further comprising the step of the WTRU and the second core network performing authentication procedure.

[0118] 17. The method as in any embodiments 2-16, further comprising the step of the WTRU and the second core network performing an IMEI checking procedure.

[0119] 18. The method as in any embodiments 2-17, wherein the attach request indicating an attach type.

[0120] 19. The method of embodiment 18 wherein the attach type indicates an E-UTRAN only attachment.

[0121] 20. The method of embodiment 18 wherein the attach type indicates an E-UTRAN and IMSI attachment.

[0122] 21. The method as in any embodiments 4-20, wherein the attach accept message includes at least one of a PDP type, a PDP address, a TI, QoS, radio priority, a packet flow identifier and PDP configuration.

[0123] 22. The method as in any embodiments 2-21, further comprising the step of the second core network constructing an SMM context for SM and MM for the WTRU.

[0124] 23. The method of embodiment 22 wherein a state of the SMM is defined as one of an MM-detached and SM-inactive state, an MM-connected and SM-active state and an MM-idle and SM-active state.

[0125] 24. The method as in any embodiments 22-23, wherein an SMM state of the WTRU changes depending on allocation of PDP address to the WTRU.

[0126] 25. The method as in any embodiments 2-24, further comprising the step of the second core network rejecting the attach request if the WTRU is not allowed in an RA with respect to the second core network.

[0127] 26. A wireless communication system comprising a first core network, a second core network evolved from the first core network and a WTRU configured to send an attach request message to the second core network

[0128] 27. The system of embodiment 26 wherein the second core network is configured to activate a PDP context for the WTRU and send an attach accept message to the WTRU including information regarding the PDP context.

[0129] 28. The system as in any embodiments 26-27, wherein the attach request message includes an IMSI.

[0130] 29. The system as in any embodiments 26-27, wherein the attach request message includes a P-TMSI and an RAI with respect to the first core network.

[0131] 30. The system as in any embodiments 26-29, wherein the second core network is configured to send an identification request to the first core network to obtain an IMSI from the first core network.

[0132] 31. The system of embodiment 30 wherein the first core network is configured to send an identification response to the second core network including the IMSI if the WTRU is known in the first core network.

[0133] 32. The system as in any embodiments 29-31, wherein the second core network derives an address of the first core network using the RAI.

[0134] 33. The system as in any embodiments 32 wherein the first core network is configured to send the identification response with an error message if the WTRU is not known in the first core network.

[0135] 34. The system as in any embodiments 26-29, wherein the second core network is configured to send an ID request to the WTRU to obtain the IMSI and the WTRU is configured to send an ID response with the IMSI.

[0136] 35. The system of embodiment 34 wherein the first core network is configured to send the identification response with an error message if the P-TMSI does not match the value stored in the first core network.

[0137] 36. The system as in any embodiments 26-35, wherein the second core network is configured to send an ID request to the WTRU to obtain the IMSI and the WTRU is configured to send an ID response with the IMSI.

[0138] 37. The system as in any embodiments 26-36, wherein the WTRU and the second core network are configured to perform authentication procedure.

[0139] 38. The system as in any embodiments 26-37, wherein the WTRU and the second core network are configured to perform an IMEI checking procedure with an EIR.

[0140] 39. The system as in any embodiments of 26-38, wherein the attach request indicating an attach type.

[0141] 40. The system of embodiment 39 wherein the attach type indicates an E-UTRAN only attachment.

[0142] 41. The system of embodiment 39 wherein the attach type indicates an E-UTRAN and IMSI attachment.

[0143] 42. The system as in any embodiments 27-41, wherein the attach accept message includes at least one of a PDP type, a PDP address, a TI, QoS, radio priority, a packet flow identifier and PDP configuration.

[0144] 43. The system as in any embodiments 26-42, wherein the second core network is configured to construct an SMM context for SM and MM for the WTRU.

[0145] 44. The system of embodiment 43 wherein a state of the SMM is defined as one of an MM-detached and SM-inactive state, an MM-connected and SM-active state and an MM-idle and SM-active state.

[0146] 45. The system as in any embodiments 43-44, wherein an SMM state of the WTRU changes depending on allocation of PDP address to the WTRU.

[0147] 46. The system as in any embodiments 27-45, wherein the second core network is configured to reject the attach request if the WTRU is not allowed in an RA with respect to the second core network.

[0148] 47. A state machine for SMM comprising a MM-detached and SM-inactive state indicating a WTRU is detached and PDP context is not activated.

[0149] 48. The state machine of embodiment 47 further comprising an MM-connected and SM-active state indicating the WTRU is attached and PDP context is activated and an SM connection is established.

[0150] 49. The state machine as in any embodiments 47-48, further comprising an MM-idle and SM-active state indicating the WTRU is attached, PDP context is activated and the SM connection is released.

[0151] Although the features and elements of the present invention are described in the preferred embodiments in particular combinations, each feature or element can be used alone without the other features and elements of the preferred embodiments or in various combinations with or without other features and elements of the present invention.

* * *

CLAIMS

What is claimed is:

1. In an evolved wireless communication system including a first core network and a second core network, the second core network being evolved from the first core network, a method for system attachment, the method comprising:

a wireless transmit/receive unit (WTRU) sending an attach request message to the second core network;

the second core network activating a packet data protocol (PDP) context; and

the second core network sending an attach accept message to the WTRU, the attach accept message including information regarding the PDP context.

2. The method of claim 1 wherein the attach request message includes an international mobile subscriber identity (IMSI).

3. The method of claim 1 wherein the attach request message includes a packet temporary mobile subscriber identity (P-TMSI) and a routing area identity (RAI) with respect to the first core network.

4. The method of claim 3 further comprising:

the second core network sending an identification request to the first core network to obtain an international mobile subscriber identity (IMSI) from the first core network; and

the first core network sending an identification response to the second core network including the IMSI if the WTRU is known in the first core network.

5. The method of claim 4 wherein the second core network derives an address of the first core network using the RAI.

6. The method of claim 4 further comprising:

the first core network sending the identification response with an error message if the WTRU is not known in the first core network.

7. The method of claim 6 further comprising:

the second core network sending an identity (ID) request to the WTRU to obtain the IMSI; and

the WTRU sending an ID response with the IMSI.

8. The method of claim 4 further comprising:

the first core network sending the identification response with an error message if the P-TMSI does not match the value stored in the first core network.

9. The method of claim 8 further comprising:

the second core network sending an identity (ID) request to the WTRU to obtain the IMSI; and

the WTRU sending an ID response with the IMSI.

10. The method of claim 1 further comprising:

the WTRU and the second core network performing authentication procedure.

11. The method of claim 1 further comprising:

the WTRU and the second core network performing an international mobile equipment identity (IMEI) checking procedure.

12. The method of claim 1 wherein the attach request indicating an attach type.

13. The method of claim 12 wherein the attach type indicates an evolved universal mobile telecommunication system (UMTS) terrestrial radio access network (E-UTRAN) only attachment.

14. The method of claim 12 wherein the attach type indicates an evolved universal mobile telecommunication system (UMTS) terrestrial radio access network (E-UTRAN) and IMSI attachment.

15. The method of claim 1 wherein the attach accept message includes at least one of a PDP type, a PDP address, a transaction identifier (TI), quality of service (QoS), radio priority, a packet flow identifier and PDP configuration.

16. The method of claim 1 further comprising:

the second core network constructing a session and mobility management (SMM) context for SM and MM for the WTRU.

17. The method of claim 16 wherein a state of the SMM is defined as one of an MM-detached and SM-inactive state, an MM-connected and SM-active state and an MM-idle and SM-active state.

18. The method of claim 16 wherein an SMM state of the WTRU changes depending on allocation of PDP address to the WTRU.

19. The method of claim 1 further comprising:

the second core network rejecting the attach request if the WTRU is not allowed in a routing area (RA) with respect to the second core network.

20. A wireless communication system comprising:

a first core network;

a second core network evolved from the first core network; and

a wireless transmit/receive unit (WTRU) configured to send an attach request message to the second core network, wherein the second core network is configured to activate a packet data protocol (PDP) context for the WTRU and send an attach accept message to the WTRU including information regarding the PDP context.

21. The system of claim 20 wherein the attach request message includes an international mobile subscriber identity (IMSI).

22. The system of claim 20 wherein the attach request message includes a packet temporary mobile subscriber identity (P-TMSI) and a routing area identity (RAI) with respect to the first core network.

23. The system of claim 22 wherein the second core network is configured to send an identification request to the first core network to obtain an international mobile subscriber identity (IMSI) from the first core network and the first core network is configured to send an identification response to the second core network including the IMSI if the WTRU is known in the first core network.

24. The system of claim 23 wherein the second core network derives an address of the first core network using the RAI.

25. The system of claim 23 wherein the first core network is configured to send the identification response with an error message if the WTRU is not known in the first core network.

26. The system of claim 25 wherein the second core network is configured to send an identity (ID) request to the WTRU to obtain the IMSI and the WTRU is configured to send an ID response with the IMSI.

27. The system of claim 23 wherein the first core network is configured to send the identification response with an error message if the P-TMSI does not match the value stored in the first core network.

28. The system of claim 27 wherein the second core network is configured to send an identity (ID) request to the WTRU to obtain the IMSI and the WTRU is configured to send an ID response with the IMSI.

29. The system of claim 20 wherein the WTRU and the second core network are configured to perform authentication procedure.

30. The system of claim 20 wherein the WTRU and the second core network are configured to perform an international mobile equipment identity (IMEI) checking procedure with an equipment identity register (EIR).

31. The system of claim 20 wherein the attach request indicating an attach type.

32. The system of claim 31 wherein the attach type indicates an evolved universal mobile telecommunication system (UMTS) terrestrial radio access network (E-UTRAN) only attachment.

33. The system of claim 31 wherein the attach type indicates an evolved universal mobile telecommunication system (UMTS) terrestrial radio access network (E-UTRAN) and IMSI attachment.

34. The system of claim 20 wherein the attach accept message includes at least one of a PDP type, a PDP address, a transaction identifier (TI), quality of service (QoS), radio priority, a packet flow identifier and PDP configuration.

35. The system of claim 20 wherein the second core network is configured to construct a session and mobility management (SMM) context for session management (SM) and mobility management (MM) for the WTRU.

36. The system of claim 35 wherein a state of the SMM is defined as one of an MM-detached and SM-inactive state, an MM-connected and SM-active state and an MM-idle and SM-active state.

37. The system of claim 35 wherein an SMM state of the WTRU changes depending on allocation of PDP address to the WTRU.

38. The system of claim 20 wherein the second core network is configured to reject the attach request if the WTRU is not allowed in a routing area (RA) with respect to the second core network.

39. A state machine for session and mobility management (SMM), comprising:

a mobility management (MM)-detached and session management (SM)-inactive state indicating a WTRU is detached and PDP context is not activated;

an MM-connected and SM-active state indicating the WTRU is attached and PDP context is activated and an SM connection is established; and

an MM-idle and SM-active state indicating the WTRU is attached, PDP context is activated and the SM connection is released.

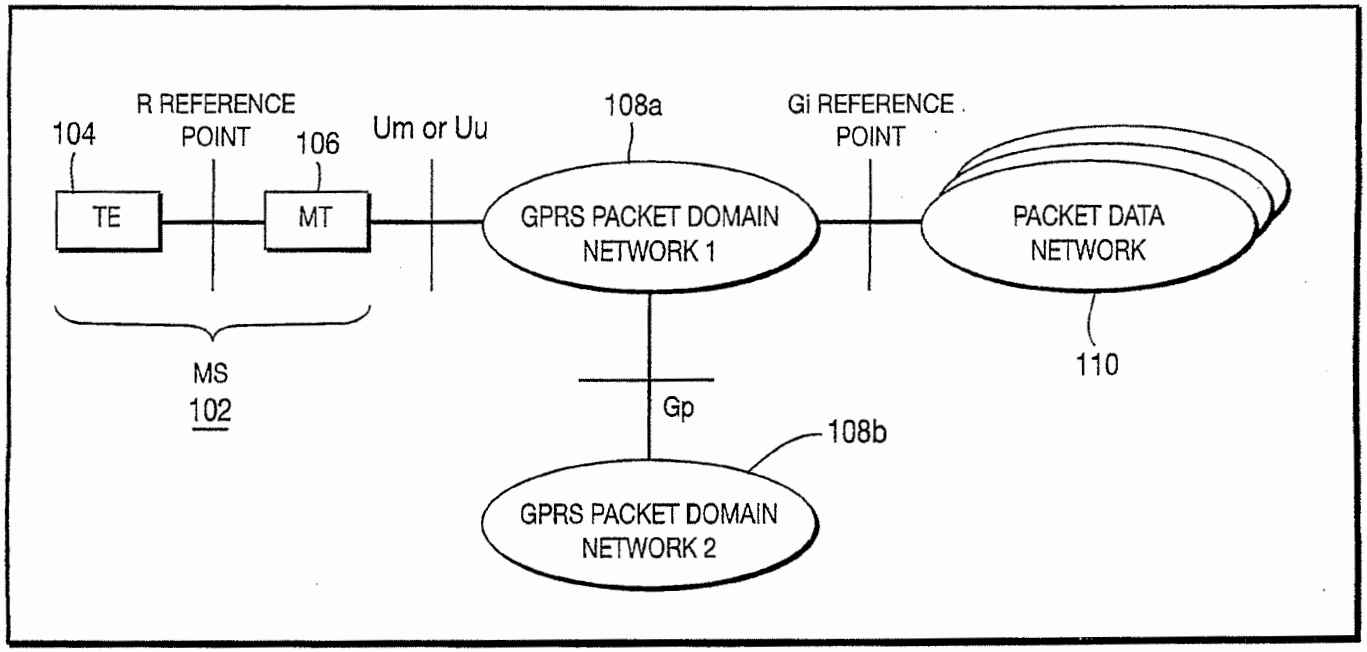


FIG. 1
PRIOR ART

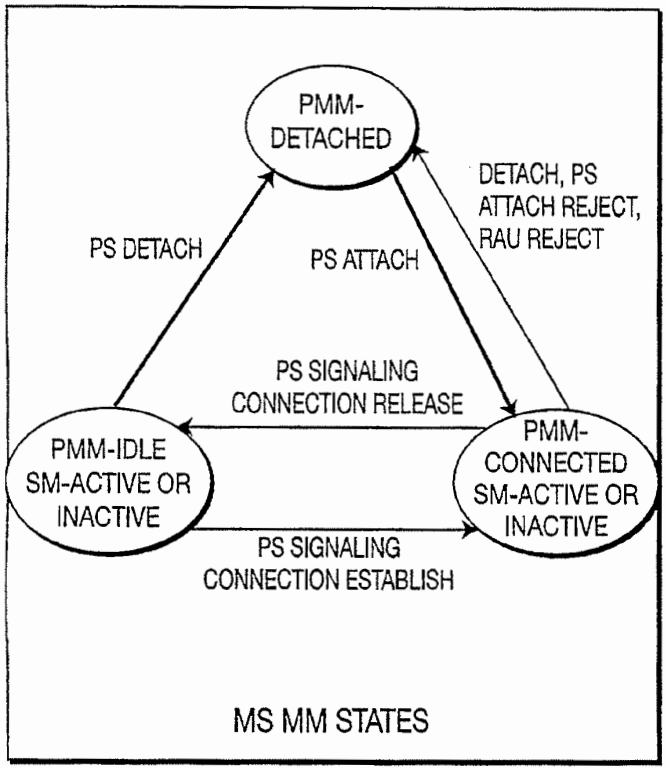


FIG. 2A
PRIOR ART

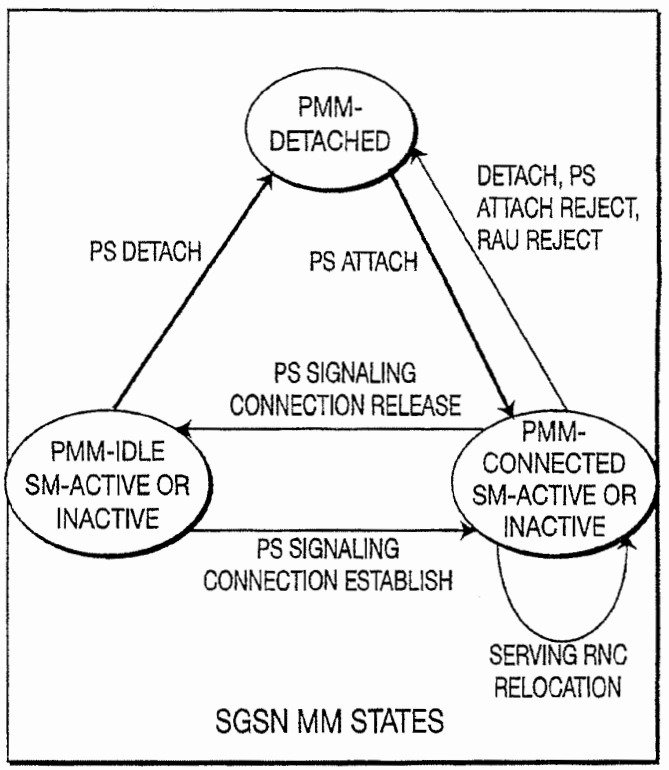


FIG. 2B
PRIOR ART

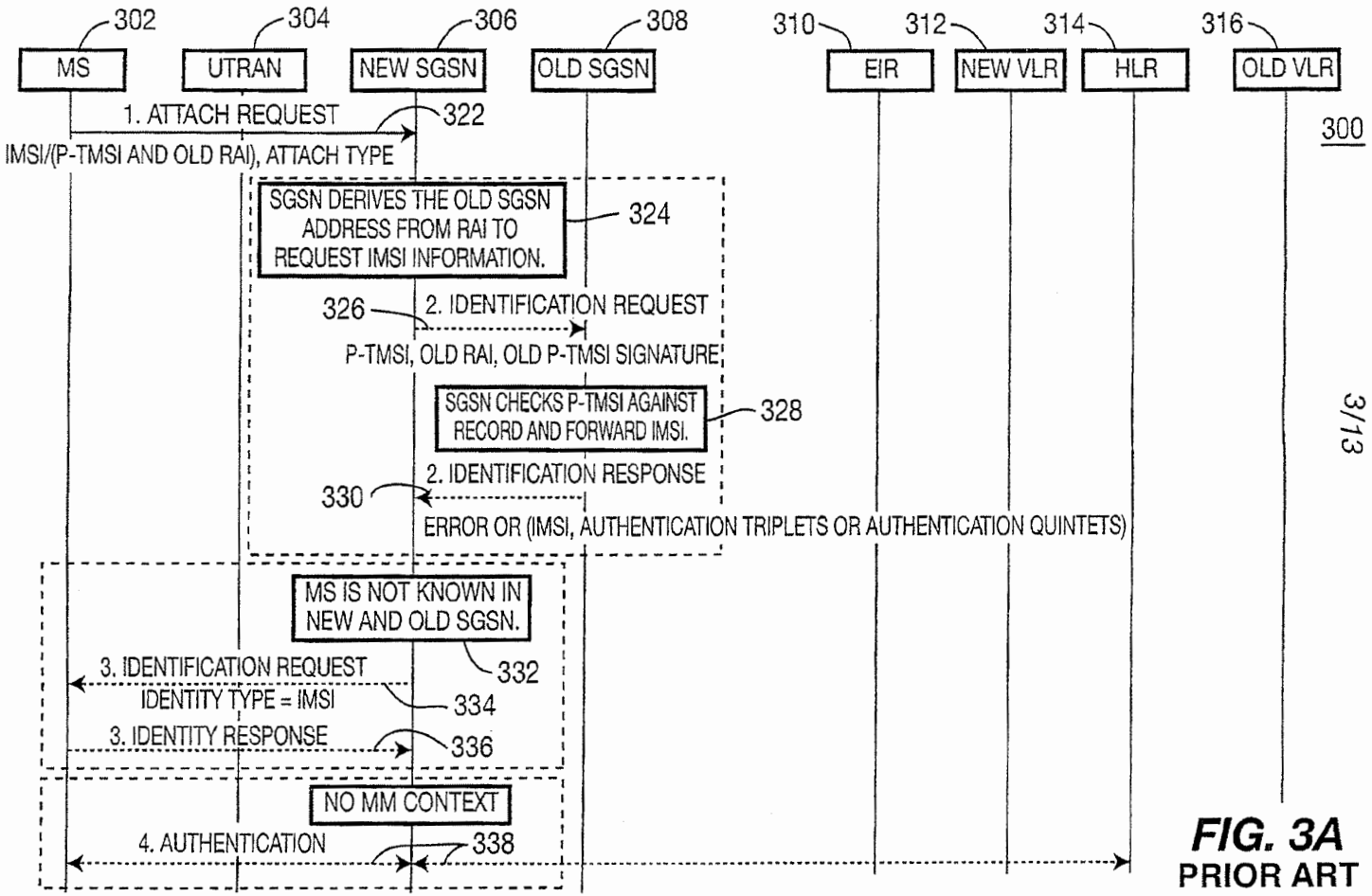


FIG. 3A
PRIOR ART

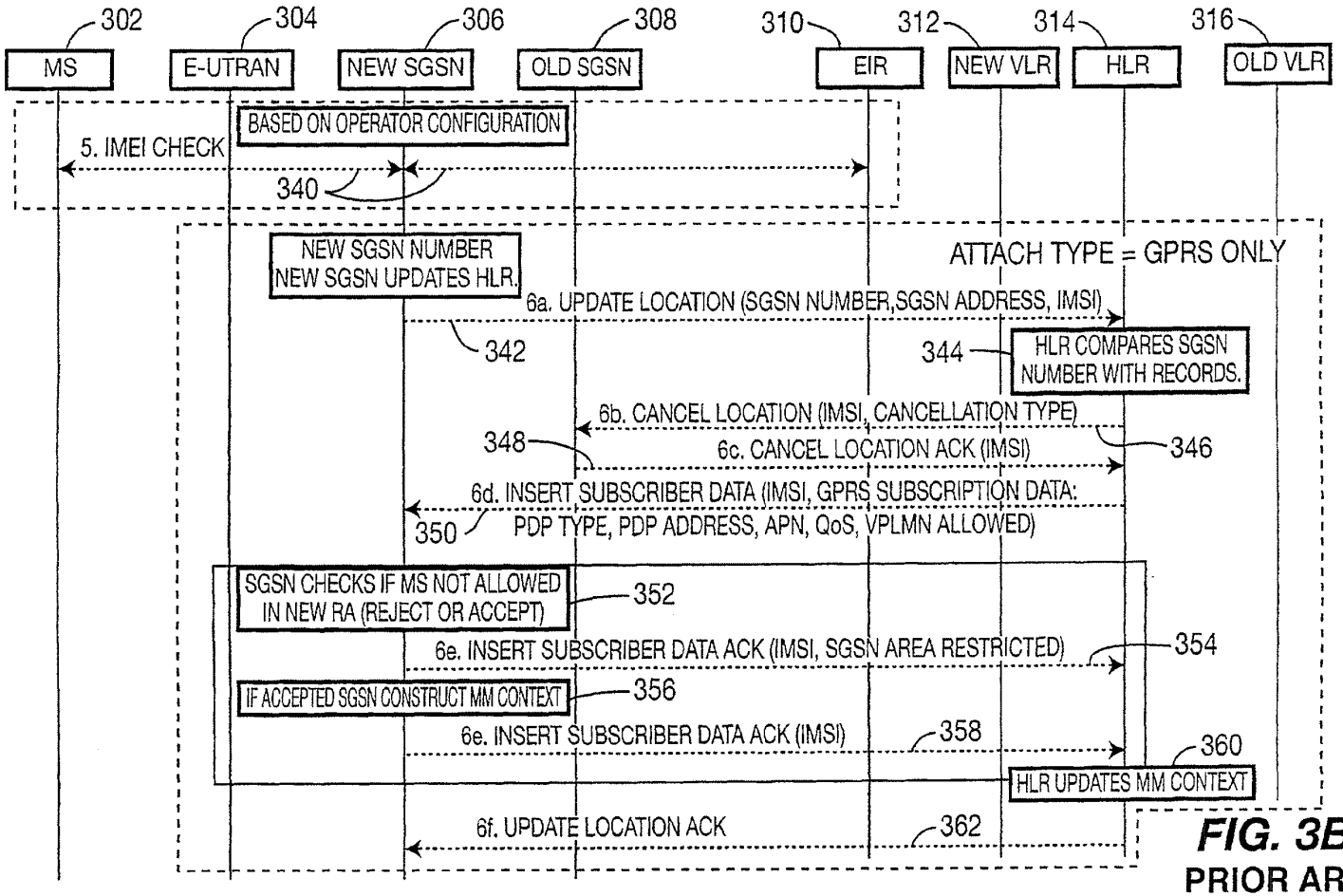


FIG. 3B
PRIOR ART

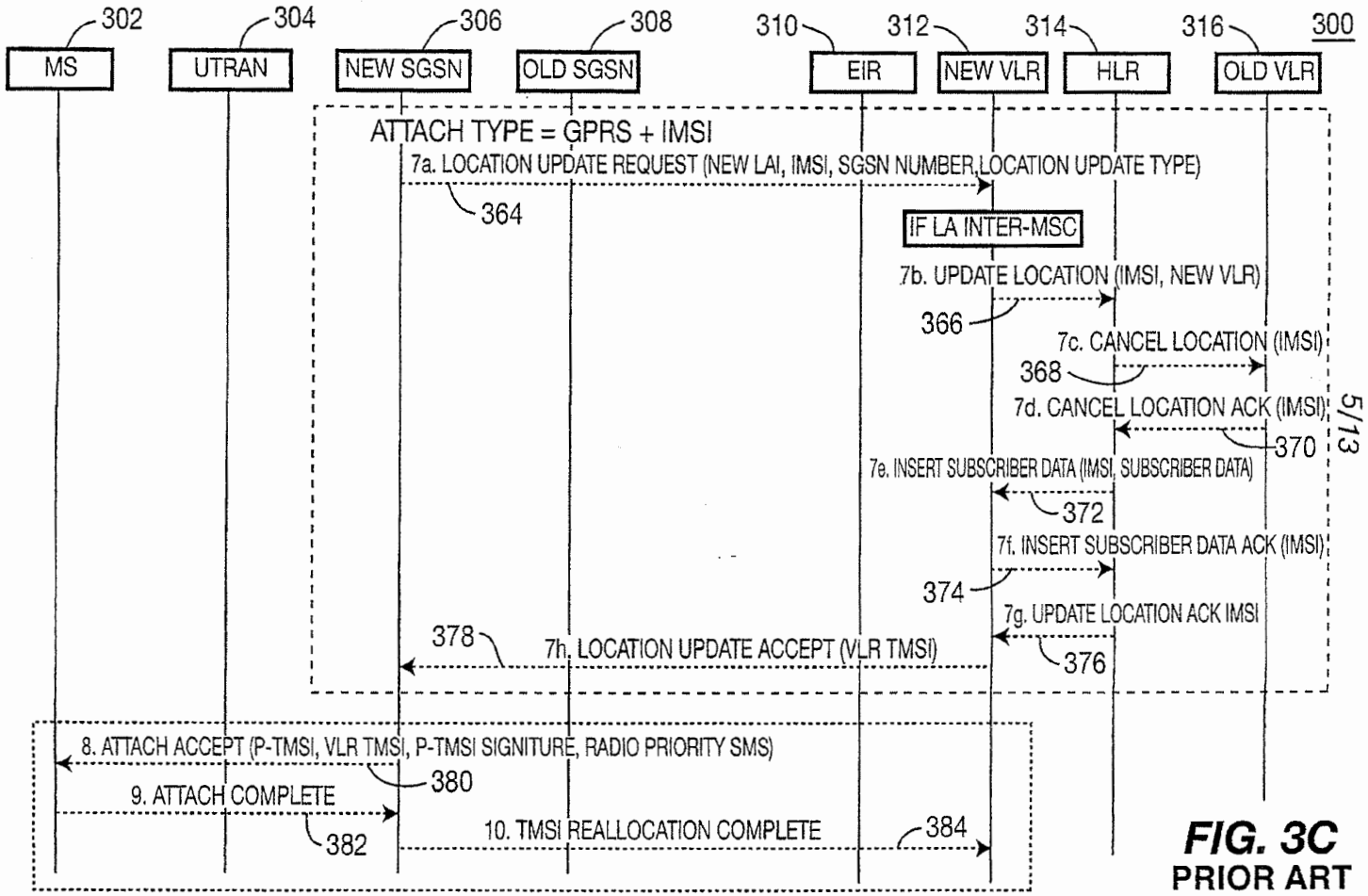


FIG. 3C
PRIOR ART

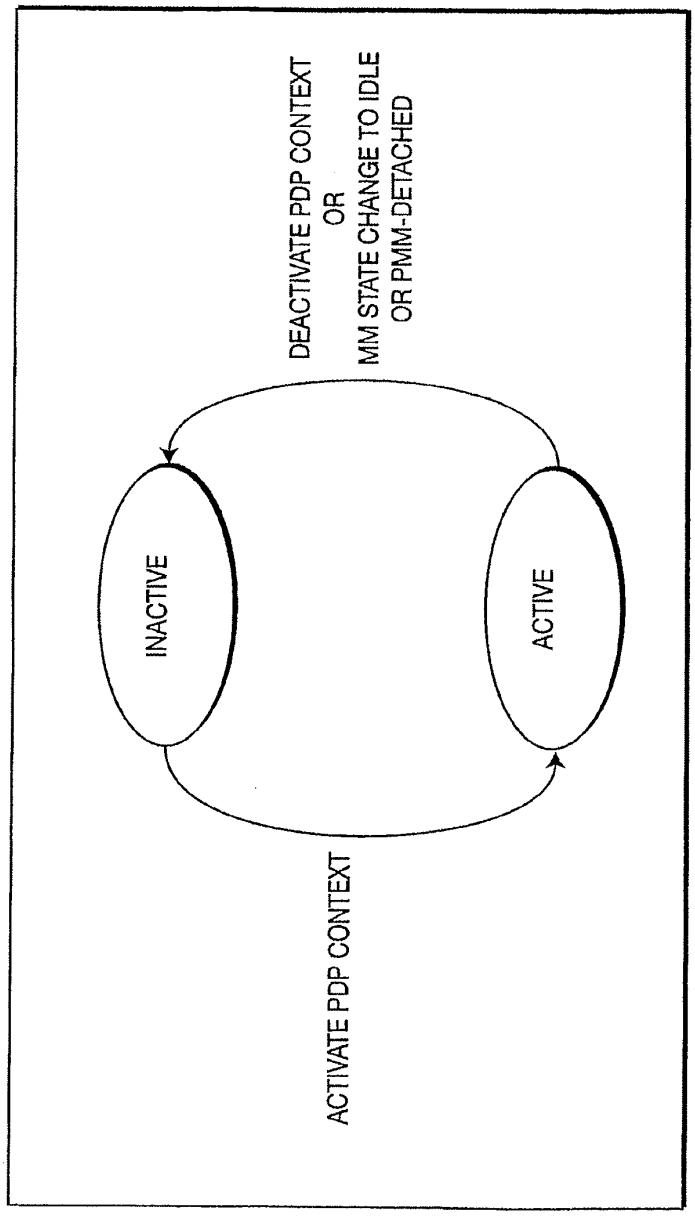


FIG. 4
PRIOR ART

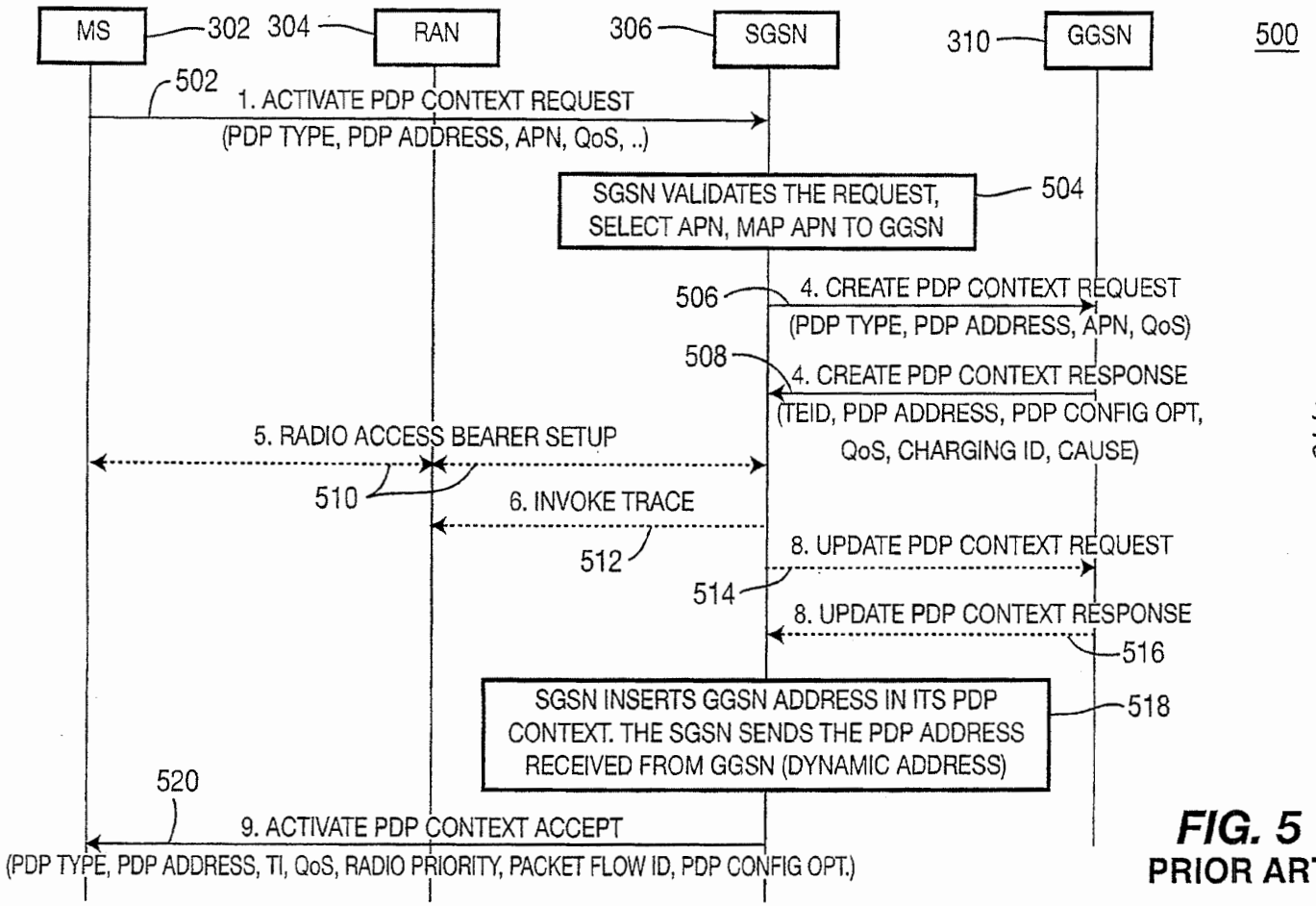


FIG. 5
PRIOR ART

PCT/US2006/027183

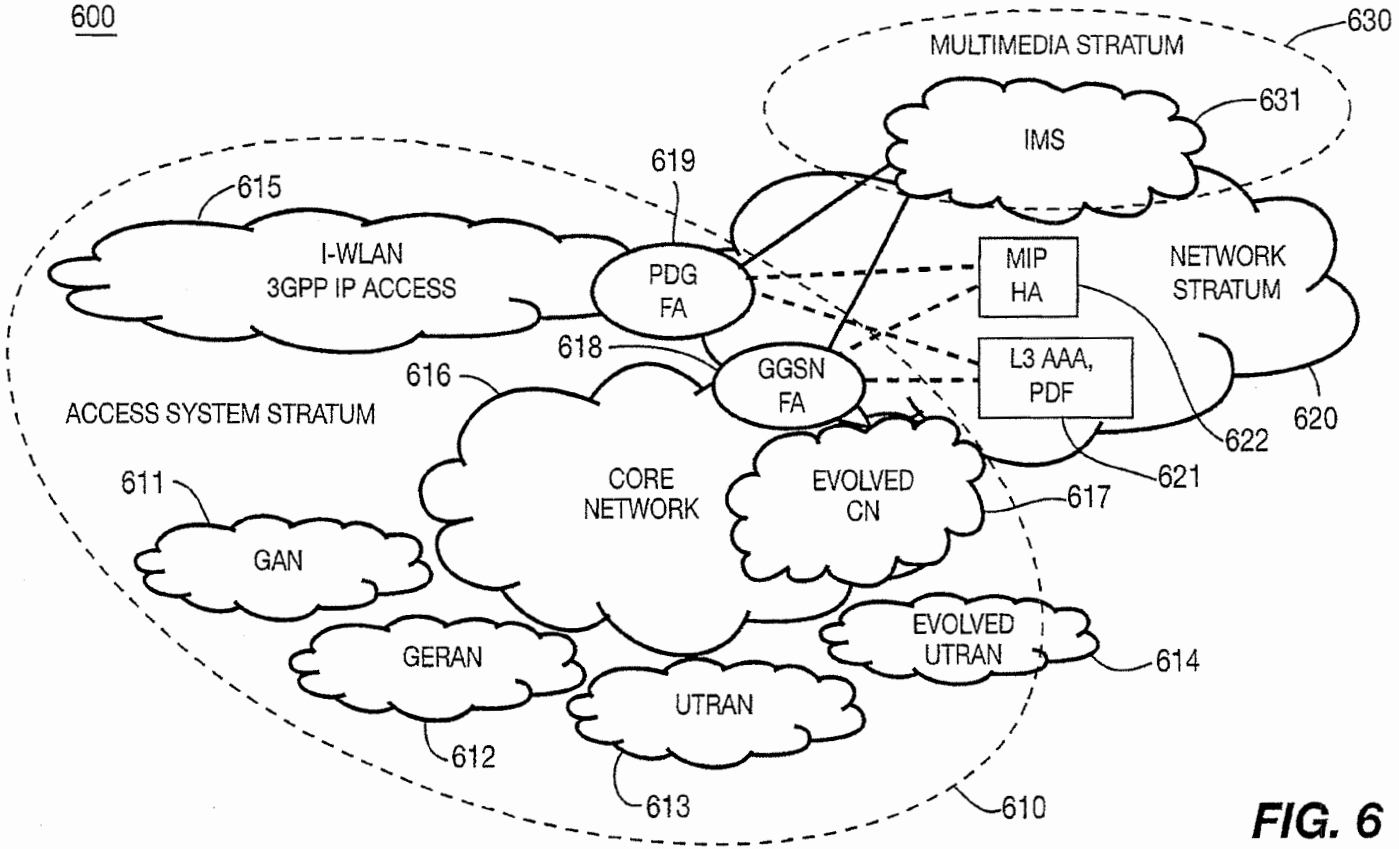


FIG. 6

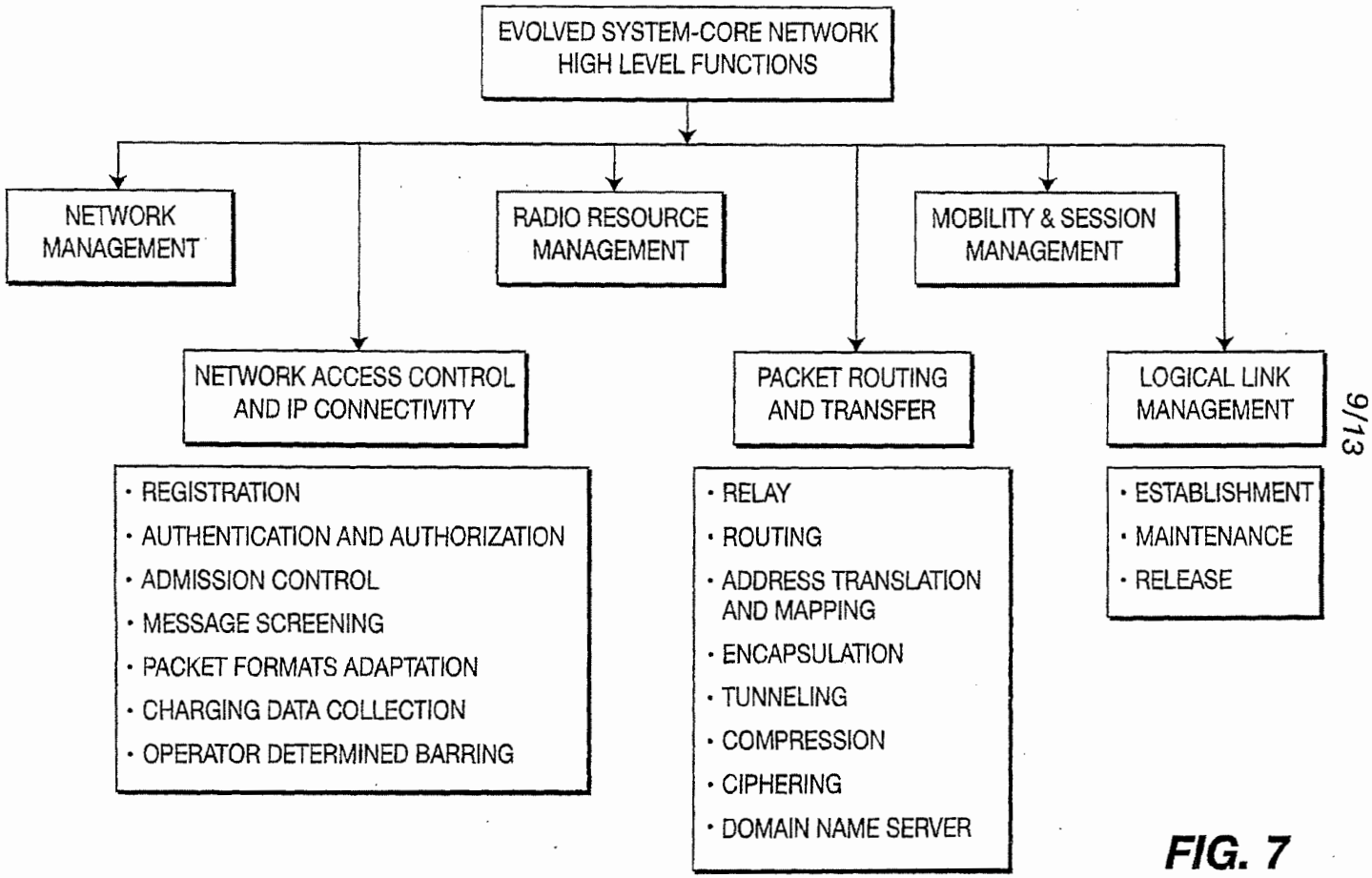
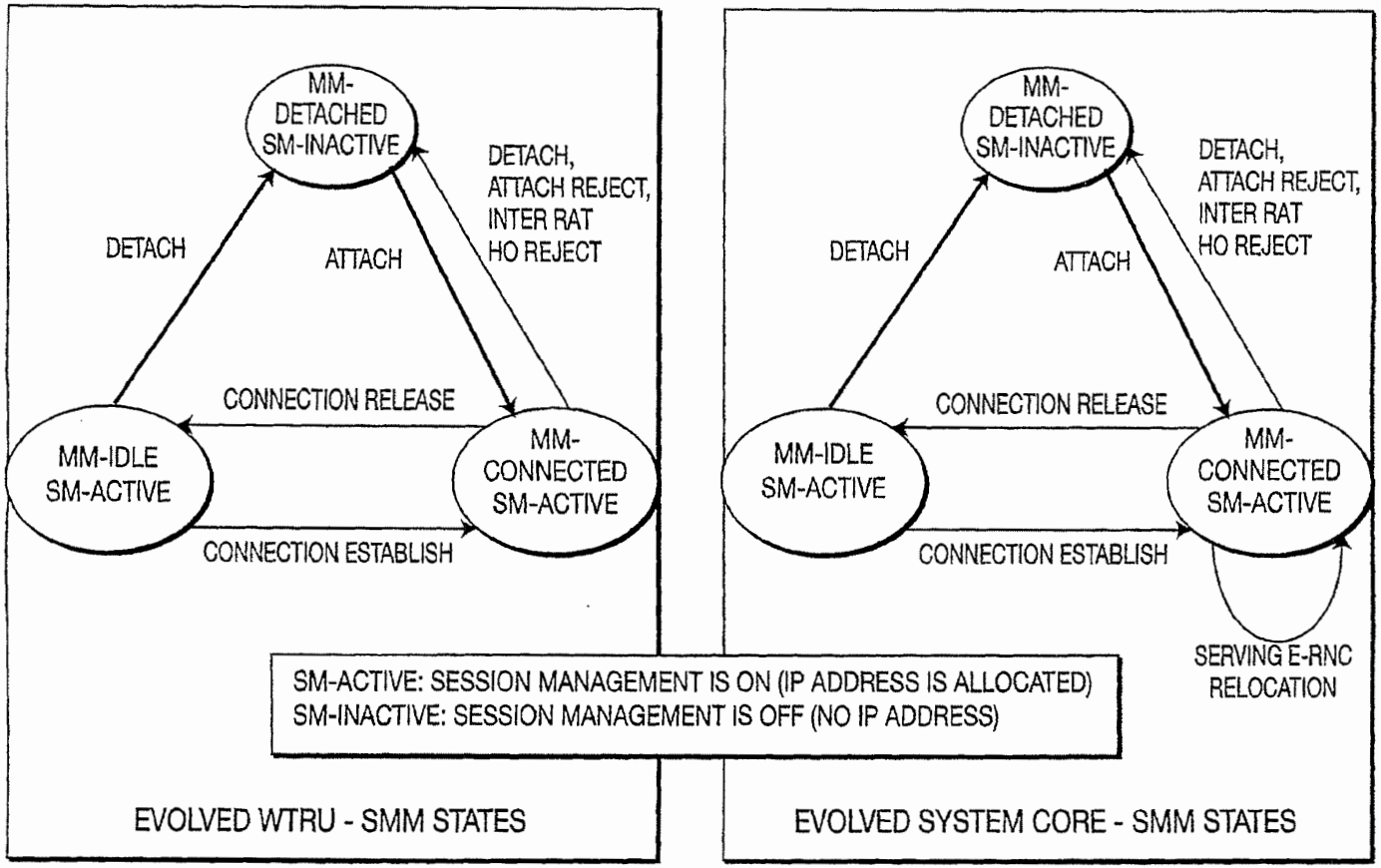

EVOLVED SYSTEM-CORE NETWORK HIGH LEVEL FUNCTIONS
NETWORK MANAGEMENT
RADIO RESOURCE MANAGEMENT
MOBILITY & SESSION MANAGEMENT
NETWORK ACCESS CONTROL AND IP CONNECTIVITY
PACKET ROUTING AND TRANSFER
LOGICAL LINK MANAGEMENT
• REGISTRATION
• AUTHENTICATION AND AUTHORIZATION
• ADMISSION CONTROL
• MESSAGE SCREENING
• PACKET FORMATS ADAPTATION
• CHARGING DATA COLLECTION
• OPERATOR DETERMINED BARRING
• RELAY
• ROUTING
• ADDRESS TRANSLATION AND MAPPING
• ENCAPSULATION
• TUNNELING
• COMPRESSION
• CIPHERING
• DOMAIN NAME SERVER
• ESTABLISHMENT
• MAINTENANCE
• RELEASE

FIG. 7


MM-
DETACHED
SM-INACTIVE
DETACH,
ATTACH REJECT,
INTER RAT
HO REJECT
DETACH
ATTACH
CONNECTION RELEASE
MM-IDLE
SM-ACTIVE
MM-
CONNECTED
SM-ACTIVE
CONNECTION ESTABLISH
SM-ACTIVE: SESSION MANAGEMENT IS ON (IP ADDRESS IS ALLOCATED)
SM-INACTIVE: SESSION MANAGEMENT IS OFF (NO IP ADDRESS)
EVOLVED WTRU - SMM STATES
MM-
DETACHED
SM-INACTIVE
DETACH,
ATTACH REJECT,
INTER RAT
HO REJECT
DETACH
ATTACH
CONNECTION RELEASE
MM-IDLE
SM-ACTIVE
MM-
CONNECTED
SM-ACTIVE
CONNECTION ESTABLISH
SERVING E-RNC
RELOCATION
EVOLVED SYSTEM CORE - SMM STATES

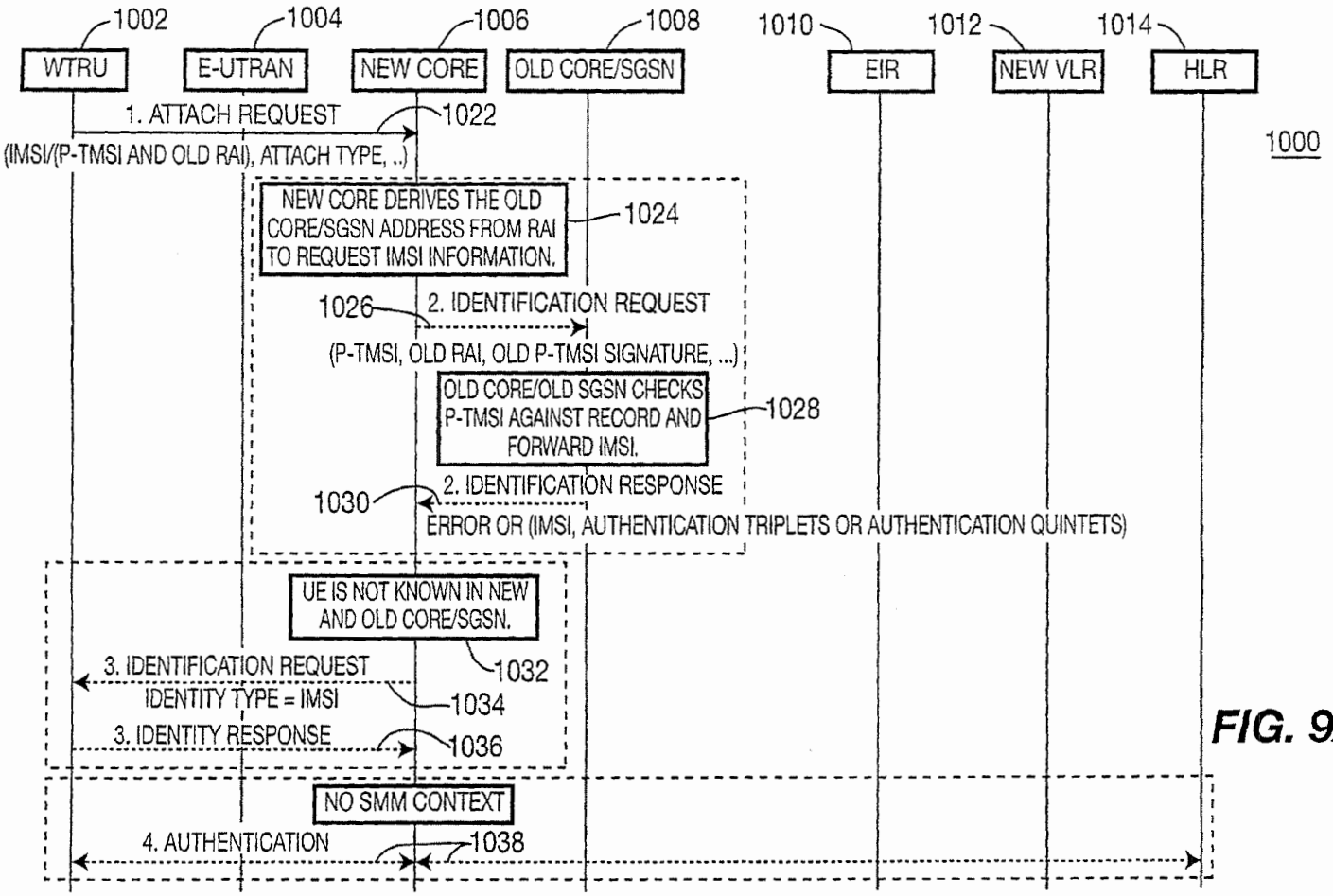

1002
1004
1006
1008
1010
1012
1014
WTRU
E-UTRAN
NEW CORE
OLD CORE/SGSN
EIR
NEW VLR
HLR
1000
1. ATTACH REQUEST
1022
(IMSI/(P-TMSI AND OLD RAI), ATTACH TYPE, ..)
NEW CORE DERIVES THE OLD CORE/SGSN ADDRESS FROM RAI TO REQUEST IMSI INFORMATION.
1024
1026
2. IDENTIFICATION REQUEST
(P-TMSI, OLD RAI, OLD P-TMSI SIGNATURE, ...)
OLD CORE/OLD SGSN CHECKS P-TMSI AGAINST RECORD AND FORWARD IMSI.
1028
2. IDENTIFICATION RESPONSE
1030
ERROR OR (IMSI, AUTHENTICATION TRIPLETS OR AUTHENTICATION QUINTETS)
UE IS NOT KNOWN IN NEW AND OLD CORE/SGSN.
1032
3. IDENTIFICATION REQUEST
IDENTITY TYPE = IMSI
1034
3. IDENTITY RESPONSE
1036
NO SMM CONTEXT
4. AUTHENTICATION
1038

FIG. 9A

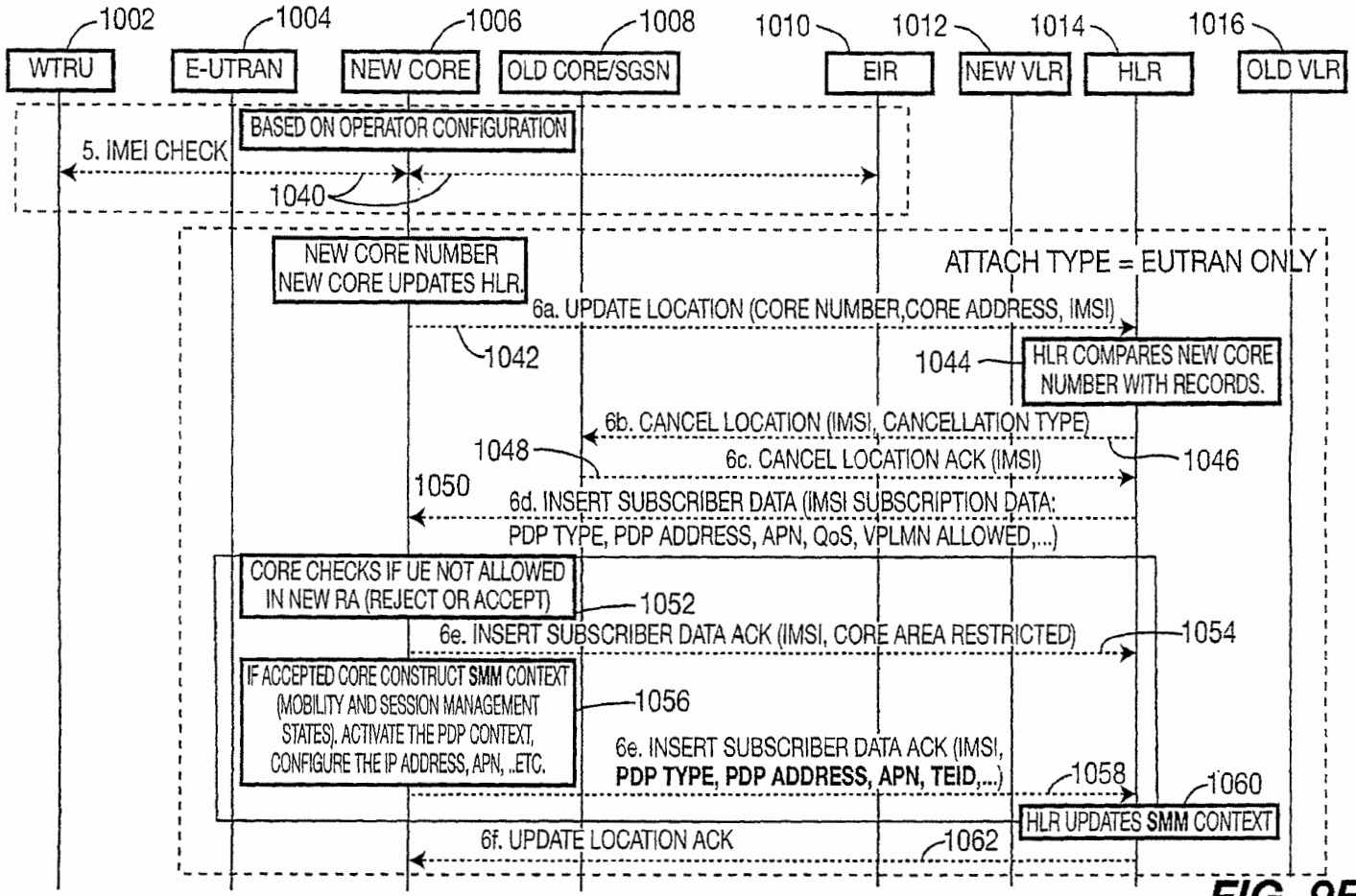

1002
1004
1006
1008
1010
1012
1014
1016
WTRU
E-UTRAN
NEW CORE
OLD CORE/SGSN
EIR
NEW VLR
HLR
OLD VLR
BASED ON OPERATOR CONFIGURATION
5. IMEI CHECK
1040
NEW CORE NUMBER
NEW CORE UPDATES HLR.
ATTACH TYPE = EUTRAN ONLY
6a. UPDATE LOCATION (CORE NUMBER,CORE ADDRESS, IMSI)
1042
1044
HLR COMPARES NEW CORE NUMBER WITH RECORDS.
6b. CANCEL LOCATION (IMSI, CANCELLATION TYPE)
1048
6c. CANCEL LOCATION ACK (IMSI)
1046
1050
6d. INSERT SUBSCRIBER DATA (IMSI SUBSCRIPTION DATA:
PDP TYPE, PDP ADDRESS, APN, QoS, VPLMN ALLOWED,...)
CORE CHECKS IF UE NOT ALLOWED IN NEW RA (REJECT OR ACCEPT)
1052
6e. INSERT SUBSCRIBER DATA ACK (IMSI, CORE AREA RESTRICTED)
1054
IF ACCEPTED CORE CONSTRUCT SMM CONTEXT (MOBILITY AND SESSION MANAGEMENT STATES). ACTIVATE THE PDP CONTEXT, CONFIGURE THE IP ADDRESS, APN, ..ETC.
1056
6e. INSERT SUBSCRIBER DATA ACK (IMSI, PDP TYPE, PDP ADDRESS, APN, TEID,...)
1058
1060
HLR UPDATES SMM CONTEXT
6f. UPDATE LOCATION ACK
1062

FIG. 9B

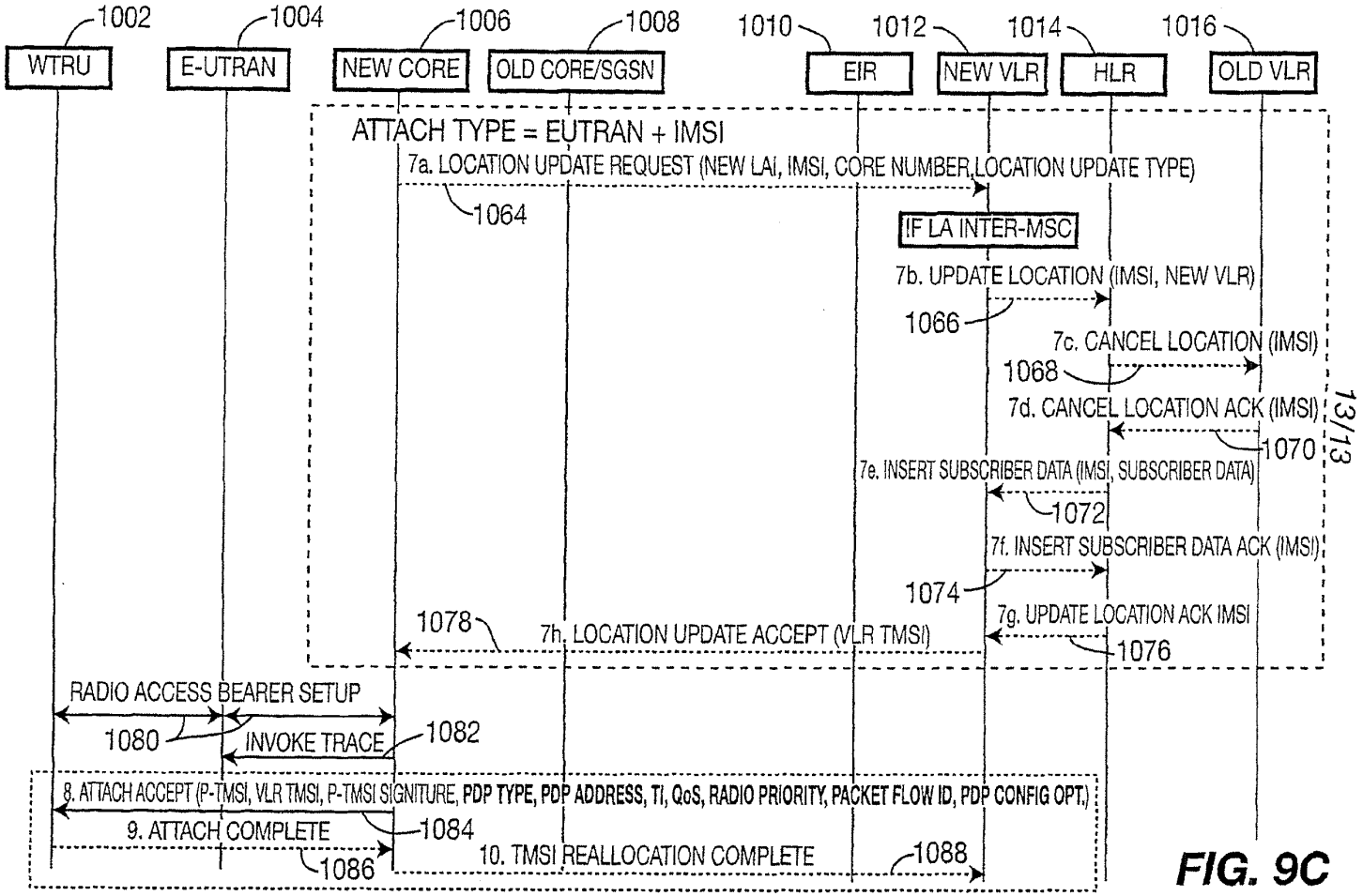

1002
1004
1006
1008
1010
1012
1014
1016
WTRU
E-UTRAN
NEW CORE
OLD CORE/SGSN
EIR
NEW VLR
HLR
OLD VLR
ATTACH TYPE = EUTRAN + IMSI
7a. LOCATION UPDATE REQUEST (NEW LAI, IMSI, CORE NUMBER,LOCATION UPDATE TYPE)
1064
IF LA INTER-MSC
7b. UPDATE LOCATION (IMSI, NEW VLR)
1066
7c. CANCEL LOCATION (IMSI)
1068
7d. CANCEL LOCATION ACK (IMSI)
1070
7e. INSERT SUBSCRIBER DATA (IMSI, SUBSCRIBER DATA)
1072
7f. INSERT SUBSCRIBER DATA ACK (IMSI)
1074
7g. UPDATE LOCATION ACK IMSI
1076
1078
7h. LOCATION UPDATE ACCEPT (VLR TMSI)
RADIO ACCESS BEARER SETUP
1080
INVOKE TRACE
1082
8. ATTACH ACCEPT (P-TMSI, VLR TMSI, P-TMSI SIGNITURE, PDP TYPE, PDP ADDRESS, TI, QoS, RADIO PRIORITY, PACKET FLOW ID, PDP CONFIG OPT.)
1084
9. ATTACH COMPLETE
1086
10. TMSI REALLOCATION COMPLETE
1088

FIG. 9C

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

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PCT

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(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

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(71) Applicant *(for all designated States except US)*: INTERDIGITAL TECHNOLOGY CORPORATION [US/US]; 3411 SILVERSIDE ROAD, Concord Plaza, Suite 105, Hagley Building, Wilmington, DE 19810 (US).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: SHAHEEN, Kamel, M. [EG/US]; 429 Ashton Drive, King Of Prussia, PA 19406 (US).

(74) Agent: BALLARINI, Robert, J.; VOLPE AND KOENIG, P.C., UNITED PLAZA, SUITE 1600, 30 S. 17th Street, Philadelphia, PA 19103 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

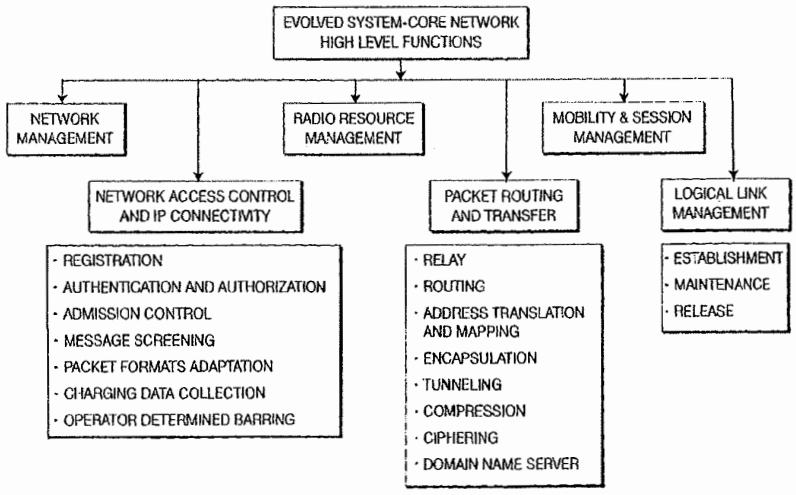
Published:

— *with international search report*

(88) Date of publication of the international search report:
15 November 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: WIRELESS COMMUNICATION SYSTEM AND METHOD OF IMPLEMENTING AN EVOLVED SYSTEM ATTACHMENT PROCEDURE



(57) Abstract: A wireless communication system and method of implementing an evolved system attachment procedure are disclosed. The system includes a first core network and a second core network which is evolved from the first core network. A wireless transmit/receive unit (WTRU) sends an attach request message to the second core network. The second core network activates a packet data protocol (PDP) context and sends an attach accept message to the WTRU. The attach accept message includes information regarding the PDP context. The second core network constructs a session and mobility management (SMM) context for session management (SM) and mobility management (MM) for the WTRU.

WO 2007/011638 A3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US06/27183

A CLASSIFICATION OF SUBJECT MATTER
IPC(8) - H04L 12/28 (2007.01)
USPC - 370/395.21
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC(8) - H04L 12/28; H04L 12/56; H04J 3/16; H04J 3/22; H04Q 7/00; H04Q 7/24; H04L 12/66; H04B 7/005; H04M 1/66; H04M 1/68; H04M 3/16; H04Q 7/20 (2007.01)
USPC - 370/389, 401, 465, 328, 338, 352, 466, 278, 395.21, 469; 455/411, 422.1, 552.1, 334, 426.1, 445

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatBase, IP.com, DialogPro

Search Terms: WTRU, packet data protocol, mobility management, session management, core, network

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/0128963 A1 (GAZDA et al) 16 June 2006 (16.06.2005), entire document.	1-38
X	US 2005/0147061 A1 (FRANCOEUR et al) 07 July 2005 (07.07.2005), entire document.	39
X	US 2005/0009527 A1 (SHARMA) 13 January 2005 (13.01.2005), entire document.	39
A	US 2004/0240479 A1 (BOHNHOFF) 02 December 2004 (02.12.2004), entire document.	1-39
A	US 2004/0248615 A1 (PURKAYASTHA et al) 09 December 2004 (09.12.2004), entire document.	1-39

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
30 March 2007	29 AUG 2007
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US06/27183

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
See Extra Sheet (Page 10)

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☒ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US06/27183

This application contains the following inventions ur groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-38, drawn to a method/device for system attachment in an evolved wireless communication system.

Group II, claim 39, drawn to a state machine for session and mobility management.

The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical feature of the Group I invention, a wireless transmit/receive unit (WTRU) sending/receiving an attach request message to/from a second core network as claimed therein, is not present in Group II; and the special technical feature of the Group II invention, a mobility management (MM) and session management (SM) in various states as claimed therein, is not present in Group I.

Since none of the special technical features of the Group I and II inventions is found in more than one of the inventions, unity of invention is lacking.

Form PCT/ISA/210 (extra sheet) (April 2005)

Electronic Acknowledgement Receipt

EFS ID:	8912363
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Nkosi Harvey
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	24-NOV-2010
Filing Date:	19-OCT-2009
Time Stamp:	16:38:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213IDS.PDF	226362 3f817756db3038a8b8018eee407796bd7aef5ba9	yes	5

	Multipart Description/PDF files in .zip description				
	Document Description	**Start**	**End**		
	Miscellaneous Incoming Letter	1	1		
	Transmittal Letter	2	4		
	Information Disclosure Statement (IDS) Filed (SB/08)	5	5		
Warnings:					
Information:					
2	Foreign Reference	B1.PDF	2096940 8bd19869c68756b917e418ed1c99ec321848b4bc	no	44
Warnings:					
Information:					
3	Foreign Reference	B2.PDF	515973 2b05f352d71776dc5d33202347062c3fe91ea0c4	no	12
Warnings:					
Information:					
4	Foreign Reference	B3.PDF	419822 faae25920a37e044e6747be5b51fb7e376f20b30	no	6
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Information:					
5	Foreign Reference	B4.PDF	127023 e5a49f068254547501368c604d765df6e47a081c	no	4
Warnings:					
Information:					
6	Foreign Reference	B5.PDF	360760 01710db307b1501ed919fbac7a81c3fb4e38bd87	no	6
Warnings:					
Information:					
7	Foreign Reference	B6.PDF	235508 005acf0a6e882c2bbb3731d03aa863b7387bbf58	no	5
Warnings:					
Information:					
		Total Files Size (in bytes):	3982388		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: November 24, 2010 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wefu Wu

Appln. No.: 12/581,575

Filed: October 19, 2009

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Attorney Docket No: 13674-213
Client Ref. No. 0810596US

Examiner: Dady Chery

Art Unit: 2461

Confirmation No.: 2875

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Information Disclosure Statement; PTO-1449; Cited References B1 through B6.

Fee calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a _____-month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(_____).

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

November 24, 2010
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
11/24/2010
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
11/24/2010
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu	
Appln. No.:	12/581,575	Examiner: Dady Chery
Filed:	October 19, 2009	Art Unit: 2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.: 2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US	

SECOND SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(c), Applicant hereby cites the following reference(s):

FOREIGN PATENT DOCUMENTS		
DOCUMENT NO.	**DATE**	**COUNTRY**
WO 2007/011638 A2	01/25/2007	PCT

BRINKS HOFER GILSON &LIONE

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Extended European Search Report issued in corresponding European Patent Application No. 10167471.1, mailed October 12, 2010.
Wang et al., "A Mobile IPv6 Based Seamless Handoff Strategy for Heterogeneous Wireless Networks", 4th International Conference on Computer and Information Technology, 2004.
Huawei, "Handover From No 3GPP TO 3GPP Approval/Discussion", 3GPP TSG SA WG2 Architecture – S2#57. Beijing, China, April 23-27, 2007.
Huawei, "Attach Type in Attach Procedure Discussion /Approval", 3GPP TSG SA WG2 Architecture – S2#58. Orlando, Florida, June 25-29, 2007.
Change Request, 23.402 CR 0158. 3GPP TSG-SA WG2 Meeting #63. Athens, Greece, February 18-22, 2008.

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). As each of the listed references is in English, no further commentary is believed to be necessary, 37 C.F.R §1.98(a)(3). Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

The Applicant or Applicants certifies under 37 CFR §1.97(e)(1) that each item of information in this Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure Statement (a copy of any foreign communication first citing a listed reference is attached for the Examiner's reference). Accordingly, Applicant has calculated no fee to be due in connection with the filing of this Information Disclosure Statement. However, the Director is authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to a deposit account, as authorized in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

November 24, 2010
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	A1	Copy of Second Office Action issued in corresponding Chinese Patent Application No. 200810085729.8, mailed October 18, 2010.

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Acknowledgement Receipt

EFS ID:	9235540
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Nkosi Harvey
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	14-JAN-2011
Filing Date:	19-OCT-2009
Time Stamp:	15:35:54
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213IDS.PDF	184512 8fe396371948866a0fc9c7c7bc25d5e0d9aea4ac	yes	4

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Transmittal Letter	2	3
	Information Disclosure Statement (IDS) Filed (SB/08)	4	4

Warnings:					
Information:					
2	Foreign Reference	D1.PDF	516249 e288c3bdfb1b3686c0b425b5ab66c7e709590403	no	8
Warnings:					
Information:					
		Total Files Size (in bytes):	700761		

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New Applications Under 35 U.S.C. 111
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CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: January 14, 2011 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON & LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wefu Wu

Appln. No.: 12/581,575

Filed: October 19, 2009

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Attorney Docket No: 13674-213
Client Ref. No. 0810596US

Examiner: Dady Chery

Art Unit: 2461

Confirmation No.: 2875

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Information Disclosure Statement; PTO-1449; Cited Reference D1.

Fee calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

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Respectfully submitted,

January 14, 2011
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
1/14/2011
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
1/14/2011
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu	
Appln. No.:	12/581,575	Examiner: Dady Chery
Filed:	October 19, 2009	Art Unit: 2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.: 2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US	

THIRD SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(c), Applicant hereby cites the following reference(s):

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Second Office Action issued in corresponding Chinese Patent Application No. 200810085729.8, mailed October 18, 2010.

BRINKS
HOFER
GILSON
&LIONE

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

Applicant hereby certifies pursuant to 37 CFR §1.97(e)(2) that no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated in 37 CFR §1.56(c), more than three months prior to the filing of this Information Disclosure Statement. Accordingly, Applicant has calculated no fee to be due in connection with the filing of this Information Disclosure Statement. However, the Director is authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to a deposit account, as authorized in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

January 14, 2011
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

Brinks 08105/60US

中华人民共和国国家知识产权局
STATE INTELLECTUAL PROPERTY OFFICE
OF THE PEOPLE'S REPUBLIC OF CHINA

证 明

本证明之附件是向本局提交的下列专利申请文件副本。

申 请 日：2007年05月11日

申 请 号：200710104400.7

申 请 类 别：发明专利

发明创造名称：一种注册处理方法、系统及装置

申 请 人：华为技术有限公司

发明人或设计人：吴问付

中华人民共和国
国家知识产权局局长 田力普

2010 年 11 月 26 日

07.05.17

权 利 要 求 书

1、一种注册处理方法，其特征在于，包括下列步骤：

网络侧接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及

网络侧根据所述处理类型信息，识别该注册的处理类型。

2、如权利要求 1 所述的方法，其特征在于，UE 在需要注册到网络时，识别该注册的类型。

3、如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 上报处理类型信息的方式，包括下列之一：

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的跟踪区更新请求消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的路由区更新请求消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的接入请求消息中增加信元，以携带该注册的处理类型信息。

4、如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 在注册到网络的过程中，以向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息；或者，

所述 UE 在注册到网络的过程中，以向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息；或者，

所述 UE 在注册到网络的过程中，以向网络侧发送不同的路由区更新请求消息，分别表征对应的注册处理类型信息；或者，

所述 UE 在注册到网络的过程中，以向网络侧发送不同的接入请求消息，分别表征对应的注册处理类型信息。

5、一种注册处理系统，其特征在于，包括：

用户终端 UE，用于在注册到网络的过程中，将该注册的处理类型信息上报；

网络侧，用于根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

6、如权利要求 5 所述的系统，其特征在于，由网络侧的移动性管理实体 MME、服务 GPRS 支持节点 SGSN 或非 3GPP 网关对 UE 上报的处理类型信息进行识别。

7、一种用户终端，其特征在于，包括：

识别单元，用于在该 UE 需要发起注册时，识别该注册的类型；

注册发起单元，用于发起注册，并发出注册触发信号；

上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报。

8、如权利要求 7 所述的用户终端，其特征在于，上报单元将所述处理类型信息携带于附着请求消息中增加的信元中；或者，

将所述处理类型信息携带于跟踪区更新请求消息中增加的信元中；或者，

将所述处理类型信息携带于路由区更新请求消息中增加的信元中；或者，

将所述处理类型信息携带于接入请求消息中增加的信元中。

9、如权利要求 7 所述的用户终端，其特征在于，所述上报单元对应不同的注册类型，向网络侧发送不同的附着请求消息；或者，

对应不同的注册类型，向网络侧发送不同的跟踪区更新请求消息；或者，

对应不同的注册类型，向网络侧发送不同的路由区更新请求消息；或者，

对应不同的注册类型，向网络侧发送不同的接入请求消息。

10、一种网络侧的网元，其特征在于，包括：

提取单元，用于提取 UE 在注册到网络的过程中上报的处理类型信息；

识别单元，用于根据提取单元提取的处理类型信息，识别该注册的处理类

型。

11、如权利要求 10 所述的网元，其特征在于，所述网元为移动性管理实体 MME、服务 GPRS 支持节点 SGSN 或非 3GPP 网关。

07.05.17

说 明 书

一种注册处理方法、系统及装置

技术领域

本发明涉及通信领域，特别是涉及一种注册处理方法、系统及装置。

背景技术

3GPP 为了增强未来网络的竞争能力，正在研究一种全新的演进网络，其系统架构参见图 1 所示，其中包括:

演进的 UMTS 陆地无线接入网(E-UTRAN, Evolved UMTS Terrestrial Radio Access Network)，用于实现所有与演进网络无线有关的功能。

移动性管理实体（MME，Mobility Management Entity)，负责控制面的移动性管理，包括用户上下文和移动状态管理，分配用户临时身份标识等。

服务网关实体（Serving GW，Serving Gateway)，是 3GPP 接入系统间的用户面锚点，终止 E-TURAN 的接口。

分组数据网络网关实体(PDN GW，Packet Data Network Gateway)是 3GPP 接入系统和非 3GPP 接入系统之间的用户面锚点，终止和外部分组数据网络（PDN，Packet Data Network）的接口。

策略和计费规则功能实体（PCRF，Policy and Charging Rule Function)，用于策略控制决定和流计费控制功能。

归属网络服务器（HSS，Home Subscriber Server）用于存储用户签约信息。

UMTS 陆地无线接入网（UTRAN，UMTS Terrestrial Radio Access Network)、GSM/EDGE 无线接入网（GERAN，GSM/EDGE Radio Access Network)，用于实现所有与现有 GPRS/UMTS 网络中无线有关的功能。

服务通用分组无线业务支持节点(SGSN，Serving GPRS Supporting Node)，用于实现 GPRS/UMTS 网络中路由转发、移动性管理、会话管理以及用户信息

存储等功能。

非 3GPP IP 接入系统（Non-3GPP IP Access），主要是一些非 3GPP 组织定义的接入网络，如无线局域网（WLAN，Wireless Local Area Network），微波存取全球互通（Wimax， Worldwide Interoperability for Microwave Access）等网络。

说明：这个架构并不意味着最终的 SAE 系统架构，最后的架构可能和这个架构有所差别，本专利不作限制。

上述演进网络的一个需求是实现 3GPP 的接入系统（GERAN/UTRAN/E-UTRAN）和 Non-3GPP 接入系统（如 WLAN/Wimax 等）之间的切换（Handover）。在目前的协议中规定，切换流程是通过 UE 在新接入系统中的附着（Attach）或者跟踪区更新（TAU）流程来实现的。参见图 2 所示，用户终端从 Non-3GPP 接入系统到 3GPP 接入系统的切换流程包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到演进网络。

3、UE 发送附着请求或者跟踪区更新请求消息到 MME。

4、UE、MME、HSS 之间执行鉴权流程，获取用户使用的 PDN GW 地址信息。

5、MME 发送请求承载创建消息到获取的 PDN GW，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。

6、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

7、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。

参见图 3 所示，在目前的协议中规定，用户终端正常附着（也可称之为初

始附着 Initial Attach）到 3GPP 接入系统的流程包括下列步骤：

1、UE 发送附着请求消息到 MME。

2、UE、MME、HSS 之间执行鉴权流程。

3、如果用户存在已经创建的承载，则 MME 发起删除承载流程，将用户以前建立的承载删除掉。

参见图 4 所示，在目前的协议中规定，用户终端正常跟踪区更新（也可称之为初始跟踪区更新 Initial TAU）到 3GPP 接入系统的流程包括下列步骤：

1、UE 发送跟踪区更新请求消息到 MME。

2、UE、MME、HSS 之间执行鉴权流程。

3、MME 接受 UE 的跟踪区更新请求，并发送跟踪区更新接受消息到 UE。

发明人在发明过程中发现，切换导致的 Attach/TAU 流程和正常 Attach/TAU 流程处理机制存在很大的不同：正常的 Attach 流程网络侧需要将用户以前建立的承载都删除掉，而切换导致的 Attach 流程网络侧需将用户以前建立的承载都重新创建出来。正常的 TAU 流程网络侧不处理用户的承载，而切换导致的 TAU 流程网络侧需将用户以前建立的承载都重新创建出来。

所以网络侧收到 UE 发送的 Attach Request 消息或者 TAU Request 消息后，需要知道发起的是正常的 Attach/TAU 流程，还是切换导致的 Attach/TAU 流程，但目前的机制无法进行区分。

发明内容

本发明实施例提供一种注册处理方法、系统及装置，以使网络侧可区分不同的注册处理类型。

本发明实施例的方法包括：网络侧接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例的系统，包括：用户终端 UE，用于在注册到网络的过程中，

将该注册的处理类型信息上报；网络侧，用于根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

本发明实施例的用户终端，包括：识别单元，用于在该 UE 需要发起注册时，识别该注册的类型；注册发起单元，用于发起注册，并发出注册触发信号；上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报。

本发明实施例的网络侧的网元，包括：提取单元，用于提取 UE 在注册到网络的过程中上报的处理类型信息；识别单元，用于根据提取单元提取的处理类型信息，识别该注册的处理类型。

本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

附图说明

图 1 为现有演进网络的系统架构示意图；

图 2 为现有用户终端从 Non-3GPP 接入系统到 3GPP 接入系统的切换流程图；

图 3 为现有用户终端正常附着到 3GPP 接入系统的流程图；

图 4 为现有用户终端正常跟踪区更新到 3GPP 接入系统的流程图；

图 5 为本发明实施例的方法步骤流程图；

图 6 为本发明实施例的系统的结构示意图；

图 7 为本发明实施例的用户终端的结构示意图；

图 8 为本发明实施例的网络侧网元的结构示意图；

图 9 为本发明实施例 1 的流程图；

图 10 为本发明实施例 2 的流程图；

图 11 为本发明实施例 3 的流程图。

具体实施方式

为了使网络侧可区分不同的注册处理类型。

本发明实施例提供了一种注册处理方法，参见图 5 所示，包括下列主要步骤：

S1、网络侧接收 UE 在注册到网络的过程中上报的该注册的处理类型信息。

本步骤之前，UE 在需要注册到网络时，可先识别该注册的类型。当 UE 注册到网络的过程中，将识别出的该注册类型对应的处理类型信息上报给网络侧。

S2、网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例还提供了一种注册处理系统，参见图 6 所示，其包括：用户终端和网络侧。

UE，用于在注册到网络的过程中，将该注册的处理类型信息上报。

网络侧，用于根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。具体的，由网络侧的移动性管理实体 MME（演进网络）、服务 GPRS 支持节点 SGSN（2G/3G 网络）或非 3GPP 网关（非 3GPP 网络）对 UE 上报的处理类型信息进行识别。

本发明实施例还提供了一种用户终端，参见图 7 所示，其包括：识别单元、注册发起单元和上报单元。

识别单元，用于在该 UE 需要发起注册时，识别该注册的类型。

注册发起单元，用于发起注册，并发出注册触发信号。

上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报。

进一步，上报单元将所述处理类型信息携带于附着请求消息中增加的信元中；或者，将所述处理类型信息携带于跟踪区更新请求消息中增加的信元中；或者，将所述处理类型信息携带于路由区更新请求消息中增加的信元中；或者，将所述处理类型信息携带于接入请求消息中增加的信元中。

或者，所述上报单元对应不同的注册类型，向网络侧发送不同的附着请求消息；或者，对应不同的注册类型，向网络侧发送不同的跟踪区更新请求消息；或者，对应不同的注册类型，向网络侧发送不同的路由区更新请求消息；或者，对应不同的注册类型，向网络侧发送不同的接入请求消息。

本发明实施例还提供了一种网络侧的网元，具体的，该网元为移动性管理实体 MME（演进网络）、服务 GPRS 支持节点 SGSN（2G/3G 网络）或非 3GPP 网关（非 3GPP 网络），参见图 8 所示，其包括：提取单元和识别单元。

提取单元，用于提取 UE 在注册到网络的过程中上报的处理类型信息。

识别单元，用于根据提取单元提取的处理类型信息，识别该注册的处理类型。

以下通过 3 个实施例具体描述。

实施例 1：UE 在发送注册请求消息到 MME 时，将该注册的处理类型信息上报给 MME，MME 据此识别该注册的处理类型；进一步根据该注册的处理类型进行相应的处理，完成注册。参见图 9 所示，包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到演进网络。

3、UE 在发起注册到演进网络之前，识别该注册的类型；之后发送注册请求消息到 MME，并相应将该注册的处理类型信息上报给 MME。

其中，可以通过如下方式之一上报：

1）在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。

2）定义新的消息。例如：定义新的切换附着请求消息（Handover Attach Request），该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息），这样 UE

可向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。(也可新定义对应正常附着请求的消息（或者称之为初始附着请求的消息），原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附着请求消息（或者称之为初始附着请求消息）都重新定义）

3）在跟踪区更新请求消息中增加 Update Type 信元。例如：该 Update Type 信元有如下两个取值：0 对应 Normal TAU（也可称之为 Initial TAU），表明该跟踪区更新请求消息是正常的跟踪区更新请求消息（也可称之为初始的跟踪区更新请求消息）；1 对应 Handover TAU，表明该跟踪区更新请求消息是切换导致的跟踪区更新请求消息。

4)定义新的消息。例如：定义新的切换跟踪区更新请求消息(Handover TAU Request)，该消息表明一个切换导致的跟踪区更新请求消息，而原有的跟踪区更新请求消息表明一个正常的跟踪区更新请求消息（或者称之为初始的跟踪区更新请求消息），这样 UE 可向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息。(也可新定义对应正常的跟踪区更新请求（或者称之为初始的跟踪区更新请求）的消息，原有的跟踪区更新请求消息对应切换导致的跟踪区更新请求消息；或者切换导致的跟踪区更新请求消息和正常跟踪区更新请求（或者称之为初始跟踪区更新请求）消息都重新定义）

4、UE、MME、HSS 之间执行鉴权流程，获取用户使用的 PDN GW 地址信息。

5、MME 根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，MME 已区分了不同的注册处理类型。

进一步，如果处理类型为正常发起的注册，则 MME 按照正常的注册流程处理。

如果处理类型为切换导致的注册，则 MME 发送请求承载创建消息到获取的 PDN GW 的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。并转入步骤 6。

6、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

7、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。

后续 MME 继续其它流程的处理，完成 UE 的注册过程。

实施例 2：这种机制也能应用到 2G/3G 系统。UE 在发送注册请求消息到 SGSN 时，将该注册的处理类型信息上报给 SGSN，SGSN 据此识别该注册的处理类型；进一步根据该注册的处理类型进行相应的处理，完成注册。参见图 10 所示，包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到 2G 或者 3G 网络。

3、UE 在发起注册到 2G 或者 3G 网络之前，识别该注册的类型；之后发送注册请求消息到 SGSN，并相应将该注册的处理类型信息上报给 SGSN。

其中，可以通过如下方式之一上报：

1）在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。

2）定义新的消息。例如：定义新的切换附着请求消息（Handover Attach Request），该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求（或者称之为初始的附着请求）消息，这样 UE 可向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常附着请求（或者称之为初始附着请求）的消息，原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附着请求（或者称之为初始附着请求）消息都重新定义）

3）在路由区更新请求消息中增加 Update Type 信元。例如：该 Update Type

信元有如下两个取值：0 对应 Normal RAU（也可称之为 Initial RAU），表明该路由区更新请求消息是正常的路由区更新请求消息（也可称之为初始的路由区更新请求消息）；1 对应 Handover RAU，表明该路由区更新请求消息是切换导致的路由区更新请求消息。

4）定义新的消息。例如：定义新的切换路由区更新请求消息（Handover RAU Request），该消息表明一个切换导致的路由区更新请求消息，而原有的路由区更新请求消息表明一个正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，这样 UE 可向网络侧发送不同的路由区更新请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，原有的路由区更新请求消息对应切换导致的路由区更新请求消息；或者切换导致的路由区更新请求消息和正常路由区更新请求（或者称之为初始路由区更新请求）消息都重新定义）

4、UE、SGSN、HSS 之间执行鉴权流程，获取用户使用的 PDN GW 地址信息。

5、SGSN 根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，SGSN 已区分了不同的注册处理类型。

进一步，如果处理类型为正常发起的注册，则 SGSN 按照正常的流程处理。

如果处理类型为切换导致的注册，则 SGSN 发送请求承载创建消息到获取的 PDN GW（也就是现在的 GGSN）的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。并转入步骤 6。

6、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

7、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。

后续 SGSN 继续其它流程的处理，完成 UE 的注册过程。

实施例 3：这种机制也能应用到 non-3GPP 系统。UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。参见图 11 所示，包括下列步骤：

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

2、MME 发送切换命令到 UE 通知 UE 切换到 Non-3GPP 网络。

3、UE 在发起注册到 Non-3GPP 网络之前，识别该注册的类型；之后发送接入请求消息到非 3GPP 网关设备，并相应将该注册的处理类型信息上报给非 3GPP 网关设备。

其中，可以通过如下方式之一上报：

1）在接入请求消息中增加 Access Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。

2）定义新的消息。例如：定义新的切换接入请求消息（Handover Access Request），该消息表明一个切换导致的接入请求消息，而原有的接入请求消息表明一个正常的接入请求（或者称之为初始的接入请求）消息，这样 UE 可向网络侧发送不同的接入请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常接入请求（或者称之为初始接入请求）消息，原有的接入请求消息对应切换导致的接入请求消息；或者切换导致的接入请求消息和正常接入请求（或者称之为初始接入请求）消息都重新定义）

4、UE、非 3GPP 网关、AAA Server、HSS 之间执行鉴权流程。

5、非 3GPP 网关设备根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，非 3GPP 网关设备已区分了不同的注册处理类型。

进一步，如果处理类型为正常的接入，则非 3GPP 网关设备按照正常的接

入流程处理。

如果处理类型为切换导致的接入，则非 3GPP 网关设备发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到非 3GPP 网关设备。并转入步骤 6。

6、非 3GPP 网关发起网络侧承载创建流程，创建用户使用的承载。

后续非 3GPP 网关继续其它流程的处理，完成 UE 的接入过程。

综上所述，本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

进一步，网络侧可按照识别出的处理类型，进行对应的流程处理。而且本发明实施例中还公开了 UE 上报注册的处理类型信息的具体方式：通过增加信元或新定义消息，更好的支撑了本发明实施例。

显然，本领域的技术人员可以对本发明进行各种改动和变型而不脱离本发明的精神和范围。这样，倘若本发明的这些修改和变型属于本发明权利要求及其等同技术的范围之内，则本发明也意图包含这些改动和变型在内。

说 明 书 附 图

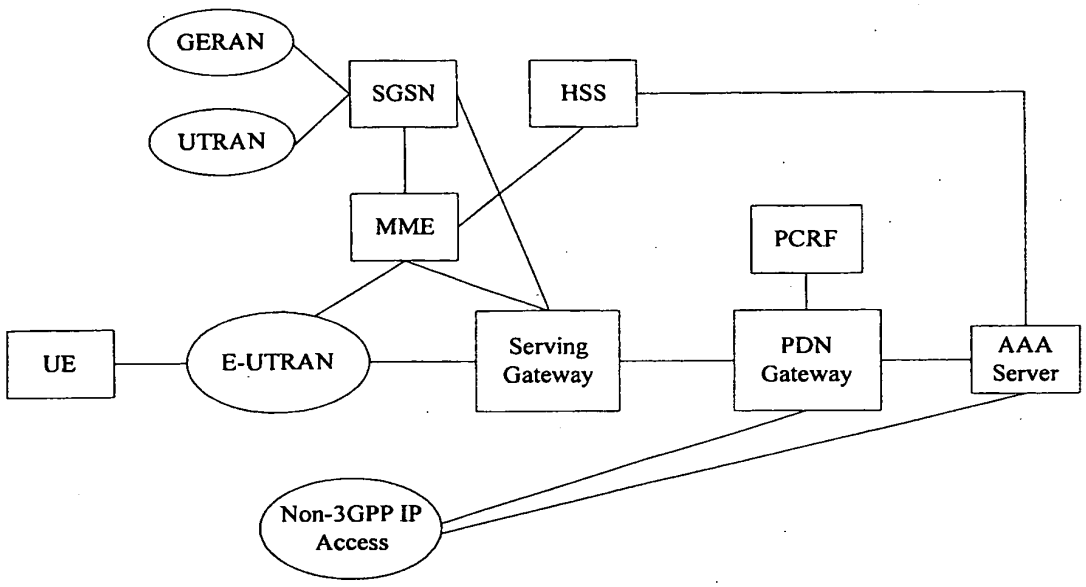
GERAN
UTRAN
SGSN
HSS
MME
PCRF
UE
E-UTRAN
Serving Gateway
PDN Gateway
AAA Server
Non-3GPP IP Access

图 1

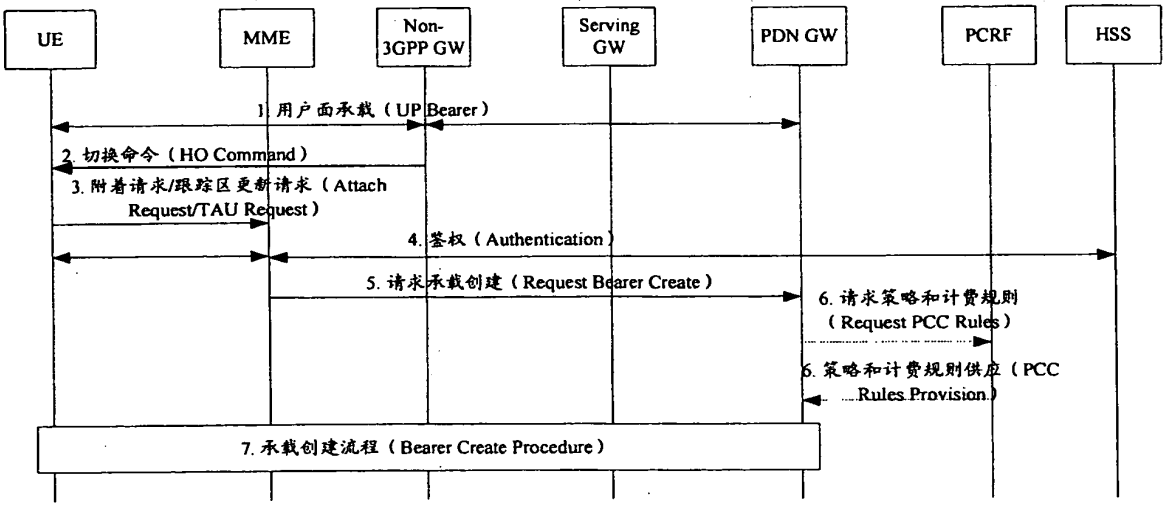
UE
MME
Non-3GPP GW
Serving GW
PDN GW
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/跟踪区更新请求（Attach Request/TAU Request）
4. 鉴权（Authentication）
5. 请求承载创建（Request Bearer Create）
6. 请求策略和计费规则（Request PCC Rules）
6. 策略和计费规则供应（PCC Rules Provision）
7. 承载创建流程（Bearer Create Procedure）

图 2

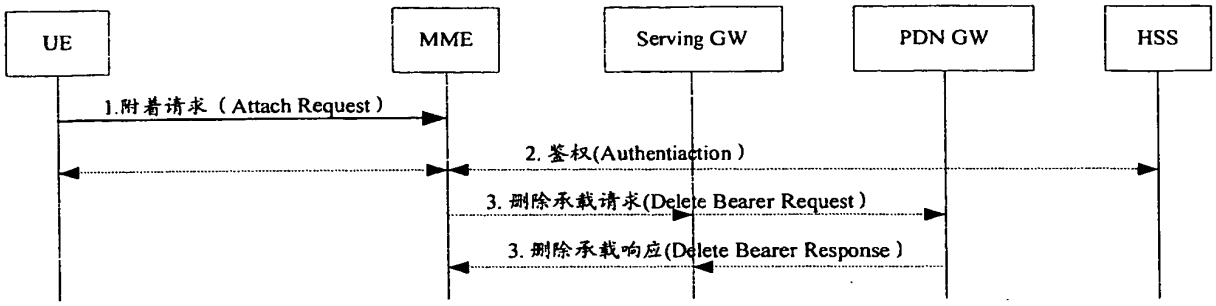
UE
MME
Serving GW
PDN GW
HSS
1.附着请求（Attach Request）
2. 鉴权(Authentiaction)
3. 删除承载请求(Delete Bearer Request)
3. 删除承载响应(Delete Bearer Response)

图 3

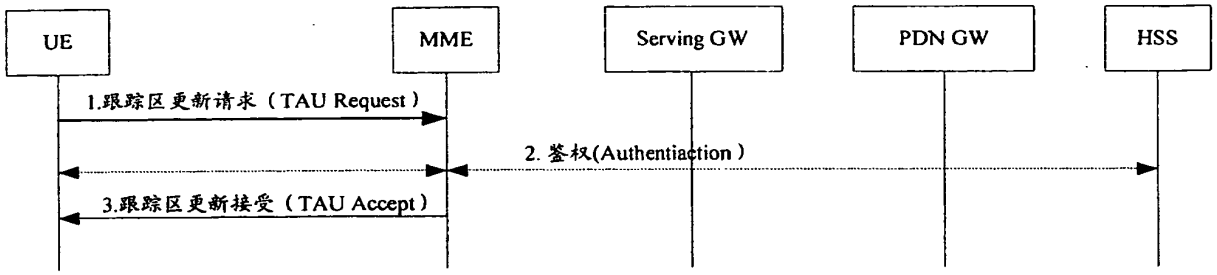
UE
MME
Serving GW
PDN GW
HSS
1.跟踪区更新请求（TAU Request）
2. 鉴权(Authentiaction)
3.跟踪区更新接受（TAU Accept）

图 4

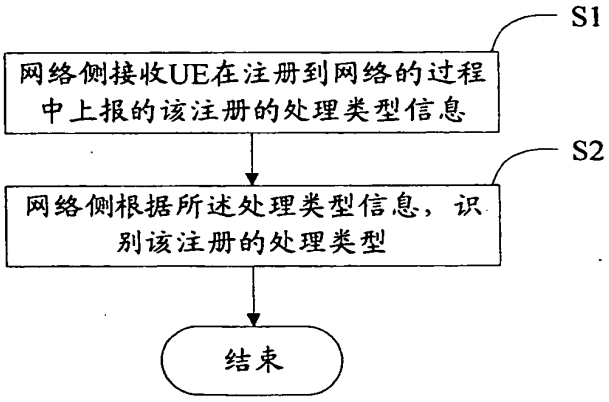
S1
网络侧接收UE在注册到网络的过程中上报的该注册的处理类型信息
S2
网络侧根据所述处理类型信息，识别该注册的处理类型
结束

图 5

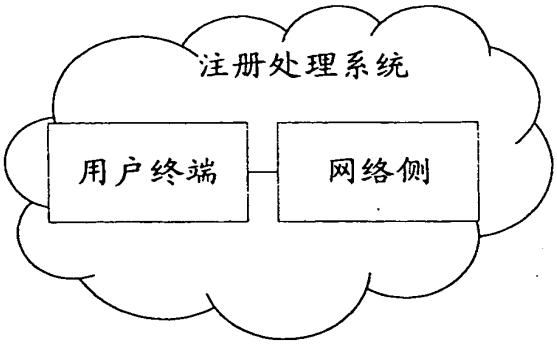

图 6

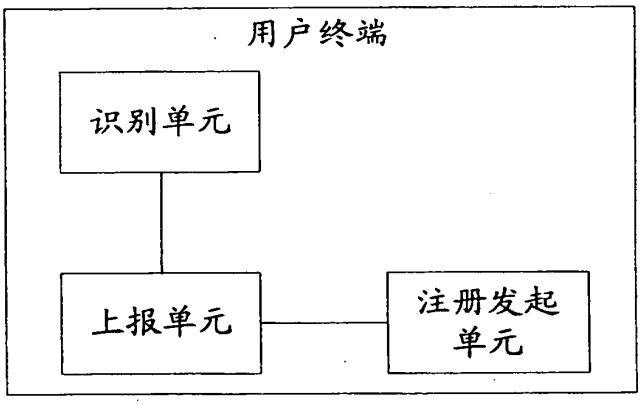

图 7

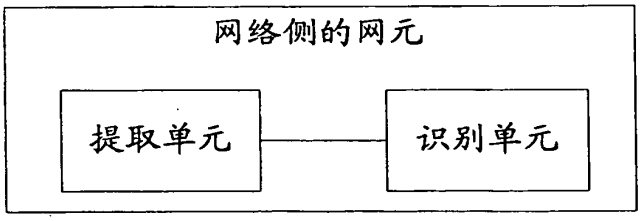

图 8

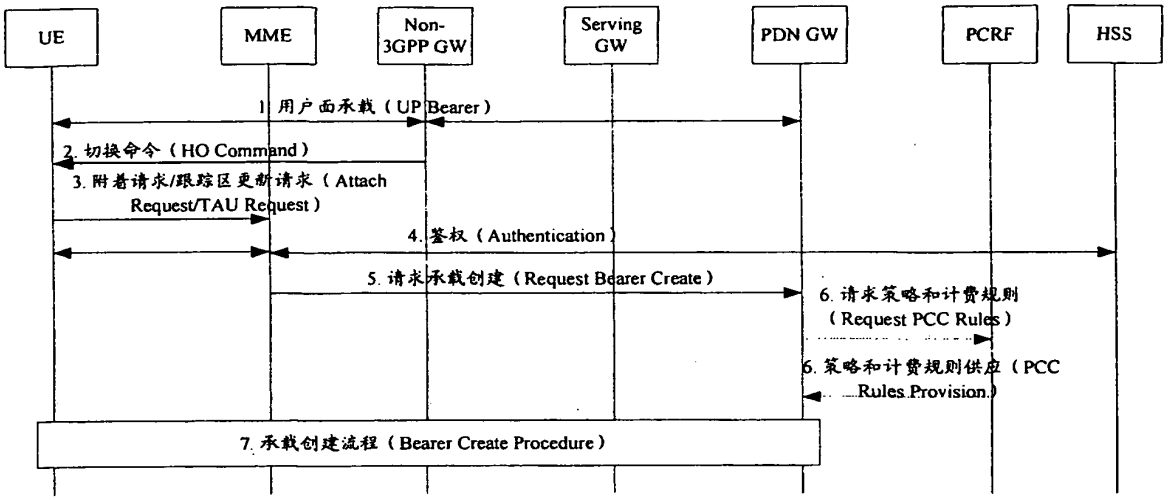
UE
MME
Non-3GPP GW
Serving GW
PDN GW
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/跟踪区更新请求（Attach Request/TAU Request）
4. 鉴权（Authentication）
5. 请求承载创建（Request Bearer Create）
6. 请求策略和计费规则（Request PCC Rules）
6. 策略和计费规则供应（PCC Rules Provision）
7. 承载创建流程（Bearer Create Procedure）

图 9

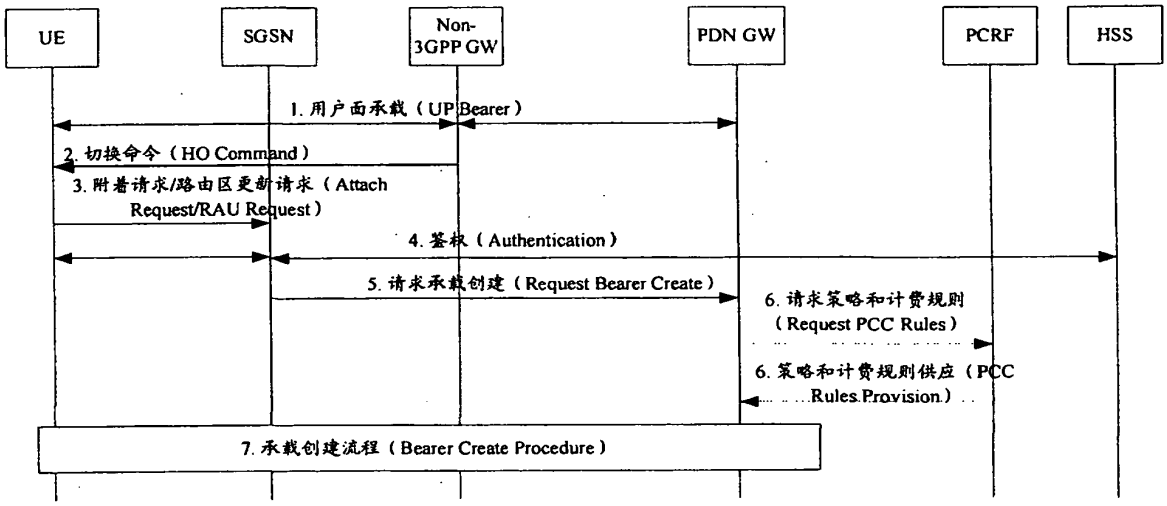
UE
SGSN
Non-3GPP GW
PDN GW
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/路由区更新请求（Attach Request/RAU Request）
4. 鉴权（Authentication）
5. 请求承载创建（Request Bearer Create）
6. 请求策略和计费规则（Request PCC Rules）
6. 策略和计费规则供应（PCC Rules Provision）
7. 承载创建流程（Bearer Create Procedure）

图 10

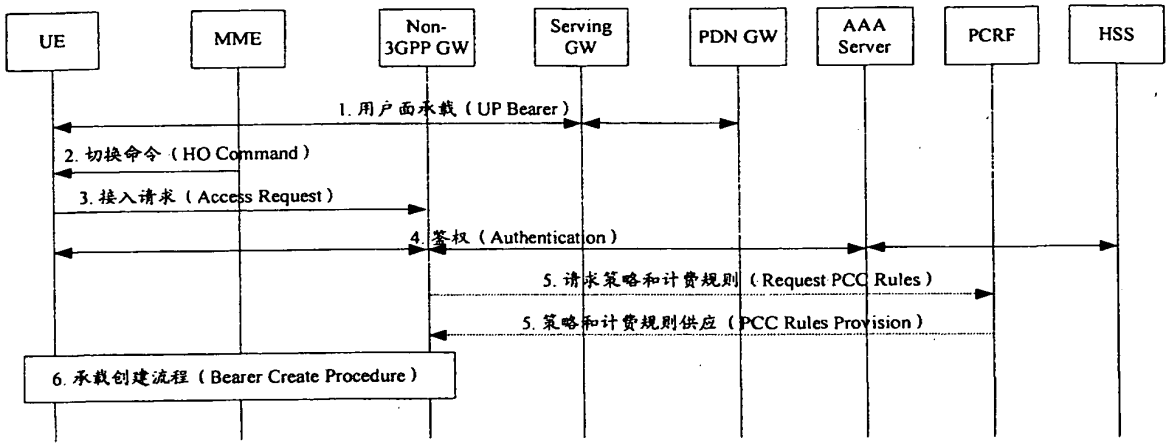
UE
MME
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求策略和计费规则（Request PCC Rules）
5. 策略和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）

图 11

Brinks 08105960US

中华人民共和国国家知识产权局
STATE INTELLECTUAL PROPERTY OFFICE
OF THE PEOPLE'S REPUBLIC OF CHINA

证 明

本证明之附件是向本局提交的下列专利申请文件副本。

申 请 日：2007年10月24日

申 请 号：200710181758.X

申 请 类 别：发明专利

发明创造 名称：一种注册处理方法、系统及装置

申请人：华为技术有限公司

发明设计人：吴问付

中华人民共和国
国家知识产权局局长 田力普

2010 年 11 月 26 日

权 利 要 求 书

1、一种注册处理方法，其特征在于，包括下列步骤：

网络侧接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及

网络侧根据所述处理类型信息，识别该注册的处理类型。

2、如权利要求 1 所述的方法，其特征在于，所述处理类型信息由 UE 在需要注册到网络时识别。

3、如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 上报处理类型信息的方式，包括下列之一：

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中增加指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的跟踪区更新请求消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的跟踪区更新请求消息中增加指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的路由区更新请求消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的路由区更新请求消息中增加指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的接入请求消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的接入请求消息中增加指示位信元，以表征切换注册处理类型；

所述 UE 在接入鉴权或者鉴权的过程中，该 UE 在向网络侧发送的消息中

增加信元，以携带该注册的处理类型信息；

所述 UE 在接入鉴权或者鉴权的过程中，该 UE 在向网络侧发送的消息中增加指示位信元，以表征切换注册处理类型；

所述 UE 在因特网密钥交换协议版本 2IKEv2 或者 IP 网络安全协议安全联盟 IPsec SA 建立的过程中，该 UE 在向网络侧发送的消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在因特网密钥交换协议版本 2 或者 IP 网络安全协议安全联盟建立的过程中，该 UE 在向网络侧发送的消息中增加指示位信元，以表征切换注册处理类型。

4、如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 在注册到网络的过程中，以向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息；或者，

所述 UE 在注册到网络的过程中，以向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息；或者，

所述 UE 在注册到网络的过程中，以向网络侧发送不同的路由区更新请求消息，分别表征对应的注册处理类型信息；或者，

所述 UE 在注册到网络的过程中，以向网络侧发送不同的接入请求消息，分别表征对应的注册处理类型信息。

5、如权利要求 1 所述的方法，其特征在于，网络侧网元在收到 UE 发送的注册处理类型信息后，将该注册处理类型信息通知给归属签约寄存器 HSS 或者 AAA Server。

6、如权利要求 5 所述的方法，其特征在于，所述网络侧网元为移动性管理实体 MME 或服务 GPRS 支持节点 SGSN，则 HSS 收到 MME 或 SGSN 上报的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 HSS 中存在该 UE 在 non-3GPP 网络中使用的分组数据网络网关实体 PDN GW 地址信息，则 HSS 通知 AAA Server 取消该 UE 在 non-3GPP 网络的注册；

AAA Server 通知 non-3GPP 网络释放该 UE 在 non-3GPP 网络中使用的资源。

7、如权利要求 5 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，则 AAA Server 收到非 3GPP 网关设备上报的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 AAA Server 中存在该 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 PDN GW 释放该 UE 在 3GPP 网络中使用的资源。

8、如权利要求 7 所述的方法，其特征在于，AAA Server 进一步通知 HSS 取消所述 UE 在 3GPP 网络中的注册。

9、如权利要求 5 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，则 AAA Server 收到非 3GPP 网关设备上报的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 AAA Server 中存在该 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消该 UE 在 3GPP 网络中的注册；

HSS 通知 MME/SGSN 释放该 UE 在 3GPP 网络中使用的资源。

10、一种注册处理系统，其特征在于，包括：

用户终端 UE，用于在注册到网络的过程中，将该注册的处理类型信息上报；

网络侧，用于根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

11、如权利要求 10 所述的系统，其特征在于，由网络侧的移动性管理实体 MME、服务 GPRS 支持节点 SGSN 或非 3GPP 网关对 UE 上报的处理类型信息进行识别。

12、一种用户终端，其特征在于，包括：

识别单元，用于在该 UE 需要发起注册时，识别该注册的类型；

注册发起单元，用于发起注册，并发出注册触发信号；

上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报。

13、如权利要求 12 所述的用户终端，其特征在于，上报单元将所述处理类型信息携带于附着请求消息中增加的信元中；或者，

将所述处理类型信息携带于跟踪区更新请求消息中增加的信元中；或者，

将所述处理类型信息携带于路由区更新请求消息中增加的信元中；或者，

将所述处理类型信息携带于接入请求消息中增加的信元中；或者，

将所述处理类型信息携带于接入鉴权或者鉴权消息中增加的信元中；或者

将所述处理类型信息携带于 IKEv2 或 IPsec SA 建立消息中增加的信元中。

14、如权利要求 12 所述的用户终端，其特征在于，所述上报单元对应不同的注册类型，向网络侧发送不同的附着请求消息；或者，

对应不同的注册类型，向网络侧发送不同的跟踪区更新请求消息；或者，

对应不同的注册类型，向网络侧发送不同的路由区更新请求消息；或者，

对应不同的注册类型，向网络侧发送不同的接入请求消息。

15、一种网络侧的网元，其特征在于，包括：

提取单元，用于提取 UE 在注册到网络的过程中上报的处理类型信息；

识别单元，用于根据提取单元提取的处理类型信息，识别该注册的处理类型。

16、如权利要求 15 所述的网元，其特征在于，所述网元为移动性管理实体 MME、服务 GPRS 支持节点 SGSN 或非 3GPP 网关。

07.10.26

说 明 书

一种注册处理方法、系统及装置

技术领域

本发明涉及通信领域，特别是涉及一种注册处理方法、系统及装置。

背景技术

3GPP 为了增强未来网络的竞争能力，正在研究一种全新的演进网络，其系统架构参见图 1 所示，其中包括:

演进的 UMTS 陆地无线接入网(E-UTRAN, Evolved UMTS Terrestrial Radio Access Network)，用于实现所有与演进网络无线有关的功能。

移动性管理实体（MME，Mobility Management Entity)，负责控制面的移动性管理，包括用户上下文和移动状态管理，分配用户临时身份标识等。

服务网关实体（Serving GW，Serving Gateway)，是 3GPP 接入系统间的用户面锚点，终止 E-TURAN 的接口。

分组数据网络网关实体(PDN GW, Packet Data Network Gateway)是 3GPP 接入系统和非 3GPP 接入系统之间的用户面锚点，终止和外部分组数据网络（PDN，Packet Data Network）的接口。

策略和计费规则功能实体（PCRF，Policy and Charging Rule Function)，用于策略控制决定和流计费控制功能。

归属网络服务器（HSS，Home Subscriber Server）用于存储用户签约信息。

UMTS 陆地无线接入网（UTRAN，UMTS Terrestrial Radio Access Network)、GSM/EDGE 无线接入网（GERAN，GSM/EDGE Radio Access Network)，用于实现所有与现有 GPRS/UMTS 网络中无线有关的功能。

服务通用分组无线业务支持节点(SGSN, Serving GPRS Supporting Node)，用于实现 GPRS/UMTS 网络中路由转发、移动性管理、会话管理以及用户信息

存储等功能。

非 3GPP IP 接入系统（Non-3GPP IP Access），主要是一些非 3GPP 组织定义的接入网络，如无线局域网（WLAN，Wireless Local Area Network），微波存取全球互通（Wimax， Worldwide Interoperability for Microwave Access）等网络。

认证、授权与计费服务器（AAA Server，Authentication，Authorization and Accounting Server）用于对用户设备（UE, User Equipment）执行接入认证、授权和计费功能。

说明：这个架构并不意味着最终的 SAE 系统架构，最后的架构可能和这个架构有所差别，本专利不作限制。

上述演进网络的一个需求是实现 3GPP 的接入系统（GERAN/UTRAN/E-UTRAN）和 Non-3GPP 接入系统（如 WLAN/Wimax 等）之间的切换（Handover）。在目前的协议中规定，切换流程是通过 UE 在新接入系统中的附着（Attach）或者跟踪区更新（TAU）流程来实现的。参见图 2 所示，用户终端从 Non-3GPP 接入系统到 3GPP 接入系统的切换流程包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到演进网络。或者 UE 发现演进网络并且决定切换到演进网络。

3、UE 发送附着请求或者跟踪区更新请求消息到 MME。

4、UE、MME、HSS 之间执行鉴权流程。HSS 可以在这个步骤中将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

5、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

6、HSS 将用户的签约数据插入到 MME 中。

7、HSS 返回位置更新确认消息给 MME。HSS 可以在这个步骤中将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

8、MME 发送请求承载创建消息到获取的 PDN GW，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。

9、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。

11、MME 发送附着接受或者跟踪区更新接受消息到 UE。

参见图 3 所示，在目前的协议中规定，用户终端正常附着（也可称之为初始附着 Initial Attach）到 3GPP 接入系统的流程包括下列步骤：

1、UE 发送附着请求消息到 MME。

2、UE、MME、HSS 之间执行鉴权流程。

3、如果用户存在已经创建的承载，则 MME 发起删除承载流程，将用户以前建立的承载删除掉。

4、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

5、HSS 将用户的签约数据插入到 MME 中。

6、HSS 返回位置更新确认消息给 MME。

7、MME 发起缺省承载创建程序，创建 UE 和 PDN GW 之间的缺省承载。

8、MME 注册 UE 使用的 PDN GW 地址信息到 HSS。这个处理也可以通过位置更新流程来处理，MME 发送位置更新消息给 HSS，消息中携带 PDN GW 地址信息。

9、MME 发送附着接受消息给 UE。

参见图 4 所示，在目前的协议中规定，用户终端正常跟踪区更新（也可称之为初始跟踪区更新 Initial TAU）到 3GPP 接入系统的流程包括下列步骤：

1、UE 发送跟踪区更新请求消息到 MME。

2、UE、MME、HSS 之间执行鉴权流程。

3、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

4、HSS 将用户的签约数据插入到 MME 中。

5、HSS 返回位置更新确认消息给 MME。

6、MME 接受 UE 的跟踪区更新请求，并发送跟踪区更新接受消息到 UE。

发明人在发明过程中发现，切换导致的 Attach/TAU 流程和正常 Attach/TAU 流程处理机制存在很大的不同：正常的 Attach 流程网络侧需要将用户以前建立的承载都删除掉，建立 UE 和 PDN GW 之间的缺省承载并且将 UE 使用的 PDN GW 地址信息注册到 HSS，而切换导致的 Attach 流程网络侧需将用户以前建立的承载都重新创建出来。正常的 TAU 流程网络侧不处理用户的承载，而切换导致的 TAU 流程网络侧需将用户以前建立的承载都重新创建出来。

所以网络侧收到 UE 发送的 Attach Request 消息或者 TAU Request 消息后，需要知道发起的是正常的 Attach/TAU 流程，还是切换导致的 Attach/TAU 流程，但目前的机制无法进行区分。

发明内容

本发明实施例提供一种注册处理方法、系统及装置，以使网络侧可区分不同的注册处理类型。

本发明实施例的方法包括：网络侧接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例的系统，包括：用户终端 UE，用于在注册到网络的过程中，将该注册的处理类型信息上报；网络侧，用于根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

本发明实施例的用户终端，包括：识别单元，用于在该 UE 需要发起注册时，识别该注册的类型；注册发起单元，用于发起注册，并发出注册触发信号；上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网

络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报。

本发明实施例的网络侧的网元，包括：提取单元，用于提取 UE 在注册到网络的过程中上报的处理类型信息；识别单元，用于根据提取单元提取的处理类型信息，识别该注册的处理类型。

本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

附图说明

图 1 为现有演进网络的系统架构示意图；

图 2 为现有用户终端从 Non-3GPP 接入系统到 3GPP 接入系统的切换流程图；

图 3 为现有用户终端正常附着到 3GPP 接入系统的流程图；

图 4 为现有用户终端正常跟踪区更新到 3GPP 接入系统的流程图；

图 5 为本发明实施例的方法步骤流程图；

图 6 为本发明实施例的系统的结构示意图；

图 7 为本发明实施例的用户终端的结构示意图；

图 8 为本发明实施例的网络侧网元的结构示意图；

图 9 为本发明实施例 1 的流程图；

图 10 为本发明实施例 2 的流程图；

图 11 为本发明实施例 3 的流程图；

图 12 为本发明实施例 4 的流程图；

图 13 为本发明实施例 5 的流程图。

具体实施方式

为了使网络侧可区分不同的注册处理类型。

本发明实施例提供了一种注册处理方法，参见图 5 所示，包括下列主要步

骤:

S1、网络侧接收 UE 在注册到网络的过程中上报的该注册的处理类型信息。

本步骤之前，UE 在需要注册到网络时，可先识别该注册的类型。当 UE 注册到网络的过程中，将识别出的该注册类型对应的处理类型信息上报给网络侧。

S2、网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例还提供了一种注册处理系统，参见图 6 所示，其包括：用户终端和网络侧。

UE，用于在注册到网络的过程中，将该注册的处理类型信息上报。

网络侧，用于根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。具体的，由网络侧的移动性管理实体 MME（演进网络）、服务 GPRS 支持节点 SGSN（2G/3G 网络）或非 3GPP 网关（非 3GPP 网络）对 UE 上报的处理类型信息进行识别。

本发明实施例还提供了一种用户终端，参见图 7 所示，其包括：识别单元、注册发起单元和上报单元。

识别单元，用于在该 UE 需要发起注册时，识别该注册的类型。

注册发起单元，用于发起注册，并发出注册触发信号。

上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报，上报的方式包括但不限于以下几种:

上报单元将处理类型信息携带于附着请求消息中增加的信元中；或者，将处理类型信息携带于跟踪区更新请求消息中增加的信元中；或者，将处理类型信息携带于路由区更新请求消息中增加的信元中；或者，将处理类型信息携带于接入请求消息中增加的信元中；或者，将处理类型信息携带于接入鉴权或者鉴权消息中增加的信元中；或者将处理类型信息携带于 IKEv2 或 IPsec SA 建立消息中增加的信元中。

或者，所述上报单元对应不同的注册类型，向网络侧发送不同的附着请求消息；或者，对应不同的注册类型，向网络侧发送不同的跟踪区更新请求消息；或者，对应不同的注册类型，向网络侧发送不同的路由区更新请求消息；或者，对应不同的注册类型，向网络侧发送不同的接入请求消息。

本发明实施例还提供了一种网络侧的网元，具体的，该网元为移动性管理实体 MME（演进网络）、服务 GPRS 支持节点 SGSN（2G/3G 网络）或非 3GPP 网关（非 3GPP 网络），参见图 8 所示，其包括：提取单元和识别单元。

提取单元，用于提取 UE 在注册到网络的过程中上报的处理类型信息。

识别单元，用于根据提取单元提取的处理类型信息，识别该注册的处理类型。

以下通过 5 个实施例具体描述。

实施例 1：UE 在发送注册请求消息到 MME 时，将该注册的处理类型信息上报给 MME，MME 据此识别该注册的处理类型；进一步根据该注册的处理类型进行相应的处理，完成注册。MME 上报注册的处理类型给 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 non-3GPP 网络中使用的资源在 3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 non-3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 non-3GPP 网络中的注册，AAA Server 通知 non-3GPP 网络释放 UE 使用的资源。参见图 9 所示，包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到演进网络。或者 UE 发现演进网络并决定发起切换。

3、UE 在发起注册到演进网络之前，识别该注册的类型；之后发送注册请求消息到 MME，并相应将该注册的处理类型信息上报给 MME。

其中，可以通过如下方式之一上报：

1）在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有

如下两个取值：0对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。或者 UE 在附着请求消息中增加指示位，表明该附着请求消息是切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为 “Handover Attach”。

2）定义新的消息。例如：定义新的切换附着请求消息（Handover Attach Request），该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息），这样 UE 可向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常附着请求的消息（或者称之为初始附着请求的消息），原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附着请求消息（或者称之为初始附着请求消息）都重新定义）

3）在跟踪区更新请求消息中增加 Update Type 信元。例如：该 Update Type 信元有如下两个取值：0对应 Normal TAU（也可称之为 Initial TAU），表明该跟踪区更新请求消息是正常的跟踪区更新请求消息（也可称之为初始的跟踪区更新请求消息）；1 对应 Handover TAU，表明该跟踪区更新请求消息是切换导致的跟踪区更新请求消息。或者 UE 在跟踪区更新请求消息中增加指示位表明该跟踪区更新请求消息是切换导致的跟踪区更新请求消息，而原有的跟踪区更新请求消息表明一个正常的跟踪区更新请求消息（或者称之为初始的跟踪区更新请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “TAU due to Handover”。

c) Update Type 信元。UE 将该信元设置为 “Handover TAU”。

4)定义新的消息。例如: 定义新的切换跟踪区更新请求消息(Handover TAU Request)，该消息表明一个切换导致的跟踪区更新请求消息，而原有的跟踪区更新请求消息表明一个正常的跟踪区更新请求消息(或者称之为初始的跟踪区更新请求消息)，这样 UE 可向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息。(也可新定义对应正常的跟踪区更新请求(或者称之为初始的跟踪区更新请求)的消息，原有的跟踪区更新请求消息对应切换导致的跟踪区更新请求消息; 或者切换导致的跟踪区更新请求消息和正常跟踪区更新请求(或者称之为初始跟踪区更新请求)消息都重新定义)

4、UE、MME、HSS 之间执行鉴权流程，获取用户使用的 PDN GW 地址信息。MME 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。如果注册处理类型为切换处理类型，则 HSS 可以将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

5、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。MME 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。

6、HSS 将用户的签约数据插入到 MME 中。

7、HSS 返回位置更新确认消息给 MME。HSS 可以在这个步骤中将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

8、MME 根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。至此，MME 已区分了不同的注册处理类型。

进一步，如果处理类型为正常发起的注册，则 MME 按照正常的注册流程处理。步骤 11 至 18 将被执行。

如果处理类型为切换导致的注册，则 MME 发送请求承载创建消息到获取的 PDN GW 的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。并转入步骤 9。

9、如果需要到 PCRF 获取用户使用的策略和计费(PCC)规则，则 PDN GW

发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 18。

11、如果 UE 的注册处理类型为正常发起的注册，且 HSS 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 non-3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 AAA Server 注册到 HSS，则 HSS 发送取消注册消息到 AAA Server 请求取消 UE 在 non-3GPP 接入网络中的注册。AAA Server 回取消注册确认消息到 HSS。

12、AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 non-3GPP 接入网络中的注册。PDN GW 回取消注册确认消息到 AAA Server。

13、如果 PDN GW 和 non-3GPP 网关设备之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 non-3GPP 网关设备，取消 non-3GPP 网关设备和 PDN GW 之间的 PMIP 绑定。non-3GPP 网关设备回绑定撤销确认消息到 PDN GW。

14、AAA Server 也可以发送会话终止消息到 non-3GPP 网关设备。non-3GPP 网关设备回会话终止确认消息到 AAA Server。

15、non-3GPP 网关设备收到绑定取消指示消息或者会话终止消息后发起资源释放程序，释放 UE 在 non-3GPP 接入网络中使用的资源。

16、如果 UE 的注册处理类型为正常发起的注册，则 MME 发起缺省承载创建程序，创建 UE 和 PDN GW 之间的缺省承载。

17、MME 注册 UE 使用的 PDN GW 地址信息到 HSS。这个处理也可以通过位置更新流程来处理，MME 发送位置更新消息给 HSS，消息中携带 PDN GW 地址信息。

18、MME 回附着接受或者跟踪区更新接受消息到 UE。

实施例 2：这种机制也能应用到 2G/3G 系统。UE 在发送注册请求消息到

SGSN 时，将该注册的处理类型信息上报给 SGSN，SGSN 据此识别该注册的处理类型；进一步根据该注册的处理类型进行相应的处理，完成注册。SGSN 上报注册的处理类型给 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 non-3GPP 网络中使用的资源在 3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 non-3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 non-3GPP 网络中的注册，AAA Server 通知 non-3GPP 网络释放 UE 使用的资源。参见图 10 所示，包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到 2G 或者 3G 网络。或者 UE 发现 2G 或者 3G 网络并决定发起切换。

3、UE 在发起注册到 2G 或者 3G 网络之前，识别该注册的类型；之后发送注册请求消息到 SGSN，并相应将该注册的处理类型信息上报给 SGSN。

其中，可以通过如下方式之一上报：

1）在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。或者 UE 在附着请求消息中增加指示位表明该附着请求消息是切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为 “Handover Attach”。

2）定义新的消息。例如：定义新的切换附着请求消息（Handover Attach Request），该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求（或者称之为初始的附着请求）消息，这样 UE 可向

网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常附着请求（或者称之为初始附着请求）的消息，原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附着请求（或者称之为初始附着请求）消息都重新定义）

3）在路由区更新请求消息中增加 Update Type 信元。例如：该 Update Type 信元有如下两个取值：0 对应 Normal RAU（也可称之为 Initial RAU），表明该路由区更新请求消息是正常的路由区更新请求消息（也可称之为初始的路由区更新请求消息）；1 对应 Handover RAU，表明该路由区更新请求消息是切换导致的路由区更新请求消息。或者 UE 在路由区更新请求消息中增加指示位表明该路由区更新请求消息是切换导致的路由区更新请求消息，而原有的路由区更新请求消息表明一个正常的路由区更新请求消息（或者称之为初始的路由区更新请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “RAU due to Handover”。

c) Update Type 信元。UE 将该信元设置为 “Handover RAU”。

4）定义新的消息。例如：定义新的切换路由区更新请求消息（Handover RAU Request），该消息表明一个切换导致的路由区更新请求消息，而原有的路由区更新请求消息表明一个正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，这样 UE 可向网络侧发送不同的路由区更新请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，原有的路由区更新请求消息对应切换导致的路由区更新请求消息；或者切换导致的路由区更新请求消息和正常路由区更新请求（或者称之为初始路由区更新请求）消息都重新定义）

4、UE、SGSN、HSS 之间执行鉴权流程。SGSN 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。如果注册处理类型为切换处理类型，则 HSS 可以将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 SGSN。

5、SGSN 发送位置更新消息给 HSS，注册 SGSN 的地址信息到 HSS。SGSN 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。

6、HSS 将用户的签约数据插入到 SGSN 中。

7、HSS 返回位置更新确认消息给 SGSN。HSS 可以在这个步骤中将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 SGSN。

8、SGSN 根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，SGSN 已区分了不同的注册处理类型。

进一步，如果处理类型为正常发起的注册，则 SGSN 按照正常的流程处理，步骤 11 至 16 将被执行。

如果处理类型为切换导致的注册，则 SGSN 发送请求承载创建消息到获取的 PDN GW（也就是现在的 GGSN）的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。并转入步骤 9。

9、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 16。

步骤 11 至步骤 15 同实施例 1 中的处理。这里不再描述。

16、SGSN 回附着接受或者路由区更新接受消息到 UE。

实施例 3：这种机制也能应用到可信（Trusted）的 non-3GPP 系统。UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使

用的资源在 non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，同时 AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 11 所示，包括下列步骤：

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

2、MME 或者 SGSN 发送切换命令到 UE 通知 UE 切换到 Non-3GPP 网络。或者 UE 发现 Non-3GPP 网络并决定发起切换。

3、UE 在发起注册到 Non-3GPP 网络之前，识别该注册的类型；之后发送接入请求消息到非 3GPP 网关设备，并相应将该注册的处理类型信息上报给非 3GPP 网关设备。

其中，可以通过如下方式之一上报：

1）在接入请求消息中增加 Access Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。或者 UE 在接入请求消息中增加指示位表明该接入请求消息是切换导致的接入请求消息，而原有的接入请求消息表明一个正常的接入请求消息（或者称之为初始的接入请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Access due to Handover”。

c) Access Type 信元。UE 将该信元设置为 “Handover Access”。

2）定义新的消息。例如：定义新的切换接入请求消息（Handover Access Request），该消息表明一个切换导致的接入请求消息，而原有的接入请求消息表明一个正常的接入请求（或者称之为初始的接入请求）消息，这样 UE 可向网络侧发送不同的接入请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常接入请求（或者称之为初始接入请求）消息，原有的接入请求

消息对应切换导致的接入请求消息；或者切换导致的接入请求消息和正常接入请求（或者称之为初始接入请求）消息都重新定义）

4、UE、非 3GPP 网关、AAA Server、HSS 之间执行鉴权流程。UE 也可以在这个步骤中将 UE 的注册处理类型上报给非 3GPP 网关。UE 在鉴权流程的消息中携带 Access Type 信元。例如：该 Access Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。

或者 UE 在鉴权流程的消息中携带 Attach Type 信元。例如：该 Atatch Type 信元有如下两个取值：0 对应 Normal Attach（或者称之为 Initial Attach），表明该 UE 的注册处理类型是正常的注册(或者称之为初始的注册)；1 对应 Handover Attach，表明该 UE 的注册处理类型是切换导致的注册。

或者 UE 在鉴权流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的鉴权流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为 “Handover Attach”。

非 3GPP 网关在这个步骤中将 UE 的注册处理类型上报给 AAA Server。

5、非 3GPP 网关设备根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，非 3GPP 网关设备已区分了不同的注册处理类型。

进一步，如果处理类型为正常的接入，则非 3GPP 网关设备按照正常的接入流程处理。步骤 7 到 13 将被执行。

如果处理类型为切换导致的接入，则非 3GPP 网关设备发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC

规则到非 3GPP 网关设备。并转入步骤 6。

6、非 3GPP 网关发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 13。

7、 如果 UE 的注册处理类型为正常发起的注册，且 AAA Server 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 HSS 注册到 AAA Server，则 AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 3GPP 接入网络中的注册。PDN GW 回取消注册确认消息到 AAA Server。

8、如果 PDN GW 和 Serving GW 之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 Serving GW，取消 Serving GW 网关设备和 PDN GW 之间的 PMIP 绑定。Serving GW 回绑定取消确认消息给 PDN GW。

9、如果 Serving GW 收到绑定取消指示消息，则 Serving GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

10、如果 PDN GW 和 Serving GW 之间的接口协议为 GTP 协议，则 PDN GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

11、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

12、AAA Server 发送取消注册消息到 HSS，取消 UE 在 HSS 中的注册。HSS 回取消注册确认消息到 AAA Server。

13、非 3GPP 网关回接入接受消息到 UE。

实施例 4：这种机制也能应用到可信（Trusted）的 non-3GPP 系统。UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使

用的资源在 non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，HSS 通知 MME/SGSN 释放 UE 在 3GPP 网络中使用的资源。参见图 12 所示，包括下列步骤：

步骤 1 至 6 同实施例 3 中的处理。

7、如果 UE 的注册处理类型为正常发起的注册，且 AAA Server 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 HSS 注册到 AAA Server，则 AAA Server 发送取消注册消息到 HSS，取消 UE 在 HSS 中的注册。HSS 回取消注册确认消息到 AAA Server。

8、HSS 发送位置取消消息到 MME/SGSN。MME/SGSN 回位置取消确认消息到 HSS。

9、MME/SGSN 分离 UE，释放 UE 在 3GPP 接入网络中使用的资源。

10、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

11、非 3GPP 网关回接入接受消息到 UE。

实施例 5：这种机制也能应用到非可信（Untrusted）的 non-3GPP 系统。UE 在发送接入鉴权请求或者 IKEv2/IPSec SA（Internet Key Exchange Protocol Version 2/IP Security Protocol Security Association，因特网密钥交换协议版本 2/IP 网络安全协议安全联盟）建立请求消息到演进分组数据网关（一种非 3GPP 网关）ePDG（Evolved Packet data Gateway）时，将该注册的处理类型信息上报给 ePDG，ePDG 据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。ePDG 上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的

PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，同时 AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 13 所示，包括下列步骤：

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

2、MME 或者 SGSN 发送切换命令到 UE 通知 UE 切换到 Non-3GPP 网络。或者 UE 发现 Non-3GPP 网络并决定发起切换。

3、UE、ePDG、AAA Server、HSS 之间执行接入鉴权流程。UE 可以在这个步骤中将 UE 的注册处理类型上报给 ePDG。UE 在接入鉴权流程的消息中携带 Access Type 信元。例如：该 Access Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。

或者 UE 在接入鉴权流程的消息中携带 Attach Type 信元。例如：该 Atatch Type 信元有如下两个取值：0 对应 Normal Attach（或者称之为 Initial Attach），表明该 UE 的注册处理类型是正常的注册（或者称之为初始的注册）；1 对应 Handover Attach，表明该 UE 的注册处理类型是切换导致的注册。

或者 UE 在接入鉴权流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的接入鉴权流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为 “Handover Attach”。

ePDG 在这个步骤中可以将 UE 的注册处理类型上报给 AAA Server，AAA Server 将 UE 的注册处理类型上报给 HSS。

4、UE、ePDG、AAA Server 之间执行 IKEv2/IPSec SA 建立流程。UE 可以在这个步骤中将 UE 的注册处理类型上报给 ePDG。UE 可以在 IKEv2/IPSec

SA 建立流程的消息中携带 Access Type 信元或者 Attach Type 信元指明 UE 的注册处理类型。或者 UE 在 IKEv2/IPSec SA 建立流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的 IKEv2/IPSec SA 建立流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Access due to Handover”。

c) Access Type 信元。UE 将该信元设置为 “Handover Access”。

ePDG 在这个步骤中可以将 UE 的注册处理类型上报给 AAA Server，AAA Server 将 UE 的注册处理类型上报给 HSS。

5、ePDG 根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，ePDG 已区分了不同的注册处理类型。

进一步，如果处理类型为正常的接入，则 ePDG 按照正常的接入流程处理。步骤 7 到 13 将被执行。

如果处理类型为切换导致的接入，则 ePDG 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到非 3GPP 网关设备。并转入步骤 6。

6、ePDG 发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 13。

步骤 7 至 13 同实施例 3 中的处理。

综上所述，本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

进一步，网络侧可按照识别出的处理类型，进行对应的流程处理。而且本发明实施例中还公开了 UE 上报注册的处理类型信息的具体方式：通过增加信元或新定义消息，更好的支撑了本发明实施例。

进一步，本发明中 UE 上报的注册处理类型信息可能还包括其它的注册处理类型，而不仅仅是本专利中说明的 Initial Attach 和 Handover Attach 处理类型。

如对于多模终端（Multi Mode）或者双模（Dual Mode）终端（即这种终端能够同时接入到多个网络中）来说，注册的处理类型可能有：Power On Attach（即UE开机时的注册处理类型），Normal Attach（即UE正常接入时的注册处理类型），Handover Attach（即UE切换时的注册处理类型）等。本专利不限制注册处理类型的取值。

显然，本领域的技术人员可以对本发明进行各种改动和变型而不脱离本发明的精神和范围。这样，倘若本发明的这些修改和变型属于本发明权利要求及其等同技术的范围之内，则本发明也意图包含这些改动和变型在内。

说 明 书 附 图

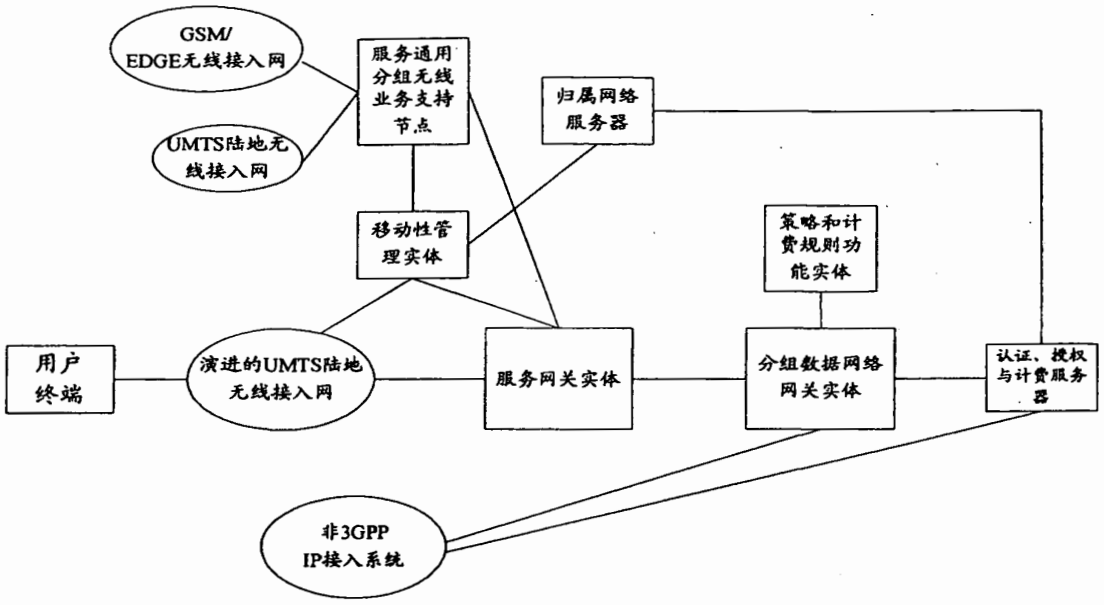
GSM/
EDGE无线接入网
UMTS陆地无
线接入网
服务通用
分组无线
业务支持
节点
归属网络
服务器
移动性管
理实体
策略和计
费规则功
能实体
用户
终端
演进的UMTS陆地
无线接入网
服务网关实体
分组数据网络
网关实体
认证、授权
与计费服务
器
非3GPP
IP接入系统

图 1

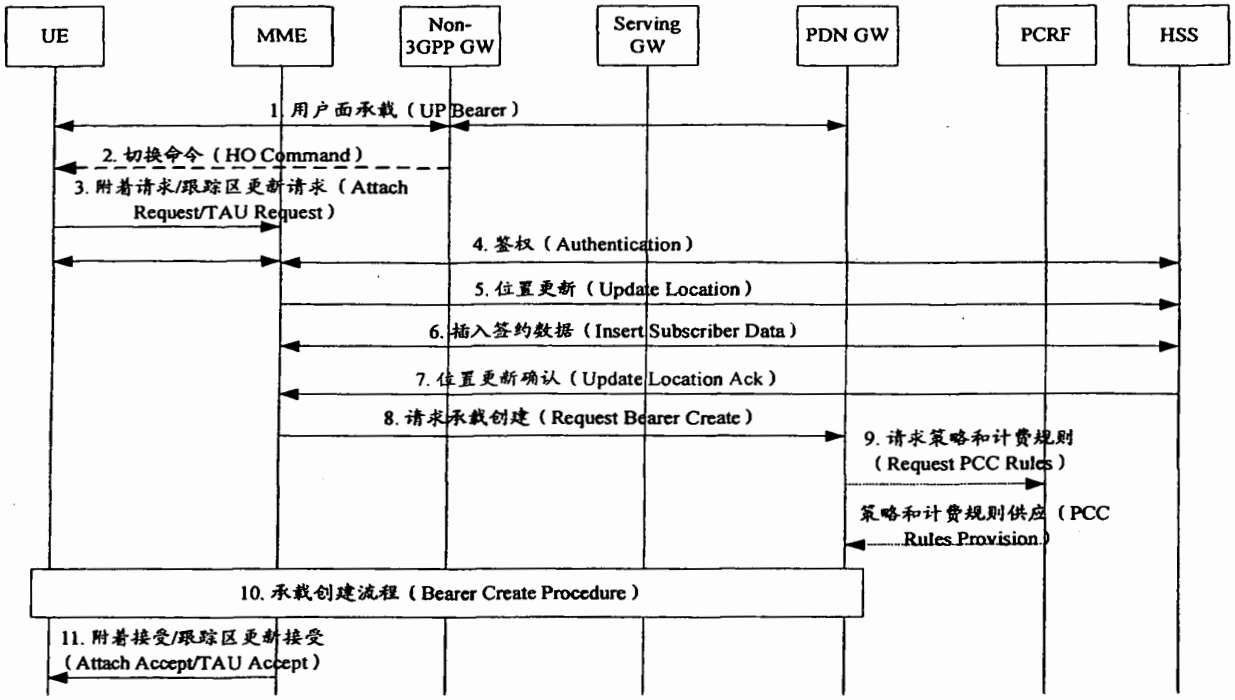
UE
MME
Non-3GPP GW
Serving GW
PDN GW
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/跟踪区更新请求（Attach Request/TAU Request）
4. 鉴权（Authentication）
5. 位置更新（Update Location）
6. 插入签约数据（Insert Subscriber Data）
7. 位置更新确认（Update Location Ack）
8. 请求承载创建（Request Bearer Create）
9. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
10. 承载创建流程（Bearer Create Procedure）
11. 附着接受/跟踪区更新接受（Attach Accept/TAU Accept）

图 2

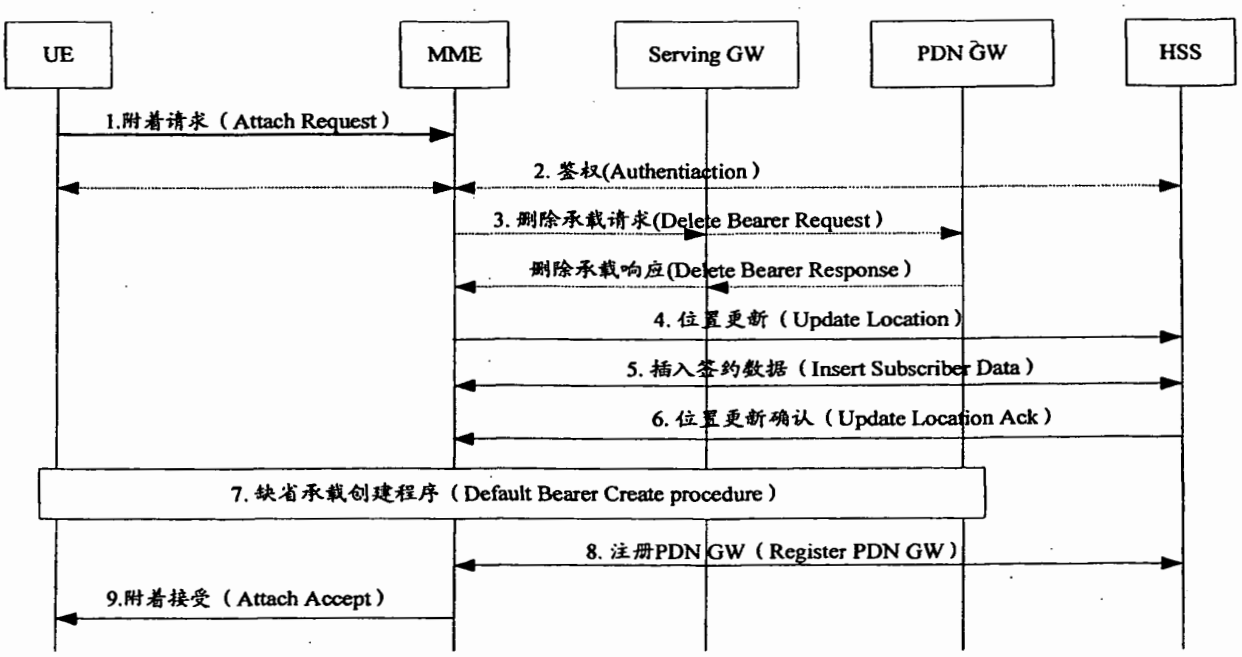
UE
MME
Serving GW
PDN GW
HSS
1.附着请求（Attach Request）
2. 鉴权(Authentiaction）
3. 删除承载请求(Delete Bearer Request）
删除承载响应(Delete Bearer Response）
4. 位置更新（Update Location）
5. 插入签约数据（Insert Subscriber Data）
6. 位置更新确认（Update Location Ack）
7. 缺省承载创建程序（Default Bearer Create procedure）
8. 注册PDN GW（Register PDN GW）
9.附着接受（Attach Accept）

图 3

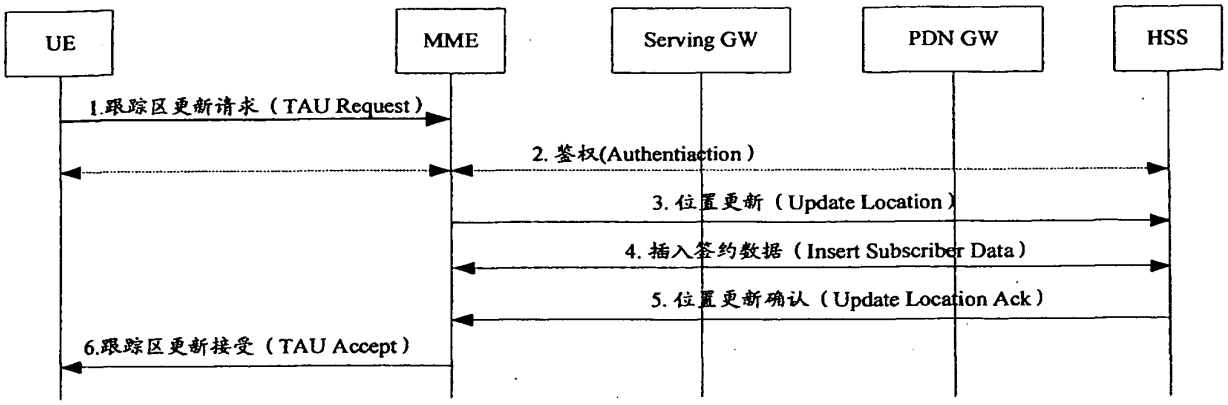
UE
MME
Serving GW
PDN GW
HSS
1.跟踪区更新请求（TAU Request）
2. 鉴权(Authentiaction）
3. 位置更新（Update Location）
4. 插入签约数据（Insert Subscriber Data）
5. 位置更新确认（Update Location Ack）
6.跟踪区更新接受（TAU Accept）

图 4

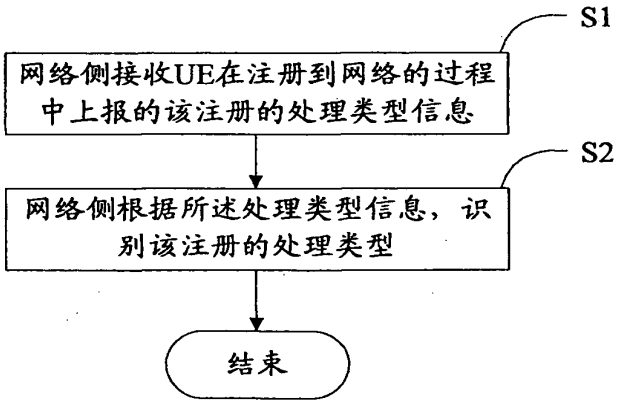
S1
网络侧接收UE在注册到网络的过程中上报的该注册的处理类型信息
S2
网络侧根据所述处理类型信息，识别该注册的处理类型
结束

图 5

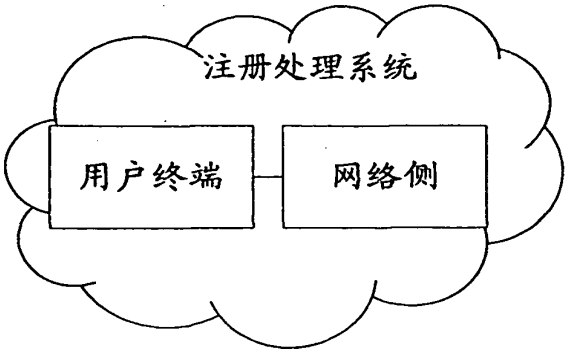
注册处理系统
用户终端
网络侧

图 6

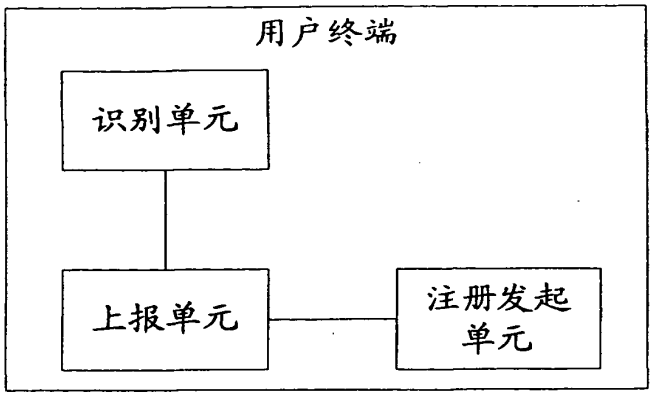

图 7

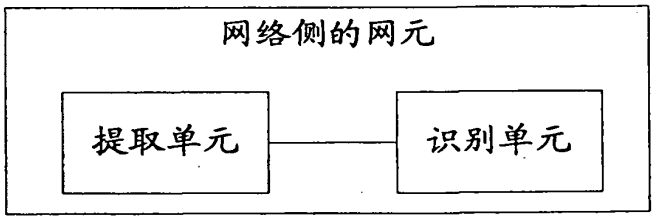

图 8

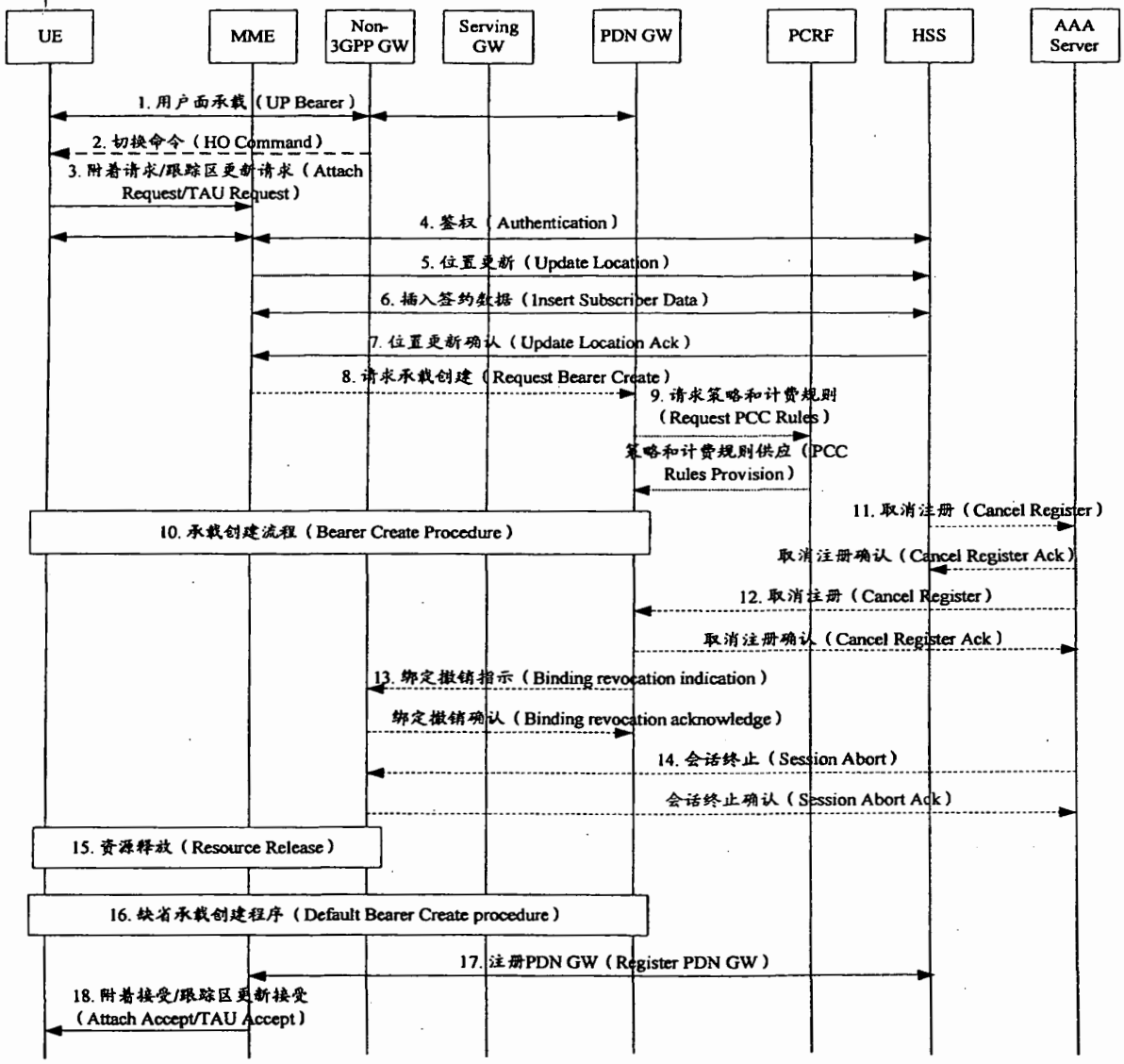
UE
MME
Non-3GPP GW
Serving GW
PDN GW
PCRF
HSS
AAA Server
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/跟踪区更新请求（Attach Request/TAU Request）
4. 鉴权（Authentication）
5. 位置更新（Update Location）
6. 插入签约数据（Insert Subscriber Data）
7. 位置更新确认（Update Location Ack）
8. 请求承载创建（Request Bearer Create）
9. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
10. 承载创建流程（Bearer Create Procedure）
11. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
12. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
13. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
14. 会话终止（Session Abort）
会话终止确认（Session Abort Ack）
15. 资源释放（Resource Release）
16. 缺省承载创建程序（Default Bearer Create procedure）
17. 注册PDN GW（Register PDN GW）
18. 附着接受/跟踪区更新接受（Attach Accept/TAU Accept）

图 9

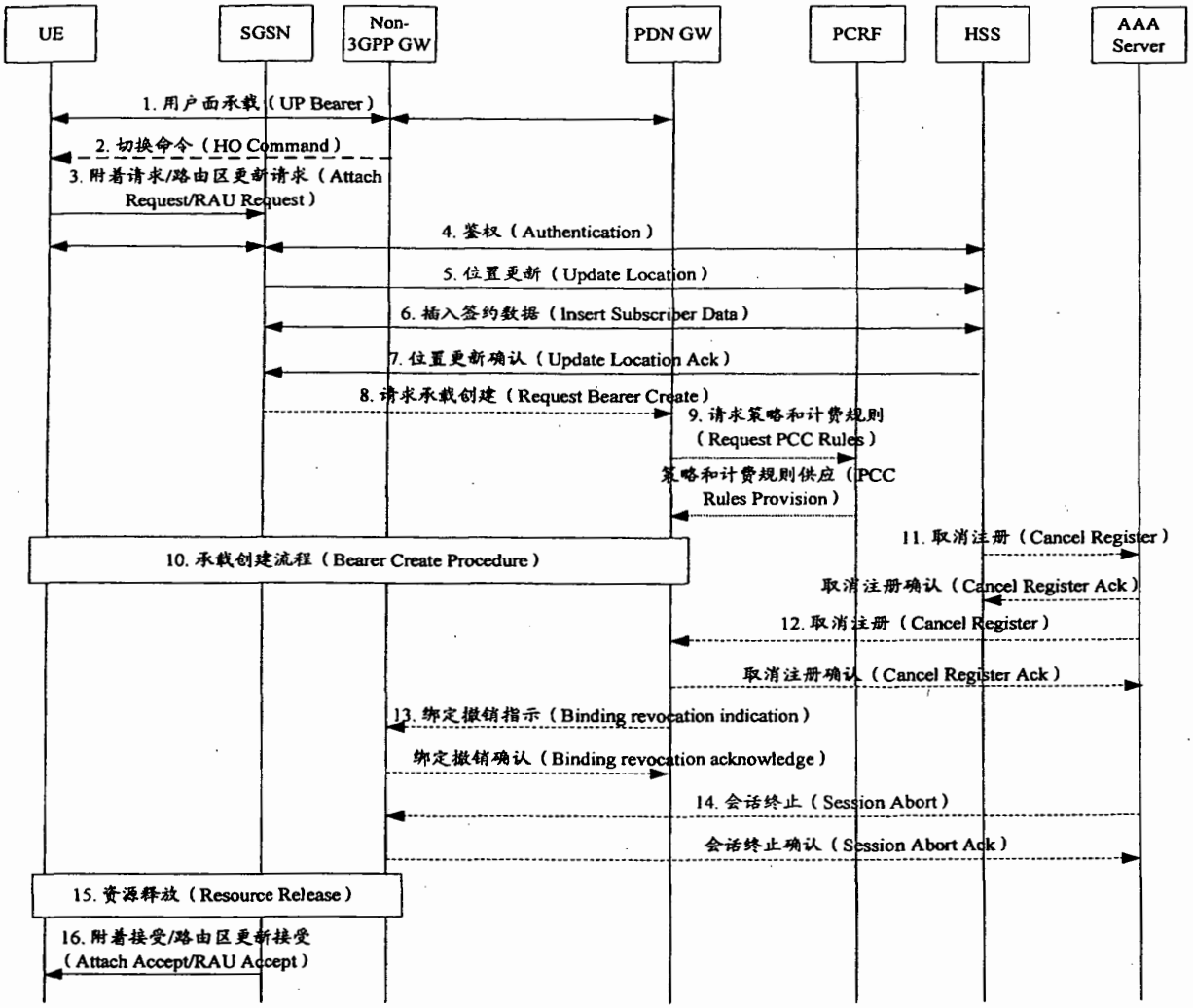
UE
SGSN
Non-3GPP GW
PDN GW
PCRF
HSS
AAA Server
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/路由区更新请求（Attach Request/RAU Request）
4. 鉴权（Authentication）
5. 位置更新（Update Location）
6. 插入签约数据（Insert Subscriber Data）
7. 位置更新确认（Update Location Ack）
8. 请求承载创建（Request Bearer Create）
9. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
10. 承载创建流程（Bearer Create Procedure）
11. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
12. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
13. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
14. 会话终止（Session Abort）
会话终止确认（Session Abort Ack）
15. 资源释放（Resource Release）
16. 附着接受/路由区更新接受（Attach Accept/RAU Accept）

图 10

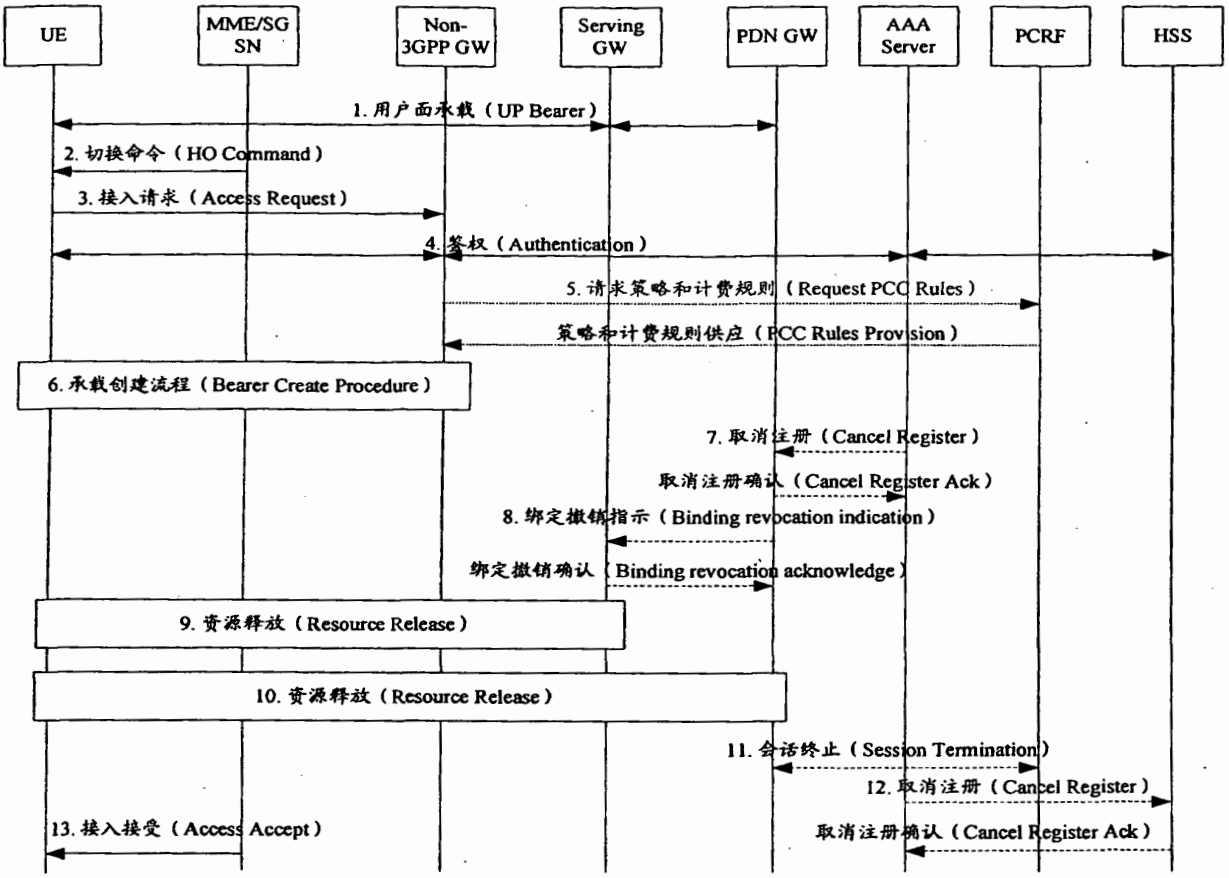
UE
MME/SG SN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
9. 资源释放（Resource Release）
10. 资源释放（Resource Release）
11. 会话终止（Session Termination）
12. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
13. 接入接受（Access Accept）

图 11

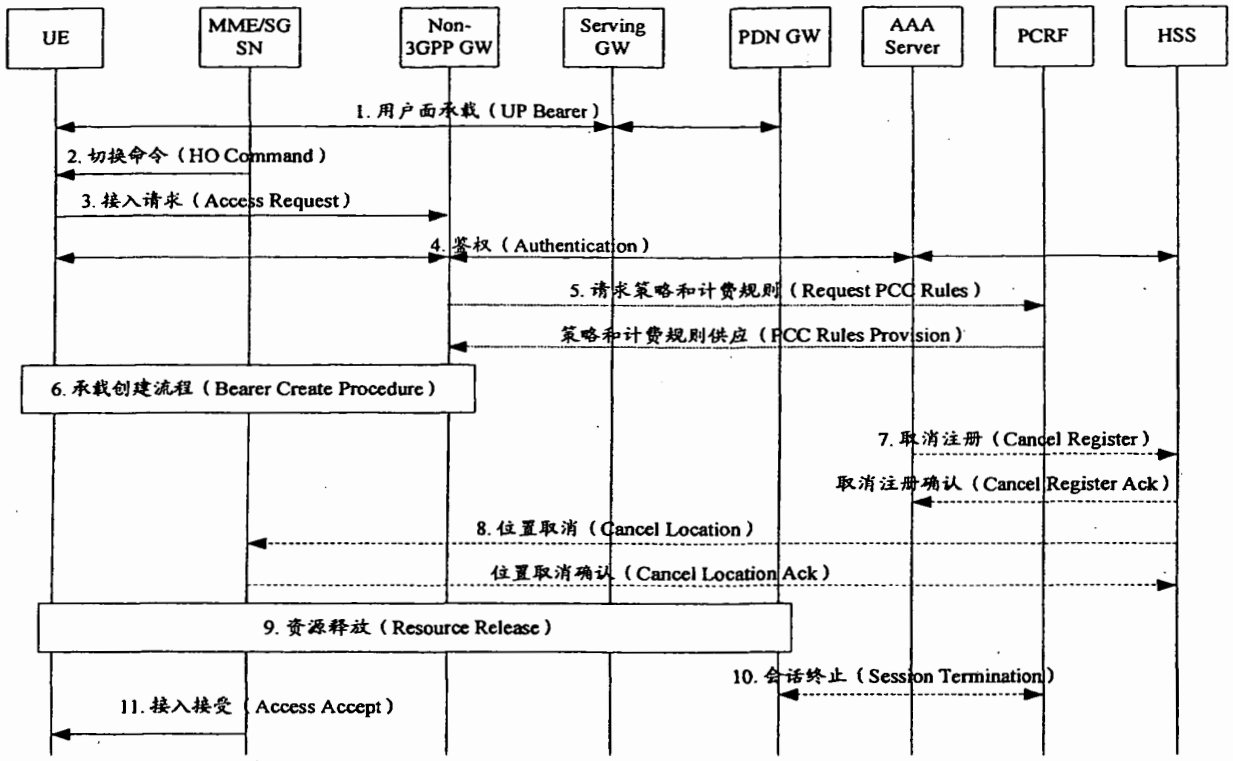
UE
MME/SG SN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 位置取消（Cancel Location）
位置取消确认（Cancel Location Ack）
9. 资源释放（Resource Release）
10. 会话终止（Session Termination）
11. 接入接受（Access Accept）

图 12

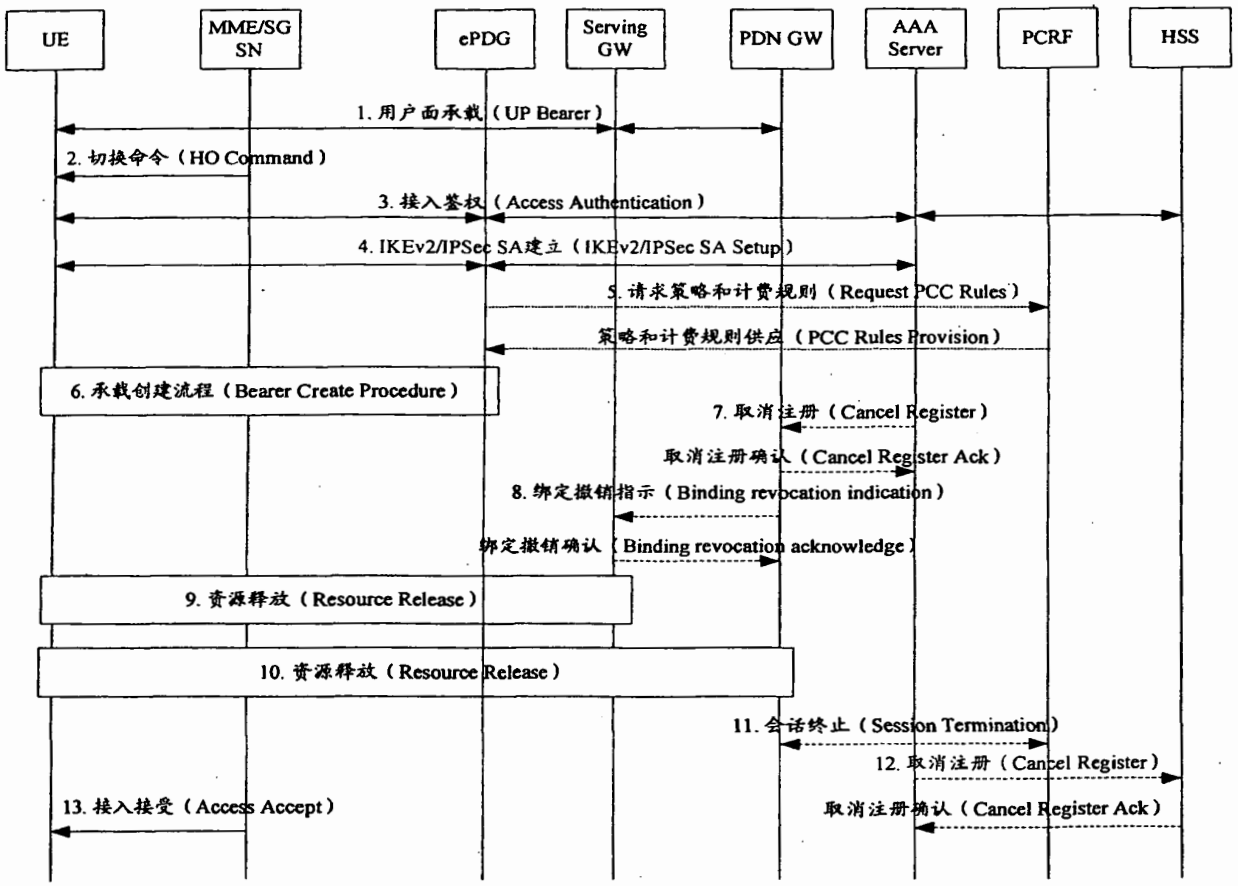
UE
MME/SG SN
ePDG
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入鉴权（Access Authentication）
4. IKEv2/IPSec SA建立（IKEv2/IPSec SA Setup）
5. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
9. 资源释放（Resource Release）
10. 资源释放（Resource Release）
11. 会话终止（Session Termination）
12. 取消注册（Cancel Register）
13. 接入接受（Access Accept）
取消注册确认（Cancel Register Ack）

图 13

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中华人民共和国国家知识产权局
STATE INTELLECTUAL PROPERTY OFFICE
OF THE PEOPLE'S REPUBLIC OF CHINA

证 明

本证明之附件是向本局提交的下列专利申请文件副本。

请　　日：2007年11月02日

请　　号：200710165540.5

请　类　别：发明专利

创造　名称：一种注册处理方法、系统及装置

请　　人：华为技术有限公司

发明设计人：吴问付

中华人民共和国
国家知识产权局局长　田力普

2010 年 11 月 26 日

权 利 要 求 书

1、一种注册处理方法，其特征在于，包括下列步骤：

网络侧接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及

网络侧根据所述处理类型信息，识别该注册的处理类型。

2、如权利要求 1 所述的方法，其特征在于，所述处理类型信息由 UE 在需要注册到网络时识别。

3、如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 上报处理类型信息的方式，包括下列之一：

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中增加指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中增加指示位信元，以表征空闲模式切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中增加指示位信元，以表征激活模式切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的跟踪区更新请求消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的跟踪区更新请求消息中增加指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的路由区更新请求消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的路由区更新请求消息中增加指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的接入请求消息

中增加信元，以携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的接入请求消息中增加指示位信元，以表征切换注册处理类型；

所述 UE 在接入鉴权或者鉴权的过程中，该 UE 在向网络侧发送的消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在接入鉴权或者鉴权的过程中，该 UE 在向网络侧发送的消息中增加指示位信元，以表征切换注册处理类型；

所述 UE 在因特网密钥交换协议版本 2IKEv2 或者 IP 网络安全协议安全联盟 IPsec SA 建立的过程中，该 UE 在向网络侧发送的消息中增加信元，以携带该注册的处理类型信息；

所述 UE 在因特网密钥交换协议版本 2 或者 IP 网络安全协议安全联盟建立的过程中，该 UE 在向网络侧发送的消息中增加指示位信元，以表征切换注册处理类型。

4、如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 在注册到网络的过程中，以向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息；或者，

所述 UE 在注册到网络的过程中，以向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息；或者，

所述 UE 在注册到网络的过程中，以向网络侧发送不同的路由区更新请求消息，分别表征对应的注册处理类型信息；或者，

所述 UE 在注册到网络的过程中，以向网络侧发送不同的接入请求消息，分别表征对应的注册处理类型信息。

5、如权利要求 1 所述的方法，其特征在于，网络侧网元在收到 UE 发送的注册处理类型信息后，将该注册处理类型信息通知给归属签约寄存器 HSS 或者 AAA Server。

6、如权利要求 5 所述的方法，其特征在于，所述网络侧网元为移动性管

理实体 MME 或服务 GPRS 支持节点 SGSN，则 HSS 收到 MME 或 SGSN 上报的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 HSS 中存在该 UE 在 non-3GPP 网络中使用的分组数据网络网关实体 PDN GW 地址信息，则 HSS 通知 AAA Server 取消该 UE 在 non-3GPP 网络的注册；

AAA Server 通知 non-3GPP 网络释放该 UE 在 non-3GPP 网络中使用的资源。

7、如权利要求 5 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，则 AAA Server 收到非 3GPP 网关设备上报的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 AAA Server 中存在该 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 PDN GW 释放该 UE 在 3GPP 网络中使用的资源。

8、如权利要求 7 所述的方法，其特征在于，AAA Server 进一步通知 HSS 取消所述 UE 在 3GPP 网络中的注册。

9、如权利要求 5 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，则 AAA Server 收到非 3GPP 网关设备上报的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 AAA Server 中存在该 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消该 UE 在 3GPP 网络中的注册；

HSS 通知 MME/SGSN 释放该 UE 在 3GPP 网络中使用的资源。

10、如权利要求 1 所述的方法，其特征在于，如果注册处理类型为激活模式下的切换注册处理类型，则创建接入网侧资源。

11、如权利要求 1 所述的方法，其特征在于，如果注册处理类型为激活模式下的切换注册处理类型，则使用预先路径切换机制。

12、一种注册处理方法，其特征在于，包括下列步骤：

网络侧接收 HSS 或者 AAA Server 上报的用户终端 UE 注册的处理类型信息；

以及

网络侧根据所述处理类型信息，识别该注册的处理类型。

13、如权利要求 12 所述的方法，其特征在于，所述的 HSS、AAA Sever 上报注册类型信息之前，HSS 或者 AAA Server 根据是否保存有 UE 使用的 PDN GW 地址信息识别 UE 的注册处理类型；

如果 HSS 或者 AAA Server 发现保存有 UE 使用的 PDN GW 地址信息则识别 UE 的注册处理类型为切换注册处理类型；或者，

如果 HSS 或者 AAA Server 发现没有保存 UE 使用的 PDN GW 地址信息则识别 UE 的注册处理类型为初始化注册处理类型。

14、如权利要求 12 所述的方法，其特征在于，所述网络侧网元为移动性管理实体 MME 或服务 GPRS 支持节点 SGSN 或非 3GPP 网关设备。

15、如权利要求 12 所述的方法，其特征在于，所述网络侧网元如果获取 UE 的注册处理类型为切换注册处理类型，则所述网络侧网元通知 PDN GW 恢复 UE 在源接入网络使用的承载资源。

16、一种注册处理系统，其特征在于，包括：

用户终端 UE，用于在注册到网络的过程中，将该注册的处理类型信息上报；

网络侧，用于根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

17、如权利要求 16 所述的系统，其特征在于，由网络侧的移动性管理实体 MME、服务 GPRS 支持节点 SGSN 或非 3GPP 网关对 UE 上报的处理类型信息进行识别。

18、一种用户终端，其特征在于，包括：

识别单元，用于在该 UE 需要发起注册时，识别该注册的类型；

注册发起单元，用于发起注册，并发出注册触发信号；

上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册

到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报。

19、如权利要求 18 所述的用户终端，其特征在于，上报单元将所述处理类型信息携带于附着请求消息中增加的信元中；或者，

将所述处理类型信息携带于跟踪区更新请求消息中增加的信元中；或者，

将所述处理类型信息携带于路由区更新请求消息中增加的信元中；或者，

将所述处理类型信息携带于接入请求消息中增加的信元中；或者，

将所述处理类型信息携带于接入鉴权或者鉴权消息中增加的信元中；或者

将所述处理类型信息携带于 IKEv2 或 IPsec SA 建立消息中增加的信元中。

20、如权利要求 18 所述的用户终端，其特征在于，所述上报单元对应不同的注册类型，向网络侧发送不同的附着请求消息；或者，

对应不同的注册类型，向网络侧发送不同的跟踪区更新请求消息；或者，

对应不同的注册类型，向网络侧发送不同的路由区更新请求消息；或者，

对应不同的注册类型，向网络侧发送不同的接入请求消息。

21、一种网络侧的网元，其特征在于，包括：

获取单元，用于获取注册过程中 UE 的注册处理类型信息；

识别单元，用于根据获取单元获取的处理类型信息，识别该注册的处理类型。

22、如权利要求 21 所述的网元，其特征在于，所述网元为移动性管理实体 MME、服务 GPRS 支持节点 SGSN 或非 3GPP 网关。

23、如权利要求 21 所述的网元，其特征在于，所述获取单元获取的处理类型信息由所述 UE、HSS 或者 AAA Server 上报。

说 明 书

一种注册处理方法、系统及装置

技术领域

本发明涉及通信领域，特别是涉及一种注册处理方法、系统及装置。

背景技术

3GPP 为了增强未来网络的竞争能力，正在研究一种全新的演进网络，其系统架构参见图 1 所示，其中包括:

演进的 UMTS 陆地无线接入网(E-UTRAN, Evolved UMTS Terrestrial Radio Access Network)，用于实现所有与演进网络无线有关的功能。

移动性管理实体（MME，Mobility Management Entity），负责控制面的移动性管理，包括用户上下文和移动状态管理，分配用户临时身份标识等。

服务网关实体（Serving GW，Serving Gateway），是 3GPP 接入系统间的用户面锚点，终止 E-TURAN 的接口。

分组数据网络网关实体(PDN GW, Packet Data Network Gateway)是 3GPP 接入系统和非 3GPP 接入系统之间的用户面锚点，终止和外部分组数据网络（PDN，Packet Data Network）的接口。

策略和计费规则功能实体（PCRF，Policy and Charging Rule Function），用于策略控制决定和流计费控制功能。

归属网络服务器（HSS，Home Subscriber Server）用于存储用户签约信息。

UMTS 陆地无线接入网（UTRAN，UMTS Terrestrial Radio Access Network）、GSM/EDGE 无线接入网（GERAN，GSM/EDGE Radio Access Network），用于实现所有与现有 GPRS/UMTS 网络中无线有关的功能。

服务通用分组无线业务支持节点(SGSN, Serving GPRS Supporting Node)，用于实现 GPRS/UMTS 网络中路由转发、移动性管理、会话管理以及用户信息

存储等功能。

非 3GPP IP 接入系统（Non-3GPP IP Access），主要是一些非 3GPP 组织定义的接入网络，如无线局域网（WLAN，Wireless Local Area Network），微波存取全球互通（Wimax， Worldwide Interoperability for Microwave Access）等网络。

认证、授权与计费服务器（AAA Server，Authentication，Authorization and Accounting Server）用于对用户设备（UE, User Equipment）执行接入认证、授权和计费功能。

说明：这个架构并不意味着最终的 SAE 系统架构，最后的架构可能和这个架构有所差别，本专利不作限制。

上述演进网络的一个需求是实现 3GPP 的接入系统（GERAN/UTRAN/E-UTRAN）和 Non-3GPP 接入系统（如 WLAN/Wimax 等）之间的切换（Handover）。在目前的协议中规定，切换流程是通过 UE 在新接入系统中的附着（Attach）或者跟踪区更新（TAU）流程来实现的。参见图 2 所示，用户终端从 Non-3GPP 接入系统到 3GPP 接入系统的切换流程包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到演进网络。或者 UE 发现演进网络并且决定切换到演进网络。

3、UE 发送附着请求或者跟踪区更新请求消息到 MME。

4、UE、MME、HSS 之间执行鉴权流程。HSS 可以在这个步骤中将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

5、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

6、HSS 将用户的签约数据插入到 MME 中。

7、HSS 返回位置更新确认消息给 MME。HSS 可以在这个步骤中将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

8、MME 发送请求承载创建消息到获取的 PDN GW，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。

9、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。

11、MME 发送附着接受或者跟踪区更新接受消息到 UE。

参见图 3 所示，在目前的协议中规定，用户终端正常附着（也可称之为初始附着 Initial Attach）到 3GPP 接入系统的流程包括下列步骤：

1、UE 发送附着请求消息到 MME。

2、UE、MME、HSS 之间执行鉴权流程。

3、如果用户存在已经创建的承载，则 MME 发起删除承载流程，将用户以前建立的承载删除掉。

4、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

5、HSS 将用户的签约数据插入到 MME 中。

6、HSS 返回位置更新确认消息给 MME。

7、MME 发起缺省承载创建程序，创建 UE 和 PDN GW 之间的缺省承载。

8、MME 注册 UE 使用的 PDN GW 地址信息到 HSS。这个处理也可以通过位置更新流程来处理，MME 发送位置更新消息给 HSS，消息中携带 PDN GW 地址信息。

9、MME 发送附着接受消息给 UE。

参见图 4 所示，在目前的协议中规定，用户终端正常跟踪区更新（也可称之为初始跟踪区更新 Initial TAU）到 3GPP 接入系统的流程包括下列步骤：

1、UE 发送跟踪区更新请求消息到 MME。

2、UE、MME、HSS 之间执行鉴权流程。

3、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

4、HSS 将用户的签约数据插入到 MME 中。

5、HSS 返回位置更新确认消息给 MME。

6、MME 接受 UE 的跟踪区更新请求，并发送跟踪区更新接受消息到 UE。

发明人在发明过程中发现，切换导致的 Attach/TAU 流程和正常 Attach/TAU 流程处理机制存在很大的不同：正常的 Attach 流程网络侧需要将用户以前建立的承载都删除掉，建立 UE 和 PDN GW 之间的缺省承载并且将 UE 使用的 PDN GW 地址信息注册到 HSS，而切换导致的 Attach 流程网络侧需将用户以前建立的承载都重新创建出来。正常的 TAU 流程网络侧不处理用户的承载，而切换导致的 TAU 流程网络侧需将用户以前建立的承载都重新创建出来。所以需要一种机制对不同的 Attach/TAU 流程进行处理。

正常的 3GPP 和 non-3GPP 之间的切换由于先将 UE 从源接入网络断开，然后 UE 再从目标接入网络通过 Attach 等流程接入，导致 UE 业务中断的时间比较长，影响用户的业务体验。所以现在 E-UTRAN 和 CDMA 网络中的 HRPD（High Rate Packet Data，高速分组数据）接入网络之间切换提出了一种优化切换机制。图 5 为 E-UTRAN 和 HRPD 网络优化切换的系统架构图。MME 和 HRPD AN（HRPD Access Network，HRPD 接入网络，处理 HRPD 网络中的移动性管理，无线资源管理等）之间增加 S101 接口，传递 MME 和 HRPD AN 之间的信令。PDSN（Packet Data Serving Node，分组数据服务节点）是 HRPD 网络中的一个用户面处理网元，进行 HRPD 网络的用户面处理。

现在 HRPD 网络和 E-UTRAN 网络之间的优化切换提出了一种预先路径切换（Early path switch）机制，即 UE 还未切换到目标接入网络（UE 还在源接入网络）时先将用户面路径切换到目标接入网络。

用户终端从 HRPD 到 E-UTRAN 网络的预先路径切换的优化切换流程包括下列步骤：

1、UE 在 HRPD 网络接入。

2、UE 或者 HRPD AN（Access Network，接入网络）决定执行切换到 E-UTRAN 网络。

3、UE 通过 HRPD 网络发送 Attach Request 消息到 MME。

4、鉴权程序被执行。

5、MME 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

6、MME 选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。

7、Serving GW 发起预先路径切换流程。Serving GW 和 PDN GW 之间的接口协议为 PMIP，则 Serving GW 发送 Proxy BU 消息到 PDN GW。

PDN GW 收到上述消息后切换用户面的路由到 Serving GW，即 PDN GW 收到下行数据后将发给 Serving GW。同时 PDN GW 不再向 PDSN 发送下行数据包。

8、Serving GW 回 Create Default Bearer Response 消息给 MME。

9、MME 发送 Relocation Request 消息到 eNodeB 请求 eNodeB 建立接入网侧资源。eNodeB 完成接入网侧资源的创建后回 Relocation Request Acknowledge 消息给 MME。

10、MME 发送 Update Bearer Request 消息到 Serving GW 更新 Serving GW 的下行用户面路径到 eNodeB。Serving GW 回 Update Bearer Response 消息到 MME。

11、MME 发送 S101 HO Command 消息到 HRPD AN，消息中包含 Attach Accept 消息和 HO Command 消息。

12、HRPD AN 发送 HRPD AN L2 消息到 UE，消息中包含 Attach Accept 消息和 HO Command 消息。

13、UE 切换到 E-UTRAN 网络，发送 HO Complete 消息到 eNodeB。

14、eNodeB 发送 Relocation Complete 消息给 MME，通知 MME UE 已经

切换到 E-UTRAN 网络。发明人在发明过程中发现，对于 HRPD 网络到 E-UTRAN 网络切换来说，UE 可能在两种状态下发生切换：空闲状态和激活状态。当 UE 在激活状态下发生切换时在切换的流程中通知接入网建立接入网侧的承载可以加快 UE 切换到目标接入网络后业务恢复的时间。但是在空闲状态下 UE 并没有业务在运行，对切换的时延要求也不是很高，同时 UE 在空闲状态下建立接入网侧的承载会浪费接入网侧的资源。而且预先切换机制，当 UE 切换失败时还需要通知 PDN GW 将下行路径切回源接入网络。所以预先切换机制会增加系统的复杂性。

所以为了优化网络的处理和节省接入网的资源，需要一种机制对激活状态和空闲状态的切换流程进行区分处理。

发明内容

本发明实施例提供一种注册处理方法、系统及装置，以使网络侧可区分不同的注册处理类型。

本发明实施例的一种注册处理方法包括：网络侧接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例的另一种注册处理方法，包括下列步骤：网络侧接收 HSS 或者 AAA Server 上报的用户终端 UE 注册的处理类型信息；以及网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例的系统，包括：用户终端 UE，用于在注册到网络的过程中，将该注册的处理类型信息上报；网络侧，用于根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

本发明实施例的用户终端，包括：识别单元，用于在该 UE 需要发起注册时，识别该注册的类型；注册发起单元，用于发起注册，并发出注册触发信号；上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网

络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报。

本发明实施例的网络侧的网元，包括：获取单元，用于获取 UE 在注册到网络的过程中上报的处理类型信息；识别单元，用于根据获取单元获取的处理类型信息，识别该注册的处理类型。

本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

附图说明

图 1 为现有演进网络的系统架构示意图；

图 2 为现有用户终端从 Non-3GPP 接入系统到 3GPP 接入系统的切换流程图；

图 3 为现有用户终端正常附着到 3GPP 接入系统的流程图；

图 4 为现有用户终端正常跟踪区更新到 3GPP 接入系统的流程图；

图 5 为现有 HRPD 和 E-UTRAN 接入系统的优化切换系统架构示意图；

图 6 为本发明实施例 6 的流程图；

图 7 为本发明实施例的方法步骤流程图；

图 8 为本发明实施例的系统的结构示意图；

图 9 为本发明实施例的用户终端的结构示意图；

图 10 为本发明实施例的网络侧网元的结构示意图；

图 11 为本发明实施例 1 的流程图；

图 12 为本发明实施例 2 的流程图；

图 13 为本发明实施例 3 的流程图；

图 14 为本发明实施例 4 的流程图；

图 15 为本发明实施例 5 的流程图；

图 16 为本发明实施例 7 的流程图；

图 17 为本发明实施例 8 的流程图。

具体实施方式

为了使网络侧可区分不同的注册处理类型。

本发明实施例提供了一种注册处理方法，参见图 7 所示，包括下列主要步骤：

S1、网络侧接收 UE 在注册到网络的过程中上报的该注册的处理类型信息。

本步骤之前，UE 在需要注册到网络时，可先识别该注册的类型。当 UE 注册到网络的过程中，将识别出的该注册类型对应的处理类型信息上报给网络侧。

S2、网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例还提供了另一种注册处理方法，包括下列主要步骤：网络侧接收 HSS 或者 AAA Server 上报的用户终端 UE 注册的处理类型信息；网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例还提供了一种注册处理系统，参见图 8 所示，其包括：用户终端和网络侧。

UE，用于在注册到网络的过程中，将该注册的处理类型信息上报。

网络侧，用于根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。具体的，由网络侧的移动性管理实体 MME（演进网络）、服务 GPRS 支持节点 SGSN（2G/3G 网络）或非 3GPP 网关（非 3GPP 网络）对 UE 上报的处理类型信息进行识别。

本发明实施例还提供了一种用户终端，参见图 9 所示，其包括：识别单元、注册发起单元和上报单元。

识别单元，用于在该 UE 需要发起注册时，识别该注册的类型。

注册发起单元，用于发起注册，并发出注册触发信号。

上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报，

上报的方式包括但不限于以下几种:

上报单元将处理类型信息携带于附着请求消息中增加的信元中; 或者, 将处理类型信息携带于跟踪区更新请求消息中增加的信元中; 或者, 将处理类型信息携带于路由区更新请求消息中增加的信元中; 或者, 将处理类型信息携带于接入请求消息中增加的信元中; 或者, 将处理类型信息携带于接入鉴权或者鉴权消息中增加的信元中; 或者将处理类型信息携带于 IKEv2 或 IPsec SA 建立消息中增加的信元中。

或者, 所述上报单元对应不同的注册类型, 向网络侧发送不同的附着请求消息; 或者, 对应不同的注册类型, 向网络侧发送不同的跟踪区更新请求消息; 或者, 对应不同的注册类型, 向网络侧发送不同的路由区更新请求消息; 或者, 对应不同的注册类型, 向网络侧发送不同的接入请求消息。

本发明实施例还提供了一种网络侧的网元, 具体的, 该网元为移动性管理实体 MME(演进网络)、服务 GPRS 支持节点 SGSN(2G/3G 网络)或非 3GPP 网关(非 3GPP 网络), 参见图 10 所示, 其包括: 获取单元和识别单元。

获取单元, 用于获取注册的过程中 UE 的注册处理类型信息。具体的, 获取的处理类型信息由所述 UE、HSS 或者 AAA Server 上报。

识别单元, 用于根据获取单元获取的处理类型信息, 识别该注册的处理类型。

以下通过 5 个实施例具体描述。

实施例 1: UE 在发送注册请求消息到 MME 时, 将该注册的处理类型信息上报给 MME, MME 据此识别该注册的处理类型; 进一步根据该注册的处理类型进行相应的处理, 完成注册。MME 上报注册的处理类型给 HSS。对于切换导致的注册, 网络侧发起承载建立流程, 将 UE 在源 non-3GPP 网络中使用的资源在 3GPP 网络中建立; 对于初始化注册, 如果 HSS 中保存 UE 在 non-3GPP 网络中使用的 PDN GW 地址信息, 则 HSS 通知 AAA Server 取消 UE 在 non-3GPP 网络中的注册, AAA Server 通知 non-3GPP 网络释放 UE 使用的资源。

参见图 11 所示，包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到演进网络。或者 UE 发现演进网络并决定发起切换。

3、UE 在发起注册到演进网络之前，识别该注册的类型；之后发送注册请求消息到 MME，并相应将该注册的处理类型信息上报给 MME。

其中，可以通过如下方式之一上报：

1）在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。或者 UE 在附着请求消息中增加指示位，表明该附着请求消息是切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为 “Handover Attach”。

2）定义新的消息。例如：定义新的切换附着请求消息（Handover Attach Request），该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息），这样 UE 可向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常附着请求的消息（或者称之为初始附着请求的消息），原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附着请求消息（或者称之为初始附着请求消息）都重新定义）

3）在跟踪区更新请求消息中增加 Update Type 信元。例如：该 Update Type 信元有如下两个取值：0 对应 Normal TAU（也可称之为 Initial TAU），表明该

跟踪区更新请求消息是正常的跟踪区更新请求消息（也可称之为初始的跟踪区更新请求消息）；1 对应 Handover TAU，表明该跟踪区更新请求消息是切换导致的跟踪区更新请求消息。或者 UE 在跟踪区更新请求消息中增加指示位表明该跟踪区更新请求消息是切换导致的跟踪区更新请求消息，而原有的跟踪区更新请求消息表明一个正常的跟踪区更新请求消息（或者称之为初始的跟踪区更新请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “TAU due to Handover”。

c) Update Type 信元。UE 将该信元设置为 “Handover TAU”。

4）定义新的消息。例如：定义新的切换跟踪区更新请求消息（Handover TAU Request），该消息表明一个切换导致的跟踪区更新请求消息，而原有的跟踪区更新请求消息表明一个正常的跟踪区更新请求消息（或者称之为初始的跟踪区更新请求消息），这样 UE 可向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常的跟踪区更新请求（或者称之为初始的跟踪区更新请求）的消息，原有的跟踪区更新请求消息对应切换导致的跟踪区更新请求消息；或者切换导致的跟踪区更新请求消息和正常跟踪区更新请求（或者称之为初始跟踪区更新请求）消息都重新定义）

4、UE、MME、HSS 之间执行鉴权流程，获取用户使用的 PDN GW 地址信息。MME 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。如果注册处理类型为切换处理类型，则 HSS 可以将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

5、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。MME 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。

6、HSS 将用户的签约数据插入到 MME 中。

7、HSS 返回位置更新确认消息给 MME。HSS 可以在这个步骤中将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

如果 UE 的注册过程中由 HSS 识别 UE 的注册处理类型（如 HSS 发现保存有用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息，则 HSS 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，HSS 认为 UE 的注册处理类型为正常的注册处理类型），则 HSS 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给 MME。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 HSS 增加切换指示位信元（Handover Indication）。对于正常的注册处理类型，HSS 不携带这个信元。

b) Cause 信元。对于切换导致的注册处理，HSS 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，HSS 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带这个 Cause 信元。

c) Update Type 信元。对于切换导致的注册处理，HSS 将该信元设置为“Handover Attach”。对于正常注册处理，HSS 将该信元设置为“Initial Attach”或者不携带这个信元。

8、MME 根据 UE 上报或者 HSS 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，MME 已区分了不同的注册处理类型。

进一步，如果处理类型为正常发起的注册，则 MME 按照正常的注册流程处理。步骤 11 至 18 将被执行。

如果处理类型为切换导致的注册，则 MME 发送请求承载创建消息到获取的 PDN GW 的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。并转入步骤 9。

9、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。并转入步

骤 18。

11、如果 UE 的注册处理类型为正常发起的注册，且 HSS 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 non-3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 AAA Server 注册到 HSS，则 HSS 发送取消注册消息到 AAA Server 请求取消 UE 在 non-3GPP 接入网络中的注册。AAA Server 回取消注册确认消息到 HSS。

12、AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 non-3GPP 接入网络中的注册。PDN GW 回取消注册确认消息到 AAA Server。

13、如果 PDN GW 和 non-3GPP 网关设备之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 non-3GPP 网关设备，取消 non-3GPP 网关设备和 PDN GW 之间的 PMIP 绑定。non-3GPP 网关设备回绑定撤销确认消息到 PDN GW。

14、AAA Server 也可以发送会话终止消息到 non-3GPP 网关设备。non-3GPP 网关设备回会话终止确认消息到 AAA Server。

15、non-3GPP 网关设备收到绑定取消指示消息或者会话终止消息后发起资源释放程序，释放 UE 在 non-3GPP 接入网络中使用的资源。

16、如果 UE 的注册处理类型为正常发起的注册，则 MME 发起缺省承载创建程序，创建 UE 和 PDN GW 之间的缺省承载。

17、MME 注册 UE 使用的 PDN GW 地址信息到 HSS。这个处理也可以通过位置更新流程来处理，MME 发送位置更新消息给 HSS，消息中携带 PDN GW 地址信息。

18、MME 回附着接受或者跟踪区更新接受消息到 UE。

实施例 2：这种机制也能应用到 2G/3G 系统。UE 在发送注册请求消息到 SGSN 时，将该注册的处理类型信息上报给 SGSN，SGSN 据此识别该注册的处理类型；进一步根据该注册的处理类型进行相应的处理，完成注册。SGSN 上报注册的处理类型给 HSS。对于切换导致的注册，网络侧发起承载建立流程，

将 UE 在源 non-3GPP 网络中使用的资源在 3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 non-3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 non-3GPP 网络中的注册，AAA Server 通知 non-3GPP 网络释放 UE 使用的资源。参见图 12 所示，包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到 2G 或者 3G 网络。或者 UE 发现 2G 或者 3G 网络并决定发起切换。

3、UE 在发起注册到 2G 或者 3G 网络之前，识别该注册的类型；之后发送注册请求消息到 SGSN，并相应将该注册的处理类型信息上报给 SGSN。

其中，可以通过如下方式之一上报：

1）在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。或者 UE 在附着请求消息中增加指示位表明该附着请求消息是切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为 “Handover Attach”。

2）定义新的消息。例如：定义新的切换附着请求消息（Handover Attach Request），该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求（或者称之为初始的附着请求）消息，这样 UE 可向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常附着请求（或者称之为初始附着请求）的消息，原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附

着请求（或者称之为初始附着请求）消息都重新定义）

3）在路由区更新请求消息中增加 Update Type 信元。例如：该 Update Type 信元有如下两个取值：0 对应 Normal RAU（也可称之为 Initial RAU），表明该路由区更新请求消息是正常的路由区更新请求消息（也可称之为初始的路由区更新请求消息）；1 对应 Handover RAU，表明该路由区更新请求消息是切换导致的路由区更新请求消息。或者 UE 在路由区更新请求消息中增加指示位表明该路由区更新请求消息是切换导致的路由区更新请求消息，而原有的路由区更新请求消息表明一个正常的路由区更新请求消息（或者称之为初始的路由区更新请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “RAU due to Handover”。

c) Update Type 信元。UE 将该信元设置为 “Handover RAU”。

4）定义新的消息。例如：定义新的切换路由区更新请求消息（Handover RAU Request），该消息表明一个切换导致的路由区更新请求消息，而原有的路由区更新请求消息表明一个正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，这样 UE 可向网络侧发送不同的路由区更新请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，原有的路由区更新请求消息对应切换导致的路由区更新请求消息；或者切换导致的路由区更新请求消息和正常路由区更新请求（或者称之为初始路由区更新请求）消息都重新定义）

4、UE、SGSN、HSS 之间执行鉴权流程。SGSN 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。如果注册处理类型为切换处理类型，则 HSS 可以将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 SGSN。

5、SGSN 发送位置更新消息给 HSS，注册 SGSN 的地址信息到 HSS。SGSN 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。

6、HSS 将用户的签约数据插入到 SGSN 中。

7、HSS 返回位置更新确认消息给 SGSN。HSS 可以在这个步骤中将用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 SGSN。如果 UE 的注册过程中由 HSS 识别 UE 的注册处理类型（如 HSS 发现保存有用户在 non-3GPP 接入网络中使用的 PDN GW 地址信息，则 HSS 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，HSS 认为 UE 的注册处理类型为正常的注册处理类型），则 HSS 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给 SGSN。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 HSS 增加切换指示位信元（Handover Indication）。对于正常的注册处理类型，HSS 不携带这个信元。

b) Cause 信元。对于切换导致的注册处理，HSS 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，HSS 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带这个 Cause 信元。

c) Update Type 信元。对于切换导致的注册处理，HSS 将该信元设置为“Handover Attach”。对于正常注册处理，HSS 将该信元设置为“Initial Attach”或者不携带这个信元。

8、SGSN 根据 UE 上报或者 HSS 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，SGSN 已区分了不同的注册处理类型。

进一步，如果处理类型为正常发起的注册，则 SGSN 按照正常的流程处理，步骤 11 至 16 将被执行。

如果处理类型为切换导致的注册，则 SGSN 发送请求承载创建消息到获取的 PDN GW（也就是现在的 GGSN）的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。并转入步骤 9。

9、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW

发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 16。

步骤 11 至步骤 15 同实施例 1 中的处理。这里不再描述。

16、SGSN 回附着接受或者路由区更新接受消息到 UE。

实施例 3：这种机制也能应用到可信（Trusted）的 non-3GPP 系统。UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，同时 AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 13 所示，包括下列步骤：

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

2、MME 或者 SGSN 发送切换命令到 UE 通知 UE 切换到 Non-3GPP 网络。或者 UE 发现 Non-3GPP 网络并决定发起切换。

3、UE 在发起注册到 Non-3GPP 网络之前，识别该注册的类型；之后发送接入请求消息到非 3GPP 网关设备，并相应将该注册的处理类型信息上报给非 3GPP 网关设备。

其中，可以通过如下方式之一上报：

1）在接入请求消息中增加 Access Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应

Handover Access，表明该接入请求消息是切换导致的接入请求消息。或者 UE 在接入请求消息中增加指示位表明该接入请求消息是切换导致的接入请求消息，而原有的接入请求消息表明一个正常的接入请求消息（或者称之为初始的接入请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Access due to Handover”。

c) Access Type 信元。UE 将该信元设置为 “Handover Access”。

2）定义新的消息。例如：定义新的切换接入请求消息（Handover Access Request），该消息表明一个切换导致的接入请求消息，而原有的接入请求消息表明一个正常的接入请求（或者称之为初始的接入请求）消息，这样 UE 可向网络侧发送不同的接入请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常接入请求（或者称之为初始接入请求）消息，原有的接入请求消息对应切换导致的接入请求消息；或者切换导致的接入请求消息和正常接入请求（或者称之为初始接入请求）消息都重新定义）

4、UE、非 3GPP 网关、AAA Server、HSS 之间执行鉴权流程。UE 也可以在这个步骤中将 UE 的注册处理类型上报给非 3GPP 网关。UE 在鉴权流程的消息中携带 Access Type 信元。例如：该 Access Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。

或者 UE 在鉴权流程的消息中携带 Attach Type 信元。例如：该 Atatch Type 信元有如下两个取值：0 对应 Normal Attach（或者称之为 Initial Attach），表明该 UE 的注册处理类型是正常的注册（或者称之为初始的注册）；1 对应 Handover Attach，表明该 UE 的注册处理类型是切换导致的注册。

或者 UE 在鉴权流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的鉴权流程的消息表明一个正常的注册（或者称之为初

始的注册)。指示位可能的方法有:

a) 切换指示位信元(Handover Indication)。

b) Cause 信元。UE 将该 Cause 信元设置为 "Attach due to Handover"。

c) Attach Type 信元。UE 将该信元设置为 "Handover Attach"。

非 3GPP 网关在这个步骤中将 UE 的注册处理类型上报给 AAA Server。

如果 UE 的注册过程中由 AAA Server 识别 UE 的注册处理类型(如 AAA Server 发现保存有用户在 3GPP 接入网络中使用的 PDN GW 地址信息,则 AAA Server 认为 UE 的注册处理类型为切换导致的注册处理类型;否则,AAA Server 认为 UE 的注册处理类型为正常的注册处理类型),则 AAA Server 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给非 3GPP 网关。指示位可能的方法有:

a) 如果 UE 的注册处理类型为切换导致的注册,则 AAA Server 增加切换指示位信元(Handover Indication)。对于正常的注册处理类型,AAA Server 不携带这个信元。

b) Cause 信元。对于切换导致的注册处理,AAA Server 将该 Cause 信元设置为 "Update due to Handover Attach"。对于正常注册处理,AAA Server 将该 Cause 信元设置为 "Update due to Initial Attach" 或者不携带这个 Cause 信元。

c) Update Type 信元。对于切换导致的注册处理,AAA Server 将该信元设置为 "Handover Attach"。对于正常注册处理,AAA Server 将该信元设置为 "Initial Attach" 或者不携带这个信元。

5、非 3GPP 网关设备根据 UE 上报的该注册的处理类型信息,识别该注册的处理类型。

至此,非 3GPP 网关设备已区分了不同的注册处理类型。

进一步,如果处理类型为正常的接入,则非 3GPP 网关设备按照正常的接入流程处理。步骤 7 到 13 将被执行。

如果处理类型为切换导致的接入，则非 3GPP 网关设备发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到非 3GPP 网关设备。并转入步骤 6。

6、非 3GPP 网关发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 13。

7、 如果 UE 的注册处理类型为正常发起的注册，且 AAA Server 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 HSS 注册到 AAA Server，则 AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 3GPP 接入网络中的注册。PDN GW 回取消注册确认消息到 AAA Server。

8、如果 PDN GW 和 Serving GW 之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 Serving GW，取消 Serving GW 网关设备和 PDN GW 之间的 PMIP 绑定。Serving GW 回绑定取消确认消息给 PDN GW。

9、如果 Serving GW 收到绑定取消指示消息，则 Serving GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

10、如果 PDN GW 和 Serving GW 之间的接口协议为 GTP 协议，则 PDN GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

11、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

12、AAA Server 发送取消注册消息到 HSS，取消 UE 在 HSS 中的注册。HSS 回取消注册确认消息到 AAA Server。

13、非 3GPP 网关回接入接受消息到 UE。

实施例 4：这种机制也能应用到可信（Trusted）的 non-3GPP 系统。UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上

报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，HSS 通知 MME/SGSN 释放 UE 在 3GPP 网络中使用的资源。参见图 14 所示，包括下列步骤：

步骤 1 至 6 同实施例 3 中的处理。

7、 如果 UE 的注册处理类型为正常发起的注册，且 AAA Server 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 HSS 注册到 AAA Server，则 AAA Server 发送取消注册消息到 HSS，取消 UE 在 HSS 中的注册。HSS 回取消注册确认消息到 AAA Server。

8、HSS 发送位置取消消息到 MME/SGSN。MME/SGSN 回位置取消确认消息到 HSS。

9、MME/SGSN 分离 UE，释放 UE 在 3GPP 接入网络中使用的资源。

10、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

11、非 3GPP 网关回接入接受消息到 UE。

实施例 5：这种机制也能应用到非可信（Untrusted）的 non-3GPP 系统。UE 在发送接入鉴权请求或者 IKEv2/IPSec SA（Internet Key Exchange Protocol Version 2/IP Security Protocol Security Association，因特网密钥交换协议版本 2/IP 网络安全协议安全联盟）建立请求消息到演进分组数据网关（一种非 3GPP 网关）ePDG（Evolved Packet data Gateway）时，将该注册的处理类型信息上报给 ePDG，ePDG 据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。ePDG 上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络

侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，同时 AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 15 所示，包括下列步骤：

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

2、MME 或者 SGSN 发送切换命令到 UE 通知 UE 切换到 Non-3GPP 网络。或者 UE 发现 Non-3GPP 网络并决定发起切换。

3、UE、ePDG、AAA Server、HSS 之间执行接入鉴权流程。UE 可以在这个步骤中将 UE 的注册处理类型上报给 ePDG。UE 在接入鉴权流程的消息中携带 Access Type 信元。例如：该 Access Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。

或者 UE 在接入鉴权流程的消息中携带 Attach Type 信元。例如：该 Atatch Type 信元有如下两个取值：0 对应 Normal Attach（或者称之为 Initial Attach），表明该 UE 的注册处理类型是正常的注册（或者称之为初始的注册）；1 对应 Handover Attach，表明该 UE 的注册处理类型是切换导致的注册。

或者 UE 在接入鉴权流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的接入鉴权流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为 “Handover Attach”。

ePDG 在这个步骤中可以将 UE 的注册处理类型上报给 AAA Server，AAA Server 将 UE 的注册处理类型上报给 HSS。

如果 UE 的注册过程中由 AAA Server 识别 UE 的注册处理类型（如 AAA Server 发现保存有用户在 3GPP 接入网络中使用的 PDN GW 地址信息，则 AAA Server 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，AAA Server 认为 UE 的注册处理类型为正常的注册处理类型），则 AAA Server 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给 ePDG。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 AAA Server 增加切换指示位信元（Handover Indication）。对于正常的注册处理类型，AAA Server 不携带这个信元。

b) Cause 信元。对于切换导致的注册处理，AAA Server 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，AAA Server 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带这个 Cause 信元。

c) Update Type 信元。对于切换导致的注册处理，AAA Server 将该信元设置为“Handover Attach”。对于正常注册处理，AAA Server 将该信元设置为“Initial Attach”或者不携带这个信元。

4、UE、ePDG、AAA Server 之间执行 IKEv2/IPSec SA 建立流程。UE 可以在这个步骤中将 UE 的注册处理类型上报给 ePDG。UE 可以在 IKEv2/IPSec SA 建立流程的消息中携带 Access Type 信元或者 Attach Type 信元指明 UE 的注册处理类型。或者 UE 在 IKEv2/IPSec SA 建立流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的 IKEv2/IPSec SA 建立流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为“Access due to Handover”。

c) Access Type 信元。UE 将该信元设置为“Handover Access”。

ePDG 在这个步骤中可以将 UE 的注册处理类型上报给 AAA Server，AAA

Server 将 UE 的注册处理类型上报给 HSS。

5、ePDG 根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，ePDG 已区分了不同的注册处理类型。

进一步，如果处理类型为正常的接入，则 ePDG 按照正常的接入流程处理。步骤 7 到 13 将被执行。

如果处理类型为切换导致的接入，则 ePDG 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到非 3GPP 网关设备。并转入步骤 6。

6、ePDG 发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 13。

步骤 7 至 13 同实施例 3 中的处理。

综上所述，本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

进一步，网络侧可按照识别出的处理类型，进行对应的流程处理。而且本发明实施例中还公开了 UE 上报注册的处理类型信息的具体方式：通过增加信元或新定义消息，更好的支撑了本发明实施例。

进一步，除前述流程中说明的 Initial Attach 和 Handover Attach 处理类型外，本发明中 UE、HSS、AAA 服务器等实体上报的注册处理类型信息还可以包括其它的注册处理类型，如 Pre-Registration（即 UE 预先注册到目标接入网络的注册处理类型），Idle Mode Handover（即 UE 空闲模式下切换时的注册处理类型），Active Mode Handover（即 UE 激活模式下切换时的注册处理类型）。如对于多模终端（Multi Mode）或者双模（Dual Mode）终端（即这种终端能够同时接入到多个网络中）来说，注册的处理类型可能有：Power On Attach（即 UE 开机时的注册处理类型），Normal Attach（即 UE 正常接入时的注册处理类型），Handover Attach（即 UE 切换时的注册处理类型）等。本发明不限制注册处理类型的取值。如下以 Idle Mode Handover 和 Active Mode Handover 的处理

来说明其它注册处理类型的处理。

实施例 6: UE 激活模式下的 HRPD 到 E-UTRAN 网络切换时，MME 获取 UE 的切换处理类型。MME 判断切换处理类型为 UE 激活模式下的切换时则 MME 通知 eNodeB 建立接入网侧资源及使用预先路径切换机制。参见图 6 所示，包括下列步骤:

1、UE 在 HRPD 网络接入。

2、UE 或者 HRPD AN（Access Network，接入网络）决定执行切换到 3GPP 网络。

3、UE 通过 HRPD 网络发送 Attach Request 消息到 MME。由 MME 获取处理类型信息。MME 获取处理类型信息具体可以为:

1）UE 上报: UE 在 Attach Request 消息中通知 MME 本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是:

✓ UE 在 Attach Request 消息中增加“Attach Type”信元指示 MME 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型:

0 表明（Idle Mode Handover）空闲模式下的切换;

1 表明（Active Mode Handover）激活状态下的切换;

✓ UE 在 Attach Request 消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。UE 可以设置 Cause 原因值为:

“Idle Mode Handover”表明Attach Request是由于空闲状态下的切换导致的;

“Active Mode Handover”表明Attach Request是由于激活状态下的切换导致的;

✓ UE 在 Attach Request 消息中增加“UE State”信元将 UE 的状态上报。MME 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的

切换。UE 可以设置“UE State”为:

0 （Idle state）表明UE的状态为空闲状态

1 （Active state）表明UE的状态为激活状态

✓ UE 在激活状态下的切换时在 Attach Request 消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时在 Attach Request 消息中不携带“active flag”信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将“active flag”信元设置为“True（1）”指示需要建立接入网侧的承载。在空闲状态下的切换时将“active flag”信元设置为“False（0）”指示不需要建立接入网侧的承载。

✓ UE 在空闲状态下的切换时在 Attach Request 消息中增加“non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时在 Attach Request 消息中不携带“non-active flag”信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将“non-active flag”信元设置为“True（1）”指示不需要建立接入网侧的承载。在激活状态下的切换时将“non-active flag”信元设置为“False（0）”指示需要建立接入网侧的承载。

2）HRPD AN 上报: HRPD AN 在 S101 接口的消息中通知 MME 本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是:

✓ HRPD AN 在 S101 接口的消息中增加“Attach Type”信元指示 MME 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型:

0 表明（Idle Mode Handover）空闲模式下的切换

1 表明（Active Mode Handover）激活状态下的切换

✓ HRPD AN 在 S101 接口的消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。HRPD AN 可以设置 Cause 原因值为:

"Idle Mode Handover" 表明Attach Request是由于空闲状态下的切换导致的;

"Active Mode Handover" 表明Attach Request是由于激活状态下的切换导致的;

- ✓ HRPD AN 在 S101 接口的消息中增加 "UE State" 信元将 UE 的状态上报。MME 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置 "UE State" 为:

  0 (Idle state) 表明UE的状态为空闲状态

  1 (Active state) 表明UE的状态为激活状态

- ✓ UE 在激活状态下的切换时 HRPD AN 在 S101 接口的消息中增加"active flag" 信元指示需要建立接入网侧的承载。在空闲状态下的切换时 HRPD AN 在 S101 接口的消息中不携带 "active flag" 信元指示不需要建立接入网侧的承载。

- ✓ UE 在空闲状态下的切换时 HRPD AN 在 S101 接口的消息中增加 "non-active flag" 信元指示不需要建立接入网侧的承载。在激活状态下的切换时 HRPD AN 在 S101 接口的消息中不携带 "non-active flag" 信元指示需要建立接入网侧的承载。

4、鉴权程序被执行。

5、MME 发送 Update Location 消息到 HSS, 获取 UE 的签约数据。HSS 返回 UE 的签约数据, 包括 UE 使用的 PDN GW 地址信息。

6、MME选择Serving GW, 向 Serving GW发送Create Default Bearer Request 消息。MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在激活状态下的切换, 则 MME 在 Create Default Bearer Request 消息中要求 Serving GW "预先路径切换"。

7、Serving GW 收到 Create Default Bearer Request 消息后如果发现这个消

息要求 Serving GW "预先路径切换"，则 Serving GW 发起预先路径切换流程。Serving GW 发送 Proxy BU 消息到 PDN GW。PDN GW 收到上述消息后切换用户面的路由到 Serving GW，即 PDN GW 收到下行数据后将发给 Serving GW。

8、Serving GW 回 Create Default Bearer Response 消息到 MME。

9、MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在激活状态下的切换，则 MME 发送 Relocation Request 消息到 eNodeB 请求 eNodeB 建立接入网侧资源。eNodeB 完成接入网侧资源的创建后回 Relocation Request Acknowledge 消息给 MME。

10、MME 发送 Update Bearer Request 消息到 Serving GW 更新 Serving GW 的下行用户面路径到 eNodeB。Serving GW 回 Update Bearer Response 消息到 MME。

11、MME 如果发现切换是 UE 在激活状态下的切换，则 MME 发送 S101 HO Command 消息到 HRPD AN，消息中包含 Attach Accept 消息和 HO Command 消息。

12、HRPD AN 发送 HRPD AN L2 消息到 UE，消息中包含 Attach Accept 消息和 HO Command 消息。

13、UE 切换到 E-UTRAN 网络，发送 HO Complete 消息到 eNodeB。

14、eNodeB 发送 Relocation Complete 消息给 MME，通知 MME UE 已经切换到 E-UTRAN 网络。

值得说明的是：本实施例中步骤 6 与步骤 9 并没有绝对的先后时序关系。

实施例 7：UE 空闲模式下的 HRPD 到 E-UTRAN 网络切换时 MME 获取 UE 的切换处理类型。MME 判断切换处理类型为 UE 空闲模式下的切换时则 MME 不通知 eNodeB 建立接入网侧资源及不使用预先路径切换机制。参见图 16 所示，包括下列步骤：

1、UE 在 HRPD 网络接入。

2、UE 或者 HRPD AN（Access Network，接入网络）决定执行切换到 3GPP 网络。

3、UE 通过 HRPD 网络发送 Attach Request 消息到 MME。切换的处理类型需要通知给 MME。处理方法同实施例 6 中的描述。

4、鉴权程序被执行。

5、MME 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

6、MME 选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在空闲状态下的切换，则 MME 在 Create Default Bearer Request 消息中不要求 Serving GW “预先路径切换”。Serving GW 回 Create Default Bearer Response 消息到 MME。

7、MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在空闲状态下的切换，则 MME 不通知 eNodeB 建立接入网侧的资源，MME 通过 HRPD 网络直接发 Attach Accept 消息到 UE。

8、UE 切换到 E-UTRAN 网络，发送 TAU Request 消息到 MME 通知 MME UE 已经切换到 E-UTRAN 网络。

9、MME 发现 UE 在空闲状态下已经切换到 E-UTRAN 网络，则 MME 发送 Update Bearer Request 消息给 Serving GW。MME 在 Update Bearer Request 增加指示位要求 Serving GW 进行用户面路径切换。

10、Serving GW 收到 Update Bearer Request 消息后如果发现要求用户面路径切换，则 Serving GW 发送 Proxy BU 消息到 PDN GW 更新 PDN GW 的下行用户面路径。PDN GW 将下行用户面路径切换到 Serving GW 后回 Proxy BA 消息给 Serving GW。

11、Serving GW 回 Update Bearer Response 消息给 MME。

12、MME 回 TAU Accept 消息给 UE。

实施例 8: 切换处理类型通知处理方法也能应用到 non-3GPP 到 3GPP 网络的正常切换处理。UE 在 Attach Request 消息中将切换处理类型信息通知给 MME 或者 SGSN, MME 或者 SGSN 根据切换处理类型信息决定是否通知接入网建立接入网侧的资源。参见图 17 所示，包括下列步骤:

1、UE 在 non-3GPP 网络（如 Wimax、WLAN 等网络）接入。

2、UE 决定执行切换到 3GPP 网络，发起切换流程。

3、UE 通过 3GPP 接入网络（AN，Access network）发送 Attach Request 消息到核心网网元。如果 3GPP 接入网络为 GERAN/UTRAN，则核心网网元为 SGSN; 如果 3GPP 接入网络为 E-UTRAN, 则核心网网元为 MME。UE 在 Attach Request 消息中通知 MME/SGSN 这个 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程, MME 或者 SGSN 获取处理类型信息。具体的通知方式可以是:

- ✓ UE 在 Attach Request 消息中增加 “Attach Type” 信元指示 MME/SGSN 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型:

  0 表明（Idle Mode Handover）空闲模式下的切换;

  1 表明（Active Mode Handover）激活状态下的切换;

- ✓ UE 在 Attach Request 消息中增加 “Cause” 信元表明导致 Attach Request 消息的原因值。UE 可以设置 Cause 原因值为:

  “Idle Mode Handover” 表明Attach Request是由于空闲状态下的切换导致的;

  “Active Mode Handover” 表明Attach Request是由于激活状态下的切换导致的;

- ✓ UE 在 Attach Request 消息中增加 “UE State” 信元将 UE 的状态上报。MME/SGSN 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置 “UE State” 为:

0 （Idle state）表明UE的状态为空闲状态

1 （Active state）表明UE的状态为激活状态

✓ UE 在激活状态下的切换时在 Attach Request 消息中增加 “active flag” 信元指示需要建立接入网侧的承载。在空闲状态下的切换时在 Attach Request 消息中不携带 “active flag” 信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将 “active flag” 信元设置为 “True（1）” 指示需要建立接入网侧的承载。在空闲状态下的切换时将 “active flag” 信元设置为 “False（0）” 指示不需要建立接入网侧的承载。

✓ UE 在空闲状态下的切换时在 Attach Request 消息中增加 “non-active flag” 信元指示不需要建立接入网侧的承载。在激活状态下的切换时在 Attach Request 消息中不携带 “non-active flag” 信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将 “non-active flag” 信元设置为 “True（1）” 指示不需要建立接入网侧的承载。在激活状态下的切换时将 “non-active flag” 信元设置为 “False（0）” 指示需要建立接入网侧的承载。

4、鉴权程序被执行。

5、MME/SGSN 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

6、MME/SGSN 选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。

7、Serving GW 发送 Proxy BU 消息到 PDN GW 更新 PDN GW 的下行用户面路径。PDN GW 将下行用户面路径切换到 Serving GW 后回 Proxy BA 消息给 Serving GW。

8、Serving GW 回 Create Default Bearer Response 消息给 MME/SGSN。

9、MME/SGSN 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME/SGSN 如果发现 UE 在激活状态下

的切换，则步骤 9 至 12 被执行。MME/SGSN 如果发现 UE 在空闲状态下的切换，则步骤 13 至 14 被执行。

MME/SGSN发送Initial Context Setup Request消息给3GPP AN请求3GPP AN建立接入网侧的资源，同时这个消息也携带Attach Accept消息。

10、3GPP AN 和 UE 之间建立无线承载。

11、3GPP AN 回 Initial Context Setup Complete 消息给 MME/SGSN。这个消息中也携带 Attach Complete 消息。

12、MME/SGSN 发送 Update Bearer Request 消息给 Serving GW 请求 Serving GW 更新下行用户面路径到 eNodeB。Serving GW 更新下行用户面路径到 3GPP AN 后回 Update Bearer Response 消息到 MME/SGSN。

13、MME/SGSN 如果发现 UE 在空闲状态下的切换，则 MME/SGSN 发送 Attach Accept 消息给 UE。

14、UE 回 Attach Complete 消息给 MME/SGSN。

综上所述，采用本发明的实施例，网络侧网元获取 UE 的注册处理类型信息后可以进行区分的处理，能够解决现有机制下网络侧无法针对不同的注册流程区分处理的问题。

显然，本领域的技术人员可以对本发明进行各种改动和变型而不脱离本发明的精神和范围。这样，倘若本发明的这些修改和变型属于本发明权利要求及其等同技术的范围之内，则本发明也意图包含这些改动和变型在内。

说 明 书 附 图

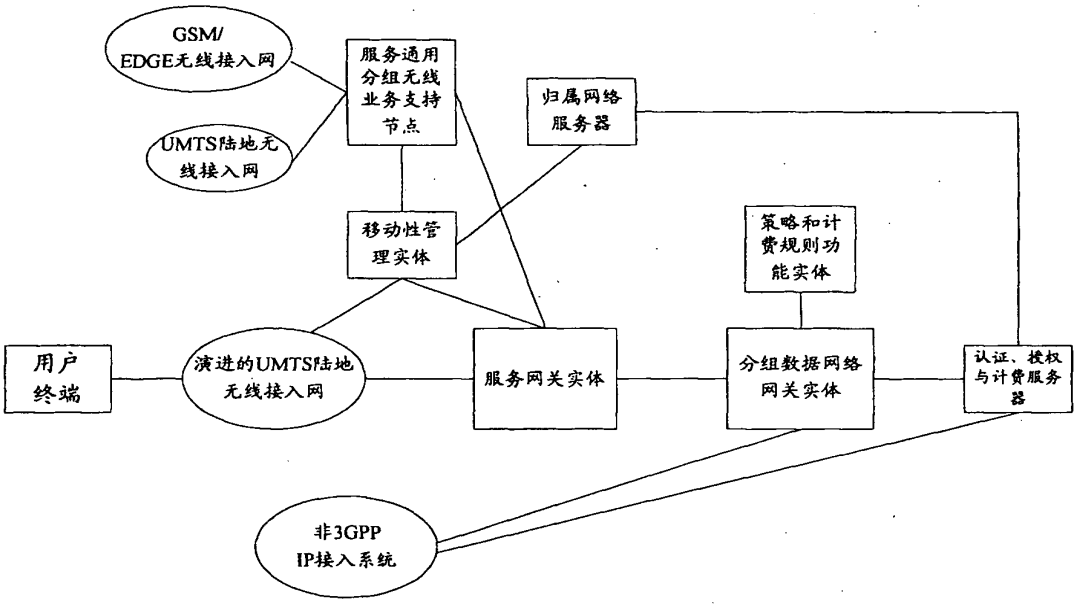

GSM/
EDGE无线接入网
UMTS陆地无
线接入网
服务通用
分组无线
业务支持
节点
归属网络
服务器
移动性管
理实体
策略和计
费规则功
能实体
用户
终端
演进的UMTS陆地
无线接入网
服务网关实体
分组数据网络
网关实体
认证、授权
与计费服务
器
非3GPP
IP接入系统

图 1

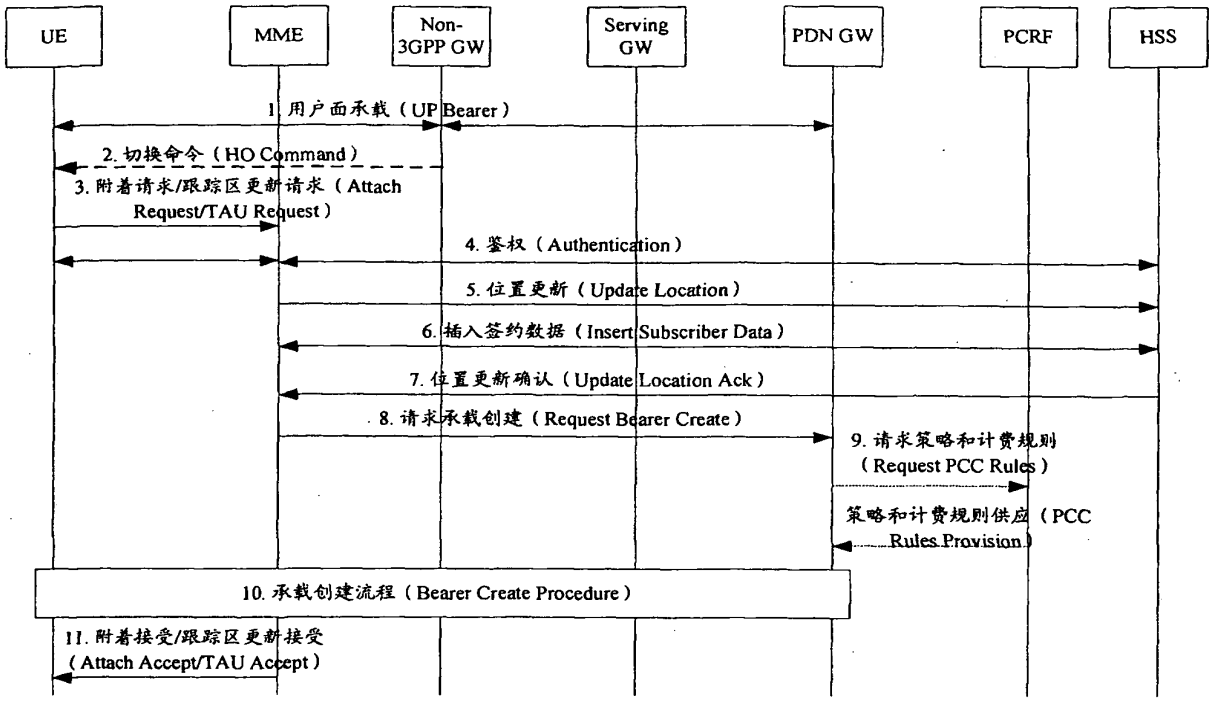

UE
MME
Non-3GPP GW
Serving GW
PDN GW
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/跟踪区更新请求（Attach Request/TAU Request）
4. 鉴权（Authentication）
5. 位置更新（Update Location）
6. 插入签约数据（Insert Subscriber Data）
7. 位置更新确认（Update Location Ack）
8. 请求承载创建（Request Bearer Create）
9. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
10. 承载创建流程（Bearer Create Procedure）
11. 附着接受/跟踪区更新接受（Attach Accept/TAU Accept）

图 2

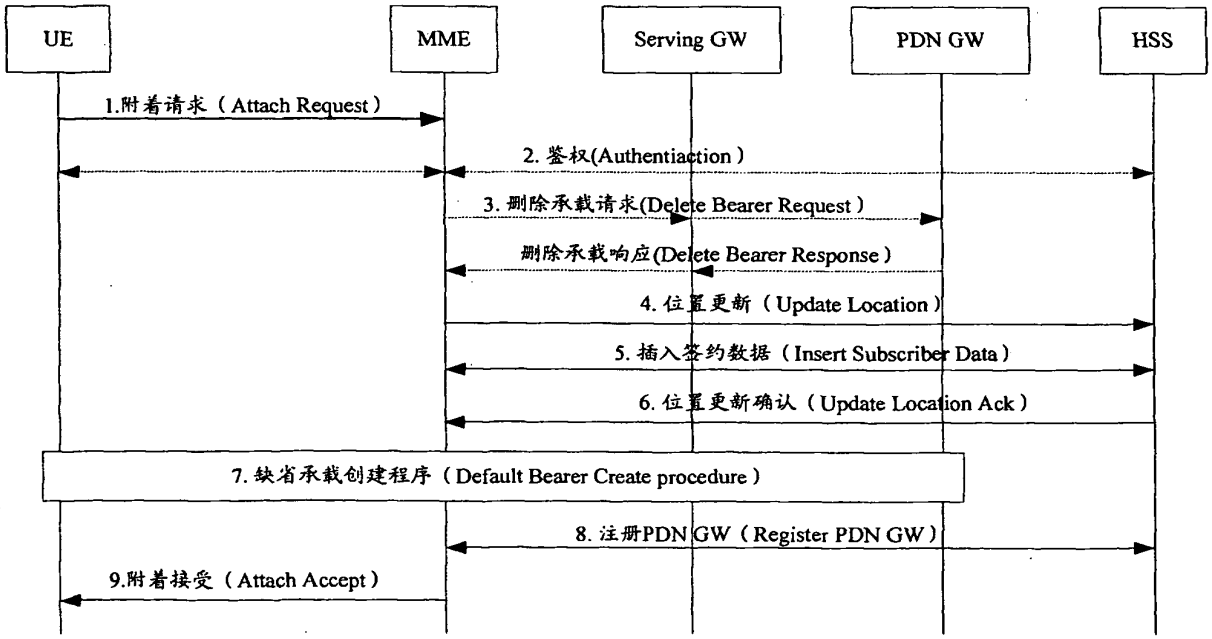

UE
MME
Serving GW
PDN GW
HSS
1.附着请求（Attach Request）
2. 鉴权(Authentiaction）
3. 删除承载请求(Delete Bearer Request）
删除承载响应(Delete Bearer Response）
4. 位置更新（Update Location）
5. 插入签约数据（Insert Subscriber Data）
6. 位置更新确认（Update Location Ack）
7. 缺省承载创建程序（Default Bearer Create procedure）
8. 注册PDN GW（Register PDN GW）
9.附着接受（Attach Accept）

图 3

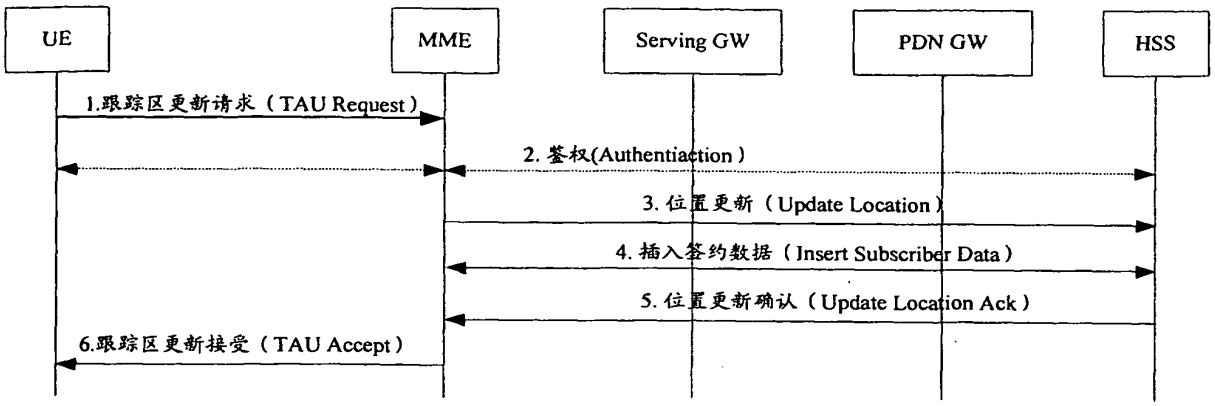

UE
MME
Serving GW
PDN GW
HSS
1.跟踪区更新请求（TAU Request）
2. 鉴权(Authentiaction）
3. 位置更新（Update Location）
4. 插入签约数据（Insert Subscriber Data）
5. 位置更新确认（Update Location Ack）
6.跟踪区更新接受（TAU Accept）

图 4

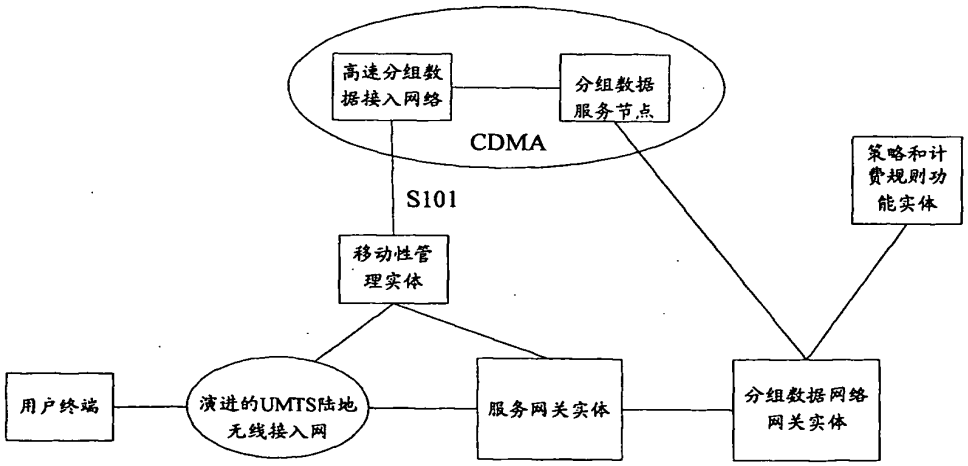

高速分组数据接入网络
分组数据服务节点
CDMA
策略和计费规则功能实体
S101
移动性管理实体
用户终端
演进的UMTS陆地无线接入网
服务网关实体
分组数据网络网关实体

图 5

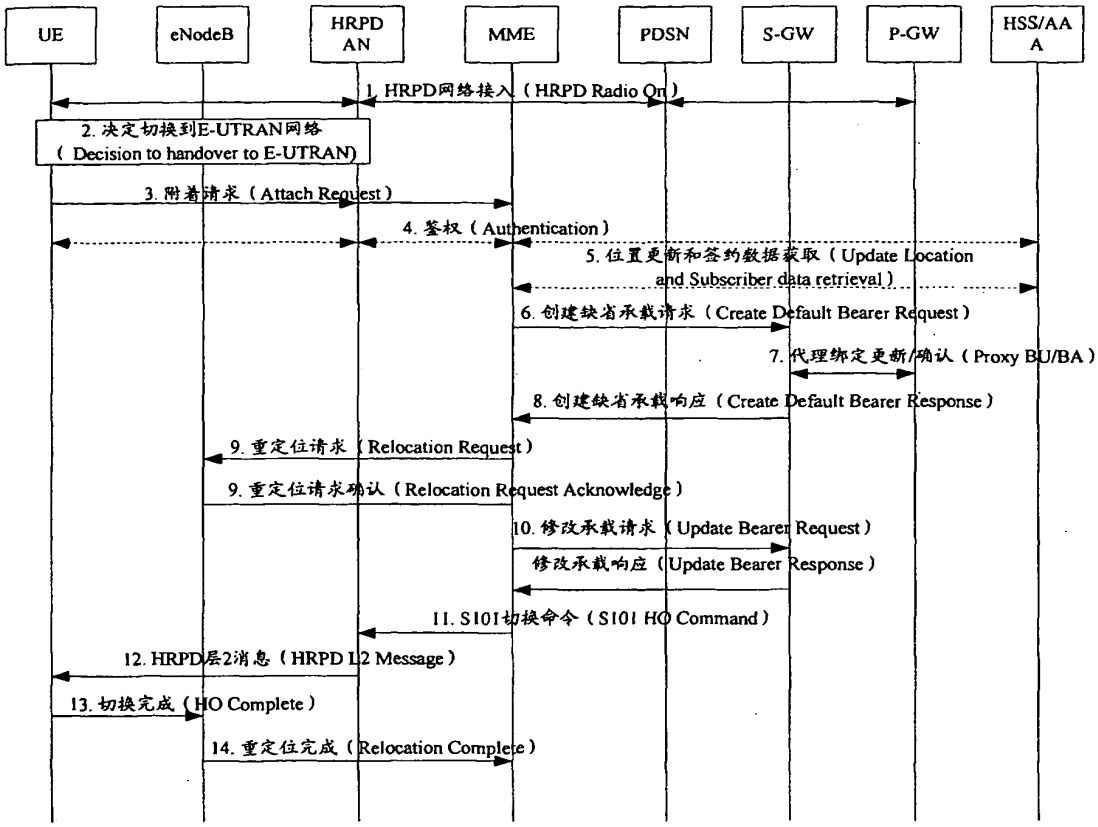

UE
eNodeB
HRPD AN
MME
PDSN
S-GW
P-GW
HSS/AAA
1. HRPD网络接入（HRPD Radio On）
2. 决定切换到E-UTRAN网络（Decision to handover to E-UTRAN）
3. 附着请求（Attach Request）
4. 鉴权（Authentication）
5. 位置更新和签约数据获取（Update Location and Subscriber data retrieval）
6. 创建缺省承载请求（Create Default Bearer Request）
7. 代理绑定更新/确认（Proxy BU/BA）
8. 创建缺省承载响应（Create Default Bearer Response）
9. 重定位请求（Relocation Request）
9. 重定位请求确认（Relocation Request Acknowledge）
10. 修改承载请求（Update Bearer Request）
修改承载响应（Update Bearer Response）
11. S101切换命令（S101 HO Command）
12. HRPD层2消息（HRPD L2 Message）
13. 切换完成（HO Complete）
14. 重定位完成（Relocation Complete）

图 6

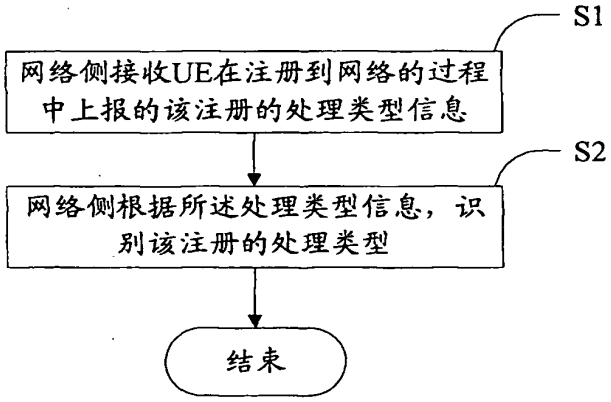

S1
网络侧接收UE在注册到网络的过程中上报的该注册的处理类型信息
S2
网络侧根据所述处理类型信息，识别该注册的处理类型
结束

图 7

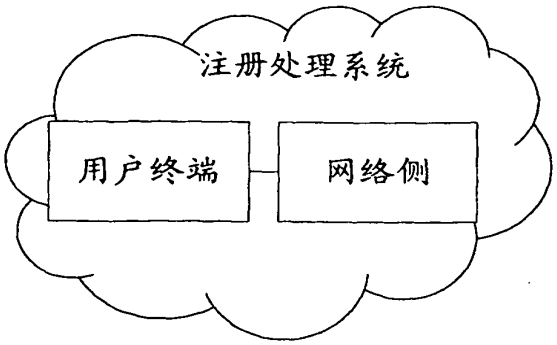


图 8

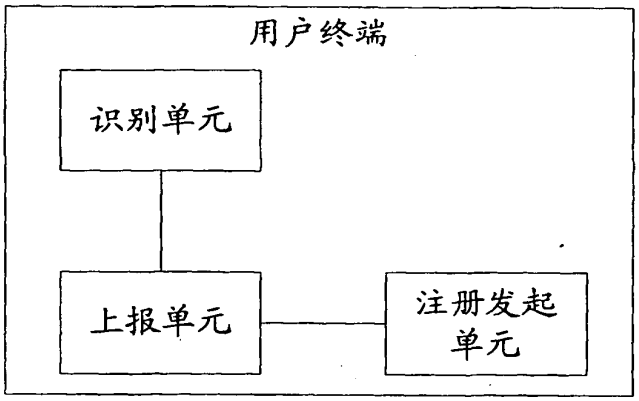


图 9

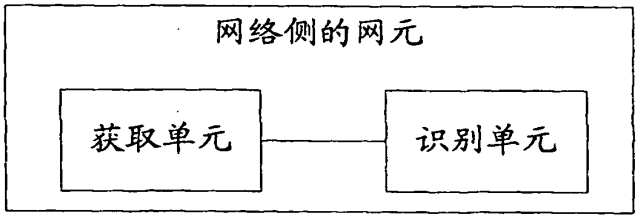


图 10

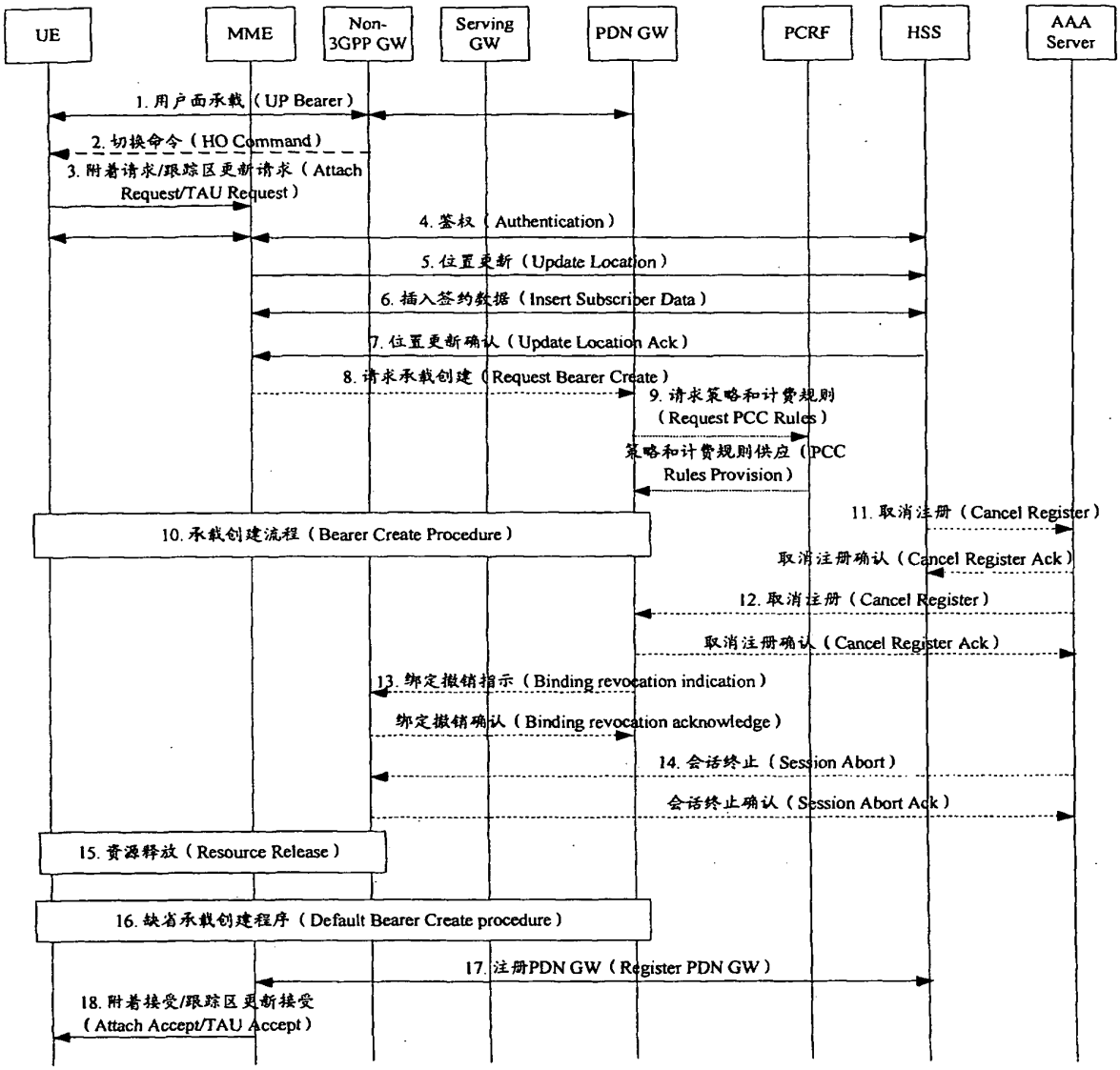

UE
MME
Non-3GPP GW
Serving GW
PDN GW
PCRF
HSS
AAA Server
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/跟踪区更新请求（Attach Request/TAU Request）
4. 鉴权（Authentication）
5. 位置更新（Update Location）
6. 插入签约数据（Insert Subscriber Data）
7. 位置更新确认（Update Location Ack）
8. 请求承载创建（Request Bearer Create）
9. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
10. 承载创建流程（Bearer Create Procedure）
11. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
12. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
13. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
14. 会话终止（Session Abort）
会话终止确认（Session Abort Ack）
15. 资源释放（Resource Release）
16. 缺省承载创建程序（Default Bearer Create procedure）
17. 注册PDN GW（Register PDN GW）
18. 附着接受/跟踪区更新接受（Attach Accept/TAU Accept）

图 11

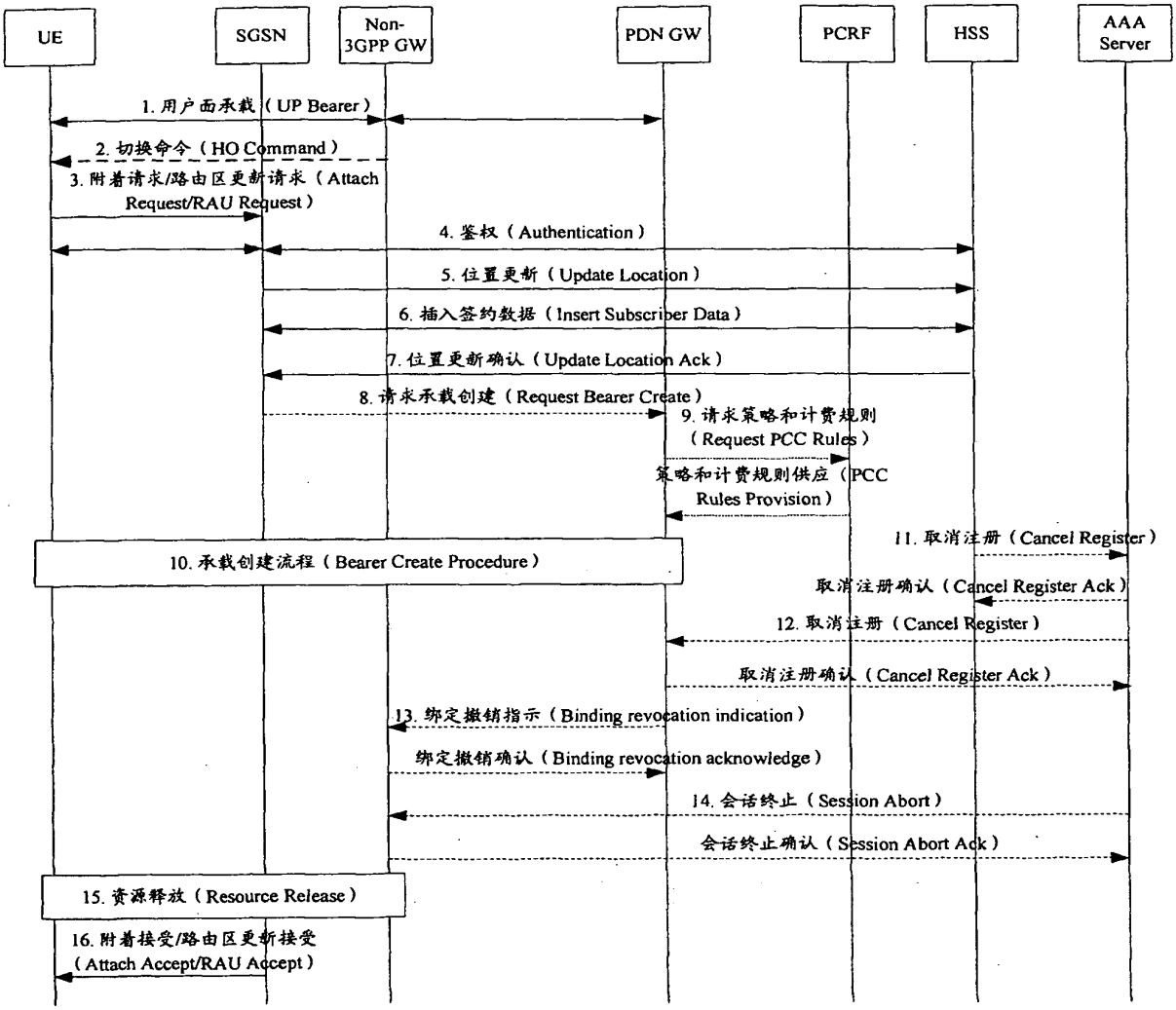

UE
SGSN
Non-3GPP GW
PDN GW
PCRF
HSS
AAA Server
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/路由区更新请求（Attach Request/RAU Request）
4. 鉴权（Authentication）
5. 位置更新（Update Location）
6. 插入签约数据（Insert Subscriber Data）
7. 位置更新确认（Update Location Ack）
8. 请求承载创建（Request Bearer Create）
9. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
10. 承载创建流程（Bearer Create Procedure）
11. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
12. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
13. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
14. 会话终止（Session Abort）
会话终止确认（Session Abort Ack）
15. 资源释放（Resource Release）
16. 附着接受/路由区更新接受（Attach Accept/RAU Accept）

图 12

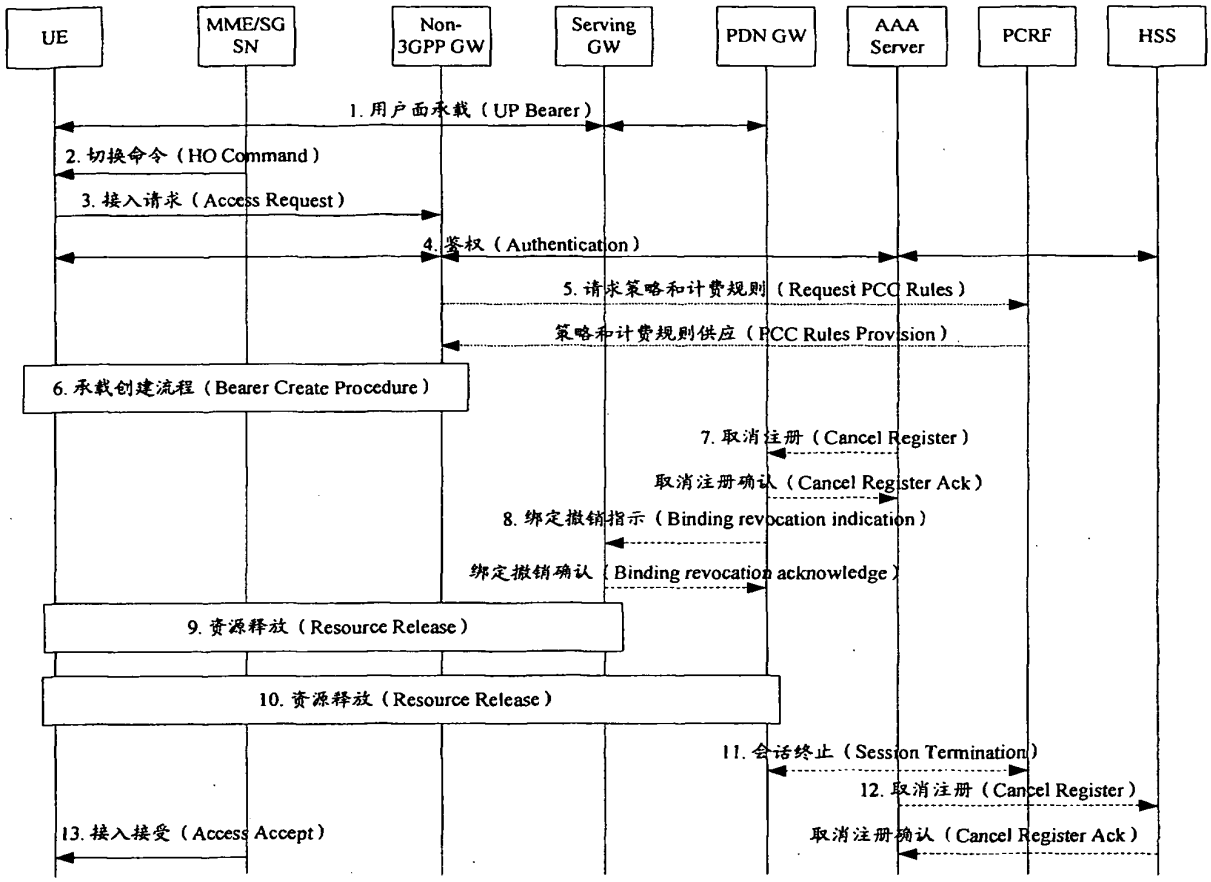
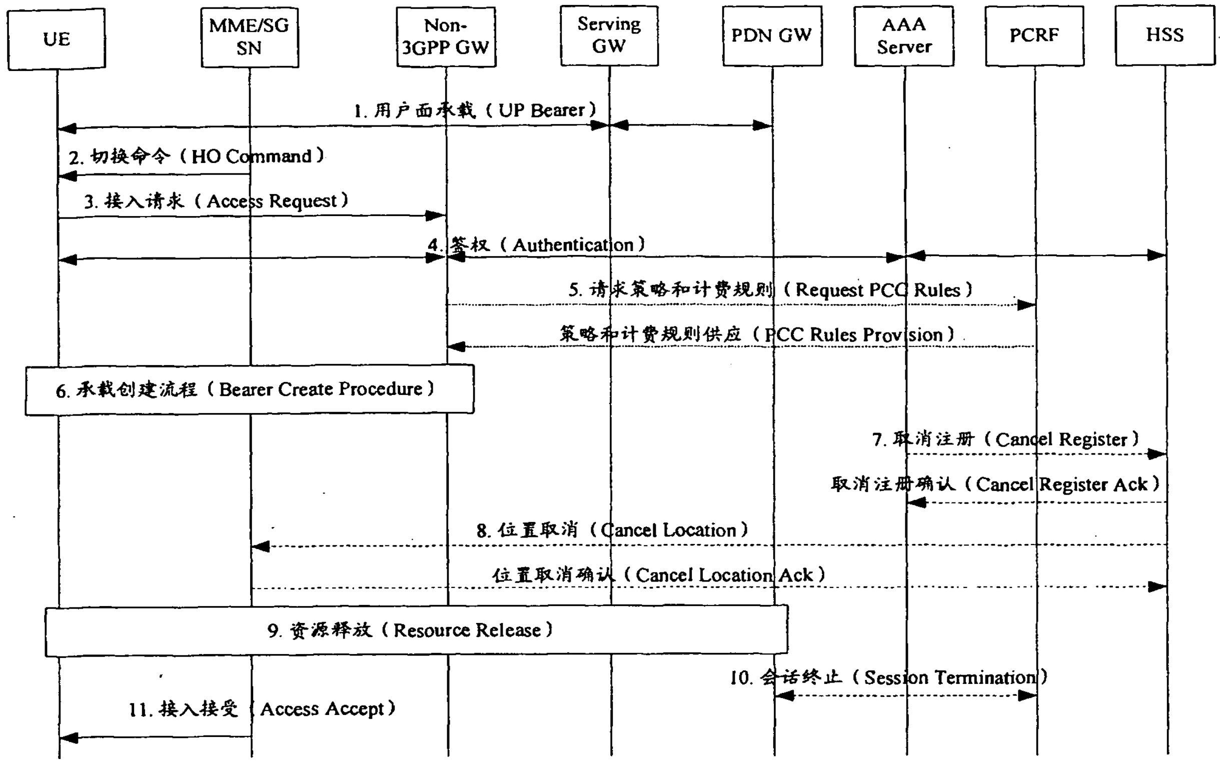

UE
MME/SG SN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
9. 资源释放（Resource Release）
10. 资源释放（Resource Release）
11. 会话终止（Session Termination）
12. 取消注册（Cancel Register）
13. 接入接受（Access Accept）
取消注册确认（Cancel Register Ack）

图 13



UE
MME/SGSN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 位置取消（Cancel Location）
位置取消确认（Cancel Location Ack）
9. 资源释放（Resource Release）
10. 会话终止（Session Termination）
11. 接入接受（Access Accept）

图 14

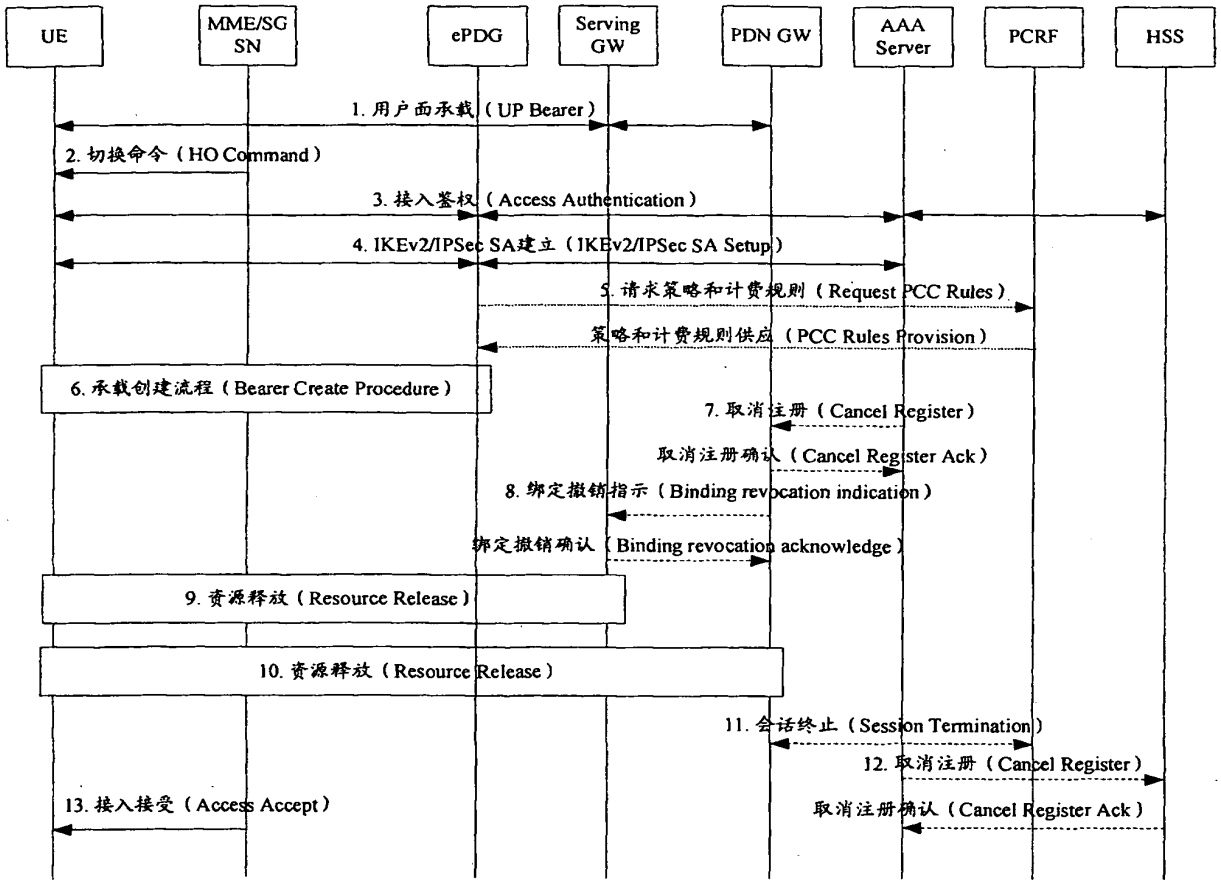

UE
MME/SG SN
ePDG
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入鉴权（Access Authentication）
4. IKEv2/IPSec SA建立（IKEv2/IPSec SA Setup）
5. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
9. 资源释放（Resource Release）
10. 资源释放（Resource Release）
11. 会话终止（Session Termination）
12. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
13. 接入接受（Access Accept）

图 15

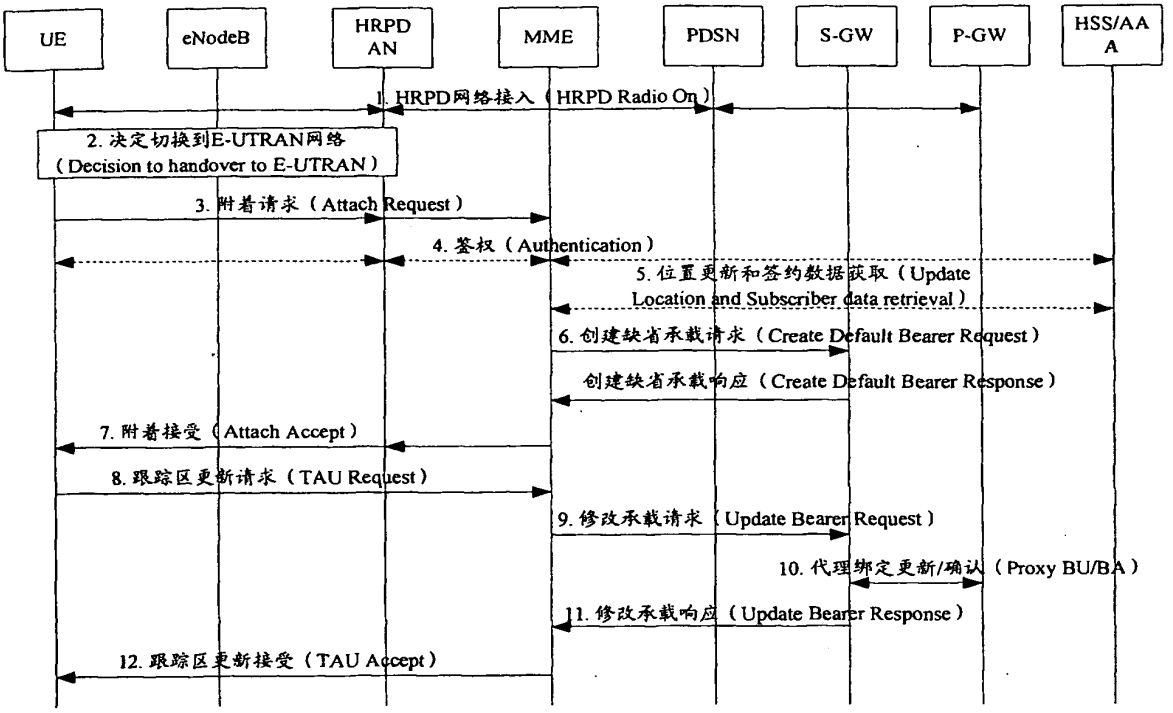

UE
eNodeB
HRPD AN
MME
PDSN
S-GW
P-GW
HSS/AAA
1. HRPD网络接入（HRPD Radio On）
2. 决定切换到E-UTRAN网络（Decision to handover to E-UTRAN）
3. 附着请求（Attach Request）
4. 鉴权（Authentication）
5. 位置更新和签约数据获取（Update Location and Subscriber data retrieval）
6. 创建缺省承载请求（Create Default Bearer Request）
创建缺省承载响应（Create Default Bearer Response）
7. 附着接受（Attach Accept）
8. 跟踪区更新请求（TAU Request）
9. 修改承载请求（Update Bearer Request）
10. 代理绑定更新/确认（Proxy BU/BA）
11. 修改承载响应（Update Bearer Response）
12. 跟踪区更新接受（TAU Accept）

图 16

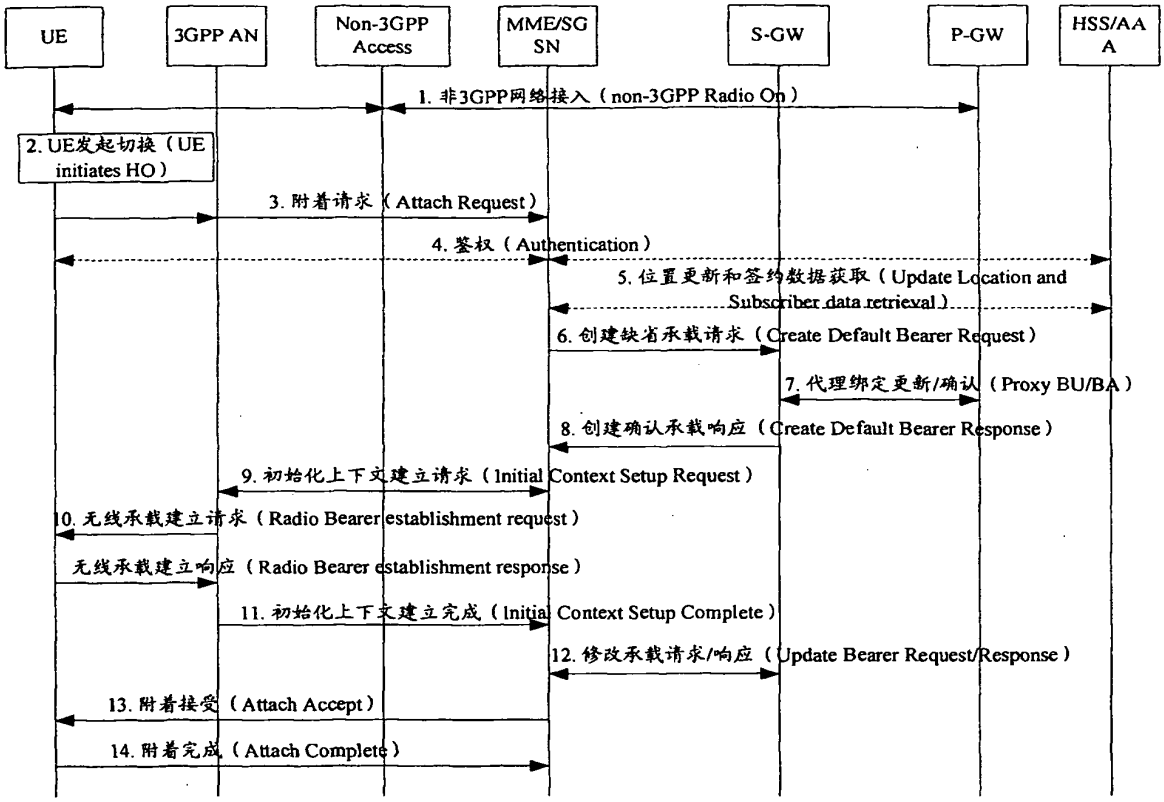

UE
3GPP AN
Non-3GPP Access
MME/SGSN
S-GW
P-GW
HSS/AAA
1. 非3GPP网络接入（non-3GPP Radio On）
2. UE发起切换（UE initiates HO）
3. 附着请求（Attach Request）
4. 鉴权（Authentication）
5. 位置更新和签约数据获取（Update Location and Subscriber data retrieval）
6. 创建缺省承载请求（Create Default Bearer Request）
7. 代理绑定更新/确认（Proxy BU/BA）
8. 创建确认承载响应（Create Default Bearer Response）
9. 初始化上下文建立请求（Initial Context Setup Request）
10. 无线承载建立请求（Radio Bearer establishment request）
无线承载建立响应（Radio Bearer establishment response）
11. 初始化上下文建立完成（Initial Context Setup Complete）
12. 修改承载请求/响应（Update Bearer Request/Response）
13. 附着接受（Attach Accept）
14. 附着完成（Attach Complete）

图 17

Brinks 08059/60US

中华人民共和国国家知识产权局
STATE INTELLECTUAL PROPERTY OFFICE
OF THE PEOPLE'S REPUBLIC OF CHINA

证 明

本证明之附件是向本局提交的下列专利申请文件副本。

请　　日：2008年03月13日

请　　号：200810085729.8

请 类 别：发明专利

创造 名称：一种注册处理方法、系统及装置

申 请　　人：华为技术有限公司

发 设计人：吴问付

中华人民共和国
国家知识产权局局长 田力普

2010 年 11 月 26 日

权 利 要 求 书

1、一种注册处理方法，其特征在于，包括下列步骤：

接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及

根据所述处理类型信息，识别该注册的处理类型。

2、如权利要求 1 所述的方法，其特征在于，所述处理类型信息由 UE 在注册到网络时识别。

3、如权利要求 2 所述的方法，其特征在于，所述 UE 识别所述注册处理类型信息包括：

所述 UE 发现注册是由于切换到不同网络或者需要切换不同网络导致时，识别注册处理类型为切换注册处理类型；或者，

所述 UE 发现注册是由于需要切换不同网络导致时，识别注册处理类型为优化切换注册处理类型或者预注册处理类型；或者

所述 UE 发现注册是由于切换到不同网络或者需要切换不同网络导致时，根据 UE 状态识别为激活模式下的切换注册处理类型或空闲模式下的切换注册处理类型。

4、如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 上报处理类型信息的方式，包括下列之一：

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带指示位信元，以表征空闲模式切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带指示位信元，以表征激活模式切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的跟踪区更新请求消息中携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的跟踪区更新请

求消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的路由区更新请求消息中携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的路由区更新请求消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的接入请求消息中携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的接入请求消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在接入鉴权或者鉴权的过程中，该 UE 在向网络侧发送的消息中携带该注册的处理类型信息；

所述 UE 在接入鉴权或者鉴权的过程中，该 UE 在向网络侧发送的消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在因特网密钥交换协议版本 2IKEv2 或者 IP 网络安全协议安全联盟 IPsec SA 建立的过程中，该 UE 在向网络侧发送的消息中携带该注册的处理类型信息；

所述 UE 在因特网密钥交换协议版本 2 或者 IP 网络安全协议安全联盟建立的过程中，该 UE 在向网络侧发送的消息中携带指示位信元，以表征切换注册处理类型。

5、如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 上报处理类型信息具体包括：

向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息；或者，

向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息；或者，

向网络侧发送不同的路由区更新请求消息，分别表征对应的注册处理类型信息；或者，

向网络侧发送不同的接入请求消息，分别表征对应的注册处理类型信息。

6、如权利要求 1 所述的方法，其特征在于，所述根据处理类型信息，识

别该注册的处理类型具体为:

网络侧网元将接收的注册处理类型信息通知给归属签约寄存器 HSS 或者认证、授权与计费服务器 AAA Server，由所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理。

7、如权利要求 6 所述的方法，其特征在于，所述网络侧网元为移动性管理实体 MME 或服务 GPRS 支持节点 SGSN，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为:

HSS 收到 MME 或 SGSN 通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 HSS 中存在该 UE 在 Non-3GPP 网络中使用的分组数据网络网关实体 PDN GW 地址信息，则 HSS 通知 AAA Server 取消该 UE 在 Non-3GPP 网络的注册;

AAA Server 通知 Non-3GPP 网络释放该 UE 在 Non-3GPP 网络中使用的资源。

8、如权利要求 6 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为:

AAA Server 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 AAA Server 中存在该 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 PDN GW 释放该 UE 在 3GPP 网络中使用的资源。

9、如权利要求 8 所述的方法，其特征在于，所述方法进一步包括:

AAA Server 进一步通知 HSS 取消所述 UE 在 3GPP 网络中的注册。

10、如权利要求 6 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为:

HSS 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 HSS 中存在所述 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消所述 UE 在 3GPP 网络中的注册;

所述 AAA Server 通知 PDN GW 释放该 UE 在 3GPP 网络中使用的资源。

11、如权利要求 6 所述的方法，其特征在于：所述网络侧网元为非 3GPP 网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

AAA Server 或者 HSS 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为切换注册且 AAA Server 或者 HSS 中存在所述 UE 在 3GPP 网络中使用的 PDN GW 的地址信息，则 AAA Server 或者 HSS 将所述 PDN GW 地址信息下发给所述非 3GPP 网关设备。

12、如权利要求 6 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

AAA Server 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 AAA Server 中存在该 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消该 UE 在 3GPP 网络中的注册；或者，

HSS 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 HSS 中存在所述 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消该 UE 在 3GPP 网络中的注册；

HSS 通知 MME/SGSN 释放该 UE 在 3GPP 网络中使用的资源。

13、如权利要求 1 所述的方法，其特征在于，所述方法进一步包括：

如果识别的注册处理类型为切换注册处理类型，网络侧网元为移动性管理实体 MME 或服务 GPRS 支持节点 SGSN，则所述 MME 或 SGSN 通知 PDN GW 发起网络侧承载创建流程，创建 UE 使用的承载资源。

14、如权利要求 1 所述的方法，其特征在于，所述方法进一步包括：

如果识别的注册处理类型为切换注册处理类型，网络侧网元为非 3GPP 网关设备，则所述非 3GPP 网关设备发起网络侧承载创建流程，创建 UE 使用的承载资源。

15、如权利要求 1 所述的方法，其特征在于，所述方法进一步包括：

如果识别的注册处理类型为激活模式下的切换注册处理类型，则创建接入网侧资源。

16、如权利要求 1 所述的方法，其特征在于，所述方法进一步包括：

如果识别的注册处理类型为激活模式下的切换注册处理类型，则使用预先路径切换机制。

17、如权利要求 1 所述的方法，其特征在于，所述方法进一步包括：

如果识别的注册处理类型为空闲模式下的切换注册处理类型，则不创建接入网侧资源。

18、如权利要求 1 所述的方法，其特征在于，所述方法进一步包括：

如果识别的注册处理类型为空闲模式下的切换注册处理类型，则在所述 UE 切换到目标网络后，通过在修改承载请求消息中携带指示位信息指示服务网关实体 Serving GW 通知 PDN GW 切换下行用户面路径。

19、如权利要求 1 所述的方法，其特征在于，所述方法进一步包括：

如果识别的注册处理类型为激活模式下的切换注册处理类型，则移动性管理实体 MME、或者服务 GPRS 支持节点 SGSN、或者 Non-3GPP GW 通知 PDN GW 不发起源接入网络的资源释放处理。

20、如权利要求 19 所述的方法，其特征在于，所述通知 PDN GW 不发起源接入网络的资源释放处理具体为：

在发送给 PDN GW 的消息中携带指示位信息指示 PDN GW 不发起源接入网络的资源释放处理。

21、如权利要求 1 所述的方法，其特征在于，所述方法进一步包括：

如果识别的注册处理类型为激活模式下的切换注册处理类型，则目标网络的网元与源网络的网元之间根据所述目标网络的数据转发隧道资源信息建立数据转发隧道。

22、如权利要求 21 所述的方法，其特征在于，所述目标网络为 3GPP 网络、所述源网络为 Non-3GPP 网络时，所述目标网络的网元与源网络的网元之间根据所述目标网络的数据转发隧道资源信息建立数据转发隧道具体为：

所述 3GPP 网络侧第一网元接收到激活模式下的切换注册处理类型信息后，将从 Serving GW 获取的数据转发隧道资源信息通过 Non-3GPP 接入网元发送给 Non-3GPP GW，或者直接发送给 Non-3GPP GW；

由所述 Non-3GPP GW 建立 Non 与 Serving GW 之间的数据转发隧道。

23、如权利要求 21 所述的方法，其特征在于，所述目标网络为 Non-3GPP 网络、所述源网络为 3GPP 网络时，所述目标网络的网元与源网络的网元之间根据所述目标网络的数据转发隧道资源信息建立数据转发隧道具体为：

所述 Non-3GPP 网络的接入网元或者 Non-3GPP GW 接收到激活模式下的切换注册处理类型信息后，将所述 Non-3GPP GW 的数据转发隧道资源信息通过 3GPP 网络侧第一网元发送给 Serving GW；

由所述 Serving GW 建立与 Non-3GPP GW 之间的数据转发隧道。

24、一种注册处理方法，其特征在于，包括下列步骤：

接收 HSS 或者 AAA Server 上报的用户终端 UE 注册的处理类型信息；

以及

根据所述处理类型信息，识别该注册的处理类型。

25、如权利要求 24 所述的方法，其特征在于，所述方法进一步包括：

HSS 或者 AAA Server 根据是否保存有 UE 使用的 PDN GW 地址信息识别 UE 的注册处理类型；

如果 HSS 或者 AAA Server 发现保存有 UE 使用的 PDN GW 地址信息则识别 UE 的注册处理类型为切换注册处理类型;或者，

如果 HSS 或者 AAA Server 发现没有保存 UE 使用的 PDN GW 地址信息则识别 UE 的注册处理类型为初始化注册处理类型。

26、如权利要求 24 所述的方法，其特征在于，接收所述注册的处理类型信息的网络侧网元为移动性管理实体 MME 或服务 GPRS 支持节点 SGSN 或非 3GPP 网关设备。

27、如权利要求 24 所述的方法，其特征在于，所述方法进一步包括：

接收所述注册的处理类型信息的网络侧网元如果识别 UE 的注册处理类型为切换注册处理类型，则所述网络侧网元通知 PDN GW 恢复 UE 在源接入网络使用的承载资源。

28、一种注册处理系统，其特征在于，包括：

用户终端 UE，用于在注册到网络的过程中，将该注册的处理类型信息上报；

网络侧，用于根据接收的 UE 上报的该注册的处理类型信息，识别该注册

的处理类型。

29、如权利要求 28 所述的系统，其特征在于，网络侧接收所述注册的处理类型信息的网元为网络侧的移动性管理实体 MME、服务 GPRS 支持节点 SGSN 或非 3GPP 网关设备。

30、如权利要求 28 所述的系统，其特征在于，所述用户终端 UE 在注册到网络的过程中，将该注册的处理类型信息上报具体为：

所述用户终端 UE 在注册到网络时，识别注册的处理类型信息后再将所述注册的处理类型信息上报。

31、一种用户终端，其特征在于，包括：

识别单元，用于在所述用户终端发起注册时，识别该注册的类型；

注册发起单元，用于发起注册，并发出注册触发信号；

上报单元，用于接收注册发起单元发出的注册触发信号，并在所述用户终端注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报。

32、如权利要求 31 所述的用户终端，其特征在于，所述上报单元按以下方式进行上报：

将所述处理类型信息携带于附着请求消息中的信元中进行上报；或者，

将所述处理类型信息携带于跟踪区更新请求消息中的信元中进行上报；或者，

将所述处理类型信息携带于路由区更新请求消息中的信元中进行上报；或者，

将所述处理类型信息携带于接入请求消息中的信元中进行上报；或者，

将所述处理类型信息携带于接入鉴权或者鉴权消息中的信元中进行上报；或者，

将所述处理类型信息携带于 IKEv2 或 IPsec SA 建立消息中的信元中进行上报。

33、如权利要求 31 所述的用户终端，其特征在于，所述上报单元上报的过程具体为：

对应不同的注册类型，向网络侧发送不同的附着请求消息；或者，

对应不同的注册类型，向网络侧发送不同的跟踪区更新请求消息；或者，

对应不同的注册类型，向网络侧发送不同的路由区更新请求消息；或者，

对应不同的注册类型，向网络侧发送不同的接入请求消息。

34、一种网络侧的网元，其特征在于，包括：

获取单元，用于获取注册过程中 UE 的注册处理类型信息；

识别单元，用于根据获取单元获取的处理类型信息，识别该注册的处理类型。

35、如权利要求 34 所述的网元，其特征在于，所述网元为移动性管理实体 MME、服务 GPRS 支持节点 SGSN 或非 3GPP 网关设备。

36、如权利要求 34 所述的网元，其特征在于，所述获取单元获取的处理类型信息由所述 UE、HSS 或者 AAA Server 上报。

37、如权利要求 34 至 36 任一项所述的网元，其特征在于，所述网元进一步包括：

第一处理单元，用于在所述识别单元识别注册的处理类型为切换注册处理类型时，发起网络侧承载创建流程，创建所述 UE 使用的承载资源。

38、如权利要求 34 至 36 任一项所述的网元，其特征在于，所述网元进一步包括：

第二处理单元，用于在所述识别单元识别注册的处理类型为激活模式下的切换注册处理类型时，不发起源接入网络的资源释放处理。

39、如权利要求 34 至 36 任一项所述的网元，其特征在于，所述网元进一步包括：

第三处理单元，用于在所述识别单元识别注册的处理类型为激活模式下的切换注册处理类型时，发起目标网络的网元与源网络的网元之间的数据转发隧道资源创建处理。

说 明 书

一种注册处理方法、系统及装置

技术领域

本发明涉及通信领域，特别是涉及一种注册处理方法、系统及装置。

背景技术

3GPP 为了增强未来网络的竞争能力，正在研究一种全新的演进网络，其系统架构参见图 1 所示，其中包括:

演进的UMTS 陆地无线接入网(E-UTRAN,Evolved UMTS Terrestrial Radio Access Network)，用于实现所有与演进网络无线有关的功能。

移动性管理实体（MME，Mobility Management Entity），负责控制面的移动性管理，包括用户上下文和移动状态管理，分配用户临时身份标识等。

服务网关实体（Serving GW，Serving Gateway），是 3GPP 接入系统间的用户面锚点，终止 E-TURAN 的接口。

分组数据网络网关实体(PDN GW，Packet Data Network Gateway)是 3GPP 接入系统和非 3GPP 接入系统之间的用户面锚点，终止和外部分组数据网络（PDN，Packet Data Network）的接口。

策略和计费规则功能实体（PCRF，Policy and Charging Rule Function），用于策略控制决定和流计费控制功能。

归属网络服务器（HSS，Home Subscriber Server）用于存储用户签约信息。

UMTS 陆地无线接入网（UTRAN，UMTS Terrestrial Radio Access Network）、GSM/EDGE 无线接入网（GERAN，GSM/EDGE Radio Access Network），用于实现所有与现有 GPRS/UMTS 网络中无线有关的功能。

服务通用分组无线业务支持节点(SGSN，Serving GPRS Supporting Node)，用于实现 GPRS/UMTS 网络中路由转发、移动性管理、会话管理以及用户信息存储等功能。

非 3GPP IP 接入系统（Non-3GPP IP Access），主要是一些非 3GPP 组织定义的接入网络，如无线局域网（WLAN，Wireless Local Area Network），微波

存取全球互通（Wimax， Worldwide Interoperability for Microwave Access）等网络。

认证、授权与计费服务器（AAA Server，Authentication，Authorization and Accounting Server）用于对用户设备（UE, User Equipment）执行接入认证、授权和计费功能。

说明：这个架构并不意味着最终的 SAE 系统架构，最后的架构可能和这个架构有所差别，本专利不作限制。

上述演进网络的一个需求是实现 3GPP 的接入系统（GERAN/UTRAN/E-UTRAN）和 Non-3GPP 接入系统（如 WLAN/Wimax 等）之间的切换（Handover）。在目前的协议中规定，切换流程是通过 UE 在新接入系统中的附着（Attach）或者跟踪区更新（TAU）流程来实现的。参见图 2 所示，用户终端从 Non-3GPP 接入系统到 3GPP 接入系统的切换流程包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到演进网络。或者 UE 发现演进网络并且决定切换到演进网络。

3、UE 发送附着请求或者跟踪区更新请求消息到 MME。

4、UE、MME、HSS 之间执行鉴权流程。HSS 可以在这个步骤中将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

5、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

6、HSS 将用户的签约数据插入到 MME 中。

7、HSS 返回位置更新确认消息给 MME。HSS 可以在这个步骤中将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

8、UE、Serving GW、PDN GW 之间执行承载创建流程，创建 UE 使用的资源。

9、MME 发送附着接受或者跟踪区更新接受消息到 UE。

参见图 3 所示，在目前的协议中规定，用户终端正常附着（也可称之为初始附着 Initial Attach）到 3GPP 接入系统的流程包括下列步骤：

1、UE 发送附着请求消息到 MME。

2、UE、MME、HSS 之间执行鉴权流程。

3、如果用户存在已经创建的承载，则 MME 发起删除承载流程，将用户以前建立的承载删除掉。

4、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

5、HSS 将用户的签约数据插入到 MME 中。

6、HSS 返回位置更新确认消息给 MME。

7、MME 发起缺省承载创建程序，创建 UE 和 PDN GW 之间的缺省承载。

8、MME 注册 UE 使用的 PDN GW 地址信息到 HSS。这个处理也可以通过位置更新流程来处理，MME 发送位置更新消息给 HSS，消息中携带 PDN GW 地址信息。

9、MME 发送附着接受消息给 UE。

参见图 4 所示，在目前的协议中规定，用户终端正常跟踪区更新（也可称之为初始跟踪区更新 Initial TAU）到 3GPP 接入系统的流程包括下列步骤：

1、UE 发送跟踪区更新请求消息到 MME。

2、UE、MME、HSS 之间执行鉴权流程。

3、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

4、HSS 将用户的签约数据插入到 MME 中。

5、HSS 返回位置更新确认消息给 MME。

6、MME 接受 UE 的跟踪区更新请求，并发送跟踪区更新接受消息到 UE。

发明人在发明过程中发现，切换导致的 Attach/TAU 流程和正常 Attach/TAU 流程处理机制存在很大的不同：正常的 Attach 流程网络侧需要将用户以前建立的承载都删除掉，建立 UE 和 PDN GW 之间的缺省承载并且将 UE 使用的 PDN GW 地址信息注册到 HSS，而切换导致的 Attach 流程网络侧需将用户以前建立的承载都重新创建出来。正常的 TAU 流程网络侧不处理用户的承载，而切换导致的 TAU 流程网络侧需将用户以前建立的承载都重新创建出来。所以需要一种机制对不同的 Attach/TAU 流程进行处理。

正常的 3GPP 和 Non-3GPP 之间的切换由于先将 UE 从源接入网络断开，

然后 UE 再从目标接入网络通过 Attach 等流程接入，导致 UE 业务中断的时间比较长，影响用户的业务体验。所以现在 E-UTRAN 和 CDMA 网络中的 HRPD（High Rate Packet Data，高速分组数据）接入网络之间切换提出了一种优化切换机制。图 5 为 E-UTRAN 和 HRPD 网络优化切换的系统架构图。MME 和 HRPD AN（HRPD Access Network，HRPD 接入网络，处理 HRPD 网络中的移动性管理，无线资源管理等）之间增加 S101 接口，传递 MME 和 HRPD AN 之间的信令。PDSN（Packet Data Serving Node，分组数据服务节点）是 HRPD 网络中的一个用户面处理网元，进行 HRPD 网络的用户面处理。

现在 HRPD 网络和 E-UTRAN 网络之间的优化切换提出了一种预先路径切换（Early path switch）机制，即 UE 还未切换到目标接入网络（UE 还在源接入网络）时先将用户面路径切换到目标接入网络。

用户终端从 HRPD 到 E-UTRAN 网络的预先路径切换的优化切换流程包括下列步骤:

1、UE 在 HRPD 网络接入。

2、UE 或者 HRPD AN（Access Network，接入网络）决定执行切换到 E-UTRAN 网络。

3、UE 通过 HRPD 网络发送 Attach Request 消息到 MME。

4、鉴权程序被执行。

5、MME 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

6、MME 选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。

7、Serving GW 发起预先路径切换流程。Serving GW 和 PDN GW 之间的接口协议为 PMIP，则 Serving GW 发送 Proxy BU 消息到 PDN GW。

PDN GW 收到上述消息后切换用户面的路由到 Serving GW，即 PDN GW 收到下行数据后将发给 Serving GW。同时 PDN GW 不再向 PDSN 发送下行数据包。

8、Serving GW 回 Create Default Bearer Response 消息给 MME。

9、MME 发送 Relocation Request 消息到 eNodeB 请求 eNodeB 建立接入网侧资源。eNodeB 完成接入网侧资源的创建后回 Relocation Request Acknowledge 消息给 MME。

10、MME 发送 Update Bearer Request 消息到 Serving GW 更新 Serving GW 的下行用户面路径到 eNodeB。Serving GW 回 Update Bearer Response 消息到 MME。

11、MME 发送 S101 HO Command 消息到 HRPD AN，消息中包含 Attach Accept 消息和 HO Command 消息。

12、HRPD AN 发送 HRPD AN L2 消息到 UE，消息中包含 Attach Accept 消息和 HO Command 消息。

13、UE 切换到 E-UTRAN 网络，发送 HO Complete 消息到 eNodeB。

14、eNodeB 发送 Relocation Complete 消息给 MME，通知 MME UE 已经切换到 E-UTRAN 网络。发明人在发明过程中发现，对于 HRPD 网络到 E-UTRAN 网络切换来说，UE 可能在两种状态下发生切换：空闲状态和激活状态。当 UE 在激活状态下发生切换时在切换的流程中通知接入网建立接入网侧的承载可以加快 UE 切换到目标接入网络后业务恢复的时间。但是在空闲状态下 UE 并没有业务在运行，对切换的时延要求也不是很高，同时 UE 在空闲状态下建立接入网侧的承载会浪费接入网侧的资源。而且预先切换机制，当 UE 切换失败时还需要通知 PDN GW 将下行路径切回源接入网络。所以预先切换机制会增加系统的复杂性。

所以为了优化网络的处理和节省接入网的资源，需要一种机制对激活状态和空闲状态的切换流程进行区分处理。

发明内容

本发明实施例提供一种注册处理方法、系统及装置，以使网络侧可区分不同的注册处理类型。

本发明实施例的一种注册处理方法，包括：接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及根据所述处理类型信息，识别该注册的处理类型。

本发明实施例的另一种注册处理方法，包括下列步骤：接收 HSS 或者 AAA Server 上报的用户终端 UE 注册的处理类型信息；以及根据所述处理类型信息，识别该注册的处理类型。

本发明实施例的系统，包括：用户终端 UE，用于在注册到网络的过程中，将该注册的处理类型信息上报；网络侧，用于根据接收的 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

本发明实施例的用户终端，包括：识别单元，用于在该 UE 发起注册时，识别该注册的类型；注册发起单元，用于发起注册，并发出注册触发信号；上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报。

本发明实施例的网络侧的网元，包括：获取单元，用于获取 UE 在注册到网络的过程中上报的处理类型信息；识别单元，用于根据获取单元获取的处理类型信息，识别该注册的处理类型。

本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

附图说明

图 1 为现有演进网络的系统架构示意图；

图 2 为现有用户终端从 Non-3GPP 接入系统到 3GPP 接入系统的切换流程图；

图 3 为现有用户终端正常附着到 3GPP 接入系统的流程图；

图 4 为现有用户终端正常跟踪区更新到 3GPP 接入系统的流程图；

图 5 为现有 HRPD 和 E-UTRAN 接入系统的优化切换系统架构示意图；

图 6 为本发明实施例 6 的流程图；

图 7 为本发明实施例的方法步骤流程图；

图 8 为本发明实施例的系统的结构示意图；

图 9 为本发明实施例的用户终端的结构示意图；

图 10 为本发明实施例的网络侧网元的结构示意图；

图 11 为本发明实施例 1 的流程图；

图 12 为本发明实施例 2 的流程图；

图 13 为本发明实施例 3 的流程图；

图 14 为本发明实施例 4 的流程图；

图 15 为本发明实施例 5 的流程图；

图 16 为本发明实施例 7 的流程图；

图 17 为本发明实施例 8 的流程图；

图 18 为本发明实施例 9 的流程图；

图 19 为本发明实施例 10 的流程图；

图 20 为本发明实施例 11 的流程图；

图 21 为本发明实施例 12 的流程图；

图 22 为本发明实施例 13 的流程图。

具体实施方式

为了使网络侧可区分不同的注册处理类型。

本发明实施例提供了一种注册处理方法，参见图 7 所示，包括下列主要步骤：

S1、网络侧接收 UE 在注册到网络的过程中上报的该注册的处理类型信息。

本步骤之前，UE 在注册到网络时，可先识别该注册的类型。当 UE 注册到网络的过程中，将识别出的该注册类型对应的处理类型信息上报给网络侧。

S2、网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例还提供了另一种注册处理方法，包括下列主要步骤：网络侧接收 HSS 或者 AAA Server 上报的用户终端 UE 注册的处理类型信息；网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例还提供了一种注册处理系统，参见图 8 所示，其包括：用户终端和网络侧。

UE，用于在注册到网络的过程中，将该注册的处理类型信息上报。所述用户终端 UE 在注册到网络时，识别注册的处理类型信息后再将所述注册的处理类型信息上报。

网络侧，用于根据接收的 UE 上报的该注册的处理类型信息，识别该注册的处理类型。具体的，由网络侧的移动性管理实体 MME（演进网络）、服务 GPRS 支持节点 SGSN（2G/3G 网络）或非 3GPP 网关设备（非 3GPP 网络）对 UE 上报的处理类型信息进行识别。

本发明实施例还提供了一种用户终端，参见图 9 所示，其包括：识别单元、注册发起单元和上报单元。

识别单元，用于在该 UE 发起注册时，识别该注册的类型。

注册发起单元，用于发起注册，并发出注册触发信号。

上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报，上报的方式包括但不限于以下几种：

上报单元将处理类型信息携带于附着请求消息中的信元中；或者，将处理类型信息携带于跟踪区更新请求消息中的信元中；或者，将处理类型信息携带于路由区更新请求消息中的信元中；或者，将处理类型信息携带于接入请求消息中的信元中；或者，将处理类型信息携带于接入鉴权或者鉴权消息中的信元中；或者将处理类型信息携带于 IKEv2 或 IPsec SA 建立消息中的信元中。

上报单元上报的过程具体为：所述上报单元对应不同的注册类型，向网络侧发送不同的附着请求消息；或者，对应不同的注册类型，向网络侧发送不同的跟踪区更新请求消息；或者，对应不同的注册类型，向网络侧发送不同的路由区更新请求消息；或者，对应不同的注册类型，向网络侧发送不同的接入请求消息。

本发明实施例还提供了一种网络侧的网元，具体的，该网元为移动性管理实体 MME（演进网络）、服务 GPRS 支持节点 SGSN（2G/3G 网络）或非 3GPP 网关（非 3GPP 网络），参见图 10 所示，其包括：获取单元和识别单元。

获取单元，用于获取注册的过程中 UE 的注册处理类型信息。具体的，获取的处理类型信息由所述 UE、HSS 或者 AAA Server 上报。

识别单元，用于根据获取单元获取的处理类型信息，识别该注册的处理类型。

所述的网元进一步包括：第一处理单元，

用于在所述识别单元识别注册的处理类型为切换注册处理类型时，发起网络侧承载创建流程，创建所述 UE 使用的承载资源。

所述的网元进一步包括第二处理单元，用于在所述识别单元识别注册的处理类型为激活模式下的切换注册处理类型时，不发起源接入网络的资源释放处理。

所述的网元进一步包括第三处理单元，用于在所述识别单元识别注册的处理类型为激活模式下的切换注册处理类型时，发起目标网络的网元与源网络的网元之间的数据转发隧道资源创建处理。

以下通过多个实施例具体描述。

实施例 1：UE 在发送注册请求消息到 MME 时，将该注册的处理类型信息上报给 MME，MME 据此识别该注册的处理类型；进一步根据该注册的处理类型进行相应的处理，完成注册。MME 上报注册的处理类型给 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 Non-3GPP 网络中使用的资源在 3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 Non-3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 Non-3GPP 网络中的注册，AAA Server 通知 Non-3GPP 网络释放 UE 使用的资源。参见图 11 所示，包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到演进网络。或者 UE 发现演进网络并决定发起切换。

3、UE 在发起注册到演进网络之前，识别该注册的类型；之后发送注册请求消息到 MME，并相应将该注册的处理类型信息上报给 MME。

其中，可以通过如下方式之一上报：

1）在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。或者 UE

在附着请求消息中增加指示位，表明该附着请求消息是切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为 “Handover Attach”。

2）定义新的消息。例如：定义新的切换附着请求消息（Handover Attach Request），该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息），这样 UE 可向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常附着请求的消息（或者称之为初始附着请求的消息），原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附着请求消息（或者称之为初始附着请求消息）都重新定义）

3）在跟踪区更新请求消息中增加 Update Type 信元。例如：该 Update Type 信元有如下两个取值：0 对应 Normal TAU（也可称之为 Initial TAU），表明该跟踪区更新请求消息是正常的跟踪区更新请求消息（也可称之为初始的跟踪区更新请求消息）；1 对应 Handover TAU，表明该跟踪区更新请求消息是切换导致的跟踪区更新请求消息。或者 UE 在跟踪区更新请求消息中增加指示位表明该跟踪区更新请求消息是切换导致的跟踪区更新请求消息，而原有的跟踪区更新请求消息表明一个正常的跟踪区更新请求消息（或者称之为初始的跟踪区更新请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “TAU due to Handover”。

c) Update Type 信元。UE 将该信元设置为 “Handover TAU”。

4)定义新的消息。例如：定义新的切换跟踪区更新请求消息(Handover TAU Request)，该消息表明一个切换导致的跟踪区更新请求消息，而原有的跟踪区更新请求消息表明一个正常的跟踪区更新请求消息（或者称之为初始的跟踪区更新请求消息），这样 UE 可向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常的跟踪区更新请求（或

者称之为初始的跟踪区更新请求）的消息，原有的跟踪区更新请求消息对应切换导致的跟踪区更新请求消息；或者切换导致的跟踪区更新请求消息和正常跟踪区更新请求（或者称之为初始跟踪区更新请求）消息都重新定义）

4、UE、MME、HSS 之间执行鉴权流程，获取用户使用的 PDN GW 地址信息。MME 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。如果注册处理类型为切换处理类型，则 HSS 可以将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

5、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。MME 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。

6、HSS 将用户的签约数据插入到 MME 中。

7、HSS 返回位置更新确认消息给 MME。HSS 可以在这个步骤中将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

如果 UE 的注册过程中由 HSS 识别 UE 的注册处理类型（如 HSS 发现保存有用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息，则 HSS 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，HSS 认为 UE 的注册处理类型为正常的注册处理类型），则 HSS 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给 MME。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 HSS 增加切换指示位信元（Handover Indication）。对于正常的注册处理类型，HSS 不携带这个信元。

b) Cause 信元。对于切换导致的注册处理，HSS 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，HSS 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带这个 Cause 信元。

c) Update Type 信元。对于切换导致的注册处理，HSS 将该信元设置为“Handover Attach”。对于正常注册处理，HSS 将该信元设置为“Initial Attach”或者不携带这个信元。

8、MME 根据 UE 上报或者 HSS 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，MME 已区分了不同的注册处理类型。

进一步，如果处理类型为正常发起的注册，则 MME 按照正常的注册流程处理。步骤 11 至 18 将被执行。

如果处理类型为切换导致的注册，则 MME 发送请求承载创建消息到获取的 PDN GW 的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。并转入步骤 9。

9、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 18。

11、如果 UE 的注册处理类型为正常发起的注册，且 HSS 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 Non-3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 AAA Server 注册到 HSS，则 HSS 发送取消注册消息到 AAA Server 请求取消 UE 在 Non-3GPP 接入网络中的注册。AAA Server 回取消注册确认消息到 HSS。

12、AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 Non-3GPP 接入网络中的注册。PDN GW 回取消注册确认消息到 AAA Server。

13、如果 PDN GW 和 Non-3GPP 网关设备之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 Non-3GPP 网关设备，取消 Non-3GPP 网关设备和 PDN GW 之间的 PMIP 绑定。Non-3GPP 网关设备回绑定撤销确认消息到 PDN GW。

14、AAA Server 也可以发送会话终止消息到 Non-3GPP 网关设备。Non-3GPP 网关设备回会话终止确认消息到 AAA Server。

15、Non-3GPP 网关设备收到绑定取消指示消息或者会话终止消息后发起资源释放程序，释放 UE 在 Non-3GPP 接入网络中使用的资源。

16、如果 UE 的注册处理类型为正常发起的注册，则 MME 发起缺省承载创建程序，创建 UE 和 PDN GW 之间的缺省承载。

17、MME 注册 UE 使用的 PDN GW 地址信息到 HSS。这个处理也可以通过位置更新流程来处理，MME 发送位置更新消息给 HSS，消息中携带 PDN GW 地址信息。

18、MME 回附着接受或者跟踪区更新接受消息到 UE。

实施例 2：这种机制也能应用到 2G/3G 系统。UE 在发送注册请求消息到 SGSN 时，将该注册的处理类型信息上报给 SGSN，SGSN 据此识别该注册的处理类型；进一步根据该注册的处理类型进行相应的处理，完成注册。SGSN 上报注册的处理类型给 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 Non-3GPP 网络中使用的资源在 3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 Non-3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 Non-3GPP 网络中的注册，AAA Server 通知 Non-3GPP 网络释放 UE 使用的资源。参见图 12 所示，包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到 2G 或者 3G 网络。或者 UE 发现 2G 或者 3G 网络并决定发起切换。

3、UE 在发起注册到 2G 或者 3G 网络之前，识别该注册的类型；之后发送注册请求消息到 SGSN，并相应将该注册的处理类型信息上报给 SGSN。

其中，可以通过如下方式之一上报：

1）在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。或者 UE 在附着请求消息中增加指示位表明该附着请求消息是切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为 “Handover Attach”。

2）定义新的消息。例如：定义新的切换附着请求消息（Handover Attach Request），该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求（或者称之为初始的附着请求）消息，这样 UE 可向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常附着请求（或者称之为初始附着请求）的消息，原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附着请求（或者称之为初始附着请求）消息都重新定义）

3）在路由区更新请求消息中增加 Update Type 信元。例如：该 Update Type 信元有如下两个取值：0 对应 Normal RAU（也可称之为 Initial RAU），表明该路由区更新请求消息是正常的路由区更新请求消息（也可称之为初始的路由区更新请求消息）；1 对应 Handover RAU，表明该路由区更新请求消息是切换导致的路由区更新请求消息。或者 UE 在路由区更新请求消息中增加指示位表明该路由区更新请求消息是切换导致的路由区更新请求消息，而原有的路由区更新请求消息表明一个正常的路由区更新请求消息（或者称之为初始的路由区更新请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “RAU due to Handover”。

c) Update Type 信元。UE 将该信元设置为 “Handover RAU”。

4）定义新的消息。例如：定义新的切换路由区更新请求消息（Handover RAU Request），该消息表明一个切换导致的路由区更新请求消息，而原有的路由区更新请求消息表明一个正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，这样 UE 可向网络侧发送不同的路由区更新请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，原有的路由区更新请求消息对应切换导致的路由区更新请求消息；或者切换导致的路由区更新请求消息和正常路由区更新请求（或者称之为初始路由区更新请求）消息都重新定义）

4、UE、SGSN、HSS 之间执行鉴权流程。SGSN 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。如果注册处理类型为切换处理类型，则 HSS 可以将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 SGSN。

5、SGSN 发送位置更新消息给 HSS，注册 SGSN 的地址信息到 HSS。SGSN 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。

6、HSS 将用户的签约数据插入到 SGSN 中。

7、HSS 返回位置更新确认消息给 SGSN。HSS 可以在这个步骤中将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 SGSN。如果 UE 的注册过程中由 HSS 识别 UE 的注册处理类型（如 HSS 发现保存有用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息，则 HSS 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，HSS 认为 UE 的注册处理类型为正常的注册处理类型），则 HSS 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给 SGSN。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 HSS 增加切换指示位信元（Handover Indication）。对于正常的注册处理类型，HSS 不携带这个信元。

b) Cause 信元。对于切换导致的注册处理，HSS 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，HSS 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带这个 Cause 信元。

c) Update Type 信元。对于切换导致的注册处理，HSS 将该信元设置为“Handover Attach”。对于正常注册处理，HSS 将该信元设置为“Initial Attach”或者不携带这个信元。

8、SGSN 根据 UE 上报或者 HSS 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，SGSN 已区分了不同的注册处理类型。

进一步，如果处理类型为正常发起的注册，则 SGSN 按照正常的流程处理，步骤 11 至 16 将被执行。

如果处理类型为切换导致的注册，则 SGSN 发送请求承载创建消息到获取的 PDN GW（也就是现在的 GGSN）的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。并转入步骤 9。

9、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 16。

步骤 11 至步骤 15 同实施例 1 中的处理。这里不再描述。

16、SGSN 回附着接受或者路由区更新接受消息到 UE。

实施例 3：这种机制也能应用到可信（Trusted）的 Non-3GPP 系统。UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，同时 AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 13 所示，包括下列步骤：

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

2、MME 或者 SGSN 发送切换命令到 UE 通知 UE 切换到 Non-3GPP 网络。或者 UE 发现 Non-3GPP 网络并决定发起切换。

3、UE 在发起注册到 Non-3GPP 网络之前，识别该注册的类型；之后发送接入请求消息到非 3GPP 网关设备，并相应将该注册的处理类型信息上报给非 3GPP 网关设备。

其中，可以通过如下方式之一上报：

1）在接入请求消息中增加 Access Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。或者 UE 在接入请求消息中增加指示位表明该接入请求消息是切换导致的接入请求消

息，而原有的接入请求消息表明一个正常的接入请求消息（或者称之为初始的接入请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Access due to Handover”。

c) Access Type 信元。UE 将该信元设置为 “Handover Access”。

2）定义新的消息。例如：定义新的切换接入请求消息（Handover Access Request），该消息表明一个切换导致的接入请求消息，而原有的接入请求消息表明一个正常的接入请求（或者称之为初始的接入请求）消息，这样 UE 可向网络侧发送不同的接入请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常接入请求（或者称之为初始接入请求）消息，原有的接入请求消息对应切换导致的接入请求消息；或者切换导致的接入请求消息和正常接入请求（或者称之为初始接入请求）消息都重新定义）

4、UE、非 3GPP 网关、AAA Server、HSS 之间执行鉴权流程。UE 也可以在这个步骤中将 UE 的注册处理类型上报给非 3GPP 网关。UE 在鉴权流程的消息中携带 Access Type 信元。例如：该 Access Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。

或者 UE 在鉴权流程的消息中携带 Attach Type 信元。例如：该 Atatch Type 信元有如下两个取值：0 对应 Normal Attach（或者称之为 Initial Attach），表明该 UE 的注册处理类型是正常的注册(或者称之为初始的注册)；1 对应 Handover Attach，表明该 UE 的注册处理类型是切换导致的注册。

或者 UE 在鉴权流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的鉴权流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为 “Handover Attach”。

非 3GPP 网关在这个步骤中将 UE 的注册处理类型上报给 AAA Server。

如果 UE 的注册过程中由 AAA Server 识别 UE 的注册处理类型（如 AAA Server 发现保存有用户在 3GPP 接入网络中使用的 PDN GW 地址信息，则 AAA Server 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，AAA Server 认为 UE 的注册处理类型为正常的注册处理类型），则 AAA Server 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给非 3GPP 网关。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 AAA Server 增加切换指示位信元（Handover Indication）。对于正常的注册处理类型，AAA Server 不携带这个信元。

b) Cause 信元。对于切换导致的注册处理，AAA Server 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，AAA Server 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带这个 Cause 信元。

c) Update Type 信元。对于切换导致的注册处理，AAA Server 将该信元设置为“Handover Attach”。对于正常注册处理，AAA Server 将该信元设置为“Initial Attach”或者不携带这个信元。

5、非 3GPP 网关设备根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，非 3GPP 网关设备已区分了不同的注册处理类型。

进一步，如果处理类型为正常的接入，则非 3GPP 网关设备按照正常的接入流程处理。步骤 7 到 13 将被执行。

如果处理类型为切换导致的接入，则非 3GPP 网关设备发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到非 3GPP 网关设备。并转入步骤 6。

6、非 3GPP 网关发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 13。

7、 如果 UE 的注册处理类型为正常发起的注册，且 AAA Server 中存在注

册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 HSS 注册到 AAA Server，则 AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 3GPP 接入网络中的注册。PDN GW 回取消注册确认消息到 AAA Server。

8、如果 PDN GW 和 Serving GW 之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 Serving GW，取消 Serving GW 网关设备和 PDN GW 之间的 PMIP 绑定。Serving GW 回绑定取消确认消息给 PDN GW。

9、如果 Serving GW 收到绑定取消指示消息，则 Serving GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

10、如果 PDN GW 和 Serving GW 之间的接口协议为 GTP 协议，则 PDN GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

11、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

12、AAA Server 发送取消注册消息到 HSS，取消 UE 在 HSS 中的注册。HSS 回取消注册确认消息到 AAA Server。

13、非 3GPP 网关回接入接受消息到 UE。

实施例 4：这种机制也能应用到可信（Trusted）的 Non-3GPP 系统。UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，HSS 通知 MME/SGSN 释放 UE 在 3GPP 网络中使用的资源。参见图 14 所示，包括下列步骤：

步骤 1 至 6 同实施例 3 中的处理。

7、如果 UE 的注册处理类型为正常发起的注册，且 AAA Server 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用

的 PDN GW 地址信息，且通过 HSS 注册到 AAA Server，则 AAA Server 发送取消注册消息到 HSS，取消 UE 在 HSS 中的注册。HSS 回取消注册确认消息到 AAA Server。

8、HSS 发送位置取消消息到 MME/SGSN。MME/SGSN 回位置取消确认消息到 HSS。

9、MME/SGSN 分离 UE，释放 UE 在 3GPP 接入网络中使用的资源。

10、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

11、非 3GPP 网关回接入接受消息到 UE。

实施例 5：这种机制也能应用到非可信（Untrusted）的 Non-3GPP 系统。UE 在发送接入鉴权请求或者 IKEv2/IPSec SA（Internet Key Exchange Protocol Version 2/IP Security Protocol Security Association，因特网密钥交换协议版本 2/IP 网络安全协议安全联盟）建立请求消息到演进分组数据网关（一种非 3GPP 网关）ePDG（Evolved Packet data Gateway）时，将该注册的处理类型信息上报给 ePDG，ePDG 据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。ePDG 上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，同时 AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 15 所示，包括下列步骤：

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

2、MME 或者 SGSN 发送切换命令到 UE 通知 UE 切换到 Non-3GPP 网络。或者 UE 发现 Non-3GPP 网络并决定发起切换。

3、UE、ePDG、AAA Server、HSS 之间执行接入鉴权流程。UE 可以在这个步骤中将 UE 的注册处理类型上报给 ePDG。UE 在接入鉴权流程的消息中携带 Access Type 信元。例如：该 Access Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或

者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。

或者 UE 在接入鉴权流程的消息中携带 Attach Type 信元。例如：该 Atatch Type 信元有如下两个取值：0 对应 Normal Attach（或者称之为 Initial Attach），表明该 UE 的注册处理类型是正常的注册（或者称之为初始的注册）；1 对应 Handover Attach，表明该 UE 的注册处理类型是切换导致的注册。

或者 UE 在接入鉴权流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的接入鉴权流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为 “Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为 “Handover Attach”。

ePDG 在这个步骤中可以将 UE 的注册处理类型上报给 AAA Server，AAA Server 将 UE 的注册处理类型上报给 HSS。

如果 UE 的注册过程中由 AAA Server 识别 UE 的注册处理类型（如 AAA Server 发现保存有用户在 3GPP 接入网络中使用的 PDN GW 地址信息，则 AAA Server 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，AAA Server 认为 UE 的注册处理类型为正常的注册处理类型），则 AAA Server 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给 ePDG。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 AAA Server 增加切换指示位信元（Handover Indication）。对于正常的注册处理类型，AAA Server 不携带这个信元。

b) Cause 信元。对于切换导致的注册处理，AAA Server 将该 Cause 信元设置为 “Update due to Handover Attach”。对于正常注册处理，AAA Server 将该 Cause 信元设置为 “Update due to Initial Attach” 或者不携带这个 Cause 信元。

c) Update Type 信元。对于切换导致的注册处理，AAA Server 将该信元设

置为“Handover Attach”。对于正常注册处理，AAA Server 将该信元设置为“Initial Attach”或者不携带这个信元。

4、UE、ePDG、AAA Server 之间执行 IKEv2/IPSec SA 建立流程。UE 可以在这个步骤中将 UE 的注册处理类型上报给 ePDG。UE 可以在 IKEv2/IPSec SA 建立流程的消息中携带 Access Type 信元或者 Attach Type 信元指明 UE 的注册处理类型。或者 UE 在 IKEv2/IPSec SA 建立流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的 IKEv2/IPSec SA 建立流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为“Access due to Handover”。

c) Access Type 信元。UE 将该信元设置为“Handover Access”。

ePDG 在这个步骤中可以将 UE 的注册处理类型上报给 AAA Server，AAA Server 将 UE 的注册处理类型上报给 HSS。

5、ePDG 根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，ePDG 已区分了不同的注册处理类型。

进一步，如果处理类型为正常的接入，则 ePDG 按照正常的接入流程处理。步骤 7 到 13 将被执行。

如果处理类型为切换导致的接入，则 ePDG 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到非 3GPP 网关设备。并转入步骤 6。

6、ePDG 发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 13。

步骤 7 至 13 同实施例 3 中的处理。

综上所述，本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

进一步，网络侧可按照识别出的处理类型，进行对应的流程处理。而且本发明实施例中还公开了 UE 上报注册的处理类型信息的具体方式：通过增加信元或新定义消息，更好的支撑了本发明实施例。

进一步，除前述流程中说明的 Initial Attach 和 Handover Attach 处理类型外，本发明实施例中 UE、HSS、AAA 服务器等实体上报的注册处理类型信息还可以包括其它的注册处理类型，如 Pre-Registration（即 UE 预先注册到目标接入网络的注册处理类型），Idle Mode Handover（即 UE 空闲模式下切换时的注册处理类型），Active Mode Handover（即 UE 激活模式下切换时的注册处理类型）。如对于多模终端（Multi Mode）或者双模（Dual Mode）终端（即这种终端能够同时接入到多个网络中）来说，注册的处理类型可能有：Power On Attach（即 UE 开机时的注册处理类型），Normal Attach（即 UE 正常接入时的注册处理类型），Handover Attach（即 UE 切换时的注册处理类型）等。本发明实施例不限制注册处理类型的取值。如下以 Idle Mode Handover 和 Active Mode Handover 的处理来说明其它注册处理类型的处理。

实施例 6：UE 激活模式下的 HRPD 到 E-UTRAN 网络切换时，MME 获取 UE 的切换处理类型。MME 判断切换处理类型为 UE 激活模式下的切换时则 MME 通知 eNodeB 建立接入网侧资源及使用预先路径切换机制。参见图 6 所示，包括下列步骤：

1、UE 在 HRPD 网络接入。

2、UE 或者 HRPD AN（Access Network，接入网络）决定执行切换到 3GPP 网络。

3、UE 通过 HRPD 网络发送 Attach Request 消息到 MME。由 MME 获取处理类型信息。MME 获取处理类型信息具体可以为：

1）UE 上报：UE 在 Attach Request 消息中通知 MME 本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

✓ UE 在 Attach Request 消息中增加“Attach Type”信元指示 MME 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

0 表明（Idle Mode Handover）空闲模式下的切换；

1 表明（Active Mode Handover）激活状态下的切换；

✓ UE 在 Attach Request 消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。UE 可以设置 Cause 原因值为：

"Idle Mode Handover" 表明Attach Request是由于空闲状态下的切换导致的;

"Active Mode Handover" 表明Attach Request是由于激活状态下的切换导致的;

- ✓ UE 在 Attach Request 消息中增加 "UE State" 信元将 UE 的状态上报。MME 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置 "UE State" 为:

  0 (Idle state) 表明UE的状态为空闲状态

  1 (Active state) 表明UE的状态为激活状态

- ✓ UE 在激活状态下的切换时在 Attach Request 消息中增加 "active flag" 信元指示需要建立接入网侧的承载。在空闲状态下的切换时在 Attach Request 消息中不携带 "active flag" 信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将 "active flag" 信元设置为 "True (1)" 指示需要建立接入网侧的承载。在空闲状态下的切换时将 "active flag" 信元设置为 "False (0)" 指示不需要建立接入网侧的承载。

- ✓ UE 在空闲状态下的切换时在 Attach Request 消息中增加 "Non-active flag" 信元指示不需要建立接入网侧的承载。在激活状态下的切换时在 Attach Request 消息中不携带 "Non-active flag" 信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将 "Non-active flag" 信元设置为 "True (1)" 指示不需要建立接入网侧的承载。在激活状态下的切换时将 "Non-active flag" 信元设置为 "False (0)" 指示需要建立接入网侧的承载。

2) HRPD AN 上报: HRPD AN 在 S101 接口的消息中通知 MME 本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是:

- ✓ HRPD AN 在 S101 接口的消息中增加 "Attach Type" 信元指示 MME 切换的处理类型。其中, Attach Type 以不同取值表明不同的处理类型:

  0 表明 (Idle Mode Handover) 空闲模式下的切换

1 表明（Active Mode Handover）激活状态下的切换

✓ HRPD AN 在 S101 接口的消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。HRPD AN 可以设置 Cause 原因值为：

“Idle Mode Handover”表明Attach Request是由于空闲状态下的切换导致的；

“Active Mode Handover”表明Attach Request是由于激活状态下的切换导致的；

✓ HRPD AN 在 S101 接口的消息中增加“UE State”信元将 UE 的状态上报。MME 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

0 （Idle state）表明UE的状态为空闲状态

1 （Active state）表明UE的状态为激活状态

✓ UE 在激活状态下的切换时 HRPD AN 在 S101 接口的消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时 HRPD AN 在 S101 接口的消息中不携带“active flag”信元指示不需要建立接入网侧的承载。

✓ UE 在空闲状态下的切换时 HRPD AN 在 S101 接口的消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时 HRPD AN 在 S101 接口的消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。

4、鉴权程序被执行。

5、MME 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

6、MME选择Serving GW，向 Serving GW发送Create Default Bearer Request 消息。MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在激活状态下的切换，则 MME 在 Create Default Bearer Request 消息中要求 Serving GW“预先路径切换”。

7、Serving GW 收到 Create Default Bearer Request 消息后如果发现这个消

息要求 Serving GW "预先路径切换"，则 Serving GW 发起预先路径切换流程。Serving GW 发送 Proxy BU 消息到 PDN GW。PDN GW 收到上述消息后切换用户面的路由到 Serving GW，即 PDN GW 收到下行数据后将发给 Serving GW。

8、Serving GW 回 Create Default Bearer Response 消息到 MME。

9、MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在激活状态下的切换，则 MME 发送 Relocation Request 消息到 eNodeB 请求 eNodeB 建立接入网侧资源。eNodeB 完成接入网侧资源的创建后回 Relocation Request Acknowledge 消息给 MME。

10、MME 发送 Update Bearer Request 消息到 Serving GW 更新 Serving GW 的下行用户面路径到 eNodeB。Serving GW 回 Update Bearer Response 消息到 MME。

11、MME 如果发现切换是 UE 在激活状态下的切换，则 MME 发送 S101 HO Command 消息到 HRPD AN，消息中包含 Attach Accept 消息和 HO Command 消息。

12、HRPD AN 发送 HRPD AN L2 消息到 UE，消息中包含 Attach Accept 消息和 HO Command 消息。

13、UE 切换到 E-UTRAN 网络，发送 HO Complete 消息到 eNodeB。

14、eNodeB 发送 Relocation Complete 消息给 MME，通知 MME UE 已经切换到 E-UTRAN 网络。

值得说明的是：本实施例中步骤 6 与步骤 9 并没有绝对的先后时序关系。

实施例 7：UE 空闲模式下的 HRPD 到 E-UTRAN 网络切换时 MME 获取 UE 的切换处理类型。MME 判断切换处理类型为 UE 空闲模式下的切换时则 MME 不通知 eNodeB 建立接入网侧资源及不使用预先路径切换机制。参见图 16 所示，包括下列步骤：

1、UE 在 HRPD 网络接入。

2、UE 或者 HRPD AN（Access Network，接入网络）决定执行切换到 3GPP 网络。

3、UE 通过 HRPD 网络发送 Attach Request 消息到 MME。切换的处理类型需要通知给 MME。处理方法同实施例 6 中的描述。

4、鉴权程序被执行。

5、MME 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

6、MME 选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在空闲状态下的切换，则 MME 在 Create Default Bearer Request 消息中不要求 Serving GW "预先路径切换"。Serving GW 回 Create Default Bearer Response 消息到 MME。

7、MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在空闲状态下的切换，则 MME 不通知 eNodeB 建立接入网侧的资源，MME 通过 HRPD 网络直接发 Attach Accept 消息到 UE。

8、UE 切换到 E-UTRAN 网络，发送 TAU Request 消息到 MME 通知 MME UE 已经切换到 E-UTRAN 网络。

9、MME 发现 UE 在空闲状态下已经切换到 E-UTRAN 网络，则 MME 发送 Update Bearer Request 消息给 Serving GW。MME 在 Update Bearer Request 增加指示位要求 Serving GW 进行用户面路径切换。

10、Serving GW 收到 Update Bearer Request 消息后如果发现要求用户面路径切换，则 Serving GW 发送 Proxy BU 消息到 PDN GW 更新 PDN GW 的下行用户面路径。PDN GW 将下行用户面路径切换到 Serving GW 后回 Proxy BA 消息给 Serving GW。

11、Serving GW 回 Update Bearer Response 消息给 MME。

12、MME 回 TAU Accept 消息给 UE。

实施例 8：切换处理类型通知处理方法也能应用到 Non-3GPP 到 3GPP 网络的正常切换处理。UE 在 Attach Request 消息中将切换处理类型信息通知给 MME 或者 SGSN，MME 或者 SGSN 根据切换处理类型信息决定是否通知接入

网建立接入网侧的资源。参见图 17 所示，包括下列步骤：

1、UE 在 Non-3GPP 网络（如 Wimax、WLAN 等网络）接入。

2、UE 决定执行切换到 3GPP 网络，发起切换流程。

3、UE 通过 3GPP 接入网络（AN，Access network）发送 Attach Request 消息到核心网网元。如果 3GPP 接入网络为 GERAN/UTRAN，则核心网网元为 SGSN；如果 3GPP 接入网络为 E-UTRAN，则核心网网元为 MME。UE 在 Attach Request 消息中通知 MME/SGSN 这个 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程，MME 或者 SGSN 获取处理类型信息。具体的通知方式可以是：

- ✓ UE 在 Attach Request 消息中增加“Attach Type”信元指示 MME/SGSN 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

  0 表明（Idle Mode Handover）空闲模式下的切换；

  1 表明（Active Mode Handover）激活状态下的切换；

- ✓ UE 在 Attach Request 消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。UE 可以设置 Cause 原因值为：

  “Idle Mode Handover”表明Attach Request是由于空闲状态下的切换导致的；

  “Active Mode Handover”表明Attach Request是由于激活状态下的切换导致的；

- ✓ UE 在 Attach Request 消息中增加“UE State”信元将 UE 的状态上报。MME/SGSN 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

  0 （Idle state）表明UE的状态为空闲状态

  1 （Active state）表明UE的状态为激活状态

- ✓ UE 在激活状态下的切换时在 Attach Request 消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时在 Attach Request 消息中不携带“active flag”信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将“active flag”信元设置为“True

（1）”指示需要建立接入网侧的承载。在空闲状态下的切换时将“active flag”信元设置为“False（0）”指示不需要建立接入网侧的承载。

✓ UE 在空闲状态下的切换时在 Attach Request 消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时在 Attach Request 消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将“Non-active flag”信元设置为“True（1）”指示不需要建立接入网侧的承载。在激活状态下的切换时将“Non-active flag”信元设置为“False（0）”指示需要建立接入网侧的承载。

4、鉴权程序被执行。

5、MME/SGSN 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

6、MME/SGSN 选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。

7、Serving GW 发送 Proxy BU 消息到 PDN GW 更新 PDN GW 的下行用户面路径。PDN GW 将下行用户面路径切换到 Serving GW 后回 Proxy BA 消息给 Serving GW。

8、Serving GW 回 Create Default Bearer Response 消息给 MME/SGSN。

9、MME/SGSN 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME/SGSN 如果发现 UE 在激活状态下的切换，则步骤 9 至 12 被执行。MME/SGSN 如果发现 UE 在空闲状态下的切换，则步骤 13 至 14 被执行。

MME/SGSN发送Initial Context Setup Request消息给3GPP AN请求3GPP AN建立接入网侧的资源，同时这个消息也携带Attach Accept消息。

10、3GPP AN 和 UE 之间建立无线承载。

11、3GPP AN 回 Initial Context Setup Complete 消息给 MME/SGSN。这个消息中也携带 Attach Complete 消息。

12、MME/SGSN 发送 Update Bearer Request 消息给 Serving GW 请求

Serving GW 更新下行用户面路径到 eNodeB。Serving GW 更新下行用户面路径到 3GPP AN 后回 Update Bearer Response 消息到 MME/SGSN。

13、MME/SGSN 如果发现 UE 在空闲状态下的切换，则 MME/SGSN 发送 Attach Accept 消息给 UE。

14、UE 回 Attach Complete 消息给 MME/SGSN。

实施例 9: UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，由 AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 3GPP 网络中的注册， AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 18 所示，包括下列步骤：

— 1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

2、MME 或者 SGSN 发送切换命令到 UE，通知 UE 切换到 Non-3GPP 网络。或者 UE 发现 Non-3GPP 网络并决定发起切换。

3、UE 在发起注册到 Non-3GPP 网络之前，识别该注册的类型；之后发送接入请求消息到非 3GPP 网关设备，并相应将该注册的处理类型信息上报给非 3GPP 网关设备。

4、UE、非 3GPP 网关、AAA Server、HSS 之间执行鉴权流程。UE 也可以在这个步骤中将 UE 的注册处理类型上报给非 3GPP 网关。

非 3GPP 网关在这个步骤中将 UE 的注册处理类型上报给 AAA Server 和 HSS。如果注册处理类型为切换处理类型，则 AAA Server 或者 HSS 可以将用户在 3GPP 接入网络中使用的 PDN GW 地址信息提供给非 3GPP 网关。

如果 UE 的注册过程中由 AAA Server 或者 HSS 识别 UE 的注册处理类型（如 AAA Server 或者 HSS 发现保存有用户在 3GPP 接入网络中使用的 PDN GW 地址信息，则 AAA Server 或者 HSS 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，AAA Server 或者 HSS 认为 UE 的注册处理类型为正

常的注册处理类型），则 AAA Server 或者 HSS 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给非 3GPP 网关。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 AAA Server 或者 HSS 增加切换指示位信元（Handover Indication（切换指示位））。对于正常的注册处理类型，AAA Server 或者 HSS 不携带这个信元。

b) Cause（原因）信元。对于切换导致的注册处理，AAA Server 或者 HSS 将该 Cause 信元设置为 “Update due to Handover Attach（切换附着导致的更新）”。对于正常注册处理，AAA Server 或者 HSS 将该 Cause 信元设置为 “Update due to Initial Attach（初始化附着导致的更新）” 或者不携带这个 Cause 信元。

c) Update Type（更新类型）信元。对于切换导致的注册处理，AAA Server 或者 HSS 将该信元设置为 “Handover Attach（切换附着）”。对于正常注册处理，AAA Server 或者 HSS 将该信元设置为 “Initial Attach（初始化附着）” 或者不携带这个信元。

5、非 3GPP 网关设备根据 UE 上报或者 AAA Server 上报或者 HSS 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，非 3GPP 网关设备已区分了不同的注册处理类型。

进一步，如果处理类型为正常的接入，则非 3GPP 网关设备按照正常的接入流程处理。步骤 7 到 13 将被执行。

如果处理类型为切换导致的接入，则非 3GPP 网关设备发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到非 3GPP 网关设备。转入步骤 6。

6、非 3GPP 网关发起网络侧承载创建流程，创建用户使用的承载。转入步骤 13。

7、 如果 UE 的注册处理类型为正常发起的注册，且 HSS 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，则 HSS 发送取消注册消息到 AAA Server，取消 UE 在 AAA Server 中的注册。AAA Server 回取消注册确认消息到 HSS。

8、AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 3GPP 接入网络中的注册，PDN GW 回取消注册确认消息到 AAA Server。

9、如果 PDN GW 和 Serving GW 之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 Serving GW，取消 Serving GW 网关设备和 PDN GW 之间的 PMIP 绑定。Serving GW 回绑定取消确认消息给 PDN GW。

10、如果 Serving GW 收到绑定取消指示消息，则 Serving GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

11、如果 PDN GW 和 Serving GW 之间的接口协议为 GTP 协议，则 PDN GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

12、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

13、非 3GPP 网关回接入接受消息到 UE。

实施例 10： UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 3GPP 网络中的注册，同时 HSS 通知 MME/SGSN 释放 UE 在 3GPP 网络中使用的资源。参见图 19 所示，包括下列步骤：

步骤 1 至 6 同实施例 9 中的处理。

7、 如果 UE 的注册处理类型为正常发起的注册，且 HSS 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，则 HSS 发送取消注册消息到 AAA Server，取消 UE 在 AAA Server 中的注册。AAA Server 回取消注册确认消息到 HSS。

8、HSS 发送位置取消消息到 MME/SGSN。MME/SGSN 回位置取消确认消息到 HSS。

9、MME/SGSN 分离 UE，释放 UE 在 3GPP 接入网络中使用的资源。

10、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

11、非 3GPP 网关回接入接受消息到 UE。

实施例 11：UE 激活模式下的 Non-3GPP 到 3GPP 网络切换时，3GPP 网络侧第一网元获取 UE 的切换处理类型。3GPP 网络侧第一网元判断切换处理类型为 UE 激活模式下的切换时，则 3GPP 网络侧第一网元通知 PDN GW 不发起源 Non-3GPP 网络的资源释放处理、通知 Serving GW 创建 Serving GW 和 Non-3GPP GW 之间的数据转发隧道资源。参见图 20 所示，包括下列步骤：

1、UE 在 Non-3GPP 网络接入。

2、UE 或者 Non-3GPP 接入网元（如对于 HRPD 网络来说，Non-3GPP 接入网元为 HRPD RNC）决定执行切换到 3GPP 网络。

3、UE 通过 Non-3GPP 网络发送 Attach Request 消息到 3GPP 网络侧第一网元（对于 E-UTRAN 网络来说，3GPP 网络侧第一网元为 MME；对于 GERAN/UTRAN 网络来说，3GPP 网络侧第一网元为 SGSN）。由 3GPP 网络侧第一网元获取处理类型信息。3GPP 网络侧第一网元获取处理类型信息具体可以为：

1）UE 上报：UE 在 Attach Request 消息中通知 3GPP 网络侧第一网元本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

✓ UE 在 Attach Request 消息中增加“Attach Type”信元指示 MME 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

0 表明（Idle Mode Handover）空闲模式下的切换；

1 表明（Active Mode Handover）激活状态下的切换；或者，

对于激活状态下的优化切换或者预注册，UE将Attach Request消息中的“Attach Type”信元设置为“Optimized Handover（优化切换）”或者为“Pre-registration（预注册）”或者为“Handover（切换）”。网络侧第一网元收到这个Attach Type后缺省认为Attach流程是UE在激活状态下的切换

流程。

✓ UE 在 Attach Request 消息中增加"Cause"信元表明导致 Attach Request 消息的原因值。UE 可以设置 Cause 原因值为：

"Idle Mode Handover"表明Attach Request是由于空闲状态下的切换导致的；

"Active Mode Handover"表明Attach Request是由于激活状态下的切换导致的；

✓ UE 在 Attach Request 消息中增加"UE State"信元将 UE 的状态上报。MME 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置"UE State"为：

0 （Idle state）表明UE的状态为空闲状态；

1 （Active state）表明UE的状态为激活状态。

✓ UE 在激活状态下的切换时在 Attach Request 消息中增加"active flag"信元指示需要建立接入网侧的承载。在空闲状态下的切换时在 Attach Request 消息中不携带"active flag"信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将"active flag"信元设置为"True（1）"指示需要建立接入网侧的承载。在空闲状态下的切换时将"active flag"信元设置为"False（0）"指示不需要建立接入网侧的承载。

✓ UE 在空闲状态下的切换时在 Attach Request 消息中增加"Non-active flag"信元指示不需要建立接入网侧的承载。在激活状态下的切换时在 Attach Request 消息中不携带"Non-active flag"信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将"Non-active flag"信元设置为"True（1）"指示不需要建立接入网侧的承载。在激活状态下的切换时将"Non-active flag"信元设置为"False（0）"指示需要建立接入网侧的承载。

2） Non-3GPP 接入网元或者 Non-3GPP GW 上报：Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中通知 3GPP 网络侧第一网元本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

✓ Non-3GPP接入网元或者Non-3GPP GW在发送给3GPP网络侧第一网元接口的消息中增加“Attach Type”信元指示3GPP网络侧第一网元切换的处理类型。其中，Attach Type以不同取值表明不同的处理类型：

0 表明（Idle Mode Handover）空闲模式下的切换；

1 表明（Active Mode Handover）激活状态下的切换；或者，

对于激活状态下的优化切换或者预注册，Non-3GPP接入网元或者Non-3GPP GW将“Attach Type”信元设置为“Optimized Handover（优化切换）”或者为“Pre-registration（预注册）”或者为“Handover（切换）”。3GPP网络侧第一网元收到这个Attach Type后缺省认为Attach流程是UE在激活状态下的切换流程。

✓ Non-3GPP接入网元或者Non-3GPP GW在发送给3GPP网络侧第一网元接口的消息中增加“Cause”信元表明导致Attach Request消息的原因值。Non-3GPP接入网元或者Non-3GPP GW可以设置Cause原因值为：

“Idle Mode Handover”表明Attach Request是由于空闲状态下的切换导致的；

“Active Mode Handover”表明Attach Request是由于激活状态下的切换导致的；

✓ Non-3GPP接入网元或者Non-3GPP GW在发送给3GPP网络侧第一网元接口的消息中增加“UE State”信元将UE的状态上报。3GPP网络侧第一网元根据UE的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE可以设置“UE State”为：

0 （Idle state）表明UE的状态为空闲状态；

1 （Active state）表明UE的状态为激活状态。

✓ UE在激活状态下的切换时Non-3GPP接入网元或者Non-3GPP GW在发送给3GPP网络侧第一网元接口的消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时Non-3GPP接入网元或者Non-3GPP GW在发送给3GPP网络侧第一网元接口的消息中不携带“active flag”信元指示不需要建立接入网侧的承载。

✓ UE在空闲状态下的切换时Non-3GPP接入网元或者Non-3GPP GW在发送给3GPP网络侧第一网元接口的消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时Non-3GPP接入网元或者Non-3GPP GW在发送给3GPP网络侧第一网元接口的消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。

4、鉴权程序被执行。

5、3GPP网络侧第一网元发送Update Location消息到HSS，获取UE的签约数据。HSS返回UE的签约数据，包括UE使用的PDN GW地址信息。

6、3GPP网络侧第一网元选择Serving GW，向Serving GW发送Create Default Bearer Request消息。

7、如果Serving GW和PDN GW之间的接口协议使用GTP协议，Serving GW发送Create Default Bearer Request消息到PDN GW。如果Serving GW和PDN GW之间的接口协议使用PMIP协议，Serving GW发送Proxy BU消息到PDN GW。PDN GW回Create Default Bearer Response消息或者Proxy BA消息到Serving GW。

8、Serving GW回Create Default Bearer Response消息到3GPP网络侧第一网元。

9、3GPP网络侧第一网元如果发现UE在激活状态下的切换，则3GPP网络侧第一网元发送创建转发隧道请求消息到Serving GW，请求Serving GW建立转发隧道资源。Serving GW回创建转发隧道响应消息到3GPP网络侧第一网元，消息中携带转发隧道信息（Serving GW Address和GRE Keys）。

10、3GPP网络侧第一网元如果发现切换是UE在激活状态下的切换，则3GPP网络侧第一网元发送HO Command消息到Non-3GPP接入网元或者Non-3GPP GW，消息中包含Attach Accept消息和HO Command消息以及转发隧道信息（Serving GW Address和GRE Keys）。

11、如果Non-3GPP接入网元收到HO Command消息后发送创建转发隧道请求消息给Non-3GPP GW，将获得的转发隧道信息通知给Non-3GPP GW。Non-3GPP GW回创建转发隧道响应消息给Non-3GPP接入网元。

后续Non-3GPP GW通过转发隧道（Serving GW Address和GRE Keys）将

收到的下行数据转发给 Serving GW。

12、Non-3GPP 接入网元或者 Non-3GPP GW 发送 HO Command 消息到 UE，消息中包含 Attach Accept 消息和 HO Command 消息。

13、UE 切换到 3GPP 网络，发送 HO Complete 消息到 3GPP 接入网元。

14、3GPP 接入网元发送 Relocation Complete 消息给 3GPP 网络侧第一网元，通知 3GPP 网络侧第一网元 UE 已经切换到 3GPP 网络。

15、3GPP 网络侧第一网元发送修改承载请求消息到 Serving GW。3GPP 网络侧第一网元如果发现切换是 UE 在激活状态下的切换，则 3GPP 网络侧第一网元在修改承载请求消息中增加指示位信息指示 PDN GW 不发起 UE 在源 Non-3GPP 接入网络中的资源释放处理流程。这个指示位可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体处理方式可以有：

1）“Update Type”（更新类型）指示位。网络侧第一网元设置“Update Type”指示位为“Pre-registration（预注册）”或者为“Optimized Handover（优化切换）”。

2）“Cause（原因）”原因值。网络侧第一网元设置“Cause”原因值为“Pre-registration（预注册）”或者为“Optimized Handover（优化切换）”或者为“Resource not Release（资源不释放）”。

3）“Pre-registration Indication（预注册指示位）”指示位或者“Optimized Handover Indication（优化切换指示位）”指示位或者“Resource not Release Indication（资源不释放指示位）”指示位。

16、如果 Serving GW 和 PDN GW 之间的接口使用 GTP 协议，则 Serving GW 发送修改承载请求消息到 PDN GW。如果 Serving GW 和 PDN GW 之间的接口使用 PMIP 协议，则 Serving GW 发送代理绑定更新消息到 PDN GW。Serving GW 在修改承载请求或者代理绑定更新消息中增加指示位信息指示 PDN GW 不发起 UE 在源 Non-3GPP 接入网络中的资源释放处理流程。这个指示位可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体处理方式可以有：

1）“Update Type（更新类型）”或者“Binding Type（绑定类型）”指示位。Serving GW 设置“Update Type（更新类型）”或者“Binding Type（绑定类型）”

指示位为“Pre-registration（预注册）”或者为“Optimized Handover（优化切换）”。

2）“Cause（原因）”原因值。Serving GW 设置“Cause”原因值为“Pre-registration（预注册）”或者为“Optimized Handover（优化切换）”或者为“Resource not Release（资源不释放）”指示位。

3）“Pre-registration Indication（预注册指示位）”指示位或者“Optimized Handover Indication（优化切换指示位）”指示位或者“Resource not Release Indication（资源不释放指示位）”指示位。

PDN GW 收到上述消息后不发起 UE 在源 Non-3GPP 接入网络中的资源释放处理流程(即 Non-3GPP 接入网络中的资源释放处理不是由 PDN GW 触发)。PDN GW 回修改承载响应或者代理绑定确认消息到 Serving GW。

17、Serving GW 回修改承载响应消息到 3GPP 网络侧第一网元。

18、3GPP 网络侧第一网元在收到 eNodeB 发送 Relocation Complete 消息后回切换完成消息到 Non-3GPP 接入网元或者 Non-3GPP GW。

19、Non-3GPP 接入网元或者 Non-3GPP GW 收到 3GPP 网络侧第一网元发送的切换完成消息后发起源 Non-3GPP 接入网络中的资源释放处理流程。

值得说明的是:

1、本实施例中步骤 6 与步骤 9 并没有绝对的先后时序关系。

2、本实施例不限定步骤 9 和步骤 11 中的消息。如对于 HRPD 网络来说，步骤 11 中的消息也有可能为 A11 注册请求（A11-Registration Request）消息（A11-Registration Request）。

实施例 12: UE 激活模式下的 3GPP 到 Non-3GPP 网络切换时，Non-3GPP 网络中的网元获取 UE 的切换处理类型。Non-3GPP 网络中的网元判断切换处理类型为 UE 激活模式下的切换时则建立接入网侧资源、创建数据转发资源、通知 PDN GW 不发起源侧资源的释放处理。参见图 21 所示，包括下列步骤:

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 网络。

2、UE 通过 3GPP 网络执行 Non-3GPP 网络特定的附着程序、鉴权及认证程序。

3、UE 通过 3GPP 网络触发 Non-3GPP 网络中的层 3 附着程序。Non-3GPP 网络中的接入网络（如 HRPD 网络中的 RNC）或者 Non-3GPP GW（如 HRPD 网络中的 PDSN）获取切换处理类型信息。Non-3GPP 网络中的接入网络或者 Non-3GPP GW 获取切换处理类型信息具体可以为：

1）UE 上报：UE 在层 3 附着程序的消息中通知 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 本次流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

✓ UE 在层 3 附着程序的消息中增加“Attach Type”信元指示 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

0 表明（Idle Mode Handover）空闲模式下的切换；

1 表明（Active Mode Handover）激活状态下的切换；或者，

对于激活状态下的优化切换或者预注册，UE将层3附着程序的消息中的“Attach Type”信元设置为“Optimized Handover（优化切换）”或者为“Pre-registration（预注册）”或者为“Handover（切换）”。Non-3GPP网络中的接入网络或者Non-3GPP GW收到这个Attach Type后缺省认为层3附着程序是UE在激活状态下的切换流程。

✓ UE 在层 3 附着程序的消息中增加“Cause”信元表明导致层 3 附着程序的消息的原因值。UE 可以设置 Cause 原因值为：

“Idle Mode Handover”表明层3附着程序的消息是由于空闲状态下的切换导致的；

“Active Mode Handover”表明层3附着程序的消息是由于激活状态下的切换导致的；

✓ UE 在层 3 附着程序的消息中增加“UE State”信元将 UE 的状态上报。Non-3GPP 网络中的接入网络或者 Non-3GPP GW 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

0 （Idle state）表明UE的状态为空闲状态；

1 （Active state）表明UE的状态为激活状态。

✓ UE 在激活状态下的切换时在层 3 附着程序的消息消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时在层 3 附着程序的消息消息中不携带“active flag”信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将“active flag”信元设置为“True（1）”指示需要建立接入网侧的承载。在空闲状态下的切换时将“active flag”信元设置为“False（0）”指示不需要建立接入网侧的承载。

✓ UE 在空闲状态下的切换时在层 3 附着程序的消息消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时在层 3 附着程序的消息消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将“Non-active flag”信元设置为“True（1）”指示不需要建立接入网侧的承载。在激活状态下的切换时将“Non-active flag”信元设置为“False（0）”指示需要建立接入网侧的承载。

2） 3GPP 网络侧第一网元上报：3GPP 网络侧第一网元在与 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间的接口消息中通知 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 本次层 3 附着程序是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

✓ 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加“Attach Type”信元指示 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

0 表明（Idle Mode Handover）空闲模式下的切换；

1 表明（Active Mode Handover）激活状态下的切换；或者，

对于激活状态下的优化切换或者预注册，3GPP网络侧第一网元将“Attach Type”信元设置为“Optimized Handover（优化切换）”或者为“Pre-registration（预注册）”或者为“Handover（切换）”。Non-3GPP网络中的接入网络或者Non-3GPP GW收到这个Attach Type后缺省认为层3附

着程序是UE在激活状态下的切换流程。

- ✓ 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加“Cause”信元表明导致层 3 附着程序消息的原因值。3GPP 网络侧第一网元可以设置 Cause 原因值为:

“Idle Mode Handover”表明层3附着程序消息是由于空闲状态下的切换导致的;

“Active Mode Handover”表明层3附着程序消息是由于激活状态下的切换导致的;

- ✓ 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加“UE State”信元将 UE 的状态上报。Non-3GPP 网络中的接入网络或者 Non-3GPP GW 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为:

0 （Idle state）表明UE的状态为空闲状态;

1 （Active state）表明UE的状态为激活状态。

- ✓ UE 在激活状态下的切换时 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中不携带“active flag”信元指示不需要建立接入网侧的承载。
- ✓ UE 在空闲状态下的切换时 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。

值得说明的是:

Non-3GPP 网络中的接入网络或者 Non-3GPP GW 也可以在步骤 2 中获取切换处理类型信息。具体处理方式同步骤 3 中的处理。

4、如果 Non-3GPP 接入网络发现 UE 是在激活状态下的切换，则 Non-3GPP 接入网络发送创建转发隧道请求消息到 Non-3GPP GW 请求数据转发资源。

5、Non-3GPP GW 回创建转发隧道响应消息到 Non-3GPP 接入网络，消息中携带 Non-3GPP GW 的数据转发隧道信息（如对于 HRPD 网络来说，其数据转发隧道信息为 PDSN Address 和 PDSN GRE Key）。

6、如果 Non-3GPP GW 发现 UE 是在激活状态下的切换，则 Non-3GPP GW 发送创建资源请求消息到 Non-3GPP 接入网元请求建立接入网侧资源。Non-3GPP 接入网元分配接入网侧资源，回创建资源响应消息到 Non-3GPP GW。

7、如果 Non-3GPP 接入网元或者 Non-3GPP GW 发现 UE 是在激活状态下的切换，则 Non-3GPP 接入网元或者 Non-3GPP GW 发送切换命令到 3GPP 网络侧第一网元，消息中携带 Non-3GPP GW 的数据转发隧道信息。

8、3GPP 网络侧第一网元收到切换命令后发送创建转发隧道请求消息到 Serving GW，请求 Serving GW 建立数据转发隧道资源，消息中携带 Non-3GPP GW 的数据转发隧道信息。Serving GW 创建数据转发隧道信息，回创建转发隧道响应消息到 3GPP 网络侧第一网元。

9、3GPP 网络侧第一网元发送重定位命令消息到 3GPP 接入网元。

3GPP 接入网元将收到的下行数据包转发给 Serving GW，Serving GW 将收到的转发数据包转发给 Non-3GPP GW。

10、3GPP 接入网络发送切换命令消息到 UE，请求 UE 切换到 Non-3GPP 网络。

11、UE 切换到 Non-3GPP 网络，发送接入消息通知 Non-3GPP 网络中的网元 UE 已经切换到 Non-3GPP 网络（具体的接入消息由特定的 Non-3GPP 网络确定，如对于 HRPD 网络来说，接入消息为 HRPD Traffic Channel Complete（TCC，传输通道完成）消息）。

12、如果 Non-3GPP GW 和 PDN GW 之间的接口使用 PMIP 协议，则

Non-3GPP GW 发送代理绑定更新消息到 PDN GW。Non-3GPP GW 如果发现 UE 是在激活状态下的切换，则在代理绑定更新消息中增加指示位信息指示 PDN GW 不发起 UE 在源 3GPP 接入网络中的资源释放处理流程。这个指示位可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体处理方式同实施例 11 中的处理。

PDN GW 收到上述消息后不发起 UE 在源 3GPP 接入网络中的资源释放处理流程(即 3GPP 接入网络中的资源释放处理不是由 PDN GW 触发)。PDN GW 回代理绑定确认消息到 Non-3GPP GW。

13、如果 UE 和 PDN GW 之间的接口使用基于主机移动性协议(host-based mobility protocol，如双栈移动因特网版本 6 协议(DSMIPv6，Dual Stack MIPv6))，则 UE 发送绑定更新消息到 PDN GW。UE 如果发现 UE 是在激活状态下的切换，则在绑定更新消息中增加指示位信息指示 PDN GW 不发起 UE 在源 3GPP 接入网络中的资源释放处理流程。这个指示位可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体处理方式同实施例 11 中的处理。

PDN GW 收到上述消息后不发起 UE 在源 3GPP 接入网络中的资源释放处理流程(即 3GPP 接入网络中的资源释放处理不是由 PDN GW 触发)。PDN GW 回绑定确认消息到 UE。

14、Non-3GPP 接入网元或者 Non-3GPP GW 发送切换完成消息到 3GPP 网络侧第一网元。

15、3GPP 网络侧第一网元收到切换完成消息后发起 3GPP 网络侧的资源释放处理程序，删除 UE 在 3GPP 网络中使用的资源。

值得说明的是:

1、本发明实施例不限定步骤 5 和步骤 8 中的消息。如对于 HRPD 网络来说，步骤 5 中的消息也有可能为 A11 注册请求消息。

实施例 13: 切换处理类型通知处理方法也能应用到 3GPP 到 Non-3GPP 网络的正常切换处理。UE 在 Non-3GPP 网络的接入消息中将切换处理类型信息通知给 Non-3GPP GW，Non-3GPP GW 根据切换处理类型信息决定是否通知接入网建立接入网侧的资源。参见图 22 所示，包括下列步骤:

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 网络。

2、UE 切换到 Non-3GPP 网络，执行 Non-3GPP 网络特定的附着程序、鉴权及认证程序。

3、UE 通过 Non-3GPP 网络的接入网元触发 Non-3GPP 网络中的层 3 附着程序。Non-3GPP GW（如 HRPD 网络中的 PDSN）获取切换处理类型信息。Non-3GPP GW 获取切换处理类型信息具体可以为：

UE 上报：UE 在层 3 附着程序的消息中通知 Non-3GPP GW 本次流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式同实施例 6 中的处理。

值得说明的是：

Non-3GPP GW 也可以在步骤 2 中获取切换处理类型信息。具体处理方式同步骤 3 中的处理。

4、如果 Non-3GPP GW 发现 UE 是在激活状态下的切换，则 Non-3GPP GW 发送创建资源请求消息到 Non-3GPP 接入网元请求建立接入网侧资源。Non-3GPP 接入网元分配接入网侧资源，回创建资源响应消息到 Non-3GPP GW。

5、如果 Non-3GPP GW 和 PDN GW 之间的接口使用 PMIP 协议，则 Non-3GPP GW 发送代理绑定更新消息到 PDN GW。PDN GW 回代理绑定确认消息到 Non-3GPP GW。

6、如果 UE 和 PDN GW 之间的接口使用客户移动因特网协议，则 UE 发送绑定更新消息到 PDN GW。PDN GW 回绑定确认消息到 UE。

7、Non-3GPP GW 回层 3 附着完成消息到 UE。

综上所述，采用本发明的实施例，网络侧网元获取 UE 的注册处理类型信息后可以进行区分的处理，能够解决现有机制下网络侧无法针对不同的注册流程区分处理的问题。

显然，本领域的技术人员可以对本发明实施例进行各种改动和变型而不脱离本发明的精神和范围。这样，倘若本发明的这些修改和变型属于本发明权利要求及其等同技术的范围之内，则本发明也意图包含这些改动和变型在内。

说 明 书 附 图

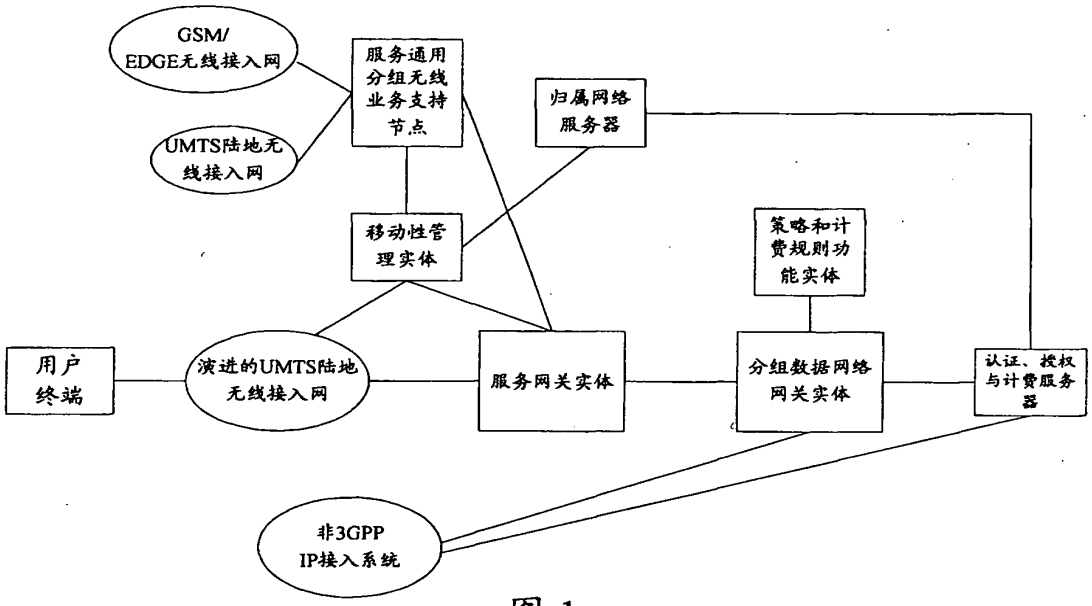

GSM/
EDGE无线接入网
UMTS陆地无
线接入网
服务通用
分组无线
业务支持
节点
归属网络
服务器
移动性管
理实体
策略和计
费规则功
能实体
用户
终端
演进的UMTS陆地
无线接入网
服务网关实体
分组数据网络
网关实体
认证、授权
与计费服务
器
非3GPP
IP接入系统

图 1

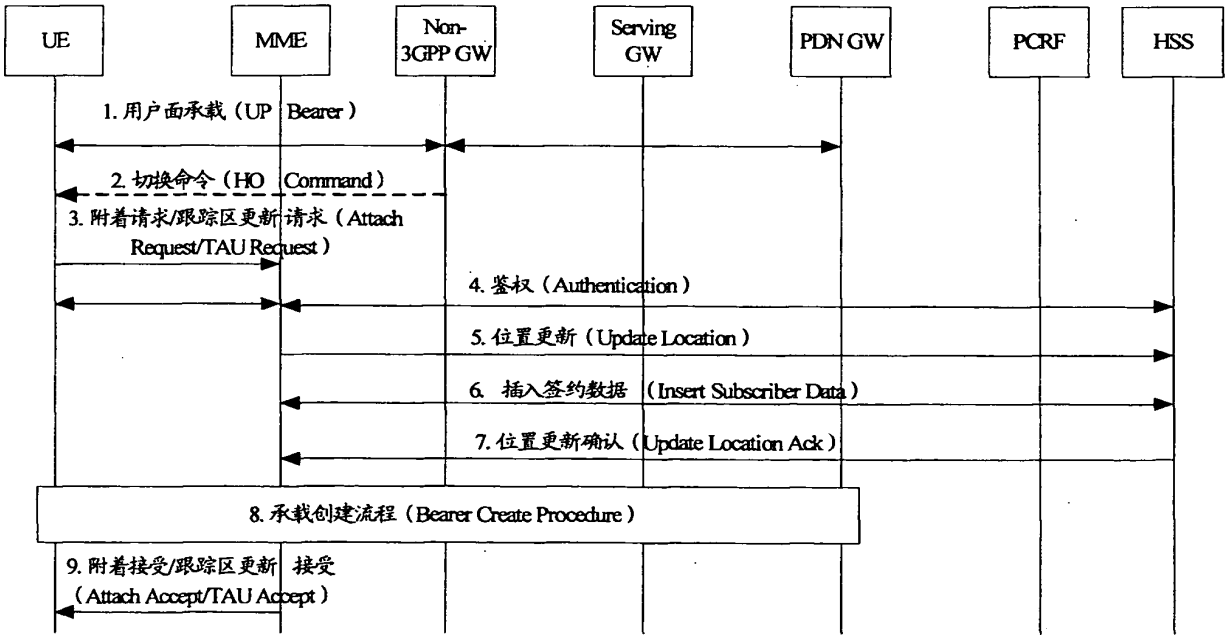

UE
MME
Non-
3GPP GW
Serving
GW
PDN GW
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/跟踪区更新请求（Attach
Request/TAU Request）
4. 鉴权（Authentication）
5. 位置更新（Update Location）
6. 插入签约数据（Insert Subscriber Data）
7. 位置更新确认（Update Location Ack）
8. 承载创建流程（Bearer Create Procedure）
9. 附着接受/跟踪区更新 接受
（Attach Accept/TAU Accept）

图 2

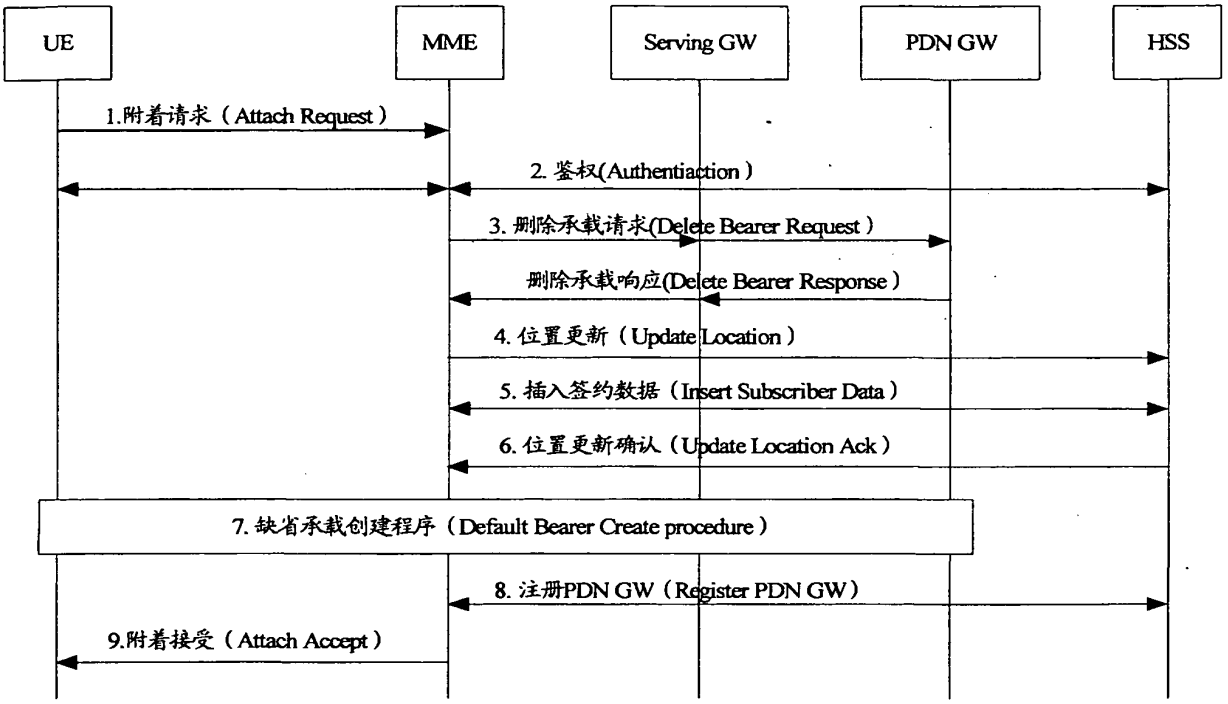

UE
MME
Serving GW
PDN GW
HSS
1.附着请求（Attach Request）
2. 鉴权(Authentiaction)
3. 删除承载请求(Delete Bearer Request)
删除承载响应(Delete Bearer Response)
4. 位置更新（Update Location）
5. 插入签约数据（Insert Subscriber Data）
6. 位置更新确认（Update Location Ack）
7. 缺省承载创建程序（Default Bearer Create procedure）
8. 注册PDN GW（Register PDN GW）
9.附着接受（Attach Accept）

图 3

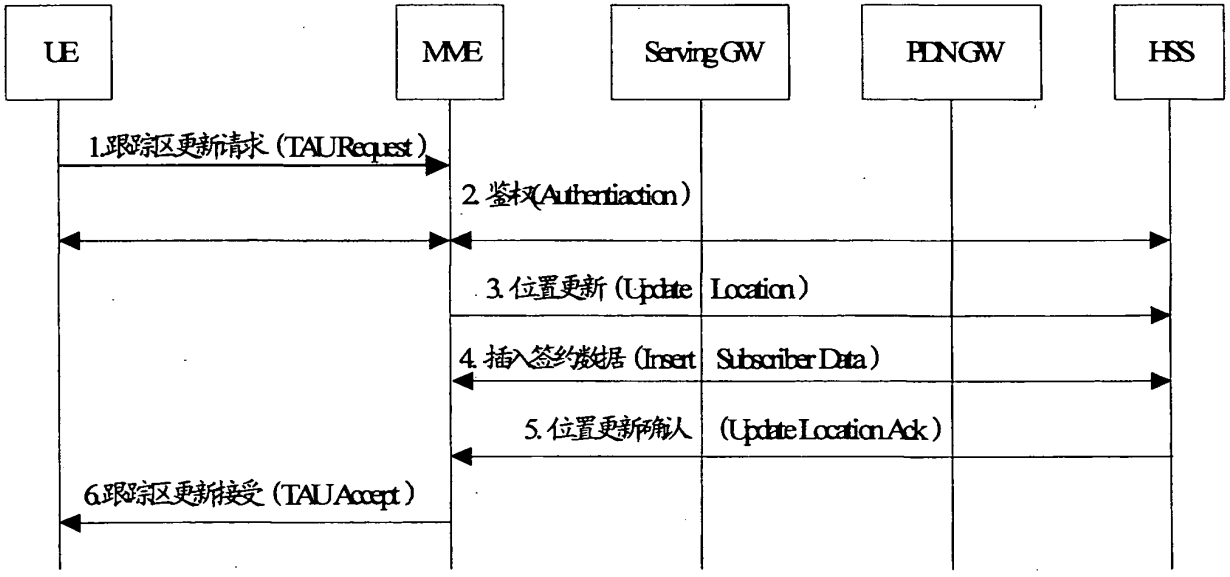

UE
MME
Serving GW
PDN GW
HSS
1.跟踪区更新请求（TAU Request）
2. 鉴权(Authentiaction)
3. 位置更新（Update Location）
4. 插入签约数据（Insert Subscriber Data）
5. 位置更新确认（Update Location Ack）
6.跟踪区更新接受（TAU Accept）

图 4

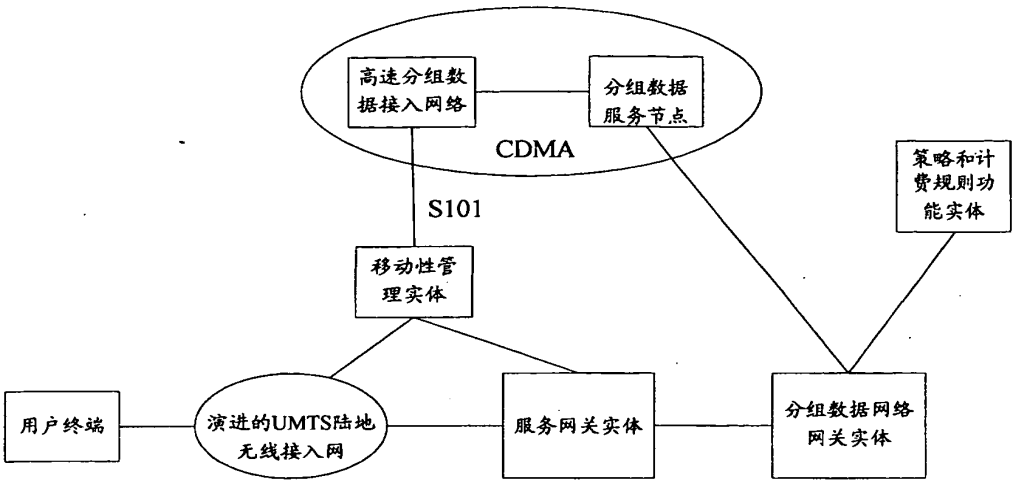

高速分组数据接入网络
分组数据服务节点
CDMA
策略和计费规则功能实体
S101
移动性管理实体
用户终端
演进的UMTS陆地无线接入网
服务网关实体
分组数据网络网关实体

图 5

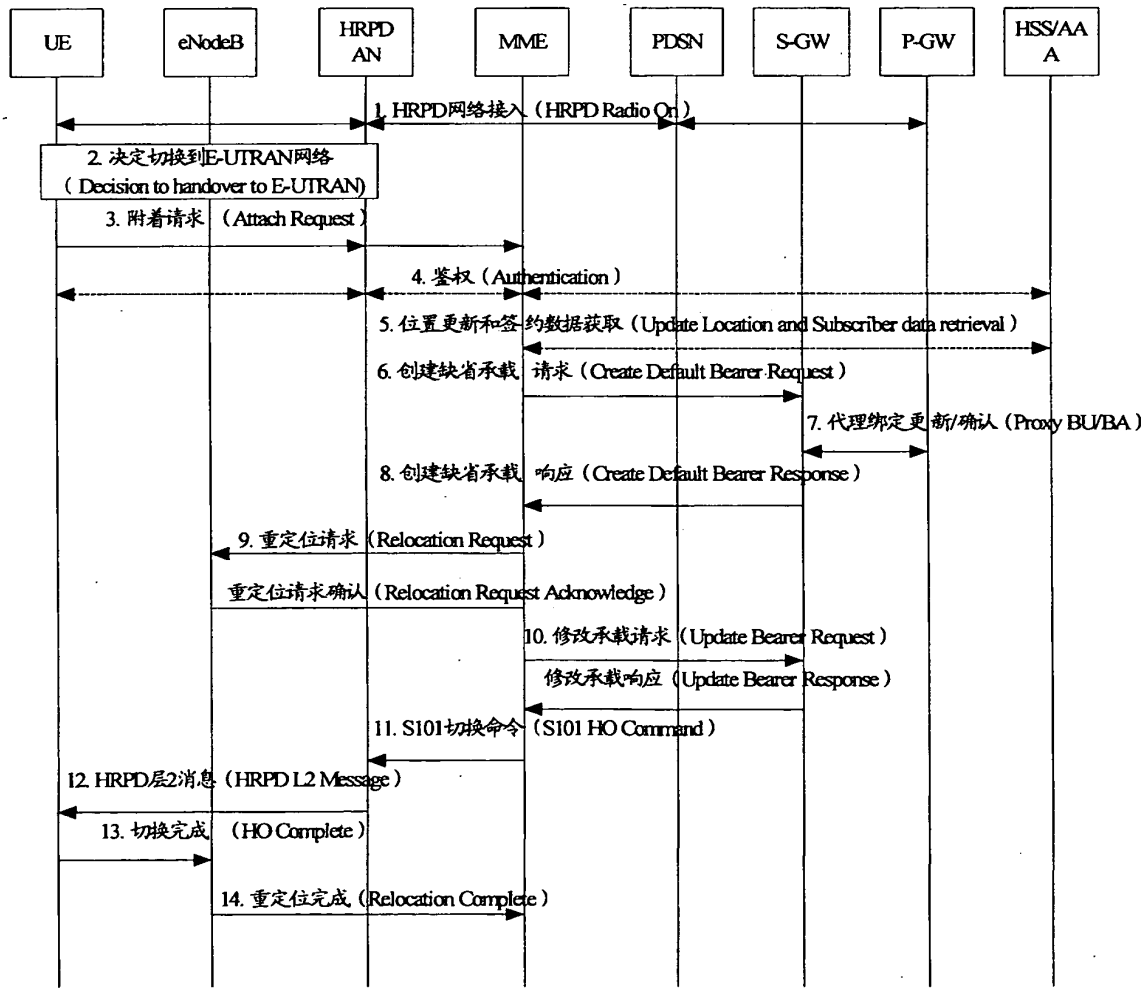

UE
eNodeB
HRPD AN
MME
PDSN
S-GW
P-GW
HSS/AAA
1. HRPD网络接入（HRPD Radio On）
2. 决定切换到E-UTRAN网络（Decision to handover to E-UTRAN）
3. 附着请求（Attach Request）
4. 鉴权（Authentication）
5. 位置更新和签约数据获取（Update Location and Subscriber data retrieval）
6. 创建缺省承载请求（Create Default Bearer Request）
7. 代理绑定更新/确认（Proxy BU/BA）
8. 创建缺省承载响应（Create Default Bearer Response）
9. 重定位请求（Relocation Request）
重定位请求确认（Relocation Request Acknowledge）
10. 修改承载请求（Update Bearer Request）
修改承载响应（Update Bearer Response）
11. S101切换命令（S101 HO Command）
12. HRPD层2消息（HRPD L2 Message）
13. 切换完成（HO Complete）
14. 重定位完成（Relocation Complete）

图 6

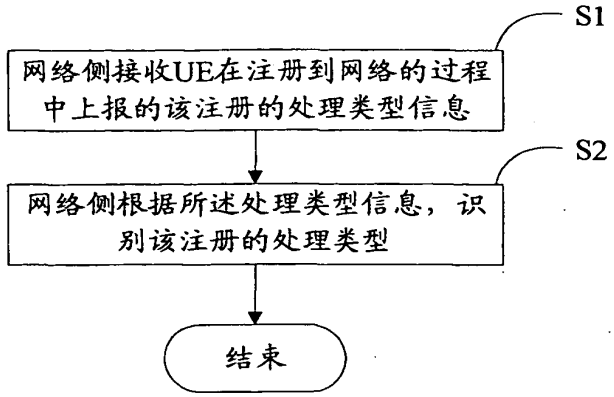

S1
网络侧接收UE在注册到网络的过程中上报的该注册的处理类型信息
S2
网络侧根据所述处理类型信息，识别该注册的处理类型
结束

图 7

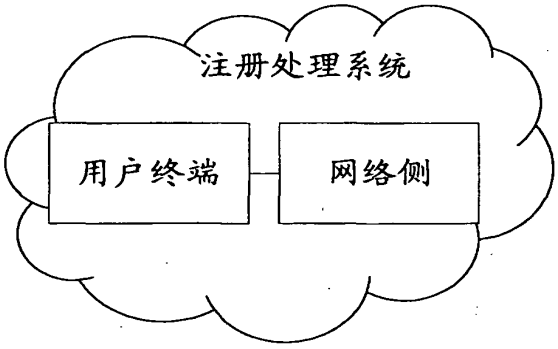

注册处理系统
用户终端
网络侧

图 8

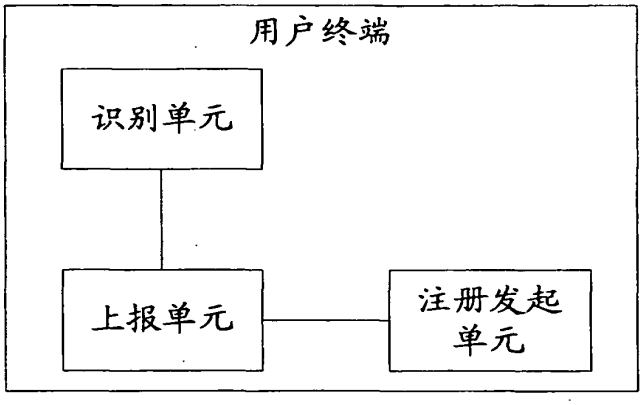

用户终端
识别单元
上报单元
注册发起单元

图 9

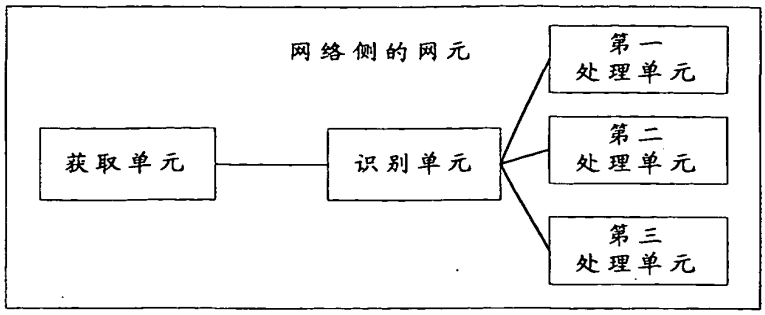

网络侧的网元
获取单元
识别单元
第一处理单元
第二处理单元
第三处理单元

图 10

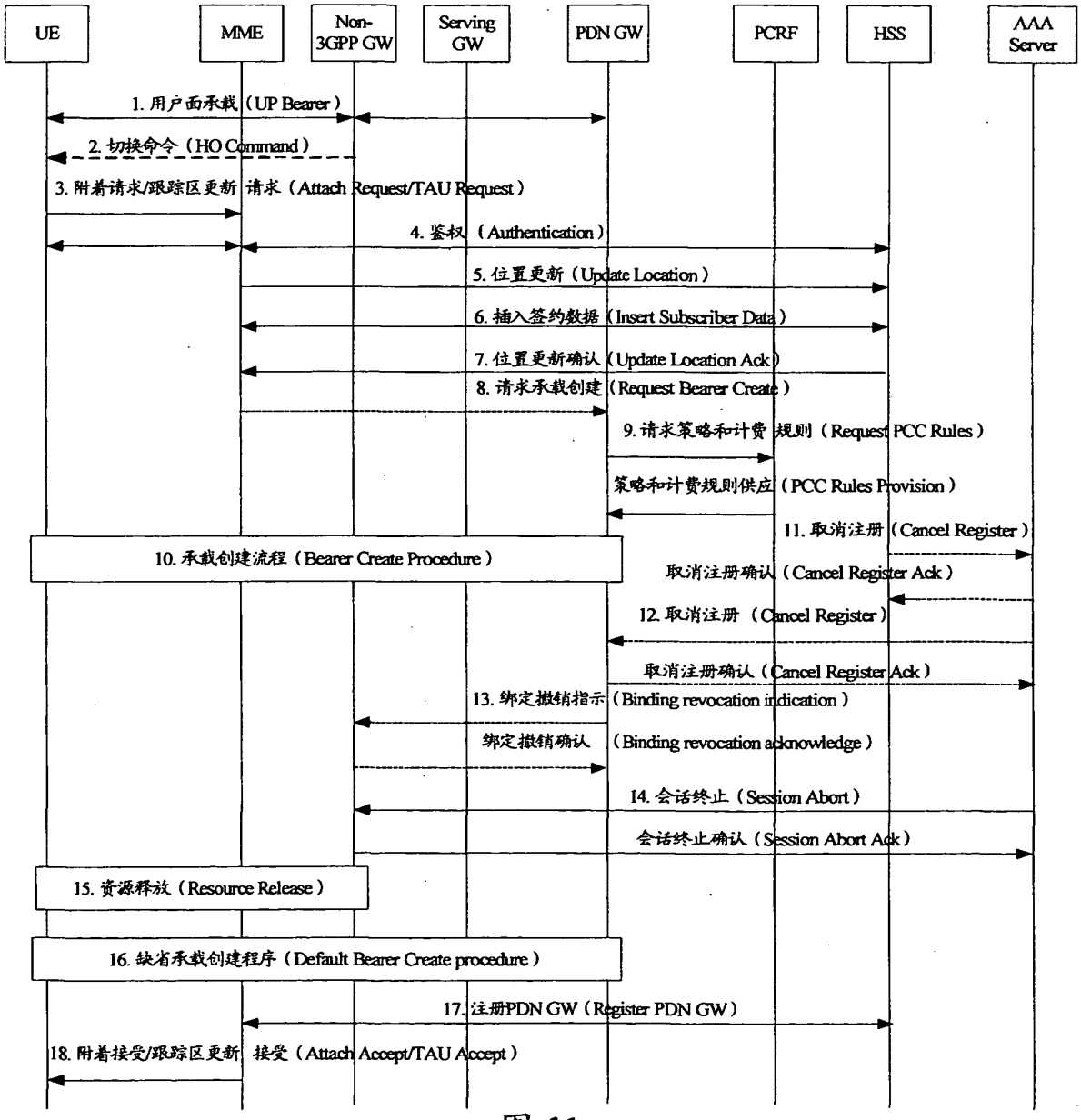

UE
MME
Non-3GPP GW
Serving GW
PDN GW
PCRF
HSS
AAA Server
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/跟踪区更新 请求（Attach Request/TAU Request）
4. 鉴权（Authentication）
5. 位置更新（Update Location）
6. 插入签约数据（Insert Subscriber Data）
7. 位置更新确认（Update Location Ack）
8. 请求承载创建（Request Bearer Create）
9. 请求策略和计费 规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
11. 取消注册（Cancel Register）
10. 承载创建流程（Bearer Create Procedure）
取消注册确认（Cancel Register Ack）
12. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
13. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
14. 会话终止（Session Abort）
会话终止确认（Session Abort Ack）
15. 资源释放（Resource Release）
16. 缺省承载创建程序（Default Bearer Create procedure）
17. 注册PDN GW（Register PDN GW）
18. 附着接受/跟踪区更新 接受（Attach Accept/TAU Accept）

图 11

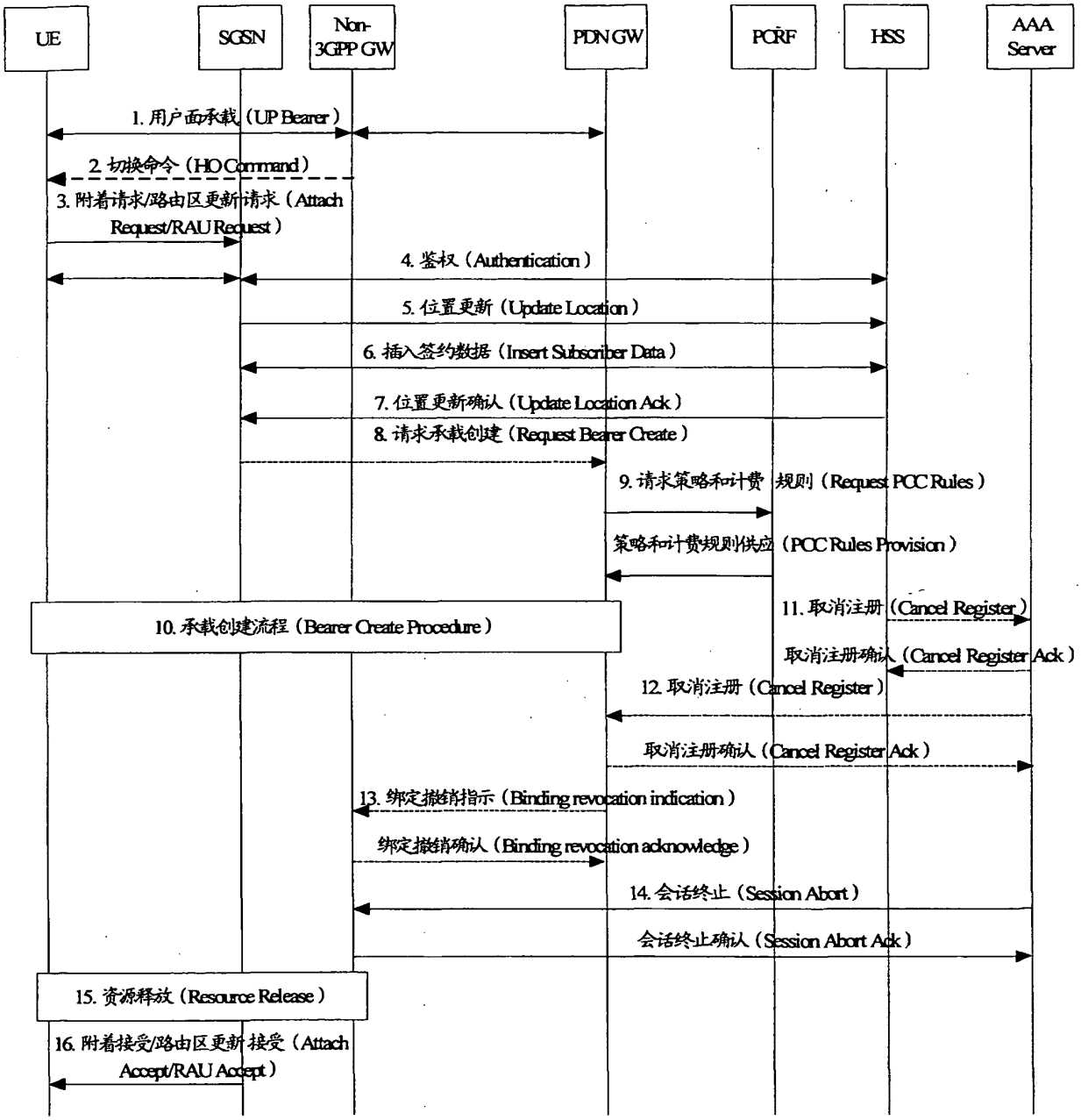

UE
SGSN
Non-3GPP GW
PDN GW
PCRF
HSS
AAA Server
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/路由区更新请求（Attach Request/RAU Request）
4. 鉴权（Authentication）
5. 位置更新（Update Location）
6. 插入签约数据（Insert Subscriber Data）
7. 位置更新确认（Update Location Ack）
8. 请求承载创建（Request Bearer Create）
9. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
10. 承载创建流程（Bearer Create Procedure）
11. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
12. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
13. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
14. 会话终止（Session Abort）
会话终止确认（Session Abort Ack）
15. 资源释放（Resource Release）
16. 附着接受/路由区更新接受（Attach Accept/RAU Accept）

图 12

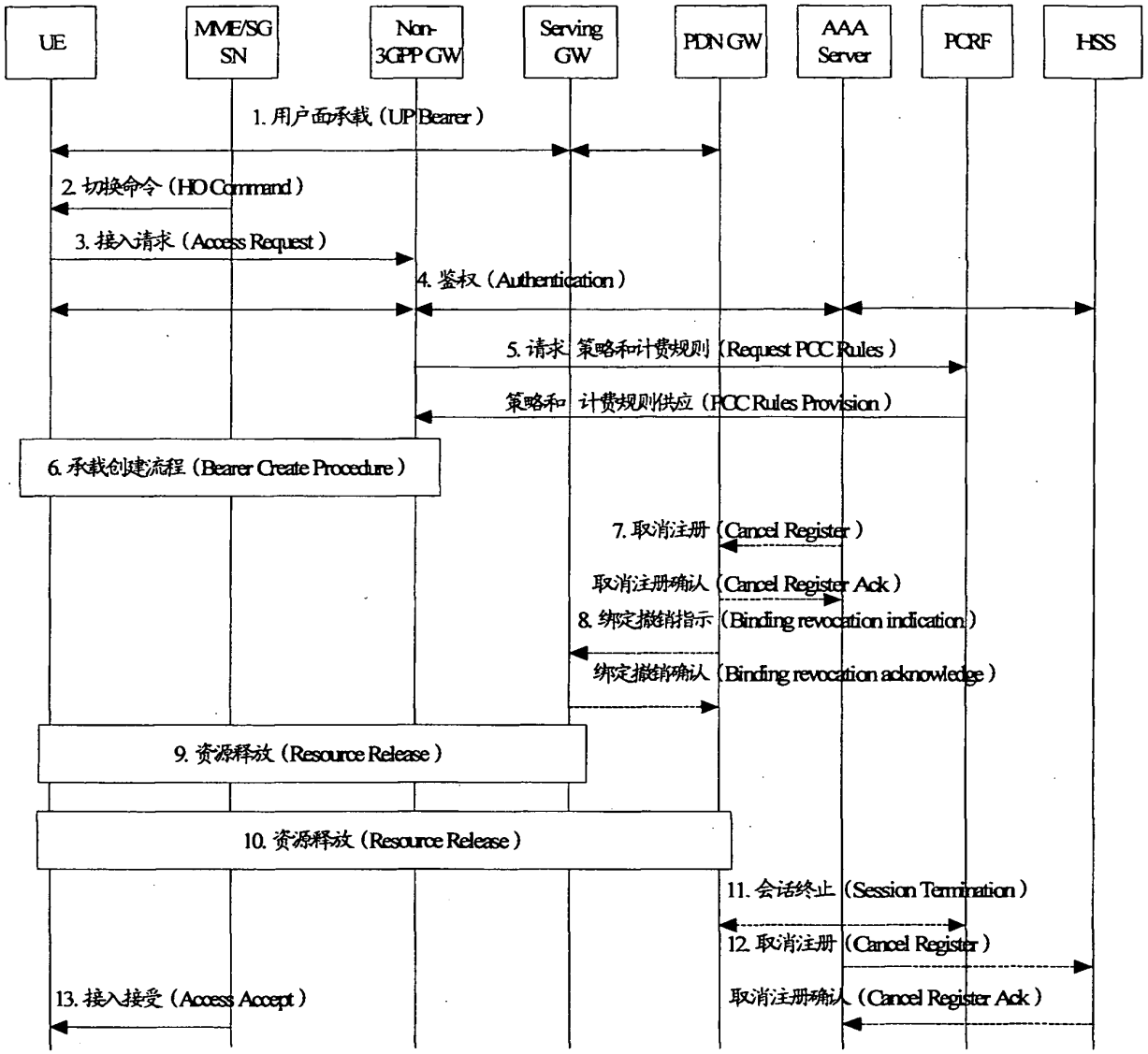

UE
MME/SG SN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求 策略和计费规则（Request PCC Rules）
策略和 计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
9. 资源释放（Resource Release）
10. 资源释放（Resource Release）
11. 会话终止（Session Termination）
12. 取消注册（Cancel Register）
13. 接入接受（Access Accept）
取消注册确认（Cancel Register Ack）

图 13

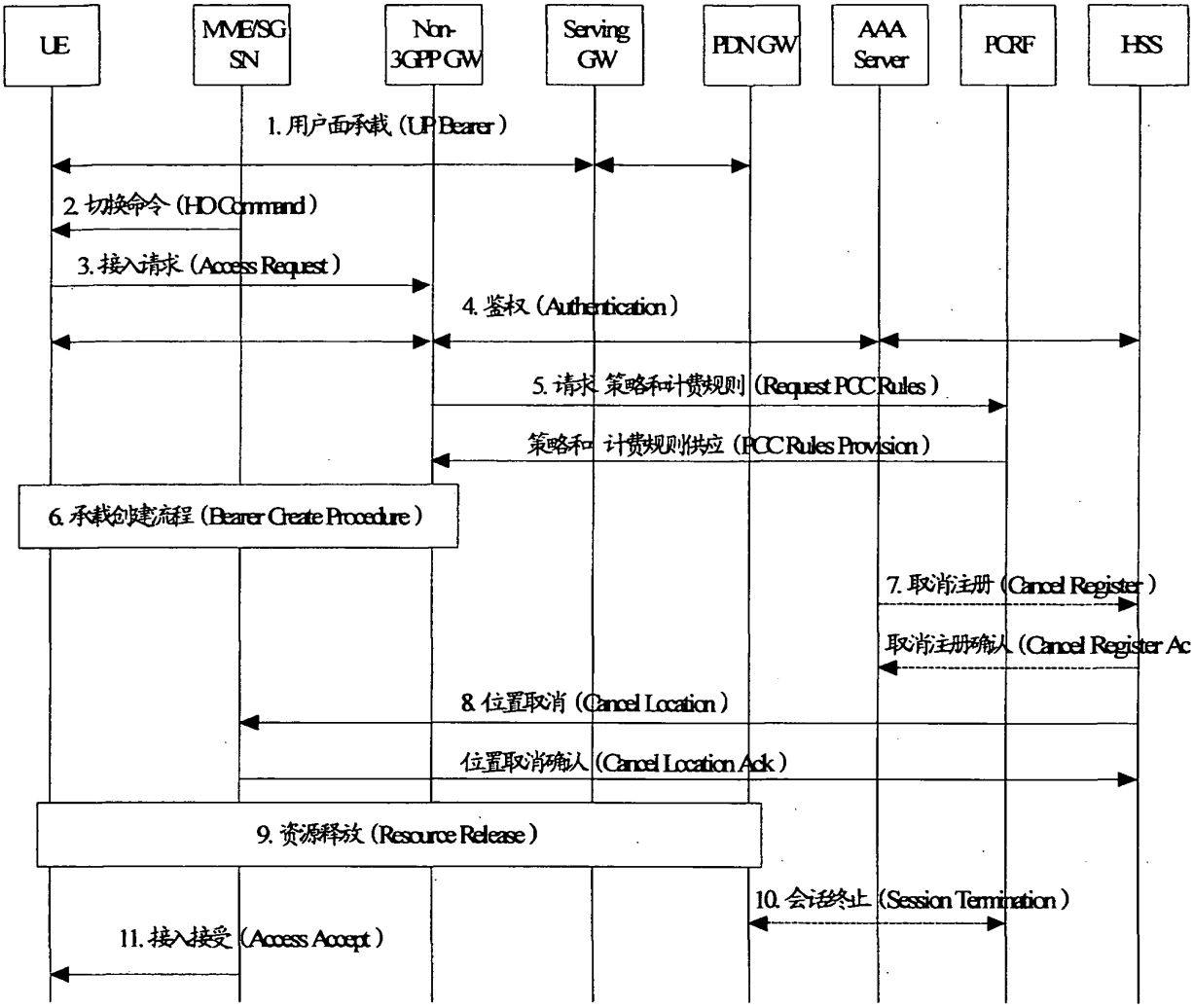

UE
MME/SG SN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载 (UP Bearer)
2. 切换命令 (HO Command)
3. 接入请求 (Access Request)
4. 鉴权 (Authentication)
5. 请求 策略和计费规则 (Request PCC Rules)
策略和 计费规则供应 (PCC Rules Provision)
6. 承载创建流程 (Bearer Create Procedure)
7. 取消注册 (Cancel Register)
取消注册确认 (Cancel Register Ac
8. 位置取消 (Cancel Location)
位置取消确认 (Cancel Location Ack)
9. 资源释放 (Resource Release)
10. 会话终止 (Session Termination)
11. 接入接受 (Access Accept)

图 14

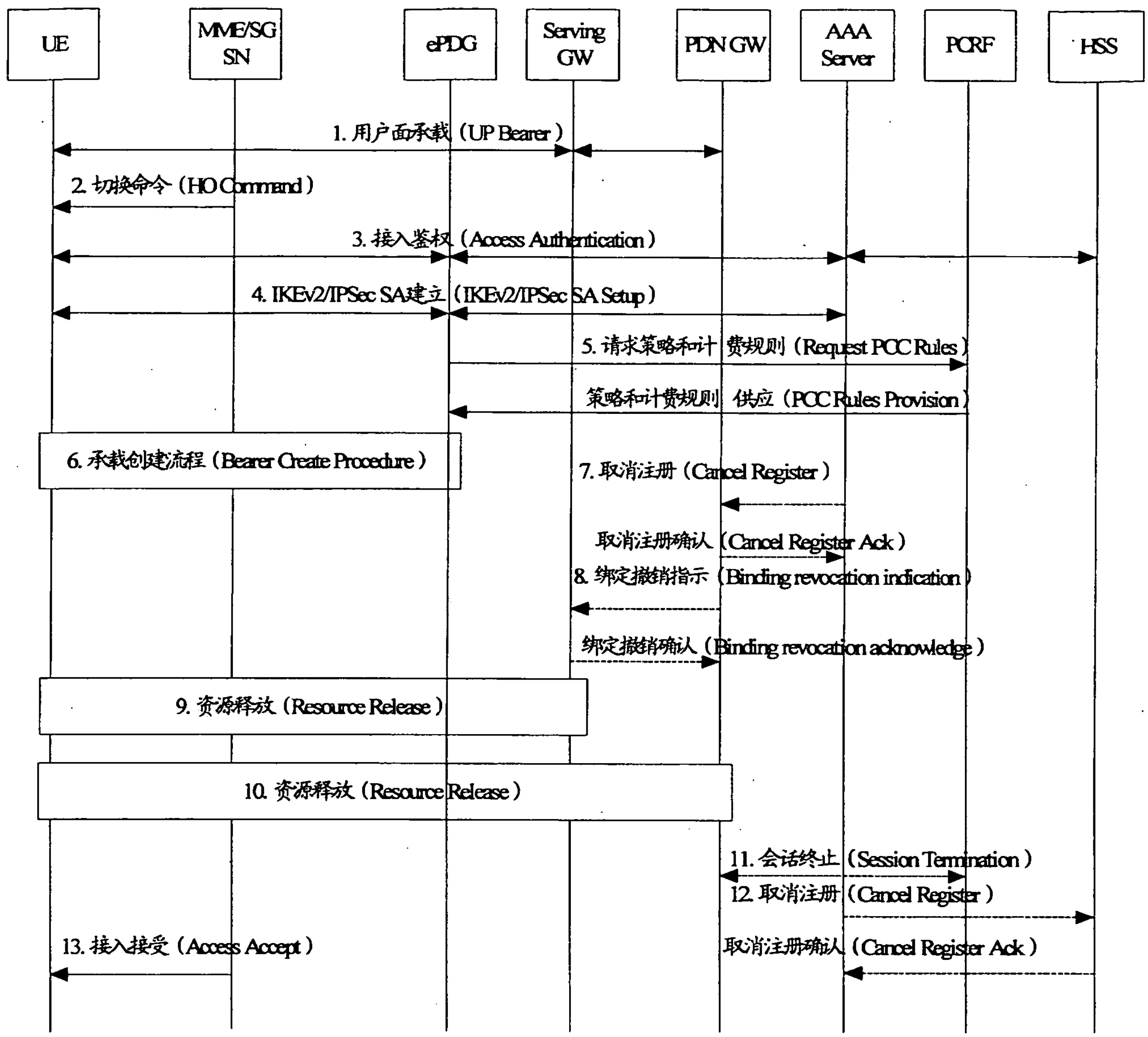

UE
MME/SGSN
ePDG
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入鉴权（Access Authentication）
4. IKEv2/IPSec SA建立（IKEv2/IPSec SA Setup）
5. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
9. 资源释放（Resource Release）
10. 资源释放（Resource Release）
11. 会话终止（Session Termination）
12. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
13. 接入接受（Access Accept）

图 15

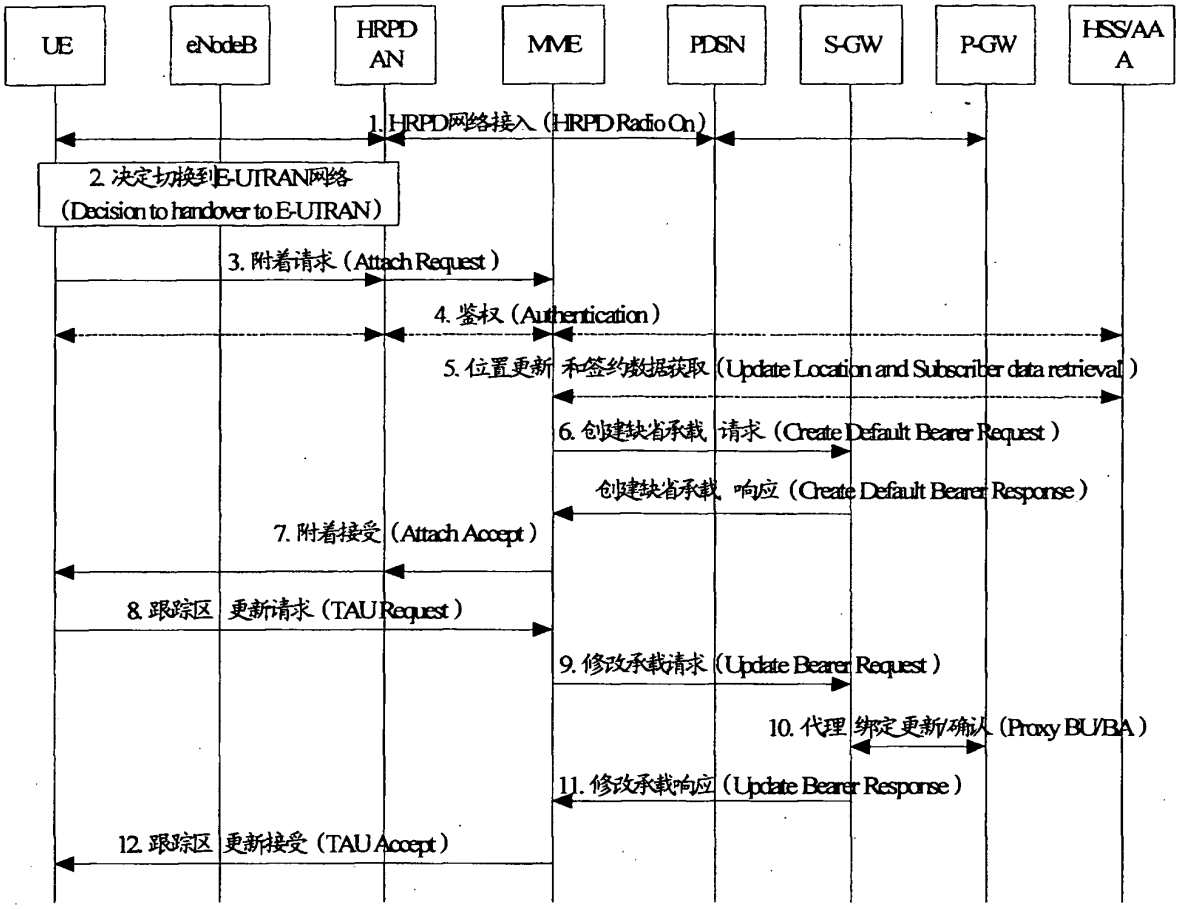

UE
eNodeB
HRPD AN
MME
PDSN
S-GW
P-GW
HSS/AAA
1. HRPD网络接入（HRPD Radio On）
2. 决定切换到E-UTRAN网络 (Decision to handover to E-UTRAN)
3. 附着请求（Attach Request）
4. 鉴权（Authentication）
5. 位置更新和签约数据获取（Update Location and Subscriber data retrieval）
6. 创建缺省承载请求（Create Default Bearer Request）
创建缺省承载响应（Create Default Bearer Response）
7. 附着接受（Attach Accept）
8. 跟踪区更新请求（TAU Request）
9. 修改承载请求（Update Bearer Request）
10. 代理绑定更新/确认（Proxy BU/BA）
11. 修改承载响应（Update Bearer Response）
12. 跟踪区更新接受（TAU Accept）

图 16

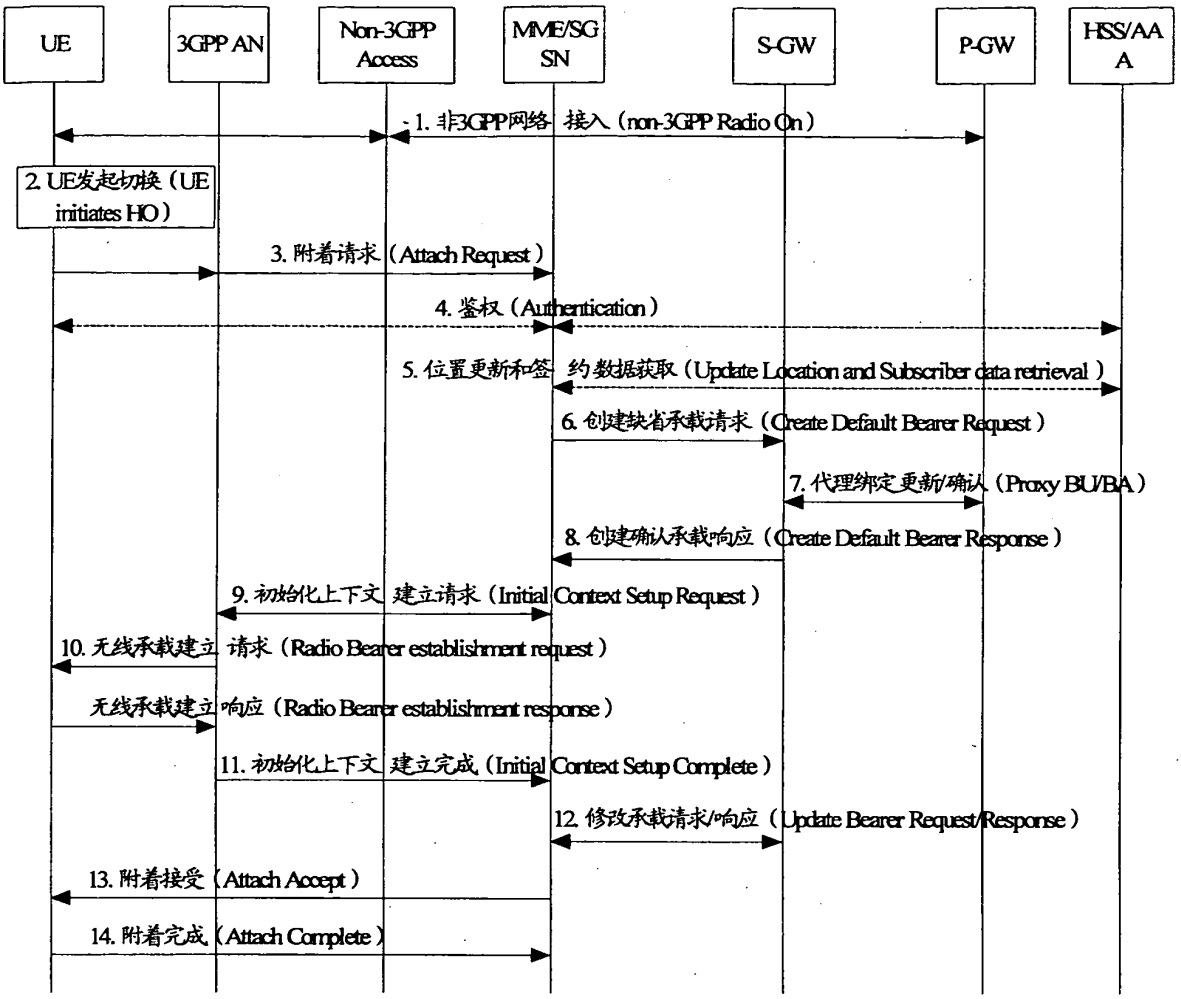

UE
3GPP AN
Non-3GPP Access
MME/SGSN
S-GW
P-GW
HSS/AAA
1. 非3GPP网络接入（non-3GPP Radio On）
2. UE发起切换（UE initiates HO）
3. 附着请求（Attach Request）
4. 鉴权（Authentication）
5. 位置更新和签约数据获取（Update Location and Subscriber data retrieval）
6. 创建缺省承载请求（Create Default Bearer Request）
7. 代理绑定更新/确认（Proxy BU/BA）
8. 创建确认承载响应（Create Default Bearer Response）
9. 初始化上下文建立请求（Initial Context Setup Request）
10. 无线承载建立请求（Radio Bearer establishment request）
无线承载建立响应（Radio Bearer establishment response）
11. 初始化上下文建立完成（Initial Context Setup Complete）
12. 修改承载请求/响应（Update Bearer Request/Response）
13. 附着接受（Attach Accept）
14. 附着完成（Attach Complete）

图 17

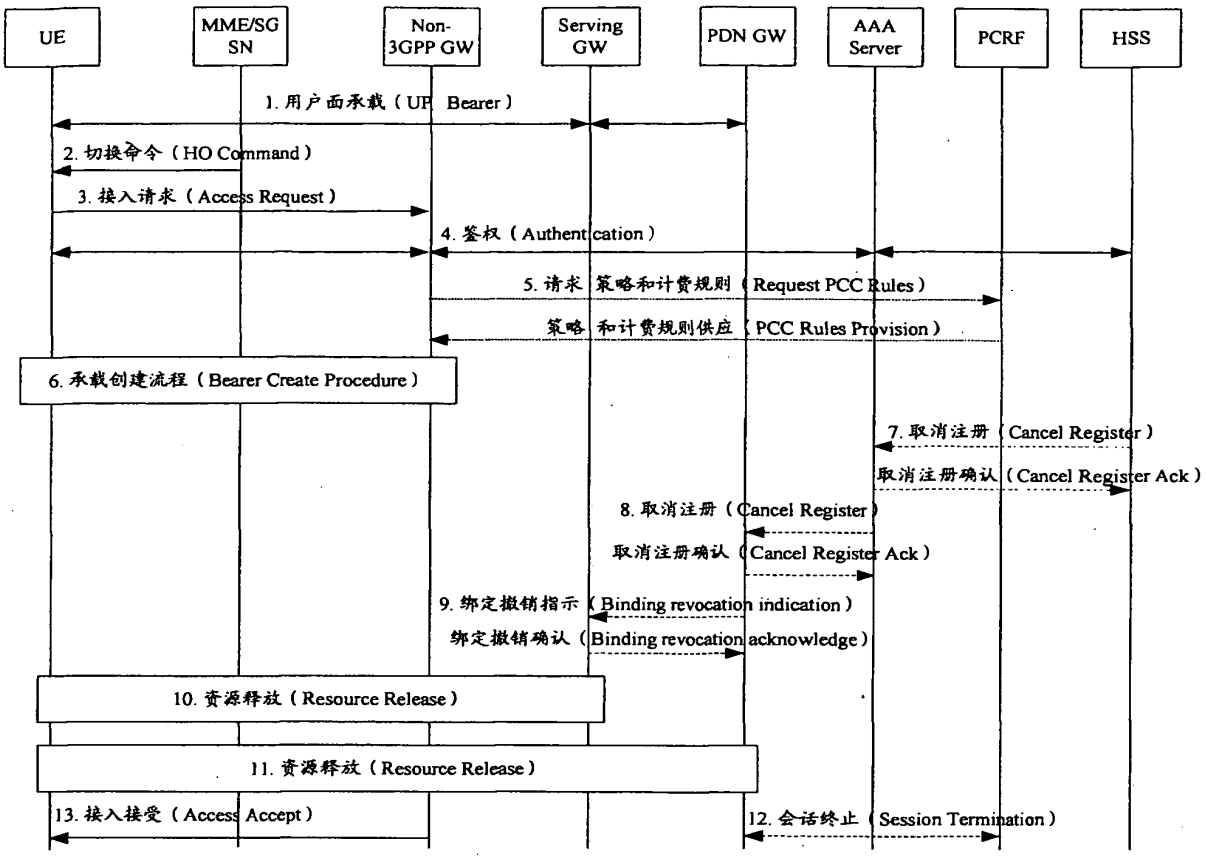

UE
MME/SG SN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求 策略和计费规则（Request PCC Rules）
策略 和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
9. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
10. 资源释放（Resource Release）
11. 资源释放（Resource Release）
13. 接入接受（Access Accept）
12. 会话终止（Session Termination）

图 18

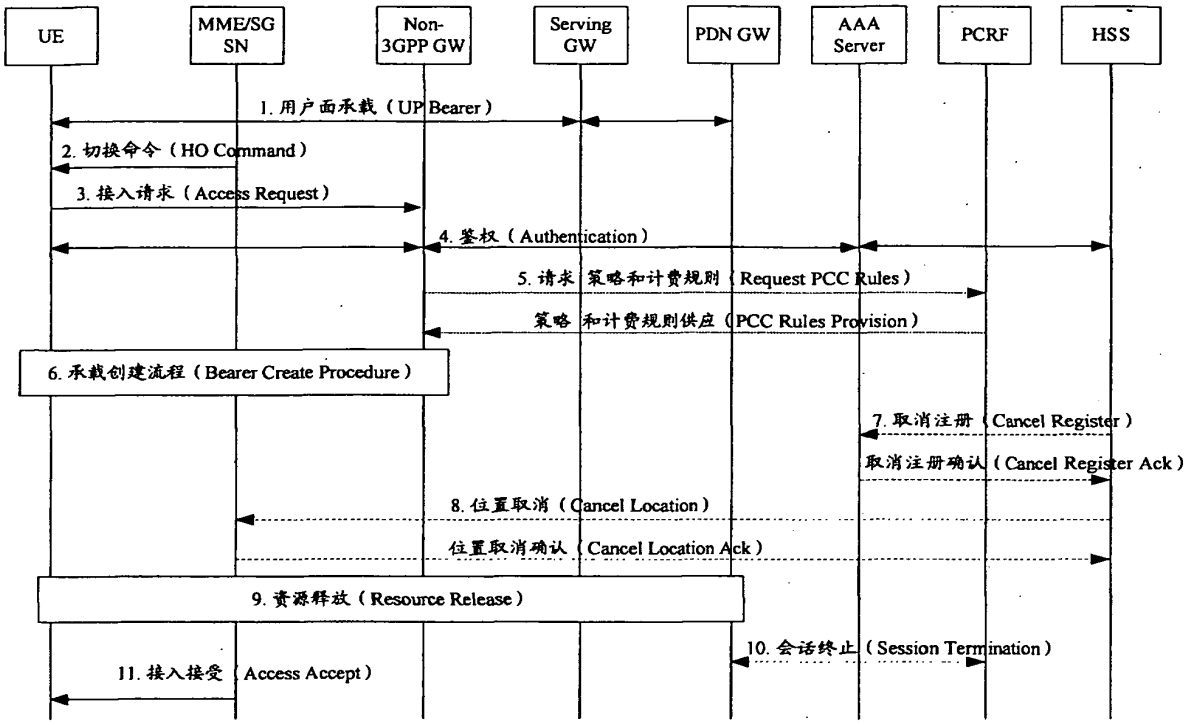

UE
MME/SG SN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求 策略和计费规则（Request PCC Rules）
策略 和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 位置取消（Cancel Location）
位置取消确认（Cancel Location Ack）
9. 资源释放（Resource Release）
10. 会话终止（Session Termination）
11. 接入接受（Access Accept）

图 19

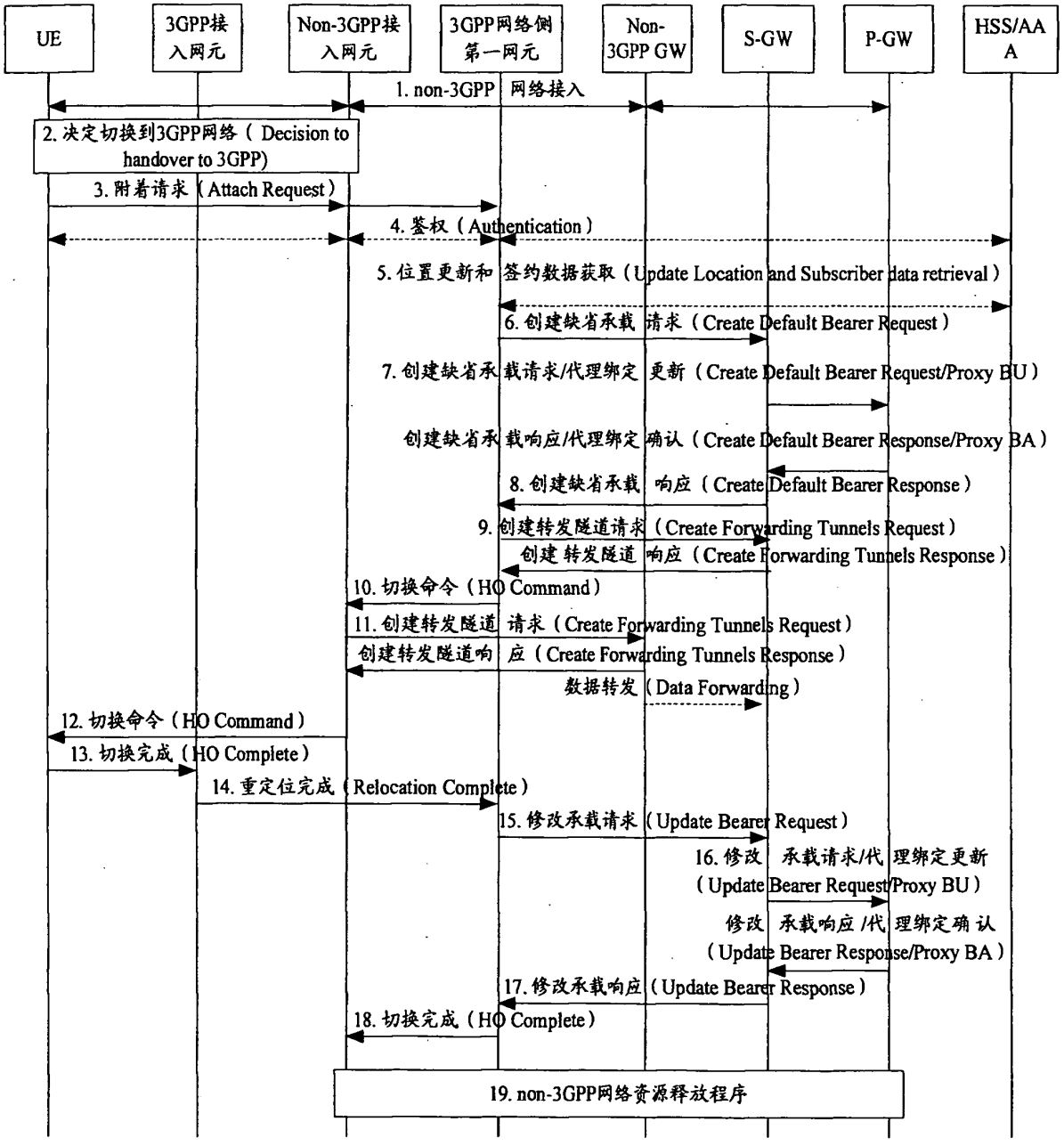

UE
3GPP接入网元
Non-3GPP接入网元
3GPP网络侧第一网元
Non-3GPP GW
S-GW
P-GW
HSS/AAA
1. non-3GPP 网络接入
2. 决定切换到3GPP网络（Decision to handover to 3GPP)
3. 附着请求（Attach Request）
4. 鉴权（Authentication）
5. 位置更新和 签约数据获取（Update Location and Subscriber data retrieval）
6. 创建缺省承载 请求（Create Default Bearer Request）
7. 创建缺省承 载请求/代理绑定 更新（Create Default Bearer Request/Proxy BU）
创建缺省承 载响应/代理绑定 确认（Create Default Bearer Response/Proxy BA）
8. 创建缺省承载 响应（Create Default Bearer Response）
9. 创建转发隧道请求（Create Forwarding Tunnels Request）
创建 转发隧道 响应（Create Forwarding Tunnels Response）
10. 切换命令（HO Command）
11. 创建转发隧道 请求（Create Forwarding Tunnels Request）
创建转发隧道响 应（Create Forwarding Tunnels Response）
数据转发（Data Forwarding）
12. 切换命令（HO Command）
13. 切换完成（HO Complete）
14. 重定位完成（Relocation Complete）
15. 修改承载请求（Update Bearer Request）
16. 修改 承载请求/代 理绑定更新
（Update Bearer Request/Proxy BU）
修改 承载响应/代 理绑定确认
（Update Bearer Response/Proxy BA）
17. 修改承载响应（Update Bearer Response）
18. 切换完成（HO Complete）
19. non-3GPP网络资源释放程序

图 20

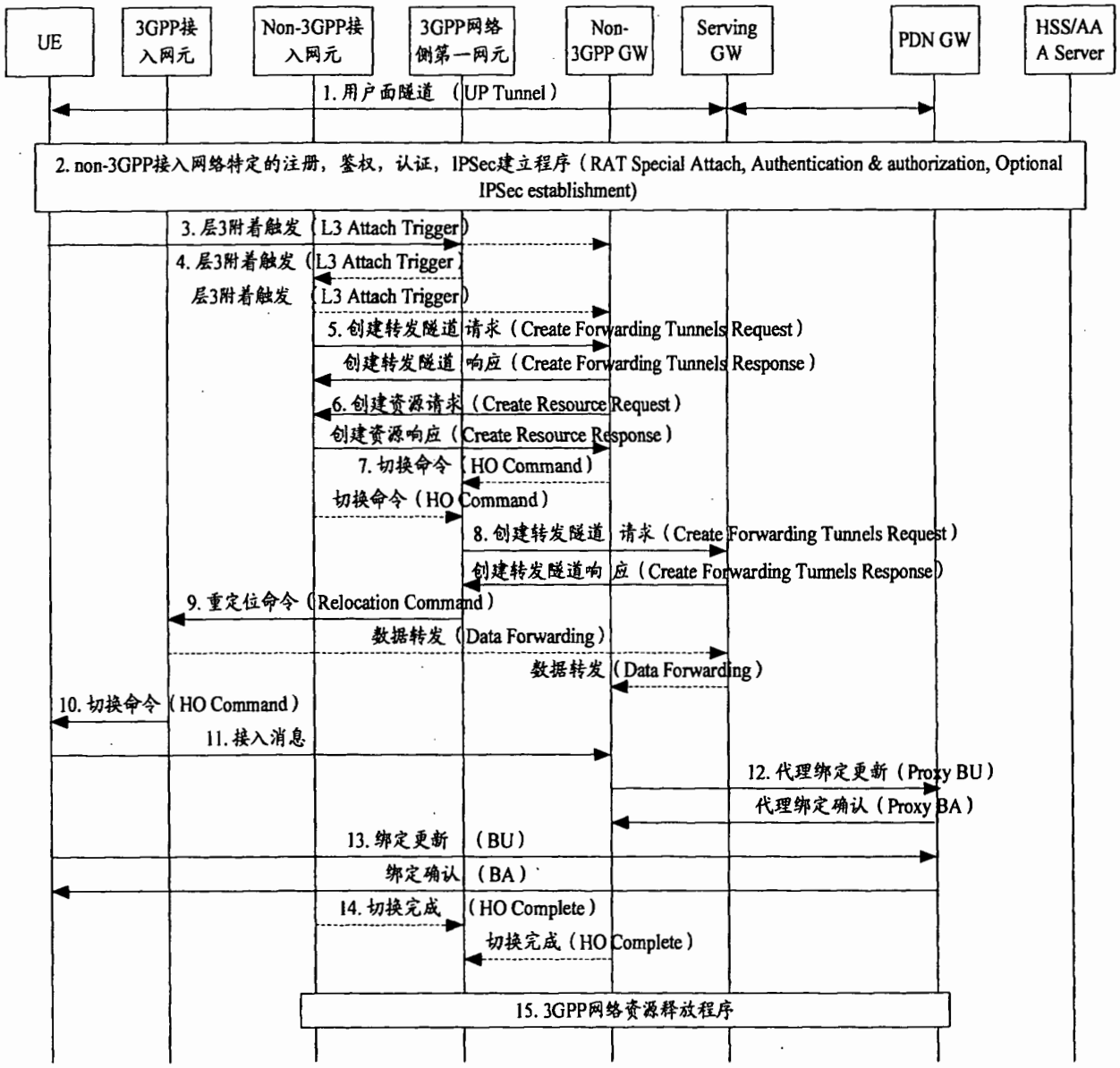

UE
3GPP接入网元
Non-3GPP接入网元
3GPP网络侧第一网元
Non-3GPP GW
Serving GW
PDN GW
HSS/AAA Server
1. 用户面隧道（UP Tunnel）
2. non-3GPP接入网络特定的注册，鉴权，认证，IPSec建立程序（RAT Special Attach, Authentication & authorization, Optional IPSec establishment)
3. 层3附着触发（L3 Attach Trigger）
4. 层3附着触发（L3 Attach Trigger）
层3附着触发（L3 Attach Trigger）
5. 创建转发隧道请求（Create Forwarding Tunnels Request）
创建转发隧道响应（Create Forwarding Tunnels Response）
6. 创建资源请求（Create Resource Request）
创建资源响应（Create Resource Response）
7. 切换命令（HO Command）
切换命令（HO Command）
8. 创建转发隧道请求（Create Forwarding Tunnels Request）
创建转发隧道响应（Create Forwarding Tunnels Response）
9. 重定位命令（Relocation Command）
数据转发（Data Forwarding）
数据转发（Data Forwarding）
10. 切换命令（HO Command）
11. 接入消息
12. 代理绑定更新（Proxy BU）
代理绑定确认（Proxy BA）
13. 绑定更新（BU）
绑定确认（BA）
14. 切换完成（HO Complete）
切换完成（HO Complete）
15. 3GPP网络资源释放程序

图 21

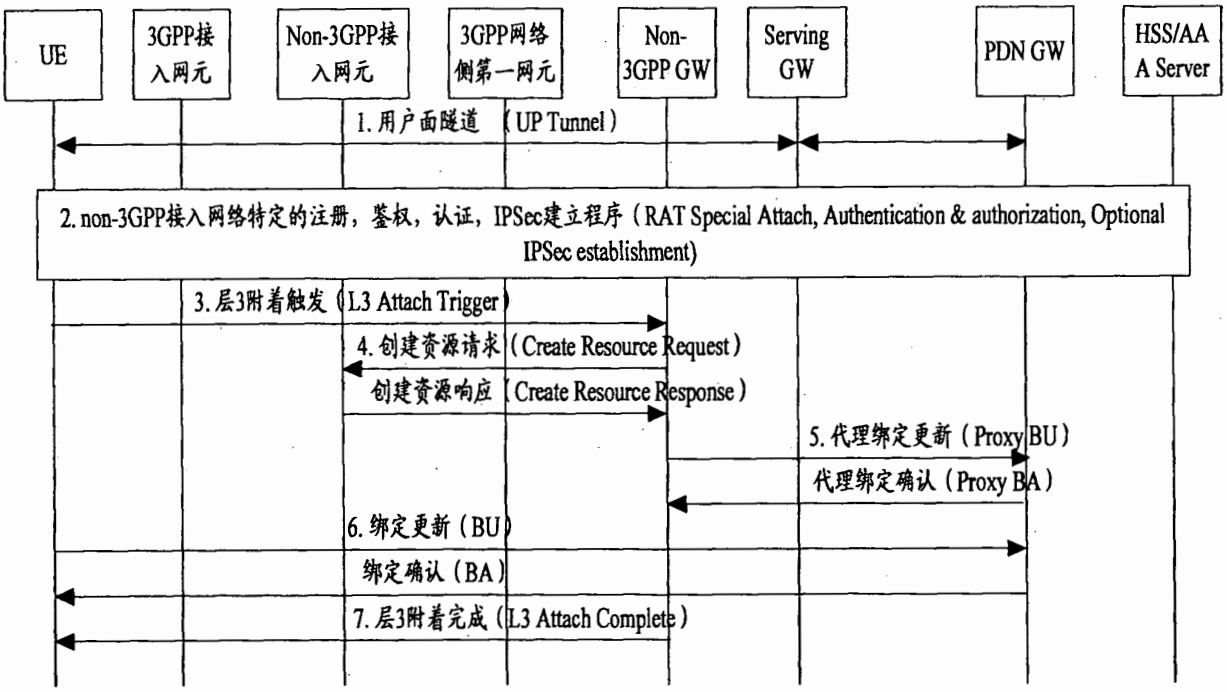

UE
3GPP接入网元
Non-3GPP接入网元
3GPP网络侧第一网元
Non-3GPP GW
Serving GW
PDN GW
HSS/AAA Server
1. 用户面隧道（UP Tunnel）
2. non-3GPP接入网络特定的注册，鉴权，认证，IPSec建立程序（RAT Special Attach, Authentication & authorization, Optional IPSec establishment)
3. 层3附着触发（L3 Attach Trigger）
4. 创建资源请求（Create Resource Request）
创建资源响应（Create Resource Response）
5. 代理绑定更新（Proxy BU）
代理绑定确认（Proxy BA）
6. 绑定更新（BU）
绑定确认（BA）
7. 层3附着完成（L3 Attach Complete）

图 22

Brinks 08105/0605

中华人民共和国国家知识产权局
STATE INTELLECTUAL PROPERTY OFFICE
OF THE PEOPLE'S REPUBLIC OF CHINA

证 明
CERTIFICATE

本证明之附件是向中国专利局作为受理局提交的下列国际申请文件副本。

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY OF THE BELOW IDENTIFIED ATIONAL APPLICATION THAT WAS FILED WITH THE CHINESE PATENT OFFICE AS RECEIVING OFFICE.

际 申 请 号： PCT/CN2008/070909

NATIONAL APPLICATION NUMBER

际 申 请 日： 2008年05月08日

TILNAL FILING DATE

名 称： 一种注册处理方法、系统及装置

INVENTION

中华人民共和国国家知识产权局局长

COMMISSIONER OF THE STATE INTELLECTUAL PROPERTY

OFFECE OF THE PEOPLE' S REPUBLIC OF CHINA

2010年12月06日

0	由受理局填写	
0-1	国际申请号	
0-2	国际申请日	
0-3	受理局名称和“PCT国际申请”	

0-4	PCT/RO/101表 PCT请求书	
0-4-1	软件版本	PCT-SAFE 版本 3.51.016.191 MT/FOP 20061001/0.20.5.7
0-5	请求 下列签字人请求按照专利合作条约的规定处理本国际申请	
0-6	申请人指定的受理局	中华人民共和国国家知识产权局 (RO/CN)
0-7	申请人或代理人的档案号	OP080256
I	发明名称	一种注册处理方法、系统及装置
II	申请人	
II-1	该人是	申请人 (applicant only)
II-2	是对下列国家的申请人	除美国以外的所有指定国 (all designated States except US)
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II-4en	Name	HUAWEI TECHNOLOGIES CO., LTD.
II-5zh	地址	中国广东省深圳市 龙岗区坂田华为总部办公楼 518129
II-5en	Address	Huawei Administration Building Bantian, Longgang District Shenzhen, Guangdong 518129 China
II-6	国籍	中国 CN
II-7	居所	中国 CN
II-8	电话号码	+86-755-2878-0808
II-9	传真号码	+86-755-2897-6244

III-1	申请人和/或发明人	
III-1-1	该人是	申请人和发明人 (applicant and inventor)
III-1-2	是对下列国家的申请人	美国 (US only)
III-1-4 zh	姓名	吴 问付
III-1-4 en	Name (LAST, First)	WU, Wenfu
III-1-5 zh	地址	中国广东省深圳市 龙岗区坂田华为总部办公楼 518129
III-1-5 en	Address	Huawei Administration Building Bantian, Longgang District Shenzhen, Guangdong 518129 China
III-1-6	国籍	中国 CN
III-1-7	居所	中国 CN
IV-1	代理人,共同代表或通信地址 下列人员被委托/已经被委托为代表申请人在主管国际单位办理事务的	代理人 (agent)
IV-1-1zh	名称	北京集佳知识产权代理有限公司
IV-1-1en	Name	UNITALEN ATTORNEYS AT LAW
IV-1-2zh	地址	中国北京市 朝阳区建国门外大街22号赛特广场7层 100004
IV-1-2en	Address	7th Floor, Scitech Place No. 22, Jian Guo Men Wai Ave., Chao Yang District Beijing 100004 China
IV-1-3	电话号码	+86-10-85115888
IV-1-4	传真号码	+86-10-85110962
IV-1-6	代理人登记号	11227

V	国家的指定	
V-1	根据细则4.9(a)，提交本请求书即为，指定在国际申请日受PCT约束的所有成员国，以要求获得可以获得的所有保护类型，适用情况下，要求获得地区专利和国家专利。	
VI-1	要求在先国家申请的优先权	
VI-1-1	申请日	2007年 5月 11日 (11.05.2007)
VI-1-2	号码	200710104400.7
VI-1-3	国家	中国 CN
VI-2	要求在先国家申请的优先权	
VI-2-1	申请日	2007年 10月 24日 (24.10.2007)
VI-2-2	号码	200710181758.X
VI-2-3	国家	中国 CN
VI-3	要求在先国家申请的优先权	
VI-3-1	申请日	2007年 11月 02日 (02.11.2007)
VI-3-2	号码	200710165540.5
VI-3-3	国家	中国 CN
VI-4	要求在先国家申请的优先权	
VI-4-1	申请日	2008年 3月 13日 (13.03.2008)
VI-4-2	号码	200810085729.8
VI-4-3	国家	中国 CN
VI-5	优先权文件请求 请受理局准备并向国际局送交上述在先申请中标号如下的在先申请的证明副本:	VI-1, VI-2, VI-3, VI-4
VII-1	选定的国际检索单位	中华人民共和国国家知识产权局 (ISA/CN)

打印件(原件为电子形式)

VIII	声明	声明数目	
VIII-1	关于发明人身份的声明	–	
VIII-2	关于申请人在国际申请日有权申请和被授予专利的声明	–	
VIII-3	关于申请人在国际申请日有权要求在先申请的优先权的说明	–	
VIII-4	发明人资格声明(仅为指定美国目的)	–	
VIII-5	关于不影响新颖性的公开或缺乏新颖性的例外的声明	–	
IX	清单	页数	附以电子文档
IX-1	请求书(包括声明页)	5	✓
IX-2	说明书	41	✓
IX-3	权利要求	8	✓
IX-4	摘要	1	✓
IX-5	附图	15	✓
IX-7	共计	70	
	附件	附以纸件	附以电子文档
IX-8	费用计算页	–	✓
IX-11	总委托书副本	–	文档号 006900
IX-17	PCT-SAFE 物理载体	–	–
IX-19	应与摘要一起公布的附图图号	3	
IX-20	国际申请所用语言	中文	
X-1	申请人，代理人或共同代表签字	(PKCS7数字签字)	
X-1-1	名称	北京集佳知识产权代理有限公司	
X-1-2	签字人姓名	逯长明	
X-1-3	身份	代理人	

由受理局填写

10-1	据称的国际申请文件的实际收到日期	
10-2 10-2-1 10-2-2	附图: 收到 未收到	
10-3	由于随后在期限内收到补充国际申请的文件或附图,更改的实际收到日期	
10-4	在期限内收到根据PCT第11(2)条所进行的改正的日期	
10-5	国际检索单位	ISA/CN
10-6	检索本的传送推迟到缴纳检索费后	

由国际局填写

11-1	国际局收到登记本的日期	

一种注册处理方法、系统及装置

本申请要求于2007年5月11日提交中国专利局、申请号为200710104400.7、发明名称为“一种注册处理方法、系统及装置”；于2007年10月24日提交中国专利局、申请号为200710181758.X、发明名称为“一种注册处理方法、系统及装置”；于2007年11月2日提交中国专利局、申请号为200710165540.5、发明名称为“一种注册处理方法、系统及装置”；以及于2008年3月13日提交中国专利局、申请号为200810085729.8、发明名称为“一种注册处理方法、系统及装置”的中国专利申请的优先权，其全部内容通过引用结合在本申请中。

技术领域

本发明涉及通信领域，特别是涉及一种注册处理方法、切换处理方法、系统及装置。

背景技术

3GPP为了增强未来网络的竞争能力，正在研究一种全新的演进网络，该演进网络的一个需求是实现3GPP的接入系统（GERAN/UTRAN/E-UTRAN）和Non-3GPP接入系统（如WLAN/Wimax等）之间的切换（Handover）。在目前的协议中规定，切换流程是通过UE在新接入系统中的附着（Attach）或者跟踪区更新（TAU）流程来实现的。

发明人在发明过程中发现，切换导致的Attach/TAU流程和正常Attach/TAU流程处理机制存在很大的不同：正常的Attach流程网络侧需要将用户以前建立的承载都删除掉，建立UE和分组数据网络网关实体（PDN GW，Packet Data Network Gateway）之间的缺省承载并且将UE使用的PDN GW地址信息注册到归属网络服务器（HSS，Home Subscriber Server），而切换导致的Attach流程网络侧需将用户以前建立的承载都重新创建出来。正常的TAU流程网络侧不处理用户的承载，而切换导致的TAU流程网络侧需将用户以前建立的承载都重新创建出来。

正常的3GPP和Non-3GPP之间的切换由于先将UE从源接入网络断开，然后UE再从目标接入网络通过Attach等流程接入，导致UE业务中断的时间比较长，影响用户的业务体验。所以现在演进的UMTS陆地无线接入网（E-UTRAN，Evolved UMTS Terrestrial Radio Access Network）和码分多址

（CDMA，Code Division Multiple Access）网络中的高速分组数据（HRPD，High Rate Packet Data）接入网络之间切换提出了一种优化切换机制，即 UE 还未切换到目标接入网络（UE 还在源接入网络）时先将用户面路径切换到目标接入网络。

发明人在发明过程中发现，对于 HRPD 网络到 E-UTRAN 网络切换来说，UE 可能在两种状态下发生切换：空闲状态和激活状态。当 UE 在激活状态下发生切换时，在切换的流程中通知接入网建立接入网侧的承载可以加快 UE 切换到目标接入网络后业务恢复的时间。但是在空闲状态下 UE 并没有业务在运行，对切换的时延要求也不是很高，同时 UE 在空闲状态下建立接入网侧的承载会浪费接入网侧的资源。而且预先切换机制，当 UE 切换失败时还需要通知 PDN GW 将下行路径切回源接入网络。所以预先切换机制会增加系统的复杂性。

发明内容

本发明实施例提供一种注册处理方法、切换处理方法、系统及装置，以使网络侧可区分不同的接入处理类型。

本发明实施例的一种注册处理方法，包括：接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及根据所述处理类型信息，识别该注册的处理类型。

本发明实施例的一种切换处理方法，包括：接收用户终端 UE 的接入请求；以及根据所述 UE 的接入请求，识别该接入请求的切换处理类型。

本发明实施例的另一种注册处理方法，包括下列步骤：接收 HSS 或者 AAA Server 上报的用户终端 UE 注册的处理类型信息；以及根据所述处理类型信息，识别该注册的处理类型。

本发明实施例的系统，包括：用户终端 UE，用于在注册到网络的过程中，上报该注册的处理类型信息；网络侧，用于根据接收的 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

本发明实施例的用户终端，包括：识别单元，用于在该 UE 发起注册时，识别该注册的类型；注册发起单元，用于发起注册，并发出注册触发信号；上报单元，用于接收所述注册发起单元发出的注册触发信号，并在该 UE 注册到

网络的过程中，将所述识别单元识别出的该注册类型对应的处理类型信息上报。

本发明实施例的网络侧的网元，包括：获取单元，用于获取 UE 在注册到网络的过程中上报的处理类型信息；识别单元，用于根据所述获取单元获取的处理类型信息，识别该注册的处理类型。

本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

附图说明

图 1 为本发明实施例的演进网络的系统架构示意图；

图 2 为本发明实施例的 HRPD 和 E-UTRAN 接入系统的优化切换系统架构示意图；

图 3 为本发明实施例的方法步骤流程图；

图 4 为本发明实施例的系统的结构示意图；

图 5 为本发明实施例的用户终端的结构示意图；

图 6 为本发明实施例的网络侧网元的结构示意图；

图 7 为本发明实施例 1 的流程图；

图 8 为本发明实施例 2 的流程图；

图 9 为本发明实施例 3 的流程图；

图 10 为本发明实施例 4 的流程图；

图 11 为本发明实施例 5 的流程图；

图 12 为本发明实施例 6 的流程图；

图 13 为本发明实施例 7 的流程图；

图 14 为本发明实施例 8 的流程图；

图 15 为本发明实施例 9 的流程图；

图 16 为本发明实施例 10 的流程图；

图 17 为本发明实施例 11 的流程图；

图 18 为本发明实施例 12 的流程图；

图 19 为本发明实施例 13 的流程图。

具体实施方式

图 1 为本发明实施例的演进网络的系统架构示意图，其中包括:

演进的 UMTS 陆地无线接入网（E-UTRAN，Evolved UMTS Terrestrial Radio Access Network），用于实现所有与演进网络无线有关的功能。

移动性管理实体（MME，Mobility Management Entity），负责控制面的移动性管理，包括用户上下文和移动状态管理，分配用户临时身份标识等。

服务网关实体（Serving GW，Serving Gateway），是 3GPP 接入系统间的用户面锚点，终止 E-TURAN 的接口。

分组数据网络网关实体（PDN GW，Packet Data Network Gateway）是 3GPP 接入系统和非 3GPP 接入系统之间的用户面锚点，终止和外部分组数据网络（PDN，Packet Data Network）的接口。

策略和计费规则功能实体（PCRF，Policy and Charging Rule Function），用于策略控制决定和流计费控制功能。

归属网络服务器（HSS，Home Subscriber Server）用于存储用户签约信息。

UMTS 陆地无线接入网（UTRAN，UMTS Terrestrial Radio Access Network）、GSM/EDGE 无线接入网（GERAN，GSM/EDGE Radio Access Network），用于实现所有与现有 GPRS/UMTS 网络中无线有关的功能。

服务通用分组无线业务支持节点（SGSN，Serving GPRS Supporting Node），用于实现 GPRS/UMTS 网络中路由转发、移动性管理、会话管理以及用户信息存储等功能。

非 3GPP IP 接入系统（Non-3GPP IP Access），主要是一些非 3GPP 组织定义的接入网络，如无线局域网（WLAN，Wireless Local Area Network），微波存取全球互通（Wimax，Worldwide Interoperability for Microwave Access）等网络。

认证、授权与计费服务器（AAA Server，Authentication，Authorization and Accounting Server）用于对用户设备（UE, User Equipment）执行接入认证、授权和计费功能。

说明：这个架构并不意味着最终的 SAE 系统架构，最后的架构可能和这个架构有所差别，本专利不作限制。

如图 2 所示，为本发明实施例的 HRPD 和 E-UTRAN 接入系统的优化切换

系统架构示意图，其中 MME 和 HRPD AN（HRPD Access Network，HRPD 接入网络，处理 HRPD 网络中的移动性管理，无线资源管理等）之间增加 S101 接口，传递 MME 和 HRPD AN 之间的信令。PDSN（Packet Data Serving Node，分组数据服务节点）是 HRPD 网络中的一个用户面处理网元，进行 HRPD 网络的用户面处理。

本发明实施例提供的注册处理方法、切换处理方法、系统及装置是基于上述两种系统结构实现的，分别具体说明如下：

为了使网络侧可区分不同的注册处理类型，本发明实施例提供了一种注册处理方法，参见图 3 所示，包括下列主要步骤：

S1、网络侧接收 UE 在注册到网络的过程中上报的该注册的处理类型信息。

本步骤之前，UE 在注册到网络时，可先识别该注册的类型。当 UE 注册到网络的过程中，将识别出的该注册类型对应的处理类型信息上报给网络侧。

S2、网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例还提供了另一种注册处理方法，包括下列主要步骤：网络侧接收 HSS 或者 AAA Server 上报的用户终端 UE 注册的处理类型信息；网络侧根据所述处理类型信息，识别该注册的处理类型。

本发明实施例还提供了一种注册处理系统，参见图 4 所示，其包括：用户终端和网络侧。

用户终端 UE，用于在注册到网络的过程中，将该注册的处理类型信息上报。所述用户终端 UE 在注册到网络时，识别注册的处理类型信息后再将所述注册的处理类型信息上报。

网络侧，用于根据接收的 UE 上报的该注册的处理类型信息，识别该注册的处理类型。具体的，由网络侧的移动性管理实体 MME（演进网络）、服务 GPRS 支持节点 SGSN（2G/3G 网络）或非 3GPP 网关设备（非 3GPP 网络）对 UE 上报的处理类型信息进行识别。

本发明实施例还提供了一种用户终端，参见图 5 所示，其包括：识别单元、注册发起单元和上报单元。

识别单元，用于在该 UE 发起注册时，识别该注册的类型。

注册发起单元，用于发起注册，并发出注册触发信号。

上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报，上报的方式包括但不限于以下几种：

上报单元将处理类型信息携带于附着请求消息中的信元中；或者，将处理类型信息携带于跟踪区更新请求消息中的信元中；或者，将处理类型信息携带于路由区更新请求消息中的信元中；或者，将处理类型信息携带于接入请求消息中的信元中；或者，将处理类型信息携带于接入鉴权或者鉴权消息中的信元中；或者将处理类型信息携带于 IKEv2 或 IPsec SA 建立消息中的信元中。

上报单元上报的过程具体为：所述上报单元对应不同的注册类型，向网络侧发送不同的附着请求消息；或者，对应不同的注册类型，向网络侧发送不同的跟踪区更新请求消息；或者，对应不同的注册类型，向网络侧发送不同的路由区更新请求消息；或者，对应不同的注册类型，向网络侧发送不同的接入请求消息。

本发明实施例还提供了一种网络侧的网元，具体的，该网元为移动性管理实体 MME（演进网络）、服务 GPRS 支持节点 SGSN（2G/3G 网络）或非 3GPP 网关（非 3GPP 网络），参见图 6 所示，其包括：获取单元和识别单元。

获取单元，用于获取注册的过程中 UE 的注册处理类型信息。具体的，获取的处理类型信息由所述 UE、HSS 或者 AAA Server 上报。

识别单元，用于根据所述获取单元获取的处理类型信息，识别该注册的处理类型。

所述的网元进一步包括第一处理单元，用于在所述识别单元识别注册的处理类型为切换注册处理类型时，发起网络侧承载创建流程，创建所述 UE 使用的承载资源。

所述的网元进一步包括第二处理单元，用于在所述识别单元识别注册的处理类型为激活模式下的切换注册处理类型时，不发起源接入网络的资源释放处理。

所述的网元进一步包括第三处理单元，用于在所述识别单元识别注册的处理类型为激活模式下的切换注册处理类型时，发起目标网络的网元与源网络的

网元之间的数据转发隧道资源创建处理。

以下通过多个实施例具体描述。

实施例 1：UE 在发送注册请求消息到 MME 时，将该注册的处理类型信息上报给 MME，MME 据此识别该注册的处理类型；进一步根据该注册的处理类型进行相应的处理，完成注册。MME 上报注册的处理类型给 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 Non-3GPP 网络中使用的资源在 3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 Non-3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 Non-3GPP 网络中的注册，AAA Server 通知 Non-3GPP 网络释放 UE 使用的资源。参见图 7 所示，包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到演进网络；或者 UE 发现演进网络并决定发起切换。

3、UE 在发起注册到演进网络之前，识别该注册的类型；之后发送注册请求消息到 MME，并相应将该注册的处理类型信息上报给 MME。

其中，可以通过如下方式之一上报：

1）在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。或者 UE 在附着请求消息中增加指示位，表明该附着请求消息是切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为“Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为“Handover Attach”。

2）定义新的消息。例如：定义新的切换附着请求消息（Handover Attach Request），该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息），这样 UE

可向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。(也可新定义对应正常附着请求的消息（或者称之为初始附着请求的消息），原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附着请求消息（或者称之为初始附着请求消息）都重新定义）

3）在跟踪区更新请求消息中增加 Update Type 信元。例如：该 Update Type 信元有如下两个取值：0 对应 Normal TAU（也可称之为 Initial TAU），表明该跟踪区更新请求消息是正常的跟踪区更新请求消息(也可称之为初始的跟踪区更新请求消息)；1 对应 Handover TAU，表明该跟踪区更新请求消息是切换导致的跟踪区更新请求消息。或者 UE 在跟踪区更新请求消息中增加指示位表明该跟踪区更新请求消息是切换导致的跟踪区更新请求消息，而原有的跟踪区更新请求消息表明一个正常的跟踪区更新请求消息(或者称之为初始的跟踪区更新请求消息)。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为“TAU due to Handover”。

c) Update Type 信元。UE 将该信元设置为“Handover TAU”。

4）定义新的消息。例如：定义新的切换跟踪区更新请求消息（Handover TAU Request），该消息表明一个切换导致的跟踪区更新请求消息，而原有的跟踪区更新请求消息表明一个正常的跟踪区更新请求消息(或者称之为初始的跟踪区更新请求消息)，这样 UE 可向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息。(也可新定义对应正常的跟踪区更新请求（或者称之为初始的跟踪区更新请求）的消息，原有的跟踪区更新请求消息对应切换导致的跟踪区更新请求消息；或者切换导致的跟踪区更新请求消息和正常跟踪区更新请求（或者称之为初始跟踪区更新请求）消息都重新定义）

4、UE、MME、HSS 之间执行鉴权流程，获取用户使用的 PDN GW 地址信息。MME 可以在该步骤中将 UE 注册的处理类型信息上报给 HSS。如果注册处理类型为切换处理类型，则 HSS 可以将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

5、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。MME 可以在该步骤中将 UE 注册的处理类型信息上报给 HSS。

6、HSS 将用户的签约数据插入到 MME 中。

7、HSS 返回位置更新确认消息给 MME。HSS 可以在该步骤中将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

如果 UE 的注册过程中由 HSS 识别 UE 的注册处理类型（如 HSS 发现保存有用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息，则 HSS 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，HSS 认为 UE 的注册处理类型为正常的注册处理类型），则 HSS 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给 MME。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 HSS 增加切换指示位信元（Handover Indication）。对于正常的注册处理类型，HSS 不携带该信元。

b) Cause 信元。对于切换导致的注册处理，HSS 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，HSS 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带该 Cause 信元。

c) Update Type 信元。对于切换导致的注册处理，HSS 将该信元设置为“Handover Attach”。对于正常注册处理，HSS 将该信元设置为“Initial Attach”或者不携带该信元。

8、MME 根据 UE 上报或者 HSS 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，MME 已区分了不同的注册处理类型。

进一步，如果处理类型为正常发起的注册，则 MME 按照正常的注册流程处理。步骤 11 至 18 将被执行。

如果处理类型为切换导致的注册，则 MME 发送请求承载创建消息到获取的 PDN GW 的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来，并转入步骤 9。

9、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载，并转入

步骤 18。

11、如果 UE 的注册处理类型为正常发起的注册，且 HSS 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 Non-3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 AAA Server 注册到 HSS，则 HSS 发送取消注册消息到 AAA Server 请求取消 UE 在 Non-3GPP 接入网络中的注册。AAA Server 回取消注册确认消息到 HSS。

12、AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 Non-3GPP 接入网络中的注册。PDN GW 回取消注册确认消息到 AAA Server。

13、如果 PDN GW 和 Non-3GPP 网关设备之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 Non-3GPP 网关设备，取消 Non-3GPP 网关设备和 PDN GW 之间的 PMIP 绑定。Non-3GPP 网关设备回绑定撤销确认消息到 PDN GW。

14、AAA Server 也可以发送会话终止消息到 Non-3GPP 网关设备。Non-3GPP 网关设备回会话终止确认消息到 AAA Server。

15、Non-3GPP 网关设备收到绑定取消指示消息或者会话终止消息后发起资源释放程序，释放 UE 在 Non-3GPP 接入网络中使用的资源。

16、如果 UE 的注册处理类型为正常发起的注册，则 MME 发起缺省承载创建程序，创建 UE 和 PDN GW 之间的缺省承载。

17、MME 注册 UE 使用的 PDN GW 地址信息到 HSS。该处理也可以通过位置更新流程来处理，MME 发送位置更新消息给 HSS，消息中携带 PDN GW 地址信息。

18、MME 回附着接受或者跟踪区更新接受消息到 UE。

实施例 2：这种机制也能应用到 2G/3G 系统。UE 在发送注册请求消息到 SGSN 时，将该注册的处理类型信息上报给 SGSN，SGSN 据此识别该注册的处理类型；进一步根据该注册的处理类型进行相应的处理，完成注册。SGSN 上报注册的处理类型给 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 Non-3GPP 网络中使用的资源在 3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 Non-3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 Non-3GPP 网络中的注册，AAA Server 通知

Non-3GPP 网络释放 UE 使用的资源。参见图 8 所示，包括下列步骤：

1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到 2G 或者 3G 网络；或者 UE 发现 2G 或者 3G 网络并决定发起切换。

3、UE 在发起注册到 2G 或者 3G 网络之前，识别该注册的类型；之后发送注册请求消息到 SGSN，并相应将该注册的处理类型信息上报给 SGSN。

其中，可以通过如下方式之一上报：

1）在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。或者 UE 在附着请求消息中增加指示位表明该附着请求消息是切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为“Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为“Handover Attach”。

2）定义新的消息。例如：定义新的切换附着请求消息（Handover Attach Request），该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求（或者称之为初始的附着请求）消息，这样 UE 可向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常附着请求（或者称之为初始附着请求）的消息，原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附着请求（或者称之为初始附着请求）消息都重新定义）

3）在路由区更新请求消息中增加 Update Type 信元。例如：该 Update Type 信元有如下两个取值：0 对应 Normal RAU（也可称之为 Initial RAU），表明该路由区更新请求消息是正常的路由区更新请求消息（也可称之为初始的路由区更新请求消息）；1 对应 Handover RAU，表明该路由区更新请求消息是切换导致的路由区更新请求消息。或者 UE 在路由区更新请求消息中增加指示位表明

该路由区更新请求消息是切换导致的路由区更新请求消息，而原有的路由区更新请求消息表明一个正常的路由区更新请求消息（或者称之为初始的路由区更新请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为“RAU due to Handover”。

c) Update Type 信元。UE 将该信元设置为“Handover RAU”。

4）定义新的消息。例如：定义新的切换路由区更新请求消息（Handover RAU Request），该消息表明一个切换导致的路由区更新请求消息，而原有的路由区更新请求消息表明一个正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，这样 UE 可向网络侧发送不同的路由区更新请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，原有的路由区更新请求消息对应切换导致的路由区更新请求消息；或者切换导致的路由区更新请求消息和正常路由区更新请求（或者称之为初始路由区更新请求）消息都重新定义）

4、UE、SGSN、HSS 之间执行鉴权流程。SGSN 可以在该步骤中将 UE 注册的处理类型信息上报给 HSS。如果注册处理类型为切换处理类型，则 HSS 可以将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 SGSN。

5、SGSN 发送位置更新消息给 HSS，注册 SGSN 的地址信息到 HSS。SGSN 可以在该步骤中将 UE 注册的处理类型信息上报给 HSS。

6、HSS 将用户的签约数据插入到 SGSN 中。

7、HSS 返回位置更新确认消息给 SGSN。HSS 可以在该步骤中将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 SGSN。如果 UE 的注册过程中由 HSS 识别 UE 的注册处理类型（如 HSS 发现保存有用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息，则 HSS 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，HSS 认为 UE 的注册处理类型为正常的注册处理类型），则 HSS 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给 SGSN。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 HSS 增加切换指示位信元（Handover Indication）。对于正常的注册处理类型，HSS 不携带

该信元。

b) Cause 信元。对于切换导致的注册处理，HSS 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，HSS 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带该 Cause 信元。

c) Update Type 信元。对于切换导致的注册处理，HSS 将该信元设置为“Handover Attach”。对于正常注册处理，HSS 将该信元设置为“Initial Attach”或者不携带该信元。

8、SGSN 根据 UE 上报或者 HSS 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，SGSN 已区分了不同的注册处理类型。

进一步，如果处理类型为正常发起的注册，则 SGSN 按照正常的流程处理，步骤 11 至 16 将被执行。

如果处理类型为切换导致的注册，则 SGSN 发送请求承载创建消息到获取的 PDN GW（也就是现在的 GGSN）的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来，并转入步骤 9。

9、如果需要到 PCRF 获取用户使用的策略和计费（PCC）规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载，并转入步骤 16。

步骤 11 至步骤 15 同实施例 1 中的处理，这里不再描述。

16、SGSN 回附着接受或者路由区更新接受消息到 UE。

实施例 3：这种机制也能应用到可信（Trusted）的 Non-3GPP 系统。UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使

用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册， 同时 AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 9 所示，包括下列步骤：

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

2、MME 或者 SGSN 发送切换命令到 UE 通知 UE 切换到 Non-3GPP 网络，或者 UE 发现 Non-3GPP 网络并决定发起切换。

3、UE 在发起注册到 Non-3GPP 网络之前，识别该注册的类型；之后发送接入请求消息到非 3GPP 网关设备，并相应将该注册的处理类型信息上报给非 3GPP 网关设备。

其中，可以通过如下方式之一上报：

1）在接入请求消息中增加 Access Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。或者 UE 在接入请求消息中增加指示位表明该接入请求消息是切换导致的接入请求消息，而原有的接入请求消息表明一个正常的接入请求消息（或者称之为初始的接入请求消息）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为“Access due to Handover”。

c) Access Type 信元。UE 将该信元设置为“Handover Access”。

2）定义新的消息。例如：定义新的切换接入请求消息（Handover Access Request），该消息表明一个切换导致的接入请求消息，而原有的接入请求消息表明一个正常的接入请求（或者称之为初始的接入请求）消息，这样 UE 可向网络侧发送不同的接入请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常接入请求（或者称之为初始接入请求）消息，原有的接入请求消息对应切换导致的接入请求消息；或者切换导致的接入请求消息和正常接入请求（或者称之为初始接入请求）消息都重新定义）

4、UE、非 3GPP 网关、AAA Server、HSS 之间执行鉴权流程。UE 也可

以在该步骤中将 UE 的注册处理类型上报给非 3GPP 网关。UE 在鉴权流程的消息中携带 Access Type 信元。例如：该 Access Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。

或者 UE 在鉴权流程的消息中携带 Attach Type 信元。例如：该 Atatch Type 信元有如下两个取值：0 对应 Normal Attach（或者称之为 Initial Attach），表明该 UE 的注册处理类型是正常的注册（或者称之为初始的注册）；1 对应 Handover Attach，表明该 UE 的注册处理类型是切换导致的注册。

或者 UE 在鉴权流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的鉴权流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为“Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为“Handover Attach”。

非 3GPP 网关在这个步骤中将 UE 的注册处理类型上报给 AAA Server。

如果 UE 的注册过程中由 AAA Server 识别 UE 的注册处理类型（如 AAA Server 发现保存有用户在 3GPP 接入网络中使用的 PDN GW 地址信息，则 AAA Server 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，AAA Server 认为 UE 的注册处理类型为正常的注册处理类型），则 AAA Server 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给非 3GPP 网关。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 AAA Server 增加切换指示位信元（Handover Indication）。对于正常的注册处理类型，AAA Server 不携带该信元。

b) Cause 信元。对于切换导致的注册处理，AAA Server 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，AAA Server 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带该 Cause 信元。

c) Update Type 信元。对于切换导致的注册处理，AAA Server 将该信元设置为“Handover Attach”。对于正常注册处理，AAA Server 将该信元设置为“Initial Attach”或者不携带该信元。

5、非 3GPP 网关设备根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，非 3GPP 网关设备已区分了不同的注册处理类型。

进一步，如果处理类型为正常的接入，则非 3GPP 网关设备按照正常的接入流程处理，步骤 7 到 13 将被执行。

如果处理类型为切换导致的接入，则非 3GPP 网关设备发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到非 3GPP 网关设备，并转入步骤 6。

6、非 3GPP 网关发起网络侧承载创建流程，创建用户使用的承载，并转入步骤 13。

7、 如果 UE 的注册处理类型为正常发起的注册，且 AAA Server 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 HSS 注册到 AAA Server，则 AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 3GPP 接入网络中的注册。PDN GW 回取消注册确认消息到 AAA Server。

8、如果 PDN GW 和 Serving GW 之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 Serving GW，取消 Serving GW 网关设备和 PDN GW 之间的 PMIP 绑定。Serving GW 回绑定取消确认消息给 PDN GW。

9、如果 Serving GW 收到绑定取消指示消息，则 Serving GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

10、如果 PDN GW 和 Serving GW 之间的接口协议为 GTP 协议，则 PDN GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

11、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

12、AAA Server 发送取消注册消息到 HSS，取消 UE 在 HSS 中的注册。HSS 回取消注册确认消息到 AAA Server。

13、非 3GPP 网关回接入接受消息到 UE。

实施例 4：这种机制也能应用到可信（Trusted）的 Non-3GPP 系统。UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，HSS 通知 MME/SGSN 释放 UE 在 3GPP 网络中使用的资源。参见图 10 所示，包括下列步骤：

步骤 1 至 6 同实施例 3 中的处理，此处不再赘述。

7、如果 UE 的注册处理类型为正常发起的注册，且 AAA Server 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 HSS 注册到 AAA Server，则 AAA Server 发送取消注册消息到 HSS，取消 UE 在 HSS 中的注册。HSS 回取消注册确认消息到 AAA Server。

8、HSS 发送位置取消消息到 MME/SGSN。MME/SGSN 回位置取消确认消息到 HSS。

9、MME/SGSN 分离 UE，释放 UE 在 3GPP 接入网络中使用的资源。

10、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

11、非 3GPP 网关回接入接受消息到 UE。

实施例 5：这种机制也能应用到非可信（Untrusted）的 Non-3GPP 系统。UE 在发送接入鉴权请求或者 IKEv2/IPSec SA（Internet Key Exchange Protocol Version 2/IP Security Protocol Security Association，因特网密钥交换协议版本 2/IP 网络安全协议安全联盟）建立请求消息到演进分组数据网关（一种非 3GPP 网关）ePDG（Evolved Packet data Gateway）时，将该注册的处理类型信息上报给 ePDG，ePDG 据此识别该注册的处理类型；进一步根据该注册的处理类

型，相应为该 UE 创建承载，完成注册。ePDG 上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，同时 AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 11 所示，包括下列步骤：

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

2、MME 或者 SGSN 发送切换命令到 UE 通知 UE 切换到 Non-3GPP 网络，或者 UE 发现 Non-3GPP 网络并决定发起切换。

3、UE、ePDG、AAA Server、HSS 之间执行接入鉴权流程。UE 可以在该步骤中将 UE 的注册处理类型上报给 ePDG。UE 在接入鉴权流程的消息中携带 Access Type 信元。例如：该 Access Type 信元有如下两个取值：0 对应 Normal Access（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。

或者 UE 在接入鉴权流程的消息中携带 Attach Type 信元。例如：该 Atatch Type 信元有如下两个取值：0 对应 Normal Attach（或者称之为 Initial Attach），表明该 UE 的注册处理类型是正常的注册（或者称之为初始的注册）；1 对应 Handover Attach，表明该 UE 的注册处理类型是切换导致的注册。

或者 UE 在接入鉴权流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的接入鉴权流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause 信元。UE 将该 Cause 信元设置为“Attach due to Handover”。

c) Attach Type 信元。UE 将该信元设置为“Handover Attach”。

ePDG 在该步骤中可以将 UE 的注册处理类型上报给 AAA Server，AAA Server 将 UE 的注册处理类型上报给 HSS。

如果 UE 的注册过程中由 AAA Server 识别 UE 的注册处理类型（如 AAA

Server发现保存有用户在3GPP接入网络中使用的PDN GW地址信息，则AAA Server认为UE的注册处理类型为切换导致的注册处理类型；否则，AAA Server认为UE的注册处理类型为正常的注册处理类型），则AAA Server在这个消息中增加指示位信元将UE的注册处理类型信息通知给ePDG。指示位可能的方法有：

a) 如果UE的注册处理类型为切换导致的注册，则AAA Server增加切换指示位信元（Handover Indication）。对于正常的注册处理类型，AAA Server不携带该信元。

b) Cause信元。对于切换导致的注册处理，AAA Server将该Cause信元设置为“Update due to Handover Attach”。对于正常注册处理，AAA Server将该Cause信元设置为“Update due to Initial Attach”或者不携带该Cause信元。

c) Update Type信元。对于切换导致的注册处理，AAA Server将该信元设置为“Handover Attach”。对于正常注册处理，AAA Server将该信元设置为“Initial Attach”或者不携带该信元。

4、UE、ePDG、AAA Server之间执行IKEv2/IPSec SA建立流程。UE可以在这个步骤中将UE的注册处理类型上报给ePDG。UE可以在IKEv2/IPSec SA建立流程的消息中携带Access Type信元或者Attach Type信元指明UE的注册处理类型。或者UE在IKEv2/IPSec SA建立流程的消息中增加指示位表明该UE的注册处理类型是切换导致的注册，而原有的IKEv2/IPSec SA建立流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

a) 切换指示位信元（Handover Indication）。

b) Cause信元。UE将该Cause信元设置为“Access due to Handover”。

c) Access Type信元。UE将该信元设置为“Handover Access”。

ePDG在这个步骤中可以将UE的注册处理类型上报给AAA Server，AAA Server将UE的注册处理类型上报给HSS。

5、ePDG根据UE上报的该注册的处理类型信息，识别该注册的处理类型。至此，ePDG已区分了不同的注册处理类型。

进一步，如果处理类型为正常的接入，则 ePDG 按照正常的接入流程处理。步骤 7 到 13 将被执行。

如果处理类型为切换导致的接入，则 ePDG 发送请求策略和计费规则消息到PCRF获取用户使用的PCC规则。PCRF提供用户使用的PCC规则到非3GPP网关设备，并转入步骤 6。

6、ePDG 发起网络侧承载创建流程，创建用户使用的承载，并转入步骤 13。

步骤 7 至 13 同实施例 3 中的处理，此处不再赘述。

综上所述，本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

进一步，网络侧可按照识别出的处理类型，进行对应的流程处理。而且本发明实施例中还公开了 UE 上报注册的处理类型信息的具体方式：通过增加信元或新定义消息，更好的支撑了本发明实施例。

进一步，除前述流程中说明的 Initial Attach 和 Handover Attach 处理类型外，本发明实施例中 UE、HSS、AAA 服务器等实体上报的注册处理类型信息还可以包括其它的注册处理类型，如 Pre-Registration（即 UE 预先注册到目标接入网络的注册处理类型），Idle Mode Handover（即 UE 空闲模式下切换时的注册处理类型），Active Mode Handover（即 UE 激活模式下切换时的注册处理类型）。如对于多模终端（Multi Mode）或者双模（Dual Mode）终端（即这种终端能够同时接入到多个网络中）来说，注册的处理类型可能有：Power On Attach（即 UE 开机时的注册处理类型），Normal Attach（即 UE 正常接入时的注册处理类型），Handover Attach（即 UE 切换时的注册处理类型）等。本发明实施例不限制注册处理类型的取值。如下以 Idle Mode Handover 和 Active Mode Handover 的处理来说明其它注册处理类型的处理。

实施例 6：UE 激活模式下的 HRPD 到 E-UTRAN 网络切换时，MME 获取 UE 的切换处理类型。MME 判断切换处理类型为 UE 激活模式下的切换时则 MME 通知 eNodeB 建立接入网侧资源及使用预先路径切换机制。参见图 12 所示，包括下列步骤：

1、UE 在 HRPD 网络接入。

2、UE 或者 HRPD AN（Access Network，接入网络）决定执行切换到 3GPP 网络。

3、UE 通过 HRPD 网络发送 Attach Request 消息到 MME。由 MME 获取处理类型信息。MME 获取处理类型信息具体可以为：

1） UE 上报：UE 在 Attach Request 消息中通知 MME 本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

- ✓ UE 在 Attach Request 消息中增加“Attach Type”信元指示 MME 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

  0 表明（Idle Mode Handover）空闲模式下的切换；

  1 表明（Active Mode Handover）激活状态下的切换；

- ✓ UE 在 Attach Request 消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。UE 可以设置 Cause 原因值为：

  “Idle Mode Handover”表明Attach Request是由于空闲状态下的切换导致的；

  “Active Mode Handover”表明Attach Request是由于激活状态下的切换导致的；

- ✓ UE 在 Attach Request 消息中增加“UE State”信元将 UE 的状态上报。MME 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

  0 （Idle state）表明UE的状态为空闲状态

  1 （Active state）表明UE的状态为激活状态

- ✓ UE 在激活状态下的切换时在 Attach Request 消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时，在 Attach Request 消息中不携带“active flag”信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将“active flag”信元设置为“True（1）”指示需要建立接入网侧的承载。在空闲状态下的切换时，将“active flag”信元设置为“False（0）”指示不需要建立接入网侧的承载。

- ✓ UE 在空闲状态下的切换时在 Attach Request 消息中增加“Non-active

flag"信元指示不需要建立接入网侧的承载。在激活状态下的切换时，在Attach Request 消息中不携带"Non-active flag"信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将"Non-active flag"信元设置为"True（1）"指示不需要建立接入网侧的承载。在激活状态下的切换时，将"Non-active flag"信元设置为"False（0）"指示需要建立接入网侧的承载。

2） HRPD AN 上报：HRPD AN 在 S101 接口的消息中通知 MME 本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

✓ HRPD AN 在 S101 接口的消息中增加"Attach Type"信元指示 MME 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

0 表明（Idle Mode Handover）空闲模式下的切换

1 表明（Active Mode Handover）激活状态下的切换

✓ HRPD AN 在 S101 接口的消息中增加"Cause"信元表明导致 Attach Request 消息的原因值。HRPD AN 可以设置 Cause 原因值为：

"Idle Mode Handover"表明Attach Request是由于空闲状态下的切换导致的；

"Active Mode Handover"表明Attach Request是由于激活状态下的切换导致的；

✓ HRPD AN 在 S101 接口的消息中增加"UE State"信元将 UE 的状态上报。MME 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置"UE State"为：

0 （Idle state）表明UE的状态为空闲状态

1 （Active state）表明UE的状态为激活状态

✓ UE 在激活状态下的切换时 HRPD AN 在 S101 接口的消息中增加"active flag"信元指示需要建立接入网侧的承载。在空闲状态下的切换时，HRPD AN 在 S101 接口的消息中不携带"active flag"信元指示不需要建立接入网侧的承载。

✓ UE 在空闲状态下的切换时 HRPD AN 在 S101 接口的消息中增加

"Non-active flag"信元指示不需要建立接入网侧的承载。在激活状态下的切换时，HRPD AN 在 S101 接口的消息中不携带"Non-active flag"信元指示需要建立接入网侧的承载。

4、鉴权程序被执行。

5、MME 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

6、MME 选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在激活状态下的切换，则 MME 在 Create Default Bearer Request 消息中要求 Serving GW"预先路径切换"。

7、Serving GW 收到 Create Default Bearer Request 消息后如果发现这个消息要求 Serving GW"预先路径切换"，则 Serving GW 发起预先路径切换流程。Serving GW 发送 Proxy BU 消息到 PDN GW。PDN GW 收到上述消息后切换用户面的路由到 Serving GW，即 PDN GW 收到下行数据后将发给 Serving GW。

8、Serving GW 回 Create Default Bearer Response 消息到 MME。

9、MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在激活状态下的切换，则 MME 发送 Relocation Request 消息到 eNodeB 请求 eNodeB 建立接入网侧资源。eNodeB 完成接入网侧资源的创建后回 Relocation Request Acknowledge 消息给 MME。

10、MME 发送 Update Bearer Request 消息到 Serving GW 更新 Serving GW 的下行用户面路径到 eNodeB。Serving GW 回 Update Bearer Response 消息到 MME。

11、MME 如果发现切换是 UE 在激活状态下的切换，则 MME 发送 S101 HO Command 消息到 HRPD AN，消息中包含 Attach Accept 消息和 HO Command 消息。

12、HRPD AN 发送 HRPD AN L2 消息到 UE，消息中包含 Attach Accept 消息和 HO Command 消息。

13、UE 切换到 E-UTRAN 网络，发送 HO Complete 消息到 eNodeB。

14、eNodeB 发送 Relocation Complete 消息给 MME，通知 MME UE 已经切换到 E-UTRAN 网络。

值得说明的是：本实施例中步骤 6 与步骤 9 并没有绝对的先后时序关系。

实施例 7：UE 空闲模式下的 HRPD 到 E-UTRAN 网络切换时 MME 获取 UE 的切换处理类型。MME 判断切换处理类型为 UE 空闲模式下的切换时则 MME 不通知 eNodeB 建立接入网侧资源及不使用预先路径切换机制。参见图 13 所示，包括下列步骤：

1、UE 在 HRPD 网络接入。

2、UE 或者 HRPD AN（Access Network，接入网络）决定执行切换到 3GPP 网络。

3、UE 通过 HRPD 网络发送 Attach Request 消息到 MME。切换的处理类型需要通知给 MME。处理方法同实施例 6 中的描述，此处不再赘述。

4、鉴权程序被执行。

5、MME 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

6、MME 选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在空闲状态下的切换，则 MME 在 Create Default Bearer Request 消息中不要求 Serving GW“预先路径切换”。Serving GW 回 Create Default Bearer Response 消息到 MME。

7、MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在空闲状态下的切换，则 MME 不通知 eNodeB 建立接入网侧的资源，MME 通过 HRPD 网络直接发 Attach Accept 消息到 UE。

8、UE 切换到 E-UTRAN 网络，发送 TAU Request 消息到 MME 通知 MME UE 已经切换到 E-UTRAN 网络。

9、MME 发现 UE 在空闲状态下已经切换到 E-UTRAN 网络，则 MME 发送 Update Bearer Request 消息给 Serving GW。MME 在 Update Bearer Request

增加指示位要求 Serving GW 进行用户面路径切换。

10、Serving GW 收到 Update Bearer Request 消息后如果发现要求用户面路径切换，则 Serving GW 发送 Proxy BU 消息到 PDN GW 更新 PDN GW 的下行用户面路径。PDN GW 将下行用户面路径切换到 Serving GW 后回 Proxy BA 消息给 Serving GW。

11、Serving GW 回 Update Bearer Response 消息给 MME。

12、MME 回 TAU Accept 消息给 UE。

实施例 8：切换处理类型通知处理方法也能应用到 Non-3GPP 到 3GPP 网络的正常切换处理。UE 在 Attach Request 消息中将切换处理类型信息通知给 MME 或者 SGSN，MME 或者 SGSN 根据切换处理类型信息决定是否通知接入网建立接入网侧的资源。参见图 14 所示，包括下列步骤：

1、UE 在 Non-3GPP 网络（如 Wimax、WLAN 等网络）接入。

2、UE 决定执行切换到 3GPP 网络，发起切换流程。

3、UE 通过 3GPP 接入网络（AN，Access network）发送 Attach Request 消息到核心网网元。如果 3GPP 接入网络为 GERAN/UTRAN，则核心网网元为 SGSN；如果 3GPP 接入网络为 E-UTRAN，则核心网网元为 MME。UE 在 Attach Request 消息中通知 MME/SGSN 这个 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程，MME 或者 SGSN 获取处理类型信息。具体的通知方式可以是：

- ✓ UE 在 Attach Request 消息中增加“Attach Type”信元指示 MME/SGSN 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

  0 表明（Idle Mode Handover）空闲模式下的切换；

  1 表明（Active Mode Handover）激活状态下的切换；

- ✓ UE 在 Attach Request 消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。UE 可以设置 Cause 原因值为：

  “Idle Mode Handover”表明Attach Request是由于空闲状态下的切换导致的；

  “Active Mode Handover”表明Attach Request是由于激活状态下的切换导致的；

✓ UE 在 Attach Request 消息中增加“UE State”信元将 UE 的状态上报。MME/SGSN 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

0 （Idle state）表明UE的状态为空闲状态

1 （Active state）表明UE的状态为激活状态

✓ UE 在激活状态下的切换时在 Attach Request 消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时在 Attach Request 消息中不携带“active flag”信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将“active flag”信元设置为“True(1)”指示需要建立接入网侧的承载。在空闲状态下的切换时将“active flag”信元设置为“False（0）”指示不需要建立接入网侧的承载。

✓ UE 在空闲状态下的切换时在 Attach Request 消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时在 Attach Request 消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将“Non-active flag”信元设置为“True（1）”指示不需要建立接入网侧的承载。在激活状态下的切换时将“Non-active flag”信元设置为“False（0）”指示需要建立接入网侧的承载。

4、鉴权程序被执行。

5、MME/SGSN 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

6、MME/SGSN 选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。

7、Serving GW 发送 Proxy BU 消息到 PDN GW 更新 PDN GW 的下行用户面路径。PDN GW 将下行用户面路径切换到 Serving GW 后回 Proxy BA 消息给 Serving GW。

8、Serving GW 回 Create Default Bearer Response 消息给 MME/SGSN。

9、MME/SGSN 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME/SGSN 如果发现 UE 在激活状态

下的切换，则步骤 9 至 12 被执行。MME/SGSN 如果发现 UE 在空闲状态下的切换，则步骤 13 至 14 被执行。

MME/SGSN发送Initial Context Setup Request消息给3GPP AN请求3GPP AN建立接入网侧的资源，同时这个消息也携带Attach Accept消息。

10、3GPP AN 和 UE 之间建立无线承载。

11、3GPP AN 回 Initial Context Setup Complete 消息给 MME/SGSN。这个消息中也携带 Attach Complete 消息。

12、MME/SGSN 发送 Update Bearer Request 消息给 Serving GW 请求 Serving GW 更新下行用户面路径到 eNodeB。Serving GW 更新下行用户面路径到 3GPP AN 后回 Update Bearer Response 消息到 MME/SGSN。

13、MME/SGSN 如果发现 UE 在空闲状态下的切换，则 MME/SGSN 发送 Attach Accept 消息给 UE。

14、UE 回 Attach Complete 消息给 MME/SGSN。

实施例 9: UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，由 AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 3GPP 网络中的注册，AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 15 所示，包括下列步骤：

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

2、MME 或者 SGSN 发送切换命令到 UE，通知 UE 切换到 Non-3GPP 网络；或者 UE 发现 Non-3GPP 网络并决定发起切换。

3、UE 在发起注册到 Non-3GPP 网络之前，识别该注册的类型；之后发送接入请求消息到非 3GPP 网关设备，并相应将该注册的处理类型信息上报给非 3GPP 网关设备。

4、UE、非 3GPP 网关、AAA Server、HSS 之间执行鉴权流程。UE 也可

以在该步骤中将 UE 的注册处理类型上报给非 3GPP 网关。

非 3GPP 网关在该步骤中将 UE 的注册处理类型上报给 AAA Server 和 HSS。如果注册处理类型为切换处理类型，则 AAA Server 或者 HSS 可以将用户在 3GPP 接入网络中使用的 PDN GW 地址信息提供给非 3GPP 网关。

如果 UE 的注册过程中由 AAA Server 或者 HSS 识别 UE 的注册处理类型（如 AAA Server 或者 HSS 发现保存有用户在 3GPP 接入网络中使用的 PDN GW 地址信息，则 AAA Server 或者 HSS 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，AAA Server 或者 HSS 认为 UE 的注册处理类型为正常的注册处理类型），则 AAA Server 或者 HSS 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给非 3GPP 网关。指示位可能的方法有：

a) 如果 UE 的注册处理类型为切换导致的注册，则 AAA Server 或者 HSS 增加切换指示位信元（Handover Indication（切换指示位））。对于正常的注册处理类型，AAA Server 或者 HSS 不携带该信元。

b) Cause（原因）信元。对于切换导致的注册处理，AAA Server 或者 HSS 将该 Cause 信元设置为“Update due to Handover Attach（切换附着导致的更新）”。对于正常注册处理，AAA Server 或者 HSS 将该 Cause 信元设置为“Update due to Initial Attach（初始化附着导致的更新）”或者不携带该 Cause 信元。

c) Update Type（更新类型）信元。对于切换导致的注册处理，AAA Server 或者 HSS 将该信元设置为“Handover Attach（切换附着）”。对于正常注册处理，AAA Server 或者 HSS 将该信元设置为“Initial Attach（初始化附着）”或者不携带该信元。

5、非 3GPP 网关设备根据 UE 上报或者 AAA Server 上报或者 HSS 上报的该注册的处理类型信息，识别该注册的处理类型。

至此，非 3GPP 网关设备已区分了不同的注册处理类型。

进一步，如果处理类型为正常的接入，则非 3GPP 网关设备按照正常的接入流程处理。步骤 7 到 13 将被执行。

如果处理类型为切换导致的接入，则非 3GPP 网关设备发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC

规则到非 3GPP 网关设备，转入步骤 6。

6、非 3GPP 网关发起网络侧承载创建流程，创建用户使用的承载，转入步骤 13。

7、 如果 UE 的注册处理类型为正常发起的注册，且 HSS 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，则 HSS 发送取消注册消息到 AAA Server，取消 UE 在 AAA Server 中的注册。AAA Server 回取消注册确认消息到 HSS。

8、AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 3GPP 接入网络中的注册，PDN GW 回取消注册确认消息到 AAA Server。

9、如果 PDN GW 和 Serving GW 之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 Serving GW，取消 Serving GW 网关设备和 PDN GW 之间的 PMIP 绑定。Serving GW 回绑定取消确认消息给 PDN GW。

10、如果 Serving GW 收到绑定取消指示消息，则 Serving GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

11、如果 PDN GW 和 Serving GW 之间的接口协议为 GTP 协议，则 PDN GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

12、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

13、非 3GPP 网关回接入接受消息到 UE。

实施例 10：UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 3GPP 网络中的注册，同时 HSS 通知 MME/SGSN 释放 UE 在 3GPP 网络中使用的资源。参见图 16 所示，包括下列步骤：

步骤 1 至 6 同实施例 9 中的处理。

7、如果 UE 的注册处理类型为正常发起的注册，且 HSS 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，则 HSS 发送取消注册消息到 AAA Server，取消 UE 在 AAA Server 中的注册。AAA Server 回取消注册确认消息到 HSS。

8、HSS 发送位置取消消息到 MME/SGSN。MME/SGSN 回位置取消确认消息到 HSS。

9、MME/SGSN 分离 UE，释放 UE 在 3GPP 接入网络中使用的资源。

10、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

11、非 3GPP 网关回接入接受消息到 UE。

实施例 11: UE 激活模式下的 Non-3GPP 到 3GPP 网络切换时，3GPP 网络侧第一网元获取 UE 的切换处理类型。3GPP 网络侧第一网元判断切换处理类型为 UE 激活模式下的切换时，则 3GPP 网络侧第一网元通知 PDN GW 不发起源 Non-3GPP 网络的资源释放处理、通知 Serving GW 创建 Serving GW 和 Non-3GPP GW 之间的数据转发隧道资源。参见图 17 所示，包括下列步骤:

1、UE 在 Non-3GPP 网络接入。

2、UE 或者 Non-3GPP 接入网元（如对于 HRPD 网络来说，Non-3GPP 接入网元为 HRPD RNC）决定执行切换到 3GPP 网络。

3、UE 通过 Non-3GPP 网络发送 Attach Request 消息到 3GPP 网络侧第一网元（对于 E-UTRAN 网络来说，3GPP 网络侧第一网元为 MME；对于 GERAN/UTRAN 网络来说，3GPP 网络侧第一网元为 SGSN）。由 3GPP 网络侧第一网元获取处理类型信息。3GPP 网络侧第一网元获取处理类型信息具体可以为:

1） UE 上报: UE 在 Attach Request 消息中通知 3GPP 网络侧第一网元本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是:

✓ UE 在 Attach Request 消息中增加“Attach Type”信元指示 MME 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型:

0 表明（Idle Mode Handover）空闲模式下的切换;

1 表明（Active Mode Handover）激活状态下的切换；或者，

对于激活状态下的优化切换或者预注册，UE将Attach Request消息中的“Attach Type”信元设置为“Optimized Handover（优化切换）”或者为“Pre-registration（预注册）”或者为“Handover（切换）”。网络侧第一网元收到这个Attach Type后缺省认为Attach流程是UE在激活状态下的切换流程。

- ✓ UE 在 Attach Request 消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。UE 可以设置 Cause 原因值为：

“Idle Mode Handover”表明Attach Request是由于空闲状态下的切换导致的；

“Active Mode Handover”表明Attach Request是由于激活状态下的切换导致的；

- ✓ UE 在 Attach Request 消息中增加“UE State”信元将 UE 的状态上报。MME 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

0 （Idle state）表明UE的状态为空闲状态；

1 （Active state）表明UE的状态为激活状态。

- ✓ UE 在激活状态下的切换时在 Attach Request 消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时在 Attach Request 消息中不携带“active flag”信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将“active flag”信元设置为“True（1）”指示需要建立接入网侧的承载。在空闲状态下的切换时将“active flag”信元设置为“False（0）”指示不需要建立接入网侧的承载。
- ✓ UE 在空闲状态下的切换时在 Attach Request 消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时在 Attach Request 消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将“Non-active flag”信元设置为“True（1）”指示不需要建立接入网侧的承载。在激活状态下的切换时将“Non-active flag”信元设置为“False（0）”指示需要建立接入网侧的

承载。

2） Non-3GPP 接入网元或者 Non-3GPP GW 上报：Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中通知 3GPP 网络侧第一网元本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

✓ Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中增加“Attach Type”信元指示 3GPP 网络侧第一网元切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

0 表明（Idle Mode Handover）空闲模式下的切换；

1 表明（Active Mode Handover）激活状态下的切换；或者，

对于激活状态下的优化切换或者预注册，Non-3GPP接入网元或者 Non-3GPP GW将“Attach Type”信元设置为“Optimized Handover（优化切换）”或者为“Pre-registration（预注册）”或者为“Handover（切换）”。3GPP 网络侧第一网元收到这个Attach Type后缺省认为Attach流程是UE在激活状态下的切换流程。

✓ Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。Non-3GPP 接入网元或者 Non-3GPP GW 可以设置 Cause 原因值为：

“Idle Mode Handover”表明Attach Request是由于空闲状态下的切换导致的；

“Active Mode Handover”表明Attach Request是由于激活状态下的切换导致的；

✓ Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中增加“UE State”信元将 UE 的状态上报。3GPP 网络侧第一网元根据UE的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

0 （Idle state）表明UE的状态为空闲状态；

1 （Active state）表明UE的状态为激活状态。

✓ UE 在激活状态下的切换时 Non-3GPP 接入网元或者 Non-3GPP GW 在

发送给 3GPP 网络侧第一网元接口的消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时 Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中不携带“active flag”信元指示不需要建立接入网侧的承载。

✓ UE 在空闲状态下的切换时 Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时 Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。

4、鉴权程序被执行。

5、3GPP 网络侧第一网元发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

6、3GPP 网络侧第一网元选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。

7、如果 Serving GW 和 PDN GW 之间的接口协议使用 GTP 协议，Serving GW 发送 Create Default Bearer Request 消息到 PDN GW。如果 Serving GW 和 PDN GW 之间的接口协议使用 PMIP 协议，Serving GW 发送 Proxy BU 消息到 PDN GW。PDN GW 回 Create Default Bearer Response 消息或者 Proxy BA 消息到 Serving GW。

8、Serving GW 回 Create Default Bearer Response 消息到 3GPP 网络侧第一网元。

9、3GPP 网络侧第一网元如果发现 UE 在激活状态下的切换，则 3GPP 网络侧第一网元发送创建转发隧道请求消息到 Serving GW，请求 Serving GW 建立转发隧道资源。Serving GW 回创建转发隧道响应消息到 3GPP 网络侧第一网元，消息中携带转发隧道信息（Serving GW Address 和 GRE Keys）。

10、3GPP 网络侧第一网元如果发现切换是 UE 在激活状态下的切换，则 3GPP 网络侧第一网元发送 HO Command 消息到 Non-3GPP 接入网元或者 Non-3GPP GW，消息中包含 Attach Accept 消息和 HO Command 消息以及转发隧道信息（Serving GW Address 和 GRE Keys）。

11、如果 Non-3GPP 接入网元收到 HO Command 消息后发送创建转发隧道请求消息给 Non-3GPP GW，将获得的转发隧道信息通知给 Non-3GPP GW。Non-3GPP GW 回创建转发隧道响应消息给 Non-3GPP 接入网元。

后续 Non-3GPP GW 通过转发隧道（Serving GW Address 和 GRE Keys）将收到的下行数据转发给 Serving GW。

12、Non-3GPP 接入网元或者 Non-3GPP GW 发送 HO Command 消息到 UE，消息中包含 Attach Accept 消息和 HO Command 消息。

13、UE 切换到 3GPP 网络，发送 HO Complete 消息到 3GPP 接入网元。

14、3GPP 接入网元发送 Relocation Complete 消息给 3GPP 网络侧第一网元，通知 3GPP 网络侧第一网元 UE 已经切换到 3GPP 网络。

15、3GPP 网络侧第一网元发送修改承载请求消息到 Serving GW。3GPP 网络侧第一网元如果发现切换是 UE 在激活状态下的切换，则 3GPP 网络侧第一网元在修改承载请求消息中增加指示位信息指示 PDN GW 不发起 UE 在源 Non-3GPP 接入网络中的资源释放处理流程。这个指示位可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体处理方式可以有：

1）“Update Type”（更新类型）指示位。网络侧第一网元设置“Update Type”指示位为“Pre-registration（预注册）”或者为“Optimized Handover（优化切换）”。

2）“Cause（原因）”原因值。网络侧第一网元设置“Cause”原因值为“Pre-registration（预注册）”或者为“Optimized Handover（优化切换）”或者为“Resource not Release（资源不释放）”。

3）“Pre-registration Indication（预注册指示位）”指示位或者“Optimized Handover Indication（优化切换指示位）”指示位或者“Resource not Release Indication（资源不释放指示位）”指示位。

16、如果 Serving GW 和 PDN GW 之间的接口使用 GTP 协议，则 Serving GW 发送修改承载请求消息到 PDN GW。如果 Serving GW 和 PDN GW 之间的接口使用 PMIP 协议，则 Serving GW 发送代理绑定更新消息到 PDN GW。Serving GW 在修改承载请求或者代理绑定更新消息中增加指示位信息指示 PDN GW 不发起 UE 在源 Non-3GPP 接入网络中的资源释放处理流程。这个指示位可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体

处理方式可以有:

1）“Update Type（更新类型）”或者“Binding Type（绑定类型）”指示位。Serving GW 设置“Update Type（更新类型）”或者“Binding Type（绑定类型）”指示位为“Pre-registration(预注册)”或者为“Optimized Handover(优化切换)”。

2）“Cause（原因）”原因值。Serving GW 设置“Cause”原因值为“Pre-registration（预注册）”或者为“Optimized Handover（优化切换）”或者为“Resource not Release（资源不释放）”指示位。

3）“Pre-registration Indication（预注册指示位）”指示位或者“Optimized Handover Indication（优化切换指示位）”指示位或者“Resource not Release Indication（资源不释放指示位）”指示位。

PDN GW 收到上述消息后不发起 UE 在源 Non-3GPP 接入网络中的资源释放处理流程(即 Non-3GPP 接入网络中的资源释放处理不是由 PDN GW 触发)。PDN GW 回修改承载响应或者代理绑定确认消息到 Serving GW。

17、Serving GW 回修改承载响应消息到 3GPP 网络侧第一网元。

18、3GPP 网络侧第一网元在收到 eNodeB 发送 Relocation Complete 消息后回切换完成消息到 Non-3GPP 接入网元或者 Non-3GPP GW。

19、Non-3GPP 接入网元或者 Non-3GPP GW 收到 3GPP 网络侧第一网元发送的切换完成消息后发起源 Non-3GPP 接入网络中的资源释放处理流程。

值得说明的是:

1、本实施例中步骤 6 与步骤 9 并没有绝对的先后时序关系。

2、本实施例不限定步骤 9 和步骤 11 中的消息。如对于 HRPD 网络来说，步骤 11 中的消息也有可能为 A11 注册请求（A11-Registration Request）消息（A11-Registration Request）。

实施例 12: UE 激活模式下的 3GPP 到 Non-3GPP 网络切换时，Non-3GPP 网络中的网元获取 UE 的切换处理类型。Non-3GPP 网络中的网元判断切换处理类型为 UE 激活模式下的切换时则建立接入网侧资源、创建数据转发资源、通知 PDN GW 不发起源侧资源的释放处理。参见图 18 所示，包括下列步骤:

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 网络。

2、UE 通过 3GPP 网络执行 Non-3GPP 网络特定的附着程序、鉴权及认证

程序。

3、UE 通过 3GPP 网络触发 Non-3GPP 网络中的层 3 附着程序。Non-3GPP 网络中的接入网络（如 HRPD 网络中的 RNC）或者 Non-3GPP GW（如 HRPD 网络中的 PDSN）获取切换处理类型信息。Non-3GPP 网络中的接入网络或者 Non-3GPP GW 获取切换处理类型信息具体可以为：

1） UE 上报：UE 在层 3 附着程序的消息中通知 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 本次流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

✓ UE 在层 3 附着程序的消息中增加“Attach Type”信元指示 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

0 表明（Idle Mode Handover）空闲模式下的切换；

1 表明（Active Mode Handover）激活状态下的切换；或者，

对于激活状态下的优化切换或者预注册，UE将层3附着程序的消息中的“Attach Type”信元设置为“Optimized Handover（优化切换）”或者为“Pre-registration（预注册）”或者为“Handover（切换）”。Non-3GPP网络中的接入网络或者Non-3GPP GW收到这个Attach Type后缺省认为层3附着程序是UE在激活状态下的切换流程。

✓ UE 在层 3 附着程序的消息中增加“Cause”信元表明导致层 3 附着程序的消息的原因值。UE 可以设置 Cause 原因值为：

“Idle Mode Handover”表明层3附着程序的消息是由于空闲状态下的切换导致的；

“Active Mode Handover”表明层3附着程序的消息是由于激活状态下的切换导致的；

✓ UE 在层 3 附着程序的消息中增加“UE State”信元将 UE 的状态上报。Non-3GPP 网络中的接入网络或者 Non-3GPP GW 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

0 （Idle state）表明UE的状态为空闲状态；

1 （Active state）表明UE的状态为激活状态。

✓ UE 在激活状态下的切换时，在层 3 附着程序的消息消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时，在层 3 附着程序的消息消息中不携带“active flag”信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将“active flag”信元设置为“True（1）”指示需要建立接入网侧的承载。在空闲状态下的切换时，将“active flag”信元设置为“False（0）”指示不需要建立接入网侧的承载。

✓ UE 在空闲状态下的切换时，在层 3 附着程序的消息消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时，在层 3 附着程序的消息消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时，将“Non-active flag”信元设置为“True（1）”指示不需要建立接入网侧的承载。在激活状态下的切换时，将“Non-active flag”信元设置为“False（0）”指示需要建立接入网侧的承载。

2） 3GPP 网络侧第一网元上报：3GPP 网络侧第一网元在与 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间的接口消息中通知 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 本次层 3 附着程序是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

✓ 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加“Attach Type”信元指示 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

0 表明（Idle Mode Handover）空闲模式下的切换；

1 表明（Active Mode Handover）激活状态下的切换；或者，

对于激活状态下的优化切换或者预注册，3GPP网络侧第一网元将“Attach Type”信元设置为“Optimized Handover（优化切换）”或者为“Pre-registration（预注册）”或者为“Handover（切换）”。Non-3GPP网络中的接入网络或者Non-3GPP GW收到这个Attach Type后缺省认为层3附着程序是UE在激活状态下的切换流程。

- ✓ 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW之间接口的消息中增加"Cause"信元表明导致层3附着程序消息的原因值。3GPP 网络侧第一网元可以设置 Cause 原因值为:

"Idle Mode Handover"表明层3附着程序消息是由于空闲状态下的切换导致的;

"Active Mode Handover"表明层3附着程序消息是由于激活状态下的切换导致的;

- ✓ 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加"UE State"信元将 UE 的状态上报。Non-3GPP 网络中的接入网络或者 Non-3GPP GW 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置"UE State"为:

0 (Idle state) 表明UE的状态为空闲状态;

1 (Active state) 表明UE的状态为激活状态。

- ✓ UE 在激活状态下的切换时, 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加"active flag"信元指示需要建立接入网侧的承载。在空闲状态下的切换时, 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中不携带"active flag"信元指示不需要建立接入网侧的承载。
- ✓ UE 在空闲状态下的切换时, 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加"Non-active flag"信元指示不需要建立接入网侧的承载。在激活状态下的切换时, 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中不携带"Non-active flag"信元指示需要建立接入网侧的承载。

值得说明的是:

Non-3GPP 网络中的接入网络或者 Non-3GPP GW 也可以在步骤 2 中获取切换处理类型信息。具体处理方式同步骤 3 中的处理。

4、如果 Non-3GPP 接入网络发现 UE 是在激活状态下的切换，则 Non-3GPP 接入网络发送创建转发隧道请求消息到 Non-3GPP GW 请求数据转发资源。

5、Non-3GPP GW 回创建转发隧道响应消息到 Non-3GPP 接入网络，消息中携带 Non-3GPP GW 的数据转发隧道信息（如对于 HRPD 网络来说，其数据转发隧道信息为 PDSN Address 和 PDSN GRE Key）。

6、如果 Non-3GPP GW 发现 UE 是在激活状态下的切换，则 Non-3GPP GW 发送创建资源请求消息到 Non-3GPP 接入网元请求建立接入网侧资源。Non-3GPP 接入网元分配接入网侧资源，回创建资源响应消息到 Non-3GPP GW。

7、如果 Non-3GPP 接入网元或者 Non-3GPP GW 发现 UE 是在激活状态下的切换，则 Non-3GPP 接入网元或者 Non-3GPP GW 发送切换命令到 3GPP 网络侧第一网元，消息中携带 Non-3GPP GW 的数据转发隧道信息。

8、3GPP 网络侧第一网元收到切换命令后发送创建转发隧道请求消息到 Serving GW，请求 Serving GW 建立数据转发隧道资源，消息中携带 Non-3GPP GW 的数据转发隧道信息。Serving GW 创建数据转发隧道信息，回创建转发隧道响应消息到 3GPP 网络侧第一网元。

9、3GPP 网络侧第一网元发送重定位命令消息到 3GPP 接入网元。

3GPP 接入网元将收到的下行数据包转发给 Serving GW，Serving GW 将收到的转发数据包转发给 Non-3GPP GW。

10、3GPP 接入网络发送切换命令消息到 UE，请求 UE 切换到 Non-3GPP 网络。

11、UE 切换到 Non-3GPP 网络，发送接入消息通知 Non-3GPP 网络中的网元 UE 已经切换到 Non-3GPP 网络（具体的接入消息由特定的 Non-3GPP 网络确定，如对于 HRPD 网络来说，接入消息为 HRPD Traffic Channel Complete（TCC，传输通道完成）消息）。

12、如果 Non-3GPP GW 和 PDN GW 之间的接口使用 PMIP 协议，则 Non-3GPP GW 发送代理绑定更新消息到 PDN GW。Non-3GPP GW 如果发现 UE 是在激活状态下的切换，则在代理绑定更新消息中增加指示位信息指示 PDN GW 不发起 UE 在源 3GPP 接入网络中的资源释放处理流程。这个指示位

可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体处理方式同实施例 11 中的处理。

PDN GW 收到上述消息后不发起 UE 在源 3GPP 接入网络中的资源释放处理流程(即 3GPP 接入网络中的资源释放处理不是由 PDN GW 触发)。PDN GW 回代理绑定确认消息到 Non-3GPP GW。

13、如果 UE 和 PDN GW 之间的接口使用基于主机移动性协议(host-based mobility protocol，如双栈移动因特网版本 6 协议（DSMIPv6，Dual Stack MIPv6)),则 UE 发送绑定更新消息到 PDN GW。UE 如果发现 UE 是在激活状态下的切换，则在绑定更新消息中增加指示位信息指示 PDN GW 不发起 UE 在源 3GPP 接入网络中的资源释放处理流程。这个指示位可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体处理方式同实施例 11 中的处理。

PDN GW 收到上述消息后不发起 UE 在源 3GPP 接入网络中的资源释放处理流程(即 3GPP 接入网络中的资源释放处理不是由 PDN GW 触发)。PDN GW 回绑定确认消息到 UE。

14、Non-3GPP 接入网元或者 Non-3GPP GW 发送切换完成消息到 3GPP 网络侧第一网元。

15、3GPP 网络侧第一网元收到切换完成消息后发起 3GPP 网络侧的资源释放处理程序，删除 UE 在 3GPP 网络中使用的资源。

值得说明的是:

1、本发明实施例不限定步骤 5 和步骤 8 中的消息。如对于 HRPD 网络来说，步骤 5 中的消息也有可能为 A11 注册请求消息。

实施例 13: 切换处理类型通知处理方法也能应用到 3GPP 到 Non-3GPP 网络的正常切换处理。UE 在 Non-3GPP 网络的接入消息中将切换处理类型信息通知给 Non-3GPP GW，Non-3GPP GW 根据切换处理类型信息决定是否通知接入网建立接入网侧的资源。参见图 19 所示，包括下列步骤:

1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 网络。

2、UE 切换到 Non-3GPP 网络，执行 Non-3GPP 网络特定的附着程序、鉴权及认证程序。

3、UE 通过 Non-3GPP 网络的接入网元触发 Non-3GPP 网络中的层 3 附着程序。Non-3GPP GW（如 HRPD 网络中的 PDSN）获取切换处理类型信息。Non-3GPP GW 获取切换处理类型信息具体可以为：

UE 上报：UE 在层 3 附着程序的消息中通知 Non-3GPP GW 本次流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式同实施例 6 中的处理。

值得说明的是：

Non-3GPP GW 也可以在步骤 2 中获取切换处理类型信息。具体处理方式同步骤 3 中的处理。

4、如果 Non-3GPP GW 发现 UE 是在激活状态下的切换，则 Non-3GPP GW 发送创建资源请求消息到 Non-3GPP 接入网元请求建立接入网侧资源。Non-3GPP 接入网元分配接入网侧资源，回创建资源响应消息到 Non-3GPP GW。

5、如果 Non-3GPP GW 和 PDN GW 之间的接口使用 PMIP 协议，则 Non-3GPP GW 发送代理绑定更新消息到 PDN GW。PDN GW 回代理绑定确认消息到 Non-3GPP GW。

6、如果 UE 和 PDN GW 之间的接口使用客户移动因特网协议，则 UE 发送绑定更新消息到 PDN GW。PDN GW 回绑定确认消息到 UE。

7、Non-3GPP GW 回层 3 附着完成消息到 UE。

综上所述，采用本发明的实施例，网络侧网元获取 UE 的注册处理类型信息后可以进行区分的处理，能够解决现有机制下网络侧无法针对不同的注册流程区分处理的问题。

显然，本领域的技术人员可以对本发明实施例进行各种改动和变型而不脱离本发明的精神和范围。这样，倘若本发明的这些修改和变型属于本发明权利要求及其等同技术的范围之内，则本发明也意图包含这些改动和变型在内。

权 利 要 求

1、一种注册处理方法，其特征在于，包括:

接收用户终端 UE 上报的注册的处理类型信息；以及

根据所述处理类型信息，识别该注册的处理类型。

2、如权利要求 1 所述的方法，其特征在于，所述处理类型信息由 UE 在注册到网络时识别。

3、如权利要求 2 所述的方法，其特征在于，所述 UE 识别所述注册处理类型信息包括:

所述 UE 发现注册是由于切换到不同网络或者需要切换不同网络导致时，识别注册处理类型为切换注册处理类型；或者，

所述 UE 发现注册是由于需要切换不同网络导致时，识别注册处理类型为优化切换注册处理类型或者预注册处理类型；或者

所述 UE 发现注册是由于切换到不同网络或者需要切换不同网络导致时，根据UE状态识别为激活模式下的切换注册处理类型或空闲模式下的切换注册处理类型。

4、如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 上报处理类型信息的方式，包括下列之一:

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带该注册的处理类型信息;

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带指示位信元，以表征切换注册处理类型;

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带指示位信元，以表征空闲模式切换注册处理类型;

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带指示位信元，以表征激活模式切换注册处理类型;

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的跟踪区更新请求消息中携带该注册的处理类型信息;

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的跟踪区更新请求消息中携带指示位信元，以表征切换注册处理类型;

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的路由区更新请求消息中携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的路由区更新请求消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的接入请求消息中携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的接入请求消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在接入鉴权或者鉴权的过程中，该 UE 在向网络侧发送的消息中携带该注册的处理类型信息；

所述 UE 在接入鉴权或者鉴权的过程中，该 UE 在向网络侧发送的消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在因特网密钥交换协议版本 2IKEv2 或者 IP 网络安全协议安全联盟 IPsec SA 建立的过程中，该 UE 在向网络侧发送的消息中携带该注册的处理类型信息；

所述 UE 在因特网密钥交换协议版本 2 或者 IP 网络安全协议安全联盟建立的过程中，该 UE 在向网络侧发送的消息中携带指示位信元，以表征切换注册处理类型。

5、如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 上报处理类型信息具体包括:

向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息；或者，

向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息；或者，

向网络侧发送不同的路由区更新请求消息，分别表征对应的注册处理类型信息；或者，

向网络侧发送不同的接入请求消息，分别表征对应的注册处理类型信息。

6、如权利要求 1 所述的方法，其特征在于，所述根据处理类型信息，识别该注册的处理类型具体为:

网络侧网元将接收的注册处理类型信息通知给归属签约寄存器 HSS 或者认证、授权与计费服务器 AAA Server，由所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理。

7、如权利要求 6 所述的方法，其特征在于，所述网络侧网元为移动性管理实体 MME 或服务 GPRS 支持节点 SGSN，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

HSS 收到 MME 或 SGSN 通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 HSS 中存在该 UE 在 Non-3GPP 网络中使用的分组数据网络网关实体 PDN GW 地址信息，则 HSS 通知 AAA Server 取消该 UE 在 Non-3GPP 网络的注册；

AAA Server 通知 Non-3GPP 网络释放该 UE 在 Non-3GPP 网络中使用的资源。

8、如权利要求 6 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

AAA Server 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 AAA Server 中存在该 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 PDN GW 释放该 UE 在 3GPP 网络中使用的资源。

9、如权利要求 8 所述的方法，其特征在于，所述方法进一步包括：

AAA Server 进一步通知 HSS 取消所述 UE 在 3GPP 网络中的注册。

10、如权利要求 6 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

HSS 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 HSS 中存在所述 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消所述 UE 在 3GPP 网络中的注册；

所述 AAA Server 通知 PDN GW 释放该 UE 在 3GPP 网络中使用的资源。

11、如权利要求 6 所述的方法，其特征在于：所述网络侧网元为非 3GPP

网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

AAA Server 或者 HSS 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为切换注册且 AAA Server 或者 HSS 中存在所述 UE 在 3GPP 网络中使用的 PDN GW 的地址信息，则 AAA Server 或者 HSS 将所述 PDN GW 地址信息下发给所述非 3GPP 网关设备。

12、如权利要求 6 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

AAA Server 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 AAA Server 中存在该 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消该 UE 在 3GPP 网络中的注册；或者，

HSS 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 HSS 中存在所述 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消该 UE 在 3GPP 网络中的注册；

HSS 通知 MME/SGSN 释放该 UE 在 3GPP 网络中使用的资源。

13、一种切换处理方法，其特征在于，包括：

接收用户终端 UE 的接入请求；以及

根据所述 UE 的接入请求，识别该接入请求的切换处理类型。

14、如权利要求 13 所述的方法，其特征在于，所述方法进一步包括：

如果识别的切换处理类型为切换注册处理类型，网络侧网元为移动性管理实体 MME 或服务 GPRS 支持节点 SGSN，则所述 MME 或 SGSN 通知 PDN GW 发起网络侧承载创建流程，创建 UE 使用的承载资源。

15、如权利要求 13 所述的方法，其特征在于，所述方法进一步包括：

如果识别的切换处理类型为切换注册处理类型，网络侧网元为非 3GPP 网关设备，则所述非 3GPP 网关设备发起网络侧承载创建流程，创建 UE 使用的承载资源。

16、如权利要求 13 所述的方法，其特征在于，所述方法进一步包括：

如果识别的切换处理类型为激活模式下的切换注册处理类型，则创建接入网侧资源。

17、如权利要求 13 所述的方法，其特征在于，所述方法进一步包括：

如果识别的切换处理类型为激活模式下的切换注册处理类型，则使用预先路径切换机制。

18、如权利要求 13 所述的方法，其特征在于，所述方法进一步包括：

如果识别的切换处理类型为空闲模式下的切换注册处理类型，则不创建接入网侧资源。

19、如权利要求 13 所述的方法，其特征在于，所述方法进一步包括：

如果识别的切换处理类型为空闲模式下的切换注册处理类型，则在所述 UE 切换到目标网络后，通过在修改承载请求消息中携带指示位信息指示服务网关实体 Serving GW 通知 PDN GW 切换下行用户面路径。

20、如权利要求 13 所述的方法，其特征在于，所述方法进一步包括：

如果识别的切换处理类型为激活模式下的切换注册处理类型，则移动性管理实体 MME、或者服务 GPRS 支持节点 SGSN、或者 Non-3GPP GW 通知 PDN GW 不发起源接入网络的资源释放处理。

21、如权利要求 20 所述的方法，其特征在于，所述通知 PDN GW 不发起源接入网络的资源释放处理具体为：

在发送给 PDN GW 的消息中携带指示位信息指示 PDN GW 不发起源接入网络的资源释放处理。

22、如权利要求 13 所述的方法，其特征在于，所述方法进一步包括：

如果识别的切换处理类型为激活模式下的切换注册处理类型，则目标网络的网元与源网络的网元之间根据所述目标网络的数据转发隧道资源信息建立数据转发隧道。

23、如权利要求 22 所述的方法，其特征在于，所述目标网络为 3GPP 网络、所述源网络为 Non-3GPP 网络时，所述目标网络的网元与源网络的网元之间根据所述目标网络的数据转发隧道资源信息建立数据转发隧道具体为：

所述 3GPP 网络侧第一网元接收到激活模式下的切换注册处理类型信息后，将从 Serving GW 获取的数据转发隧道资源信息通过 Non-3GPP 接入网元

发送给 Non-3GPP GW，或者直接发送给 Non-3GPP GW;

由所述 Non-3GPP GW 建立与 Serving GW 之间的数据转发隧道。

24、如权利要求 22 所述的方法，其特征在于，所述目标网络为 Non-3GPP 网络、所述源网络为 3GPP 网络时，所述目标网络的网元与源网络的网元之间根据所述目标网络的数据转发隧道资源信息建立数据转发隧道具体为:

所述 Non-3GPP 网络的接入网元或者 Non-3GPP GW 接收到激活模式下的切换注册处理类型信息后，将所述 Non-3GPP GW 的数据转发隧道资源信息通过 3GPP 网络侧第一网元发送给 Serving GW;

由所述 Serving GW 建立与 Non-3GPP GW 之间的数据转发隧道。

25、如权利要求 13 所述的方法，其特征在于，所述切换处理类型的信息由 UE 在所述的接入请求消息中携带；或者，

所述切换处理类型的信息由源网络的网元在所述接入请求消息中携带。

26、一种注册处理方法，其特征在于，包括:

接收 HSS 或者 AAA Server 上报的用户终端 UE 注册的处理类型信息；以及

根据所述处理类型信息，识别该注册的处理类型。

27、如权利要求 26 所述的方法，其特征在于，所述方法进一步包括:

所述 HSS 或者 AAA Server 根据是否保存有 UE 使用的 PDN GW 地址信息识别 UE 的注册处理类型;

如果 HSS 或者 AAA Server 发现已经保存 UE 使用的 PDN GW 地址信息，则识别 UE 的注册处理类型为切换注册处理类型；或者，

如果 HSS 或者 AAA Server 发现没有保存 UE 使用的 PDN GW 地址信息，则识别 UE 的注册处理类型为初始化注册处理类型。

28、如权利要求 26 所述的方法，其特征在于，接收所述注册的处理类型信息的网络侧网元为移动性管理实体 MME 或服务 GPRS 支持节点 SGSN 或非 3GPP 网关设备。

29、如权利要求 26 所述的方法，其特征在于，所述方法进一步包括:

接收所述注册的处理类型信息的网络侧网元如果识别 UE 的注册处理类型为切换注册处理类型，则所述网络侧网元通知 PDN GW 恢复 UE 在源接入网

络使用的承载资源。

30、一种注册处理系统，其特征在于，包括：

用户终端 UE，用于在注册到网络的过程中，上报该注册的处理类型信息；

网络侧，用于根据接收的 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

31、如权利要求 30 所述的系统，其特征在于，网络侧接收所述注册的处理类型信息的网元为网络侧的移动性管理实体 MME、服务 GPRS 支持节点 SGSN 或非 3GPP 网关设备。

32、如权利要求 30 所述的系统，其特征在于，所述用户终端 UE 在注册到网络的过程中，上报该注册的处理类型信息具体为：

所述用户终端 UE 在注册到网络时，识别注册的处理类型信息后再上报所述注册的处理类型信息。

33、一种用户终端，其特征在于，包括：

识别单元，用于在所述用户终端发起注册时，识别该注册的类型；

注册发起单元，用于发起注册，并发出注册触发信号；

上报单元，用于接收所述注册发起单元发出的注册触发信号，并在所述用户终端注册到网络的过程中，将所述识别单元识别出的该注册类型对应的处理类型信息上报。

34、如权利要求 33 所述的用户终端，其特征在于，所述上报单元按以下方式进行上报：

将所述处理类型信息携带于附着请求消息中的信元中进行上报；或者，

将所述处理类型信息携带于跟踪区更新请求消息中的信元中进行上报；或者，

将所述处理类型信息携带于路由区更新请求消息中的信元中进行上报；或者，

将所述处理类型信息携带于接入请求消息中的信元中进行上报；或者，

将所述处理类型信息携带于接入鉴权或者鉴权消息中的信元中进行上报；或者，

将所述处理类型信息携带于 IKEv2 或 IPsec SA 建立消息中的信元中进行

上报。

35、如权利要求 33 所述的用户终端，其特征在于，所述上报单元上报的过程具体为：

对应不同的注册类型，向网络侧发送不同的附着请求消息；或者，

对应不同的注册类型，向网络侧发送不同的跟踪区更新请求消息；或者，

对应不同的注册类型，向网络侧发送不同的路由区更新请求消息；或者，

对应不同的注册类型，向网络侧发送不同的接入请求消息。

36、一种网络侧的网元，其特征在于，包括：

获取单元，用于获取注册过程中 UE 的注册处理类型信息；

识别单元，用于根据所述获取单元获取的处理类型信息，识别该注册的处理类型。

37、如权利要求 36 所述的网元，其特征在于，所述网元为移动性管理实体 MME、服务 GPRS 支持节点 SGSN 或非 3GPP 网关设备。

38、如权利要求 36 所述的网元，其特征在于，所述获取单元获取的处理类型信息由所述 UE、HSS 或者 AAA Server 上报。

39、如权利要求 36 至 38 任一项所述的网元，其特征在于，所述网元进一步包括：

第一处理单元，用于在所述识别单元识别注册的处理类型为切换注册处理类型时，发起网络侧承载创建流程，创建所述 UE 使用的承载资源。

40、如权利要求 36 至 38 任一项所述的网元，其特征在于，所述网元进一步包括：

第二处理单元，用于在所述识别单元识别注册的处理类型为激活模式下的切换注册处理类型时，不发起源接入网络的资源释放处理。

41、如权利要求 36 至 38 任一项所述的网元，其特征在于，所述网元进一步包括：

第三处理单元，用于在所述识别单元识别注册的处理类型为激活模式下的切换注册处理类型时，发起目标网络的网元与源网络的网元之间的数据转发隧道资源创建处理。

摘　要

一种注册处理方法、切换处理方法、系统及装置，以使网络侧可区分不同的注册处理类型。本发明实施例方法包括：接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及根据所述处理类型信息，识别该注册的处理类型。本发明实施例系统包括：用户终端 UE，用于在注册到网络的过程中，将该注册的处理类型信息上报；网络侧，用于根据接收的 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

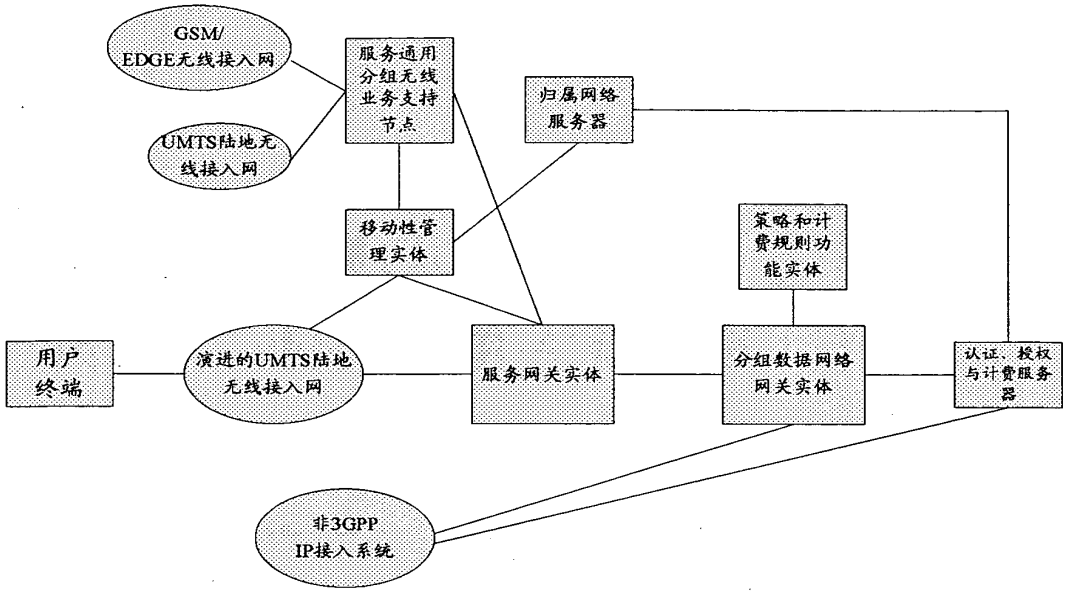
GSM/
EDGE无线接入网
UMTS陆地无线接入网
服务通用分组无线业务支持节点
归属网络服务器
移动性管理实体
策略和计费规则功能实体
用户终端
演进的UMTS陆地无线接入网
服务网关实体
分组数据网络网关实体
认证、授权与计费服务器
非3GPP IP接入系统

图 1

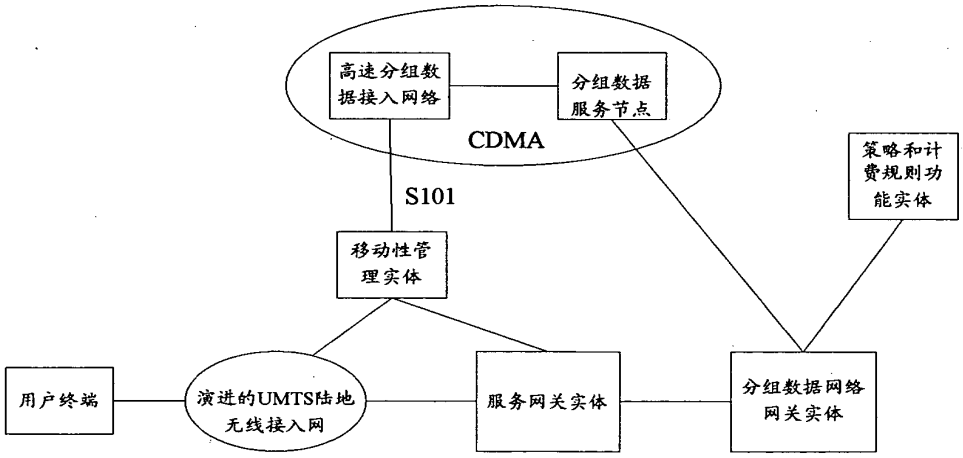
高速分组数据接入网络
分组数据服务节点
CDMA
S101
策略和计费规则功能实体
移动性管理实体
用户终端
演进的UMTS陆地无线接入网
服务网关实体
分组数据网络网关实体

图 2

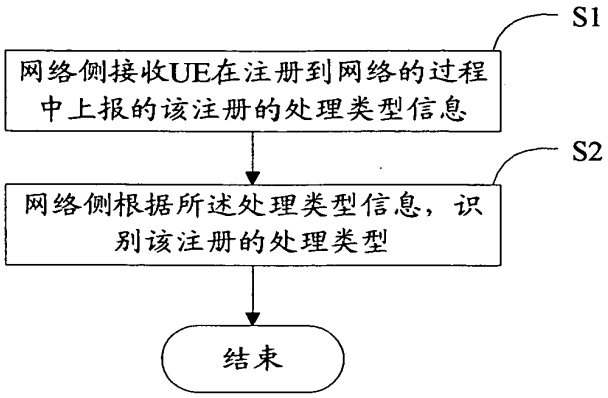
S1
网络侧接收UE在注册到网络的过程中上报的该注册的处理类型信息
S2
网络侧根据所述处理类型信息，识别该注册的处理类型
结束

图 3

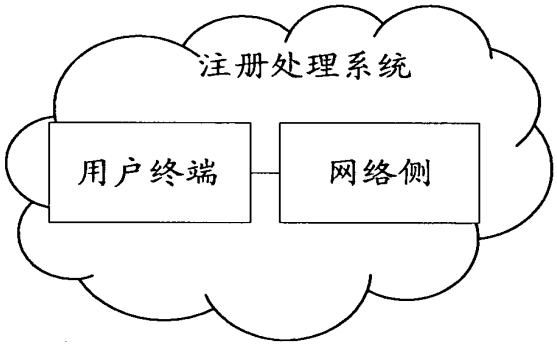
注册处理系统
用户终端
网络侧

图 4

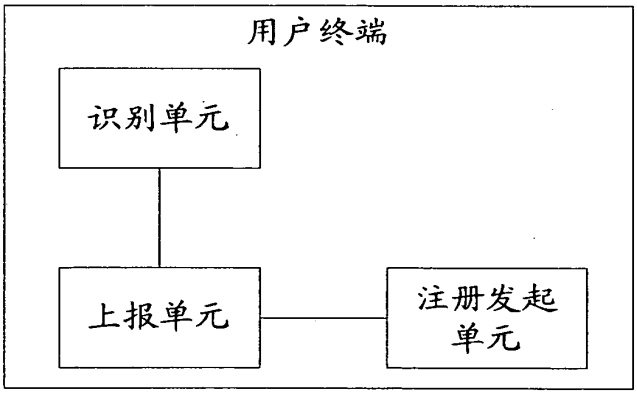
用户终端
识别单元
上报单元
注册发起单元

图 5

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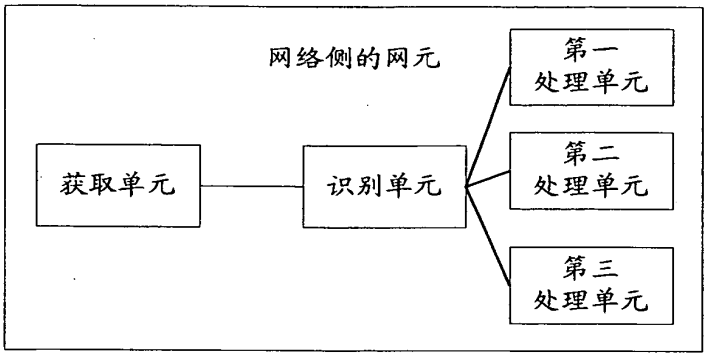
网络侧的网元
获取单元
识别单元
第一处理单元
第二处理单元
第三处理单元

图 6

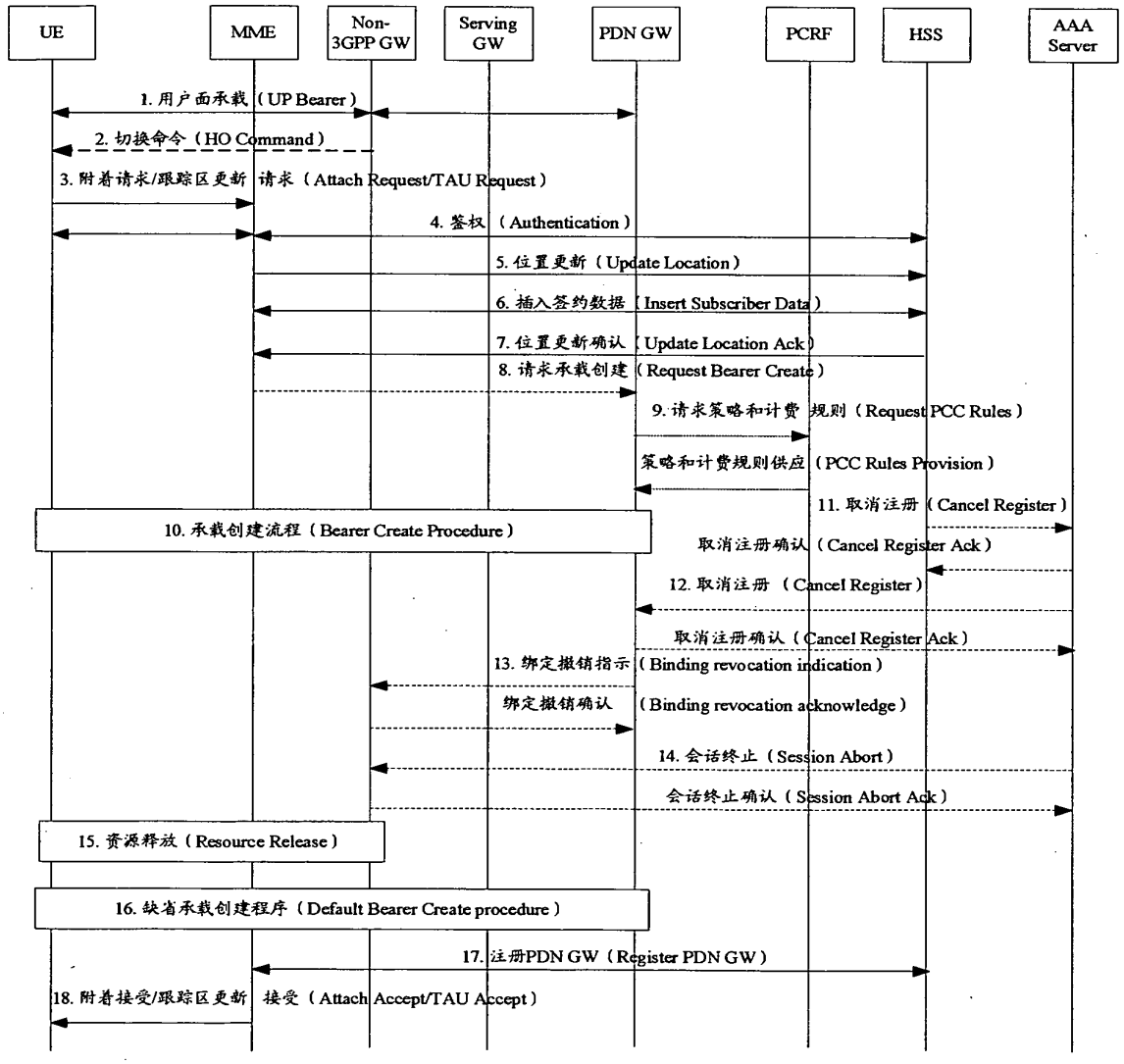
UE
MME
Non-3GPP GW
Serving GW
PDN GW
PCRF
HSS
AAA Server
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/跟踪区更新 请求（Attach Request/TAU Request）
4. 鉴权（Authentication）
5. 位置更新（Update Location）
6. 插入签约数据（Insert Subscriber Data）
7. 位置更新确认（Update Location Ack）
8. 请求承载创建（Request Bearer Create）
9. 请求策略和计费 规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
11. 取消注册（Cancel Register）
10. 承载创建流程（Bearer Create Procedure）
取消注册确认（Cancel Register Ack）
12. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
13. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
14. 会话终止（Session Abort）
会话终止确认（Session Abort Ack）
15. 资源释放（Resource Release）
16. 缺省承载创建程序（Default Bearer Create procedure）
17. 注册PDN GW（Register PDN GW）
18. 附着接受/跟踪区更新 接受（Attach Accept/TAU Accept）

图 7

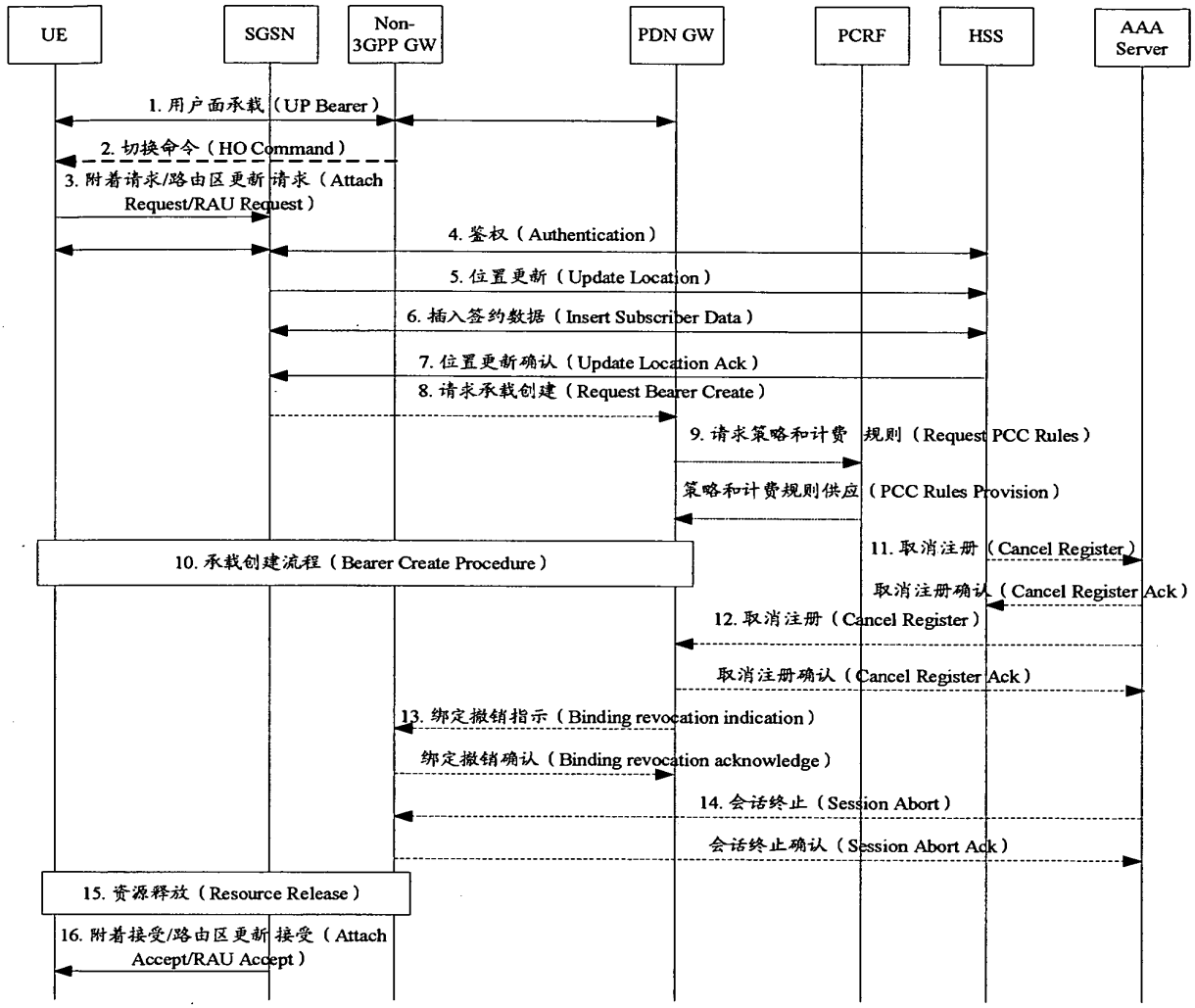
UE
SGSN
Non-3GPP GW
PDN GW
PCRF
HSS
AAA Server
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 附着请求/路由区更新请求（Attach Request/RAU Request）
4. 鉴权（Authentication）
5. 位置更新（Update Location）
6. 插入签约数据（Insert Subscriber Data）
7. 位置更新确认（Update Location Ack）
8. 请求承载创建（Request Bearer Create）
9. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
10. 承载创建流程（Bearer Create Procedure）
11. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
12. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
13. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
14. 会话终止（Session Abort）
会话终止确认（Session Abort Ack）
15. 资源释放（Resource Release）
16. 附着接受/路由区更新接受（Attach Accept/RAU Accept）

图 8

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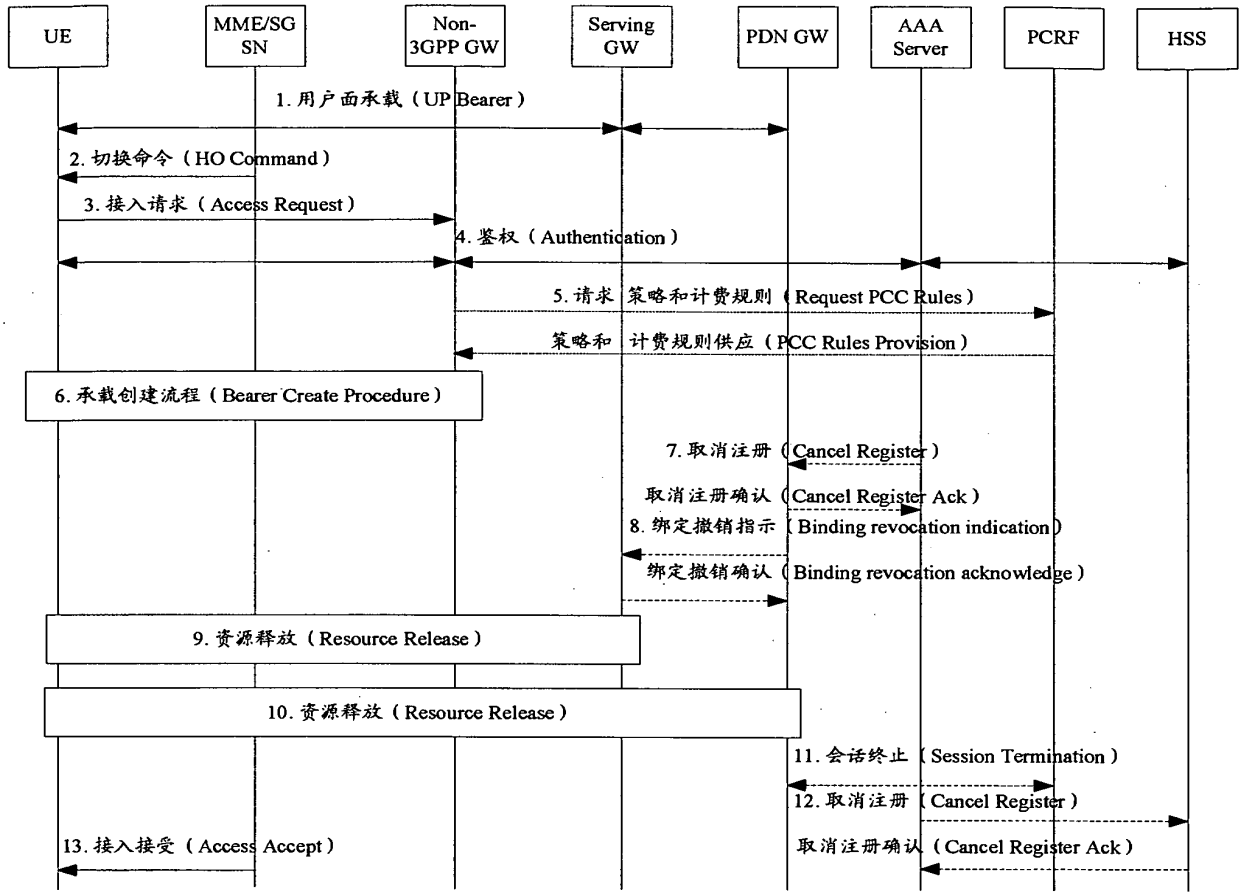
UE
MME/SG SN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求 策略和计费规则（Request PCC Rules）
策略和 计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
9. 资源释放（Resource Release）
10. 资源释放（Resource Release）
11. 会话终止（Session Termination）
12. 取消注册（Cancel Register）
13. 接入接受（Access Accept）
取消注册确认（Cancel Register Ack）

图 9

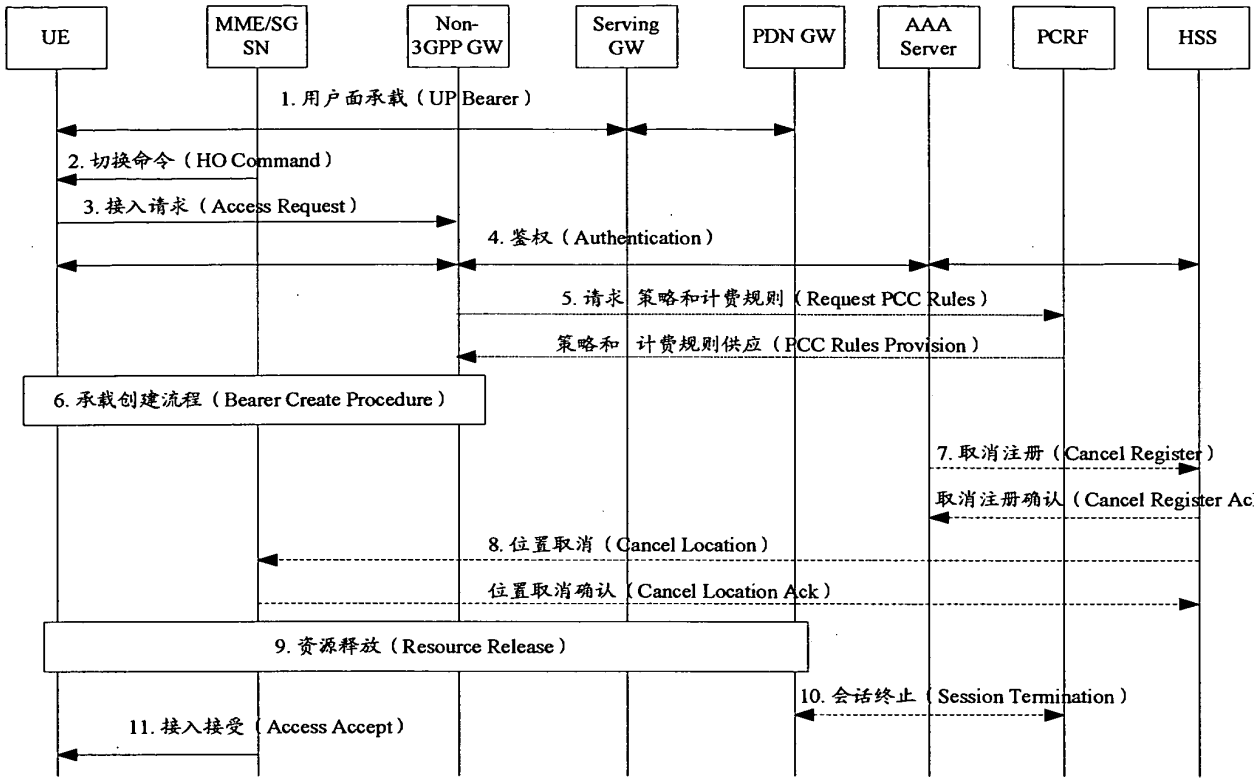
UE
MME/SG SN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求 策略和计费规则（Request PCC Rules）
策略和 计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ac
8. 位置取消（Cancel Location）
位置取消确认（Cancel Location Ack）
9. 资源释放（Resource Release）
10. 会话终止（Session Termination）
11. 接入接受（Access Accept）

图 10

—7/15—

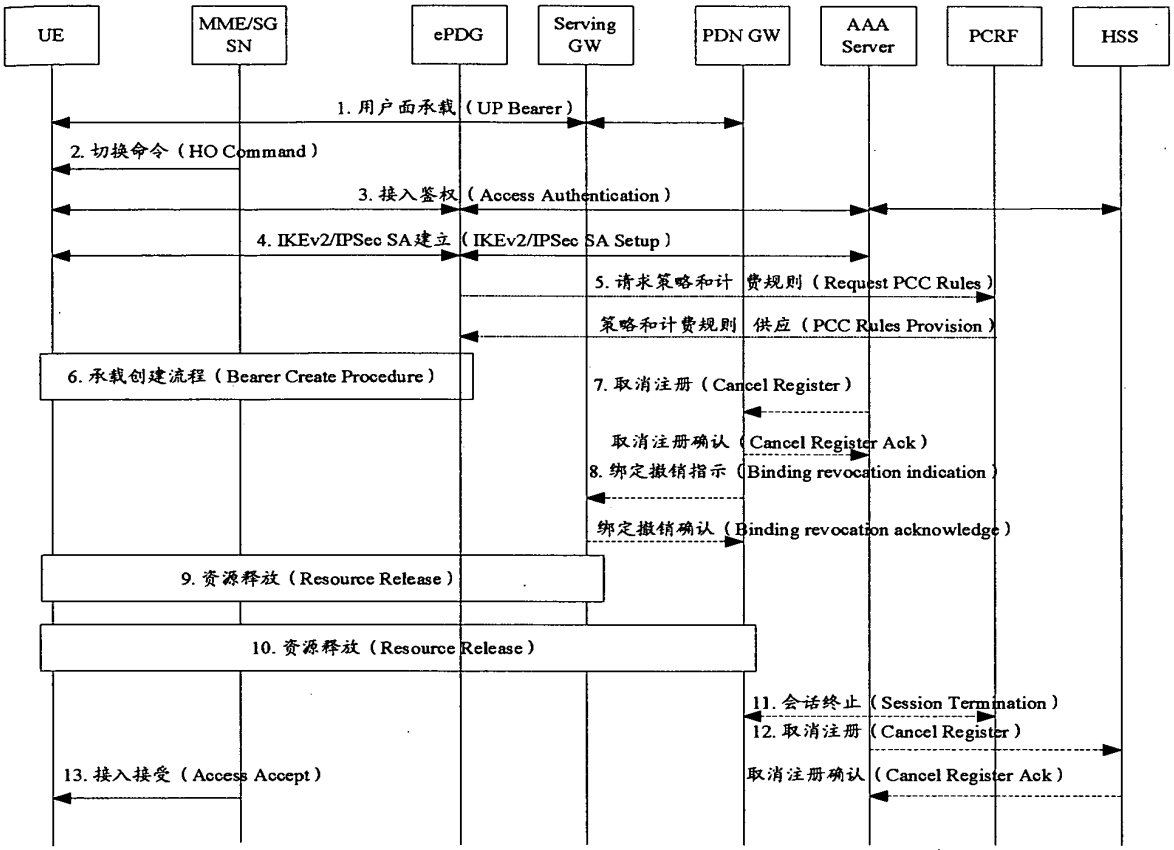
UE
MME/SG SN
ePDG
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入鉴权（Access Authentication）
4. IKEv2/IPSec SA建立（IKEv2/IPSec SA Setup）
5. 请求策略和计费规则（Request PCC Rules）
策略和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
9. 资源释放（Resource Release）
10. 资源释放（Resource Release）
11. 会话终止（Session Termination）
12. 取消注册（Cancel Register）
13. 接入接受（Access Accept）
取消注册确认（Cancel Register Ack）

图 11

—8/15—

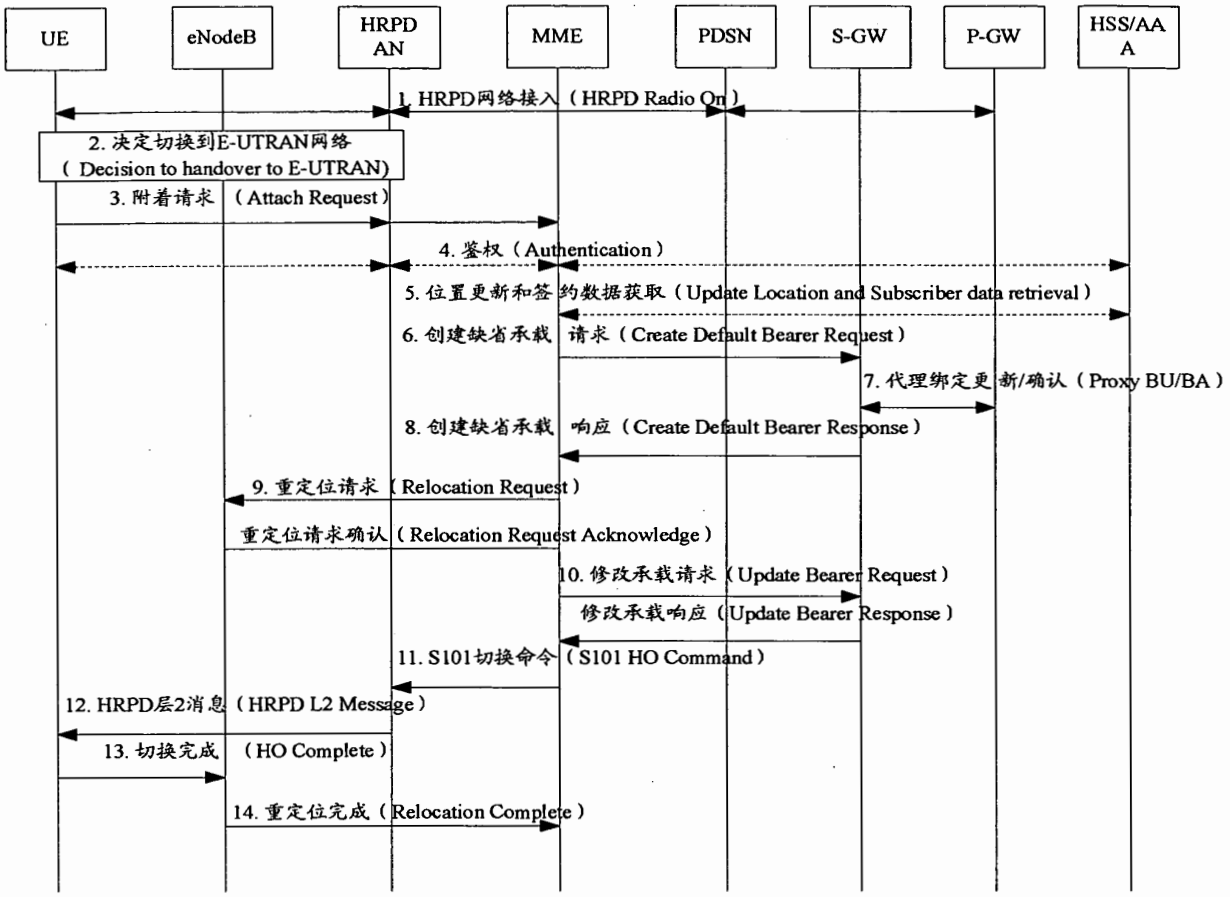
UE
eNodeB
HRPD AN
MME
PDSN
S-GW
P-GW
HSS/AAA
1. HRPD网络接入（HRPD Radio On）
2. 决定切换到E-UTRAN网络（Decision to handover to E-UTRAN）
3. 附着请求（Attach Request）
4. 鉴权（Authentication）
5. 位置更新和签约数据获取（Update Location and Subscriber data retrieval）
6. 创建缺省承载请求（Create Default Bearer Request）
7. 代理绑定更新/确认（Proxy BU/BA）
8. 创建缺省承载响应（Create Default Bearer Response）
9. 重定位请求（Relocation Request）
重定位请求确认（Relocation Request Acknowledge）
10. 修改承载请求（Update Bearer Request）
修改承载响应（Update Bearer Response）
11. S101切换命令（S101 HO Command）
12. HRPD层2消息（HRPD L2 Message）
13. 切换完成（HO Complete）
14. 重定位完成（Relocation Complete）

图 12

—9/15—

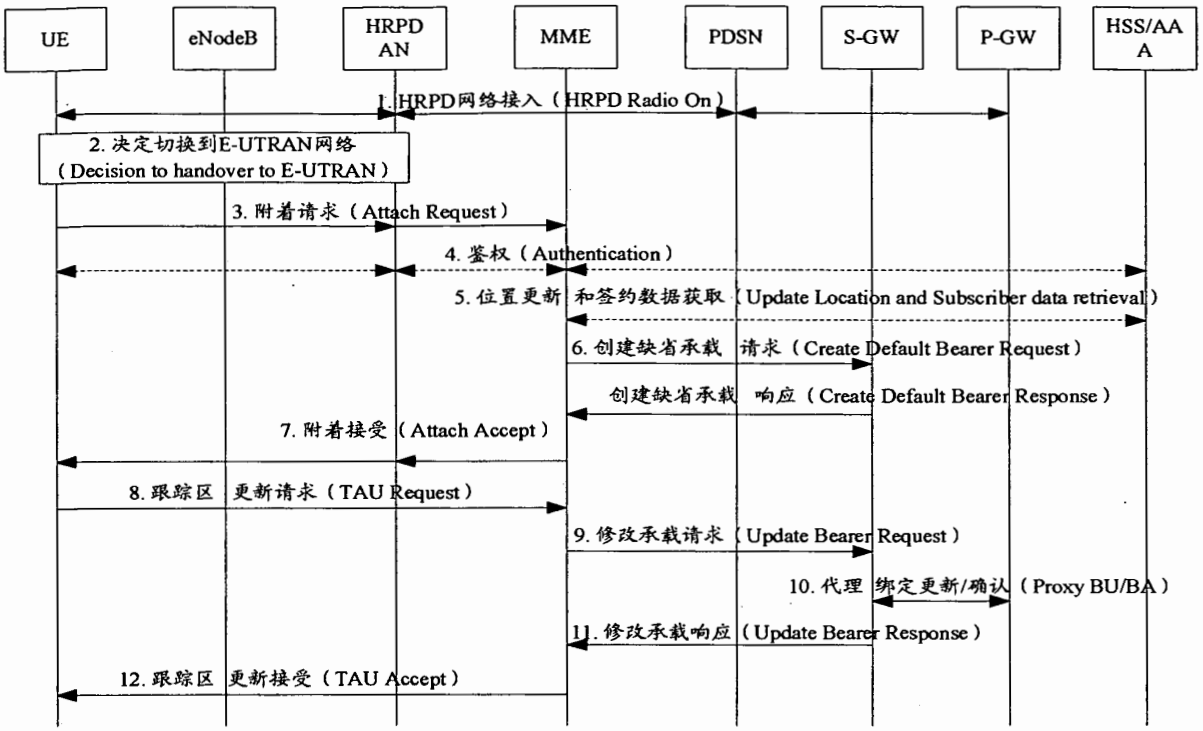
UE
eNodeB
HRPD AN
MME
PDSN
S-GW
P-GW
HSS/AAA
1. HRPD网络接入（HRPD Radio On）
2. 决定切换到E-UTRAN网络（Decision to handover to E-UTRAN）
3. 附着请求（Attach Request）
4. 鉴权（Authentication）
5. 位置更新和签约数据获取（Update Location and Subscriber data retrieval）
6. 创建缺省承载请求（Create Default Bearer Request）
创建缺省承载响应（Create Default Bearer Response）
7. 附着接受（Attach Accept）
8. 跟踪区更新请求（TAU Request）
9. 修改承载请求（Update Bearer Request）
10. 代理绑定更新/确认（Proxy BU/BA）
11. 修改承载响应（Update Bearer Response）
12. 跟踪区更新接受（TAU Accept）

图 13

—10/15—

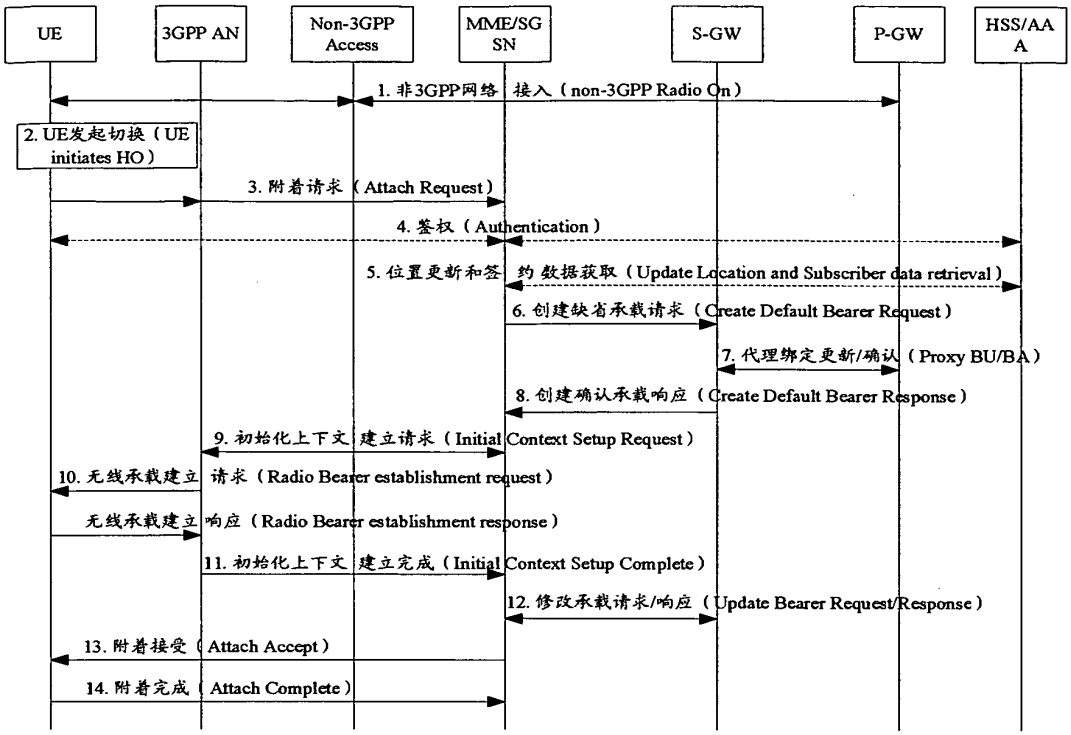
UE
3GPP AN
Non-3GPP Access
MME/SG SN
S-GW
P-GW
HSS/AAA
1. 非3GPP网络 接入（non-3GPP Radio On）
2. UE发起切换（UE initiates HO）
3. 附着请求（Attach Request）
4. 鉴权（Authentication）
5. 位置更新和签约数据获取（Update Location and Subscriber data retrieval）
6. 创建缺省承载请求（Create Default Bearer Request）
7. 代理绑定更新/确认（Proxy BU/BA）
8. 创建确认承载响应（Create Default Bearer Response）
9. 初始化上下文建立请求（Initial Context Setup Request）
10. 无线承载建立请求（Radio Bearer establishment request）
无线承载建立响应（Radio Bearer establishment response）
11. 初始化上下文建立完成（Initial Context Setup Complete）
12. 修改承载请求/响应（Update Bearer Request/Response）
13. 附着接受（Attach Accept）
14. 附着完成（Attach Complete）

图 14

—11/15—

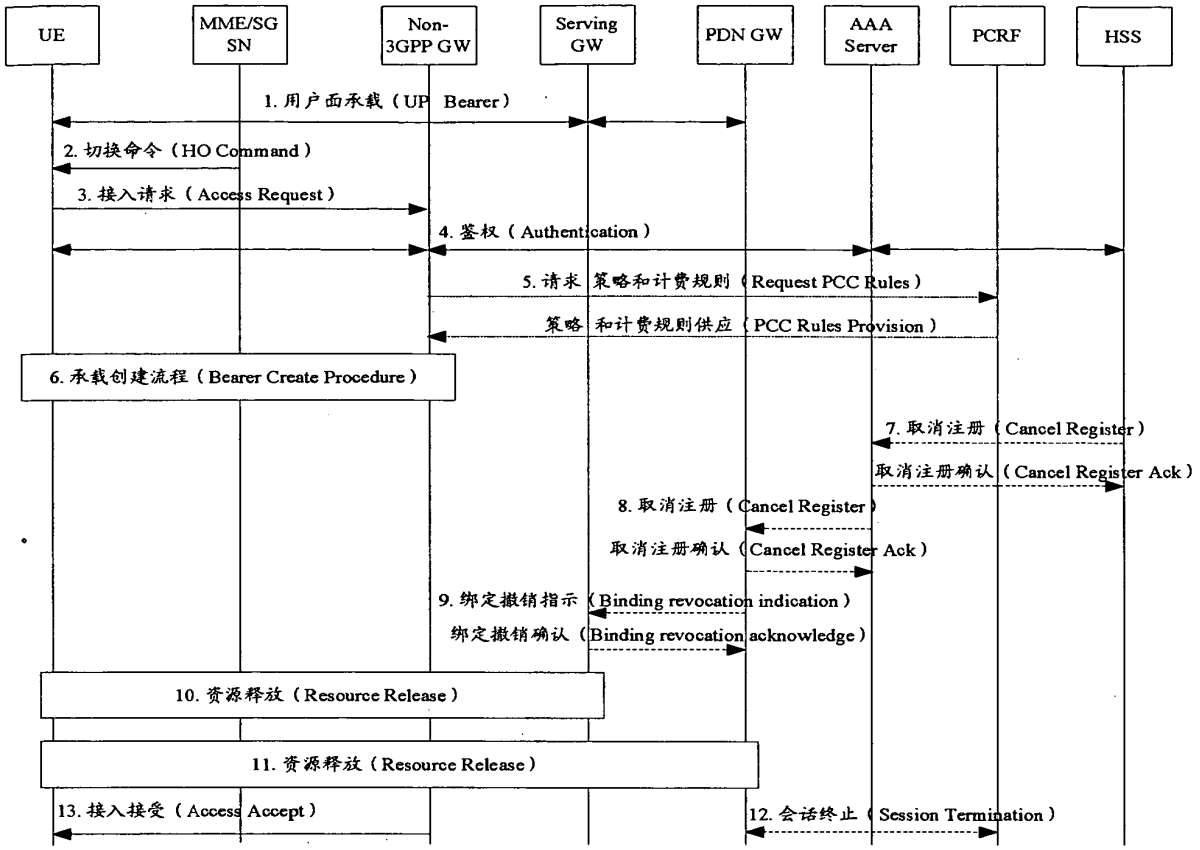
UE
MME/SG SN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求 策略和计费规则（Request PCC Rules）
策略 和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
9. 绑定撤销指示（Binding revocation indication）
绑定撤销确认（Binding revocation acknowledge）
10. 资源释放（Resource Release）
11. 资源释放（Resource Release）
13. 接入接受（Access Accept）
12. 会话终止（Session Termination）

图 15

—12/15—

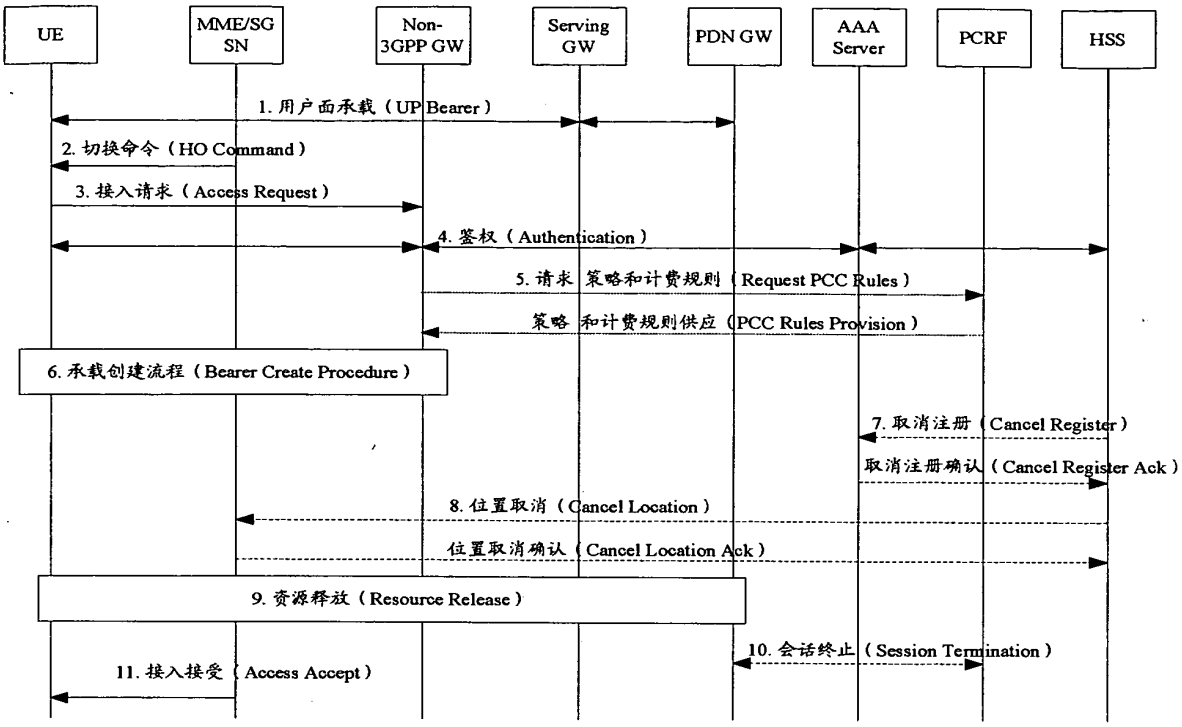
UE
MME/SG SN
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. 用户面承载（UP Bearer）
2. 切换命令（HO Command）
3. 接入请求（Access Request）
4. 鉴权（Authentication）
5. 请求 策略和计费规则（Request PCC Rules）
策略 和计费规则供应（PCC Rules Provision）
6. 承载创建流程（Bearer Create Procedure）
7. 取消注册（Cancel Register）
取消注册确认（Cancel Register Ack）
8. 位置取消（Cancel Location）
位置取消确认（Cancel Location Ack）
9. 资源释放（Resource Release）
10. 会话终止（Session Termination）
11. 接入接受（Access Accept）

图 16

—13/15—

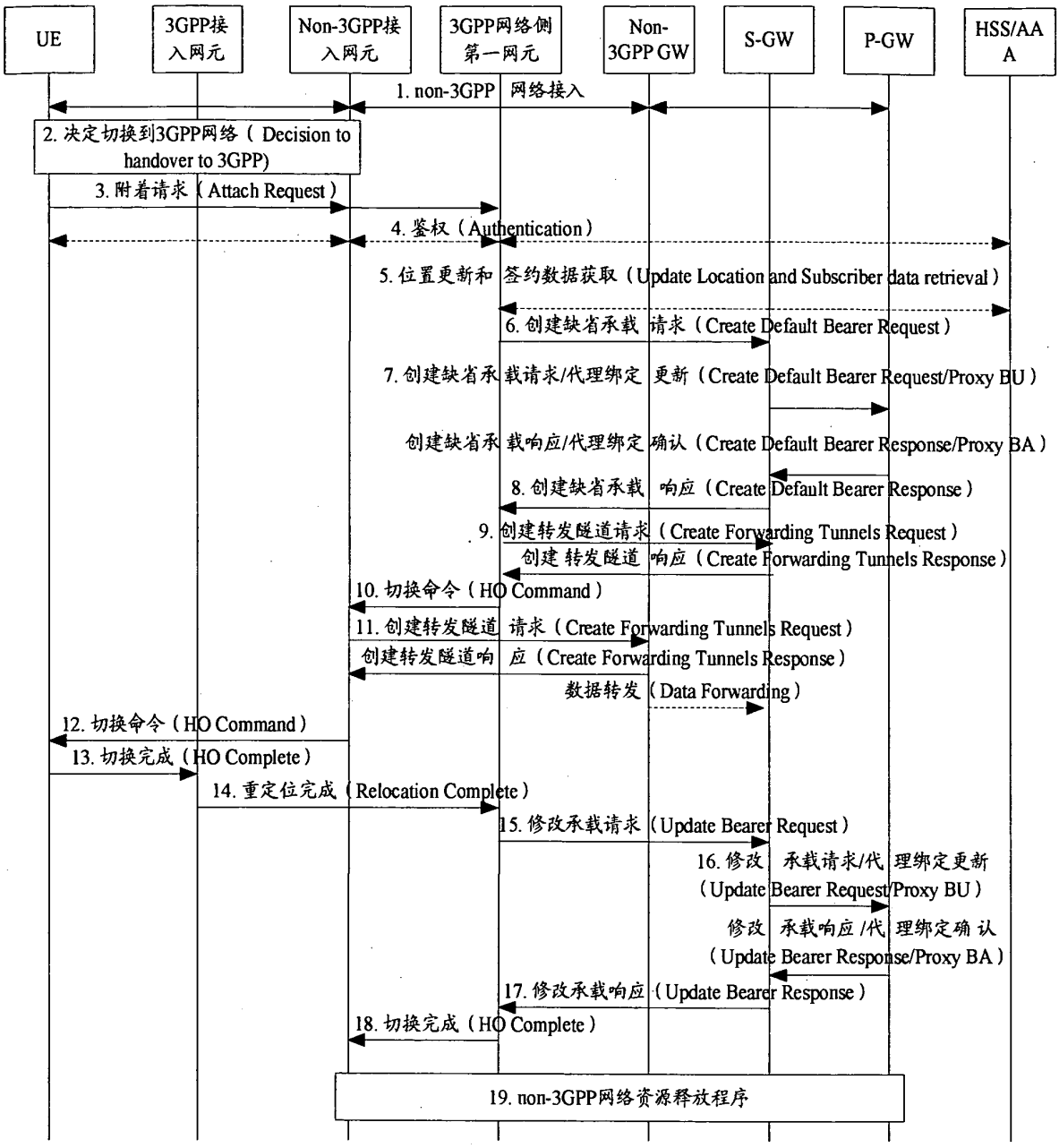
UE
3GPP接入网元
Non-3GPP接入网元
3GPP网络侧第一网元
Non-3GPP GW
S-GW
P-GW
HSS/AAA
1. non-3GPP 网络接入
2. 决定切换到3GPP网络（Decision to handover to 3GPP）
3. 附着请求（Attach Request）
4. 鉴权（Authentication）
5. 位置更新和 签约数据获取（Update Location and Subscriber data retrieval）
6. 创建缺省承载 请求（Create Default Bearer Request）
7. 创建缺省承 载请求/代理绑定 更新（Create Default Bearer Request/Proxy BU）
创建缺省承 载响应/代理绑定 确认（Create Default Bearer Response/Proxy BA）
8. 创建缺省承载 响应（Create Default Bearer Response）
9. 创建转发隧道请求（Create Forwarding Tunnels Request）
创建 转发隧道 响应（Create Forwarding Tunnels Response）
10. 切换命令（HO Command）
11. 创建转发隧道 请求（Create Forwarding Tunnels Request）
创建转发隧道响 应（Create Forwarding Tunnels Response）
数据转发（Data Forwarding）
12. 切换命令（HO Command）
13. 切换完成（HO Complete）
14. 重定位完成（Relocation Complete）
15. 修改承载请求（Update Bearer Request）
16. 修改 承载请求/代 理绑定更新
（Update Bearer Request/Proxy BU）
修改 承载响应/代 理绑定确 认
（Update Bearer Response/Proxy BA）
17. 修改承载响应（Update Bearer Response）
18. 切换完成（HO Complete）
19. non-3GPP网络资源释放程序

图 17

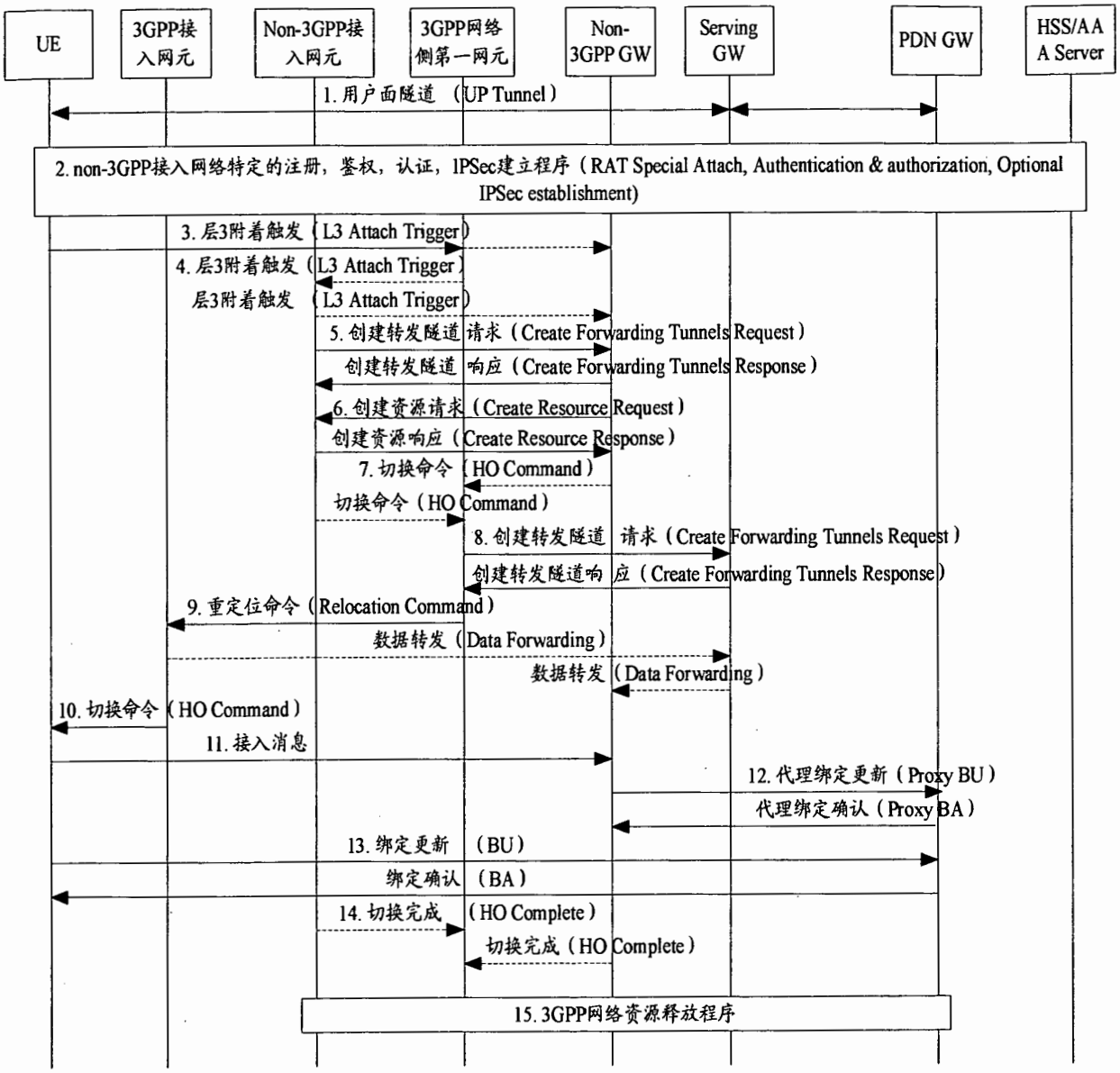
UE
3GPP接入网元
Non-3GPP接入网元
3GPP网络侧第一网元
Non-3GPP GW
Serving GW
PDN GW
HSS/AAA Server
1. 用户面隧道（UP Tunnel）
2. non-3GPP接入网络特定的注册，鉴权，认证，IPSec建立程序（RAT Special Attach, Authentication & authorization, Optional IPSec establishment)
3. 层3附着触发（L3 Attach Trigger）
4. 层3附着触发（L3 Attach Trigger）
层3附着触发（L3 Attach Trigger）
5. 创建转发隧道请求（Create Forwarding Tunnels Request）
创建转发隧道响应（Create Forwarding Tunnels Response）
6. 创建资源请求（Create Resource Request）
创建资源响应（Create Resource Response）
7. 切换命令（HO Command）
切换命令（HO Command）
8. 创建转发隧道请求（Create Forwarding Tunnels Request）
创建转发隧道响应（Create Forwarding Tunnels Response）
9. 重定位命令（Relocation Command）
数据转发（Data Forwarding）
数据转发（Data Forwarding）
10. 切换命令（HO Command）
11. 接入消息
12. 代理绑定更新（Proxy BU）
代理绑定确认（Proxy BA）
13. 绑定更新（BU）
绑定确认（BA）
14. 切换完成（HO Complete）
切换完成（HO Complete）
15. 3GPP网络资源释放程序

图 18

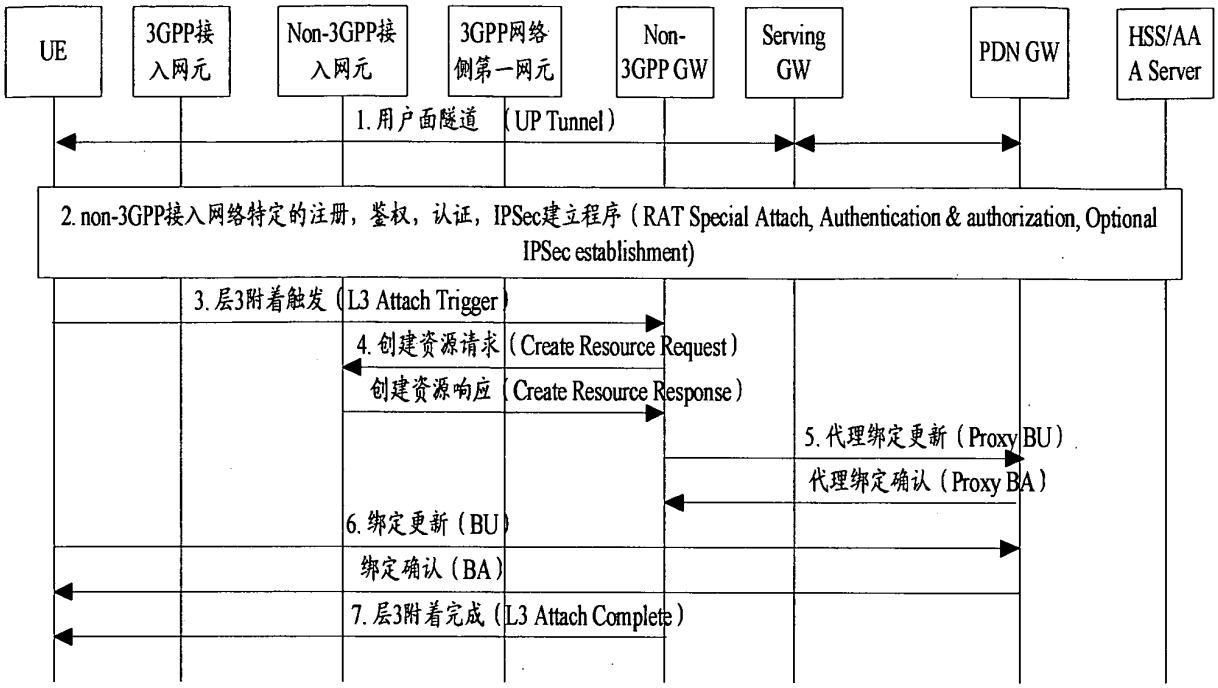
UE
3GPP接入网元
Non-3GPP接入网元
3GPP网络侧第一网元
Non-3GPP GW
Serving GW
PDN GW
HSS/AAA Server
1. 用户面隧道（UP Tunnel）
2. non-3GPP接入网络特定的注册，鉴权，认证，IPSec建立程序（RAT Special Attach, Authentication & authorization, Optional IPSec establishment)
3. 层3附着触发（L3 Attach Trigger）
4. 创建资源请求（Create Resource Request）
创建资源响应（Create Resource Response）
5. 代理绑定更新（Proxy BU）
代理绑定确认（Proxy BA）
6. 绑定更新（BU）
绑定确认（BA）
7. 层3附着完成（L3 Attach Complete）

图 19

CERTIFICATE OF MAILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to: Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450, on the below date:

Date: February 3, 2011 Name: Gustavo Siller, Jr. Signature:

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	CHERY, DADY
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.:	2875
Attorney Docket No.:	13674-213		
Client Ref. No.:	0810596US		

TRANSMITTAL

Commissioner for Patents
P O Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal (in duplicate); Submission of Certified Copy of Priority Document; Certified Copies of Chinese Patent Application Nos. 200710104400.7; 200710181758.X; 200710165540.5; 200810085729.8; PCT Application No. PCT/CN2008/070909 ; and

☒ Return Receipt Postcard.

Fee Calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a _____-month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(_____).

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee Payment:

☐ A check in the amount of $_____ is enclosed.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

February 3, 2011
Date

Gustavo Siller, Jr. (Reg. No. 32,305)

BRINKS HOFER GILSON & LIONE
NBC Tower – Suite 3600, 455 N. Cityfront Plaza Drive, Chicago, IL 60611-5599

BRINKS HOFER GILSON &LIONE

CERTIFICATE OF MAILING UNDER 37 CFR §1.8

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Date: February 3, 2011 Name: Gustavo Siller, Jr. Signature:

BRINKS HOFER GILSON & LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu	
Appln. No.:	12/581,575	Examiner: CHERY, DADY
Filed:	October 19, 2009	Art Unit: 2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.: 2875
Attorney Docket No.:	13674-213	
Client Ref. No.:	0810596US	

TRANSMITTAL

Commissioner for Patents
P O Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal (in duplicate); Submission of Certified Copy of Priority Document; Certified Copies of Chinese Patent Application Nos. 200710104400.7; 200710181758.X; 200710165540.5; 200810085729.8; PCT Application No. PCT/CN2008/070909 ; and

☒ Return Receipt Postcard.

Fee Calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a _____-month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(_____).

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee Payment:

☐ A check in the amount of $_____ is enclosed.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

February 3, 2011
Date

Gustavo Siller, Jr. (Reg. No. 32,305)

BRINKS HOFER GILSON & LIONE
NBC Tower – Suite 3600, 455 N. Cityfront Plaza Drive, Chicago, IL 60611-5599

CERTIFICATE OF MAILING UNDER 37 CFR §1.8

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Date: February 3, 2011 Name: Gustavo Siller, Jr. Signature:

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu

Appln. No.: 12/581,575

Filed: October 19, 2009

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Attorney Docket No.: 13674-213
Client Ref. No.: 0810596US

Examiner: CHERY, DADY

Art Unit: 2461

Conf. No.: 2875

SUBMISSION OF CERTIFIED COPY OF PRIORITY DOCUMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant(s) submits herewith a certified copy of Chinese Patent Application No. 200710104400.7, filed May 11, 2007; Chinese Patent Application No. 200710181758.X, filed October 24, 2007; Chinese Patent Application No. 200710165540.5, filed November 2, 2007; Chinese Patent Application No. 200810085729.8, filed March 13, 2008 and PCT Patent Application No. PCT/CN2008/070909 , filed May 8, 2008 to which the above-identified United States Patent Application claims the right of foreign priority under 35 U.S.C. §119.

Respectfully submitted,

Date: February 3, 2011

Gustavo Siller, Jr., Reg. No. 32,305
Attorney for Applicant

BRINKS HOFER GILSON & LIONE
PO BOX 10395
CHICAGO, ILLINOIS 60610
(312) 321-4200

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: February 14, 2011 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 13674-213
Client Ref. No. 0810596US

In re Application of:			
	Wenfu Wu	Examiner:	CHERY, DADY
Serial No:	12/581,575	Group Art Unit:	2461
Filed:	October 19, 2009	Conf. No.:	2875
For:	METHOD, SYSTEM AND APPARATUS FOR REGISTRATION PROCESSING		

AMENDMENT AND RESPONSE

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed November 15, 2010, please enter the following in the above-identified application.

Amendments to the claims are reflected in the listing of claims, which begin on page 2 of this paper.

Remarks begin on page 10 of this paper.

AMENDMENTS TO THE CLAIMS

Pursuant to 37 C.F.R. § 1.121 the following listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the Clams:

1. (Currently amended) A registration processing method, comprising:

receiving, by a network element, a registration request message sent by ~~registration processing type information reported by~~ a User Equipment~~,~~ (UE)~~,~~ in a process of registering the UE into a network, wherein the registration request message comprises registration processing type information; ~~and~~

identifying, by the network element, a registration processing type ~~of the registration~~ according to the registration processing type information;

wherein when the identified registration processing type is handover registration, the method further comprises:

initiating, by the network element, a bearer creation procedure to create resources; and

wherein when the identified registration processing type is initialization registration, the method further comprises:

notifying, by a Home Subscriber Server (HSS), an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a non-3GPP network when the HSS stores a Packet Data Network Gateway (PDN GW) address used by the UE in a non-3rd Generation Partnership Project (3GPP) network.

2-3. (Canceled)

4. (Currently amended) The method of claim 1, wherein the identifying the registration processing type according to the registration processing type information comprises:

notifying~~, by a network-side network element,~~ the received registration processing type information to ~~a Home Subscriber Server,~~ the HSS~~,~~ or ~~an Authentication Authorization Accounting,~~ the AAA~~,~~ server; and

identifying, by the HSS or the AAA server, the registration processing type according to the registration processing type information~~, and then performing proper operations~~.

5. (Currently amended) The method of claim 4, wherein ~~the network-side network element is a Mobility Management Entity, MME, or a Serving GPRS Supporting Node, SGSN; and the operations performed by the HSS or the AAA server after identifying the registration processing type according to the processing type information comprise~~ after the notifying the AAA server to cancel the UE registration in a non-3GPP network, the method further comprises:

~~notifying, by the HS S, the AAA server to cancel the registration of the UE in a non-3rd Generation Partnership Project, non-3GPP, network if the HSS finds that the registration processing type is initialization registration and the HSS stores a Packet Data Network Gateway, PDN GW, address used by the UE in the non-3GPP network after receiving the registration processing type information for the UE sent by the MME or the SGSN; and~~

notifying, by the AAA server, the non-3GPP network to release resource used by the UE in the non-3GPP network.

6. (Currently amended) The method of claim 4, wherein the method further comprises ~~the network-side network element is a non-3rd Generation Partnership Project, 3GPP, Gateway, GW; and the operations performed by the HSS or the AAA server after identifying the registration processing type according to the processing type information comprise one of the following~~:

~~notifying, by the HSS, the AAA server to cancel the registration for the UE in a 3GPP network if the HSS finds that the registration processing type is initialization~~

~~registration and the HSS stores a Packet Data Network, PDN, GW address used by the UE in the 3GPP network after receiving the registration processing type information for the UE sent by the non-3GPP GW, and notifying, by the AAA server, the PDN GW to release resource used by the UE in the 3GPP network;~~

sending, by the AAA server or the HSS, ~~a Packet Data Network Gateway,~~ the PDN GW~~,~~ address to the the network element ~~non-3GPP GW~~ if the AAA server or the HSS finds that the registration processing type is handover registration and the AAA server or the HSS stores a PDN GW address used by the UE in a 3GPP network ~~after receiving the registration processing type information for the UE sent by the non-3GPP GW~~;

~~notifying, by the AAA server, the HSS to cancel the registration for the UE in a 3GPP network if the AAA server finds that the registration processing type is and the AAA server stores a Packet Data Network, PDN, GW address used by the UE in the 3GPP network after receiving the registration processing type information of the UE sent by the non-3GPP GW; and~~

~~notifying, by the HSS, the AAA server to cancel the registration for the UE in the 3GPP network if the HSS finds that the registration processing type is and the HSS stores a PDN GW address used by the UE in the 3GPP network after receiving the registration processing type information for the UE sent by the non-3GPP GW, and notifying, by the HSS, a Mobility Management Entity, MME, or a Serving GPRS Supporting Node, SGSN, to release a resource used by the UE in the 3GPP network.~~

7. (Currently amended) A handover processing method, comprising:

receiving, by a network element, a registration request message sent by ~~an Access Request for~~ a User Equipment~~,~~ (UE)~~,~~ in a process of registering the UE into a network, wherein the registration request message comprises registration processing type information; and

identifying, by the network element, a handover processing type of the registration request ~~Access Request~~ according to the ~~Access Request for the UE~~ registration processing type information; and

initiating, by the network element, a bearer creation procedure to create resources.

8. (Canceled)

9. (Original) The method of claim 7, further comprising:

setting up a data forwarding tunnel between a network element of a target network and a network element of a source network according to data forwarding tunnel resource information of the target network if the identified handover processing type is an active-mode handover registration processing type.

10. (Original) The method of claim 9, wherein if the target network is a 3rd Generation Partnership Project, 3GPP, network and the source network is a non-3GPP network, the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network comprises:

sending, by a first network element of the 3GPP network, the data forwarding tunnel resource information obtained from a serving Gateway, serving GW, to a non-3GPP GW either directly or through a non-3GPP access network element after receiving information about the active-mode handover registration processing type; and

creating, by the non-3GPP GW, the data forwarding tunnel with the serving GW.

11. (Original) The method of claim 9, wherein if the target network is a non-3rd Generation Partnership Project, 3GPP, network and the source network is a 3GPP network, the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network comprises:

sending, by an access network element or a non-3GPP Gateway, GW, of the non-3GPP network, the data forwarding tunnel resource information of the non-3GPP GW to a

serving GW through a first network element of the 3GPP network after receiving information about the active-mode handover registration processing type; and

creating, by the serving GW, the data forwarding tunnel with the non-3GPP GW.

12. (Currently amended) A registration processing system ~~method~~, comprising:

a User Equipment~~,~~ (UE)~~,~~ adapted to send a registration request message~~,~~ ~~report information about a processing type of registering the UE into a network~~ in the process of registering the UE into a network, wherein the registration request message comprises registration processing type information ~~the registration; and~~

a network element, adapted to receive the registration request message and identify ~~the~~ a registration processing type ~~of the registration~~ according to the received registration processing type information reported by the UE;

wherein the network element is further adapted to initiate a bearer creation procedure to create resources when the identified registration processing type is handover registration; and

wherein the network element is further adapted to notify an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a non-3GPP network when the identified registration processing type is an initialization registration and a Home Subscriber Server (HSS) stores a Packet Data Network Gateway (PDN GW) address used by the UE in the non-3GPP network.

13. (Canceled)

14. (Currently amended) A User Equipment~~,~~ (UE)~~,~~ comprising:

an identifying unit~~,~~ adapted to identify a registration processing type ~~of registration~~ when the UE initiates the registration;

a registration initiating unit~~,~~ adapted to initiate the registration~~,~~ and send a registration triggering signal; and

a reporting unit~~,~~ adapted to receive the registration triggering signal from the registration initiating unit~~,~~ and send a registration request message ~~report processing type information in the process of registering the UE into a network~~, wherein the registration request message comprises registration processing type information that ~~the processing type information~~ corresponds to the type of registration identified by the identifying unit.

15. (Canceled)

16. (Currently amended) A network ~~side network~~ element, comprising:

an obtaining unit, adapted to receive a registration request message sent by a User Equipment (UE) in the process of registering the UE into a network, wherein the registration request message comprises registration processing type information~~obtain registration processing type information for a User Equipment, UE, in the process of registration~~; ~~and~~

an identifying unit~~,~~ adapted to identify a registration processing type ~~of the registration~~ according to the registration processing type information obtained by the obtaining unit; and

a first processing unit, adapted to initiate a bearer creation procedure to create resources when the identified registration processing type is handover registration.

17. (Canceled)

18. (New) The method of claim 1, wherein the UE reports the registration processing type information:

when the registration request message is an attach request message and includes an Attach Type in the attach request message, wherein values of the Attach Type comprise an Initial Attach or Handover Attach; or

when the registration request message is an access request message and includes an Access Type in the access request message, wherein values of the Access Type comprise an Initial Access or Handover Access.

19. (New) The method of claim 1, wherein initiating a bearer creation to create resources comprises:

sending a Create Bearer Request message via a Mobility Management Entity (MME) to an obtained PDN GW address; and

requesting that the network initiate the bearer creation procedure.

20. (New) The method of claim 19, wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules message via the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the user.

21. (New) The method of claim 1, wherein initiating a bearer creation procedure to create resources comprises:

initiating via a non-3rd Generation Partnership Project (3GPP) Gateway (GW) a network-side bearer creation procedure to create bearer resource for the UE.

22. (New) The method of claim 21,wherein the non-3GPP GW sends a Request Policy and Charging Control (PCC) rules message to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the user.

23. (New) The UE of claim 14, wherein the reporting unit sends the registration request message:

when the registration request message is an attach request message and includes an Attach Type in the attach request message, wherein values of the Attach Type comprise an Initial Attach or Handover Attach; or

when the registration request message is an access request message and includes an Access Type in the access request message, wherein values of the Access Type comprise an Initial Access or Handover Access.

REMARKS

Summary

Applicants thank the Examiner for the indication of allowable subject matter in claims 5 and 6. Claims 1, 4-7, 12, 14, and 16 are currently amended. Claims 2, 3, 8, 13, 15, and 17 have been canceled. Claims 18-23 have been added as new dependent claims. Accordingly, claims 1, 4-7, 9-12, 14, 16, 18-23 are currently pending in the application. Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

Claim objections

Claims 1, 2, 3, 12 and 16 are objected to regarding informalities. Claims 2-3 have been canceled. Claims 1, 12, and 16 have been amended for clarity, obviating the objection.

Rejection Under 35 U.S.C. § 112

Claims 3, 5, 6, 13 are rejected under 35 U.S.C. § 112, as being indefinite for failing to particularly point out distinctly claim the subject matter which applicant regards as the invention. Claims 3 and 13 have been canceled. Claims 5 and 6 have been amended for clarity. Accordingly, Applicants respectfully request the withdrawal of the rejections.

Rejection Under 35 U.S.C. § 102

Claims 1-4, 7, 9, 10, and 12-17 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat. App. Pub. No. 2009/0073933 ("*Madour*"). As mentioned, claims 2, 3, 13, 15, and 17 are canceled.

Claims 1, 4, and 12

Claims 1 and 4 recite a registration processing method. The method includes receiving, by a network element, a registration request message that includes registration processing type information, and that was sent by a User Equipment (UE) in a process of

registering the UE into a network. The method also includes identifying, by the network element, a registration processing type according to the registration processing type information. When the identified registration processing type is handover registration, the method includes initiating, by the network element, a bearer creation procedure to create resources. When the identified registration processing type is initialization registration, the method includes notifying, by a Home Subscriber Server (HSS), an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a non-3GPP network when the HSS stores a Packet Data Network Gateway (PDN GW) address used by the UE in a non-3rd Generation Partnership Project (3GPP) network.

Claim 12 recites a registration processing system. The system includes a User Equipment (UE) adapted to send a registration request message that includes registration processing type information in the process of registering the UE into a network. The system also includes a network element adapted to receive the registration request message and identify a registration processing type according to the received registration processing type information reported by the UE. The network element is further adapted to initiate a bearer creation procedure to create resources when the identified registration processing type is handover registration. Additionally, the network element is further adapted to notify an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a non-3GPP network when the identified registration processing type is an initialization registration and a Home Subscriber Server (HSS) stores a Packet Data Network Gateway (PDN GW) address used by the UE in the non-3GPP network.

Madour teaches a system for handing off user equipment between different access systems such as a high rate packet data (HRPD) system and a long term evolution (LTE) system. *Madour* Abstract. In *Madour*, an A11 registration request to establish an A10 connection is received at a gateway packet data serving node (GW-PDSN) prior to breaking a first radio connection between a UE and an LTE AN. *Madour*, ¶¶ 0009, 0010. *Madour* teaches that an A11 registration request "can include additional information ... such as the inter-system source access network identifier and security status information." *Madour*, ¶ 0031. This additional information is used "to take appropriate actions such as (a)

maintaining the ROHC (header compression) parameters .... (b) maintaining the IPv6 prefix or the CoA ... and/or (c) moving IP and user context information over the new connection." *Madour*, ¶ 0031. However, *Madour* fails to teach or suggest all of the features of claims 1, 4, and 12 for at least the following reasons.

First, *Madour* fails to teach or suggest receiving a registration request message comprising registration processing type information. As mentioned, the A11 registration request in *Madour* "can include additional information ... such as the inter-system source access network identifier and security status information." *Madour*, ¶ 0031. However, inter-system source access network identifiers and security status information are not registration processing type information. Accordingly, *Madour* fails to teach or suggest a registration request message comprising registration processing type information.

Second, *Madour* does not teach or suggest identifying a registration processing type according the registration processing type information. Instead, as mentioned, *Madour* merely teaches that the additional information added to the A11 registration is used for maintaining ROCH parameters, maintaining an IPv6 prefix or the CoA, and/or moving IP and user context information over the new connection. *Madour*, ¶ 0031. However, *Madour* is silent with respect to identifying a registration processing type according to the registration processing type information. Therefore, for this additional reason, *Madour* fails to teach or suggest all of the features of claims 1, 4, and 12.

Third, *Madour* is silent with respect to initiating, by the network element, a bearer creation procedure to create resources when the identified registration processing type is handover registration, and notifying an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a non-3GPP network when the HSS stores a Packet Data Network Gateway (PDN GW) address used by the UE in a non-3rd Generation Partnership Project (3GPP) network when the identified registration processing type is initialization registration. Rather, as mentioned, *Madour* teaches using additional information attached to an A11 registration for "(a) maintaining the ROHC (header compression) parameters .... (b) maintaining the IPv6 prefix or the CoA ... and/or (c) moving IP and user context information over the new connection." *Madour*, ¶ 0031.

For at least these reasons, *Madour* fails to teach or suggest all of the features of claims 1, 4, and 12. Accordingly, Applicants respectfully request that the rejections be withdrawn.

Claims 7, 9, and 10

Claims 7, 9, and 10 recite a handover processing method that includes receiving, by a network element, a registration request message sent by a User Equipment (UE) in a process of registering the UE into a network. The registration request message includes registration processing type information. The method also includes identifying, by the network element, a handover processing type of the registration request according to the registration processing type information. The method also includes initiating, by the network element, a bearer creation procedure to create resources.

As previously discussed, *Madour* fails to teach or suggest receiving a registration request message that includes registration processing type information. *Madour* additionally fails to teach or suggest identifying a handover processing type of the registration request according to the registration processing type information, or initiating a bearer creation procedure to create resources. Accordingly, for at least these reasons, Applicants respectfully request the withdrawal of these rejections.

Claim 14

Claim 14 recites a User Equipment (UE) that includes an identifying unit adapted to identify a registration processing type when the UE initiates the registration. The UE also includes a registration initiating unit adapted to initiate the registration and send a registration triggering signal. The UE further includes a reporting unit adapted to receive the registration triggering signal from the registration initiating unit and send a registration request message that includes registration processing type information that corresponds to the type of registration identified by the identifying unit.

As discussed, *Madour* fails to teach or suggest a registration request message that includes registration processing type information. *Madour* additionally fails to teach or

suggest an identifying unit adapted to identify a registration processing type when the UE initiates the registration. Therefore, for at least these reasons, Applicants respectfully request the withdrawal of this rejection.

Claim 16

Claim 16 recites a network element that includes an obtaining unit adapted to receive a registration request message, including registration processing type information, sent by a User Equipment (UE) in the process of registering the UE into a network. The network element also includes an identifying unit adapted to identify a registration processing type according to the registration processing type information obtained by the obtaining unit. The network element also includes a first processing unit adapted to initiate a bearer creation procedure to create resources when the identified registration processing type is handover registration.

As previously mentioned, *Madour* fails to teach or suggest receiving a registration request message that includes registration processing type information, or identifying a registration processing type according to the registration processing type information. *Madour* additionally fails to teach or suggest a first processing unit adapted to initiate a bearer creation procedure to create resources when the identified registration processing type is handover registration. As such, for at least these reasons, Applicants respectfully request that the rejection be withdrawn.

Rejection Under 35 U.S.C. § 103

Claims 8 and 11 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Madour* in view of U.S. Pat. App. Pub. No. 2008/00320149 ("*Faccin*"). Claim 8 is canceled.

Claim 11 depends from claim 7, and accordingly is directed to a handover processing method that includes receiving, by a network element, a registration request message sent by a User Equipment (UE) in a process of registering the UE into a network. The registration request message includes registration processing type information. The

method also includes identifying, by the network element, a handover processing type of the registration request according to the registration processing type information. The method also includes initiating, by the network element, a bearer creation procedure to create resources.

As mentioned, *Madour* fails to teach or suggest receiving a registration request message that includes registration processing type information, identifying a handover processing type of the registration request according to the registration processing type information, or initiating a bearer creation procedure to create resources. *Faccin* is directed to a network device with an IP connectivity generator (*Faccin* Abstract), but fails to fill in the gaps of *Madour*. Accordingly, because the proposed combination of *Madour* and *Faccin* fails to teach or suggest all of the features of claim 11, Applicants respectfully request that the rejection be withdrawn.

Allowable Subject Matter

Applicants thank the Examiner for the indication that claims 5 and 6 would be allowable if rewritten to overcome the rejections under 35 U.S.C. §112, 2nd paragraph. Claims 5 and 6 have been amended for clarity. Applicants believe that claims 5 and 6 are allowable, and respectfully request a notice of allowance indicating the same.

New Claims

Claims 18-23 are new and contain no new matter. Support for claims 18-23 is found in paragraphs [0056]-[0058] of the specification. Claims 18-22 depend from claim 1, which is allowable over the cited references for the reasons stated above. Claim 23 depends from claim 14, which is allowable over the cited references for the reasons stated above. Accordingly, Applicants respectfully request a notice of allowance for these claims indicating the same.

CONCLUSION

In view of the foregoing, Applicants respectfully submit that claims 1, 4-7, 9-12, 14, 16, 18-23 are in condition for allowance and respectfully request that the application be reconsidered and the pending claims allowed. Should the Examiner wish to discuss the foregoing to advance this application toward allowance, the Examiner is urged to telephone the undersigned at the below-indicated number.

Respectfully submitted,

/Gustavo Siller, Jr./

Registration No. 32,305
Attorney for Applicants

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Electronic Acknowledgement Receipt

EFS ID:	9440729
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Edward Popoca
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	14-FEB-2011
Filing Date:	19-OCT-2009
Time Stamp:	17:50:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674213Amendment.pdf	792622 5e33c46b97c4b421d156aecd5257c757a2948512	yes	17

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Amendment/Req. Reconsideration-After Non-Final Reject	2	17
Warnings:			
Information:			
	Total Files Size (in bytes):	792622	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: February 14, 2011 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Chery, Andy
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.:	2875
Attorney Docket No.:	13674-213		
Client Ref. No.:	0810596US		

TRANSMITTAL

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal: Amendment and Response.

Fee calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a _____-month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(_____).

☐ An additional filing fee has been calculated as shown below:

					Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra	Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus			x $26=			x $52=	
Indep.		Minus			x 110=			x $220=	
First Presentation of Multiple Dep. Claim					+$195=			+ $390=	
					Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

February 14, 2011
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

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PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/581,575	10/19/2009	

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
	02/14/2011	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 17	Minus	** 20	= 0	X $ =		OR	X $52=	0
	Independent (37 CFR 1.16(h))	* 5	Minus	***5	= 0	X $ =		OR	X $220=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)					
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/DEBORAH PORTER/

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	B1	Copy of Communication issued in corresponding European Patent Application No. 08734264.8, mailed March 14, 2011.

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Acknowledgement Receipt

EFS ID:	9812824
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Nkosi Harvey
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	05-APR-2011
Filing Date:	19-OCT-2009
Time Stamp:	16:49:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213IDS.pdf	182936 d1b00d29a2a0c8ecffcf9558701442f3ae84462f	yes	4

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Transmittal Letter	2	3
	Information Disclosure Statement (IDS) Filed (SB/08)	4	4

Warnings:					
Information:					
2	Foreign Reference	B1.pdf	181383 8f8f75693a0044692509031321633 4e0855a95d6	no	4
Warnings:					
Information:					
		Total Files Size (in bytes):	364319		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: April 5, 2011 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu

Appln. No.: 12/581,575

Filed: October 19, 2009

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Attorney Docket No: 13674-213
Client Ref. No. 0810596US

Examiner: Dady Chery

Art Unit: 2461

Confirmation No.: 2875

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal (1 page); Information Disclosure Statement (2 pages); PTO-1449 (1 page); Cited Reference B1.

Fee calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

April 5, 2011
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
April 5, 2011
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
April 5, 2011
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu	
Appln. No.:	12/581,575	Examiner: Dady Chery
Filed:	October 19, 2009	Art Unit: 2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.: 2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US	

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(c), Applicant hereby cites the following reference(s):

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Communication issued in corresponding European Patent Application No. 08734264.8, mailed March 14, 2011.

BRINKS
HOFER
GILSON
&LIONE

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). As each of the listed references is in English, no further commentary is believed to be necessary, 37 C.F.R §1.98(a)(3). Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

Applicant hereby certifies pursuant to 37 CFR §1.97(e)(2) that no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated in 37 CFR §1.56(c), more than three months prior to the filing of this Information Disclosure Statement. Accordingly, Applicant has calculated no fee to be due in connection with the filing of this Information Disclosure Statement. However, the Director is authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to a deposit account, as authorized in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

April 5, 2011
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

93823 7590 04/25/2011

Huawei/BHGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER	
CHERY, DADY	
ART UNIT	PAPER NUMBER
2461	
MAIL DATE	DELIVERY MODE
04/25/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/581,575	WU, WENFU	
	Examiner	Art Unit	
	DADY CHERY	2461	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 February 2011*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1, 4-7, 9 -12, 14, 16 and 18 – 23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 4-7, 9 -12, 14, 16 and 18 – 23* is/are rejected.

7)☐ Claim(s) _ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This communication is responsive to the amendment filed on February 14th 2011.

Claims 1, 4-7, 12, 14 and 16 have been amended.

Claims 2-3, 8, 13, 15 and 17 have been cancelled.

Claims18 - 23 have been added.

Claims 1, 4-7, 9 -12, 14, 16 and 18 – 23 are now pending.

Response to Arguments

Applicant's arguments with respect to claims 1, 4-7, 9 -12, 14, and 16 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims7, 9-11, 14, 16 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ramanna et al. (US Application 2006/0109817, hereinafter Ramanna).

Regarding claim 7, Ramanna discloses a handover processing method**(Fig. 2),** comprising:

receiving, by a network element, a registration request message sent by an Access a User Equipment (UE) in a process of registering the UE into a network**(page 5, [0039] and page 6, [0046], which recites a registration request sends by a mobile station**

into a network), wherein the registration request message comprises registration processing type information**(page 6, [0046], which recites an A11 registration type information);** and

identifying, by the network element, a handover processing type of the registration request Access Request according to the registration processing type information**(Page 5, [0039], which recites a handover process identifies by BS 204);** and

initiating, by the network element, a bearer creation procedure to create resources**(Page 5, [0042],page 6, [0046] and page 7, [0053] which recites setup a new channel in other word create a bearer resource in response to the handover request).**

Regarding claim 14, Ramanna discloses a User Equipment (UE) **(Fig. 1, 102)** comprising:

an identifying unit **(124);** adapted to identify a registration processing type when the UE initiates the registration **(Page 6, [0046]-[0047], which recites the PDSN receives a registration request from the mobile station, thereby indentifies the registration type);**

a registration initiating unit **(102);** adapted to initiate the registration; and send a registration triggering signal**(Page 6, [0046] –[0047], which recites the mobile station initiates a registration and sends the request to the PDSN)** ; and

a reporting unit **(124)**adapted to receive the registration triggering signal from the registration initiating unit and send a registration request message, **(Page 6, [0046] – [0047], which recites the PDSN receives the registration request from the mobile**

station) wherein the registration request message comprises registration processing type information that the processing type information corresponds to the type of registration identified by the identifying unit**(page 6, [0046], which recites an A11 registration type information)**.

Regarding claim 16, Ramanna discloses a element**(Fig. 1)**, comprising:

an obtaining unit**(124),** adapted to receive a registration request message sent by a User Equipment (UE) in the process of registering the UE into a network**(Page 6, [0046]-[0047], which recites the PDSN receives a registration request from the mobile station, thereby indentifies the registration type);** wherein the registration request message comprises registration processing type information **(page 6, [0046], which recites an A11 registration type information)**;

an identifying unit**(124)** adapted to identify a registration processing type according to the registration_processing type information obtained by the obtaining unit**(Page 6, [0046]-[0047], which recites the PDSN receives a registration request from the mobile station, thereby indentifies the registration type);** and

a first processing unit**(134),** adapted to initiate a bearer creation procedure to create resources when the identified registration processing type is handover registration**(Page 5, [0042],page 6, [0046] and page 7, [0053] which recites setup a new channel in other word create a bearer resource in response to the handover request).**

Regarding claim 9, Ramanna discloses the method of claim 7, further comprising: setting up a data forwarding tunnel between a network element of a target network and a network element of a source network according to data forwarding tunnel

resource information of the target network if the identified handover processing type is an active- mode handover registration processing type **(page 2, [0016] – [0017]).**

Regarding claim 10, Ramanna discloses the method of claim 9, wherein if the target network is a 3rd Generation Partnership Project, 3GPP, network and the source network is a non-3GPP network, the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network **(page 2, [0016] – [0017])**comprises:

sending, by a first network element of the 3GPP network, the data forwarding tunnel resource information obtained from a serving Gateway, serving GW, to a non-3GPP GW either directly or through a non-3GPP access network element after receiving information about the active-mode handover registration processing type; and

creating, by the non-3GPP GW, the data forwarding tunnel with the serving GW**(page 2, [0016] – [0018]).**

Regarding claim 11, Ramanna discloses the method of claim 9, wherein if the target network is a non- 3rd Generation Partnership Project, 3GPP, network and the source network is a 3GPP network, the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network**(page 2, [0016] – [0018])** comprises:

sending, by an access network element or a non-3GPP Gateway, GW, of the non-3GPP network, the data forwarding tunnel resource information of the non-3GPP GW to

a serving GW through a first network element of the 3GPP network after receiving information about the active-mode handover registration processing type; and

creating, by the serving GW, the data forwarding tunnel with the non-3GPP GW**(page 2, [0016] – [0018]).**

Regarding claim 23, Ramanna discloses the method of claim 1, wherein the UE reports the registration processing type information:

when the registration request message is an attach request message and includes an Attach Type in the attach request message, wherein values of the Attach Type comprise an Initial Attach or Handover Attach**(page 5, [0039] and page 6, [0046]);** or

when the registration request message is an access request message and includes an Access Type in the access request message, wherein values of the Access Type comprise an Initial Access or Handover Access**(page 5, [0039] and page 6, [0046])**.

Regarding claim 21, Ramanna disclose the method of claim 1, wherein initiating a bearer creation procedure to create resources comprises:

initiating via a non-3rd Generation Partnership Project (3GPP) Gateway (GW) a network-side bearer creation procedure to create bearer resource for the UE**(Page 6, [0046]).**

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

> invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 4-6, 12, and 18 -22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanna in view of Faccin (US Application 2008/0254768, hereinafter Faccin).

Regarding claims 1, 12, Ramanna discloses a registration processing method and system **(Fig. 2),** comprising:

receiving, by a network element, a registration request message sent by a User Equipment(UE) in a process of registering the (UE)into a network**(page 5, [0039] and**

page 6, [0046], which recites a registration request sends by a mobile station into a network), wherein the registration request message comprises registration processing type information**(page 6, [0046], which recites an A11 registration type);** and

identifying, by the network element, a registration processing type according to the registration processing type information**(Page 7, [0051], which recites the identification of the message or request type);**

wherein when the identified registration processing type is handover registration**(Page 5, [0039], which recites a message that triggers a handoff of the mobile, thereby a registration handover type registration),** the method further comprises:

initiating, by the network element, a bearer creation procedure to create resources**(Page 5, [0042],page 6, [0046] and page 7, [0053] which recites setup a new channel in other word create a bearer resource in response to the handover request)** ; and

Ramanna does not explicitly disclose wherein when the identified registration processing type is initialization registration, the method further comprises:

notifying, by a Home Subscriber Server (HSS), an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a non-3GPP network when the HSS stores a Packet Data Network Gateway (PDN GW) address used by the UE in a non-3rd Generation Partnership Project (3GPP) network.

However, Faccin teaches when the identified registration processing type is initialization registration **(Page 10, [0165], which recites a registration request that**

considered as the initialization registration) the method further comprises:

notifying, by a Home Subscriber Server (HSS), an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a non-3GPP network**(page 10, [0168], page 12, [0199] and [0207], which recite a cancellation send to an old MME of a non-3GPP)** when the HSS stores a Packet Data Network Gateway (PDN GW) address used by the UE in a non-3rd Generation Partnership Project (3GPP) network**(Page 11, [0185] – [0186], which recites the storing of the address).**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Ramanna by using the above features such as when the identified registration processing type is initialization registration, the method further comprises: notifying, by a Home Subscriber Server (HSS), an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a non-3GPP network when the HSS stores a Packet Data Network Gateway (PDN GW) address used by the UE in a non-3rd Generation Partnership Project (3GPP) network as taught by Faccin for the purpose of managing connectivity of networks devices relative to remote networks**(Page 1, [0002]).**

Regarding claim 4, Ramanna discloses he method of claim 1, wherein the identifying the registration processing type according to the registration processing type information **(page 6, [0046], which recites an A11 registration type information)**; comprises:

notifying, the received registration processing type information to the HSS or the AAA server**(page 4, [0028], which recites a registration receives at an AAA or a HLR);**

and

identifying, by the HSS or the AAA server, the registration processing type according to the registration_processing type information operations**(page 6, [0046], which recites an A11 registration type information)**.

Regarding claim 5, Ramanna discloses the method of claim 4, wherein after the notifying the AAA server to cancel the UE registration in a non-3GPP network, the method further comprises:

notifying, by the AAA server, the non-3GPP network to release resource used by the UE in the non-3GPP network **(page 1, [0014] –[0015] and page 4,[0028], where the non-HRPD is considered as the non-3GPP).**

Regarding claim 6, Ramanna discloses the method of claim 4 as addressed above, except wherein the method

further comprises

sending, by the AAA server or the HSS, the PDN GW address to the network element non -3GPP GW if the AAA server or the HSS finds that the registration processing type is handover registration and the AAA server or the HSS stores a PDN GW address used by the UE in a 3GPP network.

However, Faccin teaches sending, by the AAA server or the HSS, the PDN GW address to the network element_non -3GPP GW if the AAA server or the HSS finds that the registration processing type is handover registration and the AAA server or the HSS stores a PDN GW address used by the UE in a 3GPP network **(page 11, [0185] – [0186] and [0192] – [0194).**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Ramanna by using the above features such as sending, by the AAA server or the HSS, the PDN GW address to the network element non -3GPP GW if the AAA server or the HSS finds that the registration processing type is handover registration and the AAA server or the HSS stores a PDN GW address used by the UE in a 3GPP network as taught by Faccin for the purpose of managing connectivity of networks devices relative to remote networks**(Page 1, [0002]).**

Regarding claim18, Ramanna discloses the method of claim 1, wherein the UE reports the registration processing type information:

when the registration request message is an attach request message and includes an Attach Type in the attach request message, wherein values of the Attach Type comprise an Initial Attach or Handover Attach**(page 5, [0039] and page 6, [0046]);** or

when the registration request message is an access request message and includes an Access Type in the access request message, wherein values of the Access Type comprise an Initial Access or Handover Access**(page 5, [0039] and page 6, [0046])**.

Regarding claim19, Ramanna discloses the method of claim 1 as addressed above, except wherein initiating a bearer creation to create resources comprises: sending a Create Bearer Request message via a Mobility Management Entity (MME) to an obtained PDN GW address; and requesting that the network initiate the bearer creation procedure.

However, Faccin teaches initiating a bearer creation to create resources comprises: sending a Create Bearer Request message via a Mobility Management Entity (MME) to an obtained PDN GW address; and requesting that the network initiate the bearer creation procedure **(Page 10, [0172] – [0173]).**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Ramanna by using the above features such as sending a Create Bearer Request message via a Mobility Management Entity (MME) to an obtained PDN GW address; and requesting that the network initiate the bearer creation procedure as taught by Faccin for the purpose of managing connectivity of networks devices relative to remote networks **(Page 1, [0002]).**

Regarding claim 20, Ramanna discloses the method of claim 19 as addressed above, except wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules message via the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the user.

However, Faccin teaches the method of claim 19 as addressed above, except wherein after the PDN GW receives the Create Bearer Request message **(Page 10, [0172] – [0173])**, sending a Request Policy and Charging Control (PCC) rules message via the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the user **(Page 10, [0175] and page 11, [0193]).**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Ramanna by using the above features such as wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules message via the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the user as taught by Faccin for the purpose of managing connectivity of networks devices relative to remote networks **(Page 1, [0002]).**

Regarding claim 21, Ramanna disclose the method of claim 1, wherein initiating a bearer creation procedure to create resources comprises:
initiating via a non-3rd Generation Partnership Project (3GPP) Gateway (GW) a network-side bearer creation procedure to create bearer resource for the UE**(Page 6, [0046]).**

Regarding claim 22, Ramanna discloses the method of claim 21 as addressed above, except wherein the non-3GPP GW sends a Request Policy and Charging Control (PCC) rules message to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the user.

However, Faccin teaches the non-3GPP GW sends a Request Policy and Charging Control (PCC) rules message to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the user **(Page 10, [0175] and page 11, [0193]).**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Ramanna by using the above features such as the non-3GPP GW sends a Request Policy and Charging

Control (PCC) rules message to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the user as taught by Faccin for the purpose of managing connectivity of networks devices relative to remote networks **(Page 1, [0002]).**

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DADY CHERY whose telephone number is (571)270-1207. The examiner can normally be reached on Monday - Thursday 8 am - 4 pm ESt.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D. VU can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dady Chery/
Examiner, Art Unit 2461

/Dmitry H. Levitan/

Primary Examiner, Art Unit 2461

Notice of References Cited	Application/Control No. 12/581,575	Applicant(s)/Patent Under Reexamination WU, WENFU	
	Examiner DADY CHERY	Art Unit 2461	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2006/0109817	05-2006	Ramanna et al.	370/331
*	B	US-2008/0254768	10-2008	Faccin, Stefano	455/411
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	Art Unit
	DADY CHERY	2461

SEARCHED			
Class	Subclass	Date	Examiner
370	328,329,330,331,332,333,334	10/22/2010	DC
455	436,437,438,439	10/22/2010	DC
709	227,228,229	10/22/2010	DC

SEARCH NOTES		
Search Notes	Date	Examiner
Inventorship	10/22/2010	DC
Updated search	04/18/2011	DC

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	Art Unit
	DADY CHERY	2461

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	10/27/2010	04/19/2011							
	1	✓	✓							
	2	✓	-							
	3	✓	-							
	4	✓	✓							
	5	✓	✓							
	6	✓	✓							
	7	✓	✓							
	8	✓	-							
	9	✓	✓							
	10	✓	✓							
	11	✓	✓							
	12	✓	✓							
	13	✓	-							
	14	✓	✓							
	15	✓	-							
	16	✓	✓							
	17	✓	-							
	18		✓							
	19		✓							
	20		✓							
	21		✓							
	22		✓							
	23		✓							

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	A1	Copy of Second Office Action issued in corresponding Chinese Patent Application No. 200810085729.8, mailed October 18, 2010.

EXAMINER	/Dady Chery/	DATE CONSIDERED	04/19/2011

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	B1	Copy of Communication issued in corresponding European Patent Application No. 08734264.8, mailed March 14, 2011.

EXAMINER	/Dady Chery/	DATE CONSIDERED	04/19/2011

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	C1	WO 2007/011638 A2	01/25/2007	PCT		

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	C2	Copy of Extended European Search Report issued in corresponding European Patent Application No. 10167471.1, mailed October 12, 2010.
	C3	Wang et al., "A Mobile IPv6 Based Seamless Handoff Strategy for Heterogeneous Wireless Networks", 4th International Conference on Computer and Information Technology, 2004.
	C4	Huawei, "Handover From No 3GPP TO 3GPP Approval/Discussion", 3GPP TSG SA WG2 Architecture – S2#57. Beijing, China, April 23-27, 2007.
	C5	Huawei, "Attach Type in Attach Procedure Discussion /Approval", 3GPP TSG SA WG2 Architecture – S2#58. Orlando, Florida, June 25-29, 2007.
	C6	Change Request, 23.402 CR 0158. 3GPP TSG-SA WG2 Meeting #63. Athens, Greece, February 18-22, 2008.

EXAMINER /Dady Chery/	DATE CONSIDERED 04/19/2011

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

CERTIFICATE OF EFS FILING

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS on the below date:

Date: July 11, 2011 Neme: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	DADY CHERY
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.:	2875
Attorney Docket No.:	13674-213		
Client Ref. No.:	0810596US		

Mail Stop RCE
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CONTINUED EXAMINATION (37 CFR § 1.114)

Sir:

Applicant(s) requests continued examination of the above-identified application under 37 CFR §1.114.

☒ Submission under 37 CFR 1.114 (*check at least one of the following*):

- ☐ Previously submitted:
  - ☐ Applicant(s) requests nonentry of any previously-filed unentered amendments.
  - ☐ Please enter and consider the Amendment After Final Under 37 CFR §1.116 previously filed on _____.
  - ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____.
  - ☐ Other: _____.
- ☒ Attached is/are:
  - ☐ An Information Disclosure Statement
  - ☒ An Amendment to the written description, claims, or drawings
  - ☐ New Arguments and/or New Evidence in support of Patentability
  - ☐ Other: _____

☐ Request for suspension of action:

Applicant(s) hereby requests suspension of action on the above-identified application under 37 CFR §1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; requires Processing Fee under 37 CFR §1.17(i)).

☐ Small Entity Status:

- ☐ Applicant(s) hereby asserts entitlement to claim small entity status under 37 CFR §§ 1.9 and 1.27.
- ☐ A small entity statement or assertion of entitlement to claim small entity status was filed in prior application no. _____/_____ and such status is still proper and desired.
- ☐ Is no longer desired.

☒ Applicant(s) calculate the following fees to be due in connection with this Request:

- ☒ A request fee of $810.00 under 37 CFR §1.17(e).
- ☐ A suspension processing fee of $_____ under 37 CFR §1.17(i).
- ☐ An additional filing fee of $_____ under 37 CFR §1.16 (_____ additional independent claims and/or _____ additional total claims).
- ☐ An extension fee of $_____ under 37 CFR §1.17(a) for a _____-month extension of time.

☒ Fee payment to cover the above-enumerated fee(s):

- ☒ Please charge Deposit Account No. 23-1925 (BRINKS HOFER GILSON & LIONE) in the amount of $810.00.
- ☐ A payment by credit card in the amount of $_____ (Form PTO-2038 is attached).
- ☒ The Commissioner is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925 (BRINKS HOFER GILSON & LIONE).

Respectfully submitted,

July 11, 2011
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.(Reg. No. 32,305)

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: July 11, 2011 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 13674-213
Client Ref. No. 0810596US

In re Application of:	
Wenfu Wu	Examiner: CHERY, DADY
Serial No: 12/581,575	Group Art Unit: 2461
Filed: October 19, 2009	Conf. No.: 2875
For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	

AMENDMENT AND RESPONSE

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed April 25, 2011, please enter the following in the above-identified application.

Amendments to the claims are reflected in the listing of claims, which begin on page 2 of this paper.

Remarks begin on page 8 of this paper.

AMENDMENTS TO THE CLAIMS

Pursuant to 37 C.F.R. § 1.121 the following listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the Clams:

1. (Currently Amended) A registration processing method, comprising:

receiving, by a network element, a registration request message sent by a User Equipment (UE) in a process of registering the UE into a network, wherein the registration request message comprises registration processing type information;

identifying, by the network element, a registration processing type according to the registration processing type information;

wherein when the identified registration processing type is handover registration, the method further comprises:

~~initiating, by the network element, a bearer creation procedure to create resources;~~

obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS);

requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure; and

wherein when the identified registration processing type is initialization registration, the method further comprises:

notifying, by ~~a Home Subscriber Server (~~ the HSS~~)~~, an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a ~~non-3GPP~~source network when the HSS stores ~~a Packet Data Network Gateway (~~ the PDN GW~~)~~ address used by the UE in ~~a non-3rd Generation Partnership Project (3GPP)~~ the source network.

2-3. (Canceled)

4. (Previously Presented) The method of claim 1, wherein the identifying the registration processing type according to the registration processing type information comprises:

notifying the received registration processing type information to the HSS or the AAA server; and

identifying, by the HSS or the AAA server, the registration processing type according to the registration processing type information.

5. (Currently Amended) The method of claim 4, wherein after the notifying the AAA server to cancel the UE registration in a ~~non-3GPP~~ source network, the method further comprises:

notifying, by the AAA server, the ~~non-3GPP~~ source network to release resource used by the UE in the ~~non-3GPP~~ source network.

6. (Canceled)

7. (Currently Amended) A handover processing method, comprising:

receiving, by a network element, a registration request message sent by a User Equipment (UE), in a process of registering the UE into a network, wherein the registration request message comprises registration processing type information; ~~and~~

identifying, by the network element, a handover processing type of the registration request according to the registration processing type information; ~~and~~

~~initiating, by the network element, a bearer creation procedure to create resources~~

obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS); and

requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure.

8. (Canceled)

9. (Original) The method of claim 7, further comprising:

setting up a data forwarding tunnel between a network element of a target network and a network element of a source network according to data forwarding tunnel resource information of the target network if the identified handover processing type is an active-mode handover registration processing type.

10. (Original) The method of claim 9, wherein if the target network is a 3rd Generation Partnership Project, 3GPP, network and the source network is a non-3GPP network, the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network comprises:

sending, by a first network element of the 3GPP network, the data forwarding tunnel resource information obtained from a serving Gateway, serving GW, to a non-3GPP GW either directly or through a non-3GPP access network element after receiving information about the active-mode handover registration processing type; and

creating, by the non-3GPP GW, the data forwarding tunnel with the serving GW.

11. (Original) The method of claim 9, wherein if the target network is a non-3rd Generation Partnership Project, 3GPP, network and the source network is a 3GPP network, the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network comprises:

sending, by an access network element or a non-3GPP Gateway, GW, of the non-3GPP network, the data forwarding tunnel resource information of the non-3GPP GW to a serving GW through a first network element of the 3GPP network after receiving information about the active-mode handover registration processing type; and

creating, by the serving GW, the data forwarding tunnel with the non-3GPP GW.

12. (Currently Amended) A registration processing system, comprising:

a User Equipment (UE), adapted to send a registration request message in the process of registering the UE into a network, wherein the registration request message comprises registration processing type information;

a network element, adapted to receive the registration request message and identify a registration processing type according to the received registration processing type information reported by the UE;

wherein when the identified registration processing type is handover registration, the network element is further adapted to ~~initiate a bearer creation procedure to create resources~~ obtain a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS), and request a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure ~~when the identified registration processing type is handover registration~~; and

wherein when the identified registration processing type is an initialization registration and the HSS stores the PDN GW address used by the UE in the source network, the network element is further adapted to notify an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a ~~non-3GPP~~ source network ~~when the identified registration processing type is an initialization registration and a Home Subscriber Server (the HSS) stores a Packet Data Network Gateway (PDN GW) address used by the UE in the non-3GPP network~~.

13-15. (Canceled)

16. (Currently Amended) A network element, comprising:

an obtaining unit, adapted to receive a registration request message sent by a User Equipment (UE) in the process of registering the UE into a network, wherein the registration request message comprises registration processing type information;

an identifying unit, adapted to identify a registration processing type according to the registration processing type information obtained by the obtaining unit; and

a first processing unit, adapted to obtain a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS), and request a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure ~~initiate a bearer creation procedure to create resources~~ when the identified registration processing type is handover registration.

17. (Canceled)

18. (Previously Presented) The method of claim 1, wherein the UE reports the registration processing type information:

when the registration request message is an attach request message and includes an Attach Type in the attach request message, wherein values of the Attach Type comprise an Initial Attach or Handover Attach; or

when the registration request message is an access request message and includes an Access Type in the access request message, wherein values of the Access Type comprise an Initial Access or Handover Access.

19. (Currently Amended) The method of claim 1, wherein if a target network is a 3rd Generation Partnership Project (3GPP) network and the source network is a non-3GPP network, the network element is a Mobility Management Entity (MME) or a Serving GPRS Supporting Node (SGSN); ~~initiating a bearer creation to create resources~~

wherein requesting a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure comprises:

sending, by the MME or the SGSN, a Create Bearer Request message ~~via a Mobility Management Entity (MME)~~ to ~~an~~ the PDN GW corresponding to the obtained PDN GW address; and

~~requesting that the network initiate~~ initiating, by the PDN GW, the bearer creation procedure.

20. (Currently Amended) The method of claim 19, wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules message ~~via~~ by the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the ~~user~~ UE.

21-23. (Canceled)

24. (New) The method of claim 7, wherein if a target network is a 3rd Generation Partnership Project, 3GPP, network and the source network is a non-3GPP network, the network element is a Mobility Management Entity (MME) or a Serving GPRS Supporting Node (SGSN);

wherein requesting a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure comprises:

sending, by the MME or the SGSN, a Create Bearer Request message to the PDN GW corresponding to the obtained PDN GW address; and

initiating, by the PDN GW, the bearer creation procedure.

25. (New) The method of claim 24, wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules message by the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the UE.

REMARKS

Summary

Claims 1, 5, 7, 9, 12, 16, and 19-20 have been amended. Claims 2-3, 6, 8, 13-15, 17, and 21-23 are canceled. New claims 24 and 25 are added. Claims 1, 4, 5, 7, 9-12, 16, 18-20, 24 and 25 are currently pending in the application. Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

Rejections Under 35 U.S.C. § 102

Claims 7, 9-11, 14, 16 and 23 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Application Pub. No. 2006/0109817 ("*Ramanna*"). As mentioned, claims 14 and 23 are canceled.

Claims 7 and 9-11 recite a handover processing method. The method includes receiving, by a network element, a registration request message sent by a User Equipment (UE), in a process of registering the UE into a network, wherein the registration request message comprises registration processing type information. The method also includes identifying, by the network element, a handover processing type of the registration request according to the registration processing type information. The method further includes obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS), and requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure.

Claim 16 recites a network element. The network element includes an obtaining unit, adapted to receive a registration request message sent by a User Equipment (UE) in the process of registering the UE into a network, wherein the registration request message comprises registration processing type information. The network element also includes an identifying unit, adapted to identify a registration processing type according to the registration processin g type information obtained by the obtaining unit. The network element further includes a first processing unit, adapted to obtain a Packet Data Network

Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS),and request a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure when the identified registration processing type is handover registration.

Ramanna teaches some methods for a handoff of a hybrid mobile station (MS) between a legacy network implementing a non-high rate packet data (non-HRPD) communication technology and a network implementing a high rate packet data (HRPD) communication technology. *Ramanna* Abstract. However, *Ramanna* fails to teach or suggest all of the features of claims 7, 9-11, and 16, for at least the following reasons.

First, *Ramanna* fails to teach or suggest receiving, by a network element, a registration request message sent by a User Equipment (UE). In *Ramanna*, a mobile station 102 first conveys a HANDOFF REQUEST message to a base station 114 that instructs the base station (BS) 114 to initiate a handoff. *Ramanna*, ¶ 0039. However, this HANDOFF REQUEST is not a registration request message. Indeed, *Ramanna* states that the "BS 134 completes the establishment of a bearer path for mobile station 102 in HRPD network 130" by "register[ing] the mobile station and set[ting] up a new tunnel by conveying 220 an A11 REGISTRATION REQUEST message to the PDSN." *Ramanna*, ¶ 0046. As such, in *Ramanna*, it is the base station 114, and not a User Equipment, that sends registration request message. Accordingly, *Ramanna* fails to teach or suggest receiving, by a network element, a registration request message sent by a User Equipment (UE).

Second, *Ramanna* fails to teach or suggest identifying, by the network element, a handover processing type of the registration request according to the registration processing type information. In *Ramanna*, the mobile station 102 conveys the HANDOFF REQUEST message to the base station 114 that "instructs the BS to initiate a handoff." *Ramanna*, ¶ 0039. Thus, in *Ramanna*, the BS 114 receives the direct handoff request message, and does not need to identify any handover processing type of the registration request according to the registration processing type information. Accordingly, *Ramanna*

does not teach or suggest identifying, by the network element, a handover processing type of the registration request according to the registration processing type information.

Third, *Ramanna* fails to teach or suggest obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS), and requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure. Rather, in *Ramanna*, the "BS 134 allocates a forward link traffic channel and a reverse link traffic channel in air interface 132 to mobile station 102 and conveys 208 a legacy network resource allocation complete message to BS 114." *Ramanna*, ¶ 0042. "[I]n response to being informed the mobile station has successfully acquired the traffic channels allocated at BS 134, BS 134 completes the establishment of a bearer path for mobile station 102 in HRPD network 130 by registering the mobile station with PDSN 124 and setting up a new tunnel to the PDSN." *Ramanna*, ¶ 0053. As such, in *Ramanna*, the establishment of a bearer path for mobile station 102 is performed by the BS 134 by using the way of allocating a forward link traffic channel and a reverse link traffic channel in air interface 132 by the BS. This method in *Ramanna* fails to teach or suggest obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS), and requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure.

For at least these reasons, *Ramanna* fails to teach or suggest all of the features of claims 7, 9-11, and 16. Accordingly, Applicants respectfully request that the rejections be withdrawn.

Rejection Under 35 U.S.C. § 103

Claims 1, 4-6, 12, and 18-22 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ramanna* in view of U.S. Pat. App. Pub. No. 2008/0254768 ("*Faccin*"). As mentioned, claims 6, 21 and 22 are canceled.

Claims 1, 4-5, and 18-20 recite a registration processing method that includes receiving, by a network element, a registration request message sent by a User Equipment (UE) in a process of registering the UE into a network, wherein the registration request message comprises registration processing type information; and identifying, by the network element, a registration processing type according to the registration processing type information. When the identified registration processing type is handover registration, the method also includes obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS); and requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure.

Claim 12 recites a registration processing system that includes a User Equipment (UE), adapted to send a registration request message in the process of registering the UE into a network, wherein the registration request message comprises registration processing type information; and a network element, adapted to receive the registration request message and identify a registration processing type according to the received registration processing type information reported by the UE. Additionally, when the identified registration processing type is handover registration, the network element is further adapted to obtain a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS), and request a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure.

As discussed, *Ramanna* fails to teach or suggest these features of claims 1, 4-6, 12, and 18-22. *Faccin* is directed to a network device with an IP connectivity generator (*Faccin* Abstract), but fails to fill in the gaps of *Ramanna*. Accordingly, because the proposed combination of *Ramanna* and *Faccin* fails to teach or suggest all of the features of claims 1, 4-6, 12, and 18-22, Applicants respectfully request that the rejections of these claims be withdrawn.

New Claims

Claims 24-25 are new and contain no new matter. Support for claims 24-25 is found in paragraphs [0056]-[0058] of the specification. Claims 24-25 depend from claim 7, and as such, are allowable over the cited references for the reasons stated above. Accordingly, Applicants respectfully request a notice of allowance for these claims indicating the same.

CONCLUSION

In view of the foregoing, Applicants respectfully submit that claims 1, 5, 7, 9-12, 16, 18-20, 24 and 25 are in condition for allowance and respectfully request that the application be reconsidered and the pending claims allowed. Should the Examiner wish to discuss the foregoing to advance this application toward allowance, the Examiner is urged to telephone the undersigned at the below-indicated number.

Respectfully submitted,

/Gustavo Siller, Jr./

Registration No. 32,305
Attorney for Applicants

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(312) 321-4200

Electronic Patent Application Fee Transmittal

Application Number:	12581575
Filing Date:	19-Oct-2009
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Filer:	Gustavo Siller Jr./Maria Calderon
Attorney Docket Number:	13674-213

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Request for continued examination	1801	1	810	810
		Total in USD ($)		**810**

Electronic Acknowledgement Receipt

EFS ID:	10493486
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Joel Silva
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	11-JUL-2011
Filing Date:	19-OCT-2009
Time Stamp:	18:23:43
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$810
RAM confirmation Number	5549
Deposit Account	231925
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213Amendment.pdf	785089 c90849d8fd3e205e4c40591018650c4c295bb74d	yes	15

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Request for Continued Examination (RCE)	2	3
	Amendment Submitted/Entered with Filing of CPA/RCE	4	15

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30592 4aa7283452f1271d2696567506e82aa4a8354148	no	2

Warnings:

Information:

Total Files Size (in bytes):	815681

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: July 11, 2011 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	DADY CHERY
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.:	2875
Attorney Docket No.:	13674-213		
Client Ref. No.:	0810596US		

TRANSMITTAL

Mail Stop RCE
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Amendment and Response; Request for Continued Examination.

Fee calculation:

☐ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☒ A petition or processing fee in an amount of $810.00 under 37 CFR § 1.17(e).

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee payment:

☒ Please charge Deposit Account No. 23-1925 in the amount of $810.00 for filing a Request for Continued Examination.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

July 11, 2011
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

BRINKS HOFER GILSON & LIONE
NBC Tower – Suite 3600, 455 N. Cityfront Plaza Drive, Chicago, IL 60611-5599

BRINKS HOFER GILSON &LIONE

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/581,575	10/19/2009	

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT	07/11/2011	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0	X $ =		OR	X $52=	0
	Independent (37 CFR 1.16(h))	* 4	Minus	***5	= 0	X $ =		OR	X $220=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/DIANIECE JACOBS/

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	F1	Copy of Office Action issued in corresponding Chinese Patent Application No. 200810085729.8, mailed April 26, 2010.

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Acknowledgement Receipt

EFS ID:	10958813
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Maggie Pieczonka
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	15-SEP-2011
Filing Date:	19-OCT-2009
Time Stamp:	17:18:55
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213IDS.pdf	180380 905712bdb2cc3f9d55b2544793aa8382bbadc773	yes	4

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Transmittal Letter	2	3
	Information Disclosure Statement (IDS) Form (SB08)	4	4

Warnings:					
Information:					
2	Foreign Reference	F1.pdf	965164 0f161a7ed368f71608022131865bba1a9e05dab9	no	13
Warnings:					
Information:					
		Total Files Size (in bytes):	1145544		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: September 15, 2011 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu

Appln. No.: 12/581,575 Examiner: Dady Chery

Filed: October 19, 2009 Art Unit: 2461

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING Confirmation No.: 2875

Attorney Docket No: 13674-213
Client Ref. No. 0810596US

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Information Disclosure Statement; PTO-1449; Cited Reference F1.

Fee calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____for _____.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

September 15, 2011
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
9/15/2011
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
9/15/2011
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.:	2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US		

THIRD SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(b), Applicant hereby cites the following reference(s):

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Office Action issued in corresponding Chinese Patent Application No. 200810085729.8, mailed April 26, 2010.

BRINKS
HOFER
GILSON
&LIONE

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

The Applicant or Applicants have calculated no fee to be due in connection with the filing of this Information Disclosure Statement. However, the Director is authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to a deposit account, as authorized in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

September 15, 2011
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
11/7/2011
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
11/7/2011
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu	
Appln. No.:	12/581,575	Examiner: Dady Chery
Filed:	October 19, 2009	Art Unit: 2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.: 2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US	

SIXTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(b), Applicant hereby cites the following reference(s):

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Office Action issued in corresponding Chinese Patent Application No. 200810085729.8, mailed August 1, 2011.

BRINKS
HOFER
GILSON
&LIONE

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

The Applicant or Applicants have calculated no fee to be due in connection with the filing of this Information Disclosure Statement. However, the Director is authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to a deposit account, as authorized in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

November 7, 2011
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	G1	Copy of Office Action issued in corresponding Chinese Patent Application No. 200810085729.8, mailed August 1, 2011.

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Acknowledgement Receipt

EFS ID:	11349735
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Masoud Naseri
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	07-NOV-2011
Filing Date:	19-OCT-2009
Time Stamp:	15:59:31
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213ids.pdf	618345 d3dfbbaf0a9bfbb4b07b539cf38420cc25cc6eed	yes	14

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Information Disclosure Statement (IDS) Form (SB08)	2	3
	Information Disclosure Statement (IDS) Form (SB08)	4	4
	Non Patent Literature	5	14
Warnings:			
Information:			
	Total Files Size (in bytes):	618345	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
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National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: November 7, 2011 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu

Appln. No.: 12/581,575

Filed: October 19, 2009

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Attorney Docket No: 13674-213
Client Ref. No. 0810596US

Examiner: Dady Chery

Art Unit: 2461

Confirmation No.: 2875

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Information Disclosure Statement; PTO-1449; Cited Reference G1.

Fee calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

					Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra	Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus			x $26=			x $52=	
Indep.		Minus			x 110=			x $220=	
First Presentation of Multiple Dep. Claim					+$195=			+ $390=	
					Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $____for _____.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

November 7, 2011
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

93823 7590 12/06/2011

Huawei/BHGL
P.O. Box 10395
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EXAMINER	
CHERY, DADY	
ART UNIT	PAPER NUMBER
2461	
MAIL DATE	DELIVERY MODE
12/06/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/581,575	WU, WENFU	
	Examiner	Art Unit	
	DADY CHERY	2461	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 July 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,5,7-12,16,18-20,24 and 25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5,7-12,16,18-20,24 and 25* is/are rejected.

7)☐ Claim(s) _ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 11th 2011 has been entered.

Response to Amendment

This communication is responsive to the amendment filed on July 11th 2011.

Claims 1, 7, 12, 16, and 19-10 have been amended.

Claims 2-3, 6, 8, 13- 15, 17, and 21-13 have been cancelled.

Claims 24-25 have been added.

Claims 1, 4-5, 7-12, 16, 18-20, and 24-25 are now pending.

Response to Arguments

Applicant's arguments, see pages 8-12, filed on July 11th 2011, with respect to the rejection(s) of claim(s) 1, 5,7,9,12,16 under 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Faccin which discloses obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS) **(Page 7, [0125],, page 8, [0134], which recites the usage of PDN GW address used by the**

UE); requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation(**Page 10,[0164]-[0166], and [0173], which recites the creation of bearer)**.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 4-5, 7, 9-12, 16, 18 -20, and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramanna in view of Faccin (US Application 2008/0254768, hereinafter Faccin).

Regarding claims 1, 12, Ramanna discloses a registration processing method and system **(Fig. 2),** comprising:

receiving, by a network element, a registration request message sent by a User Equipment(UE) in a process of registering the (UE)into a network**(page 5,[0037] - [0039] and page 6, [0046], which recites a registration request sends by a mobile station into a network that is well-known in the art),** wherein the registration request message comprises registration processing type information**(page 6, [0046], which recites an A11 registration type);** and

identifying, by the network element, a registration processing type according to the registration processing type information**(Page 7, [0051], which recites the identification of the message or request type);**

wherein when the identified registration processing type is handover registration**(Page 5, [0039], which recites a message that triggers a handoff of the mobile, thereby a registration handover type registration),** the method further comprises:

initiating, by the network element, a bearer creation procedure to create resources**(Page 5, [0042],page 6, [0046] and page 7, [0053] which recites setup a new channel in other word create a bearer resource in response to the handover request)** ; and

Ramanna does not explicitly disclose obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS); requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation; wherein when the identified registration processing type is initialization registration, the method further comprises:

notifying, by a Home Subscriber Server (HSS), an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a non-3GPP network when the HSS stores a Packet Data Network Gateway (PDN GW) address used by the UE in a non-3rd Generation Partnership Project (3GPP) network.

However, Faccin teaches obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS) **(Page 7, [0125],, page 8, [0134], which recites the usage of PDN GW address used by the UE);** requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation(**Page 10,[0164]-[0166], and [0173], which recites the creation of bearer);** when the identified registration processing type is initialization registration **(Page 10, [0165], which recites a registration request that considered as the initialization registration)** the method further comprises:

notifying, by a Home Subscriber Server (HSS), an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a non-3GPP network**(page 10, [0168], page 12, [0199] and [0207], which recite a cancellation send to an old MME**

of a non-3GPP) when the HSS stores a Packet Data Network Gateway (PDN GW) address used by the UE in a non-3rd Generation Partnership Project (3GPP) network**(Page 11, [0185] – [0186], which recites the storing of the address).**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Ramanna by using the above features such as when the identified registration processing type is initialization registration, the method further comprises: notifying, by a Home Subscriber Server (HSS), an Authentication Authorization Accounting (AAA) server to cancel the UE registration in a non-3GPP network when the HSS stores a Packet Data Network Gateway (PDN GW) address used by the UE in a non-3rd Generation Partnership Project (3GPP) network as taught by Faccin for the purpose of managing connectivity of networks devices relative to remote networks**(Page 1, [0002]).**

Regarding claim 7, Ramanna discloses a handover processing method**(Fig. 2),** comprising:

receiving, by a network element, a registration request message sent by an Access a User Equipment (UE) in a process of registering the UE into a network**(page 5, [0037] - [0039] and page 6, [0046], which recites a registration request sends by a mobile station into a network that is well-known in the art),** wherein the registration request message comprises registration processing type information**(page 6, [0046], which recites an A11 registration type information);** and

identifying, by the network element, a handover processing type of the registration request Access Request according to the registration processing type information**(Page**

5, [0039], which recites a handover process identifies by BS 204); and initiating, by the network element, a bearer creation procedure to create resources**(Page 5, [0042],page 6, [0046] and page 7, [0053] which recites setup a new channel in other word create a bearer resource in response to the handover request).**

Ramanna does not explicitly disclose obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS); requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation.

However, Faccin teaches obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS) **(Page 7, [0125],, page 8, [0134], which recites the usage of PDN GW address used by the UE);** requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation(**Page 10,[0164]-[0166], and [0173], which recites the creation of bearer).**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Ramanna by using the above features such as obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS); requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation as taught

by Faccin for the purpose of managing connectivity of networks devices relative to remote networks**(Page 1, [0002]).**

Regarding claim 16, Ramanna discloses a element **(Fig. 1)**, comprising:

an obtaining unit**(124),** adapted to receive a registration request message sent by a User Equipment (UE) in the process of registering the UE into a network**(page 5, [0037] -[0039] and page 6, [0046], which recites a registration request sends by a mobile station into a network that is well-known in the art . Page 6, [0046]-[0047], which recites the PDSN receives a registration request from the mobile station, thereby indentifies the registration type);** wherein the registration request message comprises registration processing type information **(page 6, [0046], which recites an A11 registration type information)**;

an identifying unit**(124)** adapted to identify a registration processing type according to the registration_processing type information obtained by the obtaining unit**(Page 6, [0046]-[0047], which recites the PDSN receives a registration request from the mobile station, thereby indentifies the registration type);** and

a first processing unit**(134),** adapted to initiate a bearer creation procedure to create resources when the identified registration processing type is handover registration**(Page 5, [0042],page 6, [0046] and page 7, [0053] which recites setup a new channel in other word create a bearer resource in response to the handover request).**

Ramanna does not explicitly disclose obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network

from a Home Subscriber Server (HSS); requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation.

However, Faccin teaches obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS) **(Page 7, [0125],, page 8, [0134], which recites the usage of PDN GW address used by the UE);** requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation(**Page 10,[0164]-[0166], and [0173], which recites the creation of bearer).**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Ramanna by using the above features such as obtaining, by the network element, a Packet Data Network Gateway (PDN GW) address used by the UE in a source network from a Home Subscriber Server (HSS); requesting, by the network element, a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation as taught by Faccin for the purpose of managing connectivity of networks devices relative to remote networks**(Page 1, [0002]).**

Regarding claim 4, Ramanna discloses he method of claim 1, wherein the identifying the registration processing type according to the registration processing type information **(page 6, [0046], which recites an A11 registration type information)**; comprises:

notifying, the received registration processing type information to the HSS or the AAA server**(page 4, [0028], which recites a registration receives at an AAA or a HLR);**

and

identifying, by the HSS or the AAA server, the registration processing type according to the registration_processing type information operations**(page 6, [0046], which recites an A11 registration type information)**.

Regarding claim 5, Ramanna discloses the method of claim 4, wherein after the notifying the AAA server to cancel the UE registration in a non-3GPP network, the method further comprises:

notifying, by the AAA server, the non-3GPP network to release resource used by the UE in the non-3GPP network **(page 1, [0014] –[0015] and page 4,[0028], where the non-HRPD is considered as the non-3GPP).**

Regarding claim 9, Ramanna discloses the method of claim 7, further comprising: setting up a data forwarding tunnel between a network element of a target network and a network element of a source network according to data forwarding tunnel resource information of the target network if the identified handover processing type is an active- mode handover registration processing type **(page 2, [0016] – [0017]).**

Regarding claim 10, Ramanna discloses the method of claim 9, wherein if the target network is a 3rd Generation Partnership Project, 3GPP, network and the source network is a non-3GPP network, the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network **(page 2, [0016] – [0017])**comprises:

sending, by a first network element of the 3GPP network, the data forwarding tunnel

resource information obtained from a serving Gateway, serving GW, to a non-3GPP GW either directly or through a non-3GPP access network element after receiving information about the active-mode handover registration processing type; and

creating, by the non-3GPP GW, the data forwarding tunnel with the serving GW**(page 2, [0016] – [0018]).**

Regarding claim 11, Ramanna discloses the method of claim 9, wherein if the target network is a non- 3rd Generation Partnership Project, 3GPP, network and the source network is a 3GPP network, the setup of the data forwarding tunnel between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network**(page 2, [0016] – [0018])** comprises:

sending, by an access network element or a non-3GPP Gateway, GW, of the non-3GPP network, the data forwarding tunnel resource information of the non-3GPP GW to a serving GW through a first network element of the 3GPP network after receiving information about the active-mode handover registration processing type; and

creating, by the serving GW, the data forwarding tunnel with the non-3GPP GW**(page 2, [0016] – [0018]).**

Regarding claim 18, Ramanna discloses the method of claim 1, wherein the UE reports the registration processing type information:

when the registration request message is an attach request message and includes an Attach Type in the attach request message, wherein values of the Attach Type comprise an Initial Attach or Handover Attach**(page 5, [0039] and page 6, [0046]);** or

when the registration request message is an access request message and includes an Access Type in the access request message, wherein values of the Access Type comprise an Initial Access or Handover Access**(page 5, [0039] and page 6, [0046])**.

Regarding claim 19, Ramanna discloses the method of claim 1 as addressed above, except wherein initiating a bearer creation to create resources comprises: sending a Create Bearer Request message via a Mobility Management Entity (MME) to an obtained PDN GW address; and requesting that the network initiate the bearer creation procedure.

However, Faccin teaches initiating a bearer creation to create resources comprises: sending a Create Bearer Request message via a Mobility Management Entity (MME) to an obtained PDN GW address; and requesting that the network initiate the bearer creation procedure **(Page 10, [0172] – [0173]).**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Ramanna by using the above features such as sending a Create Bearer Request message via a Mobility Management Entity (MME) to an obtained PDN GW address; and requesting that the network initiate the bearer creation procedure as taught by Faccin for the purpose of managing connectivity of networks devices relative to remote networks **(Page 1, [0002]).**

Regarding claims 20, **25**, Ramanna discloses the method of claim 19 as addressed above, except wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules

message via the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the user.

However, Faccin teaches the method of claim 19 as addressed above, except wherein after the PDN GW receives the Create Bearer Request message **(Page 10, [0172] – [0173])**, sending a Request Policy and Charging Control (PCC) rules message via the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the user **(Page 10, [0175] and page 11, [0193]).**

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Ramanna by using the above features such as wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules message via the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain the PCC Rules applied by the user as taught by Faccin for the purpose of managing connectivity of networks devices relative to remote networks **(Page 1, [0002]).**

Regarding claim 24, Ramanna discloses the method of claim 7 as addressed above except , wherein if a target network is a 3rd Generation Partnership Project, 3GPP, network and the source network is a non-3GPP network, the network element is a Mobility Management Entity (MME) or a Serving GPRS Supporting Node (SGSN); wherein requesting a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure comprises:

sending, by the MME or the SGSN, a Create Bearer Request message to the PDN GW

corresponding to the obtained PDN GW address; and initiating, by the PDN GW, the bearer creation procedure.

However, Faccin teaches wherein if a target network is a 3rd Generation Partnership Project, 3GPP, network and the source network is a non-3GPP network**(page 1, [0004] –[0006]),** the network element is a Mobility Management Entity (MME) or a Serving GPRS Supporting Node (SGSN) **(Page 10, [0164] –[0166] and [0174]);**

wherein requesting a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure comprises:

sending, by the MME or the SGSN, a Create Bearer Request message to the PDN GW corresponding to the obtained PDN GW address; and initiating, by the PDN GW, the bearer creation procedure**(Page 10, [0164] –[0166] and [0174])**.

Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Faccin with Ramanna by using the above features such as wherein if a target network is a 3rd Generation Partnership Project, 3GPP, network and the source network is a non-3GPP network, the network element is a Mobility Management Entity (MME) or a Serving GPRS Supporting Node (SGSN);wherein requesting a PDN GW corresponding to the obtained PDN GW address to initiate a bearer creation procedure comprises:

sending, by the MME or the SGSN, a Create Bearer Request message to the PDN GW corresponding to the obtained PDN GW address; and initiating, by the PDN GW, the

bearer creation procedure as taught by Faccin for the purpose of managing connectivity of networks devices relative to remote networks **(Page 1, [0002]).**

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DADY CHERY whose telephone number is (571)270-1207. The examiner can normally be reached on Monday - Thursday 8 am - 4 pm ESt.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D. VU can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dady Chery/
Examiner, Art Unit 2461

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	G1	Copy of Office Action issued in corresponding Chinese Patent Application No. 200810085729.8, mailed August 1, 2011.

EXAMINER /Dady Chery/	DATE CONSIDERED 12/03/2011

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	**Art Unit**
	DADY CHERY	2461

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	10/27/2010	04/19/2011	12/04/2011						
	1	✓	✓	✓						
	2	✓	-	-						
	3	✓	-	-						
	4	✓	✓	✓						
	5	✓	✓	✓						
	6	✓	✓	-						
	7	✓	✓	✓						
	8	✓	-	-						
	9	✓	✓	✓						
	10	✓	✓	✓						
	11	✓	✓	✓						
	12	✓	✓	✓						
	13	✓	-	-						
	14	✓	✓	✓						
	15	✓	-	-						
	16	✓	✓	✓						
	17	✓	-	-						
	18		✓	✓						
	19		✓	✓						
	20		✓	✓						
	21		✓	-						
	22		✓	-						
	23		✓	-						
	24			✓						
	25			✓						

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	F1	Copy of Office Action issued in corresponding Chinese Patent Application No. 200810085729.8, mailed April 26, 2010.

EXAMINER	/Dady Chery/	DATE CONSIDERED	12/03/2011

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	Art Unit
	DADY CHERY	2461

SEARCHED			
Class	Subclass	Date	Examiner
370	328,329,330,331,332,333,334	10/22/2010	DC
455	436,437,438,439	10/22/2010	DC
709	227,228,229	10/22/2010	DC

SEARCH NOTES		
Search Notes	Date	Examiner
Inventorship	10/22/2010	DC
Updated search	04/18/2011	DC
Updated search	12/04/2011	Dc

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	H1	Copy of Extended European Search Report issued in corresponding European Patent Application No. 11176895.8, mailed November 21, 2011.

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Acknowledgement Receipt

EFS ID:	11778261
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Masoud Naseri
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	06-JAN-2012
Filing Date:	19-OCT-2009
Time Stamp:	15:23:15
Application Type:	Utility under 35 USC 111(a)

Payment information:

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213IDS.pdf	188953 4cc1631e4d842cc39ab261d8fb50ecbc74efd8f2	yes	4

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Transmittal Letter	2	3
	Information Disclosure Statement (IDS) Form (SB08)	4	4

Warnings:					
Information:					
2	Foreign Reference	H1.pdf	445144 797acea664478abe243cdacd757b17233ea6ea56	no	9
Warnings:					
Information:					
		Total Files Size (in bytes):	634097		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: January 6, 2012 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu

Appln. No.: 12/581,575

Filed: October 19, 2009

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Attorney Docket No: 13674-213
Client Ref. No. 0810596US

Examiner: Dady Chery

Art Unit: 2461

Confirmation No.: 2875

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Information Disclosure Statement; PTO-1449; Cited Reference H1.

Fee calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____ month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____for _____.

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☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

January 6, 2012
Date

/Gustavo Siller, Jr./
Gustavo SIller, Jr. (Reg. No. 32,305)

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
1/6/2012
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
1/6/2012
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.:	2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US		

SEVENTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(c), Applicant hereby cites the following reference(s):

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Extended European Search Report issued in corresponding European Patent Application No. 11176895.8, mailed November 21, 2011.

BRINKS HOFER GILSON &LIONE

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). As each of the listed references is in English, no further commentary is believed to be necessary, 37 C.F.R §1.98(a)(3). Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

Applicant hereby certifies pursuant to 37 CFR §1.97(e)(2) that no item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the undersigned after making reasonable inquiry, no item of information contained in this Statement was known to any individual designated in 37 CFR §1.56(c), more than three months prior to the filing of this Information Disclosure Statement. Accordingly, Applicant has calculated no fee to be due in connection with the filing of this Information Disclosure Statement. However, the Director is authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to a deposit account, as authorized in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

January 6, 2012
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: March 6, 2012 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 13674-213
Client Ref. No. 0810596US

In re Application of:	
Wenfu Wu	Examiner: CHERY, DADY
Serial No: 12/581,575	Group Art Unit: 2461
Filed: October 19, 2009	Conf. No.: 2875
For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	

AMENDMENT AND RESPONSE

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed December 06, 2011, please enter the following in the above-identified application.

Amendments to the claims are reflected in the listing of claims, which begin on page 2 of this paper.

Remarks begin on page 7 of this paper.

AMENDMENTS TO THE CLAIMS

Pursuant to 37 C.F.R. § 1.121 the following listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the Clams:

1 -6. (Canceled)

7. (Currently Amended) A handover processing method, comprising:

receiving, by ~~a network element~~ Mobility Management Entity (MME), ~~a registration~~an attach request message sent by a User Equipment (UE)~~, in a process of registering the UE into a network~~during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3rd Generation Partnership (3GPP) network, wherein the ~~registration~~ attach request message comprises ~~registration processing type~~an information element (IE) indicating handover;

~~identifying, by the network element, a handover processing type of the registration request according to the registration processing type information;~~

~~obtaining~~identifying, by the ~~network element~~MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in ~~a source network from~~ the non-3GPP network by communicating with a Home Subscriber Server (HSS); and

requesting, by the ~~network element~~MME, [[a]] the PDN GW ~~corresponding to the obtained PDN GW address~~ to initiate a bearer creation procedure.

8. (Canceled)

9. (Currently presented) The method of claim 7, wherein the handover is an active-mode handover, the method further ~~comprising~~comprises:

setting up a data forwarding tunnel between a ~~network element~~serving gateway (GW) of ~~a target~~ the 3GPP network and a ~~network element~~ non-3GPP GW of ~~a source~~ the non-3GPP network according to data forwarding tunnel resource information of the ~~target~~

3GPP network ~~if the identified handover processing type is an active mode handover registration processing type~~.

10. (Currently amended) The method of claim 9, wherein ~~if the target network is a 3rd Generation Partnership Project, 3GPP, network and the source network is a non-3GPP network, the setup of~~setting up the data forwarding tunnel ~~between the network element of the target network and the network element of the source network according to the data forwarding tunnel resource information of the target network~~ comprises:

sending, by ~~a first network element of the 3GPP network~~the MME, the data forwarding tunnel resource information ~~obtained from a serving Gateway, serving GW,~~ to [[a]] the non-3GPP GW either directly or through a non-3GPP access network element ~~after receiving information about the active mode handover registration processing type~~; and

creating, by the non-3GPP GW, the data forwarding tunnel with the serving GW.

11 - 15. (Canceled)

16. (Currently Amended) A network element, comprising:

an obtaining unit, ~~adapted~~ configured to receive ~~a registration~~an attach request message sent by a User Equipment (UE) ~~in the process of registering the UE into a network~~during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3rd Generation Partnership Project (3GPP) network, wherein the ~~registration~~ attach request message comprises an information element indicating handover ~~registration processing type information~~;

an identifying unit, ~~adapted~~ configured to identify ~~a registration processing type according to the registration processing type information obtained by the obtaining unit~~that the attach request message is due to the handover according to the IE indicating handover; and

a ~~first~~ processing unit, ~~adapted~~ configured to ~~obtain~~identify a Packet Data Network Gateway (PDN GW) whose address is used by the UE in ~~a source~~ the non-3GPP network by communicating with~~from~~ a Home Subscriber Server (HSS), and request [[a]] the PDN GW ~~corresponding to the obtained PDN GW address~~ to initiate a bearer creation procedure~~when the identified registration processing type is handover registration~~.

17 -18. (Canceled)

19. (Currently Amended) The method of claim ~~1~~7, ~~wherein if a target network is a 3rd Generation Partnership Project (3GPP) network and the source network is a non-3GPP network, the network element is a Mobility Management Entity (MME) or a Serving GPRS Supporting Node (SGSN);~~

wherein the requesting a the PDN GW ~~corresponding to the obtained PDN GW address~~ to initiate a bearer creation procedure comprises:

sending, by the MME ~~or the SGSN~~, a Create Bearer Request message to the PDN GW~~corresponding to the obtained PDN GW address~~; and

initiating, by the PDN GW, the bearer creation procedure.

20. (Currently Amended) The method of claim 19, wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules message by the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain ~~the~~ a PCC Rule~~s applied by the UE~~.

21-25. (Canceled)

26. (New) The method of claim 7, wherein the IE is an Attach Type IE.

27. (New) The method of claim 26, wherein a value of the Attach Type IE is set to "1".

28. (New) The method of claim 26, wherein a value of the Attach Type IE is set to "Handover Attach".

29. (New) The method of claim 7, wherein the MME identifies the PDN GW by obtaining the PDN GW address from the HSS.

30. (New) The method of claim 7, wherein the MME identifies the PDN GW by obtaining an identity of the PDN GW from the HSS.

31. (New) The method of claim 16, wherein the IE is an Attach Type IE.

32. (New) The method of claim 31, wherein a value of the Attach Type IE is set to "1".

33. (New) The method of claim 31, wherein a value of the Attach Type IE is set to "Handover Attach".

REMARKS

Summary

Claims 7, 9, 10, 16, 19 and 20 have been amended. Claims 1, 4, 5, 11, 12, 18, 24 and 25 have been canceled without prejudice and disclaimer. New claims 26-33 are added. Claims 7, 9, 10, 16, 19, 20 and 26-33 are currently pending in the application. Reconsideration of the application in light of the above amendments and the following remarks is respectfully requested.

Rejections Under 35 U.S.C. § 103

Claims 1, 4-5, 7, 9-12, 16, 18-20 and 24-25 are rejected under 35 U.S.C. § 103(a) as being unpatentable over *Ramanna* (U.S. Application Pub. No. 2006/0109817) in view of *Faccin* (US Application Pub. No. 2008/0254768). Applicant respectfully submits that the combination of *Ramanna* and *Faccin* fails to teach or suggest all the limitations of these claims, consequently do not render these claims obvious.

Claim 7, as amended, recites (underlined for emphasis):

> 7. A handover processing method, comprising:
>
> receiving, by a Mobility Management Entity (MME), an attach request message sent by a User Equipment (UE) during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3GPP network, wherein the attach request message comprises an information element (IE) indicating handover;
>
> identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS); and
>
> requesting, by the MME, the PDN GW to initiate a bearer creation procedure.

Ramanna teaches some methods for a handoff of a hybrid mobile station (MS) between a legacy network implementing a non-high rate packet data (non-HRPD) communication technology and a network implementing a high rate packet data (HRPD)

communication technology. However, *Ramanna* fails to disclose "receiving, by a Mobility Management Entity (MME), an attach request message sent by a User Equipment (UE) during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3rd Generation Partnership Project (3GPP) network, wherein the attach request message comprises an information element (IE) indicating handover" as recited in claim 7.

First, *Ramanna* teaches a handoff between a legacy network implementing a non-high rate packet data (non-HRPD) technology and a network implementing a high rate packet data (HRPD). The non-HRPD network is a legacy CDMA network, and the HRPD network is a HRPD CDMA network. (See page 1, paragraph [0014], lines 1-4; or page 4, paragraph [0026], lines 2-7 in *Ramanna*) It is well known in the art that a CDMA network is a non-3GPP network. Thus, both the non-HRPD network and the HRPD network are non-3GPP networks. That is, *Ramanna* discloses a handoff between two non-3GPP networks. In contrast, claim 7 recites a "handover from a non-3GPP network to a 3GPP network".

Second, Claim 7 recites "receiving, by a Mobility Management Entity (MME), an attach request message . . . wherein the attach request message comprises an information element (IE) indicating handover." *Ramanna* fails to disclose: 1) that a Mobility Management Entity (MME) receives an attach request message, and 2) that the attach request message comprises an information element (IE) indicating handover. The Examiner asserted that *Ramanna* discloses these limitations, relying on page 5, paragraph [0039] in *Ramanna*. (See Office Action, page 11, comments with respect to claim 18) Applicant respectfully submits that *Ramanna* merely discloses a base station (BS) receives a handoff trigger message (e.g., a HANDOFF REQUEST) to initiate a handoff:

> While mobile station 102 is engaged in the communication session with BS 114, the BS receives 204 a message that triggers a handoff of the mobile station. The handoff trigger message may be based on, among other considerations, any one or more of signal strength measurements of the respective pilot channels, a location of the mobile station, network cost or load considerations, and a directive of a user of the mobile station. For example, while activated in networks 110 and 130, mobile station 102 may monitor pilot channels associated with multiple BSs, such as BSs 114 and 134. In one such embodiment of the present invention, based on the monitored pilot channels, mobile station 102 may determine that the call should be handed off from BS 114 to HRPD network 130, and more

> particularly to BS 134. Mobile station 102 may then convey a handoff trigger message, preferably a HANDOFF REQUEST message as described in detail in the IOS specifications, to BS 114 that instructs the BS to initiate a handoff. The message may further notify BS 114 of a target network or BS, that is, network 130 or BS 134, and/or BS 114 may determine the target network and/or BS by reference to MSC 120, which determines the target network and/or BS by reference to at least one of the HLR and VLR coupled to the MSC. In other embodiments of the present invention, mobile station 102 may convey a handoff trigger message such as a HANDOFF REQUEST message in response being instructed by a user of the mobile station to request a handoff to network 130 or in response to self-determining to transfer networks based on cost considerations.

Ramanna, page 5, paragraph [0039].

As shown above, in *Ramanna,* the BS receives a HANDOFF REQUEST from the mobile station, and the HANDOFF REQUEST instructs the BS to initiate a handoff. However, in claim 7, it is a MME that receives an attach request from a UE (e.g., mobile station). First, a MME is not the same as the BS in *Ramanna*. Second, the attach request is not the same as the HANDOFF REQUEST in *Ramanna*. An attach procedure enables a UE to register itself to an MME for receiving packet service, and the UE starts the attach procedure by sending an attach request message to the MME.

For at least the above reasons, *Ramanna* fails to teach or suggest "receiving, by a Mobility Management Entity (MME), an attach request message sent by a User Equipment (UE) during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3GPP network, wherein the attach request message comprises an information element (IE) indicating handover" as recited in claim 7.

Faccin does not make up for the deficiencies of *Ramanna*. Therefore, the combination of *Ramanna* and *Faccin* does not teach or suggest all the limitations of claim 7, and consequently does not render claim 7 obvious. Accordingly, the rejection of claim 7 is respectfully requested to be withdrawn.

Since claims 9-10 and 19-20 depend from claim 7, they are also patentable over *Ramanna* in view of *Faccin* for at least the same reasons. The rejection of claims 9-10 is respectfully requested to be withdrawn.

Applicant respectfully submits that independent claim 16 as amended is also patentable over *Ramanna* in view of *Faccin*. Specifically, independent claim 16 recites (underlined for emphasis):

> A network element, comprising:
>
> an obtaining unit, <u>configured to receive an attach request message sent by a User Equipment (UE) during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3GPP network, wherein the attach request message comprises an information element indicating handover</u>;
>
> an identifying unit, configured to identify that the attach request message is due to the handover according to the IE indicating handover; and
>
> a first processing unit, configured to identify a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS), and request the PDN GW to initiate a bearer creation procedure.

Thus, claim 16 recites limitations similar to those in claim 7. Thus, claim 16 is also patentable over *Ramanna* in view of *Faccin* for at least the same reasons discussed above with respect to claim 7. The rejection of claim 16 is respectfully requested to be withdrawn.

Claims 1, 4, 5, 11, 12, 18, 24 and 25 have been canceled, thus the rejection of claims 1, 4, 5, 11, 12, 18, 24 and 25 is moot.

New Claims

Claims 26-30 depend from claim 7, and claims 31-33 depend from claim 16. As such, claims 26-33 are allowable over the cited references for the reasons stated above. Accordingly, Applicants respectfully request a notice of allowance for these claims indicating the same.

CONCLUSION

In view of the foregoing, Applicants respectfully submit that claims 7, 9, 10, 16, 19, 20 and 26-33 are patentable and this application is in condition for allowance. Should the Examiner wish to discuss the foregoing to advance this application toward allowance, the Examiner is urged to telephone the undersigned at the below-indicated number.

Respectfully submitted,

/Gustavo Siller, Jr./
Registration No. 32,305
Attorney for Applicants

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, ILLINOIS 60610
(312) 321-4200

Electronic Acknowledgement Receipt

EFS ID:	12234771
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Masoud Naseri
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	06-MAR-2012
Filing Date:	19-OCT-2009
Time Stamp:	14:45:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213Amendment.pdf	547542 bc925fdd4bb8ca5d44048fd2a8141b00ae0eef63	yes	11

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Amendment/Req. Reconsideration-After Non-Final Reject	2	11
Warnings:			
Information:			
	Total Files Size (in bytes):	547542	

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New International Application Filed with the USPTO as a Receiving Office
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CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

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Date: March 6, 2012 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.:	2875
Attorney Docket No.:	13674-213		
Client Ref. No.:	0810596US		

TRANSMITTAL

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Amendment and Response.

Fee calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____ month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $30=			x $60=	
Indep.		Minus				x 125=			x $250=	
First Presentation of Multiple Dep. Claim						+$225=			+ $450=	
						Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

March 6, 2012
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

BRINKS HOFER GILSON & LIONE
NBC Tower – Suite 3600, 455 N. Cityfront Plaza Drive, Chicago, IL 60611-5599

BRINKS HOFER GILSON &LIONE

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/581,575	10/19/2009	

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT	03/06/2012	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0	X $ =		OR	X $60=	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***5	= 0	X $ =		OR	X $250=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/DALE A. HALL/

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	I1					
	I2					
	I3					
	I4					
	I5					
	I6					
	I7					
	I8					
	I9					
	I10					
	I11					
	I12					
	I13					

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	I14	CN 101431797 B	02/01/2012	China		Abstract
	I15	EP 1758264 A2	02/28/2007	EPO		

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	I16	
	I17	
	I18	
	I19	
	I20	
	I21	

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Espacenet

Bibliographic data: CN101431797 (A) — 2009-05-13

Registration handling method, system and apparatus

Inventor(s):	WENFU WU [CN] ±
Applicant(s):	HUAWEI TECH CO LTD [CN] ±
Classification:	- international: ***H04W36/00; H04W60/00; H04W60/04; H04W8/02; H04W8/08***
	- European: H04W12/06; H04W60/04; H04W8/04
Application number:	CN20081085729 20080313
Priority number (s):	CN20071104400 20070511; CN20071181758 20071024; CN20071165540 20071102; CN20081085729 20080313
Also published as:	CN101431797 (B) EP2099234 (A1) EP2099234 (A4) US2011292913 (A1) US2010040024 (A1) more

Abstract of CN101431797 (A)

The embodiment of invention discloses a register processing method, a system and a device, which makes a network side differentiate different register processing types. The method of the embodiment comprises steps of: receiving registered processing type information reported by user terminal UE in registering to the network; identifying the registered processing type according to the registered processing type information. The system of the embodiment comprises user terminal UE for reporting the registered processing type information in registering to the network; a network side for identifying the registered processing type according to the registered processing type information reported by the UE.

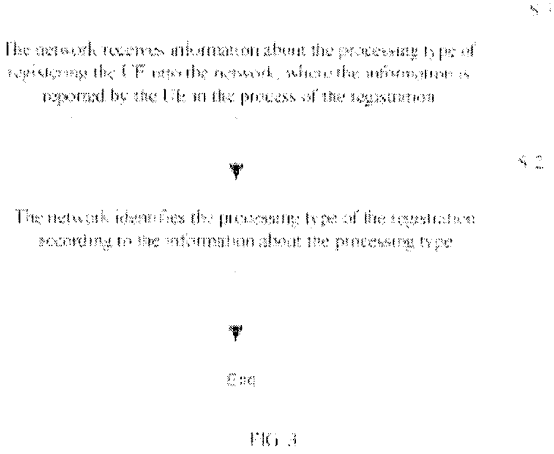

FIG. 3

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CN 1605222 A,2005.04.06,摘要、权利要求书及说明书第9页第19行-第15页第13行.
CN 1882160 A,2006.12.20,全文.
EP 1758264 A2,2007.02.28,全文.
CATT.TAU procedure.3GPP TSG SA WG2 Architecture.3GPP,2007,(S2-071772),1-5.
Huawei.refine attach procedure.3GPP TSG SA WG2 Architecture.3GPP,2007,(S2-071691),1-6.

审查员 张迎新

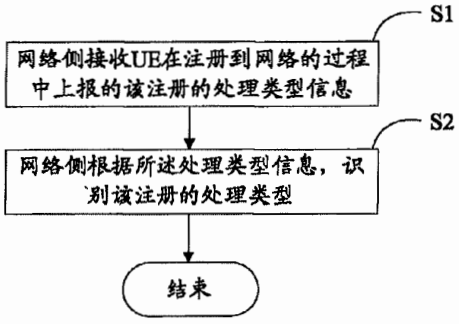
权利要求书 3 页 说明书 29 页 附图 16 页

(54)发明名称

一种注册处理方法、系统及装置

(57)摘要

本发明实施例公开了一种注册处理方法、系统及装置，以使网络侧可区分不同的注册处理类型。本发明实施例方法包括：接收用户终端UE在注册到网络的过程中上报的该注册的处理类型信息；以及根据所述处理类型信息，识别该注册的处理类型。本发明实施例系统包括：用户终端UE，用于在注册到网络的过程中，将该注册的处理类型信息上报；网络侧，用于根据接收的UE上报的该注册的处理类型信息，识别该注册的处理类型。



CN 101431797 B

1. 一种注册处理方法，其特征在于，包括下列步骤：

接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及

根据所述处理类型信息，识别该注册的处理类型；

如果处理类型为切换导致的注册，则移动性管理实体 MME 或服务 GPRS 支持节点 SGSN 发送请求承载创建消息到获取的 PDN GW 的地址对应的 PDN GW，请求网络侧发起承载创建流程，将 UE 在源 Non-3GPP 网络中使用的资源在 3GPP 网络中建立；

如果需要到策略和计费规则功能实体 PCRF 获取用户使用的策略和计费 PCC 规则，则所述 PDN GW 发送请求策略和计费规则消息到所述 PCRF 获取所述用户使用的 PCC 规则；

所述 PDN GW 获得所述 PCRF 提供的所述用户使用的 PCC 规则；

所述 PDN GW 发起网络侧承载创建流程，创建所述用户使用的承载。

2. 如权利要求 1 所述的方法，其特征在于，所述处理类型信息由 UE 在注册到网络时识别。

3. 如权利要求 2 所述的方法，其特征在于，所述 UE 识别所述注册处理类型信息包括：

所述 UE 发现注册是由于切换到不同网络或者需要切换不同网络导致时，识别注册处理类型为切换注册处理类型。

4. 如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 上报处理类型信息的方式，包括下列之一：

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带指示位信元，以表征空闲模式切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的附着请求消息中携带指示位信元，以表征激活模式切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的跟踪区更新请求消息中携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的跟踪区更新请求消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的路由区更新请求消息中携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的路由区更新请求消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的接入请求消息中携带该注册的处理类型信息；

所述 UE 在注册到网络的过程中，该 UE 在向网络侧发送的接入请求消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在接入鉴权或者鉴权的过程中，该 UE 在向网络侧发送的消息中携带该注册的处理类型信息；

所述 UE 在接入鉴权或者鉴权的过程中，该 UE 在向网络侧发送的消息中携带指示位信元，以表征切换注册处理类型；

所述 UE 在因特网密钥交换协议版本 2IKEv2 或者 IP 网络安全协议安全联盟 IPsec SA 建立的过程中，该 UE 在向网络侧发送的消息中携带该注册的处理类型信息；

所述 UE 在因特网密钥交换协议版本 2 或者 IP 网络安全协议安全联盟建立的过程中，该 UE 在向网络侧发送的消息中携带指示位信元，以表征切换注册处理类型。

5. 如权利要求 1 或 2 所述的方法，其特征在于，所述 UE 上报处理类型信息具体包括：

向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息；或者，

向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息；或者，

向网络侧发送不同的路由区更新请求消息，分别表征对应的注册处理类型信息；或者，

向网络侧发送不同的接入请求消息，分别表征对应的注册处理类型信息。

6. 如权利要求 1 所述的方法，其特征在于，所述根据处理类型信息，识别该注册的处理类型具体为：

网络侧网元将接收的注册处理类型信息通知给归属签约寄存器 HSS 或者认证、授权与计费服务器 AAA Server，由所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理。

7. 如权利要求 6 所述的方法，其特征在于，所述网络侧网元为移动性管理实体 MME 或服务 GPRS 支持节点 SGSN，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

HSS 收到 MME 或 SGSN 通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 HSS 中存在该 UE 在 Non-3GPP 网络中使用的分组数据网络网关实体 PDN GW 地址信息，则 HSS 通知 AAA Server 取消该 UE 在 Non-3GPP 网络的注册；

AAA Server 通知 Non-3GPP 网络释放该 UE 在 Non-3GPP 网络中使用的资源。

8. 如权利要求 6 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

AAA Server 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 AAA Server 中存在该 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 PDN GW 释放该 UE 在 3GPP 网络中使用的资源。

9. 如权利要求 8 所述的方法，其特征在于，所述方法进一步包括：

AAA Server 进一步通知 HSS 取消所述 UE 在 3GPP 网络中的注册。

10. 如权利要求 6 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

HSS 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 HSS 中存在所述 UE 在 3GPP 网络中使用的 PDNGW 地址信息，则 HSS 通知 AAA Server 取消所述 UE 在 3GPP 网络中的注册；

所述 AAA Server 通知 PDN GW 释放该 UE 在 3GPP 网络中使用的资源。

11. 如权利要求 6 所述的方法，其特征在于：所述网络侧网元为非 3GPP 网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

AAA Server 或者 HSS 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发

现注册处理类型为切换注册且 AAA Server 或者 HSS 中存在所述 UE 在 3GPP 网络中使用的 PDN GW 的地址信息，则 AAA Server 或者 HSS 将所述 PDN GW 地址信息下发给所述非 3GPP 网关设备。

12. 如权利要求 6 所述的方法，其特征在于，所述网络侧网元为非 3GPP 网关设备，所述 HSS 或者 AAA Serve 根据所述处理类型信息，识别该注册的处理类型后进行处理具体为：

AAA Server 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 AAA Server 中存在该 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消该 UE 在 3GPP 网络中的注册；或者，

HSS 收到非 3GPP 网关设备通知的 UE 的注册处理类型信息后，如果发现注册处理类型为初始化注册且 HSS 中存在所述 UE 在 3GPP 网络中使用的 PDNGW 地址信息，则 HSS 通知 AAA Server 取消该 UE 在 3GPP 网络中的注册；

HSS 通知 MME/SGSN 释放该 UE 在 3GPP 网络中使用的资源。

13. 如权利要求 1 所述的方法，其特征在于，所述方法进一步包括：

如果识别的注册处理类型为激活模式下的切换注册处理类型，则创建接入网侧资源。

14. 如权利要求 1 所述的方法，其特征在于，所述方法进一步包括：

如果识别的注册处理类型为激活模式下的切换注册处理类型，则移动性管理实体 MME、或者服务 GPRS 支持节点 SGSN、或者 Non-3GPP GW 通知 PDNGW 不发起源接入网络的资源释放处理。

15. 如权利要求 14 所述的方法，其特征在于，所述通知 PDN GW 不发起源接入网络的资源释放处理具体为：

在发送给 PDN GW 的消息中携带指示位信息指示 PDN GW 不发起源接入网络的资源释放处理。

16. 如权利要求 1 所述的方法，其特征在于，所述方法进一步包括：

如果识别的注册处理类型为激活模式下的切换注册处理类型，则目标网络的网元与源网络的网元之间根据所述目标网络的数据转发隧道资源信息建立数据转发隧道。

17. 如权利要求 16 所述的方法，其特征在于，所述目标网络为 3GPP 网络、所述源网络为 Non-3GPP 网络时，所述目标网络的网元与源网络的网元之 间根据所述目标网络的数据转发隧道资源信息建立数据转发隧道具体为：

所述 3GPP 网络侧第一网元接收到激活模式下的切换注册处理类型信息后，将从 Serving GW 获取的数据转发隧道资源信息通过 Non-3GPP 接入网元发送给 Non-3GPP GW，或者直接发送给 Non-3GPP GW；

由所述 Non-3GPP GW 建立与 Serving GW 之间的数据转发隧道。

18. 如权利要求 16 所述的方法，其特征在于，所述目标网络为 Non-3GPP 网络、所述源网络为 3GPP 网络时，所述目标网络的网元与源网络的网元之间根据所述目标网络的数据转发隧道资源信息建立数据转发隧道具体为：

所述 Non-3GPP 网络的接入网元或者 Non-3GPP GW 接收到激活模式下的切换注册处理类型信息后，将所述 Non-3GPP GW 的数据转发隧道资源信息通过 3GPP 网络侧第一网元发送给 Serving GW；

由所述 Serving GW 建立与 Non-3GPP GW 之间的数据转发隧道。

一种注册处理方法、系统及装置

技术领域

[0001] 本发明涉及通信领域，特别是涉及一种注册处理方法、系统及装置。

背景技术

[0002] 3GPP 为了增强未来网络的竞争能力，正在研究一种全新的演进网络，其系统架构参见图 1 所示，其中包括：

[0003] 演进的UMTS陆地无线接入网 (E-UTRAN,Evolved UMTS Terrestrial RadioAccess Network)，用于实现所有与演进网络无线有关的功能。

[0004] 移动性管理实体 (MME, Mobility Management Entity)，负责控制面的移动性管理，包括用户上下文和移动状态管理，分配用户临时身份标识等。

[0005] 服务网关实体 (Serving GW, Serving Gateway)，是 3GPP 接入系统间的用户面锚点，终止 E-TURAN 的接口。

[0006] 分组数据网络网关实体 (PDN GW, Packet Data Network Gateway) 是 3GPP 接入系统和非 3GPP 接入系统之间的用户面锚点，终止和外部分组数据网络 (PDN, Packet Data Network) 的接口。

[0007] 策略和计费规则功能实体 (PCRF,Policy and Charging Rule Function)，用于策略控制决定和流计费控制功能。

[0008] 归属网络服务器 (HSS, Home Subscriber Server) 用于存储用户签约信息。

[0009] UMTS 陆地无线接入网 (UTRAN, UMTS Terrestrial Radio AccessNetwork)、GSM/EDGE 无线接入网 (GERAN, GSM/EDGE Radio AccessNetwork)，用于实现所有与现有 GPRS/UMTS 网络中无线有关的功能。

[0010] 服务通用分组无线业务支持节点 (SGSN, Serving GPRS Supporting Node)，用于实现 GPRS/UMTS 网络中路由转发、移动性管理、会话管理以及用户信息存储等功能。

[0011] 非 3GPP IP 接入系统 (Non-3GPP IP Access)，主要是一些非 3GPP 组织定义的接入网络，如无线局域网 (WLAN,Wireless Local Area Network)，微波存取全球互通 (Wimax, Worldwide Interoperability for Microwave Access) 等网络。

[0012] 认证、授权与计费服务器 (AAA Server, Authentication, Authorization andAccounting Server) 用于对用户设备 (UE, User Equipment) 执行接入认证、授权和计费功能。

[0013] 说明：这个架构并不意味着最终的 SAE 系统架构，最后的架构可能和这个架构有所差别，本专利不作限制。

[0014] 上述演进网络的一个需求是实现 3GPP 的接入系统 (GERAN/UTRAN/E-UTRAN) 和 Non-3GPP 接入系统 (如 WLAN/Wimax 等) 之间的切换 (Handover)。在目前的协议中规定，切换流程是通过 UE 在新接入系统中的附着 (Attach) 或者跟踪区更新 (TAU) 流程来实现的。参见图 2 所示，用户终端从 Non-3GPP 接入系统到 3GPP 接入系统的切换流程包括下列步骤：

[0015] 1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

[0016] 2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到演进网络。或者 UE 发现演进网络并且决定切换到演进网络。

[0017] 3、UE 发送附着请求或者跟踪区更新请求消息到 MME。

[0018] 4、UE、MME、HSS 之间执行鉴权流程。HSS 可以在这个步骤中将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

[0019] 5、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

[0020] 6、HSS 将用户的签约数据插入到 MME 中。

[0021] 7、HSS 返回位置更新确认消息给 MME。HSS 可以在这个步骤中将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

[0022] 8、UE、Serving GW、PDN GW 之间执行承载创建流程，创建 UE 使用的资源。

[0023] 9、MME 发送附着接受或者跟踪区更新接受消息到 UE。

[0024] 参见图 3 所示，在目前的协议中规定，用户终端正常附着（也可称之为初始附着 Initial Attach）到 3GPP 接入系统的流程包括下列步骤：

[0025] 1、UE 发送附着请求消息到 MME。

[0026] 2、UE、MME、HSS 之间执行鉴权流程。

[0027] 3、如果用户存在已经创建的承载，则 MME 发起删除承载流程，将用户以前建立的承载删除掉。

[0028] 4、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

[0029] 5、HSS 将用户的签约数据插入到 MME 中。

[0030] 6、HSS 返回位置更新确认消息给 MME。

[0031] 7、MME 发起缺省承载创建程序，创建 UE 和 PDN GW 之间的缺省承载。

[0032] 8、MME 注册 UE 使用的 PDN GW 地址信息到 HSS。这个处理也可以通过位置更新流程来处理，MME 发送位置更新消息给 HSS，消息中携带 PDN GW 地址信息。

[0033] 9、MME 发送附着接受消息给 UE。

[0034] 参见图 4 所示，在目前的协议中规定，用户终端正常跟踪区更新（也可称之为初始跟踪区更新 Initial TAU）到 3GPP 接入系统的流程包括下列步骤：

[0035] 1、UE 发送跟踪区更新请求消息到 MME。

[0036] 2、UE、MME、HSS 之间执行鉴权流程。

[0037] 3、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。

[0038] 4、HSS 将用户的签约数据插入到 MME 中。

[0039] 5、HSS 返回位置更新确认消息给 MME。

[0040] 6、MME 接受 UE 的跟踪区更新请求，并发送跟踪区更新接受消息到 UE。

[0041] 发明人在发明过程中发现，切换导致的 Attach/TAU 流程和正常 Attach/TAU 流程处理机制存在很大的不同：正常的 Attach 流程网络侧需要将用户以前建立的承载都删除掉，建立 UE 和 PDN GW 之间的缺省承载并且将 UE 使用的 PDN GW 地址信息注册到 HSS，而切换导致的 Attach 流程网络侧需将用户以前建立的承载都重新创建出来。正常的 TAU 流程网络侧不处理用户的承载，而切换导致的 TAU 流程网络侧需将用户以前建立的承载都重新创建出来。所以需要一种机制对不同的 Attach/TAU 流程进行处理。

[0042] 正常的 3GPP 和 Non-3GPP 之间的切换由于先将 UE 从源接入网络断开，然后 UE 再从

目标接入网络通过Attach等流程接入，导致UE业务中断的时间比较长，影响用户的业务体验。所以现在E-UTRAN和CDMA网络中的HRPD(High Rate Packet Data,高速分组数据）接入网络之间切换提出了一种优化切换机制。图5为E-UTRAN和HRPD网络优化切换的系统架构图。MME和HRPDAN(HRPD Access Network,HRPD接入网络,处理HRPD网络中的移动性管理,无线资源管理等）之间增加S101接口,传递MME和HRPD AN之间的信令。PDSN(Packet Data Serving Node,分组数据服务节点）是HRPD网络中的一个用户面处理网元,进行HRPD网络的用户面处理。

[0043] 现在HRPD网络和E-UTRAN网络之间的优化切换提出了一种预先路径切换（Early path switch）机制,即UE还未切换到目标接入网络（UE还在源接入网络）时先将用户面路径切换到目标接入网络。

[0044] 用户终端从HRPD到E-UTRAN网络的预先路径切换的优化切换流程包括下列步骤：

[0045] 1、UE在HRPD网络接入。

[0046] 2、UE或者HRPD AN(Access Network,接入网络）决定执行切换到E-UTRAN网络。

[0047] 3、UE通过HRPD网络发送Attach Request消息到MME。

[0048] 4、鉴权程序被执行。

[0049] 5、MME发送Update Location消息到HSS,获取UE的签约数据。HSS返回UE的签约数据,包括UE使用的PDN GW地址信息。

[0050] 6、MME选择Serving GW,向Serving GW发送Create Default Bearer Request消息。

[0051] 7、Serving GW发起预先路径切换流程。Serving GW和PDN GW之间的接口协议为PMIP,则Serving GW发送Proxy BU消息到PDN GW。

[0052] PDN GW收到上述消息后切换用户面的路由到Serving GW,即PDN GW收到下行数据后将发给Serving GW。同时PDN GW不再向PDSN发送下行数据包。

[0053] 8、Serving GW回Create Default Bearer Response消息给MME。

[0054] 9、MME发送Relocation Request消息到eNodeB请求eNodeB建立接入网侧资源。eNodeB完成接入网侧资源的创建后回Relocation Request Acknowledge消息给MME。

[0055] 10、MME发送Update Bearer Request消息到Serving GW更新Serving GW的下行用户面路径到eNodeB。Serving GW回Update Bearer Response消息到MME。

[0056] 11、MME发送S101 HO Command消息到HRPD AN,消息中包含AttachAccept消息和HO Command消息。

[0057] 12、HRPD AN发送HRPD AN L2消息到UE,消息中包含Attach Accept消息和HO Command消息。

[0058] 13、UE切换到E-UTRAN网络,发送HO Complete消息到eNodeB。

[0059] 14、eNodeB发送Relocation Complete消息给MME,通知MME UE已经切换到E-UTRAN网络。发明人在发明过程中发现,对于HRPD网络到E-UTRAN网络切换来说,UE可能在两种状态下发生切换：空闲状态和激活状态。当UE在激活状态下发生切换时在切换的流程中通知接入网建立接入网侧的承载可以加快UE切换到目标接入网络后业务恢复的时间。但是在空闲状态下UE并没有业务在运行,对切换的时延要求也不是很高,同时UE在空

闲状态下建立接入网侧的承载会浪费接入网侧的资源。而且预先切换机制，当 UE 切换失败时还需要通知 PDN GW 将下行路径切回源接入网络。所以预先切换机制会增加系统的复杂性。

[0060] 所以为了优化网络的处理和节省接入网的资源，需要一种机制对激活状态和空闲状态的切换流程进行区分处理。

发明内容

[0061] 本发明实施例提供一种注册处理方法、系统及装置，以使网络侧可区分不同的注册处理类型。

[0062] 本发明实施例的一种注册处理方法，包括：接收用户终端 UE 在注册到网络的过程中上报的该注册的处理类型信息；以及根据所述处理类型信息，识别该注册的处理类型。

[0063] 本发明实施例的另一种注册处理方法，包括下列步骤：接收 HSS 或者 AAAServer 上报的用户终端 UE 注册的处理类型信息；以及根据所述处理类型信息，识别该注册的处理类型。

[0064] 本发明实施例的系统，包括：用户终端 UE，用于在注册到网络的过程中，将该注册的处理类型信息上报；网络侧，用于根据接收的 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

[0065] 本发明实施例的用户终端，包括：识别单元，用于在该 UE 发起注册时，识别该注册的类型；注册发起单元，用于发起注册，并发出注册触发信号；上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报。

[0066] 本发明实施例的网络侧的网元，包括：获取单元，用于获取 UE 在注册到网络的过程中上报的处理类型信息；识别单元，用于根据获取单元获取的处理类型信息，识别该注册的处理类型。

[0067] 本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

附图说明

[0068] 图 1 为现有演进网络的系统架构示意图；

[0069] 图 2 为现有用户终端从 Non-3GPP 接入系统到 3GPP 接入系统的切换流程图；

[0070] 图 3 为现有用户终端正常附着到 3GPP 接入系统的流程图；

[0071] 图 4 为现有用户终端正常跟踪区更新到 3GPP 接入系统的流程图；

[0072] 图 5 为现有 HRPD 和 E-UTRAN 接入系统的优化切换系统架构示意图；

[0073] 图 6 为本发明实施例 6 的流程图；

[0074] 图 7 为本发明实施例的方法步骤流程图；

[0075] 图 8 为本发明实施例的系统的结构示意图；

[0076] 图 9 为本发明实施例的用户终端的结构示意图；

[0077] 图 10 为本发明实施例的网络侧网元的结构示意图；

[0078] 图 11 为本发明实施例 1 的流程图；

[0079] 图 12 为本发明实施例 2 的流程图；

[0080] 图 13 为本发明实施例 3 的流程图；

[0081] 图 14 为本发明实施例 4 的流程图；

[0082] 图 15 为本发明实施例 5 的流程图；

[0083] 图 16 为本发明实施例 7 的流程图；

[0084] 图 17 为本发明实施例 8 的流程图；

[0085] 图 18 为本发明实施例 9 的流程图；

[0086] 图 19 为本发明实施例 10 的流程图；

[0087] 图 20 为本发明实施例 11 的流程图；

[0088] 图 21 为本发明实施例 12 的流程图；

[0089] 图 22 为本发明实施例 13 的流程图。

具体实施方式

[0090] 为了使网络侧可区分不同的注册处理类型。

[0091] 本发明实施例提供了一种注册处理方法，参见图 7 所示，包括下列主要步骤：

[0092] S1、网络侧接收 UE 在注册到网络的过程中上报的该注册的处理类型信息。

[0093] 本步骤之前，UE 在注册到网络时，可先识别该注册的类型。当 UE 注册到网络的过程中，将识别出的该注册类型对应的处理类型信息上报给网络侧。

[0094] S2、网络侧根据所述处理类型信息，识别该注册的处理类型。

[0095] 本发明实施例还提供了另一种注册处理方法，包括下列主要步骤：网络侧接收 HSS 或者 AAA Server 上报的用户终端 UE 注册的处理类型信息；网络侧根据所述处理类型信息，识别该注册的处理类型。

[0096] 本发明实施例还提供了一种注册处理系统，参见图 8 所示，其包括：用户终端和网络侧。

[0097] UE，用于在注册到网络的过程中，将该注册的处理类型信息上报。所述用户终端 UE 在注册到网络时，识别注册的处理类型信息后再将所述注册的处理类型信息上报。

[0098] 网络侧，用于根据接收的 UE 上报的该注册的处理类型信息，识别该注册的处理类型。具体的，由网络侧的移动性管理实体 MME（演进网络）、服务 GPRS 支持节点 SGSN(2G/3G 网络）或非 3GPP 网关设备（非 3GPP 网络）对 UE 上报的处理类型信息进行识别。

[0099] 本发明实施例还提供了一种用户终端，参见图 9 所示，其包括：识别单元、注册发起单元和上报单元。

[0100] 识别单元，用于在该 UE 发起注册时，识别该注册的类型。

[0101] 注册发起单元，用于发起注册，并发出注册触发信号。

[0102] 上报单元，用于接收注册发起单元发出的注册触发信号，并在该 UE 注册到网络的过程中，将识别单元识别出的该注册类型对应的处理类型信息上报，上报的方式包括但不限于以下几种：

[0103] 上报单元将处理类型信息携带于附着请求消息中的信元中；或者，将处理类型信息携带于跟踪区更新请求消息中的信元中；或者，将处理类型信息携带于路由区更新请求消息中的信元中；或者，将处理类型信息携带于接入请求消息中的信元中；或者，将处理类

型信息携带于接入鉴权或者鉴权消息中的信元中；或者将处理类型信息携带于 IKEv2 或 IPsec SA 建立消息中的信元中。

[0104] 上报单元上报的过程具体为：所述上报单元对应不同的注册类型，向网络侧发送不同的附着请求消息；或者，对应不同的注册类型，向网络侧发送不同的跟踪区更新请求消息；或者，对应不同的注册类型，向网络侧发送不同的路由区更新请求消息；或者，对应不同的注册类型，向网络侧发送不同的接入请求消息。

[0105] 本发明实施例还提供了一种网络侧的网元，具体的，该网元为移动性管理实体 MME（演进网络）、服务 GPRS 支持节点 SGSN(2G/3G 网络）或非 3GPP 网关（非 3GPP 网络），参见图 10 所示，其包括：获取单元和识别单元。

[0106] 获取单元，用于获取注册的过程中 UE 的注册处理类型信息。具体的，获取的处理类型信息由所述 UE、HSS 或者 AAA Server 上报。

[0107] 识别单元，用于根据获取单元获取的处理类型信息，识别该注册的处理类型。

[0108] 所述的网元进一步包括：第一处理单元，

[0109] 用于在所述识别单元识别注册的处理类型为切换注册处理类型时，发起网络侧承载创建流程，创建所述 UE 使用的承载资源。

[0110] 所述的网元进一步包括第二处理单元，用于在所述识别单元识别注册的处理类型为激活模式下的切换注册处理类型时，不发起源接入网络的资源释放处理。

[0111] 所述的网元进一步包括第三处理单元，用于在所述识别单元识别注册的处理类型为激活模式下的切换注册处理类型时，发起目标网络的网元与源网络的网元之间的数据转发隧道资源创建处理。

[0112] 以下通过多个实施例具体描述。

[0113] 实施例 1：UE 在发送注册请求消息到 MME 时，将该注册的处理类型信息上报给 MME，MME 据此识别该注册的处理类型；进一步根据该注册的处理类型进行相应的处理，完成注册。MME 上报注册的处理类型给 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 Non-3GPP 网络中使用的资源在 3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 Non-3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 Non-3GPP 网络中的注册，AAA Server 通知 Non-3GPP 网络释放 UE 使用的资源。参见图 11 所示，包括下列步骤：

[0114] 1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

[0115] 2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到演进网络。或者 UE 发现演进网络并决定发起切换。

[0116] 3、UE 在发起注册到演进网络之前，识别该注册的类型；之后发送注册请求消息到 MME，并相应将该注册的处理类型信息上报给 MME。

[0117] 其中，可以通过如下方式之一上报：

[0118] 1) 在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。或者 UE 在附着请求消息中增加指示位，表明该附着请求消息是切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请

求消息（或者称之为初始的附着请求消息）。指示位可能的方法有：

[0119] a) 切换指示位信元 (Handover Indication)。

[0120] b) Cause 信元。UE 将该 Cause 信元设置为“Attach due to Handover”。

[0121] c) Attach Type 信元。UE 将该信元设置为“Handover Attach”。

[0122] 2) 定义新的消息。例如：定义新的切换附着请求消息 (Handover AttachRequest)，该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息），这样 UE 可向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常附着请求的消息（或者称之为初始附着请求的消息），原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附着请求消息（或者称之为初始附着请求消息）都重新定义）

[0123] 3) 在跟踪区更新请求消息中增加 Update Type 信元。例如：该 Update Type 信元有如下两个取值：0 对应 Normal TAU（也可称之为 Initial TAU），表明该跟踪区更新请求消息是正常的跟踪区更新请求消息（也可称之为初始的跟踪区更新请求消息）；1 对应 Handover TAU，表明该跟踪区更新请求消息是切换导致的跟踪区更新请求消息。或者 UE 在跟踪区更新请求消息中增加指示位表明该跟踪区更新请求消息是切换导致的跟踪区更新请求消息，而原有的跟踪区更新请求消息表明一个正常的跟踪区更新请求消息（或者称之为初始的跟踪区更新请求消息）。指示位可能的方法有：

[0124] a) 切换指示位信元 (Handover Indication)。

[0125] b) Cause 信元。UE 将该 Cause 信元设置为“TAU due to Handover”。

[0126] c) Update Type 信元。UE 将该信元设置为“Handover TAU”。

[0127] 4) 定义新的消息。例如：定义新的切换跟踪区更新请求消息 (Handover TAURequest)，该消息表明一个切换导致的跟踪区更新请求消息，而原有的跟踪区更新请求消息表明一个正常的跟踪区更新请求消息（或者称之为初始的跟踪区更新请求消息），这样 UE 可向网络侧发送不同的跟踪区更新请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常的跟踪区更新请求（或者称之为初始的跟踪区更新请求）的消息，原有的跟踪区更新请求消息对应切换导致的跟踪区更新请求消息；或者切换导致的跟踪区更新请求消息和正常跟踪区更新请求（或者称之为初始跟踪区更新请求）消息都重新定义）

[0128] 4、UE、MME、HSS 之间执行鉴权流程，获取用户使用的 PDN GW 地址信息。MME 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。如果注册处理类型为切换处理类型，则 HSS 可以将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

[0129] 5、MME 发送位置更新消息给 HSS，注册 MME 的地址信息到 HSS。MME 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。

[0130] 6、HSS 将用户的签约数据插入到 MME 中。

[0131] 7、HSS 返回位置更新确认消息给 MME。HSS 可以在这个步骤中将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 MME。

[0132] 如果 UE 的注册过程中由 HSS 识别 UE 的注册处理类型（如 HSS 发现保存有用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息，则 HSS 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，HSS 认为 UE 的注册处理类型为正常的注册处理类型），则 HSS 在这

个消息中增加指示位信元将 UE 的注册处理类型信息通知给 MME。指示位可能的方法有：

[0133] a) 如果 UE 的注册处理类型为切换导致的注册，则 HSS 增加切换指示位信元 (Handover Indication)。对于正常的注册处理类型，HSS 不携带这个信元。

[0134] b)Cause 信元。对于切换导致的注册处理，HSS 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，HSS 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带这个 Cause 信元。

[0135] c)Update Type 信元。对于切换导致的注册处理，HSS 将该信元设置为“Handover Attach”。对于正常注册处理，HSS 将该信元设置为“InitialAttach”或者不携带这个信元。

[0136] 8、MME 根据 UE 上报或者 HSS 上报的该注册的处理类型信息，识别该注册的处理类型。

[0137] 至此，MME 已区分了不同的注册处理类型。

[0138] 进一步，如果处理类型为正常发起的注册，则 MME 按照正常的注册流程处理。步骤 11 至 18 将被执行。

[0139] 如果处理类型为切换导致的注册，则 MME 发送请求承载创建消息到获取的 PDN GW 的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。并转入步骤 9。

[0140] 9、如果需要到 PCRF 获取用户使用的策略和计费 (PCC) 规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

[0141] 10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 18。

[0142] 11、如果 UE 的注册处理类型为正常发起的注册，且 HSS 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 Non-3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 AAA Server 注册到 HSS，则 HSS 发送取消注册消息到 AAA Server 请求取消 UE 在 Non-3GPP 接入网络中的注册。AAA Server 回取消注册确认消息到 HSS。

[0143] 12、AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 Non-3GPP 接入网络中的注册。PDN GW 回取消注册确认消息到 AAA Server。

[0144] 13、如果 PDN GW 和 Non-3GPP 网关设备之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 Non-3GPP 网关设备，取消 Non-3GPP 网关设备和 PDN GW 之间的 PMIP 绑定。Non-3GPP 网关设备回绑定撤销确认消息到 PDN GW。

[0145] 14、AAA Server 也可以发送会话终止消息到 Non-3GPP 网关设备。Non-3GPP 网关设备回会话终止确认消息到 AAA Server。

[0146] 15、Non-3GPP 网关设备收到绑定取消指示消息或者会话终止消息后发起资源释放程序，释放 UE 在 Non-3GPP 接入网络中使用的资源。

[0147] 16、如果 UE 的注册处理类型为正常发起的注册，则 MME 发起缺省承载创建程序，创建 UE 和 PDN GW 之间的缺省承载。

[0148] 17、MME 注册 UE 使用的 PDN GW 地址信息到 HSS。这个处理也可以通过位置更新流程来处理，MME 发送位置更新消息给 HSS，消息中携带 PDN GW 地址信息。

[0149] 18、MME 回附着接受或者跟踪区更新接受消息到 UE。

[0150] 实施例 2：这种机制也能应用到 2G/3G 系统。UE 在发送注册请求消息到 SGSN 时，

将该注册的处理类型信息上报给 SGSN，SGSN 据此识别该注册的处理类型；进一步根据该注册的处理类型进行相应的处理，完成注册。SGSN 上报注册的处理类型给 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 Non-3GPP 网络中使用的资源在 3GPP 网络中建立；对于初始化注册，如果 HSS 中保存 UE 在 Non-3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 Non-3GPP 网络中的注册，AAA Server 通知 Non-3GPP 网络释放 UE 使用的资源。参见图 12 所示，包括下列步骤：

[0151] 1、UE 通过 Non-3GPP 网关和 PDN GW 接入到 Non-3GPP 接入网络。

[0152] 2、非 3GPP 网元发送切换命令到 UE 通知 UE 切换到 2G 或者 3G 网络。或者 UE 发现 2G 或者 3G 网络并决定发起切换。

[0153] 3、UE 在发起注册到 2G 或者 3G 网络之前，识别该注册的类型；之后发送注册请求消息到 SGSN，并相应将该注册的处理类型信息上报给 SGSN。

[0154] 其中，可以通过如下方式之一上报：

[0155] 1) 在附着请求消息中增加 Attach Type 信元。例如：该 Attach Type 信元有如下两个取值：0 对应 Normal Attach（也可称之为 Initial Attach），表明该附着请求消息是正常的附着请求消息（也可称之为初始的附着请求消息）；1 对应 Handover Attach，表明该附着请求消息是切换导致的附着请求消息。或者 UE 在附着请求消息中增加指示位表明该附着请求消息是切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求消息（或者称之为初始的附着请求消息）。指示位可能的方法有：

[0156] a) 切换指示位信元 (Handover Indication)。

[0157] b) Cause 信元。UE 将该 Cause 信元设置为“Attach due to Handover”。

[0158] c) Attach Type 信元。UE 将该信元设置为“Handover Attach”。

[0159] 2) 定义新的消息。例如：定义新的切换附着请求消息 (Handover AttachRequest)，该消息表明一个切换导致的附着请求消息，而原有的附着请求消息表明一个正常的附着请求（或者称之为初始的附着请求）消息，这样 UE 可向网络侧发送不同的附着请求消息，分别表征对应的注册处理类型信息。（也可新定义对应正常附着请求（或者称之为初始附着请求）的消息，原有的附着请求消息对应切换导致的附着请求消息；或者切换导致的附着请求消息和正常附着请求（或者称之为初始附着请求）消息都重新定义）

[0160] 3) 在路由区更新请求消息中增加 Update Type 信元。例如：该 Update Type 信元有如下两个取值：0 对应 Normal RAU（也可称之为 Initial RAU），表明该路由区更新请求消息是正常的路由区更新请求消息（也可称之为初始的路由区更新请求消息）；1 对应 Handover RAU，表明该路由区更新请求消息是切换导致的路由区更新请求消息。或者 UE 在路由区更新请求消息中增加指示位表明该路由区更新请求消息是切换导致的路由区更新请求消息，而原有的路由区更新请求消息表明一个正常的路由区更新请求消息（或者称之为初始的路由区更新请求消息）。指示位可能的方法有：

[0161] a) 切换指示位信元 (Handover Indication)。

[0162] b) Cause 信元。UE 将该 Cause 信元设置为“RAU due to Handover”。

[0163] c) Update Type 信元。UE 将该信元设置为“Handover RAU”。

[0164] 4) 定义新的消息。例如：定义新的切换路由区更新请求消息 (Handover RAURequest)，该消息表明一个切换导致的路由区更新请求消息，而原有的路由区更新请求

消息表明一个正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，这样 UE 可向网络侧发送不同的路由区更新请求消息，分别表征 对应的注册处理类型信息。（也可新定义对应正常的路由区更新请求（或者称之为初始的路由区更新请求）消息，原有的路由区更新请求消息对应切换导致的路由区更新请求消息；或者切换导致的路由区更新请求消息和正常路由区更新请求（或者称之为初始路由区更新请求）消息都重新定义）

[0165] 4、UE、SGSN、HSS 之间执行鉴权流程。SGSN 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。如果注册处理类型为切换处理类型，则 HSS 可以将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 SGSN。

[0166] 5、SGSN 发送位置更新消息给 HSS，注册 SGSN 的地址信息到 HSS。SGSN 可以在这个步骤中将 UE 注册的处理类型信息上报给 HSS。

[0167] 6、HSS 将用户的签约数据插入到 SGSN 中。

[0168] 7、HSS 返回位置更新确认消息给 SGSN。HSS 可以在这个步骤中将用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息提供给 SGSN。如果 UE 的注册过程中由 HSS 识别 UE 的注册处理类型（如 HSS 发现保存有用户在 Non-3GPP 接入网络中使用的 PDN GW 地址信息，则 HSS 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，HSS 认为 UE 的注册处理类型为正常的注册处理类型），则 HSS 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给 SGSN。指示位可能的方法有：

[0169] a) 如果 UE 的注册处理类型为切换导致的注册，则 HSS 增加切换指示位信元 (Handover Indication)。对于正常的注册处理类型，HSS 不携带这个信元。

[0170] b)Cause 信元。对于切换导致的注册处理，HSS 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，HSS 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带这个 Cause 信元。

[0171] c)Update Type 信元。对于切换导致的注册处理，HSS 将该信元设置为“Handover Attach”。对于正常注册处理，HSS 将该信元设置为“Initial Attach”或者不携带这个信元。

[0172] 8、SGSN 根据 UE 上报或者 HSS 上报的该注册的处理类型信息，识别该注册的处理类型。

[0173] 至此，SGSN 已区分了不同的注册处理类型。

[0174] 进一步，如果处理类型为正常发起的注册，则 SGSN 按照正常的流程处理，步骤 11 至 16 将被执行。

[0175] 如果处理类型为切换导致的注册，则 SGSN 发送请求承载创建消息到获取的 PDN GW（也就是现在的 GGSN）的地址，请求网络侧发起承载创建流程，将用户在 Non-3GPP 接入网络使用的业务在新接入系统重新创建起来。并转入步骤 9。

[0176] 9、如果需要到 PCRF 获取用户使用的策略和计费 (PCC) 规则，则 PDN GW 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到 PDN GW。

[0177] 10、PDN GW 发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 16。

[0178] 步骤 11 至步骤 15 同实施例 1 中的处理。这里不再描述。

[0179] 16、SGSN 回附着接受或者路由区更新接受消息到 UE。

[0180] 实施例 3 :这种机制也能应用到可信 (Trusted) 的 Non-3GPP 系统。UE 在发送注册请求消息到非 3GPP 网关设备时,将该注册的处理类型信息上报给非 3GPP 网关设备,非 3GPP 网关设备据此识别该注册的处理类型 ;进一步根据该注册的处理类型,相应为该 UE 创建承载,完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server, AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册,网络侧发起承载建立流程,将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立 ;对于初始化注册,如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息,则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册,同时 AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 13 所示,包括下列步骤 :

[0181] 1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

[0182] 2、MME 或者 SGSN 发送切换命令到 UE 通知 UE 切换到 Non-3GPP 网络。或者 UE 发现 Non-3GPP 网络并决定发起切换。

[0183] 3、UE 在发起注册到 Non-3GPP 网络之前,识别该注册的类型 ;之后发送接入请求消息到非 3GPP 网关设备,并相应将该注册的处理类型信息上报给非 3GPP 网关设备。

[0184] 其中,可以通过如下方式之一上报 :

[0185] 1) 在接入请求消息中增加 Access Type 信元。例如 :该 Attach Type 信元有如下两个取值 :0 对应 Normal Access(或者称之为 Initial Access),表明该接入请求消息是正常的接入请求 (或者称之为初始的接入请求) 消息 ;1 对应 Handover Access,表明该接入请求消息是切换导致的接入请求消息。或者 UE 在接入请求消息中增加指示位表明该接入请求消息是切换导致的接入请求消息,而原有的接入请求消息表明一个正常的接入请求消息 (或者称之为初始的接入请求消息)。指示位可能的方法有 :

[0186] a) 切换指示位信元 (Handover Indication)。

[0187] b)Cause 信元。UE 将该 Cause 信元设置为“Access due to Handover”。

[0188] c)Access Type 信元。UE 将该信元设置为“Handover Access”。

[0189] 2) 定义新的消息。例如 : 定义新的切换接入请求消息 (Handover AccessRequest),该消息表明一个切换导致的接入请求消息,而原有的接入请求消息表明一个正常的接入请求 (或者称之为初始的接入请求) 消息,这样 UE 可向网络侧发送不同的接入请求消息,分别表征对应的注册处理类型信息。(也可新定义对应正常接入请求 (或者称之为初始接入请求) 消息,原有的接入请求消息对应切换导致的接入请求消息 ;或者切换导致的接入请求消息和正常接入请求 (或者称之为初始接入请求) 消息都重新定义)

[0190] 4、UE、非 3GPP 网关、AAA Server、HSS 之间执行鉴权流程。UE 也可以在这个步骤中将 UE 的注册处理类型上报给非 3GPP 网关。UE 在鉴权流程的消息中携带 Access Type 信元。例如 :该 Access Type 信元有如下两个取值 :0 对应 Normal Access(或者称之为 Initial Access),表明该接入请求消息是正常的接入请求 (或者称之为初始的接入请求) 消息 ;1 对应 Handover Access,表明该接入请求消息是切换导致的接入请求消息。

[0191] 或者 UE 在鉴权流程的消息中携带 Attach Type 信元。例如 :该 Atatch Type 信元有如下两个取值 :0 对应 Normal Attach(或者称之为 Initial Attach),表明该 UE 的注册处理类型是正常的注册 (或者称之为初始的注册) ;1 对应 HandoverAttach,表明该 UE 的注册处理类型是切换导致的注册。

[0192] 或者UE在鉴权流程的消息中增加指示位表明该UE的注册处理类型是切换导致的注册，而原有的鉴权流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

[0193] a) 切换指示位信元 (Handover Indication)。

[0194] b)Cause 信元。UE 将该 Cause 信元设置为“Attach due to Handover”。

[0195] c)Attach Type 信元。UE 将该信元设置为“Handover Attach”。

[0196] 非 3GPP 网关在这个步骤中将 UE 的注册处理类型上报给 AAA Server。

[0197] 如果 UE 的注册过程中由 AAA Server 识别 UE 的注册处理类型（如 AAAServer 发现保存有用户在 3GPP 接入网络中使用的 PDN GW 地址信息，则 AAAServer 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，AAA Server 认为 UE 的注册处理类型为正常的注册处理类型），则 AAA Server 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给非 3GPP 网关。指示位可能的方法有：

[0198] a) 如果 UE 的注册处理类型为切换导致的注册，则 AAA Server 增加切换指示位信元 (Handover Indication)。对于正常的注册处理类型，AAAServer 不携带这个信元。

[0199] b)Cause 信元。对于切换导致的注册处理，AAA Server 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，AAA Server 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带这个 Cause 信元。

[0200] c)Update Type 信元。对于切换导致的注册处理，AAA Server 将该信元设置为“Handover Attach”。对于正常注册处理，AAA Server 将该信元设置为“Initial Attach”或者不携带这个信元。

[0201] 5、非 3GPP 网关设备根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

[0202] 至此，非 3GPP 网关设备已区分了不同的注册处理类型。

[0203] 进一步，如果处理类型为正常的接入，则非 3GPP 网关设备按照正常的接入流程处理。步骤 7 到 13 将被执行。

[0204] 如果处理类型为切换导致的接入，则非 3GPP 网关设备发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到非 3GPP 网关设备。并转入步骤 6。

[0205] 6、非 3GPP 网关发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 13。

[0206] 7、如果 UE 的注册处理类型为正常发起的注册，且 AAA Server 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 HSS 注册到 AAA Server，则 AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 3GPP 接入网络中的注册。PDN GW 回取消注册确认消息到 AAA Server。

[0207] 8、如果 PDN GW 和 Serving GW 之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 Serving GW，取消 Serving GW 网关设备和 PDN GW 之间的 PMIP 绑定。Serving GW 回绑定取消确认消息给 PDN GW。

[0208] 9、如果 Serving GW 收到绑定取消指示消息，则 Serving GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

[0209] 10、如果 PDN GW 和 Serving GW 之间的接口协议为 GTP 协议，则 PDN GW 发起资源

释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

[0210] 11、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

[0211] 12、AAA Server 发送取消注册消息到 HSS，取消 UE 在 HSS 中的注册。HSS 回取消注册确认消息到 AAA Server。

[0212] 13、非 3GPP 网关回接入接受消息到 UE。

[0213] 实施例 4：这种机制也能应用到可信 (Trusted) 的 Non-3GPP 系统。UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，HSS 通知 MME/SGSN 释放 UE 在 3GPP 网络中使用的资源。参见图 14 所示，包括下列步骤：

[0214] 步骤 1 至 6 同实施例 3 中的处理。

[0215] 7、如果 UE 的注册处理类型为正常发起的注册，且 AAA Server 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDN GW 地址信息，且通过 HSS 注册到 AAA Server，则 AAA Server 发送取消注册消息到 HSS，取消 UE 在 HSS 中的注册。HSS 回取消注册确认消息到 AAA Server。

[0216] 8、HSS 发送位置取消消息到 MME/SGSN。MME/SGSN 回位置取消确认消息到 HSS。

[0217] 9、MME/SGSN 分离 UE，释放 UE 在 3GPP 接入网络中使用的资源。

[0218] 10、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

[0219] 11、非 3GPP 网关回接入接受消息到 UE。

[0220] 实施例 5：这种机制也能应用到非可信 (Untrusted) 的 Non-3GPP 系统。UE 在发送接入鉴权请求或者 IKEv2/IPSec SA(Internet Key Exchange ProtocolVersion 2/IP Security Protocol Security Association，因特网密钥交换协议版本 2/IP 网络安全协议安全联盟）建立请求消息到演进分组数据网关（一种非 3GPP 网关）ePDG(Evolved Packet data Gateway) 时，将该注册的处理类型信息上报给 ePDG，ePDG 据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。ePDG 上报注册的处理类型给 AAAServer，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注册，如果 AAA Server 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 AAA Server 通知 HSS 取消 UE 在 3GPP 网络中的注册，同时 AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 15 所示，包括下列步骤：

[0221] 1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

[0222] 2、MME 或者 SGSN 发送切换命令到 UE 通知 UE 切换到 Non-3GPP 网络。或者 UE 发现 Non-3GPP 网络并决定发起切换。

[0223] 3、UE、ePDG、AAA Server、HSS 之间执行接入鉴权流程。UE 可以在这个步骤中将

UE 的注册处理类型上报给 ePDG。UE 在接入鉴权流程的消息中携带 Access Type 信元。例如：该 Access Type 信元有如下两个取值：0 对应 NormalAccess（或者称之为 Initial Access），表明该接入请求消息是正常的接入请求（或者称之为初始的接入请求）消息；1 对应 Handover Access，表明该接入请求消息是切换导致的接入请求消息。

[0224] 或者 UE 在接入鉴权流程的消息中携带 Attach Type 信元。例如：该 AtatchType 信元有如下两个取值：0 对应 Normal Attach（或者称之为 Initial Attach），表明该 UE 的注册处理类型是正常的注册（或者称之为初始的注册）；1 对应 Handover Attach，表明该 UE 的注册处理类型是切换导致的注册。

[0225] 或者 UE 在接入鉴权流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的接入鉴权流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

[0226] a) 切换指示位信元 (Handover Indication)。

[0227] b) Cause 信元。UE 将该 Cause 信元设置为“Attach due to Handover”。

[0228] c) Attach Type 信元。UE 将该信元设置为“Handover Attach”。

[0229] ePDG 在这个步骤中可以将 UE 的注册处理类型上报给 AAA Server，AAAServer 将 UE 的注册处理类型上报给 HSS。

[0230] 如果 UE 的注册过程中由 AAA Server 识别 UE 的注册处理类型（如 AAAServer 发现保存有用户在 3GPP 接入网络中使用的 PDN GW 地址信息，则 AAAServer 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，AAA Server 认为 UE 的注册处理类型为正常的注册处理类型），则 AAA Server 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给 ePDG。指示位可能的方法有：

[0231] a) 如果 UE 的注册处理类型为切换导致的注册，则 AAA Server 增加切换指示位信元 (Handover Indication)。对于正常的注册处理类型，AAAServer 不携带这个信元。

[0232] b) Cause 信元。对于切换导致的注册处理，AAA Server 将该 Cause 信元设置为“Update due to Handover Attach”。对于正常注册处理，AAA Server 将该 Cause 信元设置为“Update due to Initial Attach”或者不携带这个 Cause 信元。

[0233] c) Update Type 信元。对于切换导致的注册处理，AAA Server 将该信元设置为“Handover Attach”。对于正常注册处理，AAA Server 将该信元设置为“Initial Attach”或者不携带这个信元。

[0234] 4、UE、ePDG、AAA Server 之间执行 IKEv2/IPSec SA 建立流程。UE 可以在这个步骤中将 UE 的注册处理类型上报给 ePDG。UE 可以在 IKEv2/IPSecSA 建立流程的消息中携带 Access Type 信元或者 Attach Type 信元指明 UE 的注册处理类型。或者 UE 在 IKEv2/IPSec SA 建立流程的消息中增加指示位表明该 UE 的注册处理类型是切换导致的注册，而原有的 IKEv2/IPSec SA 建立流程的消息表明一个正常的注册（或者称之为初始的注册）。指示位可能的方法有：

[0235] a) 切换指示位信元 (Handover Indication)。

[0236] b) Cause 信元。UE 将该 Cause 信元设置为“Access due to Handover”。

[0237] c) Access Type 信元。UE 将该信元设置为“Handover Access”。

[0238] ePDG 在这个步骤中可以将 UE 的注册处理类型上报给 AAA Server，AAAServer 将

UE 的注册处理类型上报给 HSS。

[0239] 5、ePDG 根据 UE 上报的该注册的处理类型信息，识别该注册的处理类型。

[0240] 至此，ePDG 已区分了不同的注册处理类型。

[0241] 进一步，如果处理类型为正常的接入，则 ePDG 按照正常的接入流程处理。步骤 7 到 13 将被执行。

[0242] 如果处理类型为切换导致的接入，则 ePDG 发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到非 3GPP 网关设备。并转入步骤 6。

[0243] 6、ePDG 发起网络侧承载创建流程，创建用户使用的承载。并转入步骤 13。

[0244] 步骤 7 至 13 同实施例 3 中的处理。

[0245] 综上所述，本发明实施例中，由于 UE 在注册到网络的过程中，将该注册的处理类型信息上报给网络侧，所以网络侧可据此区分不同的注册处理类型。

[0246] 进一步，网络侧可按照识别出的处理类型，进行对应的流程处理。而且本发明实施例中还公开了 UE 上报注册的处理类型信息的具体方式：通过增加信元或新定义消息，更好的支撑了本发明实施例。

[0247] 进一步，除前述流程中说明的 Initial Attach 和 Handover Attach 处理类型外，本发明实施例中 UE、HSS、AAA 服务器等实体上报的注册处理类型信息还可以包括其它的注册处理类型，如 Pre-Registration（即 UE 预先注册到目标接入网络的注册处理类型），Idle Mode Handover（即 UE 空闲模式下切换时的注册处理类型），Active Mode Handover（即 UE 激活模式下切换时的注册处理类型）。如对于多模终端 (Multi Mode) 或者双模 (Dual Mode) 终端（即这种终端能够同时接入到多个网络中）来说，注册的处理类型可能有：Power On Attach（即 UE 开机时的注册处理类型），Normal Attach（即 UE 正常接入时的注册处理类型），Handover Attach（即 UE 切换时的注册处理类型）等。本发明实施例不限制注册处理类型的取值。如下以 Idle Mode Handover 和 Active Mode Handover 的处理来说明其它注册处理类型的处理。

[0248] 实施例 6：UE 激活模式下的 HRPD 到 E-UTRAN 网络切换时，MME 获取 UE 的切换处理类型。MME 判断切换处理类型为 UE 激活模式下的切换时则 MME 通知 eNodeB 建立接入网侧资源及使用预先路径切换机制。参见图 6 所示，包括下列步骤：

[0249] 1、UE 在 HRPD 网络接入。

[0250] 2、UE 或者 HRPD AN(Access Network，接入网络）决定执行切换到 3GPP 网络。

[0251] 3、UE 通过 HRPD 网络发送 Attach Request 消息到 MME。由 MME 获取处理类型信息。MME 获取处理类型信息具体可以为：

[0252] 1)UE 上报：UE 在 Attach Request 消息中通知 MME 本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

[0253] √ UE 在 Attach Request 消息中增加“Attach Type”信元指示 MME 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

[0254] 0 表明 (Idle Mode Handover) 空闲模式下的切换；

[0255] 1 表明 (Active Mode Handover) 激活状态下的切换；

[0256] √ UE 在 Attach Request 消息中增加“Cause”信元表明导致 Attach Request 消

息的原因值。UE 可以设置 Cause 原因值为：

[0257] “Idle Mode Handover”表明 Attach Request 是由于空闲状态下的切换导致的；

[0258] “Active Mode Handover”表明 Attach Request 是由于激活状态下的切换导致的；

[0259] √ UE 在 Attach Request 消息中增加“UE State”信元将 UE 的状态上报。MME 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

[0260] 0(Idle state) 表明 UE 的状态为空闲状态

[0261] 1(Active state) 表明 UE 的状态为激活状态

[0262] √ UE 在激活状态下的切换时在 Attach Request 消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时在 AttachRequest 消息中不携带“active flag”信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将“active flag”信元设置为“True(1)”指示需要建立接入网侧的承载。在空闲状态下的切换时将“activeflag”信元设置为“False(0)”指示不需要建立接入网侧的承载。

[0263] √ UE 在空闲状态下的切换时在 Attach Request 消息中增加“Non-activeflag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时在 Attach Request 消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将“Non-active flag”信元设置为“True(1)”指示不需要建立接入网侧的承载。在激活状态下的切换时将“Non-active flag”信元设置为“False(0)”指示需要建立接入网侧的承载。

[0264] 2)HRPD AN 上报：HRPD AN 在 S101 接口的消息中通知 MME 本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

[0265] √ HRPD AN 在 S101 接口的消息中增加“Attach Type”信元指示 MME 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

[0266] 0 表明 (Idle Mode Handover) 空闲模式下的切换

[0267] 1 表明 (Active Mode Handover) 激活状态下的切换

[0268] √ HRPD AN 在 S101 接口的消息中增加“Cause”信元表明导致 AttachRequest 消息的原因值。HRPD AN 可以设置 Cause 原因值为：

[0269] “Idle Mode Handover”表明 Attach Request 是由于空闲状态下的切换导致的；

[0270] “Active Mode Handover”表明 Attach Request 是由于激活状态下的切换导致的；

[0271] √ HRPD AN 在 S101 接口的消息中增加“UE State”信元将 UE 的状态上报。MME 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

[0272] 0(Idle state) 表明 UE 的状态为空闲状态

[0273] 1(Active state) 表明 UE 的状态为激活状态

[0274] √ UE 在激活状态下的切换时 HRPD AN 在 S101 接口的消息中增加“activeflag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时 HRPDAN 在 S101 接口的消息中不携带“active flag”信元指示不需要建立接入网侧的承载。

[0275] √ UE 在空闲状态下的切换时 HRPD AN 在 S101 接口的消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时 HRPD AN 在 S101 接口

的消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。

[0276] 4、鉴权程序被执行。

[0277] 5、MME 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

[0278] 6、MME 选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在激活状态下的切换，则 MME 在 Create Default Bearer Request 消息中要求 Serving GW “预先路径切换”。

[0279] 7、Serving GW 收到 Create Default Bearer Request 消息后如果发现这个消息要求 Serving GW “预先路径切换”，则 Serving GW 发起预先路径切换流程。Serving GW 发送 Proxy BU 消息到 PDN GW。PDN GW 收到上述消息后切换用户面的路由到 Serving GW，即 PDN GW 收到下行数据后将发给 Serving GW。

[0280] 8、Serving GW 回 Create Default Bearer Response 消息到 MME。

[0281] 9、MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在激活状态下的切换，则 MME 发送 Relocation Request 消息到 eNodeB 请求 eNodeB 建立接入网侧资源。eNodeB 完成接入网侧资源的创建后回 Relocation Request Acknowledge 消息给 MME。

[0282] 10、MME 发送 Update Bearer Request 消息到 Serving GW 更新 Serving GW 的下行用户面路径到 eNodeB。Serving GW 回 Update Bearer Response 消息到 MME。

[0283] 11、MME 如果发现切换是 UE 在激活状态下的切换，则 MME 发送 S101 HOCommand 消息到 HRPD AN，消息中包含 Attach Accept 消息和 HO Command 消息。

[0284] 12、HRPD AN 发送 HRPD AN L2 消息到 UE，消息中包含 Attach Accept 消息和 HO Command 消息。

[0285] 13、UE 切换到 E-UTRAN 网络，发送 HO Complete 消息到 eNodeB。

[0286] 14、eNodeB 发送 Relocation Complete 消息给 MME，通知 MME UE 已经切换到 E-UTRAN 网络。

[0287] 值得说明的是：本实施例中步骤 6 与步骤 9 并没有绝对的先后时序关系。

[0288] 实施例 7：UE 空闲模式下的 HRPD 到 E-UTRAN 网络切换时 MME 获取 UE 的切换处理类型。MME 判断切换处理类型为 UE 空闲模式下的切换时则 MME 不通知 eNodeB 建立接入网侧资源及不使用预先路径切换机制。参见图 16 所示，包括下列步骤：

[0289] 1、UE 在 HRPD 网络接入。

[0290] 2、UE 或者 HRPD AN(Access Network，接入网络）决定执行切换到 3GPP 网络。

[0291] 3、UE 通过 HRPD 网络发送 Attach Request 消息到 MME。切换的处理类型需要通知给 MME。处理方法同实施例 6 中的描述。

[0292] 4、鉴权程序被执行。

[0293] 5、MME 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

[0294] 6、MME 选择 Serving GW，向 Serving GW 发送 Create Default Bearer Request 消息。MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲

状态下的切换。MME 如果发现 UE 在空闲状态下的切换，则 MME 在 Create Default Bearer Request 消息中不要求 Serving GW“预先路径切换”。Serving GW 回 Create Default Bearer Response 消息到 MME。

[0295] 7、MME 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME 如果发现 UE 在空闲状态下的切换，则 MME 不通知 eNodeB 建立接入网侧的资源，MME 通过 HRPD 网络直接发 AttachAccept 消息到 UE。

[0296] 8、UE 切换到 E-UTRAN 网络，发送 TAU Request 消息到 MME 通知 MMEUE 已经切换到 E-UTRAN 网络。

[0297] 9、MME 发现 UE 在空闲状态下已经切换到 E-UTRAN 网络，则 MME 发送 Update Bearer Request 消息给 Serving GW。MME 在 Update Bearer Request 增加指示位要求 Serving GW 进行用户面路径切换。

[0298] 10、Serving GW 收到 Update Bearer Request 消息后如果发现要求用户面路径切换，则 Serving GW 发送 Proxy BU 消息到 PDN GW 更新 PDN GW 的下行用户面路径。PDN GW 将下行用户面路径切换到 Serving GW 后回 Proxy BA 消息给 Serving GW。

[0299] 11、Serving GW 回 Update Bearer Response 消息给 MME。

[0300] 12、MME 回 TAU Accept 消息给 UE。

[0301] 实施例 8：切换处理类型通知处理方法也能应用到 Non-3GPP 到 3GPP 网络的正常切换处理。UE 在 Attach Request 消息中将切换处理类型信息通知给 MME 或者 SGSN，MME 或者 SGSN 根据切换处理类型信息决定是否通知接入网建立接入网侧的资源。参见图 17 所示，包括下列步骤：

[0302] 1、UE 在 Non-3GPP 网络（如 Wimax、WLAN 等网络）接入。

[0303] 2、UE 决定执行切换到 3GPP 网络，发起切换流程。

[0304] 3、UE 通过 3GPP 接入网络 (AN, Access network) 发送 Attach Request 消息到核心网网元。如果 3GPP 接入网络为 GERAN/UTRAN，则核心网网元为 SGSN；如果 3GPP 接入网络为 E-UTRAN，则核心网网元为 MME。UE 在 AttachRequest 消息中通知 MME/SGSN 这个 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程，MME 或者 SGSN 获取处理类型信息。具体的通知方式可以是：

[0305] √ UE 在 Attach Request 消息中增加“Attach Type”信元指示 MME/SGSN 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

[0306] 0 表明 (Idle Mode Handover) 空闲模式下的切换；

[0307] 1 表明 (Active Mode Handover) 激活状态下的切换；

[0308] √ UE 在 Attach Request 消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。UE 可以设置 Cause 原因值为：

[0309] “Idle Mode Handover”表明 Attach Request 是由于空闲状态下的切换导致的；

[0310] “Active Mode Handover”表明 Attach Request 是由于激活状态下的切换导致的；

[0311] √ UE 在 Attach Request 消息中增加“UE State”信元将 UE 的状态上报。MME/SGSN 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

[0312] 0(Idle state) 表明 UE 的状态为空闲状态

[0313] 1(Active state) 表明 UE 的状态为激活状态

[0314] √ UE 在激活状态下的切换时在 Attach Request 消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时在 AttachRequest 消息中不携带“active flag”信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将“active flag”信元设置为“True(1)”指示需要建立接入网侧的承载。在空闲状态下的切换时将“activeflag”信元设置为“False(0)”指示不需要建立接入网侧的承载。

[0315] √ UE 在空闲状态下的切换时在 Attach Request 消息中增加“Non-activeflag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时在 Attach Request 消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将“Non-active flag”信元设置为“True(1)”指示不需要建立接入网侧的承载。在激活状态下的切换时将“Non-active flag”信元设置为“False(0)”指示需要建立接入网侧的承载。

[0316] 4、鉴权程序被执行。

[0317] 5、MME/SGSN 发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

[0318] 6、MME/SGSN 选择 Serving GW，向 Serving GW 发送 Create Default BearerRequest 消息。

[0319] 7、Serving GW 发送 Proxy BU 消息到 PDN GW 更新 PDN GW 的下行用户面路径。PDN GW 将下行用户面路径切换到 Serving GW 后回 Proxy BA 消息给 Serving GW。

[0320] 8、Serving GW 回 Create Default Bearer Response 消息给 MME/SGSN。

[0321] 9、MME/SGSN 根据 Attach Request 消息中携带的信息判断 UE 是在激活状态下的切换还是空闲状态下的切换。MME/SGSN 如果发现 UE 在激活状态下的切换，则步骤 9 至 12 被执行。MME/SGSN 如果发现 UE 在空闲状态下的切换，则步骤 13 至 14 被执行。

[0322] MME/SGSN 发送 Initial Context Setup Request 消息给 3GPP AN 请求 3GPP AN 建立接入网侧的资源，同时这个消息也携带 Attach Accept 消息。

[0323] 10、3GPP AN 和 UE 之间建立无线承载。

[0324] 11、3GPP AN 回 Initial Context Setup Complete 消息给 MME/SGSN。这个消息中也携带 Attach Complete 消息。

[0325] 12、MME/SGSN 发送 Update Bearer Request 消息给 Serving GW 请求 Serving GW 更新下行用户面路径到 eNodeB。Serving GW 更新下行用户面路径到 3GPP AN 后回 Update Bearer Response 消息到 MME/SGSN。

[0326] 13、MME/SGSN 如果发现 UE 在空闲状态下的切换，则 MME/SGSN 发送 Attach Accept 消息给 UE。

[0327] 14、UE 回 Attach Complete 消息给 MME/SGSN。

[0328] 实施例 9：UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型；进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，由 AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立；对于初始化注

册，如果 HSS 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAA Server 取消 UE 在 3GPP 网络中的注册，AAA Server 通知 PDN GW 释放 UE 在 3GPP 网络中使用的资源。参见图 1 8 所示，包括下列步骤：

[0329] 1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 接入网络。

[0330] 2、MME 或者 SGSN 发送切换命令到 UE，通知 UE 切换到 Non-3GPP 网络。或者 UE 发现 Non-3GPP 网络并决定发起切换。

[0331] 3、UE 在发起注册到 Non-3GPP 网络之前，识别该注册的类型；之后发送接入请求消息到非 3GPP 网关设备，并相应将该注册的处理类型信息上报给非 3GPP 网关设备。

[0332] 4、UE、非 3GPP 网关、AAA Server、HSS 之间执行鉴权流程。UE 也可以在这个步骤中将 UE 的注册处理类型上报给非 3GPP 网关。

[0333] 非 3GPP 网关在这个步骤中将 UE 的注册处理类型上报给 AAA Server 和 HSS。如果注册处理类型为切换处理类型，则 AAA Server 或者 HSS 可以将用户在 3GPP 接入网络中使用的 PDN GW 地址信息提供给非 3GPP 网关。

[0334] 如果 UE 的注册过程中由 AAA Server 或者 HSS 识别 UE 的注册处理类型（如 AAA Server 或者 HSS 发现保存有用户在 3GPP 接入网络中使用的 PDNGW 地址信息，则 AAA Server 或者 HSS 认为 UE 的注册处理类型为切换导致的注册处理类型；否则，AAA Server 或者 HSS 认为 UE 的注册处理类型为正常的注册处理类型），则 AAA Server 或者 HSS 在这个消息中增加指示位信元将 UE 的注册处理类型信息通知给非 3GPP 网关。指示位可能的方法有：

[0335] a) 如果 UE 的注册处理类型为切换导致的注册，则 AAA Server 或者 HSS 增加切换指示位信元 (Handover Indication(切换指示位))。对于正常的注册处理类型，AAA Server 或者 HSS 不携带这个信元。

[0336] b)Cause(原因）信元。对于切换导致的注册处理，AAA Server 或者 HSS 将该 Cause 信元设置为“Update due to Handover Attach(切换附着导致的更新)”。对于正常注册处理，AAA Server 或者 HSS 将该 Cause 信元设置为“Update due to Initial Attach(初始化附着导致的更新)”或者不携带这个 Cause 信元。

[0337] c)Update Type(更新类型）信元。对于切换导致的注册处理，AAA Server 或者 HSS 将该信元设置为“Handover Attach(切换附着)”。对于正常注册处理，AAA Server 或者 HSS 将该信元设置为“Initial Attach(初始化附着)”或者不携带这个信元。

[0338] 5、非 3GPP 网关设备根据 UE 上报或者 AAA Server 上报或者 HSS 上报的该注册的处理类型信息，识别该注册的处理类型。

[0339] 至此，非 3GPP 网关设备已区分了不同的注册处理类型。

[0340] 进一步，如果处理类型为正常的接入，则非 3GPP 网关设备按照正常的接入流程处理。步骤 7 到 13 将被执行。

[0341] 如果处理类型为切换导致的接入，则非 3GPP 网关设备发送请求策略和计费规则消息到 PCRF 获取用户使用的 PCC 规则。PCRF 提供用户使用的 PCC 规则到非 3GPP 网关设备。转入步骤 6。

[0342] 6、非 3GPP 网关发起网络侧承载创建流程，创建用户使用的承载。转入步骤 13。

[0343] 7、如果 UE 的注册处理类型为正常发起的注册，且 HSS 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDNGW 地址信息，则 HSS 发送取消注

册消息到 AAA Server，取消 UE 在 AAA Server 中的注册。AAA Server 回取消注册确认消息到 HSS。

[0344] 8、AAA Server 发送取消注册消息到 PDN GW 请求取消 UE 在 3GPP 接入网络中的注册，PDN GW 回取消注册确认消息到 AAA Server。

[0345] 9、如果 PDN GW 和 Serving GW 之间的接口协议为 PMIP 协议，则 PDN GW 发送绑定取消指示消息给 Serving GW，取消 Serving GW 网关设备和 PDN GW 之间的 PMIP 绑定。Serving GW 回绑定取消确认消息给 PDN GW。

[0346] 10、如果 Serving GW 收到绑定取消指示消息，则 Serving GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

[0347] 11、如果 PDN GW 和 Serving GW 之间的接口协议为 GTP 协议，则 PDN GW 发起资源释放程序，释放 UE 在 3GPP 接入网络中使用的资源。

[0348] 12、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

[0349] 13、非 3GPP 网关回接入接受消息到 UE。

[0350] 实施例 10 :UE 在发送注册请求消息到非 3GPP 网关设备时，将该注册的处理类型信息上报给非 3GPP 网关设备，非 3GPP 网关设备据此识别该注册的处理类型 ;进一步根据该注册的处理类型，相应为该 UE 创建承载，完成注册。非 3GPP 网关设备上报注册的处理类型给 AAA Server，AAA Server 上报注册的处理类型到 HSS。对于切换导致的注册，网络侧发起承载建立流程，将 UE 在源 3GPP 网络中使用的资源在 Non-3GPP 网络中建立 ;对于初始化注册，如果 HSS 中保存 UE 在 3GPP 网络中使用的 PDN GW 地址信息，则 HSS 通知 AAAServer 取消 UE 在 3GPP 网络中的注册，同时 HSS 通知 MME/SGSN 释放 UE 在 3GPP 网络中使用的资源。参见图 19 所示，包括下列步骤 :

[0351] 步骤 1 至 6 同实施例 9 中的处理。

[0352] 7、如果 UE 的注册处理类型为正常发起的注册，且 HSS 中存在注册的 PDN GW 地址，这些 PDN GW 地址为 UE 在 3GPP 接入网络接入时使用的 PDNGW 地址信息，则 HSS 发送取消注册消息到 AAA Server，取消 UE 在 AAA Server 中的注册。AAA Server 回取消注册确认消息到 HSS。

[0353] 8、HSS 发送位置取消消息到 MME/SGSN。MME/SGSN 回位置取消确认消息到 HSS。

[0354] 9、MME/SGSN 分离 UE，释放 UE 在 3GPP 接入网络中使用的资源。

[0355] 10、PDN GW 和 PCRF 之间执行会话终止程序，通知 PCRF 释放 UE 在 3GPP 接入网络中使用的 PCC rules。

[0356] 11、非 3GPP 网关回接入接受消息到 UE。

[0357] 实施例 11 :UE 激活模式下的 Non-3GPP 到 3GPP 网络切换时，3GPP 网络侧第一网元获取 UE 的切换处理类型。3GPP 网络侧第一网元判断切换处理类型为 UE 激活模式下的切换时，则 3GPP 网络侧第一网元通知 PDN GW 不发起源 Non-3GPP 网络的资源释放处理、通知 Serving GW 创建 Serving GW 和 Non-3GPP GW 之间的数据转发隧道资源。参见图 20 所示，包括下列步骤 :

[0358] 1、UE 在 Non-3GPP 网络接入。

[0359] 2、UE 或者 Non-3GPP 接入网元（如对于 HRPD 网络来说，Non-3GPP 接入网元为 HRPD

RNC) 决定执行切换到 3GPP 网络。

[0360] 3、UE 通过 Non-3GPP 网络发送 Attach Request 消息到 3GPP 网络侧第一网元（对于 E-UTRAN 网络来说，3GPP 网络侧第一网元为 MME；对于 GERAN/UTRAN 网络来说，3GPP 网络侧第一网元为 SGSN）。由 3GPP 网络侧第一网元获取处理类型信息。3GPP 网络侧第一网元获取处理类型信息具体可以为：

[0361] 1) UE 上报：UE 在 Attach Request 消息中通知 3GPP 网络侧第一网元本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

[0362] √ UE 在 Attach Request 消息中增加“Attach Type”信元指示 MME 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

[0363] 0 表明 (Idle Mode Handover) 空闲模式下的切换；

[0364] 1 表明 (Active Mode Handover) 激活状态下的切换；或者，

[0365] 对于激活状态下的优化切换或者预注册，UE 将 Attach Request 消息中的“Attach Type”信元设置为“Optimized Handover（优化切换）”或者为“Pre-registration（预注册）”或者为“Handover（切换）”。网络侧第一网元收到这个 Attach Type 后缺省认为 Attach 流程是 UE 在激活状态下的切换流程。

[0366] √ UE 在 Attach Request 消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。UE 可以设置 Cause 原因值为：

[0367] “Idle Mode Handover”表明 Attach Request 是由于空闲状态下的切换导致的；

[0368] “Active Mode Handover”表明 Attach Request 是由于激活状态下的切换导致的；

[0369] √ UE 在 Attach Request 消息中增加“UE State”信元将 UE 的状态上报。MME 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

[0370] 0 (Idle state) 表明 UE 的状态为空闲状态；

[0371] 1 (Active state) 表明 UE 的状态为激活状态。

[0372] √ UE 在激活状态下的切换时在 Attach Request 消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时在 AttachRequest 消息中不携带“active flag”信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将“active flag”信元设置为“True(1)”指示需要建立接入网侧的承载。在空闲状态下的切换时将“activeflag”信元设置为“False(0)”指示不需要建立接入网侧的承载。

[0373] √ UE 在空闲状态下的切换时在 Attach Request 消息中增加“Non-activeflag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时在 Attach Request 消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将“Non-active flag”信元设置为“True(1)”指示不需要建立接入网侧的承载。在激活状态下的切换时将“Non-active flag”信元设置为“False(0)”指示需要建立接入网侧的承载。

[0374] 2) Non-3GPP 接入网元或者 Non-3GPP GW 上报：Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中通知 3GPP 网络侧第一网元本次 Attach 流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以

是：

[0375] √ Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中增加“Attach Type”信元指示 3GPP 网络侧第一网元切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

[0376] 0 表明 (Idle Mode Handover) 空闲模式下的切换；

[0377] 1 表明 (Active Mode Handover) 激活状态下的切换；或者，

[0378] 对于激活状态下的优化切换或者预注册，Non-3GPP 接入网元或者 Non-3GPP GW 将“Attach Type”信元设置为“Optimized Handover(优化切换)”或者为“Pre-registration(预注册)”或者为“Handover(切换)”。3GPP 网络侧第一网元收到这个 Attach Type 后缺省认为 Attach 流程是 UE 在激活状态下的切换流程。

[0379] √ Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中增加“Cause”信元表明导致 Attach Request 消息的原因值。Non-3GPP 接入网元或者 Non-3GPP GW 可以设置 Cause 原因值为：

[0380] “Idle Mode Handover”表明 Attach Request 是由于空闲状态下的切换导致的；

[0381] “Active Mode Handover”表明Attach Request是由于激活状态下的切换导致的；

[0382] √ Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中增加“UE State”信元将 UE 的状态上报。3GPP 网络侧第一网元根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

[0383] 0(Idle state) 表明 UE 的状态为空闲状态；

[0384] 1(Active state) 表明 UE 的状态为激活状态。

[0385] √ UE 在激活状态下的切换时 Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中增加“active flag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时 Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中不携带“active flag”信元指示不需要建立接入网侧的承载。

[0386] √ UE 在空闲状态下的切换时 Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时 Non-3GPP 接入网元或者 Non-3GPP GW 在发送给 3GPP 网络侧第一网元接口的消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。

[0387] 4、鉴权程序被执行。

[0388] 5、3GPP 网络侧第一网元发送 Update Location 消息到 HSS，获取 UE 的签约数据。HSS 返回 UE 的签约数据，包括 UE 使用的 PDN GW 地址信息。

[0389] 6、3GPP 网络侧第一网元选择 Serving GW，向 Serving GW 发送 CreateDefault Bearer Request 消息。

[0390] 7、如果 Serving GW 和 PDN GW 之间的接口协议使用 GTP 协议，ServingGW 发送 Create Default Bearer Request 消息到 PDN GW。如果 Serving GW 和 PDN GW 之间的接口协议使用 PMIP 协议，Serving GW 发送 Proxy BU 消息到 PDN GW。PDN GW 回 Create Default Bearer Response 消息或者 Proxy BA 消息到 Serving GW。

[0391] 8、Serving GW 回 Create Default Bearer Response 消息到 3GPP 网络侧第一网元。

[0392] 9、3GPP 网络侧第一网元如果发现 UE 在激活状态下的切换，则 3GPP 网络侧第一网元发送创建转发隧道请求消息到 Serving GW，请求 Serving GW 建立转发隧道资源。Serving GW 回创建转发隧道响应消息到 3GPP 网络侧第一网元，消息中携带转发隧道信息 (Serving GW Address 和 GRE Keys)。

[0393] 10、3GPP 网络侧第一网元如果发现切换是 UE 在激活状态下的切换，则 3GPP 网络侧第一网元发送 HO Command 消息到 Non-3GPP 接入网元或者 Non-3GPP GW，消息中包含 Attach Accept 消息和 HO Command 消息以及转发隧道信息 (Serving GW Address 和 GRE Keys)。

[0394] 11、如果 Non-3GPP 接入网元收到 HO Command 消息后发送创建转发隧道请求消息给 Non-3GPP GW，将获得的转发隧道信息通知给 Non-3GPP GW。Non-3GPP GW 回创建转发隧道响应消息给 Non-3GPP 接入网元。

[0395] 后续 Non-3GPP GW 通过转发隧道 (Serving GW Address 和 GRE Keys) 将收到的下行数据转发给 Serving GW。

[0396] 12、Non-3GPP 接入网元或者 Non-3GPP GW 发送 HO Command 消息到 UE，消息中包含 Attach Accept 消息和 HO Command 消息。

[0397] 13、UE 切换到 3GPP 网络，发送 HO Complete 消息到 3GPP 接入网元。

[0398] 14、3GPP 接入网元发送 Relocation Complete 消息给 3GPP 网络侧第一网元，通知 3GPP 网络侧第一网元 UE 已经切换到 3GPP 网络。

[0399] 15、3GPP 网络侧第一网元发送修改承载请求消息到 Serving GW。3GPP 网络侧第一网元如果发现切换是 UE 在激活状态下的切换，则 3GPP 网络侧第一网元在修改承载请求消息中增加指示位信息指示 PDN GW 不发起 UE 在源 Non-3GPP 接入网络中的资源释放处理流程。这个指示位可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体处理方式可以有：

[0400] 1) “Update Type”（更新类型）指示位。网络侧第一网元设置“Update Type”指示位为“Pre-registration（预注册）”或者为“Optimized Handover（优化切换）”。

[0401] 2) “Cause（原因）”原因值。网络侧第一网元设置“Cause”原因值为“Pre-registration（预注册）”或者为“Optimized Handover（优化切换）”或者为“Resource not Release（资源不释放）”。

[0402] 3) “Pre-registration Indication（预注册指示位）”指示位或者“OptimizedHandover Indication（优化切换指示位）”指示位或者“Resource not ReleaseIndication（资源不释放指示位）”指示位。

[0403] 16、如果 Serving GW 和 PDN GW 之间的接口使用 GTP 协议，则 Serving GW 发送修改承载请求消息到 PDN GW。如果 Serving GW 和 PDN GW 之间的接口使用 PMIP 协议，则 Serving GW 发送代理绑定更新消息到 PDN GW。ServingGW 在修改承载请求或者代理绑定更新消息中增加指示位信息指示 PDN GW 不发起 UE 在源 Non-3GPP 接入网络中的资源释放处理流程。这个指示位可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体处理方式可以有：

[0404] 1) “Update Type（更新类型）”或者“Binding Type（绑定类型）”指示位。Serving GW 设置“Update Type（更新类型）”或者“Binding Type（绑定类型）”指示位为“Pre-registration（预注册）”或者为“Optimized Handover（优化切换）”。

[0405] 2)“Cause(原因)”原因值。Serving GW设置“Cause”原因值为“Pre-registration(预注册)”或者为“Optimized Handover(优化切换)”或者为“Resource not Release(资源不释放)”指示位。

[0406] 3)“Pre-registration Indication(预注册指示位)”指示位或者“OptimizedHandover Indication(优化切换指示位)”指示位或者“Resource not ReleaseIndication(资源不释放指示位)”指示位。

[0407] PDN GW收到上述消息后不发起UE在源Non-3GPP接入网络中的资源释放处理流程(即Non-3GPP接入网络中的资源释放处理不是由PDN GW触发)。PDN GW回修改承载响应或者代理绑定确认消息到Serving GW。

[0408] 17、Serving GW回修改承载响应消息到3GPP网络侧第一网元。

[0409] 18、3GPP网络侧第一网元在收到eNodeB发送Relocation Complete消息后回切换完成消息到Non-3GPP接入网元或者Non-3GPP GW。

[0410] 19、Non-3GPP接入网元或者Non-3GPP GW收到3GPP网络侧第一网元发送的切换完成消息后发起源Non-3GPP接入网络中的资源释放处理流程。

[0411] 值得说明的是:

[0412] 1、本实施例中步骤6与步骤9并没有绝对的先后时序关系。

[0413] 2、本实施例不限定步骤9和步骤11中的消息。如对于HRPD网络来说,步骤11中的消息也有可能为A11注册请求(A11-Registration Request)消息(A11-Registration Request)。

[0414] 实施例12:UE激活模式下的3GPP到Non-3GPP网络切换时,Non-3GPP网络中的网元获取UE的切换处理类型。Non-3GPP网络中的网元判断切换处理类型为UE激活模式下的切换时则建立接入网侧资源、创建数据转发资源、通知PDN GW不发起源侧资源的释放处理。参见图21所示,包括下列步骤:

[0415] 1、UE通过Serving GW和PDN GW接入到3GPP网络。

[0416] 2、UE通过3GPP网络执行Non-3GPP网络特定的附着程序、鉴权及认证程序。

[0417] 3、UE通过3GPP网络触发Non-3GPP网络中的层3附着程序。Non-3GPP网络中的接入网络(如HRPD网络中的RNC)或者Non-3GPP GW(如HRPD网络中的PDSN)获取切换处理类型信息。Non-3GPP网络中的接入网络或者Non-3GPP GW获取切换处理类型信息具体可以为:

[0418] 1)UE上报:UE在层3附着程序的消息中通知Non-3GPP网络中的接入网络或者Non-3GPP GW本次流程是UE在空闲状态下的切换流程还是UE在激活状态下的切换流程。具体的通知方式可以是:

[0419] √ UE在层3附着程序的消息中增加“Attach Type”信元指示Non-3GPP网络中的接入网络或者Non-3GPP GW切换的处理类型。其中,AttachType以不同取值表明不同的处理类型:

[0420] 0表明(Idle Mode Handover)空闲模式下的切换;

[0421] 1表明(Active Mode Handover)激活状态下的切换;或者,

[0422] 对于激活状态下的优化切换或者预注册,UE将层3附着程序的消息中的“Attach Type”信元设置为“Optimized Handover(优化切换)”或者为“Pre-registration(预注

册）”或者为“Handover（切换）”。Non-3GPP 网络中的接入网络或者 Non-3GPP GW 收到这个 Attach Type 后缺省认为层 3 附着程序是 UE 在激活状态下的切换流程。

[0423] √ UE 在层 3 附着程序的消息中增加“Cause”信元表明导致层 3 附着程序的消息的原因值。UE 可以设置 Cause 原因值为：

[0424] “Idle Mode Handover”表明层 3 附着程序的消息是由于空闲状态下的切换导致的；

[0425] “Active Mode Handover”表明层 3 附着程序的消息是由于激活状态下的切换导致的；

[0426] √ UE 在层 3 附着程序的消息中增加“UE State”信元将 UE 的状态上报。Non-3GPP 网络中的接入网络或者 Non-3GPP GW 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UE State”为：

[0427] 0(Idle state) 表明 UE 的状态为空闲状态；

[0428] 1(Active state) 表明 UE 的状态为激活状态。

[0429] √ UE 在激活状态下的切换时在层 3 附着程序的消息消息中增加“activeflag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时在层 3 附着程序的消息消息中不携带“active flag”信元指示不需要建立接入网侧的承载。或者 UE 在激活状态下的切换时将“active flag”信元设置为“True(1)”指示需要建立接入网侧的承载。在空闲状态下的切换时将“active flag”信元设置为“False(0)”指示不需要建立接入网侧的承载。

[0430] √ UE 在空闲状态下的切换时在层 3 附着程序的消息消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时在层 3 附着程序的消息消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。或者 UE 在空闲状态下的切换时将“Non-active flag”信元设置为“True(1)”指示不需要建立接入网侧的承载。在激活状态下的切换时将“Non-active flag”信元设置为“False(0)”指示需要建立接入网侧的承载。

[0431] 2)3GPP 网络侧第一网元上报：3GPP 网络侧第一网元在与 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间的接口消息中通知 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 本次层 3 附着程序是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式可以是：

[0432] √ 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加“Attach Type”信元指示 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 切换的处理类型。其中，Attach Type 以不同取值表明不同的处理类型：

[0433] 0 表明 (Idle Mode Handover) 空闲模式下的切换；

[0434] 1 表明 (Active Mode Handover) 激活状态下的切换；或者，

[0435] 对于激活状态下的优化切换或者预注册，3GPP 网络侧第一网元将“Attach Type”信元设置为“Optimized Handover（优化切换）”或者为“Pre-registration（预注册）”或者为“Handover（切换）”。Non-3GPP 网络中的接入网络或者 Non-3GPP GW 收到这个 Attach Type 后缺省认为层 3 附着程序是 UE 在激活状态下的切换流程。

[0436] √ 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加“Cause”信元表明导致层 3 附着程序消息的原因值。3GPP 网络侧第

一网元可以设置 Cause 原因值为：

[0437] “Idle Mode Handover”表明层 3 附着程序消息是由于空闲状态下的切换导致的；

[0438] “Active Mode Handover”表明层 3 附着程序消息是由于激活状态下的切换导致的；

[0439] √ 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加“UE State”信元将 UE 的状态上报。Non-3GPP 网络中的接入网络或者 Non-3GPP GW 根据 UE 的状态就能判断出空闲状态下的切换还是激活状态下的切换。UE 可以设置“UEState”为：

[0440] 0(Idle state) 表明 UE 的状态为空闲状态；

[0441] 1(Active state) 表明 UE 的状态为激活状态。

[0442] √ UE 在激活状态下的切换时 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加“activeflag”信元指示需要建立接入网侧的承载。在空闲状态下的切换时 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPPGW 之间接口的消息中不携带“active flag”信元指示不需要建立接入网侧的承载。

[0443] √ UE 在空闲状态下的切换时 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中增加“Non-active flag”信元指示不需要建立接入网侧的承载。在激活状态下的切换时 3GPP 网络侧第一网元在发送给 Non-3GPP 网络中的接入网络或者 Non-3GPP GW 之间接口的消息中不携带“Non-active flag”信元指示需要建立接入网侧的承载。

[0444] 值得说明的是：

[0445] Non-3GPP 网络中的接入网络或者 Non-3GPP GW 也可以在步骤 2 中获取切换处理类型信息。具体处理方式同步骤 3 中的处理。

[0446] 4、如果 Non-3GPP 接入网络发现 UE 是在激活状态下的切换，则 Non-3GPP 接入网络发送创建转发隧道请求消息到 Non-3GPP GW 请求数据转发资源。

[0447] 5、Non-3GPP GW 回创建转发隧道响应消息到 Non-3GPP 接入网络，消息中携带 Non-3GPP GW 的数据转发隧道信息（如对于 HRPD 网络来说，其数据转发隧道信息为 PDSN Address 和 PDSN GRE Key）。

[0448] 6、如果 Non-3GPP GW 发现 UE 是在激活状态下的切换，则 Non-3GPP GW 发送创建资源请求消息到 Non-3GPP 接入网元请求建立接入网侧资源。Non-3GPP 接入网元分配接入网侧资源，回创建资源响应消息到 Non-3GPPGW。

[0449] 7、如果 Non-3GPP 接入网元或者 Non-3GPP GW 发现 UE 是在激活状态下的切换，则 Non-3GPP 接入网元或者 Non-3GPP GW 发送切换命令到 3GPP 网络侧第一网元，消息中携带 Non-3GPP GW 的数据转发隧道信息。

[0450] 8、3GPP 网络侧第一网元收到切换命令后发送创建转发隧道请求消息到 Serving GW，请求 Serving GW 建立数据转发隧道资源，消息中携带 Non-3GPPGW 的数据转发隧道信息。Serving GW 创建数据转发隧道信息，回创建转发隧道响应消息到 3GPP 网络侧第一网元。

[0451] 9、3GPP 网络侧第一网元发送重定位命令消息到 3GPP 接入网元。

[0452] 3GPP 接入网元将收到的下行数据包转发给 Serving GW，Serving GW 将收到的转发数据包转发给 Non-3GPP GW。

[0453] 10、3GPP 接入网络发送切换命令消息到 UE，请求 UE 切换到 Non-3GPP 网络。

[0454] 11、UE 切换到 Non-3GPP 网络，发送接入消息通知 Non-3GPP 网络中的网元 UE 已经切换到 Non-3GPP 网络（具体的接入消息由特定的 Non-3GPP 网络确定，如对于 HRPD 网络来说，接入消息为 HRPD Traffic Channel Complete(TCC，传输通道完成）消息）。

[0455] 12、如果 Non-3GPP GW 和 PDN GW 之间的接口使用 PMIP 协议，则 Non-3GPP GW 发送代理绑定更新消息到 PDN GW。Non-3GPP GW 如果发现 UE 是在激活状态下的切换，则在代理绑定更新消息中增加指示位信息指示 PDN GW 不发起 UE 在源 3GPP 接入网络中的资源释放处理流程。这个指示位可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体处理方式同实施例 11 中的处理。

[0456] PDN GW 收到上述消息后不发起 UE 在源 3GPP 接入网络中的资源释放处理流程（即 3GPP 接入网络中的资源释放处理不是由 PDN GW 触发）。PDN GW 回代理绑定确认消息到 Non-3GPP GW。

[0457] 13、如果 UE 和 PDN GW 之间的接口使用基于主机移动性协议 (host-basedmobility protocol，如双栈移动因特网版本 6 协议 (DSMIPv6，Dual StackMIPv6))，则 UE 发送绑定更新消息到 PDN GW。UE 如果发现 UE 是在激活状态下的切换，则在绑定更新消息中增加指示位信息指示 PDN GW 不发起 UE 在源 3GPP 接入网络中的资源释放处理流程。这个指示位可以为优化切换或者预注册指示位或者资源不释放指示位。指示位的具体处理方式同实施例 11 中的处理。

[0458] PDN GW 收到上述消息后不发起 UE 在源 3GPP 接入网络中的资源释放处理流程（即 3GPP 接入网络中的资源释放处理不是由 PDN GW 触发）。PDN GW 回绑定确认消息到 UE。

[0459] 14、Non-3GPP 接入网元或者 Non-3GPP GW 发送切换完成消息到 3GPP 网络侧第一网元。

[0460] 15、3GPP 网络侧第一网元收到切换完成消息后发起 3GPP 网络侧的资源释放处理程序，删除 UE 在 3GPP 网络中使用的资源。

[0461] 值得说明的是：

[0462] 1、本发明实施例不限定步骤 5 和步骤 8 中的消息。如对于 HRPD 网络来说，步骤 5 中的消息也有可能为 A11 注册请求消息。

[0463] 实施例 13：切换处理类型通知处理方法也能应用到 3GPP 到 Non-3GPP 网络的正常切换处理。UE 在 Non-3GPP 网络的接入消息中将切换处理类型信息通知给 Non-3GPP GW，Non-3GPP GW 根据切换处理类型信息决定是否通知接入网建立接入网侧的资源。参见图 22 所示，包括下列步骤：

[0464] 1、UE 通过 Serving GW 和 PDN GW 接入到 3GPP 网络。

[0465] 2、UE 切换到 Non-3GPP 网络，执行 Non-3GPP 网络特定的附着程序、鉴权及认证程序。

[0466] 3、UE 通过 Non-3GPP 网络的接入网元触发 Non-3GPP 网络中的层 3 附着程序。Non-3GPP GW（如 HRPD 网络中的 PDSN) 获取切换处理类型信息。Non-3GPP GW 获取切换处理类型信息具体可以为：

[0467] UE 上报 :UE 在层 3 附着程序的消息中通知 Non-3GPP GW 本次流程是 UE 在空闲状态下的切换流程还是 UE 在激活状态下的切换流程。具体的通知方式同实施例 6 中的处理。

[0468] 值得说明的是 :

[0469] Non-3GPP GW 也可以在步骤 2 中获取切换处理类型信息。具体处理方式 同步骤 3 中的处理。

[0470] 4、如果 Non-3GPP GW 发现 UE 是在激活状态下的切换,则 Non-3GPP GW 发送创建资源请求消息到 Non-3GPP 接入网元请求建立接入网侧资源。Non-3GPP 接入网元分配接入网侧资源,回创建资源响应消息到 Non-3GPPGW。

[0471] 5、如果 Non-3GPP GW 和 PDN GW 之间的接口使用 PMIP 协议,则 Non-3GPP GW 发送代理绑定更新消息到 PDN GW。PDN GW 回代理绑定确认消息到 Non-3GPP GW。

[0472] 6、如果 UE 和 PDN GW 之间的接口使用客户移动因特网协议,则 UE 发送绑定更新消息到 PDN GW。PDN GW 回绑定确认消息到 UE。

[0473] 7、Non-3GPP GW 回层 3 附着完成消息到 UE。

[0474] 综上所述,采用本发明的实施例,网络侧网元获取 UE 的注册处理类型信息后可以进行区分的处理,能够解决现有机制下网络侧无法针对不同的注册流程区分处理的问题。

[0475] 显然,本领域的技术人员可以对本发明实施例进行各种改动和变型而不脱离本发明的精神和范围。这样,倘若本发明的这些修改和变型属于本发明权利要求及其等同技术的范围之内,则本发明也意图包含这些改动和变型在内。

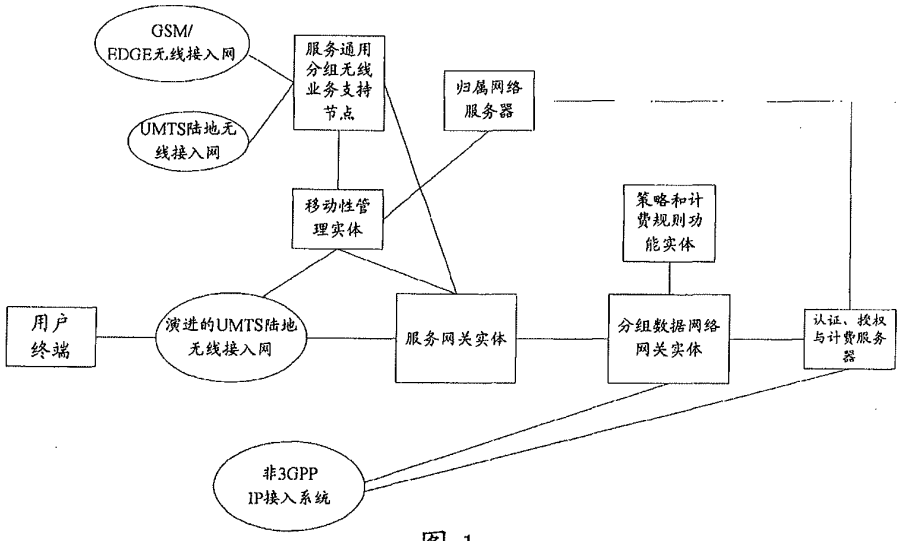


图 1

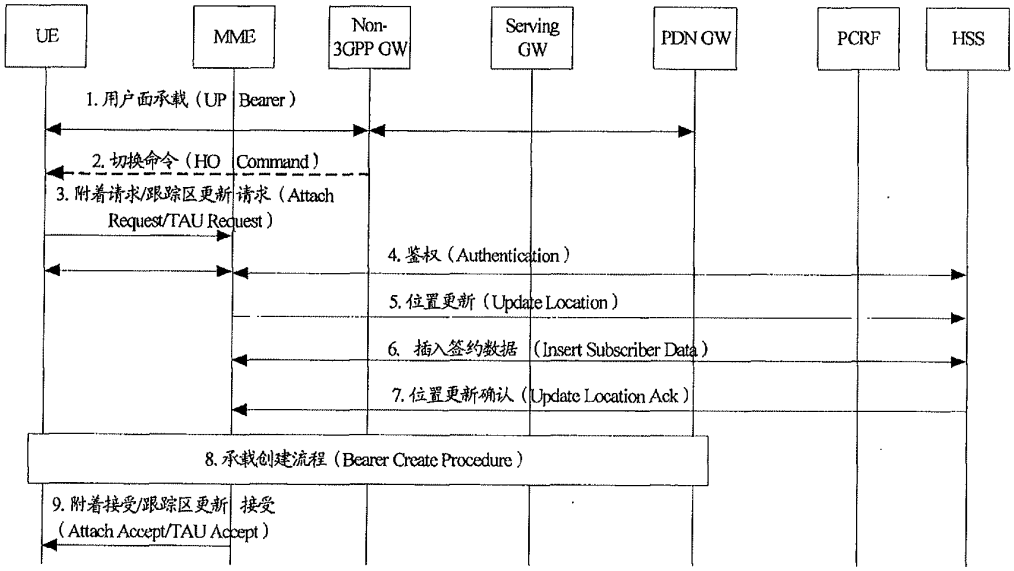


图 2

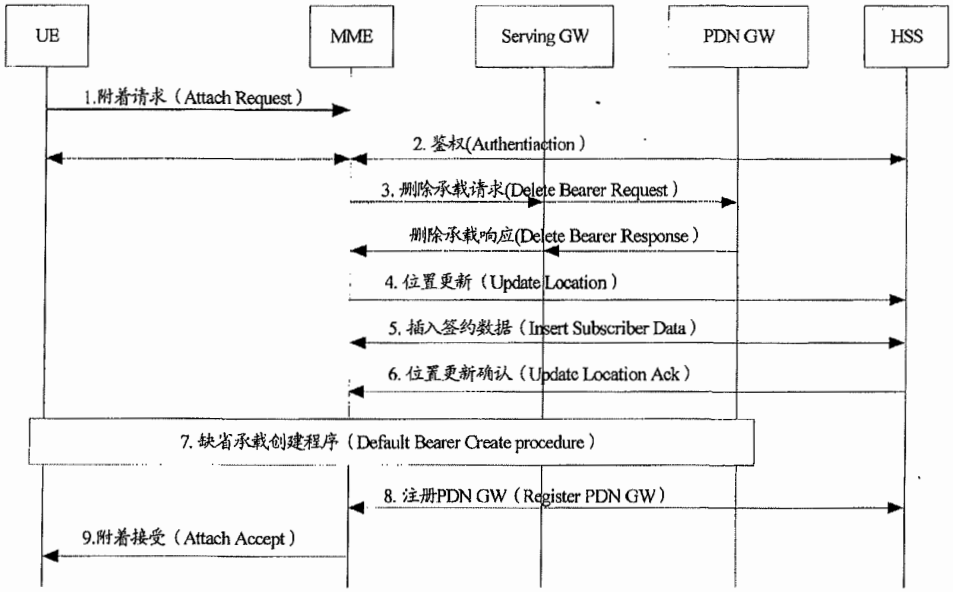


图 3

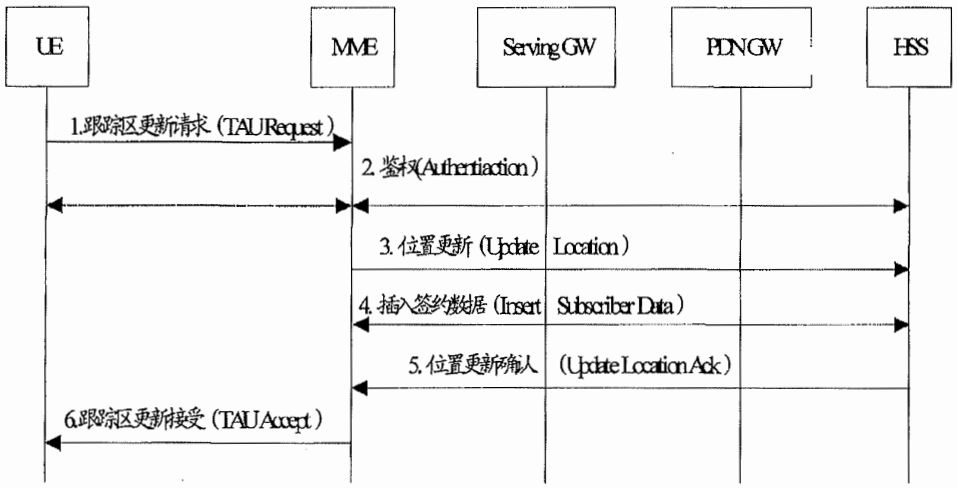
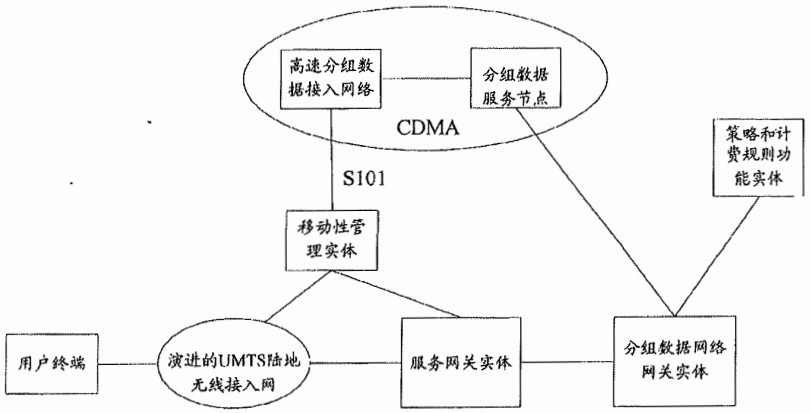


图 4



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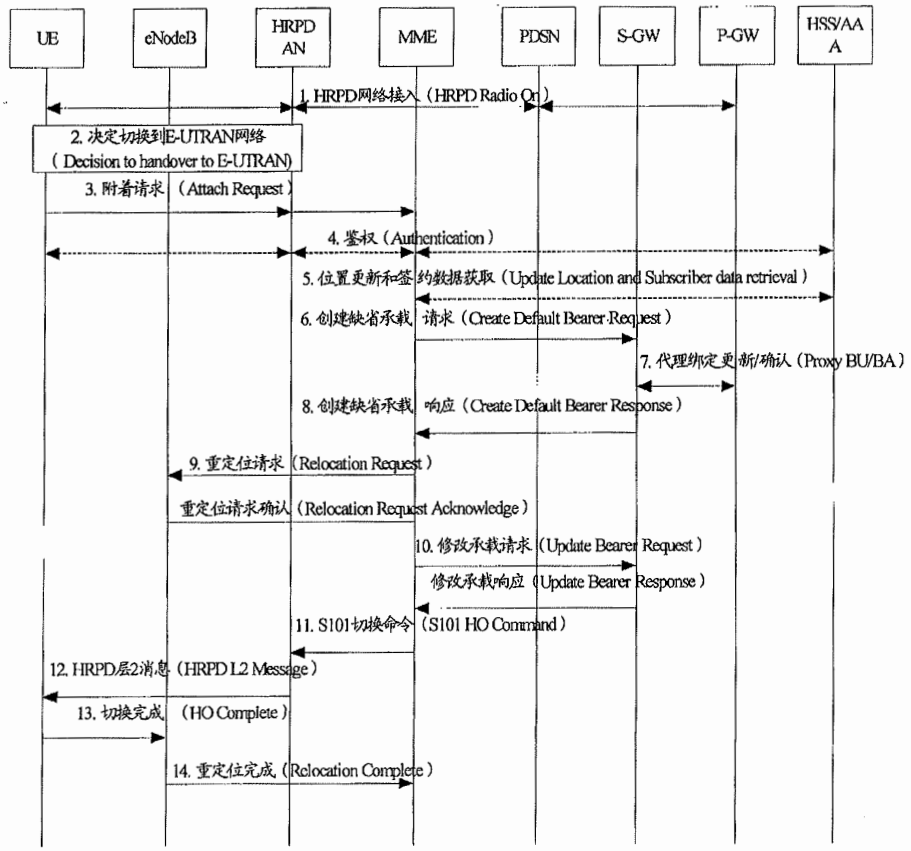

图 6

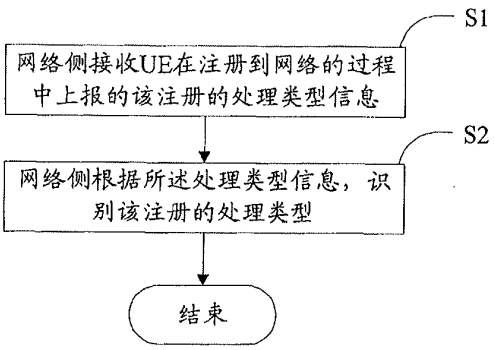

图 7

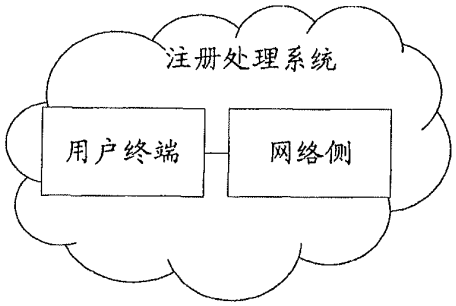

图 8

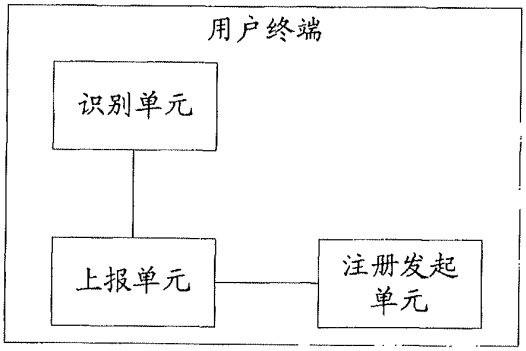

图 9

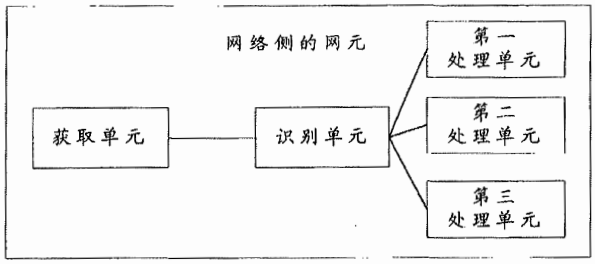

图 10

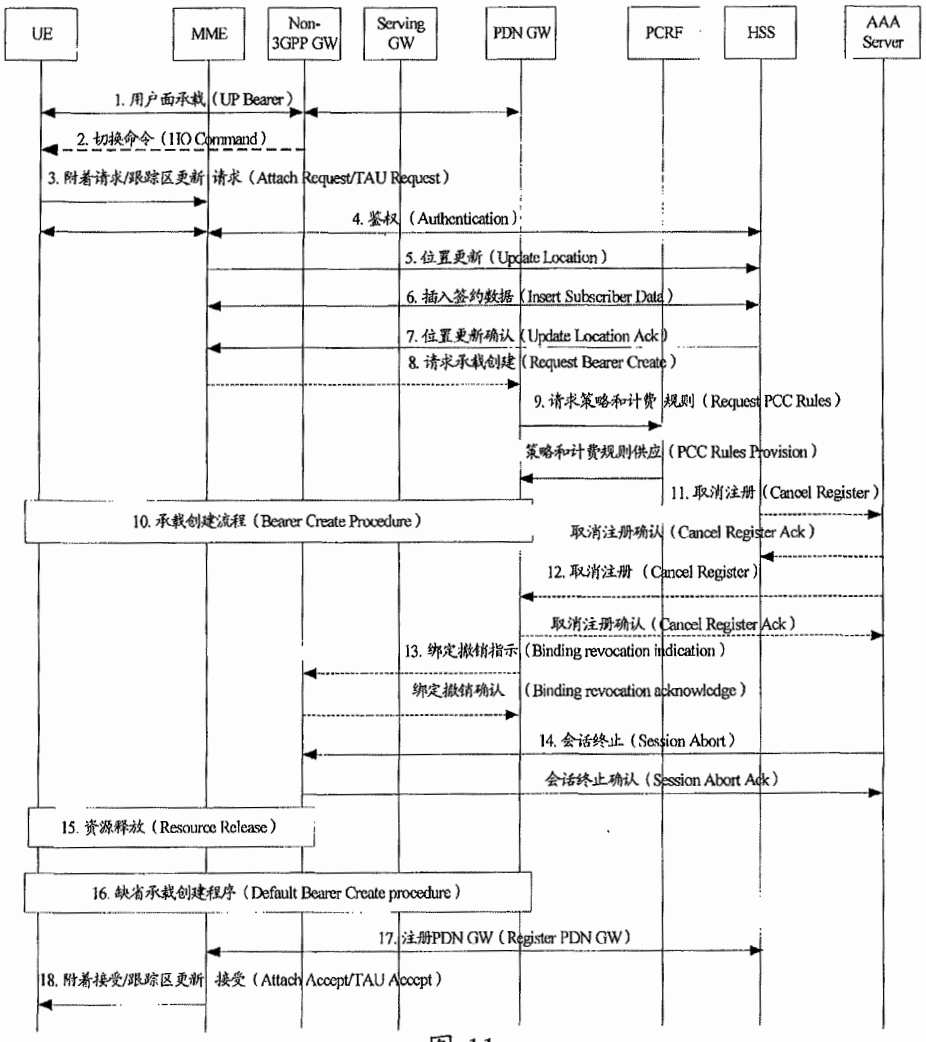

图 11

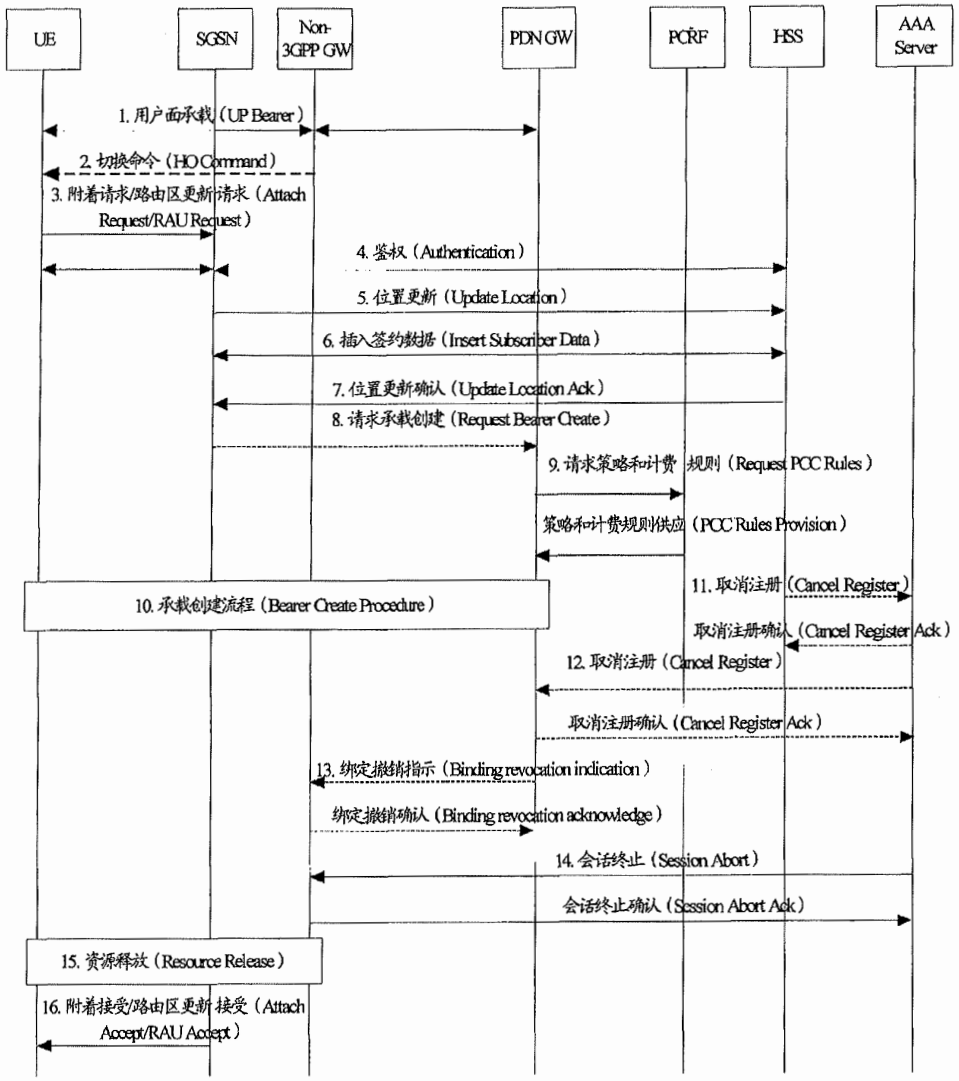

图 12

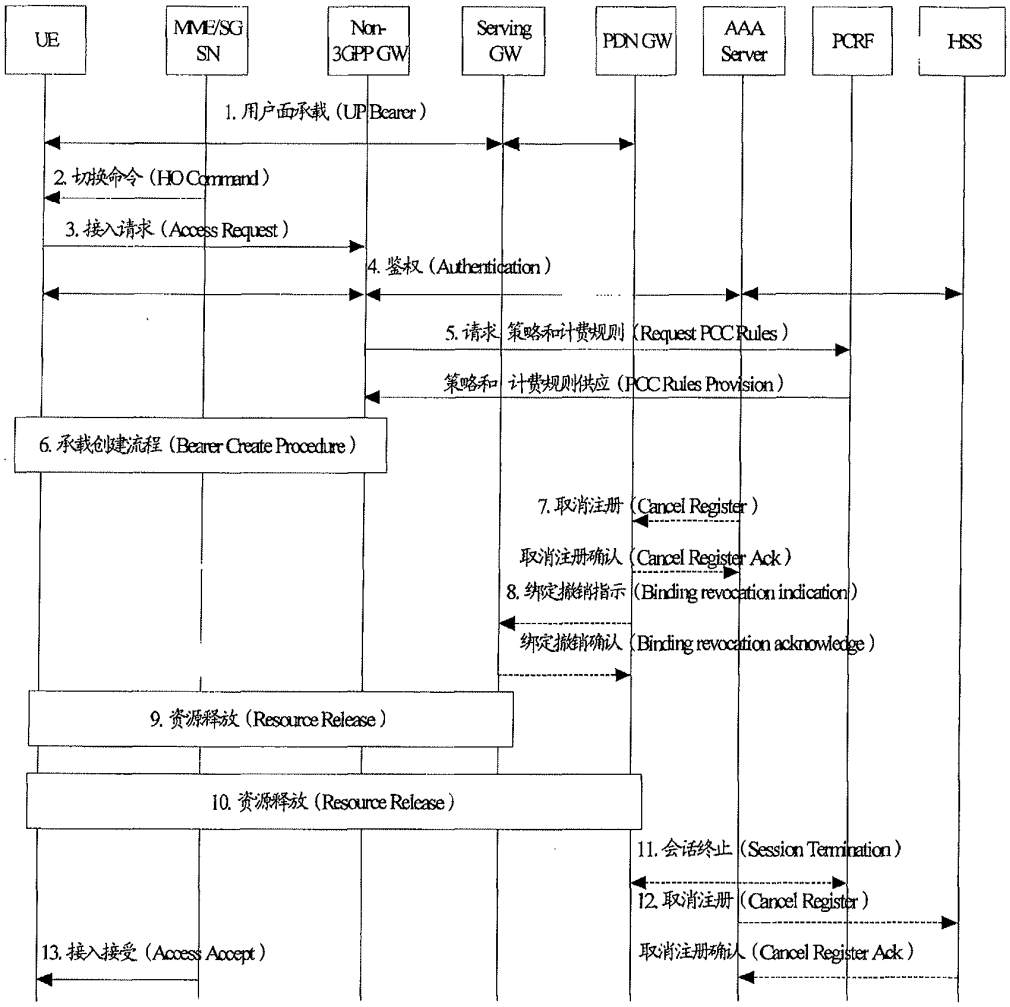

图 13

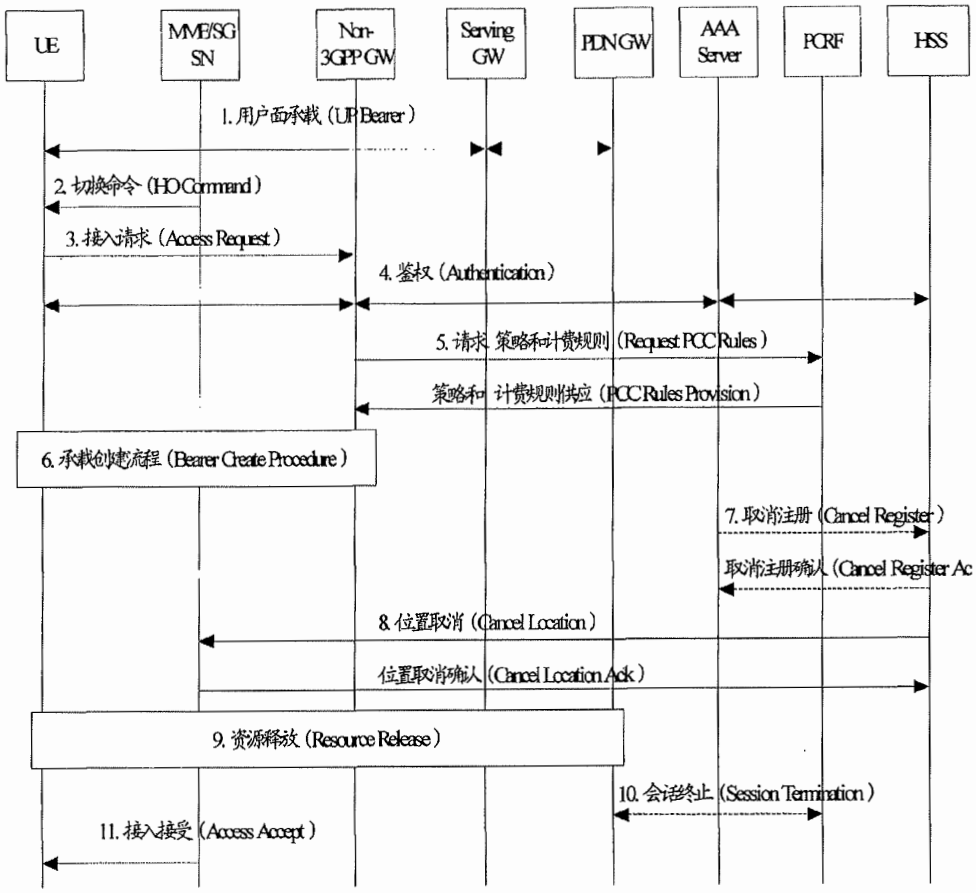

图 14

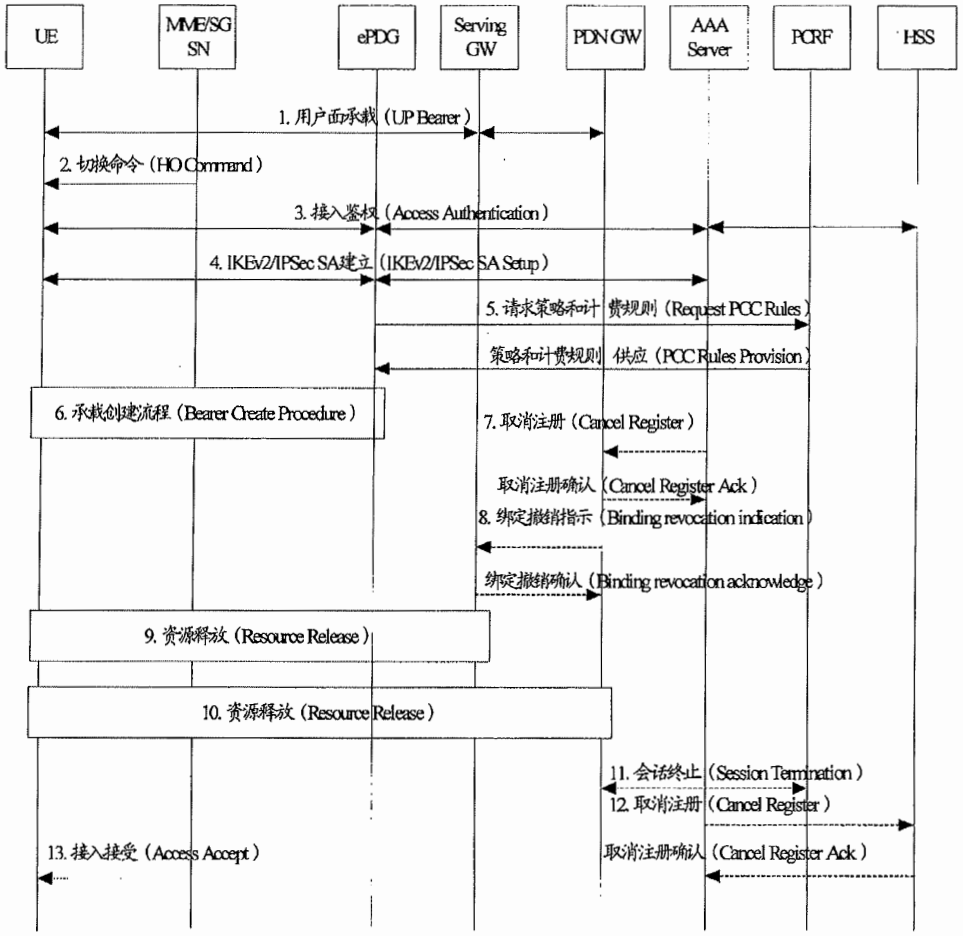

图 15

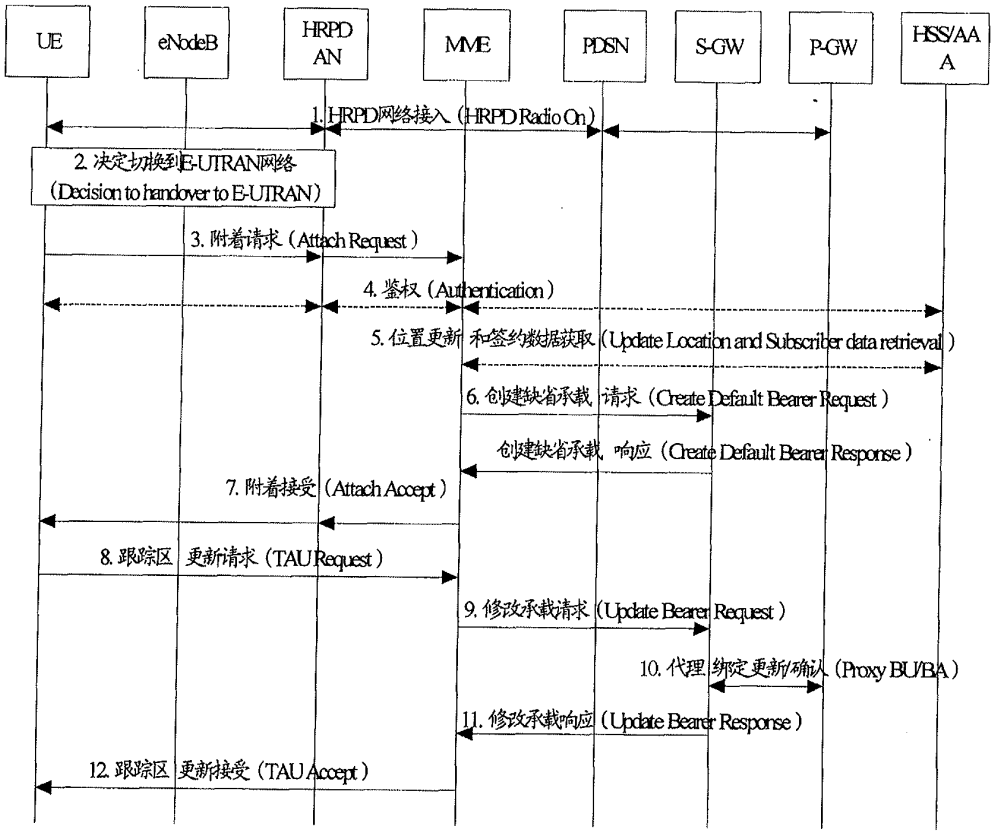

图 16

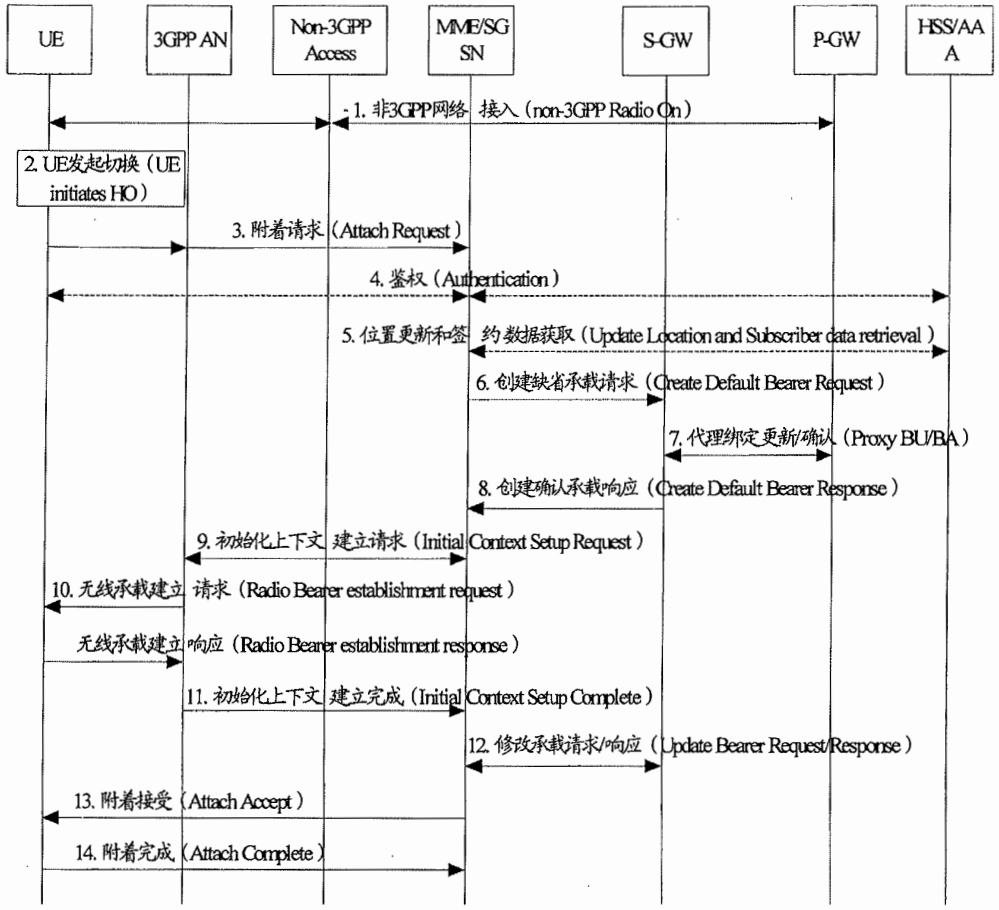

图 17

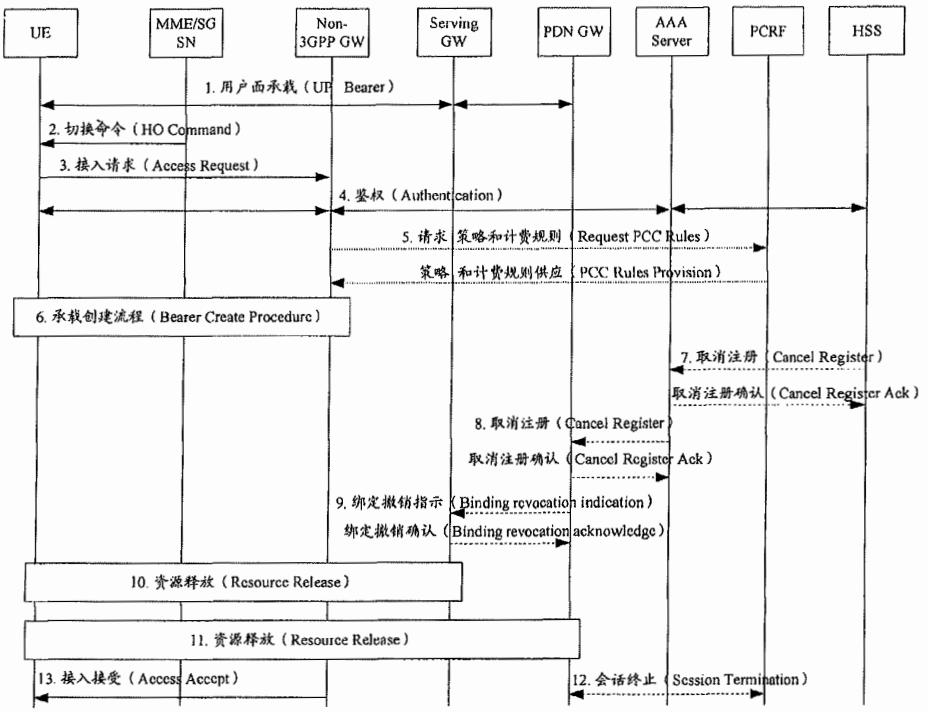

图 18

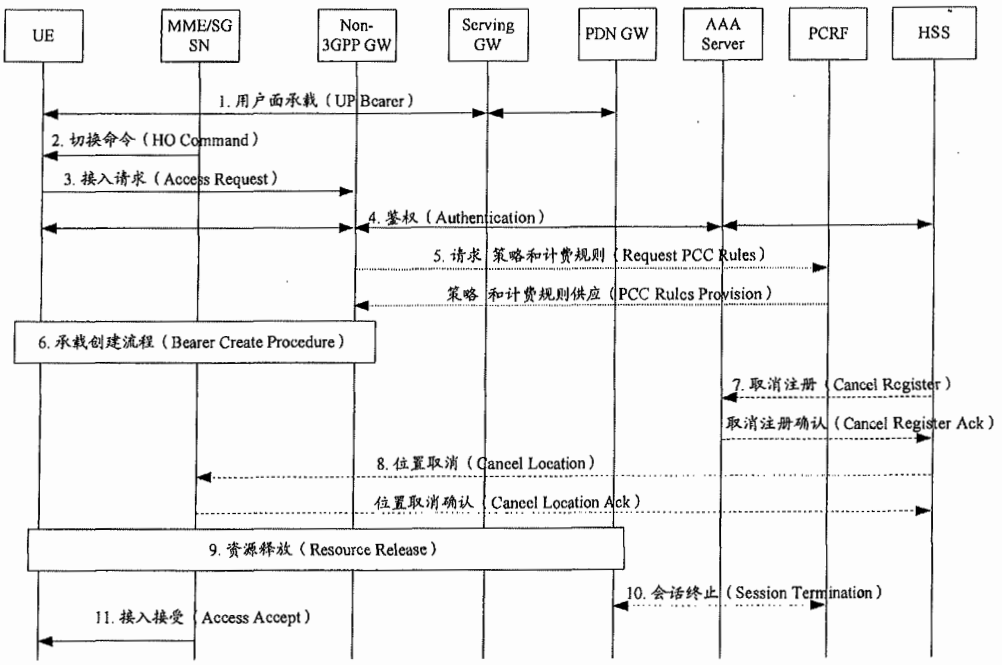

图 19

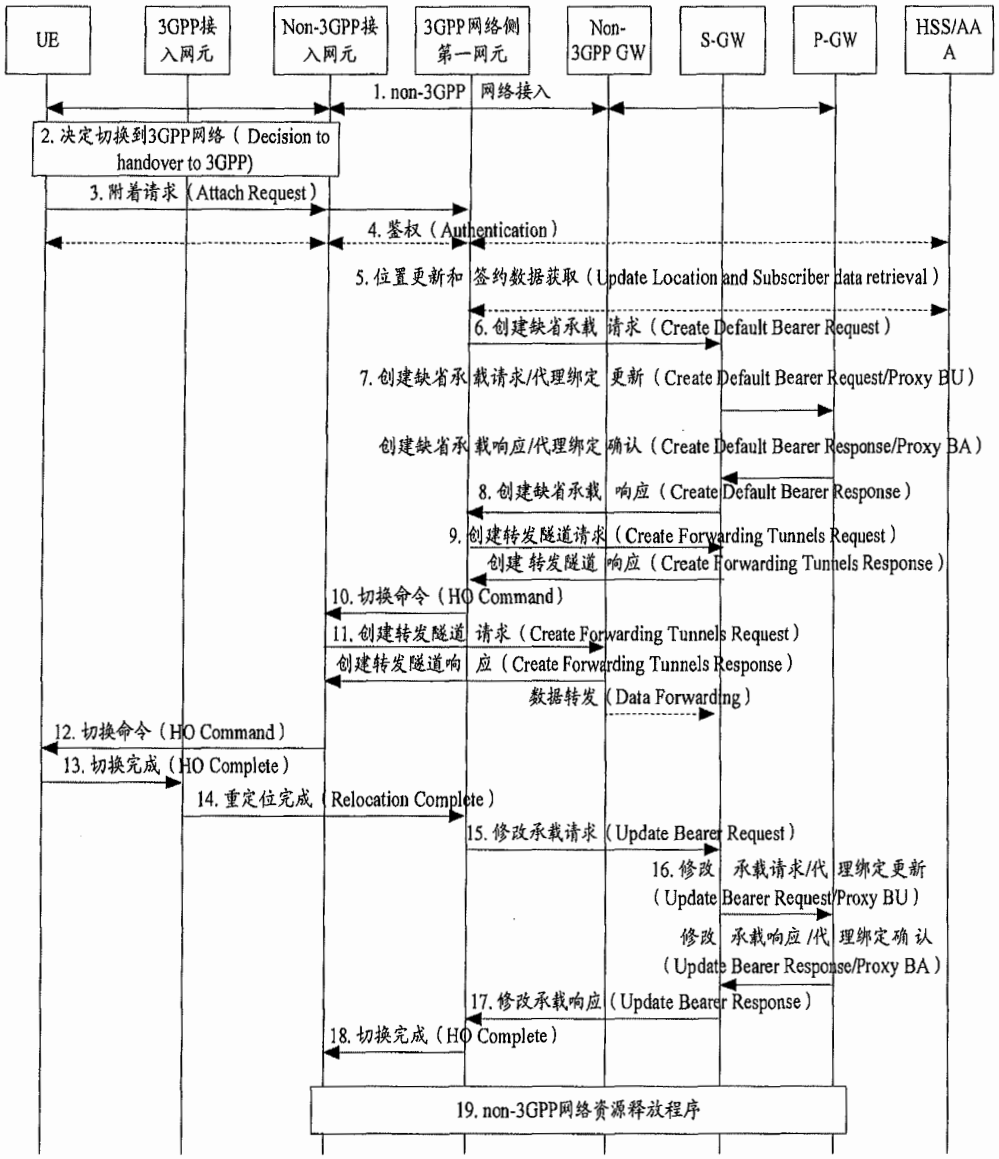

图 20

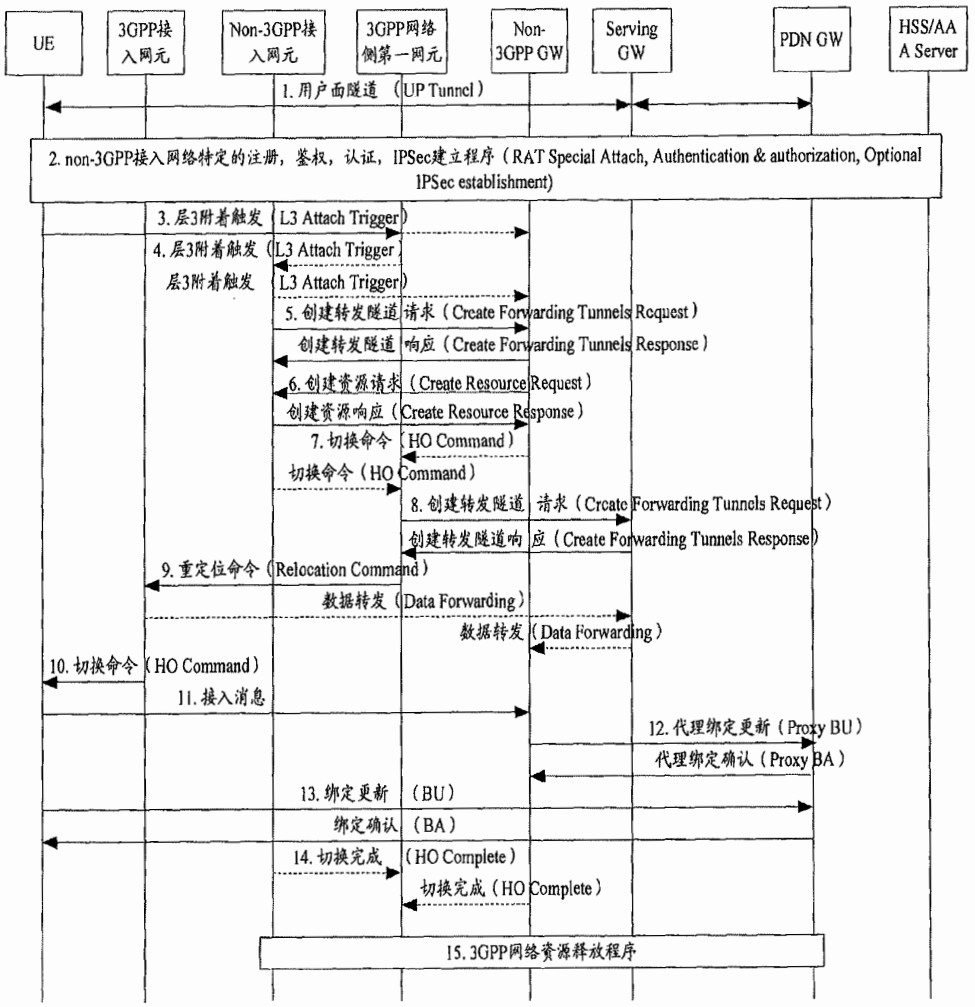

图 21

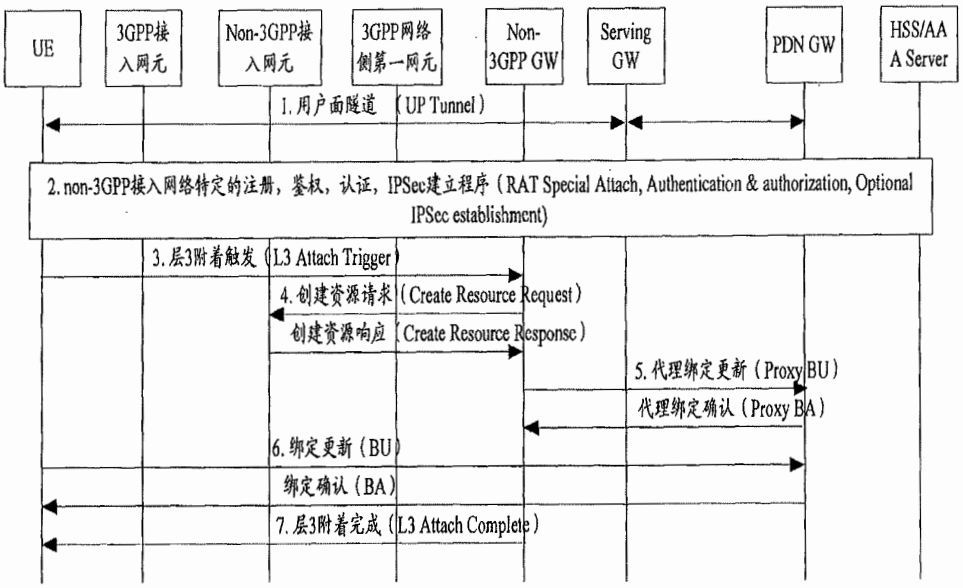

图 22

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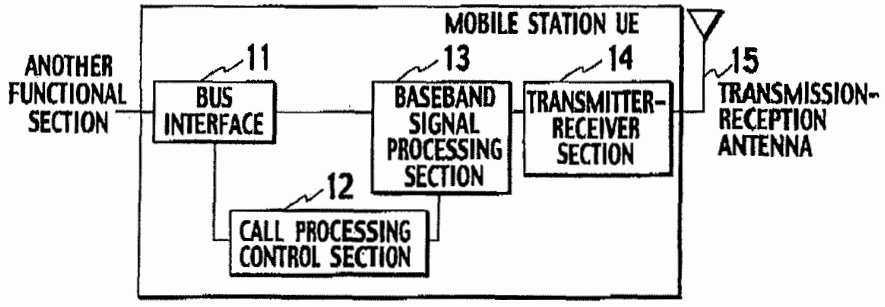
(54) Transmission power control method and mobile communication system

(57) A transmission power control method for controlling a transmission power of an E-AGCH including an absolute transmission rate of uplink user data, which is transmitted from a cell controlled by a radio base station to a mobile station, includes: notifying, from a radio network controller to the radio base station which controls a serving cell, an offset between the transmission power of the E-AGCH and a transmission power of a DPCH, when the mobile station is performing a soft-handover with the serving cell and non-serving cells; determining, at the serving cell to which the offset is notified, the transmission power of the E-AGCH based on the notified offset; and transmitting, at the serving cell, the E-AGCH to the mobile station using the determined transmission power.

FIG. 6



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Description

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application is based upon and claims the benefit of priority from the prior Japanese Patent Application No. P2005-274650, filed on August 24, 2005; the entire contents of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention relates to a transmission power control method and a mobile communication system for controlling a transmission power of an absolute transmission rate control channel including an absolute transmission rate of uplink user data, which is transmitted from a cell controlled by a radio base station to a mobile station.

2. Description of the Related Art

[0003] In a conventional mobile communication system, when setting a Dedicated Physical Channel (DPCH) between a mobile station UE and a radio base station Node B, a radio network controller RNC is configured to determine a transmission rate of uplink user data, in consideration of hardware resources for receiving of the radio base station Node B (hereinafter, hardware resource), a radio resource in an uplink (an interference volume in an uplink), a transmission power of the mobile station UE, a transmission processing performance of the mobile station UE, a transmission rate required for an upper application, or the like, and to notify the determined transmission rate of the uplink user data by a message of a layer-3 (Radio Resource Control Layer) to both of the mobile station UE and the radio base station Node B.

[0004] Here, the radio network controller RNC is provided at an upper level of the radio base station Node B, and is an apparatus configured to control the radio base station Node B and the mobile station UE.

[0005] In general, data communications often cause burst traffic compared with voice communications or TV communications. Therefore, it is preferable that a transmission rate of a channel used for the data communications is changed fast.

[0006] However, as shown in FIG. 1, the radio network controller RNC integrally controls a plurality of radio base stations Node B in general. Therefore, in the conventional mobile communication system, there has been a problem that it is difficult to perform fast control for changing of the transmission rate of uplink user data (for example, per approximately 1 through 100 ms), due to the increase of processing load and processing delay in the radio network controller RNC.

[0007] In addition, in the conventional mobile communication system, there has been also a problem that costs for implementing an apparatus and for operating a network are substantially increased even if the fast control for changing of the transmission rate of the uplink user data can be performed.

[0008] Therefore, in the conventional mobile communication system, control for changing of the transmission rate of the uplink user data is generally performed on the order from a few hundred ms to a few seconds.

[0009] Accordingly, in the conventional mobile communication system, when burst data transmission is performed as shown in FIG. 2A, the data are transmitted by accepting low-speed, ligh-delay, and low-transmission efficiency as shown in FIG. 2B, or, as shown in FIG. 2C, by reserving radio resources for high-speed communications to accept that radio bandwidth resources in an unoccupied state and hardware resources in the radio base station Node B are wasted.

[0010] It should be noted that both of the above-described radio bandwidth resources and hardware resources are applied to the vertical radio resources in FIGS. 2B and 2C.

[0011] Therefore, the 3rd Generation Partnership Project (3GPP) and the 3rd Generation Partnership Project 2 (3GPP2), which are international standardization organizations of the third generation mobile communication system, have discussed a method for controlling radio resources at high speed in a layer-1 and a media access control (MAC) sub-layer (a layer-2) between the radio base station Node B and the mobile station UE, so as to utilize the uplink radio resources effectively. Such discussions or discussed functions will be hereinafter referred to as "Enhanced Uplink (EUL)".

[0012] Referring to FIG. 3, the mobile communication system, to which the "Enhanced Uplink" is applied, is explained.

[0013] As shown in an example of FIG. 3, the cell #2 which is controlled by the radio base station Node B #1 is a serving cell for controlling the transmission rate of uplink user data of the mobile station UE mainly, and the cell #2 is configured to transmit an "Enhanced Absolute Grant Channel (E-AGCH)" which notifies an absolute transmission rate of the uplink user data, to the mobile station UE.

[0014] In addition, the above mobile communication system is configured to control the transmission rate of the uplink user data transmitted via an "Enhanced Dedicated Physical Channel (E-DPDCH)" based on the transmission rate control using the above described E-AGCH.

[0015] Further, in the above mobile communication system, a closed loop transmission power control using a "Transmit Power Control (TPC) command" is known, as an example of the transmission power control method for a downlink dedicated physical channel (herein after, DPCH) transmitted from the radio base station Node B.

[0016] Referring to FIG. 4A, the closed loop transmis-

sion power control using the TPC command is described.

[0017] As shown in FIG. 4A, the mobile station UE, which has received a downlink DPCH transmitted from the cell #2, is configured to determine the increase/decrease of a transmission power of the downlink DPCH in the cell #2 controlled by the radio base station Node B, based on the transmission power of the received downlink DPCH. Then, the mobile station UE is configured to transmit the determined result of the increase/decrease of the transmission power of the downlink DPCH to the cell #2, using the TPC command (for example, UP command/Down Command).

[0018] In addition, the cell #2 is configured to control the transmission power of the downlink DPCH to be transmitted to the mobile station UE, using the TPC command transmitted from the mobile station UE.

[0019] In the example of FIG. 4A, the cell #2 is a serving cell for controlling the transmission rate of the uplink user data transmitted from the mobile station UE mainly, and the cell #2 is configured to transmit the E-AGCH to the mobile station UE.

[0020] In addition, in the above mobile communication system, the cell #2 which is a serving cell for the mobile station UE is configured to determine the transmission power of the E-AGCH, based on the transmission power of the downlink DPCH and a predetermined offset (an E-AGCH offset).

[0021] As described above, in the mobile communication system, the reception power of the downlink DPCH in the mobile station UE will be improved by the transmission power control using the TPC command, and therefore, the reception power of the E-AGCH, which depends on the downlink DPCH, will be also improved.

[0022] Next, referring to FIG. 4B, the transmission power control using the TPC command in the mobile communication system in which soft-handover (SHO) is performed is described.

[0023] In the above mobile communication system, as shown in FIG. 4B, when the mobile station UE is performing the SHO by establishing radio links with the cell #3 as well as the cell #4, and when the mobile station UE receives the same DPCHs #1 transmitted from the cell #3 and the cell #4, the mobile station UE is configured to combine the DPCH #1 received from the cell #3 and the DPCH#1 received from the cell #4, so as to determine the increase/decrease of the transmission power of the DPCH #1 in both of the cell #3 and the cell #4, based on the reception power of the combined DPCH #1.

[0024] Then, the mobile station UE is configured to transmit the determined result of the increase/decrease of the transmission power of the DPCH #1 to the both of the cell #3 and the cell #4, using the TPC command.

[0025] Here, in the example of FIG. 4B, the cell #3 is a serving cell for the mobile station UE, and the cell #4 is a non-serving cell for the mobile station UE, which is a cell other than the serving cell and establishes a radio link with the mobile station UE. Accordingly, the mobile station UE is configured to receive the E-AGCH #1 which is transmitted from the serving cell #3.

[0026] In addition, in the above mobile communication system, the transmission power of the E-AGCH #1 transmitted from the cell #3 is configured to be determined, based on the transmission power of the DPCH #1 transmitted from the cell #3 and the predetermined offset (the E-AGCH offset).

[0027] Further, as shown in FIG. 4B, in the above mobile communication system, if the mobile station UE is performing the SHO by establishing the radio links with the cell #3 as well as the cell #4, and if the reception power of the DPCH #1 transmitted from the cell #3 is good enough, even when the reception power of the DPCH #1 transmitted from the cell #4 is insufficient, the reception power of the combined DPCH #1 will be sufficient for the mobile station UE.

[0028] Therefore, in the above mobile communication system, the mobile station UE can receive the DPCH #1, if the reception power of the DPCH #1 transmitted from the cell #3 is good enough, even when the reception power of the DPCH #1 transmitted from the cell #4 is insufficient.

[0029] Accordingly, in such a condition, the transmission power of the DPCH #1 does not have to be increased, and the mobile station UE is configured not to transmit the TPC command (for example, UP command) for increasing the transmission power of the DPCH #1 transmitted from the cell #4.

[0030] However, when the environment around the mobile station UE is changed in accordance with the moving of the mobile station UE, and the like, when the transmission power of the DPCH #1 transmitted from the serving cell #3 decreases, and when the transmission power of the DPCH #1 transmitted from the non-serving cell #4 increases, the mobile station UE does not have to increase the transmission power of the DPCH #1, as the transmission power of the DPCH #1 transmitted from the cell #4 is good enough.

[0031] Accordingly, the mobile station UE is not configured to transmit the TPC command (for example, UP command) for increasing the transmission power of the DPCH #1 transmitted from the cell #3, so that the reception power of the DPCH #1 transmitted from the serving cell #3 cannot be improved.

[0032] Here, the transmission power of the E-AGCH #1 transmitted from the cell #3 is determined, based on the transmission power of the DPCH #1 transmitted from the cell #3, and the predetermined offset (for example, by multiplying or adding the E-AGCH offset to the DPCH, and the like).

[0033] Accordingly, as shown in FIG. 5, the mobile station UE may not receive the E-AGCH #1, because the reception power of the E-AGCH #1 transmitted from the cell #3 is insufficient.

[0034] Therefore, there has been a problem that, when the SHO is performing in the mobile communication system, as shown in FIG. 5, the mobile station UE cannot control the transmission rate of the uplink user data of

the mobile station UE (such as E-DPDCH #1) based on the E-AGCH transmitted from the serving cell #3.

BRIEF SUMMARY OF THE INVENTION

[0035] The present invention has been made considering the problems, and its object is to provide a transmission power control method and a mobile communication system, in which E-AGCH can be certainly reached to a mobile station UE, even when the mobile station UE is performing the soft-handover.

[0036] A first aspect of the present invention is summarized as a transmission power control method for controlling a transmission power of an absolute transmission rate control channel including an absolute transmission rate of uplink user data, which is transmitted from a cell controlled by a radio base station to a mobile station, including: notifying, from a radio network controller to the radio base station which controls a serving cell, an offset between the transmission power of the absolute transmission rate control channel and a transmission power of a dedicated physical channel, when the mobile station is performing a soft-handover with the serving cell and non-serving cells; determining, at the serving cell to which the offset is notified, the transmission power of the absolute transmission rate control channel based on the notified offset; and transmitting, at the serving cell, the absolute transmission rate control channel to the mobile station using the determined transmission power.

[0037] In the first aspect, the radio network controller can be configured to notify, to the radio base station which controls the serving cell, the offset between the transmission power of the absolute transmission rate control channel and the transmission power of the dedicated physical channel, when the mobile station is not performing the soft-handover with the serving cell and non-serving cells.

[0038] A second aspect of the present invention is summarized as a mobile communication system for controlling a transmission power of an absolute transmission rate control channel including an absolute transmission rate of uplink user data, which is transmitted from a cell controlled by a radio base station to a mobile station, wherein a radio network controller is configured to notify, to the radio base station which controls a serving cell, an offset between the transmission power of the absolute transmission rate control Channel and a transmission power of a dedicated physical channel, when the mobile station is performing a soft-handover with the serving cell and non-serving cells, and the serving cell is configured to determine the transmission power of the absolute transmission rate control channel based on the notified offset, and to transmit the absolute transmission rate control channel to the mobile station using the determined transmission power.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0039]

FIG. 1 is diagram of an entire configuration of a general mobile communication system.

FIGs. 2A to 2C are diagrams for explaining a method for controlling a transmission power in a conventional mobile communication system.

FIG. **3** is a diagram of an entire configuration of the conventional mobile communication system.

FIGs. 4A and 4B are diagrams for explaining a transmission power control method in the conventional mobile communication system.

FIG. 5 is a diagram for explaining the transmission power control method in the conventional mobile communication system.

FIG. 6 is a functional block diagram of a mobile station in the mobile communication system according to the first embodiment of the present invention.

FIG. 7 is a functional block diagram of a baseband signal processing section of the mobile station in the mobile communication system according to the first embodiment of the present invention.

FIG. 8 is a diagram for explaining functions of the baseband signal processing section of the mobile station in the mobile communication system according to the first embodiment of the present invention.

FIG. 9 is a functional block diagram of a MAC-e functional section in the baseband signal processing section of the mobile station in the mobile communication system according to the first embodiment of the present invention.

FIG. 10 is a graph illustrating an operation of four channel stop and wait protocol performed by an HARQ processing section in the MAC-e finctional section in the baseband signal processing section of the mobile station in the mobile communication system according to the first embodiment of the present invention.

FIG. 11 is a functional block diagram of a layer-1 functional section in the baseband signal processing section of the mobile station in the mobile communication system according to the first embodiment of the present invention.

FIG. 12 is a diagram for explaining functions of the layer-1 functional section in the baseband signal processing section of the mobile station in the mobile communication system according to the first embodiment of the present invention.

FIG. **13** is a functional block diagram of a radio base station according to the first embodiment of the present invention.

FIG. 14 is a functional block diagram of a baseband signal processing section in the radio base station of the mobile communication system according to the first embodiment of the present invention.

FIG. 15 is a functional block diagram of a layer-1 functional section in the baseband signal processing section in the radio base station of the mobile communication system according to the first embodiment of the present invention.

FIG. 16 is a functional block diagram of a MAC-e functional section in the baseband signal processing section in the radio base station of the communication system according to the first embodiment of the present invention.

FIG. 17 is a functional block diagram of a radio network controller of the mobile communication system according to the first embodiment of the present invention.

FIG. 18 is a sequence diagram showing an example of a transmission power control method according to the first embodiment of the present invention.

FIG. 19 is a sequence diagram showing an example of the transmission power control method according to the first embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

(Configuration of Mobile Communication System According to First Embodiment of the Present Invention)

[0040] Referring to FIGs. 6 to 17, a configuration of a mobile communication system according to a first embodiment of the present invention will be described.

[0041] It should be noted that, the mobile communication system according to this embodiment is designed in order to increase a communication performance such as a communication capacity, a communication quality and the like. Further, the mobile communication system according to this embodiment can be applied to "W-CDMA" and "CDMA2000" of the third generation mobile communication system.

[0042] An example of general configuration of a mobile station UE according to this embodiment is shown in FIG. 6.

[0043] As shown in FIG. 6, the mobile station UE is provided with a bus interface 11, a call processing control section 12, a baseband signal processing section 13 , a transmitter-receiver section 14, and a transmission-reception antenna 15. In addition, the mobile station UE can be configured to include an amplifier section (not shown in FIG. 4).

[0044] However, these functions do not have to be independently present as hardware. That is, these functions can be partly or entirely integrated, or can be configured through a process of software.

[0045] In FIG. 7, a functional block of the baseband signal processing section 13 is shown.

[0046] As shown in FIG. 7, the baseband signal processing section 13 is provided with an upper layer functional section 131, a RLC functional section 132, a MAC-d functional section 133, a MAC-e functional section 134, and a layer-1 functional section 135.

[0047] The RLC functional section 132 is configured to work as a RLC sublayer. The layer-1 functional section 135 is configured to work as a layer-1.

[0048] As shown in FIG. 8, the RLC functional section 132 is configured to divide an application data (RLC SDU), which is received from the upper layer functional section 131, into PDUs of a predetermined PDU size. Then, the RLC functional section 132 is configured to generate RLC PDUs by adding a RLC header used for a sequence control processing, retransmission processing, and the like, so as to pass the RLC PDUs to the MAC-d functional section 133.

[0049] Here, a pipeline works as a bridge between the RLC functional section 132 and the MAC-d functional section 133 is a "logical channel". The logical channel is classified based on the contents of data to be transmitted/received, and when a communication is performed, it is possible to establish a plurality of logical channels in one connection. In other words, when the communication is performed, it is possible to transmit/receive a plurality of data with different contents (for example, control data and user data, or the like) logically in parallel.

[0050] The MAC-d functional section 133 is configured to multiplex the logical channels, and to add a MAC-d header associated with the multiplex of the logical channels, so as to generate a MAC-d PDU. A plurality of MAC-d PDUs are transferred from the MAC-d functional section 133 to the MAC-e functional section 134 as MAC-d flow.

[0051] The MAC-e functional section 134 is configured to assemble a plurality of MAC-d PDUs which are received from the MAC-d functional section 133 as MAC-d flow, and to add a MAC-e header to the assembled MAC-d PDU, so as to generate a transport block. Then, the MAC-e functional section 134 is configured to pass the generated transport block to the layer-1 functional section 135 through a transport channel.

[0052] In addition, the MAC-e functional section 134 is configured to work as a lower layer of the MAC-d functional section 133, and to implement the retransmission control function according to Hybrid ARQ (HARQ) and the transmission rate control function.

[0053] Specifically, as shown in FIG. 9, the MAC-e functional section 134 is provided with a multiplex section 134a, an E-TFC selecting section 134b, and an HARQ processing section 134c.

[0054] The multiplex section 134a is configured to perform a multiplex processing to the uplink user data, which is received from the MAC-d functional section 133 as MAC-d flow, based on a "Enhanced - Transport Format Indicator (E-TFI) "notified from the E-TFC selecting section 134b, so as to generate uplink user data (a Transport Block) to be transmitted via a transport channel (E-DCH). Then, the multiplex section 134a is configured to transmit the generated uplink user data (Transport Block) to the HARQ processing section 134c.

[0055] Hereinafter, the uplink user data received as MAC-d flow is indicated as the "uplink user data (MAC-

d flow)", and the uplink user data to be transmitted via the transport channel (E-DCH) is indicated as the "uplink user data (E-DCH)".

[0056] The E-TFI is an identifier of a transport format, which is a format for providing the transport block on the transport channel (E-DCH) per TTI, and the E-TFI is added to the MAC-e header.

[0057] The multiplex section 134a is configured to determine a transmission data block size to be applied for the uplink user data based on the E-TFI notified from the E-TFC selecting section 134b, and to notify the determined transmission data block size to the HARQ processing section 134c.

[0058] In addition, when the multiplex section 134a receives the uplink user data from the MAC-d functional section 133 as MAC-d flow, the multiplex section 134a is configured to notify, to the E-TFC selecting section 134b, E-TFC selecting information for selecting a transport format for the received uplink user data.

[0059] Here, the E-TFC selecting information includes data size and priority class of the uplink user data, or the like.

[0060] The HARQ processing section 134c is configured to perform the retransmission control processing for the "uplink user data (E-DCH)" according to the "N channel stop and wait (N-SAW) protocol", based on ACK/NACK for the uplink user data notified from the layer-1 functional section 135. An example for operations of the "4 channel stop and wait protocol" is shown in FIG. 10.

[0061] In addition, the HARQ processing section 134c is configured to transmit, to the layer-1 functional section 135, the "uplink user data (E-DCH)" received from the multiplex section 134a, and HARQ information (for example, a number for retransmission, and the like) used for the HARQ processing.

[0062] The E-TFC selecting section 134b is configured to determine the transmission rate of the uplink user data by selecting the transport format (E-TF) to be applied to the "uplink user data (E-DCH)".

[0063] Specifically, the E-TFC selecting section 134b is configured to determine whether the transmission of the uplink user data should be performed or stopped, based on scheduling information, the amount of data in MAC-d PDU, the condition of hardware resource of the radio base station Node B, and the like.

[0064] The scheduling information (such as absolute transmission rate and a relative transmission rate of the uplink user data) is received from the radio base station Node B, the amount of data in MAC-d PDU (such as data size of the uplink user data) is passed from the MAC-d functional section 133, and the condition of hardware resource of the radio base station Node B is controlled in the MAC-e functional section 134.

[0065] Then, the E-TFC selection section 134b is configured to select the transport format (E-TF) to be applied to transmission of the uplink user data, and to notify the E-TFI for identifying the selected transport format to the layer-1 functional section 135 and the multiplex section 134a.

[0066] For example, the E-TFC selecting section 134b is configured to store the transmission rate of uplink user data in association with the transport format, to update the transmission rate of uplink user data based on the scheduling information from the layer-1 functional section 135, and to notify, to the layer-1 functional section 135 and the multiplex section 134a, the E-TFI for identifying the transport format which is associated with the updated transmission rate of uplink user data.

[0067] Here, when the E-TFC selecting section 134b receives the absolute transmission rate of the uplink user data from the serving cell for the mobile station UE via the E-AGCH as the scheduling information, the E-TFC selecting section 134b is configured to change the transmission rate of the uplink user data to the received absolute transmission rate of the uplink user data.

[0068] In addition, when the E-TFC selecting section 134b receives the relative transmission rate of the uplink user data (Down command or Don't care command) from the non-serving cell for the mobile station UE via the E-RGCH as the scheduling information, the E-TFC selecting section 134b is configured to increase/decrease the transmission rate of the uplink user data, at the timing of receiving the relative transmission rate, by the predetermined rate based on the relative transmission rate of the uplink user data.

[0069] In this specification, the transmission rate of the uplink user data can be a rate which can transmit an uplink user data via an "Enhanced Dedicated Physical Data Channel (E-DPDCH)", a transmission data block size (TBS) for transmitting an uplink user data, a transmission power of an "E-DPDCH", or a transmission power ratio (a transmission power offset) between an "E-DPDCH" and a "Dedicated Physical Control Channel (DPCCH)".

[0070] As shown in FIG. 11, the layer-1 functional section 135 is provided with a transmission channel encoding section 135a, a physical channel mapping section 135b, an E-DPDCH transmitting section 135c, an E-DPCCH transmitting section 135d, an E-HICH receiving section 135e, an E-RGCH receiving section 135f, an E-AGCH receiving section 135g, a physical channel demapping section 135j, a DPDCH transmitting section 135i, a DPCCH transmitting section (not shown), and a DPCH receiving section 135h.

[0071] As shown in FIG. 12, the transmission channel encoding section 135a is provided with a FEC (Forward Error Correction) encoding section 135a1, and a transmission rate matching section 135a2.

[0072] As shown in FIG. 12, the FEC encoding section 135a1 is configured to perform the error correction encoding processing toward the "uplink user data (E-DCH)", that is, the transport block, transmitted from the MAC-e functional section 134.

[0073] In addition, as shown in FIG. 12, the transmission rate matching section 135a2 is configured to perform, toward the transport block to which the error cor-

rection encoding processing is performed, the processing of "repetition (repeat of bit) " and "puncture (bit skipping)" in order to match to the transmission capacity in the physical channel.

[0074] The physical channel mapping section 135b is configured to pair the "uplink user data (E-DCH)" from the transmission channel encoding section 135a with the E-DPDCH, and to pair the E-TFI and the HARQ information from the transmission channel encoding section 135a with the E-DPCCH.

[0075] The E-DPDCH transmitting section 135c is configured to perform a transmission processing of the E-DPDCH.

[0076] The E-DPCCH transmitting section 135d is configured to perform a transmission processing of the E-DPCCH.

[0077] The E-HICH receiving section 135e is configured to receive an "E-DCH HARQ Acknowledgement Indicator Channel (E-HICH)" transmitted from a cell (a serving cell or a non-serving cell for the mobile station UE).

[0078] The E-RGCH receiving section 135f is configured to receive the E-RGCH transmitted from the cell (the serving cell and the non-serving cell for the mobile station UE).

[0079] The E-AGCH receiving section 135g is configured to receive the E-AGCCH transmitted from the cell (the serving cell for the mobile station UE).

[0080] The physical channel de-mapping section 135j is configured to extract the scheduling information (the relative transmission rate of the uplink user data, that is, UP command/DOWN command) which is included in the E-RGCH received by the E-RGCH receiving section 135f, so as to transmit the extracted scheduling information to the MAC-e functional section 134.

[0081] In addition, the physical channel de-mapping section 135j is configured to extract the scheduling information (the absolute transmission rate of the uplink user data) which is included in the E-AGCH received by the E-AGCH receiving section 135g, so as to transmit the extracted scheduling information to the MAC-e functional section 134.

[0082] The DPDCH transmitting section 135i is configured to perform a transmission processing of an uplink "Dedicated Physical Data Channel (DPDCH)" for transmitting uplink user data to be transmitted by the mobile station UE.

[0083] Here, the above uplink user data includes a measurement report, which reports transmission power of a common pilot channel transmitted from the cell.

[0084] The DPCH receiving section 135h is configured to perform a receive processing of a downlink "Dedicated Physical Data Channel (DPCH)" transmitted from the cell.

[0085] Here, the DPCH includes a "Dedicated Physical Data Channel (DPDCH)" and a "Dedicated Physical Control Channel (DPCCH)".

[0086] FIG. 13 shows an example of a configuration of functional blocks of a radio base station Node B according to this embodiment.

[0087] As shown in FIG. 13, the radio base station Node B according to this embodiment is provided with an HWY interface 21, a baseband signal processing section 22, a transmitter-receiver section 23, an amplifier section 24, a transmission-reception antenna 25, and a call processing control section 26.

[0088] The HWY interface 21 is configured to receive downlink user data to be transmitted from the radio network controller RNC, which is located in an upper level of the radio base station Node B, so as to enter the received downlink user data to the baseband signal processing section 22.

[0089] In addition, the HWY interface 21 is configured to transmit uplink user data from the baseband signal processing section 22 to the radio network controller RNC.

[0090] The baseband signal processing section 22 is configured perform the layer-1 processing such as channel encoding processing, spreading processing, and the like, to the downlink user data, so as to transmit the baseband signal including the downlink user data to the transmitter-receiver section 23.

[0091] In addition, the baseband signal processing section 22 is configured to perform the layer-1 processing such as despreading processing, RAKE combining processing, error correction decoding processing, and the like, to the baseband signal, which is acquired from the transmitter-receiver section 23, so as to transmit the acquired uplink user data to the HWY interface 21.

[0092] The transmitter-receiver section 23 is configured to convert the baseband signal, which is acquired from the baseband signal processing section 22, to radio frequency signals.

[0093] In addition, the transmitter-receiver section 23 is configured to convert the radio frequency signals, which are acquired from the amplifier section 24, to the baseband signals.

[0094] The amplifier section 24 is configured to amplify the radio frequency signals acquired from the transmitter-receiver section 23, so as to transmit the amplified radio frequency signals to the mobile station UE via the transmission-reception antenna 25.

[0095] In addition, the amplifier section 24 is configured to amplify the signals received by the transmission-reception antenna 25, so as to transmit the amplified signals to the transmitter-receiver section 23.

[0096] The call processing control section 26 is configured to transmit / receive the call processing control signals to / from the radio network controller RNC, and to perform the processing of condition control of each function in the radio base station Node B, allocating hardware resource in layer-3, and the like.

[0097] FIG. 14 is a functional block diagram of the baseband signal processing section 22.

[0098] As shown in FIG. 14, the baseband signal processing section 22 is provided with a layer-1 functional section 221, and a MAC-e functional section 222.

[0099] As shown in FIG. 15, the layer-1 functional section 221 is provided with an E-DPCCH despreading-RAKE combining section 221a, an E-DPCCH decoding section 221b, an E-DPDCH despreading-RAKE combining section 221c, a buffer 221d, a re-despreading section 221e, an HARQ buffer 221f, an error correction decoding section 221g, a transmission channel encoding section 221h, a physical channel mapping section 221i, an E-HICH transmitting section 221j, an E-AGCH transmitting section 221k, an E-RGCH transmitting section 2211, a DPDCH respreading-RAKE combining section 221m, a DPDCH decoding section 221n, a DPCCH transmitting section (not shown), a DPCCH decoding section (not shown), and a DPCH transmitting section 221o.

[0100] However, these functions do not have to be independently present as hardware. That is, these functions can be partly or entirely integrated, or can be configured through a process of software.

[0101] The E-DPCCH despreading-RAKE combining section 221a is configured to perform the despreading processing and RAKE combining processing to the E-DPCCH.

[0102] The E-DPCCH decoding section 221b is configured to decode the E-TFCI for determining the transmission rate of the uplink user data (or an "Enhanced Transport Format and Resource Indicator (E-TFRI)" based on the output from the E-DPCCH despreading-RAKE combining section 221a, so as to transmit the decoded E-TFCI to the MAC-e functional section 222.

[0103] The E-DPDCH despreading-RAKE combining section 221c is configured to perform the despreading processing to the E-DPDCH using the spreading factor (the minimum spreading factor) and the number of multi-codes which correspond to the maximum rate that the E-DPDCH can use, so as to store the despread data to the buffer 221d. By performing the despreading processing using the above described spreading factor and the number of multi-codes, it is possible for the radio base station Node B to reserve the resources so that the radio base station Node B can receive the uplink data up to the maximum rate (bit rate) that the mobile station UE can use.

[0104] The re-despreading section 221e is configured to perform the re-despreading processing to the data stored in the buffer 221d using the spreading factor and the number of multi-codes which are notified from the MAC-e functional section 222, so as to store the re-despread data to the HARQ buffer 221f.

[0105] The error correction decoding section 221g is configured to perform the error correction decoding processing to the data stored in the HARQ buffer 221f based on the coding rate which is notified from the MAC-e functional section 222, so as to transmit the acquired "uplink user data (E-DCH)" to the MAC-e functional section 222.

[0106] The transmission channel encoding section 221h is configured to perform the necessary encoding processing to the ACK/NACK and the scheduling information for the uplink user data received from the MAC-e functional section 222.

[0107] The physical channel mapping section 221i is configured to pair the ACK/NACK for the uplink user data, which is acquired from the transmission channel encoding section 221h, with the E-HICH, to pair the scheduling information (absolute transmission rate), which is acquired from the transmission channel encoding section 221h, with the E-AGCH, and to pair the scheduling information (relative transmission rate), which is acquired from the transmission channel encoding section 221h, with the E-RGCH.

[0108] The E-HICH transmitting section 221j is configured to perform a transmission processing of the E-HICH.

[0109] The E-AGCH transmitting section 221k is configured to perform a transmission processing of the E-AGCH.

[0110] In addition, the E-AGCH transmitting section 221k is configured to determine the transmission power of the E-AGCH based on the first E-AGCH offset or the second E-AGCH offset, which are notified from the scheduling section 222c, and the transmission power of the downlink DPCH, and to transmit the E-AGCH using the determined transmission power.

[0111] To be more specific, the E-AGCH transmitting section 221k is configured to acquire the transmission power of the downlink DPCH from the DPCH transmitting section 221o, and to multiply or add the first E-AGCH offset or the second E-AGCH offset, which is notified from the scheduling section 222c, to the transmission power of the downlink DPCH, so as to determine the transmission power of the E-AGCH.

[0112] The E-RGCH transmitting section 2211 is configured to perform a transmission processing to the E-RGCH.

[0113] The DPDCH despreading-RAKE combining section 221m is configured to perform the despreading processing and the RAKE combining processing to the DPDCH.

[0114] The DPDCH decoding section 221n is configured to decode the uplink user data transmitted from the mobile station UE, based on the output from the DPDCH despreading-RAKE combining section 221m, so as to transmit the decoded uplink user data to the MAC-e functional section 222.

[0115] Here, the above uplink user data includes a measurement report, which reports reception power of a common pilot channel transmitted from the mobile station UE.

[0116] The DPCH transmitting section 221o is configured to perform a transmission processing to a "Dedicated Physical Channel (DPCH) " for downlink transmitted from the radio base station Node B.

[0117] In addition, the DPCH transmitting section 221o is configured to notify the transmission power of the downlink DPCH to the E-AGCH transmitting section 221k.

[0118] As shown in FIG. 16, the MAC-e functional sec-

tion 222 is provided with an HARQ processing section 222a, a receive processing command section 222b, a scheduling section 222c, and a de-multiplex section 222d.

[0119] The HARQ processing section 222a is configured to receive the uplink user data and the HARQ information which are received from the layer-1 functional section 221, so as to perform the HARQ processing on the "uplink user data (E-DCH)".

[0120] In addition, the HARQ processing section 222a is configured to notify, to the layer-1 functional section 221, the ACK/NACK (for the uplink user data) which shows the result of receive processing on the "uplink user data (E-DCH)".

[0121] In addition, the HARQ processing section 222a is configured to notify, to the scheduling section 222c, the ACK/NACK (for the uplink user data) per process.

[0122] The receive processing command section 222b is configured to notify, to the re-despreading section 221e and the HARQ buffer 221f, the spreading factor and the number of multi-codes for the transport format of each mobile station UE, which is specified by the E-TFCI per TTI received from the E-DPCCH decoding section 221b in the layer-1 functional section 221. Then, the receive processing command section 222b is configured to notify the encoding rate to the error correction decoding section 221g.

[0123] The scheduling section 222c is configured to change the absolute transmission rate or the relative transmission rate of the uplink user data, based on the E-TFCI per TTI received from the E-DPCCH decoding section 221 in the layer-1 functional section 221, the ACK/NACK per process received from the HARQ processing section 222a, the interference level, and the like.

[0124] In addition, the scheduling section 222c is configured to notify, to the layer-1 functional section 221, the absolute transmission rate or the relative transmission rate of the uplink user data, as the scheduling information.

[0125] In addition, the scheduling section 222c is configured to receive E-AGCH offset information which is transmitted from the radio network controller RNC via the HWY interface.

[0126] In addition, the scheduling section 222c is configured to notify the first E-AGCH offset or the second E-AGCH offset, which is included in the E-AGCH offset information, to the layer-1 functional section 221.

[0127] The de-multiplex section 222d is configured to perform the de-multiplex processing to the "uplink user data (E-DCH and DCH)" received from the HARQ processing section 222a, so as to transmit the acquired uplink user data to the HWY interface 21.

[0128] Here, the above uplink user data includes a measurement report, which reports reception power of a common pilot channel transmitted from the mobile station UE.

[0129] The radio network controller RNC according to this embodiment is an apparatus located in an upper level of the radio base station Node B, and is configured to control radio communications between the radio base station Node B and the mobile station UE.

[0130] As shown in FIG. 17, the radio network controller RNC according to this embodiment is provided with an exchange interface 31, a Logical Link Control (LLC) layer functional section 32, a MAC layer functional section 33, a media signal processing section 34, a radio base station interface 35, and a call processing control section 36.

[0131] The exchange interface 31 is an interface with an exchange 1, and is configured to forward the downlink signals transmitted from the exchange 1 to the LLC layer functional section 32, and to forward the uplink signals transmitted from the LLC layer functional section 32 to the exchange 1.

[0132] The LLC layer functional section 32 is configured to perform an LLC sub-layer processing such as a combining processing of a header or a trailer such as a sequence pattern number.

[0133] The LLC layer functional section 32 is also configured to transmit the uplink signals to the exchange interface 31 and to transmit the downlink signals to the MAC layer functional section 33, after the LLC sub-layer processing is performed.

[0134] The MAC layer functional section 33 is configured to perform a MAC layer processing such as a priority control processing or a header adding processing.

[0135] The MAC layer functional section 33 is also configured to transmit the uplink signals to the LLC layer functional section 32 and to transmit the downlink signals to the radio base station interface 35 (or the media signal processing section 34), after the MAC layer processing is performed.

[0136] The media signal processing section 34 is configured to perform a media signal processing against voice signals or real time image signals.

[0137] The media signal processing section 34 is also configured to transmit the uplink signals to the MAC layer functional section 33 and to transmit the downlink signals to the radio base station interface 35, after the media signal processing is performed.

[0138] The radio base station interface 35 is an interface with the radio base station Node B. The radio base station interface 35 is configured to forward the uplink signals transmitted from the radio base station Node B to the MAC layer functional section 33 (or the media signal processing section 34) and to forward the downlink signals transmitted from the MAC layer functional section 33 (or the media signal processing section 34) to the radio base station Node B.

[0139] The call processing control section 36 is configured to perform a radio resource control processing, a channel setup and release processing by the layer-3 signaling, or the like. Here, the radio resource control includes call admission control, handover control, or the like.

[0140] In addition, the call processing control section 36 is configured to notify the E-AGCH offset information

to the radio base station Node B via the radio base station interface 35.

[0141] In addition, as shown in FIG. 17, the call control section 36 is configured to store a transmission power ratio between the E-AGCH and the DPCH, as the first E-AGCH offset 37 or the second E-AGCH offset 37.

[0142] Further, the call processing control section 36 is configured to generate the E-AGCH offset information which includes the second E-AGCH offset, when the mobile station UE is performing the SHO, by establishing the radio links with a plurality of cells.

[0143] Furthermore, the call processing control section 36 is configured to generate the E-AGCH offset information which includes the first E-AGCH offset, when the mobile station UE is not performing the SHO, and is establishing the radio link with one cell.

[0144] The radio links according to this embodiment includes the DPCH or the E-DPDCH between the mobile station UE and the radio base station Node B.

[0145] Therefore, in this embodiment, the state in which the mobile station UE is establishing the radio link with one cell is indicated as "a Non-SHO state", and the state in which the mobile station UE is establishing the radio links with a plurality of cells is indicated as "a SHO state".

[0146] Each of the first E-AGCH offset and the second E-AGCH offset is the transmission power ratio between the E-AGCH and the DPCH, and it is configured that the second E-AGCH offset should be greater than the first E-AGCH offset.

(Operations of Mobile Communication System According to First Embodiment of the Present Invention)

[0147] Referring to FIGs. 18 and 19, operations of the mobile communication system according to this embodiment will be described.

[0148] Specifically, the operations of controlling a transmission power of an absolute transmission rate control channel (E-AGCH) for uplink user data in the mobile communication system according to this embodiment will be described.

[0149] Here, in this embodiment, examples where a radio base station Node B is configured to control one or a plurality of cells, the cells include the functions of the radio base station Node B will be described.

[0150] In FIG. 18 and FIG. 19, the cell #10 is a serving cell for the mobile station UE, and the cell #20 is a non-serving cell for the mobile station UE. Accordingly, the mobile station UE is configured to control the transmission rate of the uplink user data, based on the E-AGCH transmitted from the serving cell #10.

[0151] In this embodiment, it can be configured that both of cell #10 and cell #20 are controlled by a same single radio base station Node B, or the each of cell #10 and cell #20 is controlled by different radio base stations Node B.

[0152] As a first example, operation of controlling a transmission power of an E-AGCH by a cell #10, when a mobile station UE is shifting from the Non-SHO state, where the radio link with only the cell #10 is established, to the condition of SHO, where the radio links with the cell #10 as well as a cell #20 are established, will be described.

[0153] As shown in FIG. 18, in step S1001, the mobile station UE is establishing a data connection for transmitting uplink user data with the radio network controller RNC via the cell #10.

[0154] In this case, the cell #10 is configured to determine the transmission power of the E-AGCH, based on the transmission power of the downlink DPCH and the first E-AGCH offset.

[0155] To be more specific, the cell #10 is configured to multiply or add the first E-AGCH offset which is included in the E-AGCH offset information transmitted from the radio network controller RNC in advance, to the downlink DPCH to which the closed loop transmission power control is performed, so as to determine the transmission power of the E-AGCH.

[0156] In step S1002, when the reception power of the common pilot signal from the cell #20 become more than or equal to the predetermined value, the mobile station UE transmits a measurement report to the radio network controller RNC.

[0157] In step S1003, the radio network controller RNC requests the radio base station Node B #2 which controls the cell #20 to establish synchronization of radio links for uplink between the mobile station UE and the cell #20, based on the transmitted measurement report.

[0158] To be more specific, the radio network controller RNC transmits a SHO setting request to the radio base station Node #2 which controls the cell #20, so as to request to establish synchronization of the radio links for uplink between the mobile station UE and the cell #20.

[0159] The SHO setting request includes a channelization code for identifying the channel configuration in the radio link, and a scrambling code for identifying the mobile station UE.

[0160] In step S1004, the radio base station Node B #2 which controls the cell #20 establishes the synchronization of the radio links for uplink between the mobile station UE and the cell #20.

[0161] To be more specific, in the radio link for uplink, the radio base station Node B #2 which controls the cell #20 detects the channel transmitted by the mobile station UE using the channelization code and the scrambling code received from the radio network controller RNC, so as to establish the synchronization of the radio links for uplink between the mobile station UE and the cell #20.

[0162] When the synchronization of the radio links for uplink between the mobile station UE and the cell #20 is established, the radio base station Node B #2 which controls the cell #20 transmits a SHO setting response to the radio network controller RNC. In addition, in the downlink, the cell #20 starts the transmission of the DPCH and the like to the mobile station UE.

[0163] In step S1005, the radio network controller RNC requests the mobile station UE to establish synchronization of radio links for downlink between the cell #20 and the mobile station UE. To be more specific, the radio network controller RNC transmits a SHO setting request to the mobile station UE, so as to request to establish the synchronization of radio links or downlink between the cell #20 and the mobile station UE.

[0164] Here, the SHO setting request includes a channelization code for identifying the channel configuration in the radio link for downlink, and a scrambling code for identifying the cell #20.

[0165] In step S1006, the mobile station UE establishes the synchronization of radio links for downlink between the cell #20 and the mobile station UE.

[0166] To be more specific, in the radio link for downlink, the mobile station UE detects the channel transmitted from the cell #20 using the channelization code and the scrambling code received from the radio network controller RNC, so as to establish the synchronization of the radio links for downlink between the cell #20 and the mobile station UE.

[0167] When the synchronization of the radio links for downlink between the cell #20 and the mobile station UE is established, the mobile station UE transmits a SHO setting response to the radio network controller RNC.

[0168] In step S1007, the radio network controller RNC transmits the E-AGCH offset information including the second E-AGCH offset, to the radio base station Node B #1 which controls the cell #10 (the serving cell for the mobile station UE).

[0169] The E-AGCH offset information may be transmitted to the radio base station Node B, by the SHO setting request.

[0170] In step S1008, the cell #10 determines the transmission power of the E-AGCH, based on the second E-AGCH offset which is included in the E-AGCH offset information transmitted from the radio network controller RNC.

[0171] Here, the second E-AGCH offset transmitted from the radio network controller RNC is set to be greater than the first E-AGCH offset.

[0172] Accordingly, when the mobile station UE, i.e., the destination of the E-AGCH, is performing the SHO, the cell #10 sets the E-AGCH offset greater, and to increase the transmission power of the E-AGCH, so as to ensure the transmission of the E-AGCH to the mobile station UE which is performing the SHO.

[0173] As a second example, operation of controlling the transmission power of the E-AGGH by the cell #10, when the mobile station UE is shifting from the SHO state, where the radio links with the cell #10 as well as a cell #20 are established, to the Non-SHO state, where the radio link with only the cell #10 is established, will be described.

[0174] As shown in FIG. 19, in step S2001, when the reception power of the common pilot signal from the cell #20 become less than the predetermined value, the mobile station UE transmits a measurement report to the radio network controller RNC.

[0175] In step S2002, the radio network controller RNC requests the radio base station Node B #2 which controls the cell #20 to release the radio links for uplink between the mobile station UE and the cell #20, based on the transmitted measurement report.

[0176] In addition, the radio network controller RNC transmits a SHO release request to the mobile station UE, so as to release the radio link for downlink between the cell #20 and the mobile station UE.

[0177] In step S2003, the radio network controller RNC transmits the E-AGCH offset information including the first E-AGCH offset to the radio base station Node B #1.

[0178] In step S2004, the cell #10, which has received the E-AGCH offset information, determines the transmission power of the E-AGCH, based on the first E-AGCH offset included in the E-AGCH offset information and the transmission power of the downlink DPCH.

[0179] Accordingly, when the mobile station UE, i.e., the destination of the E-AGCH, is not performing the SHO, the cell #10 is configured to minimize the E-AGCH offset in the Non-SHO state appropriately, and to adjust the transmission power of the E-AGCH, so as to use the radio network capacity effectively.

[0180] In the mobile communication system according to this embodiment, the example that the radio network controller RNC transmits the E-AGCH offset information including the second E-AGCH offset, when the mobile station UE is performing the SHO, is shown.

[0181] However, in the present invention, the radio network controller RNC can be configured to transmit the E-AGCH offset information including the second E-AGCH offset based on the predetermined notification from the mobile station UE and the cell (for example, a predetermined measurement report from the mobile station DE, and the like).

(Effects of Mobile Communication System according to First embodiment of the Present invention)

[0182] According to the transmission power control method and the mobile communication system of the present invention, it is possible to transmit the E-AGCH to the mobile station UE, even when the mobile station UE is performing the SHO.

[0183] In other words, according to the transmission power control method and the mobile communication system of the present invention, when the mobile station UE is performing the SHO, the cell or the radio base station Node B which controls the cell can set the E-AGCH offset greater, and increase the transmission power of the E-AGCH greater. Therefore, it is possible to ensure the transmission of the E-AGCH to the mobile station UE.

[0184] Additional advantages and modifications will readily occur to those skilled in the art. Therefore, the invention in its broader aspects is not limited to the spe-

cific details and the representative embodiments shown and described herein. Accordingly, various modifications may be made without departing from the scope of the general inventive concept as defined by the appended claims and their equivalents.

Claims

1. A transmission power control method for controlling a transmission power of an absolute transmission rate control channel including an absolute transmission rate of uplink user data, which is transmitted from a cell controlled by a radio base station to a mobile station, comprising:

   notifying, from a radio network controller to the radio base station which controls a serving cell, an offset between the transmission power of the absolute transmission rate control channel and a transmission power of a dedicated physical channel, when the mobile station is performing a soft-handover with the serving cell and non-serving cells;
   determining, at the serving cell to which the offset is notified, the transmission power of the absolute transmission rate control channel based on the notified offset; and
   transmitting, at the serving cell, the absolute transmission rate control channel to the mobile station using the determined transmission power.

2. The transmission power control method according to claim 1, wherein the radio network controller is configured to notify, to the radio base station which controls the serving cell, the offset between the transmission power of the absolute transmission rate control channel and the transmission power of the dedicated physical channel, when the mobile station is not performing the soft-handover with the serving cell and non-serving cells.

3. A mobile communication system for controlling a transmission power of an absolute transmission rate control channel including an absolute transmission rate of uplink user data, which is transmitted from a cell controlled by a radio base station to a mobile station, wherein
   a radio network controller is configured to notify, to the radio base station which controls a serving cell, an offset between the transmission power of the absolute transmission rate control Channel and a transmission power of a dedicated physical channel, when the mobile station is performing a soft-handover with the serving cell and non-serving cells, and the serving cell is configured to determine the transmission power of the absolute transmission rate control channel based on the notified offset, and to transmit the absolute transmission rate control channel to the mobile station using the determined transmission power.

FIG. 1

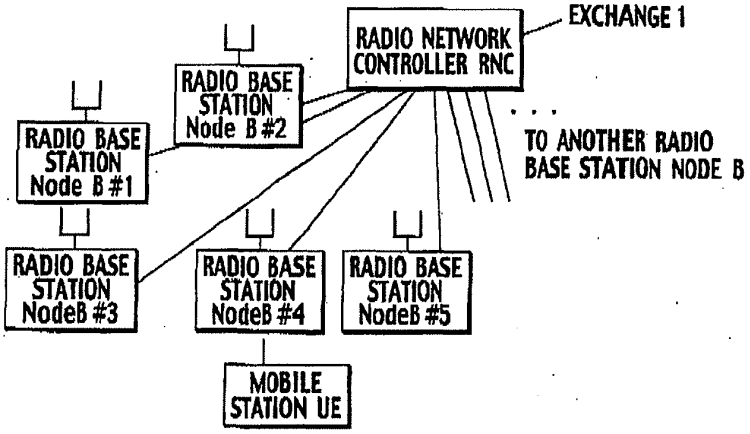


FIG. 2A

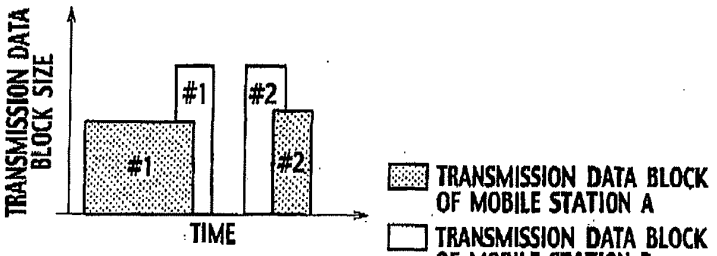


FIG. 2B

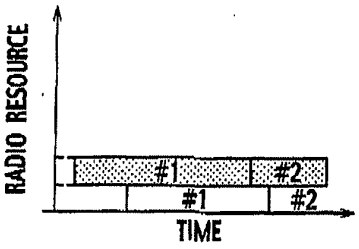


FIG. 2C

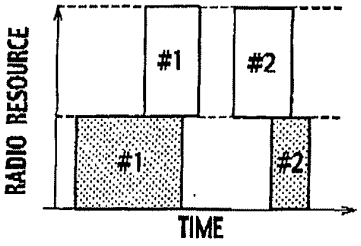


FIG. 3

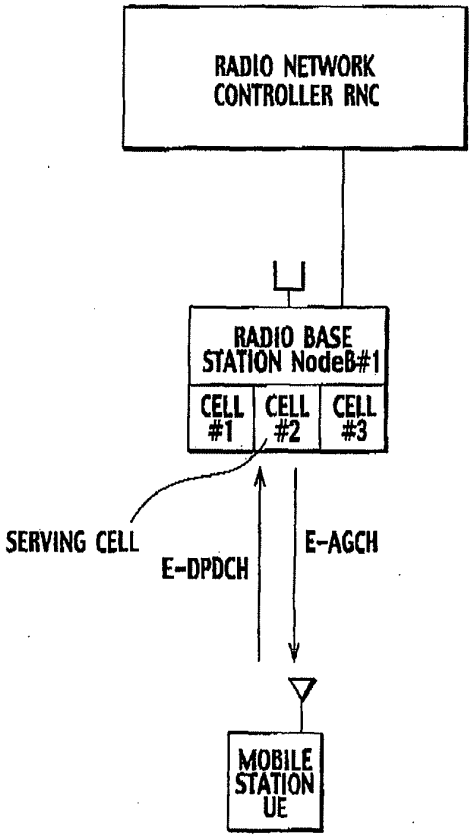

RADIO NETWORK CONTROLLER RNC
RADIO BASE STATION NodeB#1
CELL #1
CELL #2
CELL #3
SERVING CELL
E-DPDCH
E-AGCH
MOBILE STATION UE

FIG. 4A

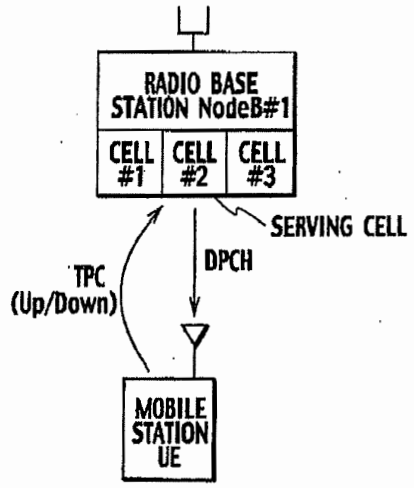


FIG. 4B

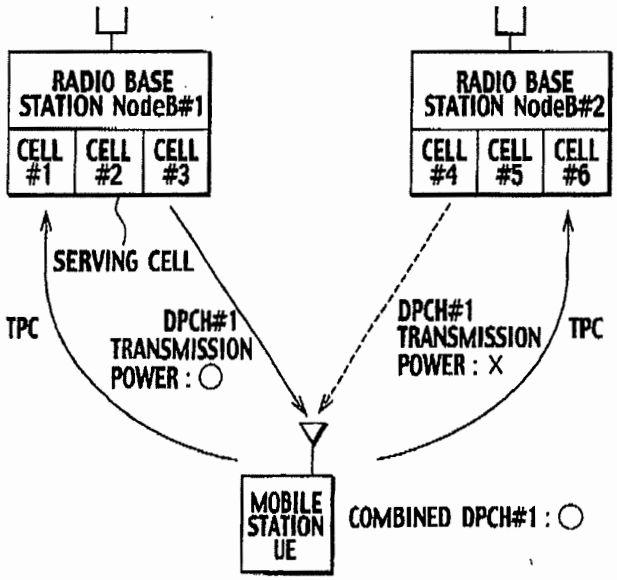


FIG. 5

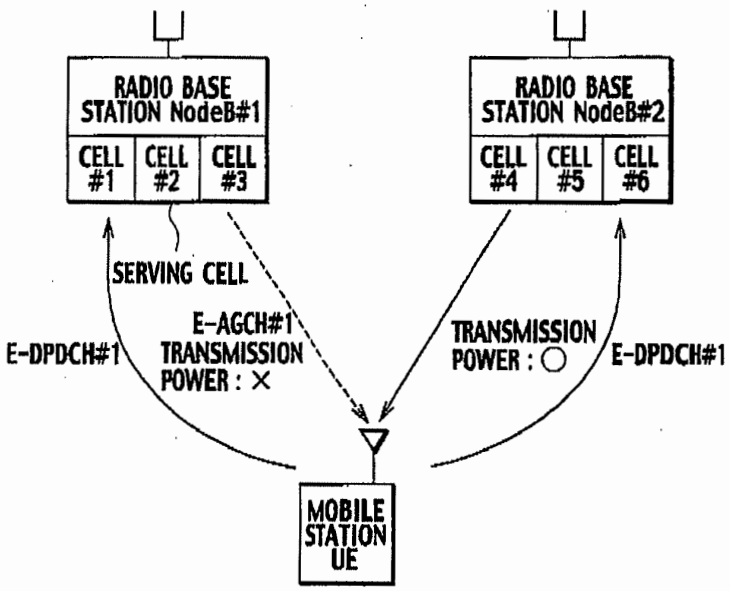

RADIO BASE STATION NodeB#1
CELL #1
CELL #2
CELL #3
RADIO BASE STATION NodeB#2
CELL #4
CELL #5
CELL #6
SERVING CELL
E-AGCH#1 TRANSMISSION POWER : ×
E-DPDCH#1
TRANSMISSION POWER : ○
E-DPDCH#1
MOBILE STATION UE

FIG. 6

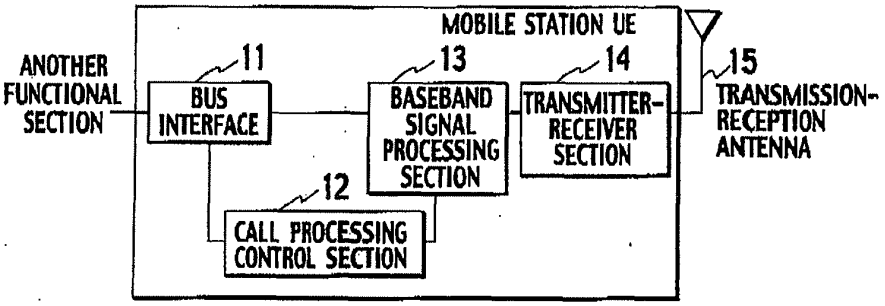


FIG. 7

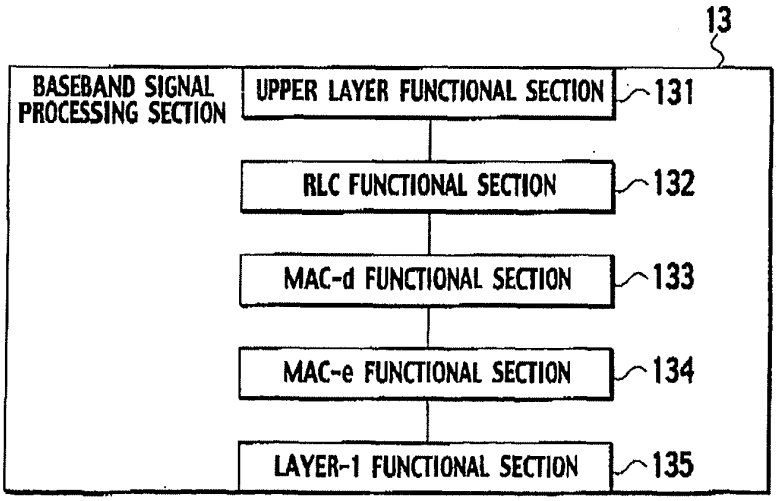


FIG. 8

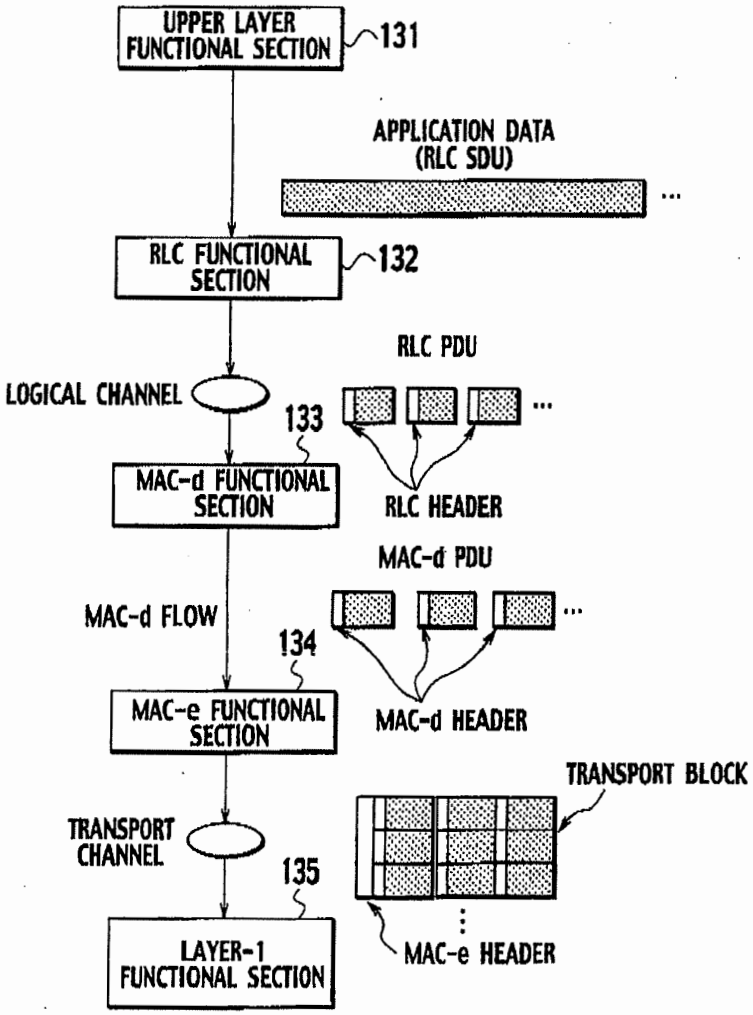

UPPER LAYER FUNCTIONAL SECTION
131
APPLICATION DATA (RLC SDU)
RLC FUNCTIONAL SECTION
132
RLC PDU
LOGICAL CHANNEL
133
MAC-d FUNCTIONAL SECTION
RLC HEADER
MAC-d PDU
MAC-d FLOW
134
MAC-e FUNCTIONAL SECTION
MAC-d HEADER
TRANSPORT BLOCK
TRANSPORT CHANNEL
135
LAYER-1 FUNCTIONAL SECTION
MAC-e HEADER

FIG. 9

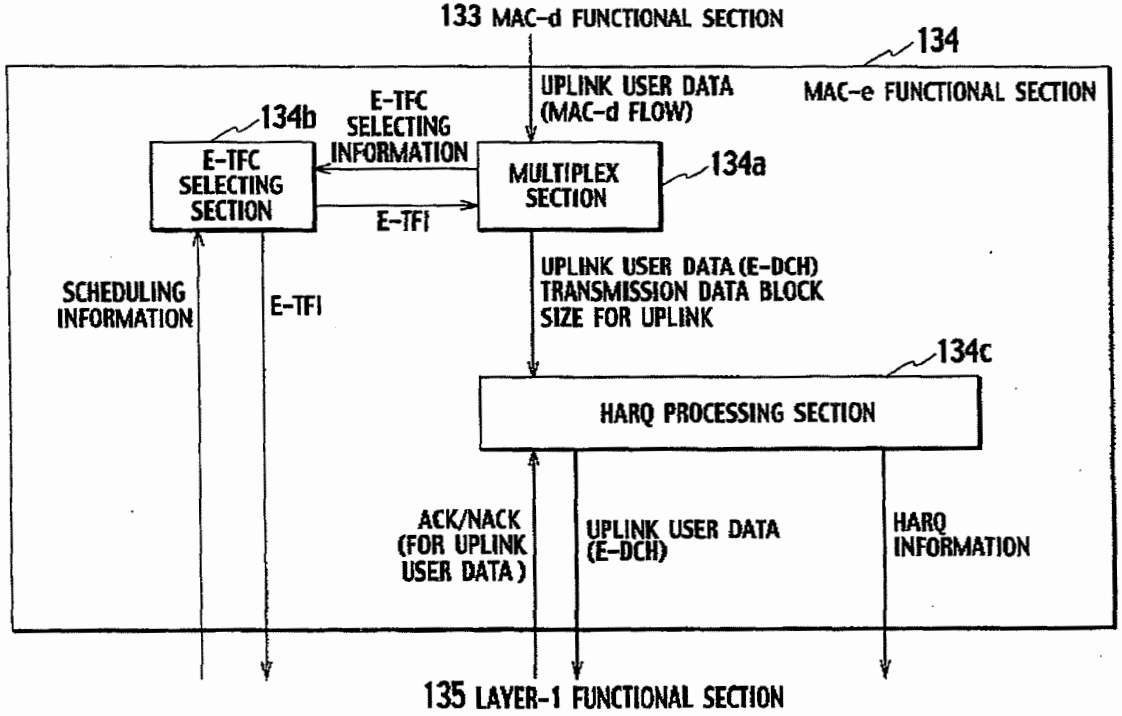

133 MAC-d FUNCTIONAL SECTION
134
MAC-e FUNCTIONAL SECTION
UPLINK USER DATA (MAC-d FLOW)
E-TFC SELECTING INFORMATION
134b
E-TFC SELECTING SECTION
MULTIPLEX SECTION
134a
E-TFI
SCHEDULING INFORMATION
E-TFI
UPLINK USER DATA (E-DCH) TRANSMISSION DATA BLOCK SIZE FOR UPLINK
134c
HARQ PROCESSING SECTION
ACK/NACK (FOR UPLINK USER DATA)
UPLINK USER DATA (E-DCH)
HARQ INFORMATION
135 LAYER-1 FUNCTIONAL SECTION

FIG. 10

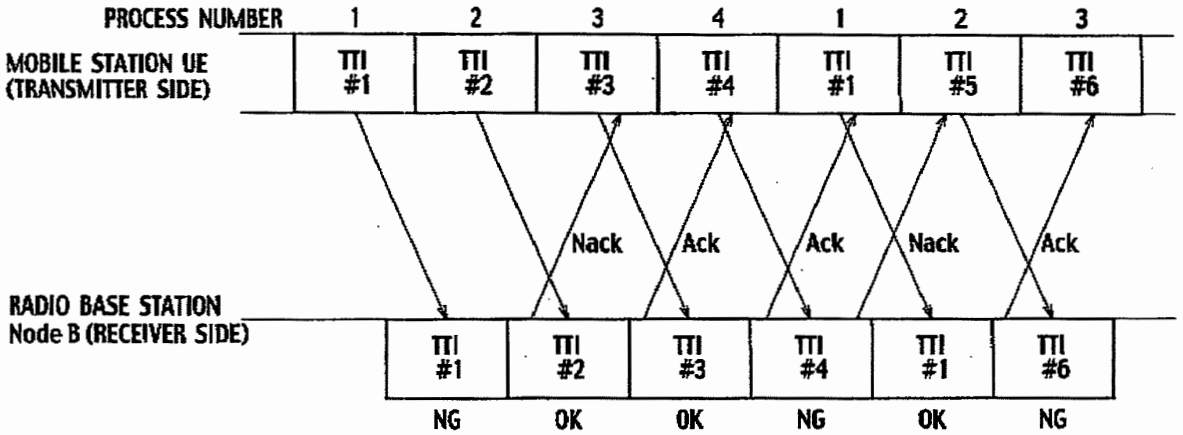

PROCESS NUMBER
1
2
3
4
1
2
3
MOBILE STATION UE
(TRANSMITTER SIDE)
TTI #1
TTI #2
TTI #3
TTI #4
TTI #1
TTI #5
TTI #6
Nack
Ack
Ack
Nack
Ack
RADIO BASE STATION
Node B (RECEIVER SIDE)
TTI #1
TTI #2
TTI #3
TTI #4
TTI #1
TTI #6
NG
OK
OK
NG
OK
NG

FIG. 11

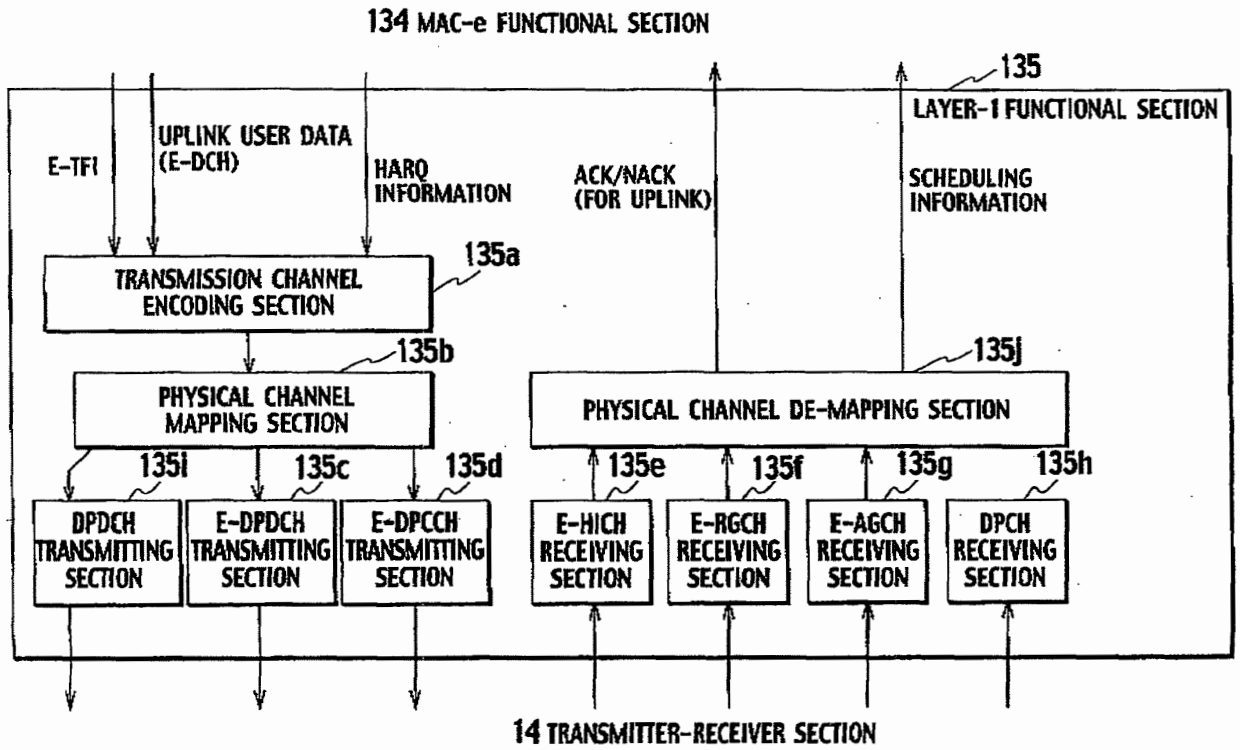

134 MAC-e FUNCTIONAL SECTION
135
LAYER-1 FUNCTIONAL SECTION
E-TFI
UPLINK USER DATA (E-DCH)
HARQ INFORMATION
ACK/NACK (FOR UPLINK)
SCHEDULING INFORMATION
TRANSMISSION CHANNEL ENCODING SECTION
135a
135b
PHYSICAL CHANNEL MAPPING SECTION
135j
PHYSICAL CHANNEL DE-MAPPING SECTION
135i
135c
135d
135e
135f
135g
135h
DPDCH TRANSMITTING SECTION
E-DPDCH TRANSMITTING SECTION
E-DPCCH TRANSMITTING SECTION
E-HICH RECEIVING SECTION
E-RGCH RECEIVING SECTION
E-AGCH RECEIVING SECTION
DPCH RECEIVING SECTION
14 TRANSMITTER-RECEIVER SECTION

FIG. 12

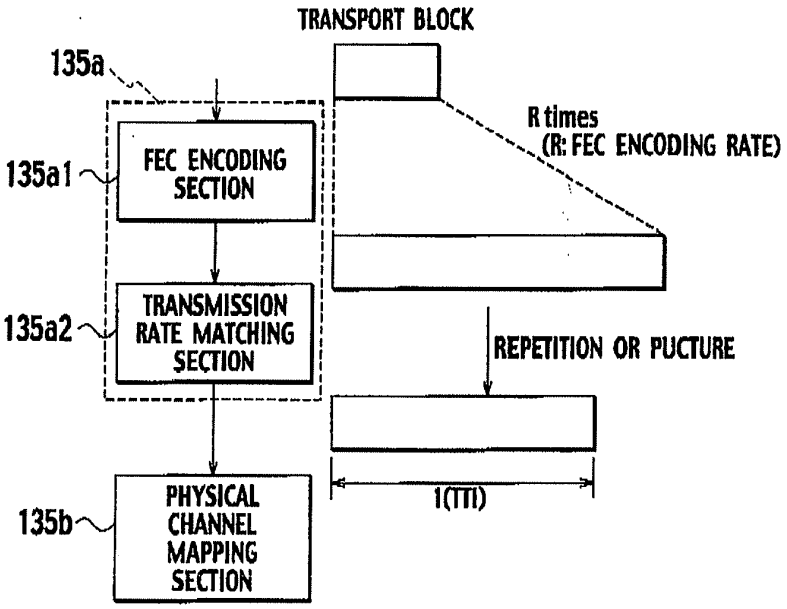


FIG. 13

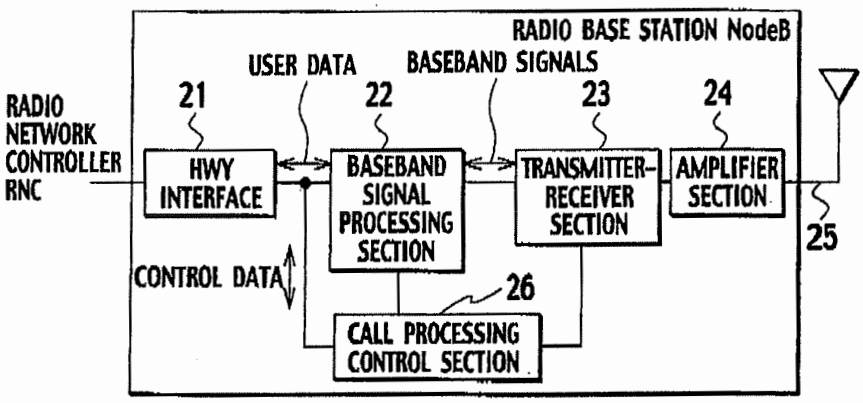

RADIO BASE STATION NodeB
USER DATA
BASEBAND SIGNALS
21
22
23
24
RADIO NETWORK CONTROLLER RNC
HWY INTERFACE
BASEBAND SIGNAL PROCESSING SECTION
TRANSMITTER-RECEIVER SECTION
AMPLIFIER SECTION
25
CONTROL DATA
26
CALL PROCESSING CONTROL SECTION

FIG. 14

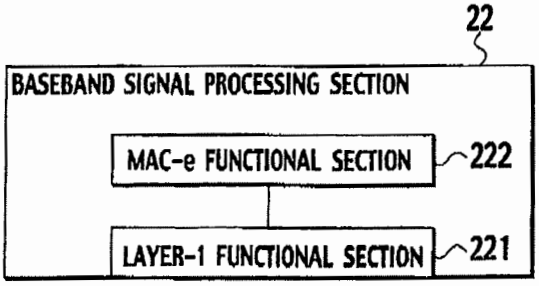
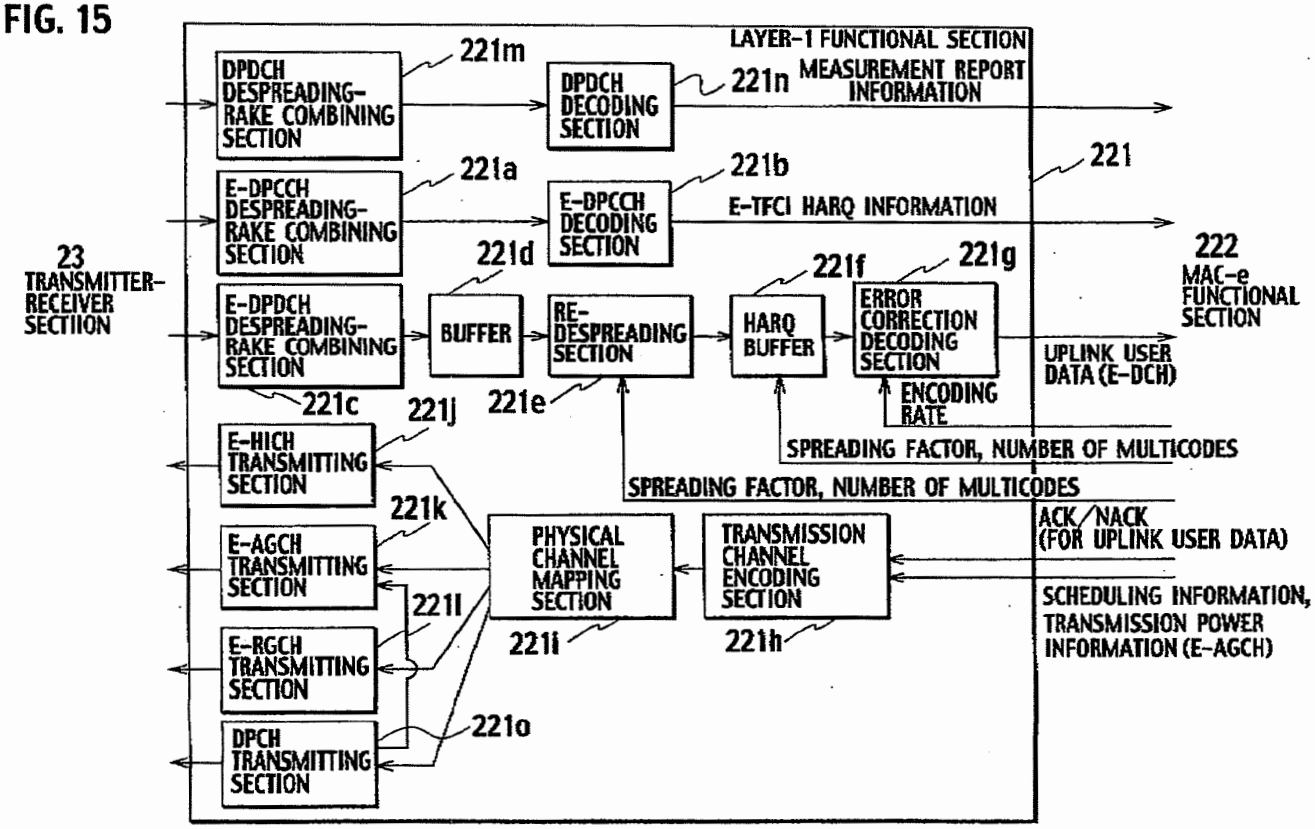

22
BASEBAND SIGNAL PROCESSING SECTION
MAC-e FUNCTIONAL SECTION
222
LAYER-1 FUNCTIONAL SECTION
221

FIG. 15



EP 1 758 264 A2

FIG. 16

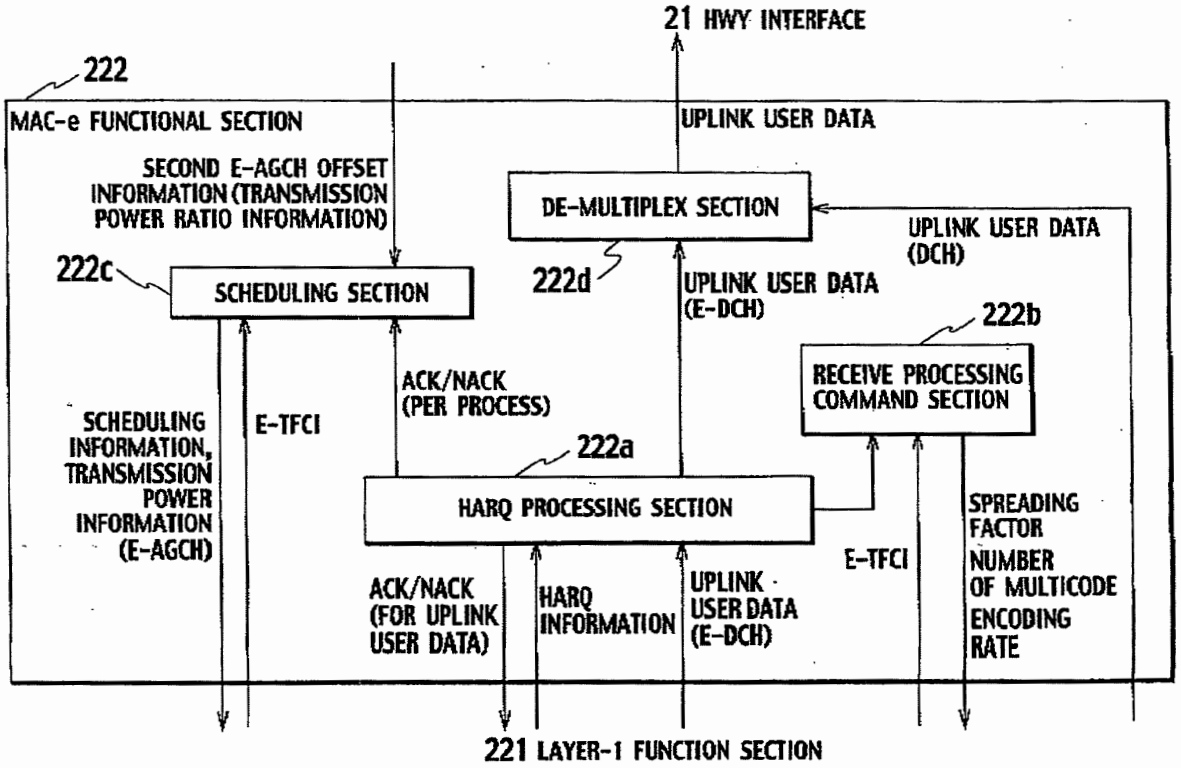

21 HWY INTERFACE
222
MAC-e FUNCTIONAL SECTION
UPLINK USER DATA
SECOND E-AGCH OFFSET INFORMATION (TRANSMISSION POWER RATIO INFORMATION)
DE-MULTIPLEX SECTION
UPLINK USER DATA (DCH)
222c
SCHEDULING SECTION
222d
UPLINK USER DATA (E-DCH)
222b
RECEIVE PROCESSING COMMAND SECTION
ACK/NACK (PER PROCESS)
SCHEDULING INFORMATION, TRANSMISSION POWER INFORMATION (E-AGCH)
E-TFCI
222a
HARQ PROCESSING SECTION
E-TFCI
SPREADING FACTOR
NUMBER OF MULTICODE
ENCODING RATE
ACK/NACK (FOR UPLINK USER DATA)
HARQ INFORMATION
UPLINK USER DATA (E-DCH)
221 LAYER-1 FUNCTION SECTION

FIG. 17

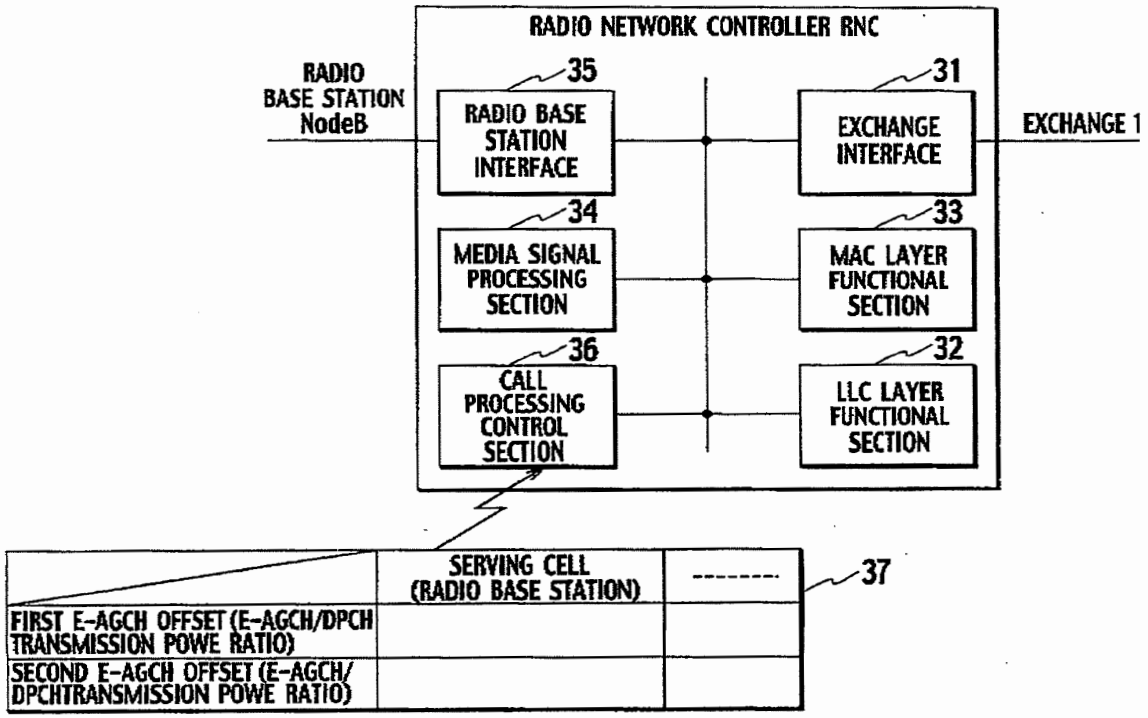

RADIO NETWORK CONTROLLER RNC
RADIO BASE STATION NodeB
35
RADIO BASE STATION INTERFACE
31
EXCHANGE INTERFACE
EXCHANGE 1
34
MEDIA SIGNAL PROCESSING SECTION
33
MAC LAYER FUNCTIONAL SECTION
36
CALL PROCESSING CONTROL SECTION
32
LLC LAYER FUNCTIONAL SECTION
SERVING CELL (RADIO BASE STATION)
37
FIRST E-AGCH OFFSET (E-AGCH/DPCH TRANSMISSION POWE RATIO)
SECOND E-AGCH OFFSET (E-AGCH/ DPCHTRANSMISSION POWE RATIO)

FIG. 18

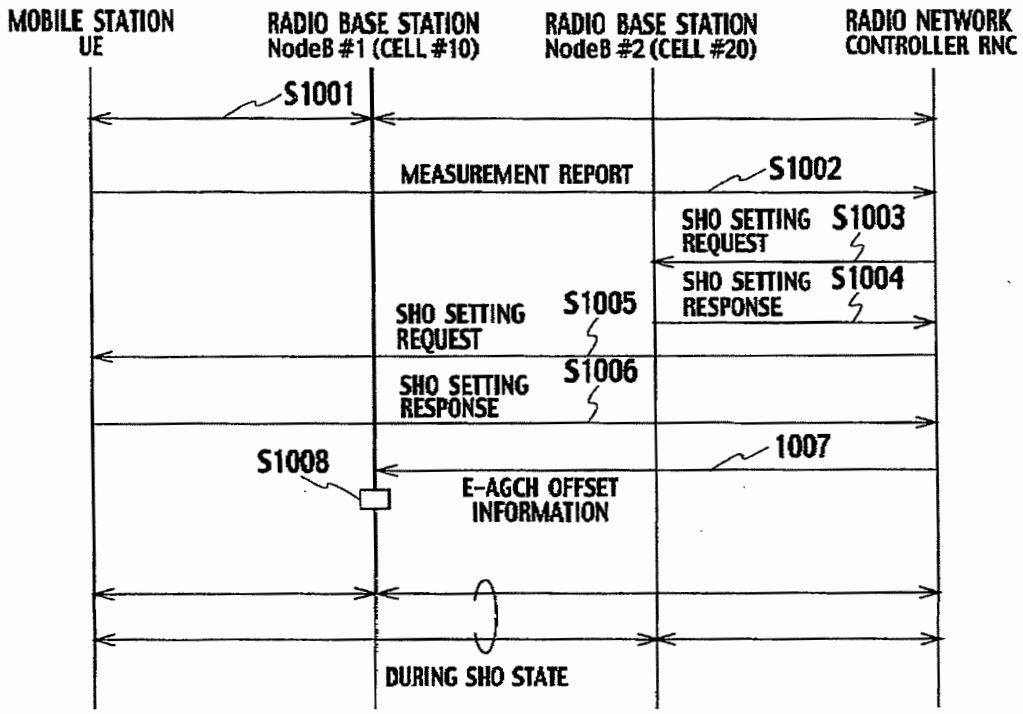
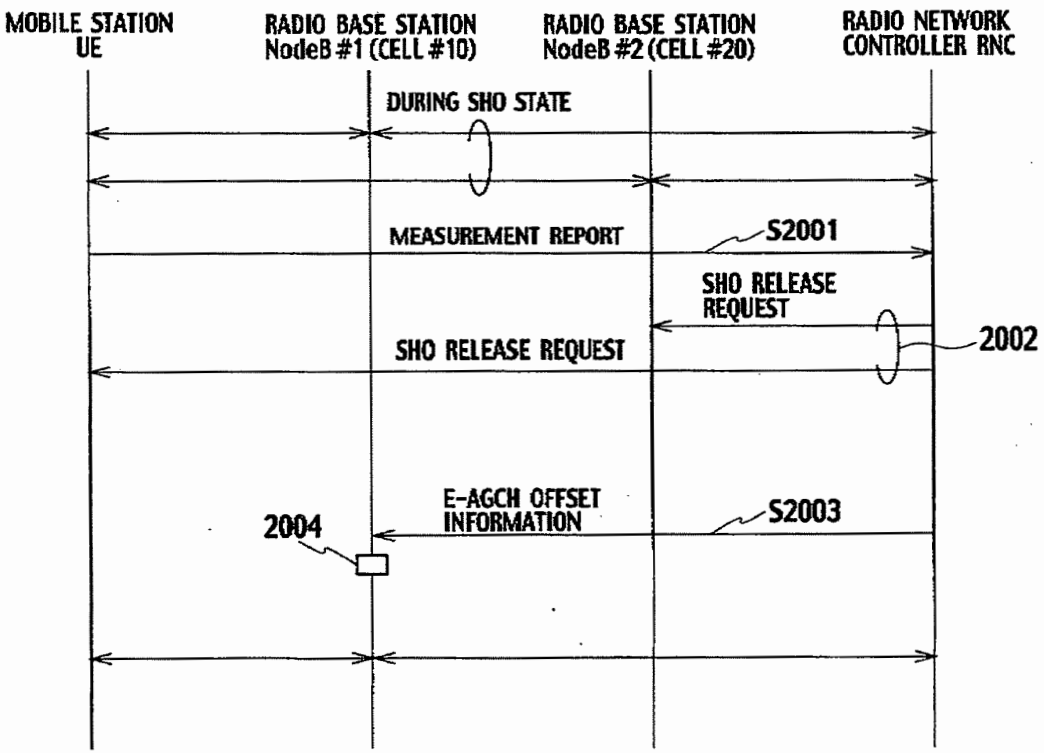

MOBILE STATION
UE
RADIO BASE STATION
NodeB #1 (CELL #10)
RADIO BASE STATION
NodeB #2 (CELL #20)
RADIO NETWORK
CONTROLLER RNC
S1001
MEASUREMENT REPORT
S1002
SHO SETTING
REQUEST
S1003
SHO SETTING
RESPONSE
S1004
SHO SETTING
REQUEST
S1005
SHO SETTING
RESPONSE
S1006
S1008
1007
E-AGCH OFFSET
INFORMATION
DURING SHO STATE

FIG. 19


MOBILE STATION
UE
RADIO BASE STATION
NodeB #1 (CELL #10)
RADIO BASE STATION
NodeB #2 (CELL #20)
RADIO NETWORK
CONTROLLER RNC
DURING SHO STATE
MEASUREMENT REPORT
S2001
SHO RELEASE
REQUEST
2002
SHO RELEASE REQUEST
E-AGCH OFFSET
INFORMATION
S2003
2004

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP P2005274650 B **[0001]**

Electronic Patent Application Fee Transmittal

Application Number:	12581575
Filing Date:	19-Oct-2009
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Filer:	Gustavo Siller Jr./Maria Calderon
Attorney Docket Number:	13674-213

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	12392602
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Masoud Naseri
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	26-MAR-2012
Filing Date:	19-OCT-2009
Time Stamp:	15:50:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	2576
Deposit Account	231925
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213IDS.pdf	219408 cb34e6c6958ea51204c157ecd7debbed9639077d	yes	4

Multipart Description/PDF files in .zip description

Document Description	Start	End
Miscellaneous Incoming Letter	1	1
Transmittal Letter	2	3
Information Disclosure Statement (IDS) Form (SB08)	4	4

Warnings:

Information:

2	Foreign Reference	I14.pdf	3494694 f2c6c3ef4426d2645fcade27440c210565331d09	no	50

Warnings:

Information:

3	Foreign Reference	I15.pdf	1461541 f3839822ffe91adf9c8ab82e525772ee7c3582e9	no	29

Warnings:

Information:

4	Fee Worksheet (SB06)	fee-info.pdf	30517 3ba71db303011e04635ef4a1305b99c8e95aea87	no	2

Warnings:

Information:

Total Files Size (in bytes):	5206160

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: March 26, 2012 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu

Appln. No.: 12/581,575

Filed: October 19, 2009

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Attorney Docket No: 13674-213
Client Ref. No. 0810596US

Examiner: Dady Chery

Art Unit: 2461

Confirmation No.: 2875

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Information Disclosure Statement; PTO-1449; Cited References I14 and I15.

Fee calculation:

☐ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee payment:

☒ Please charge Deposit Account No. 23-1925 in the amount of $180.00 for Information Disclosure Statement.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

March 26, 2012
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
3/26/2012
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
3/26/2012
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.:	2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US		

EIGHTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(c), Applicant hereby cites the following reference(s):

FOREIGN PATENT DOCUMENTS		
DOCUMENT NO.	DATE	COUNTRY
CN 101431797 B	02/01/2012	China
EP 1758264 A2	02/28/2007	EPO

BRINKS
HOFER
GILSON
&LIONE

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

Applicant has calculated a processing fee in the amount of $180.00 to be due under 37 CFR §1.17(p) in connection with the filing of this Information Disclosure Statement. Applicant has enclosed a check covering this fee, or authorized charging the fee to a deposit account or credit card, as indicated in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

March 26, 2012
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

93823 7590 05/03/2012

Huawei/BHGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER	
CHERY, DADY	
ART UNIT	PAPER NUMBER
2461	
MAIL DATE	DELIVERY MODE
05/03/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/581,575	WU, WENFU	
	Examiner	Art Unit	
	DADY CHERY	2461	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2012*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,9,10,16,19,20, and 26 -33.* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7,9,10,16,19,20, and 26 -33.* is/are rejected.

7)☐ Claim(s) _ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This communication is responsive to the amendment filed on March 6th 2012.

Claims 7, 9,10,16,19, 20 have been amended.

Claims 1- 6, 8, 11- 15, 17-18, and 21-25 have been cancelled.

Claims 26-33 have been added.

Claims 7,9,10,16,19,20, and 26 -33 are now pending.

Response to Arguments

Applicant's arguments, see pages 6-10, filed on March 6th 2012, with respect to the rejection(s) of claim(s) 7,9,10,16,19,20, under 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Shaheen (US Application 2008/0181178).

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 7,9,10,16,19,20, and 26 -33 are rejected under 35 U.S.C. 102(e) as being anticipated by Shaheen (US Application 2008/0181178).

Regarding claim 7, Shaheen discloses a handover processing method**(Fig. 2A-2D, [0008], which recites a signaling diagram during a handover),** comprising:

receiving, by a Mobility Management Entity (MME) **(215),** an attach request message sent by a User Equipment (UE) **(205),** during a handover from a non-3rd Generation Partnership Project (non-3GPP) **(210)** network to a 3rd Generation Partnership (3GPP) network**(225) ([0020], which recites the WTRU sent an attach request message to the MME 215 during a handover from network 210 to network 225),** wherein the attach request message comprises an information element (IE) indicating handover**([0015], which recites the attach request include an information (IE));**

identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS)**([0020] -[0021], which recites the identification of the old SGSN considered as the address of the PDN GW used by WTRU 205 by communication with home location register HLR considered as the HSS claimed by the instant application);** and

requesting, by the MME, the PDN GW to initiate a bearer creation procedure**([0030], which recites a radio access bearer considered as the bearer creation procedure).**

Regarding claim 16, Shaheen discloses a network element **(Fig. 2A-2D)**, comprising:

an obtaining unit**(215),** configured to receive an attach request message sent by a User Equipment (UE) **(205)** during a handover from a non-3rd Generation Partnership

Project (non-3GPP) network **(210)** to a 3rd Generation Partnership Project (3GPP) network**(225) ([0020], which recites the WTRU sent an attach request message to the MME 215 during a handover from network 210 to network 225),**, wherein the attach request message comprises an information element indicating handover**([0015], which recites the attach request include an information (IE));**

an identifying unit**(215),** configured to identify information that the attach request message is due to the handover according to the IE indicating handover**([0015], which recites the attach request include an information (IE));**

and

a processing unit **(215),** configured to identify a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS) **([0020] -[0021], which recites the identification of the old SGSN considered as the address of the PDN GW used by WTRU 205 by communication with home location register HLR considered as the HSS claimed by the instant application);** and request the PDN GW to initiate a bearer creation procedure **([0030], which recites a radio access bearer considered as the bearer creation procedure).**

Regarding claim 9, Shaheen discloses the method of claim 7, wherein the handover is an active-mode handover, the method further comprises:

setting up a data forwarding tunnel between a serving gateway (GVV) of the 3GPP network and a non-3GPP GW of the non-3GPP network according to data forwarding tunnel resource information of the 3GPP network**([0030]).**

Regarding claim 10, Shaheen discloses the method of claim 9, wherein setting up the data forwarding tunnel comprises:

sending, by MME,_the data forwarding tunnel resource information, to the non-3GPP GW either directly or through a non-3GPP access network element and creating, by the non-3GPP GW, the data forwarding tunnel with the serving GW**([0030]).**

Regarding claim 19, Shaheen discloses the method of claim 7, wherein the requesting the PDN GW to initiate a bearer creation procedure comprises:

sending, by the MME a Create Bearer Request message to the PDN GW and initiating, by the PDN GW, the bearer creation procedure**([0030]).**

Regarding claim 20, Shaheen discloses the method of claim 19, wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules message by the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain a PCC Rules **([0019] and [0031]).**

Regarding claims 26, 31, Shaheen discloses the method of claim 7, wherein the IE is an Attach Type IE **([0015]).**

Regarding claims 27, 32 Shaheen discloses the method of claim 26, wherein a value of the Attach Type IE is set to "1" **([0008], [0015]).**

Regarding claims 28, 33, Shaheen discloses the method of claim 26, wherein a value of the Attach Type IE is set to "Handover Attach"**([0008], [0015]).**

Regarding claims 29, 30,Shaheen discloses the method of claim 7, wherein the MME identifies the PDN GW by obtaining the PDN GW address from the HSS**([0020] -**

[0021]).

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DADY CHERY whose telephone number is (571)270-1207. The examiner can normally be reached on Monday - Thursday 8 am - 4 pm ESt.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D. VU can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dady Chery/
Examiner, Art Unit 2461

/KIBROM T HAILU/
Primary Examiner, Art Unit 2461

Notice of References Cited	Application/Control No. 12/581,575	Applicant(s)/Patent Under Reexamination WU, WENFU	
	Examiner DADY CHERY	Art Unit 2461	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2008/0181178	07-2008	Shaheen, Kamel M.	370/331
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	H1	Copy of Extended European Search Report issued in corresponding European Patent Application No. 11176895.8, mailed November 21, 2011.

EXAMINER /Dady Chery/	DATE CONSIDERED 05/01/2012

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	I1					
	I2					
	I3					
	I4					
	I5					
	I6					
	I7					
	I8					
	I9					
	I10					
	I11					
	I12					
	I13					

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	I14	CN 101431797 B	02/01/2012	China		Abstract
	I15	EP 1758264 A2	02/28/2007	EPO		

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	I16	
	I17	
	I18	
	I19	
	I20	
	I21	

EXAMINER	/Dady Chery/	DATE CONSIDERED	05/01/2012

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	Art Unit
	DADY CHERY	2461

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	10/27/2010	04/19/2011	12/04/2011	05/01/2012					
	1	✓	✓	✓	-					
	2	✓	-	-	-					
	3	✓	-	-	-					
	4	✓	✓	✓	-					
	5	✓	✓	✓	-					
	6	✓	✓	-	-					
	7	✓	✓	✓	✓					
	8	✓	-	-	-					
	9	✓	✓	✓	✓					
	10	✓	✓	✓	✓					
	11	✓	✓	✓	-					
	12	✓	✓	✓	-					
	13	✓	-	-	-					
	14	✓	✓	✓	-					
	15	✓	-	-	-					
	16	✓	✓	✓	✓					
	17	✓	-	-	-					
	18		✓	✓	-					
	19		✓	✓	✓					
	20		✓	✓	-					
	21		✓	-	-					
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	23		✓	-	-					
	24			✓	-					
	25			✓	-					
	26				✓					
	27				✓					
	28				✓					
	29				✓					
	30				✓					
	31				✓					
	32				✓					
	33				✓					

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	211	(mobility near2 management near2 entity MME) with (attach near2 request)	US-PGPUB; USPAT	OR	OFF	2012/05/01 13:45
S2	121	(mobility near2 management near2 entity MME) near2 (attach near2 request)	US-PGPUB; USPAT	OR	OFF	2012/05/01 13:45
S7	107045	(Handover near2 Indication IE)	US-PGPUB; USPAT	OR	OFF	2012/05/01 15:17
S8	14	S1 same S7	US-PGPUB; USPAT	OR	OFF	2012/05/01 15:17

EAST Search History (Interference)

<This search history is empty>

5/ 1/ 2012 5:31:51 PM
C:\ Users\ dchery\ Documents\ EAST\ Workspaces\ 12581575.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	Art Unit
	DADY CHERY	2461

SEARCHED			
Class	Subclass	Date	Examiner
370	328,329,330,331,332,333,334	10/22/2010	DC
455	436,437,438,439	10/22/2010	DC
709	227,228,229	10/22/2010	DC

SEARCH NOTES		
Search Notes	Date	Examiner
Inventorship	10/22/2010	DC
Updated search	04/18/2011	DC
Updated search	12/04/2011	Dc
Updated search	05/01/2012	DC

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: August 3, 2012 Name: Gustavo Siller, Jr. Signeture: /Gustevo Siller, Jr./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 13674-213
Client Ref. No. 0810596US

In re Application of:	
Wenfu Wu	Examiner: CHERY, DADY
Serial No: 12/581,575	Group Art Unit: 2461
Filed: October 19, 2009	Conf. No.: 2875
For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	

RESPONSE

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the final Office Action mailed May 03, 2012, please enter the following in the above-identified application.

Amendments to the claims are reflected in the listing of claims, which begin on page 2 of this paper.

Remarks begin on page 5 of this paper.

AMENDMENTS TO THE CLAIMS

Pursuant to 37 C.F.R. § 1.121 the following listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the Clams:

1 -6. (Canceled)

7. (Previously presented) A handover processing method, comprising:

receiving, by a Mobility Management Entity (MME), an attach request message sent by a User Equipment (UE) during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3rd Generation Partnership (3GPP) network, wherein the attach request message comprises an information element (IE) indicating handover;

identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS); and

requesting, by the MME, the PDN GW to initiate a bearer creation procedure.

8. (Canceled)

9. (Previously presented) The method of claim 7, wherein the handover is an active-mode handover, the method further comprises:

setting up a data forwarding tunnel between a serving gateway (GW) of the 3GPP network and a non-3GPP GW of the non-3GPP network according to data forwarding tunnel resource information of the 3GPP network.

10. (Previously presented) The method of claim 9, wherein setting up the data forwarding tunnel comprises:

sending, by the MME, the data forwarding tunnel resource information to the non-3GPP GW either directly or through a non-3GPP access network element; and

creating, by the non-3GPP GW, the data forwarding tunnel with the serving GW.

11 - 15. (Canceled)

16. (Previously presented) A network element, comprising:

an obtaining unit, configured to receive an attach request message sent by a User Equipment (UE) during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3rd Generation Partnership Project (3GPP) network, wherein the attach request message comprises an information element indicating handover;

an identifying unit, configured to identify that the attach request message is due to the handover according to the IE indicating handover; and

a processing unit, configured to identify a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS), and request the PDN GW to initiate a bearer creation procedure.

17 -18. (Canceled)

19. (Previously presented) The method of claim 7, wherein the requesting a the PDN GW to initiate a bearer creation procedure comprises:

sending, by the MME, a Create Bearer Request message to the PDN GW; and

initiating, by the PDN GW, the bearer creation procedure.

20. (Previously presented) The method of claim 19, wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules message by the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain a PCC Rule.

21-25. (Canceled)

26. (Previously presented) The method of claim 7, wherein the IE is an Attach Type IE.

27. (Previously presented) The method of claim 26, wherein a value of the Attach Type IE is set to "1".

28. (Previously presented) The method of claim 26, wherein a value of the Attach Type IE is set to "Handover Attach".

29. (Previously presented) The method of claim 7, wherein the MME identifies the PDN GW by obtaining the PDN GW address from the HSS.

30. (Previously presented) The method of claim 7, wherein the MME identifies the PDN GW by obtaining an identity of the PDN GW from the HSS.

31. (Previously presented) The method of claim 16, wherein the IE is an Attach Type IE.

32. (Previously presented) The method of claim 31, wherein a value of the Attach Type IE is set to "1".

33. (Previously presented) The method of claim 31, wherein a value of the Attach Type IE is set to "Handover Attach".

REMARKS

Summary

Claims 7, 9, 10, 16, 19, 20 and 26-33 are rejected under 35 U.S.C. § 102. No claims are amended and no new claims are added. Claims 7, 9, 10, 16, 19, 20 and 26-33 are pending. Reconsideration of the application in light of the following remarks is respectfully requested.

Rejections Under 35 U.S.C. § 102

Claims 7, 9, 10, 16, 19, 20 and 26-33 are rejected under 35 U.S.C. § 102(e) as being anticipated by *Shaheen* (U.S. Application Pub. No. 2008/0181178). Applicant respectfully submits that *Shaheen* fails to disclose each and every limitation of these claims, consequently do not anticipate these claims.

Claim 7 recites (underlined for emphasis):

> 7. A handover processing method, comprising:
>
> receiving, by a Mobility Management Entity (MME), an attach request message sent by a User Equipment (UE) during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3GPP network, wherein the attach request message comprises an information element (IE) indicating handover;
>
> identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS); and
>
> requesting, by the MME, the PDN GW to initiate a bearer creation procedure.

Applicant respectfully submits that *Shaheen* fails to disclose "identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS)" as recited in claim 7.

In the Office Action, the Examiner correlated the old SGSN in *Shaheen* with the PDN GW in claim 7. See Office Action, page 3. Applicant respectfully disagrees with this assertion. There are several reasons why *Shaheen* fails to teach or suggest these limitations of claim 7.

First, SGSN is different from the recited PDN GW. SGSN is a functional entity used for providing packet data services. The SGSN is responsible for forwarding incoming/outgoing Internet Protocol (IP) packets to mobile stations (MSs) within the service area of the SGSN. In contrast, the PDN GW performs policy enforcement, packet filtering for each user, charging support, lawful interception and packet screening. Another key role of the PDN GW is to act as the anchor for mobility between 3GPP and non-3GPP technologies. SGSN does not perform these functions and is therefore different from the recited structure of claim 7.

Second, in claim 7, the MME identifies the PDN GW by communicating with the HSS. In contrast, in *Shaheen* the new SGSN/MME identifies the old SGSN by deriving an old SGSN address from a routing area identity (RAI) included in the attach message received by the new SGSN/MME. See Shaheen, para. [0021], lines 2-3. That is, even if the old SGSN in *Shaheen* could be considered as the PDN GW in claim 7, the SGSN/MME identifies the old SGSN from the message it receives, but not by communicating with a HSS as required by claim 7.

Third, in *Shaheen* the new SGSN/MME sends an identification request to the old SGSN just for identifying the WTRU. For example, if the WTRU is known in the old SGSN, the old SGSN responds with an identification response message including the IMSI; if the WTRU is not known in the old SGSN, the old SGSN responds with an error indication in the identification response message. See *Shaheen*, para. [0021], lines 10-18. However, the identification is not an identification of the old SGSN as asserted by the Examiner.

In view of the above, *Shaheen* does not disclose a handover processing method, comprising "identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS)", as recited in claim 7.

Therefore, *Shaheen* fails to disclose each and every limitation in claim 7, and consequently does not anticipate claim 7. Accordingly, the rejection of claim 7 is respectfully requested to be withdrawn.

Since claims 9-10, 19-20 and 26-30 depend from claim 7; they are also not anticipated by *Shaheen* for at least the same reasons discussed above with respect to claim 7. The rejection of claims 9-10, 19-20 and 26-30 is respectfully requested to be withdrawn.

Applicant respectfully submits that independent claim 16 is also not anticipated by *Shaheen*. Specifically, independent claim 16 recites (underlined for emphasis):

> 16. A network element, comprising:
>
> an obtaining unit, configured to receive an attach request message sent by a User Equipment (UE) during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3GPP network, wherein the attach request message comprises an information element indicating handover;
>
> an identifying unit, configured to identify that the attach request message is due to the handover according to the IE indicating handover; and
>
> a first processing unit, <u>configured to identify a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS)</u>, and request the PDN GW to initiate a bearer creation procedure.

As can be seen, claim 16 recites limitations similar to those discussed above with respect to claim 7. Thus, claim 16 is not anticipated by *Shaheen* for at least the same reasons discussed above. The rejection of claim 16 is respectfully requested to be withdrawn.

Since claims 31-33 depend from claim 16, they are also not anticipated by *Shaheen* for at least the same reasons discussed above with respect to claim 16. The rejection of claims 31-33 is respectfully requested to be withdrawn.

CONCLUSION

In view of the foregoing, Applicants respectfully submit that claims 7, 9, 10, 16, 19, 20 and 26-33 are patentable and this application is in condition for allowance. Should the Examiner wish to discuss the foregoing to advance this application toward allowance, the Examiner is urged to telephone the undersigned at the below-indicated number.

Respectfully submitted,

/Gustavo Siller, Jr./
Registration No. 32,305
Attorney for Applicants

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, ILLINOIS 60610
(312) 321-4200

Electronic Acknowledgement Receipt

EFS ID:	13417043
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Masoud Naseri
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	03-AUG-2012
Filing Date:	19-OCT-2009
Time Stamp:	17:02:25
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213Response.pdf	402081 310b852dfa900e3a2482b15aa5983cd9aec739cf	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	1
	Amendment After Final	2	9
Warnings:			
Information:			
	Total Files Size (in bytes):	402081	

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Data: August 3, 2012 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.:	2875
Attorney Docket No.:	13674-213		
Client Ref. No.:	0810596US		

TRANSMITTAL

Mail Stop AF
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Response.

Fee calculation:

☒ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $30=			x $60=	
Indep.		Minus				x 125=			x $250=	
First Presentation of Multiple Dep. Claim						+$225=			+ $450=	
						Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).
WARNING: Information on this form may become public. **Credit card information should not be included on this form.**

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

August 3, 2012
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr./ (Reg. No. 32,305)

BRINKS HOFER GILSON & LIONE
NBC Tower – Suite 3600, 455 N. Cityfront Plaza Drive, Chicago, IL 60611-5599

BRINKS HOFER GILSON &LIONE

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/581,575	10/19/2009	

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT	08/03/2012	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0	X $ =		OR	X $60=	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***5	= 0	X $ =		OR	X $250=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/GAIL WOOTEN/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

93823 7590 08/16/2012

Huawei/BHGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER	
CHERY, DADY	
ART UNIT	PAPER NUMBER
2461	
MAIL DATE	DELIVERY MODE
08/16/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 12/581,575	**Applicant(s)** WU, WENFU
	Examiner DADY CHERY	**Art Unit** 2461

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 03 August 2012 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

NO NOTICE OF APPEAL FILED

1. ☒ The reply was filed after a final rejection. No Notice of Appeal has been filed. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance;

(2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114 if this is a utility or plant application. Note that RCEs are not permitted in design applications. The reply must be filed within one of the following time periods:

a) ☐ The period for reply expires _____months from the mailing date of the final rejection.

b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action; or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

c) ☐ A prior Advisory Action was mailed more than 3 months after the mailing date of the final rejection in response to a first after-final reply filed within 2 months of the mailing date of the final rejection. The current period for reply expires months from the mailing date of *the prior Advisory Action* or SIX MONTHS from the mailing date of the final rejection, whichever is earlier.

Examiner Note: If box 1 is checked, check either box (a), (b) or (c). ONLY CHECK BOX (b) WHEN THIS ADVISORY ACTION IS THE FIRST RESPONSE TO APPLICANT'S FIRST AFTER-FINAL REPLY WHICH WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. ONLY CHECK BOX (c) IN THE LIMITED SITUATION SET FORTH UNDER BOX (c). See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) or (c) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendments filed after a final rejection, but prior to the date of filing a brief, will not be entered because

a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);

b) ☐ They raise the issue of new matter (see NOTE below);

c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or

d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).

5. ☐ Applicant's reply has overcome the following rejection(s): _____.

6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).

7. ☐ For purposes of appeal, the proposed amendment(s): (a) ☐ will not be entered, or (b) ☐ will be entered, and an explanation of how the new or amended claims would be rejected is provided below or appended.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).

9. ☐ The affidavit or other evidence filed after the date of filing the Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).

10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See Continuation Sheet.

12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). _____

13. ☐ Other: _____.

STATUS OF CLAIMS

14. The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: .

Claim(s) objected to: .

Claim(s) rejected: .

Claim(s) withdrawn from consideration: .

/Dady Chery/ Examiner, Art Unit 2461	/KIBROM T HAILU/ Primary Examiner, Art Unit 2461

Continuation of 11. does NOT place the application in condition for allowance because: The applicant argues that Shaheen fails to disclose "identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS)." The examiner respectfully disagrees. Shaheen discloses and old SGSN/MME associate with the non-3GPP network having the same function as the Packet Data Network Gateway (PDN GW) disclosed by the instant invention. The WTRU identifies the address of the old SGSN/MME by communicating with home location register 240 considered as the Home Subscriber Server (HSS)([0020] -[0021])..

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: September 4, 2012 Neme: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 13674-213
Client Ref. No. 0810596US

In re Application of:	
Wenfu Wu	Examiner: CHERY, DADY
Serial No: 12/581,575	Group Art Unit: 2461
Filed: October 19, 2009	Conf. No.: 2875
For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

The Applicant requests review of the final rejection that was mailed May 03, 2012 in the above-identified application. No amendments to the claims are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reasons stated on the attached sheets. No more than five (5) pages are submitted.

REMARKS

Claims 7, 9, 10, 16, 19, 20 and 26-33 are rejected under 35 U.S.C. § 102(e) as being anticipated by *Shaheen* (U.S. Application Pub. No. 2008/0181178). Review of the pending claims 7, 9, 10, 16, 19, 20 and 26-33 in light of the following remarks is respectfully requested.

I. *Shaheen* fails to teach "identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS)"

Claim 7 recites (underlined for emphasis):

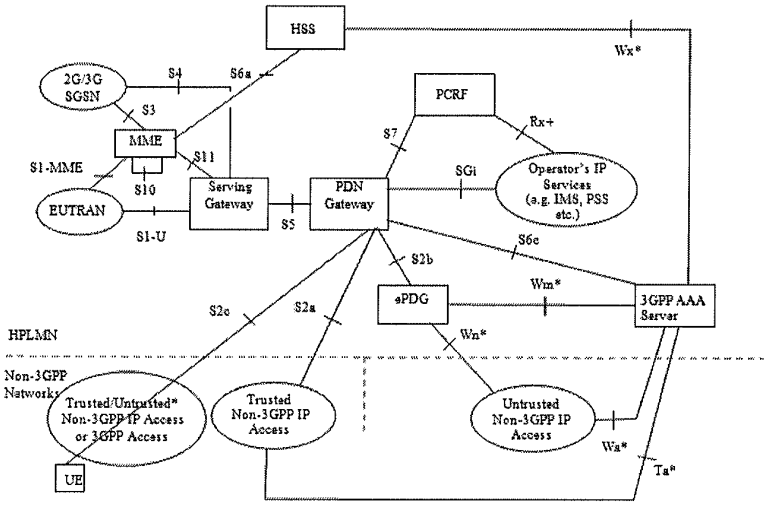
> 7. A handover processing method, comprising:
>
> receiving, by a Mobility Management Entity (MME), an attach request message sent by a User Equipment (UE) during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3GPP network, wherein the attach request message comprises an information element (IE) indicating handover;
>
> identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS); and
>
> requesting, by the MME, the PDN GW to initiate a bearer creation procedure.

Applicant respectfully submits that *Shaheen* fails to disclose a processing method that includes "identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS)" as recited in claim 7.

In the final Office Action, the Examiner correlated the old SGSN/MME in *Shaheen* with the PDN GW in claim 7. See final Office Action, page 3. The Examiner restated this point in the Advisory Action. See Advisory Action, Continuation Sheet. Applicant respectfully disagrees with this assertion.

First, it is well known that SGSN/MME is different from the recited PDN GW. SGSN/MME is a functional entity used for providing packet data services. The SGSN/MME is responsible for forwarding incoming/outgoing Internet Protocol (IP) packets to mobile stations (MSs) within the service area of the SGSN/MME. In contrast, the PDN GW performs policy enforcement, packet filtering for each user, charging support, lawful interception and packet screening. Another key role of the PDN GW is to act as the anchor for mobility between 3GPP and non-3GPP technologies.

Second, the network architecture defined by the standard 3GPP TS 23.402 V0.4.0 also shows that the SGSN/MME is different from the PDN GW:



* Untrusted non-3GPP access requires ePDG in the data path

Figure 4.2.1-1. Non-Roaming Architecture for non-3GPP Accesses within SAE

See 3GPP TS 23.402 V0.4.0 (2007-04), entitled "3GPP System Architecture Evolution:Architecture Enhancements for non-3GPP accesses", Release 8, Section 4.2.1.

Thus, the old SGSN/MME in *Shaheen* is different from the PDN GW in claim 7.

Furthermore, in claim 7, the MME identifies the PDN GW by communicating with the HSS. In contrast, in *Shaheen* the new SGSN/MME identifies the old SGSN by deriving an old SGSN address from a routing area identity (RAI) included in the attach message received by the new SGSN/MME. See *Shaheen*, para. [0021], lines 2-3. That is, even if the old SGSN in *Shaheen* could be considered as the PDN GW in claim 7, the new

SGSN/MME in *Shaheen* identifies the old SGSN from the message it receives, but not by communicating with a HSS as required by claim 7.

In the Advisory Action, the Examiner stated that "[t]he WTRU identifies the address of the old SGSN/MME by communication with home location register 240 considered as the Home Subscriber Server (HSS)". However, as discussed above, the old SGSN/MME is different from the PDN GW in claim 7. In addition, in claim 7, it is the MME that identifies the PDN GW; however, in the Examiner statement above, it is the WTRU (e.g., a user equipment) rather than the MME that identifies the old SGSN/MME even if the old SGSN/MME is same as the PDN GW as asserted by the Exmainer.

In view of the above, *Shaheen* does not disclose a handover processing method, comprising "identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS)", as recited in claim 7.

Therefore, *Shaheen* fails to disclose each and every limitation in claim 7, and consequently does not anticipate claim 7. Accordingly, the rejection of claim 7 is respectfully requested to be withdrawn.

Since claims 9-10, 19-20 and 26-30 depend from claim 7, they are also not anticipated by *Shaheen* for at least the same reasons discussed above with respect to claim 7. The rejection of claims 9-10, 19-20 and 26-30 is respectfully requested to be withdrawn.

Independent claim 16 recites limitations similar to those recited in claim 7. For at least the same reasons discussed above with respect to claim 7, claim 16 is also not anticipated by *Shaheen*. The rejection of claim 16 is respectfully requested to be withdrawn.

Since claims 31-33 depend from claim 16, they are also not anticipated by *Shaheen* for at least the same reasons discussed above with respect to claim 16. The rejection of claims 31-33 is respectfully requested to be withdrawn.

II. CONCLUSION

Based on the above remarks, Applicant respectfully submits that the claims are in condition for allowance. The Examiner is kindly invited to contact the undersigned attorney to expedite allowance.

Respectfully submitted,

/Gustavo Siller, Jr./
Registration No. 32,305
Attorney for Applicants

BRINKS HOFER GILSON & LIONE
P.O. BOX 10395
CHICAGO, ILLINOIS 60610
(312) 321-4200

NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES	Docket Number (Optional) 13674-213 Client Ref. No. 0810596US

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date: Date September 4, 2012 Signature /Gustavo Siller, Jr./ Typed or printed Name Gustavo Siller, Jr.	In re Application of Wenfu Wu		
	Application No. 12/581,575	Filed October 19, 2009	
	For METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING		
	Art Unit 2461	Confirmation No. 2875	Examiner Dady Chery

Applicant hereby appeals to the Board of Patent Appeals and Interferences from the last decision of the examiner.

The fee for this Notice of Appeal is (37 CFR 41.20(b)(1)) $620.00

☐ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee shown above is reduced by half, and the resulting fee is: $_____

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. 23-1925.

☐ A petition for an extension of time under 37 CFR 1.136(a) (PTO/SB/22) is enclosed.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the:

☐ Applicant/Inventor.

☐ Assignee of record of the entire interest. See 37 CFR 3.71. Certificate under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)

☒ Attorney or agent of record. Registration No. 32,305.

☐ Attorney or agent acting under 37 CFR 1.34. Registration No. if acting under 37 CFR 1.34._____.

/Gustavo Siller, Jr./
Signature

Gustavo Siller, Jr.
Typed or Printed Name

September 4, 2012
Date

Note: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.

☐ *Total of forms are submitted.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: September 4, 2012 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu		
Appln. No.:	12/581,575	Examiner: Dady Chery
Filed:	October 19, 2009	Art Unit: 2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.: 2875
Attorney Docket No.:	13674-213	
Client Ref. No.:	0810596US	

PETITION AND FEE FOR EXTENSION OF TIME (37 CFR § 1.136(a))

Mail Stop AF
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This is a petition for an extension of the time to respond to a Final Office Action dated May 3, 2012 for a period of one month(s).

Applicant is: ☐ small entity (per 37 CFR 1.27) ☒ other than small entity

	Extension Months	Other Than Small Entity	Small Entity
☒	One Month	$150.00	$75.00
☐	Two Months	$560.00	$280.00
☐	Three Months	$1,270.00	$635.00
☐	Four Months	$1,980.00	$990.00
☐	Five Months	$2,690.00	$1,345.00

Payment Method:

☐ Check in the amount of $_____ is enclosed to cover the fees listed above.

☐ Payment by credit card in the amount of $_____ to cover the fees listed above. Form PTO-2038 is enclosed for this purpose.

Warning: Information on this form may become public. Credit information should not be included on this form. Provide credit card information and authorization on PTO-2038.

☒ The Commissioner is hereby authorized to charge $150.00 to cover the fees listed above to Deposit Account No. 23-1925.

☒ The Commissioner is hereby authorized to charge any deficiencies in fees or credit overpayment to Deposit Account No. 23-1925.

Respectfully submitted,

Dated: September 4, 2012

/Gustavo Siller, Jr./
Gustavo Siller, Jr., Reg. No. 32,305
Attorney for Applicant(s)

BRINKS HOFER GILSON & LIONE
PO BOX 10395
CHICAGO, IL 60610
(312) 321-4200

Electronic Patent Application Fee Transmittal

Application Number:	12581575
Filing Date:	19-Oct-2009
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Filer:	Gustavo Siller Jr./Courtney Brady
Attorney Docket Number:	13674-213

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Notice of appeal	1401	1	620	620
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	1251	1	150	150
Miscellaneous:				
		Total in USD ($)		**770**

Electronic Acknowledgement Receipt

EFS ID:	13654964
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Maggie Pieczonka
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	04-SEP-2012
Filing Date:	19-OCT-2009
Time Stamp:	17:59:45
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$770
RAM confirmation Number	5606
Deposit Account	231925
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees) Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees) Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Response.pdf	379809 0ed1d7d0c84f0aa05a8da85461d20a912a0dfb3f	yes	9

Multipart Description/PDF files in .zip description

Document Description	Start	End
Miscellaneous Incoming Letter	1	1
Amendment After Final	2	2
Applicant Arguments/Remarks Made in an Amendment	3	6
Notice of Appeal Filed	7	7
Extension of Time	8	9

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	32585 c4fbeebb9c9906f233b0a4d8c454672191245308	no	2

Warnings:

Information:

Total Files Size (in bytes):	412394

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: September 4, 2012 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu		
Appln. No.:	12/581,575	Examiner: Dady Chery
Filed:	October 19, 2009	Art Unit: 2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.: 2875
Attorney Docket No.:	13674-213	
Client Ref. No.:	0810596US	

TRANSMITTAL

Mail Stop AF
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Pre-Appeal Brief Request for Review; Notice of Appeal; Petition for One-Month Extension of Time.

Fee calculation:

☐ No additional fee is required.

☐ Small Entity.

☒ An extension fee in an amount of $150.00 for a one-month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $30=			x $60=	
Indep.		Minus				x 125=			x $250=	
First Presentation of Multiple Dep. Claim						+$225=			+ $450=	
						Total	$		Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $_____ for _____.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).
WARNING: Information on this form may become public. **Credit card information should not be included on this form.**

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

September 4, 2012
Date

/Gustavo Siler, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

BRINKS HOFER GILSON & LIONE
NBC Tower – Suite 3600, 455 N. Cityfront Plaza Drive, Chicago, IL 60611-5599

BRINKS HOFER GILSON &LIONE

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/581,575	10/19/2009	

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT	09/04/2012	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X $ =		OR	X $60=	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***5	= 0	X $ =		OR	X $250=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/DEBORAH NASH/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

93823 7590 11/07/2012

Huawei/BHGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER	
CHERY, DADY	
ART UNIT	PAPER NUMBER
2461	
MAIL DATE	DELIVERY MODE
11/07/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of Panel Decision from Pre-Appeal Brief Review	Application No. 12/581,575	Applicant(s) WU, WENFU
	Examiner DADY CHERY	Art Unit 2461

This is in response to the Pre-Appeal Brief Request for Review filed 04 September, 2012.

1. ☐ **Improper Request** – The Request is improper and a conference will not be held for the following reason(s):

☐ The Notice of Appeal has not been filed concurrent with the Pre-Appeal Brief Request.
☐ The request does not include reasons why a review is appropriate.
☐ A proposed amendment is included with the Pre-Appeal Brief request.
☐ Other: .

The time period for filing a response continues to run from the receipt date of the Notice of Appeal or from the mail date of the last Office communication, if no Notice of Appeal has been received.

2. ☐ **Proceed to Board of Patent Appeals and Interferences** – A Pre-Appeal Brief conference has been held. The application remains under appeal because there is at least one actual issue for appeal. Applicant is required to submit an appeal brief in accordance with 37 CFR 41.37. The time period for filing an appeal brief will be reset to be one month from mailing this decision, or the balance of the two-month time period running from the receipt of the notice of appeal, whichever is greater. Further, the time period for filing of the appeal brief is extendible under 37 CFR 1.136 based upon the mail date of this decision or the receipt date of the notice of appeal, as applicable.

☐ The panel has determined the status of the claim(s) is as follows:
Claim(s) allowed: _____.
Claim(s) objected to: _____.
Claim(s) rejected: _____.
Claim(s) withdrawn from consideration: _____.

3. ☐ **Allowable application** – A conference has been held. The rejection is withdrawn and a Notice of Allowance will be mailed. Prosecution on the merits remains closed. No further action is required by applicant at this time.

4. ☒ **Reopen Prosecution** – A conference has been held. The rejection is withdrawn and a new Office action will be mailed. No further action is required by applicant at this time.

All participants:

(1) *DADY CHERY*.	(3)_____.
(2) *Huy D Vu*.	(4)_____.

		/HUY D VU/ Supervisory Patent Examiner, Art Unit 2461

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

93823 7590 12/18/2012

Huawei/BHGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER	
CHERY, DADY	
ART UNIT	PAPER NUMBER
2461	
MAIL DATE	DELIVERY MODE
12/18/2012	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	12/581,575	WU, WENFU	
	Examiner	Art Unit	
	DADY CHERY	2461	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 September 2012*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7,9,10,16,19,20, and 26 -33.* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7,9,10,16,19,20, and 26 -33.* is/are rejected.

7)☐ Claim(s) _ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This communication is responsive to the amendment filed on September 4th 2012.

No Claims have been amended.

Claims 1- 6, 8, 11- 15, 17-18, and 21-25 have been cancelled.

No Claims have been added.

Claims 7,9,10,16,19,20, and 26 -33 are now pending.

Response to Arguments

Applicant's arguments, see pages 6-10, filed on March 6th 2012, with respect to the rejection(s) of claim(s) 7,9,10,16,19,20, under 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Shaheen (US Application 2008/0316971).

1. In view of the Pre Appeal conference request filed on 09/04/12, PROSECUTION IS HEREBY REOPENED. The new grounds of rejection are set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth

in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 7,9,10,16,19,20, and 26 -33 are rejected under 35 U.S.C. 102(e) as being anticipated by Shaheen (US Application 2008/0316971).

Regarding claim 7, Shaheen discloses a handover processing method **(Fig. 5),** comprising:

receiving, by a Mobility Management Entity (MME) an attach request message sent by a User Equipment (UE) during a handover from a non-3rd Generation Partnership Project (non-3GPP) network to a 3rd Generation Partnership (3GPP) network **([0059]-[0062], which recites a an attach request sends by the UE to an MME during a handover from a non-3GPP to a 3GPP),** wherein the attach request message comprises an information element (IE) indicating handover**([0062], where the attach request includes the information of UE);**

identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is

used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS)**([0064], which recites the MME contacts the HSS AAA for authentication procedures where the authentication identifies the address of the PDN GW);** and

requesting, by the MME, the PDN GW to initiate a bearer creation procedure**([0065], which recites the MME selects a serving GW and sends a Create Default Bearer request).**

Regarding claim 16, Shaheen discloses a network element **(Fig. 5)**, comprising:

an obtaining unit configured to receive an attach request message sent by a User Equipment (UE) during a handover from a non-3rd Generation Partnership Project (non-3GPP) network to a 3rd Generation Partnership Project (3GPP) network **([0059]-[0062], which recites a an attach request sends by the UE to an MME during a handover from a non-3GPP to a 3GPP),**, wherein the-attach request message comprises an information element indicating handover**([0062], where the attach request includes the information of UE)**

an identifying unit**,** configured to identify information that the attach request message is due to the handover according to the IE indicating handover**([0059]-[0062], which a handover attach request message);**

and

a processing unit configured to identify a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS) **([0064], which recites the MME contacts the HSS**

AAA for authentication procedures where the authentication identifies the address of the PDN GW); and request the PDN GW to initiate a bearer creation procedure **([0065], which recites the MME selects a serving GW and sends a Create Default Bearer request).**

Regarding claim 9, Shaheen discloses the method of claim 7, wherein the handover is an active-mode handover, the method further comprises:
setting up a data forwarding tunnel between a serving gateway (GVV) of the 3GPP network and a non-3GPP GW of the non-3GPP network according to data forwarding tunnel resource information of the 3GPP network**([0066]-[0070]).**

Regarding claim 10, Shaheen discloses the method of claim 9, wherein setting up the data forwarding tunnel comprises:
sending, by MME, the data forwarding tunnel resource information, to the non-3GPP GW either directly or through a non-3GPP access network element and creating, by the non-3GPP GW, the data forwarding tunnel with the serving GW**([0066]-[0070]).**

Regarding claim 19, Shaheen discloses the method of claim 7, wherein the requesting the PDN GW to initiate a bearer creation procedure comprises:
sending, by the MME a Create Bearer Request message to the PDN GW and initiating, by the PDN GW, the bearer creation procedure**([0066]-[0070]).**

Regarding claim 20, Shaheen discloses the method of claim 19, wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules message by the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain a PCC Rules **([0012]).**

Regarding claims 26, 31, Shaheen discloses the method of claim 7, wherein the IE is an Attach Type IE **([0066]-[0070]).**

Regarding claims 27, 32 Shaheen discloses the method of claim 26, wherein a value of the Attach Type IE is set to "1" **([0066]-[0070]).**

Regarding claims 28, 33, Shaheen discloses the method of claim 26, wherein a value of the Attach Type IE is set to "Handover Attach" **([0066]-[0070]).**

Regarding claims 29, 30,Shaheen discloses the method of claim 7, wherein the MME identifies the PDN GW by obtaining the PDN GW address from the HSS**([0066]-[0070]).**

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DADY CHERY whose telephone number is (571)270-1207. The examiner can normally be reached on Monday - Thursday 8 am - 4 pm ESt.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy D. VU can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dady Chery/
Examiner, Art Unit 2461

Notice of References Cited	Application/Control No. 12/581,575	Applicant(s)/Patent Under Reexamination WU, WENFU	
	Examiner DADY CHERY	Art Unit 2461	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2008/0316971	12-2008	Shaheen, Kamel M.	370/331
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	**Art Unit**
	DADY CHERY	2461

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	10/27/2010	04/19/2011	12/04/2011	05/01/2012					
	1	✓	✓	✓	-					
	2	✓	-	-	-					
	3	✓	-	-	-					
	4	✓	✓	✓	-					
	5	✓	✓	✓	-					
	6	✓	✓	-	-					
	7	✓	✓	✓	✓					
	8	✓	-	-	-					
	9	✓	✓	✓	✓					
	10	✓	✓	✓	✓					
	11	✓	✓	✓	-					
	12	✓	✓	✓	-					
	13	✓	-	-	-					
	14	✓	✓	✓	-					
	15	✓	-	-	-					
	16	✓	✓	✓	✓					
	17	✓	-	-	-					
	18		✓	✓	-					
	19		✓	✓	✓					
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	24			✓	-					
	25			✓	-					
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	27				✓					
	28				✓					
	29				✓					
	30				✓					
	31				✓					
	32				✓					
	33				✓					

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	Art Unit
	DADY CHERY	2461

SEARCHED

Class	Subclass	Date	Examiner
370	328,329,330,331,332,333,334	10/22/2010	DC
455	436,437,438,439	10/22/2010	DC
709	227,228,229	10/22/2010	DC

SEARCH NOTES

Search Notes	Date	Examiner
Inventorship	10/22/2010	DC
Updated search	04/18/2011	DC
Updated search	12/04/2011	Dc
Updated search	05/01/2012	DC
Updated search	12/15/2012	DC

INTERFERENCE SEARCH

Class	Subclass	Date	Examiner

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	J1	20070243872 A1	10/18/2007	Gallagher et al.		
	J2					
	J3					
	J4					
	J5					
	J6					
	J7					
	J8					
	J9					
	J10					
	J11					
	J12					
	J13					

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	J14	CN 1866850 A	11/22/2006	China		Abstract

EXAMINER INITIAL		OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.
	J15	Copy of Office Action issued in commonly owned U.S. Patent Application No. 13/197,537, mailed December 18, 2012.
	J16	
	J17	
	J18	
	J19	
	J20	

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Espacenet

Bibliographic data: CN1866850 (A) — 2006-11-22

Method for H.323 gatekeeper realizing H.323 terminal timely registration

Inventor(s):	FAN GAOFENG TAO [CN] ±
Applicant(s):	ZTE CORP [CN] ±

Classification:	**- international:**	***H04L12/24***
	- European:	
Application number:	CN20051070767 20050518	
Priority number(s):	CN20051070767 20050518	
Also published as:	CN100440797 (C)	

Abstract of CN1866850 (A)

The invention discloses a H.323 net guard realizing H.323 terminal registring method, which comprises the following steps: (1) H.323 net guard receives H.323 terminal registration request and decides the type of the request and the registration state of H.323 terminal; (2) if the H.323 net guard judges the request registration H.323 terminal conflicts with registered H.323 terminal and the registration request doesn't keep registration request, the H.323 terminal sends one registration detecting information to the registered H.323 terminal; (3) if the registered H.323 terminal response message doesn't receive in given time, the registration state of registered H.323 terminal is changed into non registration state.

[19] 中华人民共和国国家知识产权局

[51] Int. Cl.
H04L 12/24 (2006.01)

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[21] 申请号 200510070767.2
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代理人 王 漪 霍育栋

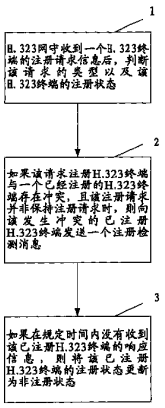
权利要求书 2 页 说明书 6 页 附图 3 页

[54] 发明名称

一种 H.323 网守实现 H.323 终端及时注册的方法

[57] 摘要

本发明公开了一种 H.323 网守实现 H.323 终端及时注册的方法，包括步骤：(1) H.323 网守收到一个 H.323 终端的注册请求信息后，判断该请求的类型以及该 H.323 终端的注册状态；(2) 如果判断到该请求注册 H.323 终端与一个已经注册的 H.323 终端存在冲突，且该注册请求并非保持注册请求时，则向该发生冲突的已注册 H.323 终端发送一个注册检测消息；(3) 如果在规定时间内没有收到该已注册 H.323 终端的响应信息，则将该已注册 H.323 终端的注册状态更新为非注册状态。 按照本发明，能够实现在 H.323 终端原注册存活周期内因 H.323 终端非正常退出而再次发起的注册请求的成功注册。



1、 一种 H.323 网守实现 H.323 终端及时注册的方法，其特征在于包括如下步骤:

（1）H.323 网守收到一个 H.323 终端的注册请求信息后，判断该请求的类型以及该 H.323 终端的注册状态;

（2）如果判断到该请求注册 H.323 终端与一个已经注册的 H.323 终端存在冲突，且该注册请求并非保持注册请求时，则向该发生冲突的已注册 H.323 终端发送一个注册检测消息;

（3）如果在规定时间内没有收到该已注册 H.323 终端的响应信息，则将该已注册 H.323 终端的注册状态更新为非注册状态。

2、 如权利要求 1 所述的方法，其特征在于进一步包括如下步骤:

（4）向该请求注册 H.323 终端发送注册成功消息，并保存该 H.323 终端的注册信息，设置其为正常注册状态。

3、 如权利要求 2 所述的方法，其特征在于: 所述步骤（4）中所述向该请求注册 H.323 终端发送注册成功消息是通过 H.323 网守直接向该请求注册 H.323 终端发送注册成功确认消息来实现的。

4、 如权利要求 2 所述的方法，其特征在于: 所述步骤（4）中所述向该请求注册 H.323 终端发送注册成功消息是通过: 当 H.323 网守再次收到该请求注册 H.323 终端的请求注册消息时，向该请求注册 H.323 终端发送注册成功确认消息来实现的。

5、 如权利要求 1 所述的方法，其特征在于所述步骤（1），如果没有判断到冲突，则向该请求注册 H.323 终端回应注册成功消息，并保存该 H.323 终端的注册信息，设置其为正常注册状态。

6、 如权利要求 1 所述的方法，其特征在于所述步骤（1），如果判断到该请求信息类型为保持注册请求，则向该 H.323 终端回应保持注册成功，该 H.323 终端的注册状态仍然有效。

7、 如权利要求 1 所述的方法，其特征在于所述步骤（1）与步骤（2），

是根据在 H.323 网守中保存的已注册 H.323 终端的注册信息判断并发送消息的。

8、 如权利要求 1 所述的方法，其特征在于所述步骤（2），如果在规定时间内收到该已注册 H.323 终端的响应信息，则该 H.323 终端的注册状态仍然有效，向该请求注册 H.323 终端发送拒绝注册消息。

9、 如权利要求 1 所述的方法，其特征在于所述步骤（2），当向该发生冲突的已注册 H.323 终端发送一个注册检测消息，可以设置一个定时器，在该定时器未到时之前，不再向该 H.323 终端发送注册检测消息。

10、 如权利要求 1 所述的方法，其特征在于所述步骤（2）中，所述请求注册 H.323 终端与一个已经注册的 H.323 终端存在冲突是注册别名一致，但注册的地址不同；或注册地址一致，但注册的别名不同；或注册别名、地址都相同。

一种 H.323 网守实现 H.323 终端及时注册的方法

技术领域

本发明涉及一种 H.323 网守实现 H.323 终端注册的方法，具体地说，是涉及一种 H.323 网守实现 H.323 终端及时注册的方法。

背景技术

H.323（Packet-based multimedia communications systems，2003 年 7 月出版，第 7.2 节，第 64～66 页）中规定了 H.323 终端(H.323 endpoint)向 H.323 的网守(GK)注册的方法。H.323 终端向 H.323 的网守(GK)注册成功后，H.323 的终端会依据 H.323 的网守(GK)策略周期性的发送注册消息，此注册消息总是有一定的存活周期，如果在存活周期内没有收到刷新的注册消息，那么 H.323 的网守(GK)认为此终端已经不是注册状态了，则该终端在网守处于非注册状态了。处于非注册状态的 H.323 的终端如果发起呼叫 H.323 的网守(GK)将拒绝此呼叫。

当 H.323 终端向注册 H.323 的网守注册时，网守发现此注册是首次注册或保持注册消息，网守允许注册并回复确认注册的消息。当某个 H.323 终端由于某些原因如掉电或终端程序异常退出而离线时，H.323 的网守(GK)在注册存活周期内仍认为此 H.323 终端处于有效注册状态，同时保留有此终端的各项注册信息。在该终端的存活注册周期之内，如果 H.323 的网守接收到对该终端用户的呼叫请求，由于网守仍然保存此终端的注册信息，H.323 的网守会依据存储的信息向终端发起呼叫，此呼叫会导致异常服务出现，如呼叫失败等等。另外，在该异常退出的终端存活注册周期内，如果该终端重新启动或者重新注册，此时终端的注册传输地址可能已经改变，依据 H.323 的网守策略，网守会拒绝此用户的重新注册，那么此用户可能在现行存活注册周期结束之前无法注册，同时无法发起呼叫也无法被呼叫，其他的各项补充业务也无法提供。随着存活周期的时间越长，影响也越大，容易出现短时间突

然不能提供服务的严重问题。

发明内容

本发明所要解决的技术问题是提供一种 H.323 网守实现 H.323 终端及时注册的方法，使得因非正常退出的 H.323 终端在其原存活注册周期内发起的注册请求可以被 H.323 网守接受，可以在短时间内重新确定 H.323 终端的注册状态，并及时的更新终端的注册状态，从而使 H.323 终端能够及时提供各项呼叫服务。

为解决上述技术问题，本发明提供方案如下：

一种 H.323 网守实现 H.323 终端及时注册的方法，包括如下步骤：

步骤一：H.323 网守收到一个 H.323 终端的注册请求信息后，判断该请求的类型以及该 H.323 终端的注册状态；

步骤二：如果判断到该请求注册 H.323 终端与一个已经注册的 H.323 终端存在冲突，且该注册请求并非保持注册请求时，则向该发生冲突的已注册 H.323 终端发送一个注册检测消息；

步骤三：如果在规定时间内没有收到该已注册 H.323 终端的响应信息，则将该已注册 H.323 终端的注册状态更新为非注册状态。

进一步地，本发明所述方法，还进一步包括步骤：

步骤四：向该请求注册 H.323 终端发送注册成功消息，并保存该 H.323 终端的注册信息，设置其为正常注册状态。

所述步骤四中所述向该请求注册 H.323 终端发送注册成功消息是通过 H.323 网守直接向该请求注册 H.323 终端发送注册成功确认消息来实现的。

所述步骤四中所述向该请求注册 H.323 终端发送注册成功消息是通过：当 H.323 网守再次收到该请求注册 H.323 终端的请求注册消息时，向该请求注册 H.323 终端发送注册成功确认消息来实现的。

本发明所述方法中，所述步骤一，如果没有判断到冲突，则向该请求注册 H.323 终端回应注册成功消息，并保存该 H.323 终端的注册信息，设置其为正常注册状态。

本发明所述方法中，所述步骤一中，如果判断到该请求信息类型为保持注册请求，则向该 H.323 终端回应保持注册成功，该 H.323 终端的注册状态仍然有效。

本发明所述的方法中，所述步骤一与步骤二中，是根据在 H.323 网守中保存的已注册 H.323 终端的注册信息判断并发送消息的。

本发明所述方法中，所述步骤二中，如果在规定时间内收到该已注册 H.323 终端的响应信息，则该 H.323 终端的注册状态仍然有效，向该请求注册 H.323 终端发送拒绝注册消息。

本发明所述的方法中，所述步骤二中，当向该发生冲突的已注册 H.323 终端发送一个注册检测消息，可以设置一个定时器，在该定时器未到时之前，不再向该 H.323 终端发送注册检测消息。

本发明所述方法中，所述步骤二中，所述请求注册 H.323 终端与一个已经注册的 H.323 终端存在冲突是注册别名一致，但注册的地址不同；或注册地址一致，但注册的别名不同；或注册别名、地址都相同。

与现有技术相比，本发明的优点在于：

本发明通过 H.323 网守向 H.323 终端发送注册检测消息判断 H.323 终端的原注册状态是否有效，从而能够实现在 H.323 终端原注册存活周期内因 H.323 终端非正常退出而再次发起的注册请求的成功注册。

本发明所要解决的技术问题、特点和优点，将结合实施例，参照附图作进一步的说明。

附图说明

图 1 是本发明所述 H.323 网守实现 H.323 终端及时注册方法的流程图。

图 2 是 H.323 终端注册在线后，H.323 网守又收到一个重复注册请求消息的流程图。

图 3 是已成功注册的 H.323 终端因异常退出重新启动后，立即向 H.323 网守发起注册请求的流程图。

具体实施方式

参照图 1，是本发明所述 H.323 网守实现 H.323 终端及时注册方法的流程图。

一种 H.323 网守实现 H.323 终端及时注册的方法，包括如下步骤：

1、H.323 网守收到一个 H.323 终端的注册请求信息后，判断该请求的类型以及该终端的注册状态；

这里的判断是根据在 H.323 网守中保存的已注册 H.323 终端的注册信息判断的；

该步骤中，如果没有判断到冲突，则向该请求注册 H.323 终端回应注册成功消息，并保存该 H.323 终端的注册信息，设置其为正常注册状态。

如果判断到该请求信息类型为保持注册请求，则向该 H.323 终端回应保持注册成功，该 H.323 终端的注册状态仍然有效。

2、如果判断到该请求注册 H.323 终端与一个已经注册的 H.323 终端存在冲突，且该注册请求并非保持注册请求时，则向该发生冲突的已注册 H.323 终端发送一个注册检测消息；

这里，所述请求注册 H.323 终端与一个已经注册的 H.323 终端存在冲突是注册别名一致，但注册的地址不同；或注册地址一致，但注册的别名不同；或注册别名、地址都相同。

所述的冲突也是根据在 H.323 网守中保存的已注册 H.323 终端的注册信息判断的。

该步骤中，如果在规定时间内收到该已注册 H.323 终端的响应信息，则该 H.323 终端的注册状态仍然有效，向该请求注册 H.323 终端发送拒绝注册消息。

在该步骤中，当向该发生冲突的已注册 H.323 终端发送一个注册检测消息，可以设置一个定时器，在该定时器未到时之前，不再向该 H.323 终端发送注册检测消息。

3、如果在规定时间内没有收到该已注册 H.323 终端的响应信息，则将该已注册 H.323 终端的注册状态更新为非注册状态。

这里还可以增加一个步骤:

4、向该请求注册 H.323 终端发送注册成功消息，并保存该 H.323 终端的注册信息，设置其为正常注册状态。

这里，所述向该请求注册 H.323 终端发送注册成功消息可以是通过 H.323 网守直接向该请求注册 H.323 终端发送注册成功确认消息来实现的。

也可以是通过：当 H.323 网守再次收到该请求注册 H.323 终端的请求注册消息时，向该请求注册 H.323 终端发送注册成功确认消息来实现的。

参照图 2，当 H.323 已经注册在线时，H.323 网守收到 H.323 终端 B 的注册请求消息，该注册消息所携带的注册信息与已经注册在线的 H.323 终端 A 的注册信息相冲突，H.323 网守发送检测注册消息，相关处理流程如下:

201、H.323 终端 A 向 H.323 网守正常注册，发送 RRQ 请求注册消息;

202、H.323 网守向 H.323 终端 A 发送注册成功的确认消息 RCF，保存 H.323 终端 A 的注册信息，并设置 H.323 终端处于正常注册状态;

203、H.323 终端 B 向 H.323 网守正常注册，发送 RRQ 请求注册消息，此注册消息所携带的注册信息与 H.323 终端 A 的注册信息冲突;

204、H.323 网守向 H.323 终端 A 发送注册检测消息 CHECKMSG;

205、H.323 终端 A 向 H.323 网守发送检测的响应消息 RESPONDMSG，H.323 网守获知终端 A 的注册状态有效;

206、H.323 网守向 H.323 终端 B 发送拒绝注册消息 RRJ。

在上述步骤 203 中，所述的相冲突的注册消息，如注册的别名是一致的，但注册的地址是不同的。

参照附图 3，H.323 终端 A 注册在线后异常退出，H.323 终端 A 立即重新发起注册请求，H.323 网守收到 H.323 终端 A 的注册请求消息，此注册消息与已经注册在线的 H.323 终端 A 注册消息冲突时，网守主动发送注册检测消息，相关处理流程如下:

301、H.323 终端 A 向 H.323 网守正常注册，发送 RRQ 请求注册消息;

302、H.323 网守向 H.323 终端 A 发送注册成功的确认消息 RCF，保存

H.323 终端 A 的注册信息，并设置 H.323 终端处于正常注册状态；

303、H.323 终端 A 断电重启后立即向 H.323 网守发起注册请求，发送 RRQ 请求注册消息，此注册请求消息所携带的注册信息与 H.323 终端 A 的注册信息冲突；

304、H.323 网守向 H.323 终端 A 发送注册检测消息 CHECKMSG；

305、H.323 网守在规定的时间内没有收到 H.323 终端 A 发送的 RESPONDMSG 响应；

306、H.323 网守更改 H.323 终端 A 的注册状态为无效；并向上述重起后的 H.323 终端 A 发送注册成功消息 RCF。

在上述步骤 303 中，所述的相冲突的注册消息，如注册的别名是一致的，但注册的地址是不同的。

本发明所述的 H.323 网守实现 H.323 终端及时注册的方法，并不仅仅限于说明书和实施方式中所列运用，它完全可以被适用于各种适合本发明之领域，对于熟悉本领域的人员而言可容易地实现另外的优点和进行修改，因此在不背离权利要求及等同范围所限定的一般概念的精神和范围的情况下，本发明并不限于特定的细节、代表性的设备和这里示出与描述的图示示例。

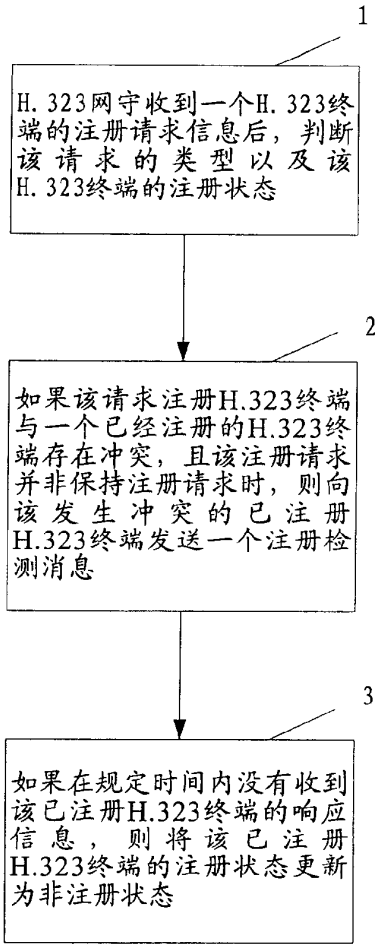


图 1

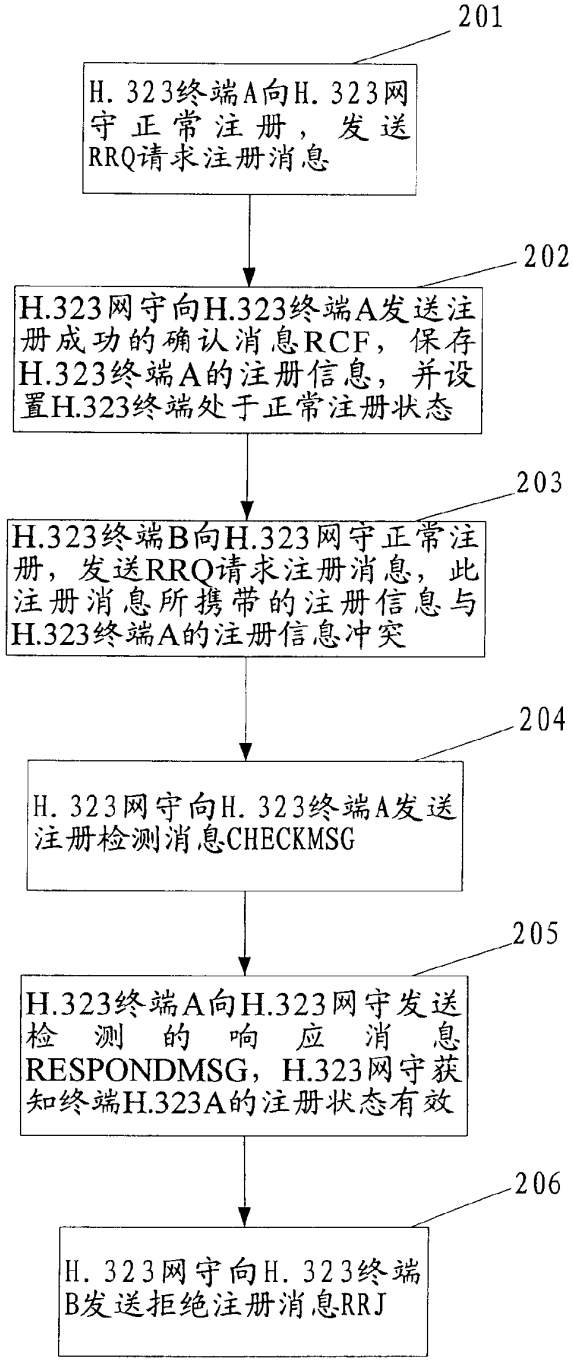


图 2

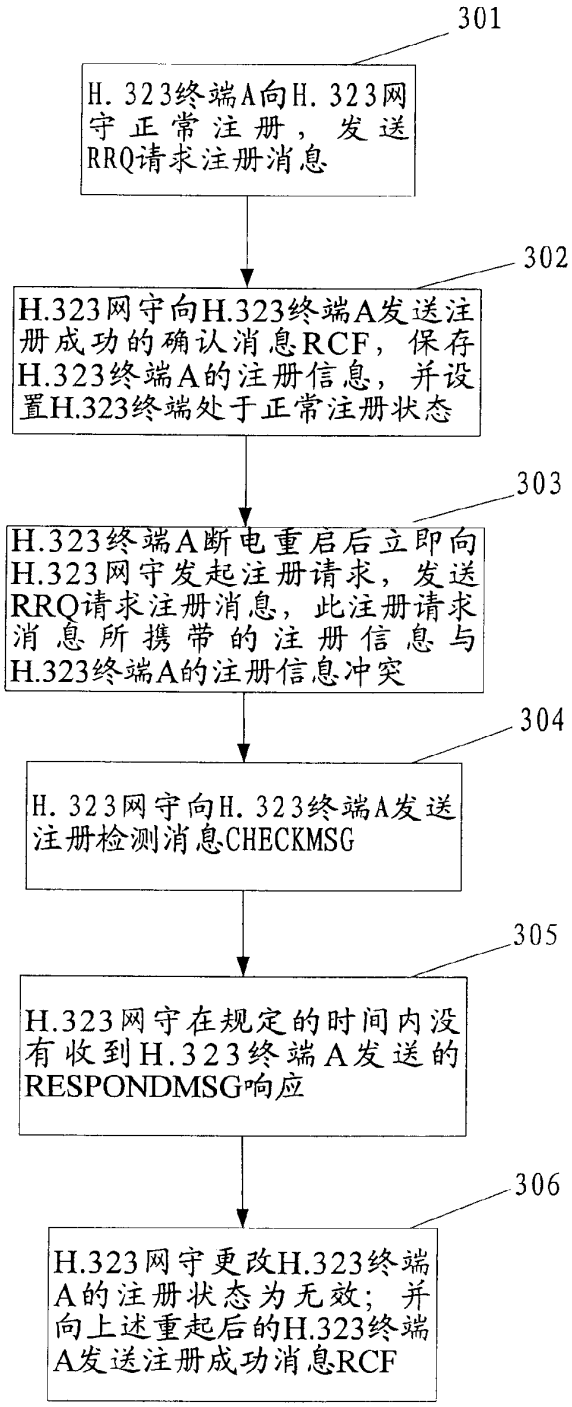


图 3

Electronic Patent Application Fee Transmittal

Application Number:	12581575
Filing Date:	19-Oct-2009
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Filer:	Gustavo Siller Jr./Cheryl Belcik
Attorney Docket Number:	13674-213

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	14561042
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Jeff Skinner
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	26-DEC-2012
Filing Date:	19-OCT-2009
Time Stamp:	16:19:33
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	2131
Deposit Account	231925
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)	
Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)	
Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213_ids_forms.pdf	124926 209f91432e610bcf36e035d574a6e6751438b15e	yes	4

Multipart Description/PDF files in .zip description

Document Description	Start	End
Miscellaneous Incoming Letter	1	1
Transmittal Letter	2	3
Information Disclosure Statement (IDS) Form (SB08)	4	4

Warnings:					
Information:					
2	Foreign Reference	CN1866850A.pdf	580861 6a91201803d8854f9aa1c2fff4d9ae2f40dda4d8	no	13
Warnings:					
Information:					
3	Other Reference-Patent or Application Document	US_OA.pdf	534604 00c746df1908b943f21621d2b2809efff8c37a97	no	16
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30752 9b2bdfc1533a32df603d2194b791d2193b4859a4	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1271143		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: December 26, 2012 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu

Appln. No.: 12/581,575 Examiner: Dady Chery

Filed: October 19, 2009 Art Unit: 2461

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING Confirmation No.: 2875

Attorney Docket No: 13674-213
Client Ref. No. 0810596US

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Information Disclosure Statement; PTO-1449; Cited References J14 and J15.

Fee calculation:

☐ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

					Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra	Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus			x $26=			x $52=	
Indep.		Minus			x 110=			x $220=	
First Presentation of Multiple Dep. Claim					+$195=			+ $390=	
					Total	$		Total	$

Fee payment:

☒ Please charge Deposit Account No. 23-1925 in the amount of $180.00 for IDS.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

December 26, 2012
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
12/26/2012

Date of Deposit
Gustavo Siller, Jr.

Name of applicant, assignee or
Registered Representative
/Gustavo Siller, Jr./

Signature
12/26/2012

Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.:	2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US		

NINTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(c), Applicant hereby cites the following reference(s):

U.S. PATENT DOCUMENTS		
DOCUMENT NO.	**DATE**	**NAME**
20070243872 A1	10/18/2007	Gallagher et al.

BRINKS
HOFER
GILSON
&LIONE

FOREIGN PATENT DOCUMENTS		
DOCUMENT NO.	DATE	COUNTRY
CN 1866850 A	11/22/2006	China

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Office Action issued in commonly owned U.S. Patent Application No. 13/197,537, mailed December 18, 2012.

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

Applicant has calculated a processing fee in the amount of $180.00 to be due under 37 CFR §1.17(p) in connection with the filing of this Information Disclosure Statement. Applicant has enclosed a check covering this fee, or authorized charging the fee to a deposit account or credit card, as indicated in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

December 26, 2012
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	K1					
	K2					
	K3					
	K4					
	K5					
	K6					
	K7					
	K8					
	K9					
	K10					
	K11					
	K12					
	K13					

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	K14	CN 1549610 A	11/24/2004	China		Abstract

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	K15	Copy of Office Action issued in corresponding Chinese Patent Application No. 201110412187.2, mailed February 5, 2013.
	K16	Copy of Search Report issued in corresponding Chinese Patent Application No. 201110412187.2, mailed February 5, 2013.

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

No documents available for this priority number.

Espacenet

Bibliographic data: CN1549610 (A) — 2004-11-24

Method for providing multi-stage insertion service in public insertion information channel

Inventor(s): LIAO JINGYI [CN]; WANG HAI [CN]; JU CHANGHUI [CN] ± (JINGYI LIAO, ; HAI WANG, ; CHANGHUI JU)

Applicant(s): BEIJING SAMSUNG COMM TECH RES [CN] ± (BEIJING SAMSUNG COMMUNICATION TECHNOLOGY RESEARCH CO., LTD)

Classification: - international: ***H04L12/28; H04L12/56; H04W74/08;*** *H04W36/00;* (IPC1-7): H04B7/26; H04L29/00; H04Q3/00; H04Q7/20
- cooperative: **H04W56/002; H04W74/008;** H04W36/00; H04W74/0833; H04W74/0875

Application number: CN20031023613 20030509

Priority number (s): CN20031023613 20030509

Also published as: WO2004100403 (A1) US2007032255 (A1) US8331933 (B2) KR20060009289 (A) KR100663444 (B1) more

Abstract of CN1549610 (A)

In the method, switching in request response message is sent to user station after switching in request message is correctly received, unique connection identification CID corresponding to this time of switching in request and disposed by system is attached with switching in request response message, time of restart to launch switching in request is confirmed by utilizing backspace algorithm calculation in corresponding backspace domain according to switching in type if switching request is launched on selected public switching in channel after at least two backspace domain division informations of at least one public switching in channel is correctly received by user station.

[19] 中华人民共和国国家知识产权局

[51] Int. Cl[7]
H04Q 7/20
H04Q 3/00 H04B 7/26
H04L 29/00

[12] 发明专利申请公开说明书

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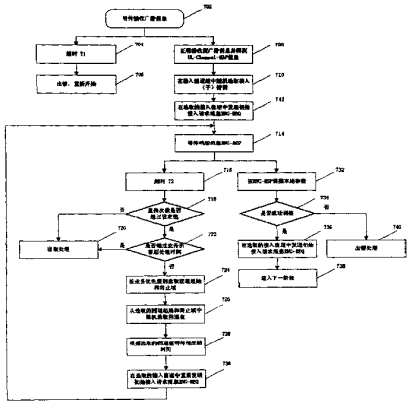
[54] 发明名称 在公共接入信道中提供多级接入服务的方法

[57] 摘要

无线网络系统中的基站定期或按需在前向公共控制信道中向基站对应的小区通告信息：公共接入(子)信道的分配信息，至少一个公共接入(子)信道的至少两个回退域的划分信息；正确接收到用户站的接入请求消息，确认能向用户站提供对应的接入服务后，将向用户站发送接入请求响应消息，接入请求响应消息将携带系统分配给与该次接入请求对应的唯一的连接标识 CID；无线网络系统中的用户站在正确接收到服务小区内通告的公共接入(子)信道分配和至少一个公共接入(子)信道的至少两个回退域的划分信息后，若在选定的公共接入(子)信道发起接入请求，将按照接入类型选择对应的回退域，在对应的回退域中，利用回退算法计算以确定重新发起接入请求的时间。



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1．一种在公共接入信道中提供多级接入服务的方法，包括步骤：

无线网络系统中的基站定期或按需在前向公共控制信道中向该基站对应的小区通告以下信息：（a）公共接入（子）信道的分配信息，以及（b）在至少一个公共接入（子）信道的至少两个回退域的划分信息；

在正确接收到用户站的接入请求消息，并确认能向该用户站提供对应的接入服务后，将向用户站发送接入请求响应消息，接入请求响应消息将携带系统分配给与该次接入请求对应的唯一的连接标识CID；

无线网络系统中的用户站在正确接收到服务小区内通告的涉及公共接入（子）信道分配，和在至少一个公共接入（子）信道的至少两个回退域的划分信息后，若在选定的公共接入（子）信道发起接入请求，将（a）按照接入类型选择对应的回退域，并且（b）在对应的回退域中，利用回退算法计算以确定重新发起接入请求的时间。

2．按照权利要求1所述的方法，其特征在于，无线网络系统中的基站在前向公共控制信道中定期或按需通告各接入（子）信道分配信息。

3．按照权利要求1所述的方法，其特征在于，无线网络系统中的基站在前向公共控制信道中定期或按需通告对应其中至少一个公共接入（子）信道的至少两个回退域的划分信息。

4．按照权利要求1所述的方法，其特征在于，无线网络系统中的用户站在正确接收到服务小区内通告的涉及公共接入（子）信道分配，和在至少一个公共接入（子）信道的至少两个回退域的划分信息后，若发起接入请求，在对应的回退域中利用回退算法随机选择一个回退值，以确定在选定的公共接入（子）信道重新发起接入请求的时间。

5. 按照权利要求1所述的方法，其特征在于，标识切换下的网络接入请求包括步骤：

用户站在切换过程中向基站发起接入请求消息，切换下的网络接入请求消息是包含有标识切换请求类型的字段的接入请求消息；

基站在正确接收到用户站的接入请求消息，并确认能向该用户站提供对应的接入服务后，将向用户站发送接入请求响应消息，接入请求响应消息将携带系统分配给与该次接入请求对应的唯一的连接标识CID。

6. 按照权利要求5所述的方法，其特征在于，所述切换下的网络接入请求消息是在原有的接入请求消息中加入标识切换请求类型的字段。

7. 按照权利要求5所述的方法，其特征在于，所述切换下的网络接入请求消息是利用专用的伪随机码信息。

8. 根据权利要求5所述的方法，其特征在于，用户站向基站发起接入请求消息，切换下的网络接入请求消息利用专用的接入请求消息RNG-REQ-HO。RNG-REQ-HO至少包括了标识采用的上行接入（子）信道和标识切换用接入类型等字段。

9. 根据权利要求5所述的方法，其特征在于，用户站向基站发起接入请求消息，切换下的网络接入请求消息是通过在原有的接入请求消息RNG-REQ中，至少加入了标识采用的上行接入（子）信道和标识切换请求类型等字段。

10. 根据权利要求5所述的方法，其特征在于，在IEEE802.16e规范中用于系统识别切换下的网络接入请求的伪随机码的生成和分配的方法，包括以下步骤：

利用IEEE802.16a的OFDMA模式下的搜索码的生成式输出的长码，用于系统识别硬切换下的网络接入请求的伪随机码是通过截取该长码而产生的，最终所截取的伪随机码与其他用途的伪随机码有所不同，以便系统识别；

用于系统识别硬切换下的网络接入请求的伪随机码 （a）可由系统固定分配给各个小区；或者（b）也可以由系统按照各小区的需求动态划分给各个小区。

11. 按照权利要求10所述的方法，其特征在于，利用IEEE802.16a的OFDMA模式下的搜索码的生成式$1+X^1+X^4+X^7+X^{15}$输出的长码，用于系统识别硬切换下的网络接入请求的伪随机码是通过截取该长码而产生的。

12. 按照权利要求10所述的方法，其特征在于，生成用于系统识别切换下的网络接入请求的伪随机码，IEEE802.16a的OFDMA模式下的搜索码的生成式$1+X^1+X^4+X^7+X^{15}$将输出长码，标识用的伪随机码将通过截取该长码而产生，截取此伪随机码的时钟与在长码中截取其他用途的伪随机码的时钟有所不同，从而使最终所截取的伪随机码有所不同，以便系统识别。

13. 按照权利要求10所述的方法，其特征在于，所述产生切换下的接入请求所需的H个伪随机码包括步骤：H个伪随机码通过截取由OFDMA模式下的搜索码的生成式$1+X^1+X^4+X^7+X^{15}$输出的长码而产生的，由这H个伪随机码的生成时钟所构成的集合与其他用途的伪随机码的生成时钟所构成的集合没有交集。

14. 按照权利要求13所述的方法，其特征在于，对长码截取后得到以下集合：截取的前N个码为集合A，后M个码为集合B，后L个码为集合C，后H个码为集合D，用于初始搜索，周期搜索，带宽请求，和硬切换的接入请求功能的伪随机码将分别选取一个集合作为各自伪随机码的集合。

15. 按照权利要求14所述的方法，其特征在于，对长码截取的前N个码（对应集合A）用于初始搜索，对应于该生成式的输出，时钟选择为0到106 * (N)-1；其后M个码（对应集合B）用于周期搜索，时钟选择为 106*N 到 106*(N+M)-1 ；随后的L个码（对应集合C）用于带宽请求，时钟选择为106 *(N+M) 到 106*(N+M+L)-1；其后的H个

码(对应集合D)用于硬切换的接入请求类型,时钟选择为106* (N+M+L)到 106 * (N+M+L+H)-1 。

16. 按照权利要求10所述的方法，其特征在于，用于系统识别切换下的网络接入请求的伪随机码可由系统固定分配给各个小区。

17. 按照权利要求10所述的方法，其特征在于还包括步骤：

(a) 各个小区可定时或者按需在前向公共控制信道中向本小区，发送分配到向本小区的伪随机码的标识符或其它标识信息；

(b) 移动站通过检测公共控制信道，得到分配给选定的新基站所在的小区的伪随机码信息。

18. 按照权利要求17所述的的方法，其特征在于，用于系统识别切换下的网络接入请求的伪随机码由系统按照各小区的需求动态划分给各个小区，各个小区可定时或者按需在前向公共控制信道中，发送分配到本小区的伪随机码的标识符或其它标识信息。

19. 按照权利要求17所述的方法，其特征在于，用户站通过检测公共控制信道，得到分配给选定的新基站所在的小区的伪随机码信息。

在公共接入信道中提供多级接入服务的方法

技术领域

本发明涉及无线通信系统，特别涉及在公共接入信道中提供接入网络服务的方法。

背景技术

在无线通信系统中，将允许在多个用户站和系统之间进行信息交换。为支持多个用户站能随机接入系统，通信系统将提供一个或多个反向（从用户站到基站）公共接入信道；当某个用户站试图接入系统时，将在选取的反向公共接入信道中发起接入请求；基站通过检测反向公共接入信道，可以获取终端的接入请求信息。

在无线通信系统中，由于反向公共接入信道向用户站提供的是共享介质的接入环境，需采用适当的随机接入方法，以减少或避免用户站的接入请求之间的冲突。按照在发送分组前是否检测信道，将随机接入方法分为两类，一类是发送分组前无需检测信道，典型的如 ALOHA和时隙 ALOHA等。因为在发送分组前未能检测信道中是否有其它用户站的接入请求，所以 ALOHA 机制不能避免用户站的接入请求之间的冲突。在ALOHA 机制中，当用户站判决接入请求遭遇冲突时，将等待一定的回退时间后重新发起接入请求，回退时间将通过回退算法计算得到。ALOHA 机制设计简单，所需系统控制信息较少，但这种方法不能避免用户站的接入请求之间的冲突。ALOHA 机制一般适用于业务量较少的系统环境。另一类是在发送分组前要求检测信道，典型的如载波侦听多重复用协议族（CSMA）等。相对于 ALOHA 机制，CSMA 协议族要求在发送分组前检测信道，因而 CSMA 协议族比 ALOHA 能更大地避免碰撞，可提供更大的业务量；但这要求系统提供信道检测等控制规程，增加了设计方法的复杂性。

作为通信网络中一种成熟的随机接入协议，ALOHA协议最初是由夏威夷大学的一些研究员设计用于将多个无线分组终端互连。ALOHA和其演进的协议，如时隙ALOHA协议的优点是设计简单，所需系统控制信息较少，适合于业务量较少的系统环境。

ALOHA协议已被广泛应用于无线通信系统。如工作于2-11GHz频段的无线宽带接入系统 IEEE802.16a，IEEE802.16a规范设计的主要目的是支持固定用户的宽带接入。在IEEE802.16a规范中，支持三种工作模式：单载波，正交频分复用（OFDM）和正交频分多址（OFDMA）等。在单载波和OFDM模式下，用户站将在反向接入信道中，利用媒质接入（MAC）层接入请求消息发起接入请求；而在OFDMA工作模式下，用户站将借助于伪随机码信息完成接入请求。

在IEEE802.16a规范中，当用户站需要接入网络时，用户站将执行 IEEE802.16a规范中的网络登录规程。IEEE802.16a规范中的的网络登录规程需要用户站和基站之间相互协作，共同完成。IEEE802.16a规范中的网络登录规程包括：用户站完成与基站的同步，并从前向（基站到用户站）控制信道中，获得有关前向和反向（用户站到基站）信道分配的有关信息；用户站和网络协作完成初始接入过程；用户站和网络协商服务能力，以得到系统服务能力等信息；用户站的认证和注册步骤；建立会话连接和其它操作等。其中在网络登录规程中的初始接入过程中，提供类似ALOHA的机制用于用户站的随机接入，当用户站判决接入请求因发生冲突未被基站正确接收时，将在相同的回退域中，采用回退算法计算并回退一段时间后重新发起接入请求。其中，回退域的分配信息将由系统在公共控制信道中定期通告给用户站。从统计角度，这种回退域的分配和回退算法的设计目标是为了支持所有用户能公平接入系统。

IEEE802.16e 是IEEE802.16a的扩展模式，IEEE802.16e 的设计目标是基于IEEE802.16a 规范，在支持用户的固定接入的基础上，扩展IEEE802.16a 以支持用户的移动性。在多小区移动通信系统中，用户的移动性不可避免地带来了切换问题，即移动用户在跨越多小区时如何维持会话连接的问题，这种问题可利用硬切换方法来完成。

在硬切换过程中，移动用户站（以下称移动站）会先中断与原基站的连接，再在一定时间内与选定的新基站建立联系，从而接入到网络系统并得到系统的服务。

在IEEE802.16e 中，硬切换过程可以由移动站向选定的新基站发起接入请求来实现。为与IEEE802.16a兼容，这种网络接入过程可基于IEEE802.16a的网络登录过程来完成：通过搜索前向控制信道，移动站完成与基站的同步并获得有关前向和反向信道分配的信息；移动站和选定的新基站之间协作完成移动站的接入；执行移动站的部分认证和注册步骤；重新建立会话连接和其它操作等。

与用户站初始接入相比，切换发生时所需的网络接入过程具有以下不同点：切换的目标是完成会话的持续，一般要求移动站的接入服务能在较短的时间内完成；而用户站初始接入的目标是使得用户站初次接入网络，因此，切换下移动站的可容忍的最大接入时间将远小于用户站的初始接入所能容忍的最大接入时间。也即对比一般用户站的初始接入请求，切换需要更快的网络接入。而在IEEE802.16a中，从对用户站接入请求提供的服务来看，其设计目标是支持用户能公平地接入系统，即提供给所有接入用户相同的接入性能。因而若在公共接入（子）信道中，利用现有的IEEE802.16a的接入服务方法将造成切换和其他接入类型的接入请求之间大量的冲突，从而增加切换下的接入时间，不易满足切换所需的快速接入的要求。为了利用IEEE802.16a的网络登录规程，完成包括支持切换所需的快速接入等的多种接入服务需求，一种可行的方案是系统为切换下的接入请求提供专用的接入（子）信道，但这样将浪费带宽等网络资源。

切换发生时所需的网络登录规程还具有以下不同点：切换发生前，移动站已经建立了与原基站的连接，也就是说移动站已经得到了包括系统时间信息，系统的有关服务能力等系统信息。为了提高切换的效率，切换发生时所需的网络登录规程中可以忽略或者跳过在IEEE802.16a中定义的网络登录规程。为了便于系统能针对切换简

化某些网络接入步骤，提供切换所需的快速接入服务，有必要提供便于系统识别出切换发生时的接入请求信息的方法。

发明内容

本发明的目的是提供一种在利用公共接入（子）信道完成接入请求服务的系统中，支持多级接入服务，以及标识切换下的网络接入请求的方法。这些方法可以方便地运用于IEEE802.16e规范中，以提供利用公共接入（子）信道满足切换所需的快速网络接入的要求。

为实现上述目的，一种在公共接入信道中提供多级接入服务的方法，包括步骤：

无线网络系统中的基站定期或按需在前向公共控制信道中向该基站对应的小区通告以下信息：（a）公共接入（子）信道的分配信息，以及（b）在至少一个公共接入（子）信道的至少两个回退域的划分信息；

在正确接收到用户站的接入请求消息，并确认能向该用户站提供对应的接入服务后，将向用户站发送接入请求响应消息，接入请求响应消息将携带系统分配给与该次接入请求对应的唯一的连接标识CID；

无线网络系统中的用户站在正确接收到服务小区内通告的涉及公共接入（子）信道分配，和在至少一个公共接入（子）信道的至少两个回退域的划分信息后，若在选定的公共接入（子）信道发起接入请求，将（a）按照接入类型选择对应的回退域，并且（b）在对应的回退域中，利用回退算法计算以确定重新发起接入请求的时间。

基于ALOHA或时隙ALOHA接入机制，提出了利用公共接入的（子）信道支持多种接入服务的方法，系统定期或按需向用户通告公共接入（子）信道和对应各个接入（子）信道的多个回退域的分配信息；用户站为避免接入请求遭遇到冲突，可按照接入类型选择回退域，并从对应回退域中计算并确定重新发起接入请求的时间。这种方法可以提供至少两级接入服务，减少不同接入类型的接入请求的冲突，而且对比向不同接入类型的接入请求提供不同的公共接入（子）信

道的方法，可以节省带宽等网络资源。对于利用公共接入（子）信道完成多种接入请求服务的系统，提出了标识切换下的网络接入请求的方法。当用户站向基站发起接入请求消息，切换下的网络接入请求消息可以利用专用的接入请求消息，或在原有的接入请求消息RNG-REQ中加入标识切换请求类型的字段，或借助于专用的伪随机码信息等方式实现。采用这些方法，可在提供用户站接入服务的同时，便于系统识别硬切换下的网络接入请求，从而简化处理切换所需的网络登录规程，提供硬切换所需的快速接入的服务要求。以IEEE802.16e规范中的OFDMA模式为实施例，进一步说明了利用伪随机码标识切换用接入请求的方法：IEEE802.16e的OFDMA模式下的搜索码的生成式将输出长码，标识用的伪随机码将通过截取该输出长码而产生。这种伪随机码的生成方式易于与IEEE802.16a规范兼容，并便于系统设计；提出的标识硬切换的伪随机码的分配方法将易于系统识别用户的硬切换下的接入请求类型。

附图说明

图1是 前向和反向信道示意图；

图2a是TDD模式下的帧控制信息和信道映射示意图 1；

图2b是TDD模式下的帧控制信息和信道映射示意图 2；

图3a是FDD模式下的帧控制信息和信道映射示意图 1；

图3b是 FDD模式下的帧控制信息和信道映射示意图 2；

图4.1是提供多个回退域的上行接入信道映射(UL-RACH-MAP)格式1；

图4.2是提供多个回退域的上行接入信道映射(UL-RACH-MAP)格式2；

图5是切换用接入请求消息RNG-REQ-HO的格式；

图6a是包含硬切换发生时的接入搜索过程；

图6b是OFDMA模式下包含硬切换发生时的接入搜索过程；

图7是用户站的接入请求流程图。

具体实施方式

本发明提出了在利用公共接入（子）信道完成接入请求服务的系统中，支持多级接入服务，以及标识切换下的网络接入请求的方法。这些方法可以方便地运用于IEEE802.16e规范中，以提供利用公共接入（子）信道满足切换所需的快速网络接入的要求。

1．信道划分和接入（子）信道中的参数信息

1．1 前向和反向信道的分配

在无线通信系统中，如IEEE802.16a规范定义的宽带无线接入系统中，用户站和基站之间的交互信息将在多个逻辑信道中进行传输。从数据信息的传输方向来分，这些逻辑信道可分为从基站到用户站的前向信道和从用户站到基站的反向信道。如图1所示，基站11和用户站12之间的前向信道包括了前向导频信道（F-PCH），前向公共控制信道（F-CCH）和前向业务信道（F-TrCH）等。其中前向导频信道（F-PCH）用于用户站12和基站11之间的同步；前向公共控制信道（F-CCH）用于基站11向用户站12传递网络参数和公共控制信息，公共控制信息可包括反向和前向信道的信道分配信息等；前向业务信道（F-TrCH）用于基站11向用户站12传递前向业务信息。基站11和用户站12 之间的反向信道包括了反向接入信道（R-ACH）和反向业务信道（R-TrCH）等。其中反向接入信道（R-ACH）用于用户站的接入服务；反向业务信道（R-TrCH）用于用户站向基站传递反向业务信息。

在无线环境下，当用户站试图接入系统时，用户站首先需要完成与基站的下行（从基站到用户站）同步，这可通过捕获和追踪前向导频信道（F-PCH）的信息来完成。用户站还需要从前向公共控制信道获得网络参数和公共控制信息，公共控制信息包括了反向和前向信道的信道分配以及各个信道的有关参数信息等。利用这些信息，用户站可在选定的反向接入信道（R-ACH）中发起接入请求。从时间

域上看，前向传输信号和反向传输信号将以帧的格式进行传输。图2a和图2b所示为时分双工（TDD）模式下帧控制信息和信道映射示意图。在TDD模式下，帧控制信息22由基站11在F-CCH信道中向用户站12发送，其中帧控制信息22包括了反向信道的映射信息（UL-MAP）和前向信道（DL-MAP）的映射信息。其中，DL-MAP信息反映了同一帧中的前向子帧24在前向信道的分配情况，如图2a和图2b所示。UL-MAP信息将反映反向子帧26在反向信道的分配情况。从基站发出UL-MAP信息，到用户站识别反向子帧26在反向信道的分配信息需经历一段时间，为便于系统处理，这段时间至少应该大于基站和用户站之间信号的最大传输时延的两倍。在图2a中，某帧中的UL-MAP信息体现的是下一帧的反向信道的分配情况；而在图2b中，某帧的UL-MAP信息体现的是同帧中一段时间后的反向信道的分配情况。

图3a和图3b所示为频分双工（FDD）模式下帧控制信息和信道映射示意图。与TDD模式类似，在FDD模式下，帧控制信息32也可由基站11在F-CCH信道中向用户站12发送，帧控制信息包括了反向信道的映射信息（UL-MAP）和前向信道（DL-MAP）的映射信息。DL-MAP信息将反映下行子帧34在前向信道的分配情况，而UL-MAP信息将反映上行子帧36在反向信道的分配情况。在图3a中，某帧中的UL-MAP信息将体现下一帧的反向信道的分配情况；而在图3b中，本帧的UL-MAP信息体现的是同帧中一段时间后的反向信道的分配情况。利用UL-MAP或其他下行广播信息，基站可向用户站传递指定的用于接入请求的一个或多个（子）信道的有关参数信息。

1.2 接入（子）信道中多级回退域的分配

本发明要求系统不仅向用户站通告公共接入（子）信道划分，而且需要通告对应于各个接入（子）信道的多级回退域的信息。图4.1和图4.2分别为发明提出的多个接入（子）信道和对应各个接入（子）信道的多回退域的映射格式400（UL-RACH-MAP）的两种格式。UL-RACH-MAP 是在UL-MAP或其他下行广播信息中描述接入信道有关参数

的部分。UL-RACH-MAP格式400示出了N（N≥1）个反向接入（子）信道，以及对应每个反向接入（子）信道，M（M≥1）级回退域的情况。

在图4.1中，每个反向接入（子）信道对应的参数至少包括了反向信道标识符UpLink Channel ID，M个回退域的起始和结束值Backoff Value Start和Backoff Value End。其中，标识符为1的上行（反向）接入子信道对应的参数包括上行信道标识符UpLink Channel ID 1 （4102），以及标示有M个回退域的参数。M个回退域的参数标示如下：从标示第一回退域的参数开始，分别为第一回退域的起始值Backoff Value Start 1 （4104）和结束值 Backoff Value End 1 （4106），直至第M回退域的参数，分别为第M回退域的起始值Backoff Value Start M （4108）和第M回退域的结束值 Backoff Value End M （4110）。UL-RACH-MAP格式400还需反映其他N-1个接入（子）信道的参数分配情况。各个接入（子）信道的参数分配方式类似于标识符为1的接入（子）信道的分配方式。例如对于编号为N的接入（子）信道，包括第N个接入（子）信道的标识符 （4112） UpLink Channel ID N，和其他有关M个回退域的参数字段4114 – 4120。

在图4.2中，每个反向接入（子）信道对应的参数至少包括了反向信道标识符UpLink Channel ID，以及对应各个反向接入信道标识符的第一个回退域的起始值Backoff Value Start 1和所有回退域的结束值Backoff Value End。其中，标识符为1的上行（反向）接入子信道对应的参数包括上行信道标识符UpLink Channel ID 1 （4202），以及标示有M个回退域的参数。M个回退域的参数标示如下：从标示第一回退域的参数开始，分别为第一回退域的起始值 Backoff Value Start 1 （4204）和结束值 Backoff Value End 1 （4206）；第二回退域的起始值可由第一回退域的结束值得到，因而从第二回退域开始，仅申明回退域的结束值，即从第二回退域的结束值Backoff Value End 2（4208）直至第M回退域的结束值Backoff Value End M （4210）。UL-RACH-MAP格式400中其他N-1个接入（子）信道的参数与标识符为1的接入（子）信道的分配方式类似，例如对

于编号为N的接入（子）信道，包括第N个接入（子）信道的标识符（4212）UpLink Channel ID N，和有关M个回退域的参数字段4214－4220。

2. 提供多级接入服务的回退算法

多级回退算法用于在公共接入（子）信道中提供多级接入服务性能。多级回退算法将与传统的ALOHA机制中采用的回退算法相结合。也即按照接入类型选择回退域，并结合传统ALOHA机制的回退算法，在选择的回退域中选取回退值。传统的ALOHA机制中，一般采用了指数型回退算法，如用于IEEE802.16a的接入算法。

以下以回退域为两级，也即M=2的情况为例，说明多级回退算法。通过检测前向公共控制信道（F-CCH），用户站12将得到有关反向接入（子）信道（R-ACH）和对应各个接入（子）信道的两级回退域的分配情况。也即在 UL-RACH-MAP 格式400中，对应于某一接入（子）信道，定义了M=2的两个回退域[0，β]和[β+1，γ]，其中，γ（γ>β）和 β 均为正整数。该接入（子）信道将提供包括快速接入和普通接入两种接入请求服务。利用二进制指数型回退算法，可提供$[0,2^{\beta}]$和$[2^{\beta}+1,2^{\gamma}]$两个选取范围。当用户站需要普通接入时，用户站将在第二回退域$[2^{\beta}+1,2^{\gamma}]$中随机选取一个数作为回退时间，而当用户站需要快速接入服务，用户站将在第一回退域 $[0,2^{\beta}]$中随机选择一个数作为回退时间。γ值和β值的选取需要考虑到业务性能和用户数。其中，β 值的选取需满足快速接入业务的有关性能要求，如可接受的接入时间和碰撞率等参数。γ值的选取则将考虑到普通接入业务可接受的接入时间，以及普通接入请求和快速接入请求之间的碰撞率等参数。这样从统计角度，将保证快速接入业务比普通接入业务有更短的接入服务时间。提出的分级回退算法易于扩展到M>2的情况。对比常规的指数型回退算法，多级回退算法的优点是易于隔离不同接入类型的接入请求，减少不同接入类型的接入请求的冲突，可以在公共接入（子）信道中利用回退域的划分提供至少两级接入服务，

而且对比向不同接入类型的接入请求提供不同的公共接入（子）信道的方法，采用这种方法，可以节省带宽等网络资源。这种方法可以方便地运用于IEEE802.16e中，以提供利用公共接入（子）信道满足硬切换所需的快速接入的要求。

3. 在公共接入（子）信道中提供多级接入服务和标识切换下的网络接入请求的方法

用户站通过检测UL-MAP或其他下行广播信息，可以得到诸如上行接入（子）信道和对应各个接入信道的多级回退域的有关信息。为了能让用户站利用公共接入（子）信道接入通信系统并得到服务，可由用户站在公共接入（子）信道向选定的基站发起接入请求。在利用公共接入（子）信道提供多级接入服务的过程中，通信系统和用户站之间需相互协作，以便于通信系统能有效地识别用户站的接入请求并提供相应的服务。以下主要以IEEE802.16e规范为例，提供在公共接入（子）信道中的多级接入服务的方法。此处多级服务包括了对切换和普通的初始接入请求的处理。相对于普通的初始接入请求，切换下的接入请求可得到简化的网络登录服务。

3.1 用户站检测下行广播信息

为在公共接入（子）信道中提供多级接入服务，基站将定期或按需向与之对应的小区广播信道分配的有关信息，这可包括反向信道的分配信息（UL-MAP），和对应接入（子）信道的多回退域的映射信息（UL-RACH-MAP）。当用户站完成与基站的下行（从基站到用户站）同步后，可通过检测UL-MAP或其他下行广播信息，得到上行接入（子）信道的有关参数信息。

3.2 用户站发起接入请求

用户站可在选定的上行接入（子）信道向选定的基站发起接入请求。为了让系统能在公共接入（子）信道中提供包括初始接入和

切换等不同类型的接入服务，并易于与IEEE802.16a兼容，用户站将利用以上提及的多级回退算法，在选定的回退域中，计算并确定各自的回退时间。采用这种方法易于减少不同类型的接入请求的冲突，并提供至少两级接入服务。

为了便于系统在公共接入（子）信道中识别用户站切换下的接入请求信息，从而便于为不同类型的接入请求提供不同的接入服务，以IEEE802.16e规范为例，原有的用户站的初始接入可继续利用IEEE802.16a的接入请求消息RNG-REQ；而切换下的接入请求类型的消息可以是包含有标识切换请求类型的字段的接入请求消息，或在已有的接入请求消息RNG-REQ中加入标识切换请求类型的字段，也可以利用专用的伪随机码信息等方式实现。

3.3 接入请求信息格式

3.3.1 MAC层的接入请求消息

切换下的接入请求类型的消息可以是包含有标识切换请求类型的字段的接入请求消息，或在已有的接入请求消息RNG-REQ中加入标识切换请求类型的字段。针对IEEE802.16e的单载波或OFDM模式，切换下的接入请求可利用专用的接入请求消息。如图5所示的是专用的切换下接入请求消息（RNG-REQ-HO）500的格式，在切换下的接入请求消息（RNG-REQ-HO）500的格式中，至少包括了采用的上行接入（子）信道 i的标识符502和标识切换用接入类型（HO_Access_Type）504等字段。切换下的接入请求消息中也可通过在原有的接入请求消息RNG-REQ中，加入标识切换用接入类型（HO_Access_Type）504等字段来实现。

3.3.2 基于伪随机码的切换用接入请求

在公共接入（子）信道中，用户站还可利用伪随机码发起切换用的网络接入请求消息。

(1) 伪随机码的生成

在IEEE802.16a规范的OFDMA模式，已经定义了三种用于用户站请求网络服务的使用伪随机码的类型，分别用于初始搜索，周期搜索和带宽请求。这三类伪随机码均来自于同一生成多项式 $1+X^{3}+X^{4}+X^{7}+X^{15}$，该生成式的输出构成了一个长码。以上三种使用这些伪随机码的类型，如初始搜索，周期搜索和带宽请求等，采用的伪随机码都是从该长码中截取得到的，但生成时钟各不相同。缺省情况下，每个伪随机码的长度是106比特。

为了在IEEE802.16e规范的OFDMA模式下，便于系统识别硬切换下的网络接入请求，从而简化系统处理硬切换所需的网络登录规程，可采用伪随机码的方式标识硬切换下的接入请求信息。为兼容IEEE802.16a，并便于系统设计，对于切换下的接入请求所需的H个伪随机码，其生成方式仍是通过对该长码进行截取而产生的，但时钟选择可与上述三种伪随机码的时钟有所不同。一种产生切换下接入请求所需的H个伪随机码的实施例表述如下：对应于该生成式的输出构成的长码，并对该长码进行截取。其中前N个码用于初始搜索，时钟选择为0到106 * N-1；其后M个码用于周期搜索，时钟选择为106*N 到 106*(N+M)-1；随后的L个码用于带宽请求，时钟选择为106*(N+M) 到 106*(N+M+L)-1；其后的H个码用于硬切换的接入请求类型，时钟选择为106* (N+M+L) 到 106 * (N+M+L+H)-1。上述实施例中的四个子集的用途也可以对调。比如，前N个码用于硬切换的接入请求类型，其后M个码用于初始搜索，随后的L个码用于周期搜索，后H个码用于带宽请求。依此类推，可以有多种排列方式。

(2) 伪随机码的分配

为使得系统能识别硬切换发生时的接入请求，可由系统将生成的H个伪随机码固定分配给各个小区，这H个伪随机码的生成方式见上。在各个小区中，当某个移动站发生硬切换时，它将随机使用分配给选定的新基站所在的小区的伪随机码用于快速接入服务。这种分配方法简单，系统和用户站之间的交互信息少；但灵活性差，不适合用户分配不均匀的情况。

也可以由系统按照各小区的需求将这H个伪随机码动态划分给各个小区，各个小区可定时或者按需在前向公共控制信道中，发送分配到本小区的伪随机码的标识符或其它标识信息，移动站通过检测公共控制信道，可以得到分配给选定的新基站所在的小区的伪随机码信息。这种分配方法的优点是可以适合于用户分配不均匀的情况，如系统可以向某个切换业务量大的小区多分配些伪随机码，以满足该小区的切换服务需求；缺点是需要系统定期或按需发送有关伪随机码的分配信息。

3.4 MAC层接入请求响应消息

当正确接收到用户站的接入请求后，基站将为该接入请求分配唯一的连接标识CID。基站将通过握手方式完成用户站的接入处理。也即当正确接收到用户站的接入请求消息RNG-REQ或RNG-REQ-HO后，且当基站确定系统可以对该用户站发起的接入请求提供后续服务时，基站将向该用户站发出接入请求响应消息RNG-RSP，在RNG-RSP消息，将包括为此次接入请求分配的唯一的连接标识CID信息。

实施例

在IEEE802.16e 中，当硬切换发生时，可由移动站发起请求以接入选定的新基站。为了兼容IEEE802.16a，移动站的接入过程可基于IEEE802.16a的网络登录过程来完成。与IEEE802.16a的网络登录过程相比，移动站在硬切换时的网络接入过程可简化包括时间信息，系统的有关服务能力等信息交互过程。移动站的接入过程将包括：搜索前向控制信道，移动站取得与基站的同步并获得有关前向和反向信道分配的有关信息；移动站和选定的新基站之间协作完成移动站的接入；执行移动站的部分认证和注册步骤；重新建立会话连接和其它操作等。

1. 包含切换发生时的搜索和接入过程

图6a示出了本发明提出的在IEEE802.16e中，支持包含硬切换发生时的接入搜索过程，这一过程易于兼容IEEE802.16a的初始搜索和接入过程。在t_0时刻基站11将利用公共控制信道在本小区内定期或按需广播UL- MAP信息，。在 t_1时刻，小区内的某个用户站接收到UL-MAP信息，UL-MAP信息中包含了描述接入信道UL-RACH-MAP的有关参数，如图4所示，在当前实施例中，M=2。该用户站将选择接入（子）信道，在t_2时刻向基站在选定的接入（子）信道发起接入请求RNG-REQ或RNG-REQ-HO；假定基站在 t_3时刻应该收到了某用户站的接入请求消息，但由于此时来自多个用户站的接入请求信息的冲突而导致该用户站接入请求信息的丢失；该用户站在等待一段时间后若未正确接收到来自基站的针对此次接入请求的接入请求响应信号，则判决此次接入请求失败，该用户站将根据接入业务选择对应的回退域，如发生切换的用户站可选择第一回退域，普通接入请求的用户站则选择第二回退域，各用户站将通过多级回退算法计算回退时间为t_4-t_2。假定用户站在t_4时刻再次发起了接入请求消息RNG-REQ或RNG-REQ-HO；在t_5时刻，基站正确接收到了此用户站的接入请求消息RNG-REQ或RNG-REQ-HO，基站将会为此次接入请求分配标识符，并在t_6时刻发起接入响应消息（RNG-RSP），该响应消息包含了对应该用户站的一些识别信息，包括发起响应的一些标识等；当该用户站正确接收到了基站的响应消息RNG-RSP，它将在t_7时刻再次发送接入请求消息RNG-REQ或RNG-REQ-HO，这个接入请求消息将携带由基站分配的对应于该接入请求的标识符，以令基站确认该用户站已正确接收了基站发送的有关信息；当t_9时刻基站接收到了用户站发来的接入请求消息RNG-REQ或RNG-REQ-HO，基站将确定用户站已经正确接收，系统将继续完成其后的步骤。

图6b示出了特指在IEEE802.16 OFDMA模式下，本发明提出的支持包含硬切换发生时的接入过程。与图6a相比，图6b主要的区别在于借助了搜索用伪随机码完成接入请求。为了在公共接入（子）信道，便于系统识别硬切换类型的接入请求，从而简化硬切换发生时

的网络登录规程，当切换发生时，移动站将选用专用的伪随机码在公共接入（子）信道完成接入请求，这些伪随机码的生成方式和在各小区的分配方式如前所述。

2. 接入搜索过程中用户站实施的流程图

接入过程中用户站实施的流程图如图7所示。用户站通过检测公共控制信道得到基站按一定周期发来的广播消息（步骤702），若在T1时间内用户站未收到这些广播消息（步骤704），则表示出错，将重新开始（步骤706）。其中T1表示为接收该广播消息所需的最大时间。若在T1时间内正确接收到基站广播消息并得到了UL-RACH-MAP信息（步骤708），用户站可利用UL-RACH-MAP信息得到分配的接入信道组的信息，用户站从接入信道组中随机选取接入（子）信道（步骤710），并在选取的接入（子）信道中发送接入请求消息RNG-REQ或RNG-REQ-HO，其中RNG-REQ-HO的格式如图5所示（步骤712），发送后用户站将等待基站发来的响应消息RNG-RSP（步骤714）。

若用户站等待基站响应消息RNG-RSP的时间超过了T2（步骤716），其中T2时间表示最大的等待响应时间，用户站将继续判决重传次数是否大于设定值（步骤718），若重传超过了设定值，则表示出错，执行错误处理（步骤720）；若步骤718判决重传次数没有大于设定值，则判决是否超过所能容忍的接入处理时间（步骤722），若超过了所能容忍的接入处理时间，则执行错误处理（步骤720）。若在步骤722中判决没有超过业务所能容忍的处理时间，则按业务优先级别选取回退域（步骤724），即选择对应的回退的起始和终止值，例如发生硬切换，移动站可按硬切换相应的接入优先级选择回退域。执行完步骤724，用户站将从选取的回退域中按照多级回退算法选取回退值（步骤726），并等待计算得到的回退时间（步骤728）；当等待的回退时间结束，用户站在指定的接入（子）信道再次发起RNG-REQ或RNG-REQ-HO（步骤730），并跳转到步骤714，等待响应消息RNG-RSP。

若用户站在T2时间内收到了基站响应消息RNG-RSP，用户站将根据RNG-RSP消息调整本地参数（步骤732），并判决用户站是否正确调整了本地参数（步骤734）；若未能正确调整，则进行错误处理（步骤740）；若步骤734判决用户站已经正确调整了本地参数，则用户站将在选取的接入（子）信道中再次发送接入请求RNG-REQ或RNG-REQ-HO（步骤736），RNG-REQ或RNG-REQ-HO将携带由基站分配的对应于该接入请求的标识符，该信息将向基站表明用户站已经成功接收了基站发送的有关信息，此后进入下一阶段（738）。

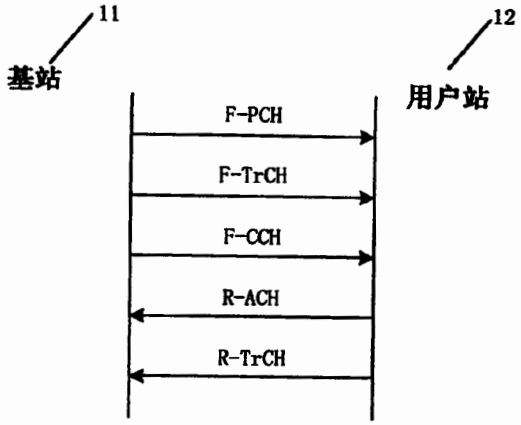

图1

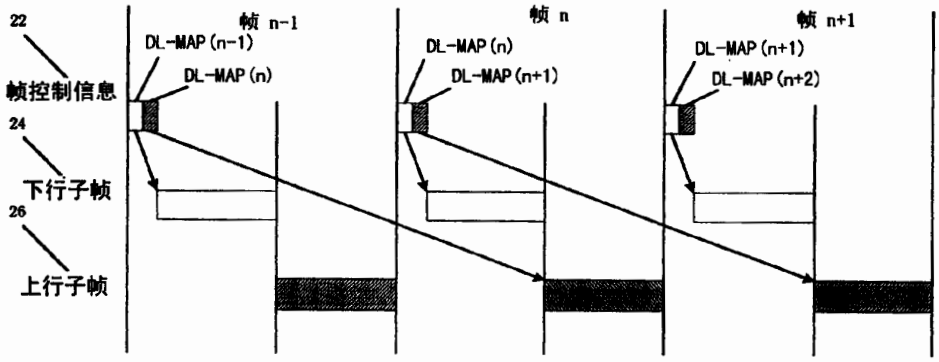

图2a

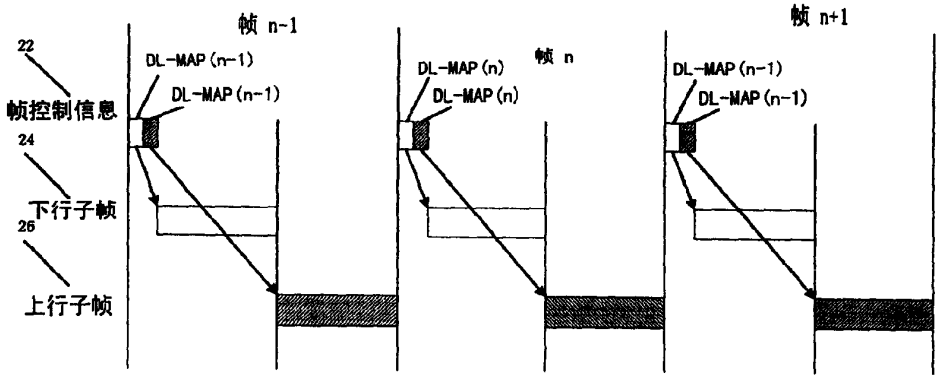

图2b

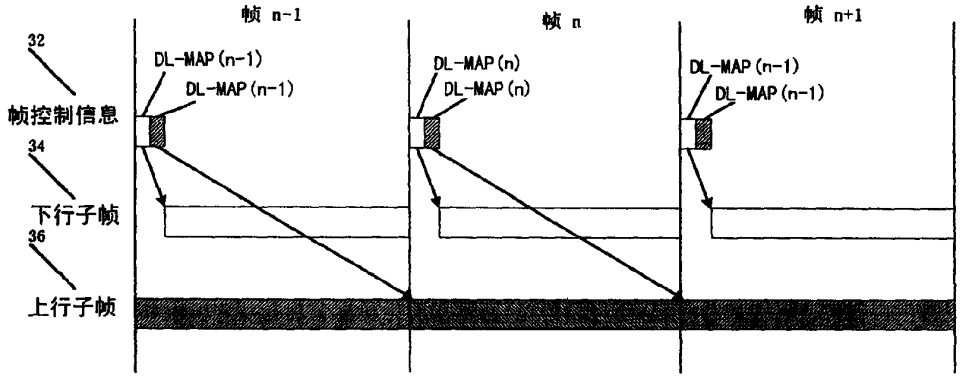

图3a

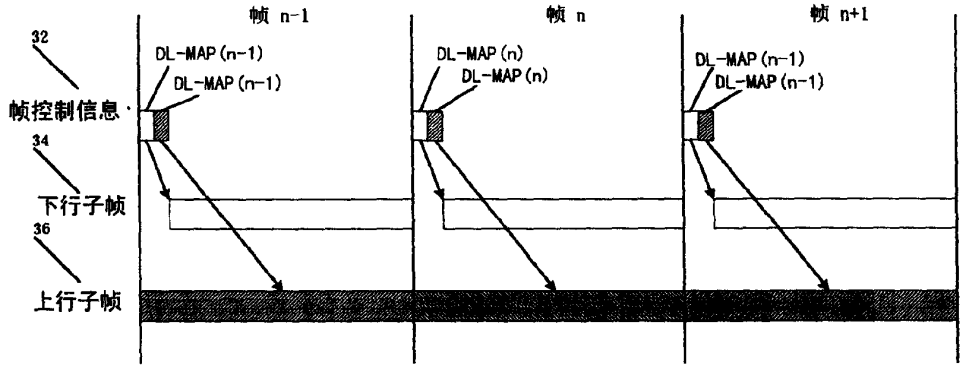

图3b

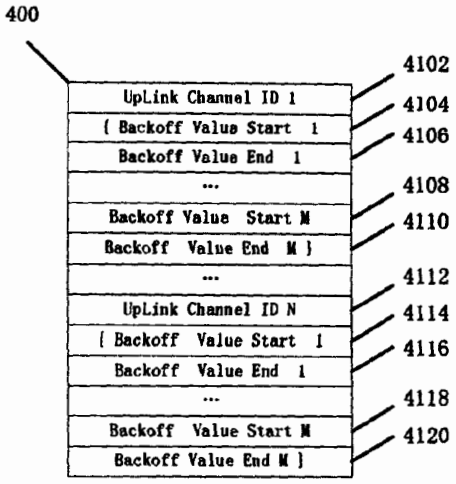

图4.1

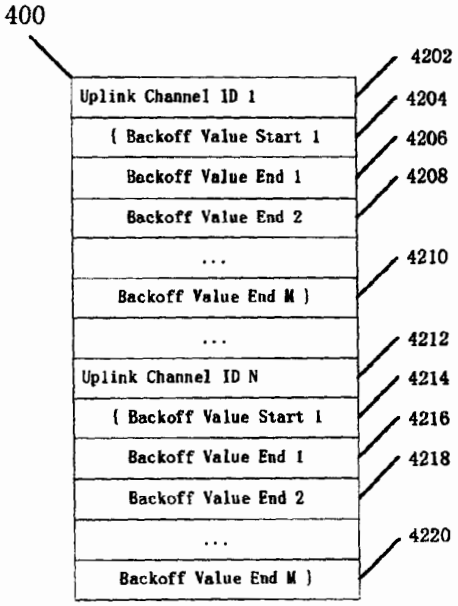

图4.2

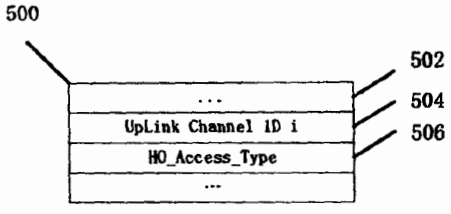

图5

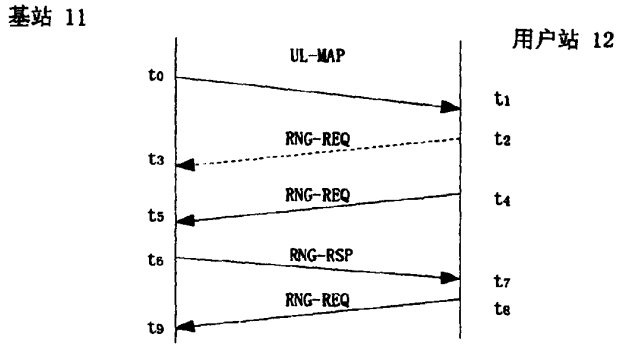

图6a

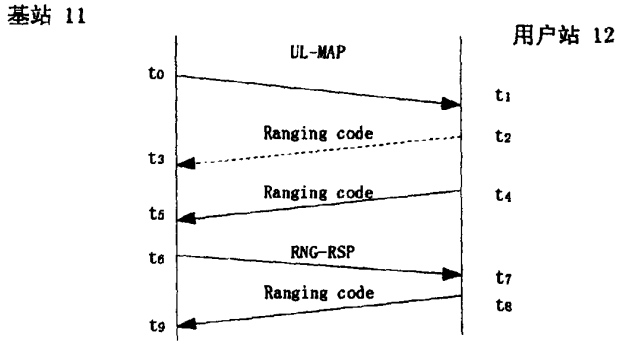

图6b

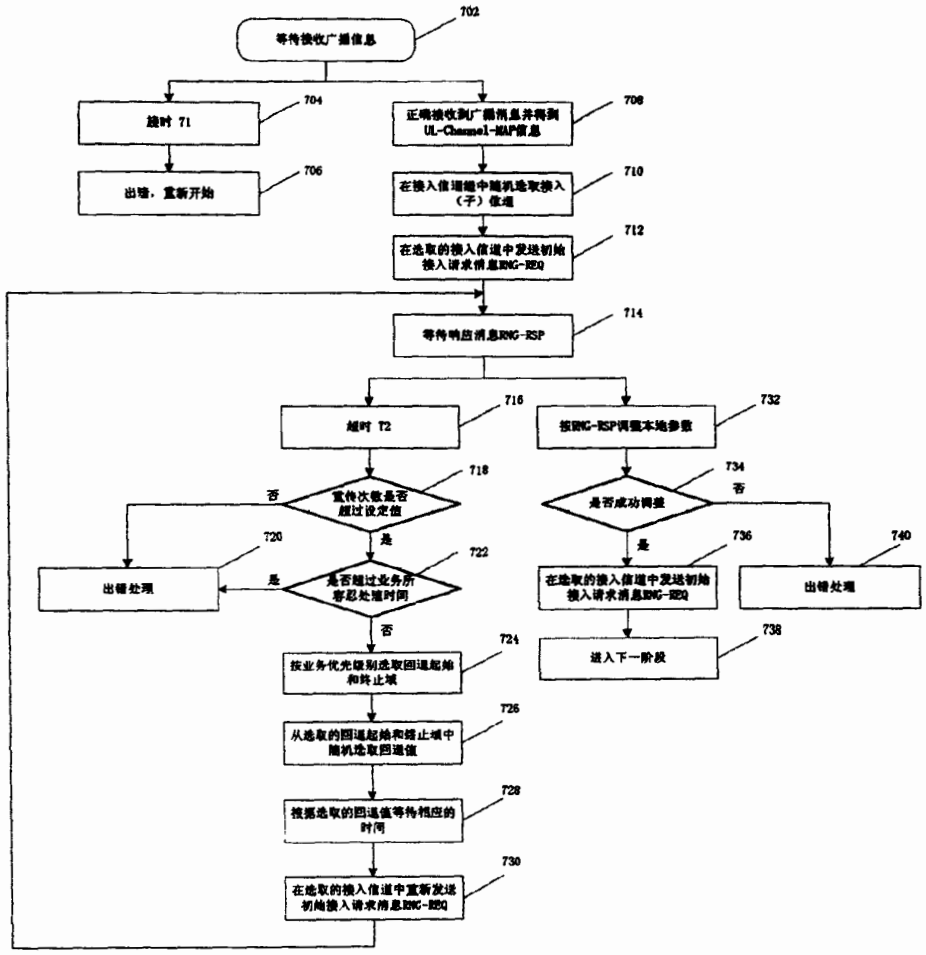

图7

Electronic Acknowledgement Receipt

EFS ID:	15506942
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Jesus Rodriguez
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	12-APR-2013
Filing Date:	19-OCT-2009
Time Stamp:	16:36:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213IDS.pdf	255573 19072997cbb7e1424d18ae2de8e431d968ee99c0	yes	5

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	1
	Transmittal Letter	2	4
	Information Disclosure Statement (IDS) Form (SB08)	5	5

Warnings:					
Information:					
2	Foreign Reference	k14.pdf	1456915 80558c5c63a6ec9d70d0035a9e113935193b0855	no	27
Warnings:					
Information:					
3	Non Patent Literature	k15.pdf	4657131 4f50b515ace793fe2ee49ded37fa8c8a7d74c865	no	25
Warnings:					
Information:					
4	Non Patent Literature	k16.pdf	787224 2751204b18a5850f7ade785e637a968a9d77ab01	no	4
Warnings:					
Information:					
		Total Files Size (in bytes):	7156843		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: April 12, 2013 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu	
Appln. No.:	12/581,575	Examiner: Dady Chery
Filed:	October 19, 2009	Art Unit: 2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.: 2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US	

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Information Disclosure Statement; PTO-1449; Cited References K14 through K16.

Fee calculation:

☒ No additional fee is required.

☐ Per 37 CFR §1.27, ☐ Applicant is small entity ☐ Applicant is micro entity.

☐ An extension fee in an amount of $_____ for a ____ month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

	Claims Remaining After Amendment		Highest No. Previously Paid	Present Extra	Fee Rate	Fee Add'l Fee	Small Entity Fee Rate	Small Entity Fee Add'l Fee	Micro Entity Fee Rate	Micro Entity Fee Add'l Fee
Total		Minus			x $ 80 =	$	x $ 40 =	$	x $20 =	$
Independent		Minus			x $420 =	$	x $210 =	$	x $105 =	$
First Presentation of Multiple Dep. Claim					+ $780 =	$	+ $390 =	$	+ $195 =	$
					Total	$	Total	$	Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $___ for ___.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).
WARNING: Information on this form may become public. **Credit card information should not be included on this form.**

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

April 12, 2013
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

BRINKS HOFER GILSON & LIONE
NBC Tower – Suite 3600, 455 N. Cityfront Plaza Drive, Chicago, IL 60611-5599

BRINKS HOFER GILSON &LIONE

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
4/12/2013
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
4/12/2013
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.:	2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US		

TENTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(c), Applicant hereby cites the following reference(s):

FOREIGN PATENT DOCUMENTS		
DOCUMENT NO.	**DATE**	**COUNTRY**
CN 1549610 A	11/24/2004	China

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Office Action issued in corresponding Chinese Patent Application No. 201110412187.2, mailed February 5, 2013.
Copy of Search Report issued in corresponding Chinese Patent Application No. 201110412187.2, mailed February 5, 2013.

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

The Applicant or Applicants certifies under 37 CFR §1.97(e)(1) that each item of information in this Information Disclosure Statement was first cited in any communication from a patent office in a counterpart foreign or international application not more than three months prior to the filing of this Information Disclosure Statement (a copy of any foreign communication first citing a listed reference is attached for the Examiner's reference). Accordingly, Applicant has calculated no fee to be due in connection with the filing of this Information Disclosure Statement. However, the Director is authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to a deposit account, as authorized in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

April 12, 2013
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

Document code: WFEE

United States Patent and Trademark Office
Sales Receipt for Accounting Date: 04/22/2013

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01 FC : 1806 180.00 DA

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Date: April 18, 2013 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attorney Docket No. 13674-213
Client Ref. No. 0810596US

In re Application of:

Wenfu Wu

Serial No: 12/581,575

Filed: October 19, 2009

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Examiner: CHERY, DADY

Group Art Unit: 2461

Conf. No.: 2875

RESPONSE

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action mailed December 18, 2012, please enter the following in the above-identified application.

Amendments to the claims are reflected in the listing of claims, which begin on page 2 of this paper.

Remarks begin on page 5 of this paper.

AMENDMENTS TO THE CLAIMS

Pursuant to 37 C.F.R. § 1.121 the following listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the Clams:

1-6. (Canceled)

7. (Previously presented) A handover processing method, comprising:

receiving, by a Mobility Management Entity (MME), an attach request message sent by a User Equipment (UE) during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3rd Generation Partnership (3GPP) network, wherein the attach request message comprises an information element (IE) indicating handover;

identifying, by the MME, a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS); and

requesting, by the MME, the PDN GW to initiate a bearer creation procedure.

8. (Canceled)

9. (Previously presented) The method of claim 7, wherein the handover is an active-mode handover, the method further comprises:

setting up a data forwarding tunnel between a serving gateway (GW) of the 3GPP network and a non-3GPP GW of the non-3GPP network according to data forwarding tunnel resource information of the 3GPP network.

10. (Previously presented) The method of claim 9, wherein setting up the data forwarding tunnel comprises:

sending, by the MME, the data forwarding tunnel resource information to the non-3GPP GW either directly or through a non-3GPP access network element; and

creating, by the non-3GPP GW, the data forwarding tunnel with the serving GW.

11 - 15. (Canceled)

16. (Previously presented) A network element, comprising:

an obtaining unit, configured to receive an attach request message sent by a User Equipment (UE) during a handover from a non 3rd Generation Partnership Project (non-3GPP) network to a 3rd Generation Partnership Project (3GPP) network, wherein the attach request message comprises an information element indicating handover;

an identifying unit, configured to identify that the attach request message is due to the handover according to the IE indicating handover; and

a processing unit, configured to identify a Packet Data Network Gateway (PDN GW) whose address is used by the UE in the non-3GPP network by communicating with a Home Subscriber Server (HSS), and request the PDN GW to initiate a bearer creation procedure.

17-18. (Canceled)

19. (Previously presented) The method of claim 7, wherein the requesting a the PDN GW to initiate a bearer creation procedure comprises:

sending, by the MME, a Create Bearer Request message to the PDN GW; and

initiating, by the PDN GW, the bearer creation procedure.

20. (Previously presented) The method of claim 19, wherein after the PDN GW receives the Create Bearer Request message, sending a Request Policy and Charging Control (PCC) rules message by the PDN GW to a Policy and Charging Rule Function (PCRF) to obtain a PCC Rule.

21-25. (Canceled)

26. (Previously presented) The method of claim 7, wherein the IE is an Attach Type IE.

27. (Previously presented) The method of claim 26, wherein a value of the Attach Type IE is set to "1".

28. (Previously presented) The method of claim 26, wherein a value of the Attach Type IE is set to "Handover Attach".

29. (Previously presented) The method of claim 7, wherein the MME identifies the PDN GW by obtaining the PDN GW address from the HSS.

30. (Previously presented) The method of claim 7, wherein the MME identifies the PDN GW by obtaining an identity of the PDN GW from the HSS.

31. (Previously presented) The method of claim 16, wherein the IE is an Attach Type IE.

32. (Previously presented) The method of claim 31, wherein a value of the Attach Type IE is set to "1".

33. (Previously presented) The method of claim 31, wherein a value of the Attach Type IE is set to "Handover Attach".

REMARKS

Summary

Claims 7, 9, 10, 16, 19, 20 and 26-33 are rejected under 35 U.S.C. § 102. No claims are amended and no new claims are added. Claims 7, 9, 10, 16, 19, 20 and 26-33 are pending. Reconsideration of the application in light of the following remarks is respectfully requested.

Rejections Under 35 U.S.C. § 102

Claims 7, 9, 10, 16, 19, 20 and 26-33 are rejected under 35 U.S.C. § 102(e) as being anticipated by *Shaheen* (U.S. Application Pub. No. 2008/0316971). Applicant respectfully traverses this ground of rejection for at least the reason that *Shaheen* does not qualify as "prior art".

More specifically, Applicant respectfully notes that the present application was filed on October 19, 2009 and claims priority to and the benefit of PCT Application No. PCT/CN2008/070909, filed on May 08, 2008 (herein "*PCT Application*"), which further claims priorities to and the benefits of: Chinese Patent Application No. 200710104400.7, filed on May 11, 2007 (herein "*Foreign Priority Application 1*"), Chinese Patent Application No. 200710165540.5, filed on November 02, 2007, Chinese Patent Application No. 200710181758.X, filed on October 24, 2007, and Chinese Patent Application No. 200810085729.8, filed on March 13, 2008. Applicant respectfully notes that, in accordance with 35 U.S.C. 119 (b), a "certified copy" of the *Foreign Priority Application* mentioned above was submitted to the USPTO on February 08, 2011. In order to perfect Applicant's claim of priority in accordance with 37 C.F.R 1.55 (a), Applicant submits herewith an English translation of the *Foreign Priority Application 1*, together with a certification stating that the translation of the "certified copy" is accurate.

In addition, Applicant respectfully notes that the pending claims 7, 9, 10, 16, 19, 20 and 26-33 are substantially similar to, and fully supported by, those of the *Foreign Priority Application.*

Based on the foregoing, Applicant respectfully submits that the pending claims of the present application should receive the benefit of, and priority to, the *Foreign Priority Application* filed on May 11, 2007. As such, acknowledgement of Applicant's right of foreign priority is earnestly solicited.

Shaheen, on the other hand, was filed June 20, 2008, with priority claims of: Provisional application No. 60/945,642, filed on June 22, 2007, Provisional application No. 60/945,676, filed on June 22, 2007, and Provisional application No. 60/946,164, filed on June 26, 2007. As such, the earliest possible date that any alleged features might be disclosed or suggested by *Shaheen* is June 22, 2007, which is *after* Applicant's priority date of May 11, 2007. Accordingly, Applicant respectfully submits that *Shaheen* does not qualify as "prior art" to support a rejection of Applicant's claimed invention in claims 7, 9, 10, 16, 19, 20 and 26-33.

Based on at least the foregoing reason, Applicant respectfully submits that *Shaheen* fails to anticipate Applicant's invention as claimed for example, in independent claims 7 and 16, and their dependent claims as well.

CONCLUSION

In view of the foregoing, Applicants respectfully submit that claims 7, 9, 10, 16, 19, 20 and 26-33 are patentable and this application is in condition for allowance. Should the Examiner wish to discuss the foregoing to advance this application toward allowance, the Examiner is urged to telephone the undersigned at the below-indicated number.

Respectfully submitted,

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VERIFICATION OF TRANSLATION

I, Shan Wu hereby solemnly affirm that I have a fluent knowledge of English and Chinese languages and that the attached document is the true and accurate translation of the A Method, System, and Apparatus for Registration Processing.

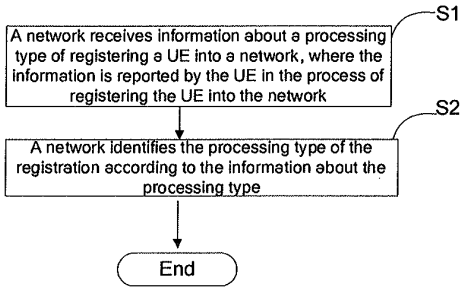
Dated this 16th day of Apr. 2013

Signature of Translator Wu Shan

ABSTRACT

A registration processing method, a system, and an apparatus are disclosed herein to enable the network side to distinguish between different registration processing types. The method includes: a network side receives information about a processing type of registering a UE into a network, where the information is reported by the UE in the process of registering the UE into the network; and a network side identifies the processing type of the registration according to the information about the processing type. The system includes: a UE, adapted to report information about the processing type of registration in the process of registering the UE into a network; and a network side, adapted to identify the processing type of the registration according to the registration processing type information reported by the UE.

DRAWING OF ABSTRACT



CLAIMS

What is claimed is:

1. A registration processing method, comprising the following steps:

a network side receives registration processing type information reported by a User Equipment, UE, where the information is reported by the UE in the process of the registering the UE into the network; and

a network side identifies a processing type of the registration according to the processing type information.

2. The method of claim 1, wherein the method comprises identifying the type of the registration when the UE needs to be registered into the network.

3. The method of claim 1 or 2, wherein the UE may report the processing type information in one of following manners:

Adding an IE in an Attach Request message sent by the UE to the network side in the process of registering UE into the network, which includes the registration processing type information;

Adding the IE in a Tracking Area Update, TAU, sent by the UE to the network side in the process of registering UE into the network, which includes the registration processing type information;

Adding the IE in a Routing Area Update, RAU, sent by the UE to the network side in the process of registering UE into the network, which includes the registration processing type information;

Adding an IE in an Access Request message sent by the UE to the network side in the process of registering UE into the network, which includes the registration processing type information;

4. The method of claim 1 or 2, wherein the UE sends different Attach Request messages to the network side in the process of registering the UE into the network to indicate the corresponding registration processing type information; or

the UE sends different TAU Request messages to the network side in the process of registering the UE into the network to indicate the corresponding registration processing type information; or

the UE sends different RAU Request messages to the network side in the process of registering the UE into the network to indicate the corresponding registration processing type information; or

the UE sends different Access Request messages to the network side in the process of

registering the UE into the network to indicate the corresponding registration processing type information.

5. A registration processing system, comprising:

a User Equipment, UE, adapted to report information about a processing type of registering the UE into a network in the process of the registration; and

a network side, adapted to identify the processing type of the registration according to the received registration processing type information reported by the UE.

6. The system of claim 5, wherein a Mobility Management Entity (MME), a Serving GPRS Supporting Node (SGSN), or a non-3GPP gateway at the network side identifies the processing type information reported by the UE.

7. A User Equipment, UE, comprising:

an identifying unit, adapted to identify a type of registration when the UE initiates the registration;

a registration initiating unit, adapted to initiate registration, and send a registration triggering signal;

a reporting unit, adapted to receive the registration triggering signal from the registration initiating unit, and in the process of registering the UE into the network, report the processing type information corresponding to the registration type identified by the identifying unit.

8. The UE of claim 7, wherein the reporting unit includes the processing type information in an IE added in an Attach Request message; or

the reporting unit includes the processing type information in an IE added in a Tracking Area Update, TAU, Request message; or

the reporting unit includes the processing type information in an IE added in a Routing Area Update, RAU, Request message; or

the reporting unit includes the processing type information in an IE added in an Access Request message.

9. The UE of claim 7, wherein the reporting unit corresponds to different registration types and sends different Attach Request messages to the network side; or

the reporting unit corresponds to different registration types and sends different TAU Request messages to the network side; or

the reporting unit corresponds to different registration types and sends different RAU Request messages to the network side; or

the reporting unit corresponds to different registration types and sends different Access Request messages to the network side.

10. A network-side network element, comprising:

an extracting unit, adapted to obtain registration processing type information reported by a UE in the processing of registering the UE into a network.

an identifying unit, adapted to identify a processing type of the registration according to the processing type information extracted by the extracting unit.

11. The network element of claim 10, wherein the network element is a Mobility Management Entity (MME), a Serving GPRS Support Node (SGSN), or a non-3GPP gateway.

SPECIFICATION

A METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

FIELD OF THE TECHNOLOGY

The present invention relates to the communication field, and in particular, to a registration processing method, a system, and an apparatus.

BACKGROUND

In order to enhance the competitiveness of the future networks, the Third Generation Partnership Project (3GPP) is researching a new evolved network. FIG. 1 shows system architecture of the evolved network. The architecture includes:

an Evolved UMTS Terrestrial Radio Access Network (E-UTRAN, Evolved UMTS Terrestrial Radio Access Network), adapted to implement all radio-related functions in the evolved network;

a Mobile Management Entity (MME), responsible for control plane mobility management, including user context and Mobility state management, and allocation of temporary mobile subscriber identifiers;

a serving gateway (Serving GW, Serving Gateway), which is a user plane anchor between 3GPP access systems and is adapted to terminate the interface to the E-UTRAN;

a packet data network gateway (PDN GW, Packet Data Network Gateway), which is a user plane anchor between a 3GPP access system and a non-3GPP access system, and is adapted to terminate the interface to the external Packet Data Network (PDN, Packet Date Network);

a Policy and Charging Rule Function (PCRF, Policy and Charging Rule Function), responsible for policy control decision and flow based charging control;

a home subscriber server (HSS, Home Subscriber Server), adapted to store subscriber data;

a UMTS Terrestrial Radio Access Network (UTRAN, UMTS Terrestrial Radio Access Network) and a GSM/EDGE Radio Access Network (GERAN, GSM/EDGE Radio Access Network), adapted to implement all radio-related functions in the existing GPRS/UMTS network;

a Serving GPRS Supporting Node (SGSN, Serving GPRS Supporting Node), adapted to implement route forwarding, mobility management, session management, and subscriber data storage in a GPRS/UMTS network;

a non-3GPP IP access system (non-3GPP IP Access), an access network defined by a non-3GPP organization, for example, Wireless Local Area Network (WLAN, Wireless Local Area Network), and Worldwide Interoperability for Microwave Access (WiMAX, Worldwide Interoperability for Microwave Access).

Note: The foregoing architecture does not mean the ultimate System Architecture Evolution (SAE), and the ultimate architecture may differ from the foregoing architecture, as is not limited by the present invention.

A requirement of the foregoing evolved network is to implement handover (Handover) between a 3GPP access system (such as GERAN, UTRAN, or E-UTRAN) and a non-3GPP access system (such as a WLAN or WiMax). In the existing protocol, the handover procedure is implemented via Attach (Attach) or Tracking Area Update (TAU) procedure by the UE in a new access system. As shown in FIG. 2, the handover procedure from the non-3GPP access system to the 3GPP access system of the UE comprises the following steps:

1. The UE accesses the non-3GPP AN through the non-3GPP GW and the PDN GW.

2. The non-3GPP network element sends a Handover Command (HO Command) to the UE, notifying the UE to hand over to the evolved network.

3. The UE sends an Attach Request or a Tracking Area Update Request message to the MME.

4. An authentication procedure is performed between the UE, the MME, and the HSS to obtain the PDN GW address used by the UE.

5. The MME sends a Create Bearer Request message to the obtained PDN GW address, requesting the network side to initiate bearer creation procedure. In this way, the service used by the UE in the non-3GPP AN is re-created in the new access system.

6. If it is necessary to obtain the Policy and Charging Control (PCC) rules applied by the user from the PCRF, the PDN GW sends a Request PCC Rules message to the PCRF to obtain the PCC rules applied by the user. The PCRF provides the PDN GW with the PCC rules applied by the user.

7. The PDN GW initiates a network-side bearer creation procedure to create the bearer of the user.

As shown in FIG. 3, in the existing protocol, the procedure from UE Normal Attach (also known as Initial Attach) to the 3GPP Access System comprises the following steps:

1. The UE sends an Attach Request message to the MME.

2. An authentication procedure is performed between the UE, the MME, and the HSS.

3. If a user already has a created bearer, the MME initiates a deletion bearer procedure, deleting the bearers previously created by the user.

As shown in FIG. 4, in the existing protocol, the procedure of Normal Tracking Area Update (also known as Initial TAU) of the UE to the 3GPP access system comprises the following steps:

1. The UE send the Tracking Area Update message to the MME.

2. An authentication procedure is performed between the UE.

3. The MME accepts the Tracking Area Update Request of the UE and sends a Tracking Area Update Accept message to the UE.

In the process of developing the present invention, the inventor finds that the processing mechanism of an Attach or TAU process caused by handover differs sharply from the processing mechanism of a normal Attach/TAU process: In a normal Attach process, the network side needs to delete all bearers previously created by the user, but in an Attach process caused by handover, the network side needs to re-create all bearers previously created by the user. In the normal TAU process, the network side does not handle the bearers of the user, but in the TAU process caused by handover, the network side needs to re-create all bearers previously created by the user.

Therefore, after receiving the Attach Request message or the TAU Request message sent by the UE, the network side needs to know whether the normal Attach/TAU procedure or the Attach/TAU procedure caused by the handover is initiated. However, the existing mechanism cannot distinguish them.

SUMMARY

A registration processing method, a system, and an apparatus are disclosed in an embodiments of the present invention to enable the network side to distinguish between different registration processing types.

The method is disclosed in an embodiment of the present invention. The method includes: receiving, by a network side, information about a processing type of registering a UE into a network, where the information is reported by the UE in the process of the registration; and identifying, by a network side, the processing type of the registration according to the information about the processing type.

A system is disclosed in an embodiment of the present invention. The system includes: a UE, adapted to report information about the processing type of registering the UE into a network in the process of the registration; and a network side, adapted to identify the processing type of the registration according to the received registration processing type information reported by the UE.

A UE is disclosed in an embodiment of the present invention. The UE includes: an identifying unit, adapted to identify the type of registration when the UE initiates the registration; a registration initiating unit, adapted to initiate registration, and send a registration triggering signal; and a reporting unit, adapted to receive the registration triggering signal from the

registration initiating unit, and in the process of registering the UE into the network, report the processing type information corresponding to the registration type identified by the identifying unit.

A network-side network element is disclosed in an embodiment of the present invention. The network element includes: an extracting unit, adapted to extract the processing type information reported by the UE in the process of registering the UE into a network; and an identifying unit, adapted to identify the processing type of the registration according to the processing type information extracted by the obtaining unit.

In an embodiment of the present invention, the UE reports the registration processing type information to the network side in the process of registering into the network, and therefore, the network side distinguishes between different registration processing types accordingly.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows system architecture of an evolved network in the prior art;

FIG. 2 is a flowchart of a handover from a non-3GPP access system to a 3GPP access system for a UE in the prior art;

FIG. 3 is a flowchart of a UE normally attaching to the 3GPP access system in the prior art;

FIG. 4 is a flowchart of normal TAU of the UE to the 3GPP access system in the prior art;

FIG. 5 is a flowchart of a method in an embodiment of the present invention;

FIG. 6 shows a structure of a system in an embodiment of the present invention;

FIG. 7 is a structure of a UE in an embodiment of the present invention;

FIG. 8 is a structure of a network-side network element in an embodiment of the present invention; and

FIG. 9 is a flowchart of the first embodiment of the present invention;

FIG. 10 is a flowchart of the second embodiment of the present invention;

FIG. 11 is a flowchart of the third embodiment of the present invention.

DETAILED DESCRIPTION OF THE EMBODIMENTS

In order to enable the network side to distinguish between different registration processing types, a registration processing method is disclosed in an embodiment of the present invention. As shown in FIG. 5, the method includes the following steps:

S1. The network side receives information about the processing type of registration, where the information is reported by the UE in the process of registering the UE into the network.

Before this step, the UE may identify the type of the registration when registering into the network. The UE reports the information about the processing type corresponding to the identified

registration type to the network side in the process of registering into the network.

S2. The network side identifies the processing type of the registration according to the information about the processing type.

A registration processing system is disclosed in an embodiment of the present invention. As shown in FIG. 6, the system includes a UE and a network side.

The UE is adapted to report information about the processing type of the registration in the process of registering the UE into a network.

The network side is adapted to identify the processing type of the registration according to the received registration processing type information reported by the UE. Specifically, the network-side MME (in an evolved network), SGSN (in a 2G/3G network), or non-3GPP GW (in a non-3GPP network) identifies the processing type information reported by the UE.

A UE is disclosed in an embodiment of the present invention. As shown in FIG. 7, the UE includes:

an identifying unit, adapted to identify the type of registration when the UE initiates the registration;

a registration initiating unit, adapted to initiate registration, and send a registration triggering signal;

a reporting unit, adapted to receive the registration triggering signal from the registration initiating unit, and in the process of registering the UE into the network, report the processing type information corresponding to the registration type identified by the identifying unit.

Further, the reporting unit includes the processing type information in an information element (IE) added to an Attach Request message; or the reporting unit includes the processing type information in an IE added to a TAU request message; or the reporting unit includes the processing type information in an IE added to a Routing Area Update (RAU) request message; or the reporting unit includes the processing type information in an IE added to an Access Request message.

or the reporting unit corresponds to different registration types and sends different Attach Request messages to the network side or the reporting unit corresponds to different registration types and sends different TAU request messages to the network side; or the reporting unit corresponds to different registration types and sends different RAU request messages to the network based on different registration types; or the reporting unit corresponds to different registration types and sends different Access Request messages to the network.

A network-side network element is disclosed in an embodiment of the present invention. Specifically, the network element is an MME (evolved network), SGSN (2G/3G network), or non-3GPP gateway (non-3GPP network). As shown in FIG. 8, the network element includes an

obtaining unit and an identifying unit.

The extracting unit is adapted to extract the registration processing type information reported by the UE in the processing of registering the UE into the network.

The identifying unit is adapted to identify the processing type of the registration according to the processing type information extracted by the extracting unit.

The present invention is elaborated through three embodiments below.

Embodiment 1: When the UE sends a registration request message to the MME, the UE reports the registration processing type information to the MME. The MME identifies the processing type of the registration according to the information, and performs the corresponding procedure according to registration processing type to complete the registration. As shown in Figure 9, the process includes the following steps:

1. The UE accesses the non-3GPP AN through the non-3GPP GW and the PDN GW.

2. The non-3GPP network element sends a Handover Command (HO Command) to the UE, notifying the UE to hand over to the evolved network.

3. Before initiating registration into the evolved network, the UE identifies the type of the registration. Afterward, the UE sends a registration request message to the MME, and reports the registration processing type to the MME.

The registration processing type may be reported in one of the following ways:

(1) An Attach Type IE is added in the Attach Request message. For example, the values of the Attach Type IE are 0 and 1. The value "0" corresponds to Normal Attach (also known as initial Attach); and the value "1" corresponds to Handover Attach, and indicates that the Attach Request message is caused by handover.

(2) A new message is defined. For example, a new Handover Attach Request message is defined. This message indicates an Attach Request message caused by handover. The original Attach Request message indicates a normal Attach Request message (also known as initial Attach Request message) is defined. In this way, the UE can send different Attach Request messages to the network side to indicate the corresponding registration processing type information. Alternatively, a new message corresponding to the normal Attach Request message (also known as initial Attach Request message) is defined, and the original Attach Request message corresponds to the Attach Request message caused by handover. Alternatively, both the Attach Request message caused by handover and the normal Attach Request message (also known as initial Attach Request message) are defined.

(3) An Update Type IE is added in the TAU request message. For example, the values of the Attach Type IE are 0 and 1. The value "0" corresponds to Normal TAU (also known as initial TAU); and the value "1" corresponds to Handover TAU, and indicates that the TAU message is

caused by handover.

(4) A new message is defined. For example, a new Handover TAU Request message is defined. This message indicates a TAU Request message caused by handover. The original TAU Request message indicates a normal TAU Request message (also known as initial TAU Request message) is defined. In this way, the UE can send different TAU Request messages to the network side to indicate the corresponding registration processing type information. Alternatively, a new message corresponding to the normal TAU request message (also known as initial TAU request message) is defined, and the original TAU request message corresponds to the TAU request message caused by handover. Alternatively, both the TAU request message caused by handover and the normal TAU request message (also known as initial TAU request message) are redefined.

4. An authentication procedure is performed between the UE, the MME, and the HSS to obtain the PDN GW address used by the UE.

5. The MME identifies the processing type of the registration according to the registration processing type information reported by the UE.

Now the MME succeeds in distinguishing between different registration processing types.

Further, if the processing type is normal registration, the MME performs the normal registration procedure.

If the processing type is registration caused by handover, the MME sends a Create Bearer Request message to the obtained PDN GW address, requesting the network side to initiate bearer creation procedure. In this way, the service used by the UE in the non-3GPP AN is re-created in the new access system. The process proceeds to step 6.

6. If it is necessary to obtain the Policy and Charging Control (PCC) rules applied by the user from the PCRF, the PDN GW sends a Request PCC Rules message to the PCRF to obtain the PCC rules applied by the user. The PCRF provides the PDN GW with the PCC rules applied by the user.

7. The PDN GW initiates a network-side bearer creation procedure to create the bearer of the user.

Subsequently, the MME continues the procedure of other processes to complete the registration of the UE.

Embodiment 2: The foregoing mechanism is also applicable to a 2G system and a 3G system. When the UE sends a registration request message to the SGSN, the UE reports the registration processing type information to the SGSN. The SGSN identifies the registration processing type according to the information. Further, the SGSN performs the corresponding operations according to the registration processing type to complete the registration. As shown in Figure 10, the process includes the following steps:

1. The UE accesses the non-3GPP AN through the non-3GPP GW and the PDN GW.

2. The non-3GPP network element sends a HO Command to the UE, notifying the UE to hand over to the 2G or 3G network.

3. Before initiating registration into the 2G or 3G network, the UE identifies the type of the registration. Afterward, the UE sends a registration request message to the SGSN, and reports the registration processing type to the SGSN.

The registration processing type may be reported in one of the following ways:

(1) An Attach Type IE is added in the Attach Request message. For example, the values of the Attach Type IE are 0 and 1. The value "0" corresponds to Normal Attach (also known as Initial Attach), and indicates that the Attach Request message is a normal Attach Request message (also known as initial Attach Request message); and the value "1" corresponds to Handover Attach, and indicates that the Attach Request message is caused by handover.

(2) A new message is defined. For example, a new Handover Attach Request message is defined. This message indicates an Attach Request message caused by handover. The original Attach Request message indicates a normal Attach Request message (also known as an initial Attach Request message). In this way, the UE can send different Attach Request messages to the network side to indicate the corresponding registration processing type information. Alternatively, a new message corresponding to the normal Attach Request message (also known as initial Attach Request message) is defined, and the original Attach Request message corresponds to the Attach Request message caused by handover. Alternatively, both the Attach Request message caused by handover and the normal Attach Request message (also known as initial Attach Request message) are redefined.

(3) An Update Type IE is added in the RAU request message. For example, the values of the Update Type IE are 0 and 1. The value "0" corresponds to Normal RAU (also known as Initial RAU), and indicates that the RAU request message is a normal RAU request message (also known as initial RAU request message); and the value "1" corresponds to Handover RAU, and indicates that the RAU request message is caused by handover.

(4) A new message is defined. For example, a new Handover RAU Request message is defined. This message indicates an RAU Request message caused by handover. The original RAU request message indicates a normal RAU Request message (also known as an initial RAU Request message). In this way, the UE can send different RAU request messages to the network side to indicate the corresponding registration processing type information. Alternatively, a new message corresponding to the normal RAU request message (also known as initial RAU request message) is defined, and the original RAU Request message corresponds to the RAU request message caused by handover. Alternatively, both the RAU request message caused by handover and the

normal RAU request message (also known as initial RAU request message) are redefined.

4. An authentication procedure is performed between the UE, the MME, and the HSS to obtain the PDN GW address used by the UE.

5. The SGSN identifies the processing type of the registration according to the registration processing type information reported by the UE.

Now the SGSN succeeds in distinguishing between different registration processing types.

Further, if the processing type is normal registration, the SGSN performs the normal registration procedure.

If the processing type is registration caused by handover, the SGSN sends a Create Bearer Request message to the obtained PDN GW (namely, the current Gateway GPRS Supporting Node (GGSN)) address, requesting the network side to initiate bearer creation procedure. In this way, the service used by the UE in the non-3GPP AN is re-created in the new access system. The process proceeds to step 6.

6. If it is necessary to obtain the PCC rules applied by the user from the PCRF, the PDN GW sends a Request PCC Rules message to the PCRF to obtain the PCC rules applied by the user. The PCRF provides the PDN GW with the PCC rules applied by the user.

7. The PDN GW initiates a network-side bearer creation procedure to create the bearer of the user.

Subsequently, the SGSN continues the procedure of other processes to complete the registration of the UE.

Embodiment 3: The foregoing mechanism is also applicable to a non-3GPP system. When the UE sends a registration request message to the non-3GPP GW, the UE reports the registration processing type information to the non-3GPP GW. The non-3GPP GW identifies the processing type of the registration according to the information, and creates a bearer for the UE according to registration processing type to complete the registration. As shown in Figure 11, the process includes the following steps:

1. The UE accesses the 3GPP network through the serving GW and the PDN GW.

2. The MME sends an HO Command to the UE, notifying the UE to hand over to the non-3GPP network.

3. Before initiating registration into the non-3GPP network, the UE identifies the type of the registration. Afterward, the UE sends an Access Request message to the non-3GPP GW, and reports the registration processing type to the non-3GPP GW.

The registration processing type may be reported in one of the following ways:

(1) An Access Type IE is added in the Access Request message. For example, the values of the Access Type IE are 0 and 1. The value "0" corresponds to Normal Access (also known as

Initial Access), and indicates that the Access Request message is a normal Access Request message (also known as initial Access Request message); and the value "1" corresponds to Handover Access, and indicates that the Access Request message is caused by handover.

(2) A new message is defined. For example, a new Handover Access Request message is defined. This message indicates an Access Request message caused by handover. The original Access Request message indicates a normal Access Request message (also known as an initial Access Request message). In this way, the UE can send different Access Request messages to the network side to indicate the corresponding registration processing type information. Alternatively, a new message corresponding to the normal Access Request message (also known as initial Access Request message) is defined, and the original Access Request message corresponds to the Access Request message caused by handover. Alternatively, both the Access Request message caused by handover and the normal Access Request message (also known as initial Access Request message) are redefined.

4. An authentication procedure is performed between the UE, the non-3GPP GW, the AAA server, and the HSS.

5. The non-3GPP GW identifies the processing type of the registration according to the registration processing type information reported by the UE.

Now the non-3GPP GW succeeds in distinguishing between different registration processing types.

Further, if the processing type is normal access, the non-3GPP GW performs the normal access procedure.

If the processing type is access caused by handover, the non-3GPP GW sends a Request PCC Rules message to the PCRF to obtain the PCC rules applied by the user. The PCRF provides the non-3GPP GW with the PCC rules applied by the user, and then the process proceeds to step 6.

6. The non-3GPP GW initiates a network-side bearer creation procedure to create the bearer of the user.

Subsequently, the on-3GPP GW continues the procedure of other processes to complete the registration of the UE.

To sum up, in the embodiments of the present invention, the UE reports the registration processing type information to the network side in the process of registering the UE into the network, and therefore, the network side distinguishes between different registration processing types accordingly.

Further, the network side may perform the corresponding procedure according to the identified processing type. Moreover, a mode of the UE reporting the registration processing type information by means of adding an IE or defining a new message is disclosed in an embodiment

of the present invention.

It is apparent that those skilled in the art can make modifications and variations to the present invention without departing from the spirit and scope of the present invention. The present invention is intended to cover the modifications and variations provided that they fall in the scope of protection defined by the following claims or their equivalents.

DRAWINGS

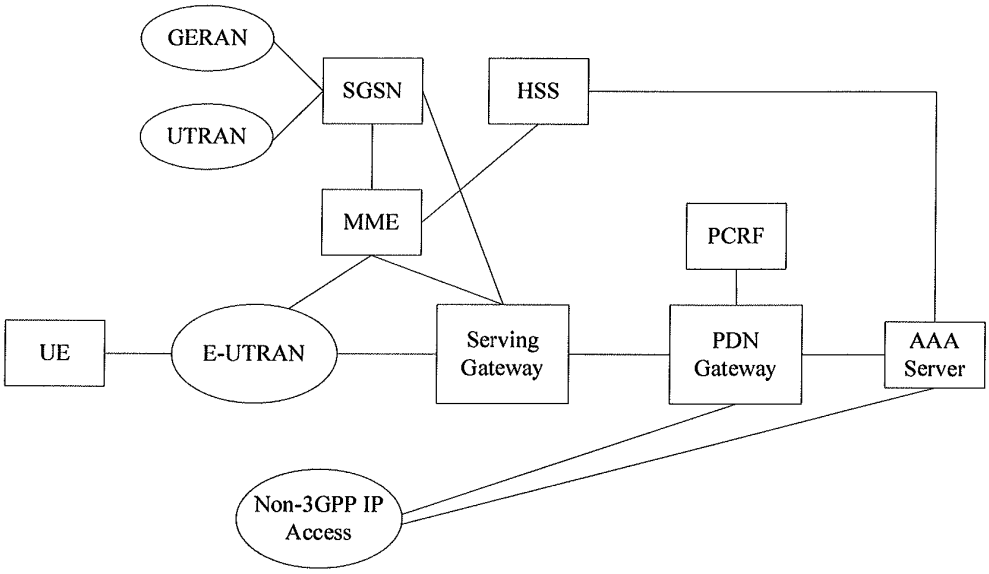


FIG. 1

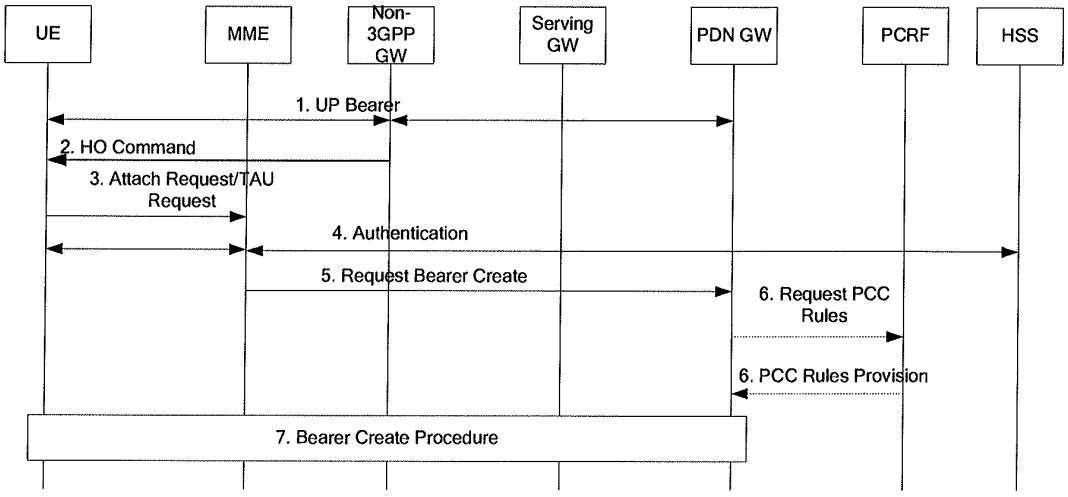


FIG. 2

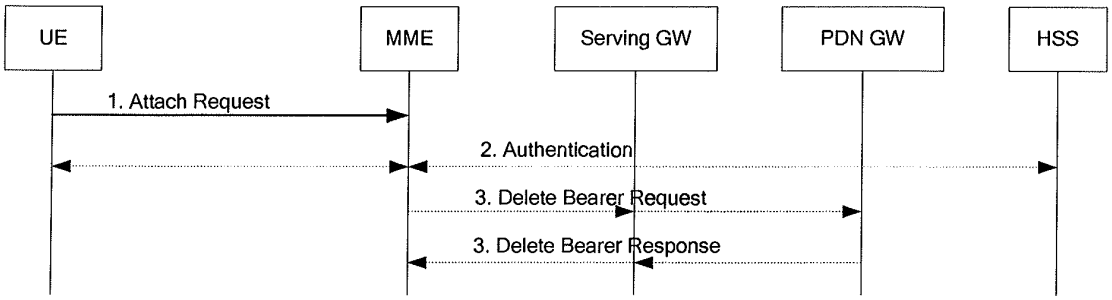


FIG. 3

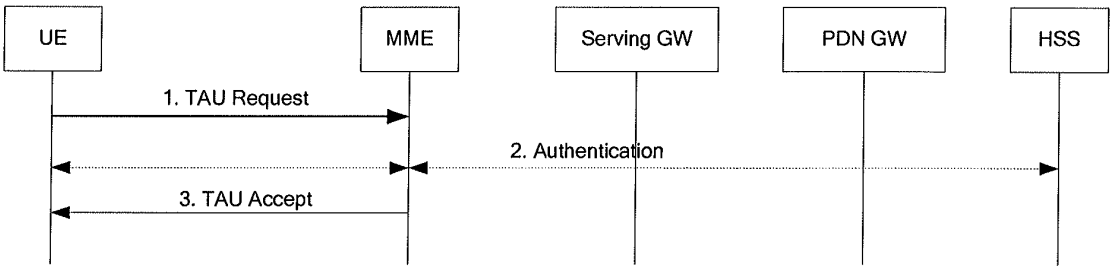


FIG. 4

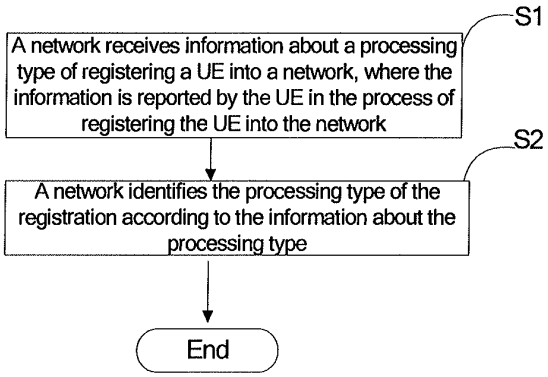


FIG. 5

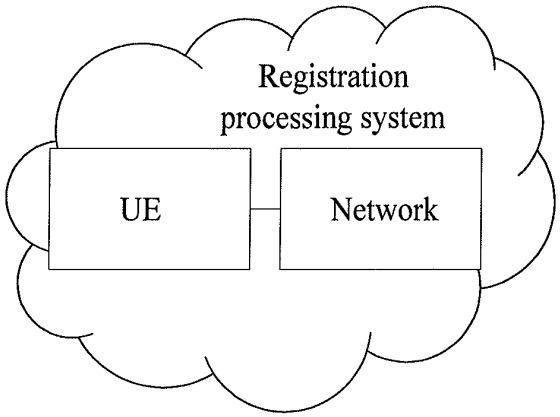


FIG. 6

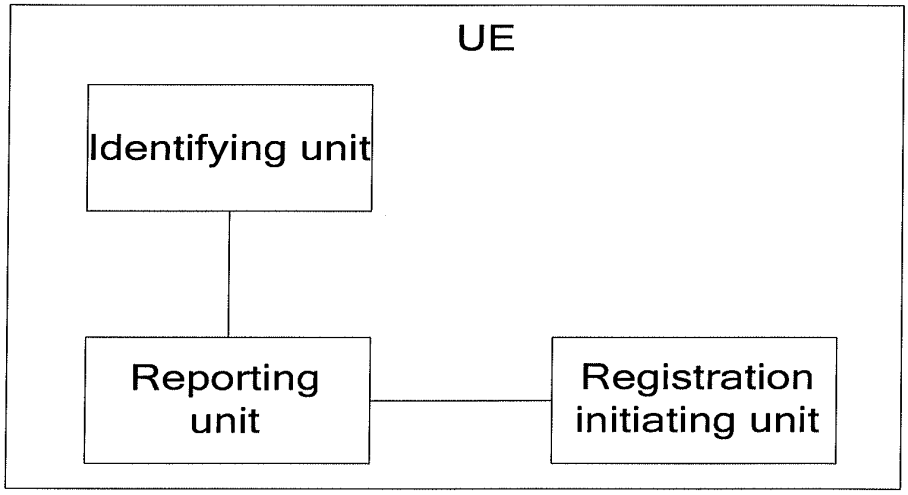


FIG. 7

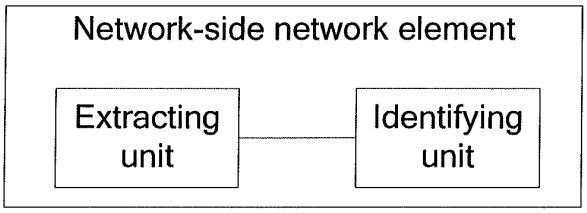


FIG. 8

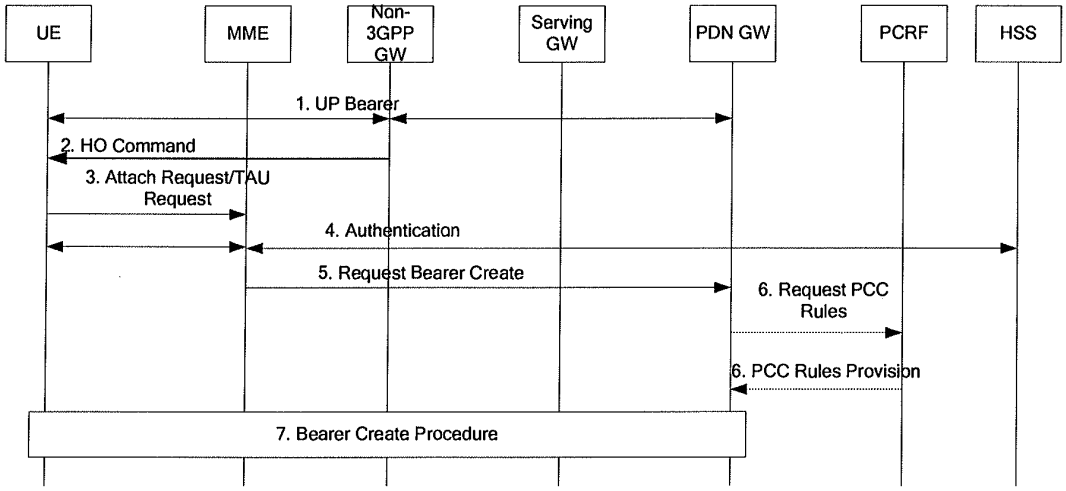

UE
MME
Non-3GPP GW
Serving GW
PDN GW
PCRF
HSS
1. UP Bearer
2. HO Command
3. Attach Request/TAU Request
4. Authentication
5. Request Bearer Create
6. Request PCC Rules
6. PCC Rules Provision
7. Bearer Create Procedure

FIG. 9

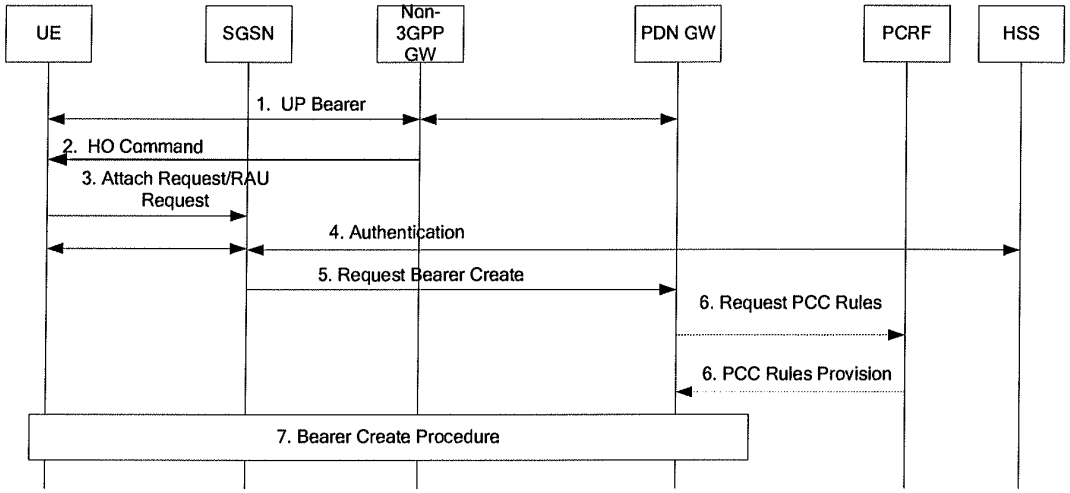

UE
SGSN
Non-3GPP GW
PDN GW
PCRF
HSS
1. UP Bearer
2. HO Command
3. Attach Request/RAU Request
4. Authentication
5. Request Bearer Create
6. Request PCC Rules
6. PCC Rules Provision
7. Bearer Create Procedure

FIG. 10

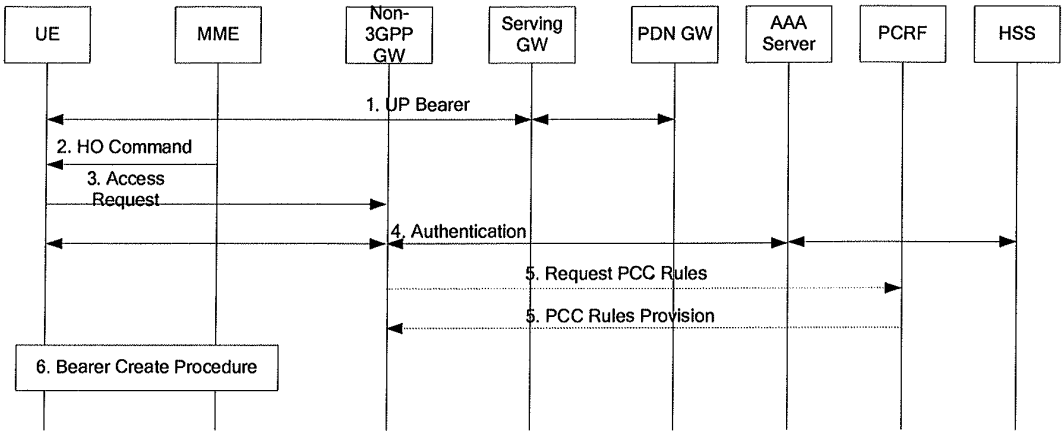

UE
MME
Non-3GPP GW
Serving GW
PDN GW
AAA Server
PCRF
HSS
1. UP Bearer
2. HO Command
3. Access Request
4. Authentication
5. Request PCC Rules
5. PCC Rules Provision
6. Bearer Create Procedure

FIG. 11

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: April 18, 2013 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu			
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.:	2875
Attorney Docket No.: 13674-213			
Client Ref. No.:	0810596US		

PETITION AND FEE FOR EXTENSION OF TIME (37 CFR § 1.136(a))

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Dear Sir/Madam:

This is a petition for an extension of the time to respond to an Office Action dated December 18, 2012 for a period of one month(s).

Per 37 CFR §1.27, ☐ Applicant is small entity ☐ Applicant is micro entity.

	Extension Months	Fee	Small Entity Fee	Micro Entity Fee
☒	One Month	$ 200	$ 100	$ 50
☐	Two Months	$ 600	$ 300	$150
☐	Three Months	$1,400	$ 700	$350
☐	Four Months	$2,200	$1,100	$550
☐	Five Months	$3,000	$1,500	$750

Payment Method:

☐ Payment by credit card in the amount of $_____ to cover the fees listed above. Form PTO-2038 is enclosed for this purpose.

☒ The Commissioner is hereby authorized to charge $200.00 to cover the fees listed above to Deposit Account No. 23-1925.

☒ The Commissioner is hereby authorized to charge any deficiencies in fees or credit overpayment to Deposit Account No. 23-1925.

Respectfully submitted,

Dated: April 18, 2013

/Gustavo Siller, Jr./
Gustavo Siller, Jr., Reg. No. 32,305
Attorney for Applicant(s)

BRINKS HOFER GILSON & LIONE
PO BOX 10395
CHICAGO, IL 60610
(312) 321-4200

Electronic Patent Application Fee Transmittal

Application Number:	12581575
Filing Date:	19-Oct-2009
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Filer:	Gustavo Siller Jr./Rachelle Holmes
Attorney Docket Number:	13674-213

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with $0 paid	1251	1	200	200

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
			Total in USD ($)	**200**

Electronic Acknowledgement Receipt

EFS ID:	15556620
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Maggie Pieczonka
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	18-APR-2013
Filing Date:	19-OCT-2009
Time Stamp:	16:28:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$200
RAM confirmation Number	3223
Deposit Account	231925
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees) Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees) Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213Response.pdf	1415285 5ac8befcbb9fbc993b3710fd1479b038d2df496c	yes	32

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Transmittal Letter	1	1
	Amendment/Req. Reconsideration-After Non-Final Reject	2	8
	Translation of Foreign Priority Documents	9	25
	Drawings-only black and white line drawings	26	30
	Extension of Time	31	32

Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30818 118aa3e45ae5c42f3cf9d0dd02f367ba93ad007c	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	1446103		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: April 18, 2013 Neme: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.:	2875
Attorney Docket No.:	13674-213		
Client Ref. No.:	0810596US		

TRANSMITTAL

Mail Stop Amendment
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Response; English Translation of Chinese Patent Application No. 200710104400.7 (including Verification of Translation); Petition for One-Month Extension of Time.

Fee calculation:

☐ No additional fee is required.

☐ Per 37 CFR §1.27, ☐ Applicant is small entity ☐ Applicant is micro entity.

☒ An extension fee in an amount of $200.00 for a one-month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(_____).

☐ An additional filing fee has been calculated as shown below:

					Fee		Small Entity Fee		Micro Entity Fee	
	Claims Remaining After Amendment		Highest No. Previously Paid	Present Extra	Rate	Add'l Fee	Rate	Add'l Fee	Rate	Add'l Fee
Total		Minus			x $ 80 =	$	x $ 40 =	$	x $20 =	$
Independent		Minus			x $420 =	$	x $210 =	$	x $105 =	$
First Presentation of Multiple Dep. Claim					+ $780 =	$	+ $390 =	$	+ $195 =	$
					Total	$	Total	$	Total	$

Fee payment:

☒ Please charge Deposit Account No. 23-1925 in the amount of $200.00 for one-month extension of time.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).
WARNING: Information on this form may become public. **Credit card information should not be included on this form.**

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

April 18, 2013
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

BRINKS HOFER GILSON & LIONE
NBC Tower – Suite 3600, 455 N. Cityfront Plaza Drive, Chicago, IL 60611-5599

BRINKS HOFER GILSON &LIONE

PTO/SB/06 (07-06)
Approved for use through 1/31/2007. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number	Filing Date	☐ To be Mailed
12/581,575	10/19/2009	

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)	SMALL ENTITY ☐		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)		RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =		OR	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =			X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $250 ($125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT	04/18/2013	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 14	Minus	** 20	= 0	X $ =		OR	X $80=	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***5	= 0	X $ =		OR	X $420=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)					
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)		RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =		OR	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =		OR	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

Legal Instrument Examiner:
/MARQUITA JONES/

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

93823 7590 05/23/2013

Huawei/BHGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER
CHERY, DADY

ART UNIT	PAPER NUMBER
2461	

DATE MAILED: 05/23/2013

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

TITLE OF INVENTION: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1780	$300	$0	$2080	08/23/2013

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

93823 7590 05/23/2013
Huawei/BHGL
P.O. Box 10395
Chicago, IL 60610

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

TITLE OF INVENTION: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1780	$300	$0	$2080	08/23/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHERY, DADY	2461	370-331000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29	NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
❑ Applicant asserting small entity status. See 37 CFR 1.27	NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
❑ Applicant changing to regular undiscounted fee status.	NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

93823 7590 05/23/2013

Huawei/BHGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER	
CHERY, DADY	

ART UNIT	PAPER NUMBER
2461	

DATE MAILED: 05/23/2013

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 02/11)

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 12/581,575	Applicant(s) WU, WENFU	
	Examiner DADY CHERY	Art Unit 2461	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *04/18/2013*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *7,9,10,16,19,20, and 26-33 renumbered as 1-14*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☒ All b) ☐ Some *c) ☐ None of the:
   1. ☒ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

   Interim copies:

   a) ☐ All b) ☐ Some c) ☐ None of the: Interim copies of the priority documents have been received.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/Dady Chery/
Examiner, Art Unit 2461

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	**Art Unit**
	DADY CHERY	2461

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	10/27/2010	04/19/2011	12/04/2011	05/01/2012	05/18/2013				
	1	✓	✓	✓	-	-				
	2	✓	-	-	-	-				
	3	✓	-	-	-	-				
	4	✓	✓	✓	-	-				
	5	✓	✓	✓	-	-				
	6	✓	✓	-	-	-				
1	7	✓	✓	✓	✓	=				
	8	✓	-	-	-	-				
2	9	✓	✓	✓	✓	=				
3	10	✓	✓	✓	✓	=				
	11	✓	✓	✓	-	-				
	12	✓	✓	✓	-	-				
	13	✓	-	-	-	-				
	14	✓	✓	✓	-	-				
	15	✓	-	-	-	-				
11	16	✓	✓	✓	✓	=				
	17	✓	-	-	-	-				
	18		✓	✓	-	-				
4	19		✓	✓	✓	=				
5	20		✓	✓	✓	=				
	21		✓	-	-	-				
	22		✓	-	-	-				
	23		✓	-	-	-				
	24			✓	-	-				
	25			✓	-	-				
6	26				✓	=				
7	27				✓	=				
8	28				✓	=				
10	29				✓	=				
9	30				✓	=				
12	31				✓	=				
13	32				✓	=				
14	33				✓	=				

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	**Art Unit**
	DADY CHERY	2461

CPC		
Symbol	**Type**	**Version**

CPC Combination Sets				
Symbol	**Type**	**Set**	**Ranking**	**Version**

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	**SUBCLASS**	**CLAIMED**					**NON-CLAIMED**					
370	331	H	0	4	W	4 / 00 (2009.01.01)						
CROSS REFERENCE(S)												
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**											
709	229											
455	436											

(Assistant Examiner)	(Date)	**Total Claims Allowed:** 14	
/DADY CHERY/ Examiner.Art Unit 2461	05/18/2013	O.G. Print Claim(s) 7	O.G. Print Figure 1
(Primary Examiner)	(Date)		

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	**Art Unit**
	DADY CHERY	2461

(Assistant Examiner)	(Date)	**Total Claims Allowed:** 14	
/DADY CHERY/ Examiner.Art Unit 2461	05/18/2013	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	7	1

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	**Art Unit**
	DADY CHERY	2461

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		17	14	33										
	2		18												
	3	4	19												
	4	5	20												
	5		21												
	6		22												
1	7		23												
	8		24												
2	9		25												
3	10	6	26												
	11	7	27												
	12	8	28												
	13	10	29												
	14	9	30												
	15	12	31												
11	16	13	32												

(Assistant Examiner)	(Date)	**Total Claims Allowed:** 14	
/DADY CHERY/ Examiner.Art Unit 2461	05/18/2013	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	7	1

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	12581575	WU, WENFU
	Examiner	Art Unit
	DADY CHERY	2461

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
370	328,329,330,331,332,333,334	10/22/2010	DC
455	436,437,438,439	10/22/2010	DC
709	227,228,229	10/22/2010	DC

SEARCH NOTES		
Search Notes	Date	Examiner
Inventorship	10/22/2010	DC
Updated search	04/18/2011	DC
Updated search	12/04/2011	Dc
Updated search	05/01/2012	DC
Updated search	12/15/2012	DC
Updated search	05/18/2013	DC

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
370	328,329,330,331,332,333,334	05/18/2013	DC

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
12/26/2012
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
12/26/2012
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.:	2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US		

NINTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(c), Applicant hereby cites the following reference(s):

U.S. PATENT DOCUMENTS		
DOCUMENT NO.	**DATE**	**NAME**
20070243872 A1	10/18/2007	Gallagher et al.

BRINKS HOFER GILSON &LIONE

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

FOREIGN PATENT DOCUMENTS		
DOCUMENT NO.	DATE	COUNTRY
CN 1866850 A	11/22/2006	China

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Office Action issued in commonly owned U.S. Patent Application No. 13/197,537, mailed December 18, 2012.

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

Applicant has calculated a processing fee in the amount of $180.00 to be due under 37 CFR §1.17(p) in connection with the filing of this Information Disclosure Statement. Applicant has enclosed a check covering this fee, or authorized charging the fee to a deposit account or credit card, as indicated in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

December 26, 2012
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

/Dady Chery/ 05/18/2013

BRINKS HOFER GILSON &LIONE

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	K1					
	K2					
	K3					
	K4					
	K5					
	K6					
	K7					
	K8					
	K9					
	K10					
	K11					
	K12					
	K13					

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	K14	CN 1549610 A	11/24/2004	China		Abstract

EXAMINER INITIAL		OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.
	K15	Copy of Office Action issued in corresponding Chinese Patent Application No. 201110412187.2, mailed February 5, 2013.
	K16	Copy of Search Report issued in corresponding Chinese Patent Application No. 201110412187.2, mailed February 5, 2013.

EXAMINER /Dady Chery/	DATE CONSIDERED 05/18/2013

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
4/12/2013
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
4/12/2013
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.:	2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US		

TENTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(c), Applicant hereby cites the following reference(s):

FOREIGN PATENT DOCUMENTS		
DOCUMENT NO.	**DATE**	**COUNTRY**
CN 1549610 A	11/24/2004	China

BRINKS HOFER GILSON &LIONE

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Office Action issued in corresponding Chinese Patent Application No. 201110412187.2, mailed February 5, 2013.
Copy of Search Report issued in corresponding Chinese Patent Application No. 201110412187.2, mailed February 5, 2013.

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

The Applicant or Applicants certifies under 37 CFR §1.97(e)(1) that each item of information in this Information Disclosure Statement was first cited in any communication from a patent office in a counterpart foreign or international application not more than three months prior to the filing of this Information Disclosure Statement (a copy of any foreign communication first citing a listed reference is attached for the Examiner's reference). Accordingly, Applicant has calculated no fee to be due in connection with the filing of this Information Disclosure Statement. However, the Director is authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to a deposit account, as authorized in the Transmittal accompanying this Information Disclosure Statement.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

Respectfully submitted,

April 12, 2013
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

/Dady Chery/ 05/18/2013

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	F1	Copy of Office Action issued in corresponding Chinese Patent Application No. 200810085729.8, mailed April 26, 2010.

EXAMINER	/Dady Chery/	DATE CONSIDERED	05/18/2013

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	G1	Copy of Office Action issued in corresponding Chinese Patent Application No. 200810085729.8, mailed August 1, 2011.

EXAMINER	/Dady Chery/	DATE CONSIDERED	05/18/2013

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

FORM PTO-1449	SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT	FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary) APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	J1	20070243872 A1	10/18/2007	Gallagher et al.		
	J2					
	J3					
	J4					
	J5					
	J6					
	J7					
	J8					
	J9					
	J10					
	J11					
	J12					
	J13					

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	J14	CN 1866850 A	11/22/2006	China		Abstract

EXAMINER INITIAL		OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.
	J15	Copy of Office Action issued in commonly owned U.S. Patent Application No. 13/197,537, mailed December 18, 2012.
	J16	
	J17	
	J18	
	J19	
	J20	

EXAMINER /Dady Chery/	DATE CONSIDERED 05/18/2013

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	84	(receiv$3 and mobility and management and entity and handover and bearer).clm.	US-PGPUB; USPAT	OR	ON	2013/05/18 11:59
L6	73	(receiv$3 and mme and handover and bearer).clm.	US-PGPUB; USPAT	OR	ON	2013/05/18 12:00
S4	2	indication same (release near request near message) same (mobility near management near network near element MME)	US-PGPUB; USPAT	OR	ON	2010/04/13 17:57
S6	15050	(370/328,329,330,331,332,333,334).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 18:35
S7	5081	(455/436,437,438,439).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 18:37
S8	13008	(709/227,228,229).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 18:37
S9	1771	S6 and S7	US-PGPUB; USPAT	OR	ON	2010/04/13 18:38
S10	18	S8 and S9	US-PGPUB; USPAT	OR	ON	2010/04/13 18:38
S11	0	(release near request near message) same (mobility near management near network near element MME)same (mobile user UE phone terminal) same (packet near switching) same (circuit near switching)	US-PGPUB; USPAT	OR	ON	2010/04/13 18:57
S12	6	(release near request near message) same (mobility near management near network near element MME)	US-PGPUB; USPAT	OR	ON	2010/04/13 18:58
S17	89	(handoff hand-off handover hand-over) same bearer same (delet$3 suspend$3 preserv$3)	US-PGPUB; USPAT	OR	ON	2010/04/13 22:38
S18	15050	(370/328,329,330,331,332,333,334).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 22:38
S19	35	S17 and S18	US-PGPUB; USPAT	OR	ON	2010/04/13 22:38
S20	13008	(709/227,228,229).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 22:38
S21	0	S17 and S20	US-PGPUB;	OR	ON	2010/04/13 22:38

			USPAT			
S22	5081	(455/436,437,438,439).ccls.	US-PGPUB; USPAT	OR	ON	2010/04/13 22:39
S23	1771	S18 and S22	US-PGPUB; USPAT	OR	ON	2010/04/13 22:39
S24	16	S17 and S23	US-PGPUB; USPAT	OR	ON	2010/04/13 22:39
S25	32	S17 and S22	US-PGPUB; USPAT	OR	ON	2010/04/13 22:39
S26	16	S25 not S24	US-PGPUB; USPAT	OR	ON	2010/04/13 22:48
S27	19	S19 not S24	US-PGPUB; USPAT	OR	ON	2010/04/13 22:50
S28	7	(wu near2 wenfu).in.	US-PGPUB; USPAT	OR	ON	2010/04/14 14:57
S29	6	US-7359347-$.DID. OR US-20070010252-$.DID. OR US-1436435-$.DID. OR US-1545236-$.DID. OR KR-20040051328-$.DID. OR WO-2007007150-$.DID.	US-PGPUB; USPAT; USOCR; JPO	OR	ON	2010/04/14 17:15
S32	3036	(suspend$3 preserv$3 delet$3 cancel$3 releas$3) same bearer$3	US-PGPUB; USPAT	OR	ON	2010/06/02 09:59
S33	280	(handoff hand-off handover hand-over) same S32	US-PGPUB; USPAT	OR	ON	2010/06/02 09:59
S34	176	S33 and "26"	US-PGPUB; USPAT	OR	ON	2010/06/02 09:59
S35	15687	(370/328,329,330,331,332,333,334).ccls.	US-PGPUB; USPAT	OR	ON	2010/06/02 10:00
S36	101	S33 and S35	US-PGPUB; USPAT	OR	ON	2010/06/02 10:00
S37	5218	(455/436,437,438,439).ccls.	US-PGPUB; USPAT	OR	ON	2010/06/02 10:11
S38	86	S33 and S37	US-PGPUB; USPAT	OR	ON	2010/06/02 10:11
S42	175	(policy near2 charging near2 control PCC) same (policy near2 charging near2 rule near2 function PCRF)	US-PGPUB; USPAT	OR	ON	2010/11/18 22:41
S43	24	(policy near2 charging near2 control PCC) same (policy near2 charging near2 rule near2 function PCRF) same (handover hand near off handoff)	US-PGPUB; USPAT	OR	ON	2010/11/18 22:41
S48	1	creat$3 near2 bearer near2 request same flag same (proxy near2 bind$3 near2	US-PGPUB;	OR	ON	2010/11/20 21:39

		updat$3)	USPAT			
S49	1	bearer near2 request same flag same (proxy near2 bind$3 near2 updat$3)	US-PGPUB; USPAT	OR	ON	2010/11/20 21:39
S50	1	bearer near2 request same flag same (bind$3 near2 updat$3)	US-PGPUB; USPAT	OR	ON	2010/11/20 21:39
S51	15	bearer near2 request same flag	US-PGPUB; USPAT	OR	ON	2010/11/20 21:40
S52	139	(proxy near2 bind$3 near2 updat$3)	US-PGPUB; USPAT	OR	ON	2010/11/20 21:40
S53	3	S51 and S52	US-PGPUB; USPAT	OR	ON	2010/11/20 21:40
S54	487	(proxy same bind$3 same updat$3)	US-PGPUB; USPAT	OR	ON	2010/11/20 21:42
S55	96	bearer same request same flag	US-PGPUB; USPAT	OR	ON	2010/11/20 21:42
S56	4	S54 and S55	US-PGPUB; USPAT	OR	ON	2010/11/20 21:42
S57	16	(wu near2 wenfu).in.	US-PGPUB; USPAT	OR	ON	2010/11/21 13:54
S69	16	(wu near2 wenfu).in.	US-PGPUB; USPAT	OR	ON	2010/12/05 17:50
S70	13	(hu near2 weihua).in.	US-PGPUB; USPAT	OR	ON	2010/12/05 17:51
S76	101	(aggregate near2 maximum near2 bit near2 rate AMBR)	US-PGPUB; USPAT	OR	ON	2011/03/01 09:10
S77	121	(handoff hand-off handover hand-over) same bearer same (delet$3 suspend$3 preserv$3)	US-PGPUB; USPAT	OR	ON	2011/03/01 09:14
S78	2	S76 same S77	US-PGPUB; USPAT	OR	ON	2011/03/01 09:14
S80	1769	(handoff hand-off handover hand-over) same bearer	US-PGPUB; USPAT	OR	ON	2011/03/01 09:21
S81	3	S76 and S77	US-PGPUB; USPAT	OR	ON	2011/03/01 09:21
S82	2605	(handoff hand-off handover hand-over mobility) same bearer	US-PGPUB; USPAT	OR	ON	2011/03/01 09:23
S83	14	S76 same S82	US-PGPUB; USPAT	OR	ON	2011/03/01 09:23
S84	23	S76 and S82	US-PGPUB;	OR	ON	2011/03/01 09:27

			USPAT			
S85	9	S84 not S83	US-PGPUB; USPAT	OR	ON	2011/03/01 09:27
S86	11	(aggregate near2 maximum near2 bit near2 rate AMBR)same (handoff hand-off handover hand-over)	US-PGPUB; USPAT	OR	ON	2011/03/01 09:30
S87	23	(aggregate near2 maximum near2 bit near2 rate AMBR)and (handoff hand-off handover hand-over)	US-PGPUB; USPAT	OR	ON	2011/03/01 09:36
S88	12	S87 not S86	US-PGPUB; USPAT	OR	ON	2011/03/01 09:36
S96	1	"7801083".pn.	US-PGPUB; USPAT	OR	ON	2013/03/18 09:42
S97	1	"20070213059"	US-PGPUB; USPAT	OR	ON	2013/03/18 10:52
S98	816	(packet near2 switch$3) same (circuit near2 switch$3) same (handoff handover)	US-PGPUB; USPAT	OR	ON	2013/03/18 10:57
S99	5552	(suspend$3 preserv$3 delet$3 cancel$3 releas$3) same bearer$3	US-PGPUB; USPAT	OR	ON	2013/03/18 10:57
S100	33	S98 same S99	US-PGPUB; USPAT	OR	ON	2013/03/18 10:57
S101	0	13/623879	US-PGPUB; USPAT	OR	OFF	2013/03/18 11:21
S102	2	"20060058032"	US-PGPUB; USPAT	OR	OFF	2013/03/18 11:28
S103	1	12/812108	US-PGPUB; USPAT; DERWENT	OR	OFF	2013/03/18 11:30
S104	2	"20100290433"	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/03/18 11:31
S105	1	2009-L79305.NRAN.	DERWENT	OR	OFF	2013/03/18 11:31
S106	3	"8289954".pn.	US-PGPUB; USPAT; EPO; JPO; DERWENT	OR	OFF	2013/03/18 11:34
S107	15	US-20070213059-$.DID. OR US-20090239526-$.DID. OR US-20060109819-$.DID. OR US-20030169725-$.DID. OR US-20070010252-$.DID. OR US-20070067234-$.DID. OR US-1436435-$.DID. OR US-1545236-$.DID. OR US-20040051328-$.DID. OR US-1120094-	US-PGPUB; USPAT; USOCR; JPO	OR	OFF	2013/03/18 12:45

		$.DID. OR US-1331018-$.DID.				
S108	1	"7764652".pn.	US-PGPUB; USPAT	OR	OFF	2013/03/19 17:17

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L4	11	(receiv$3 and mobility and management and entity and handover and bearer).clm.	USPAT; UPAD	OR	ON	2013/05/18 12:00
L5	10	(receiv$3 and mme and handover and bearer).clm.	USPAT; UPAD	OR	ON	2013/05/18 12:00
S41	1	(wu near2 wenfu).in.	USPAT; UPAD	OR	ON	2010/07/31 10:10
S60	2	(wu near2 wenfu).in.	USPAT; UPAD	OR	ON	2010/11/21 13:55
S61	0	(wang near2 shanshan).in.	USPAT; UPAD	OR	ON	2010/11/21 13:55
S71	2	(wu near2 wenfu).in.	USPAT; UPAD	OR	ON	2010/12/05 17:50
S72	0	(hu near2 weihua).in.	USPAT; UPAD	OR	ON	2010/12/05 17:51
S95	0	(agregate and maximum and bit and rate and mobility and management and access and network).clm.	USPAT; UPAD	OR	ON	2011/03/11 16:09

5/ 18/ 2013 12:26:31 PM
C:\ Users\ dchery\ Documents\ EAST\ Workspaces\ 12684625.wsp

FORM PTO-1449	SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT	FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary) APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	I1					
	I2					
	I3					
	I4					
	I5					
	I6					
	I7					
	I8					
	I9					
	I10					
	I11					
	I12					
	I13					

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	I14	CN 101431797 B	02/01/2012	China		Abstract
	I15	EP 1758264 A2	02/28/2007	EPO		

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date page(s), volume-issue number(s), publisher, city and/or country where published.	
	I16	
	I17	
	I18	
	I19	
	I20	
	I21	

EXAMINER /Dady Chery/	DATE CONSIDERED 05/18/2013

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

FORM PTO-1449	SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT	FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary) APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	L1	20070019643 A1	01/25/2007	Shaheen		
	L2	20070281699 A1	12/06/2007	Rasanen		
	L3					
	L4					
	L5					
	L6					
	L7					
	L8					
	L9					
	L10					
	L11					
	L12					
	L13					

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	L14					
	L15					
	L16					
	L17					
	L18					

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
	L19	Copy of Office Action issued in corresponding U.S. Patent Application No. 13/197,537, mailed June 27, 2013, 18 pages
	L20	Copy of Office Action issued in corresponding Chinese Patent Application No. 201110221263.1, mailed June 26, 2013, 5 pages
	L21	
	L22	
	L23	
	L24	

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Patent Application Fee Transmittal

Application Number:	12581575
Filing Date:	19-Oct-2009
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Filer:	Gustavo Siller Jr./Rachelle Holmes
Attorney Docket Number:	13674-213

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
		Total in USD ($)		**180**

Electronic Acknowledgement Receipt

EFS ID:	16539193
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Jeff Skinner
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	08-AUG-2013
Filing Date:	19-OCT-2009
Time Stamp:	16:12:50
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$180
RAM confirmation Number	3025
Deposit Account	231925
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees) Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)	

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213IDS.pdf	280787 6ab5db5fc95862485aa02ec1f74b6877c2a681aa	yes	6

Multipart Description/PDF files in .zip description

Document Description	Start	End
Transmittal Letter	1	2
Transmittal Letter	3	5
Information Disclosure Statement (IDS) Form (SB08)	6	6

Warnings:

Information:

2	Non Patent Literature	L19.pdf	603427 a330c0074e40c245fefa11dab12dc5b6b60025ab	no	18

Warnings:

Information:

3	Non Patent Literature	L20.pdf	977467 8968955109672f9c0feffb58603ab2b3d0eda68f	no	5

Warnings:

Information:

4	Fee Worksheet (SB06)	fee-info.pdf	30577 c66f40e11ba5f1413e16bd7d1dc963d46384fc92	no	2

Warnings:

Information:

Total Files Size (in bytes):	1892258

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: August 8, 2013 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu

Appln. No.: 12/581,575

Filed: October 19, 2009

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Attorney Docket No: 13674-213
Client Ref. No. 0810596US

Examiner: Dady Chery

Art Unit: 2461

Confirmation No.: 2875

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Information Disclosure Statement; PTO-1449; Cited References L19 and L20.

Fee calculation:

☐ No additional fee is required.

☐ Per 37 CFR §1.27, ☐ Applicant is small entity ☐ Applicant is micro entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

					Fee		Small Entity Fee		Micro Entity Fee	
	Claims Remaining After Amendment		Highest No. Previously Paid	Present Extra	Rate	Add'l Fee	Rate	Add'l Fee	Rate	Add'l Fee
Total		Minus			x $ 80 =	$	x $ 40 =	$	x $20 =	$
Independent		Minus			x $420 =	$	x $210 =	$	x $105 =	$
First Presentation of Multiple Dep. Claim					+ $780 =	$	+ $390 =	$	+ $195 =	$
					Total	$	Total	$	Total	$

Fee payment:

☒ Please charge Deposit Account No. 23-1925 in the amount of $180.00 for IDS.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).
WARNING: Information on this form may become public. **Credit card information should not be included on this form.**

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

August 8, 2013
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

BRINKS HOFER GILSON & LIONE
NBC Tower – Suite 3600, 455 N. Cityfront Plaza Drive, Chicago, IL 60611-5599

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
8/8/2013
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
8/8/2013
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Dady Chery
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.:	2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US		

ELEVENTH SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(d), Applicant hereby cites the following reference(s):

U.S. PATENT DOCUMENTS		
DOCUMENT NO.	**DATE**	**NAME**
20070019643 A1	01/25/2007	Shaheen
20070281699 A1	12/06/2007	Rasanen

BRINKS HOFER GILSON &LIONE

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Office Action issued in corresponding U.S. Patent Application No. 13/197,537, mailed June 27, 2013, 18 pages
Copy of Office Action issued in corresponding Chinese Patent Application No. 201110221263.1, mailed June 26, 2013, 5 pages

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). Pursuant to the undersigned attorney's obligation and duties under 37 CFR §§ 1.56 and 1.98(a)(3) and (c), either English language abstracts, partial translations, or full translations are included for patent documents which are not in English for the express purpose of providing a concise explanation of the references to the Patent and Trademark Office with the opportunity to evaluate the same. Applicant respectfully requests the Examiner's consideration of the above reference(s) and entry thereof into the record of this application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

The Applicant or Applicants certifies under 37 CFR §1.97(e)(1) that each item of information in this Information Disclosure Statement was first cited in any communication from a patent office in a counterpart foreign or international application not more than three months prior to the filing of this Information Disclosure Statement (a copy of any foreign communication first citing a listed reference is attached for the Examiner's reference). Applicant has further calculated a processing fee in the amount of $180.00 to be due under 37 CFR §1.17(p) in connection with the filing of this Information Disclosure Statement. Applicant has enclosed a check covering this fee, or authorized charging the fee to a deposit account or credit card, as indicated in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

August 8, 2013
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

FORM PTO-1449		SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT		FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary)	APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	M1					
	M2					
	M3					
	M4					
	M5					
	M6					
	M7					
	M8					
	M9					
	M10					
	M11					
	M12					
	M13					

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	M14					
	M15					
	M16					
	M17					
	M18					

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
	M19	Copy of Search Report issued in corresponding Chinese Patent Application No. 201110412187.2, mailed December 18, 2012, 21 pages
	M20	
	M21	
	M22	
	M23	
	M24	

EXAMINER	DATE CONSIDERED

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Electronic Acknowledgement Receipt

EFS ID:	16565226
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Dunia Gomez
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	12-AUG-2013
Filing Date:	19-OCT-2009
Time Stamp:	16:54:47
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213_IDS_FORMS.pdf	121370 86eaf5da04eddee610bdbdbc8a91238f9bae71fb	yes	5

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Miscellaneous Incoming Letter	1	2
	Transmittal Letter	3	4
	Information Disclosure Statement (IDS) Form (SB08)	5	5

Warnings:					
Information:					
2	Other Reference-Patent/App/Search documents	cn_sr.pdf	1230585 870fa8a26ab5fc0392676dcf283f14c0dcf72117	no	22
Warnings:					
Information:					
		Total Files Size (in bytes):	1351955		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date August 12, 2013 Name Gustavo Siller, Jr. Signature /Gustavo Siller, Jr./

BRINKS HOFER GILSON & LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of: Wenfu Wu

Appln. No.: 12/581,575

Filed: October 19, 2009

For: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

Attorney Docket No: 13674-213
Client Ref. No. 0810596US

Examiner: Dady Chery

Art Unit: 2461

Confirmation No.: 2875

TRANSMITTAL

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ Transmittal; Information Disclosure Statement; PTO-1449; Cited Reference M19.

Fee calculation:

☒ No additional fee is required.

☐ Per 37 CFR §1.27, ☐ Applicant is small entity ☐ Applicant is micro entity.

☐ An extension fee in an amount of $_____ for a ____- month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(___) .

☐ An additional filing fee has been calculated as shown below:

					Fee		Small Entity Fee		Micro Entity Fee	
	Claims Remaining After Amendment		Highest No. Previously Paid	Present Extra	Rate	Add'l Fee	Rate	Add'l Fee	Rate	Add'l Fee
Total		Minus			x $ 80 =	$	x $ 40 =	$	x $20 =	$
Independent		Minus			x $420 =	$	x $210 =	$	x $105 =	$
First Presentation of Multiple Dep. Claim					+ $780 =	$	+ $390 =	$	+ $195 =	$
					Total	$	Total	$	Total	$

Fee payment:

☐ Please charge Deposit Account No. 23-1925 in the amount of $___ for ___.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).
WARNING: Information on this form may become public. **Credit card information should not be included on this form.**

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

August 12, 2013
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

BRINKS HOFER GILSON & LIONE
NBC Tower – Suite 3600, 455 N. Cityfront Plaza Drive, Chicago, IL 60611-5599

I hereby certify that this correspondence is being Electronically Transmitted on the date noted below to:
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
8/12/2013
Date of Deposit
Gustavo Siller, Jr.
Name of applicant, assignee or Registered Representative
/Gustavo Siller, Jr./
Signature
8/12/2013
Date of Signature

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu	
Appln. No.:	12/581,575	Examiner: Dady Chery
Filed:	October 19, 2009	Art Unit: 2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Confirmation No.: 2875
Attorney Docket No:	13674-213 Client Ref. No. 0810596US	

INFORMATION DISCLOSURE STATEMENT

UNDER 37 CFR §1.97(i)

Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

In accordance with the duty of disclosure under 37 CFR §1.56 and §§1.97-1.98, and more particularly in accordance with 37 CFR §1.97(i), Applicant hereby cites the following reference(s):

BRINKS
HOFER
GILSON
&LIONE

OTHER ART – NON PATENT LITERATURE DOCUMENTS
Copy of Search Report issued in corresponding Chinese Patent Application No. 201110412187.2, mailed December 18, 2012, 21 pages

Applicant is enclosing Form PTO-1449 (one sheet), along with a copy of each listed reference for which a copy is required under 37 CFR §1.98(a)(2). Applicant respectfully requests that the citation(s) be placed into the file wrapper of the application.

By submitting this Statement, Applicant is attempting to fully comply with the duty of candor and good faith mandated by 37 CFR §1.56. As such, this Statement is not intended to constitute an admission that any of the enclosed references, or other information referred to therein, constitutes "prior art" or is otherwise "material to patentability," as that phrase is defined in 37 CFR §1.56(a).

The Applicant or Applicants have calculated no fee to be due in connection with the filing of this Information Disclosure Statement. However, the Director is authorized to charge any fee deficiency associated with the filing of this Information Disclosure Statement to a deposit account, as authorized in the Transmittal accompanying this Information Disclosure Statement.

Respectfully submitted,

August 12, 2013
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr.
(Reg. No. 32,305)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

93823 7590 05/23/2013
Huawei/BHGL
P.O. Box 10395
Chicago, IL 60610

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

Gustavo Siller, Jr.	(Depositor's name)
/Gustavo Siller, Jr./	(Signature)
August 14, 2013	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

TITLE OF INVENTION: METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$1780	$300	$0	$2080	08/23/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
CHERY, DADY	2461	370-331000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 Brinks Hofer
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: HUAWEI TECHNOLOGIES CO., LTD.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): SHENZHEN, CHINA

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)
☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 23-1925 (enclose an extra copy of this form).

PTOL-85 (Rev. 02/11)

5. **Change in Entity Status** (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
  NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
  NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status.
  NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature /Gustavo Siller, Jr./ Date August 14, 2013

Typed or printed name Gustavo Siller, Jr. Registration No. 32,305

Electronic Patent Application Fee Transmittal

Application Number:	12581575
Filing Date:	19-Oct-2009
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Filer:	Gustavo Siller Jr./Maria Calderon
Attorney Docket Number:	13674-213

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	1501	1	1780	1780
Publ. Fee- Early, Voluntary, or Normal	1504	1	300	300

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**2080**

Electronic Acknowledgement Receipt

EFS ID:	16589261
Application Number:	12581575
International Application Number:	
Confirmation Number:	2875
Title of Invention:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING
First Named Inventor/Applicant Name:	Wenfu Wu
Customer Number:	93823
Filer:	Gustavo Siller Jr./Maggie Pieczonka
Filer Authorized By:	Gustavo Siller Jr.
Attorney Docket Number:	13674-213
Receipt Date:	14-AUG-2013
Filing Date:	19-OCT-2009
Time Stamp:	15:30:06
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	$2080
RAM confirmation Number	2160
Deposit Account	231925
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		13674-213IssueFee.pdf	183196 890ebe0204e2ee555f85e929cdd337fff5468af5	yes	3

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Miscellaneous Incoming Letter	1	1
	Issue Fee Payment (PTO-85B)	2	3

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	32202 9c9eb777d0ef84268c205552cde7745a51174600	no	2

Warnings:

Information:

Total Files Size (in bytes):	215398

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

CERTIFICATE OF EFS FILING UNDER 37 CFR §1.8

I hereby certify that this correspondence is being electronically transmitted to the United States Patent and Trademark Office, Commissioner for Patents, via the EFS pursuant to 37 CFR §1.8 on the below date:

Date: August 14, 2013 Name: Gustavo Siller, Jr. Signature: /Gustavo Siller, Jr./

BRINKS HOFER GILSON &LIONE

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Appln. of:	Wenfu Wu		
Appln. No.:	12/581,575	Examiner:	Chery, Dady
Filed:	October 19, 2009	Art Unit:	2461
For:	METHOD, SYSTEM, AND APPARATUS FOR REGISTRATION PROCESSING	Conf. No.:	2875
Attorney Docket No.:	13674-213		
Client Ref. No.	0810596US		

TRANSMITTAL

Mail Stop Issue Fee
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

Attached is/are:

☒ [Transmittal] - Issue Fee Transmittal Form (PTOL-85).

Fee calculation:

☐ No additional fee is required.

☐ Small Entity.

☐ An extension fee in an amount of $_____ for a _____-month extension of time under 37 CFR § 1.136(a).

☐ A petition or processing fee in an amount of $_____ under 37 CFR § 1.17(_____).

☒ Issue Fee ($1780) and Publication Fee ($300).

						Small Entity			Not a Small Entity	
	Claims Remaining After Amendment		Highest No. Previously Paid For	Present Extra		Rate	Add'l Fee	OR	Rate	Add'l Fee
Total		Minus				x $26=			x $52=	
Indep.		Minus				x 110=			x $220=	
First Presentation of Multiple Dep. Claim						+$195=			+ $390=	
						Total	$		Total	$

Fee payment:

☒ Please charge Deposit Account No. 23-1925 in the amount of $2080.

☐ Payment by credit card in the amount of $_____ (Form PTO-2038 is attached).

☒ The Director is hereby authorized to charge payment of any additional filing fees required under 37 CFR § 1.16 and any patent application processing fees under 37 CFR § 1.17 associated with this paper (including any extension fee required to ensure that this paper is timely filed), or to credit any overpayment, to Deposit Account No. 23-1925.

Respectfully submitted,

August 14, 2013
Date

/Gustavo Siller, Jr./
Gustavo Siller, Jr. (Reg. No. 32,305)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

7590 08/15/2013

Huawei/BHGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER	
CHERY, DADY	
ART UNIT	PAPER NUMBER
2461	
MAIL DATE	DELIVERY MODE
08/15/2013	PAPER

NOTICE OF NON-COMPLIANT INFORMATION DISCLOSURE STATEMENT

An Information Disclosure Statement (IDS) filed 08-12-13 in the above-identified application fails to meet the requirements of 37 CFR 1.97(d) for the reason(s) specified below. Accordingly, the IDS will be placed in the file, but the information referred to therein has not been considered.

The IDS is not compliant with 37 CFR 1.97(d) because:

☒ The IDS lacks a statement as specified in 37 CFR 1.97(e).

☐ The IDS lacks the fee set forth in 37 CFR 1.17(p).

☐ The IDS was filed after the issue fee was paid. Applicant may wish to consider filing a petition to withdraw the application from issue under 37 CFR 1.313(c) to have the IDS considered. See MPEP 1308.

Almy Gedeon for

571-272-4200 or 1-888-786-0101
Application Assistance Unit
Office of Data Management

FORM PTOM327-B (Rev. 02/08)

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	10/19/2009	Wenfu Wu	13674-213	2875

93823 7590 08/21/2013

Huawei/BHGL
P.O. Box 10395
Chicago, IL 60610

EXAMINER	
CHERY, DADY	
ART UNIT	PAPER NUMBER
2461	
MAIL DATE	DELIVERY MODE
08/21/2013	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of Allowability	Application No. 12/581,575	Applicant(s) WU, WENFU	
	Examiner DADY CHERY	Art Unit 2461	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *04/18/2013*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *7,9,10,16,19,20, and 26-33 renumbered as 1-14*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☒ All b) ☐ Some *c) ☐ None of the:
   1. ☒ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

   Interim copies:

   a) ☐ All b) ☐ Some c) ☐ None of the: Interim copies of the priority documents have been received.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☐ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/Dady Chery/
Examiner, Art Unit 2461

FORM PTO-1449	SERIAL NO. 12/581,575	CASE NO. 13674-213 Client Ref. No. 0810596US
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT	FILING DATE 10/19/2009	GROUP ART UNIT 2461
(use several sheets if necessary) APPLICANT(S): Wenfu Wu		CONFIRMATION NO. 2875

REFERENCE DESIGNATION **U.S. PATENT DOCUMENTS**

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	NAME	CLASS/ SUBCLASS	FILING DATE
	L1	20070019643 A1	01/25/2007	Shaheen		
	L2	20070281699 A1	12/06/2007	Rasanen		
	L3					
	L4					
	L5					
	L6					
	L7					
	L8					
	L9					
	L10					
	L11					
	L12					
	L13					

FOREIGN PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER Number-Kind Code (if known)	DATE	COUNTRY	CLASS/ SUBCLASS	TRANSLATION YES OR NO
	L14					
	L15					
	L16					
	L17					
	L18					

EXAMINER INITIAL	OTHER ART – NON PATENT LITERATURE DOCUMENTS (Include name of author, title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
	L19	Copy of Office Action issued in corresponding U.S. Patent Application No. 13/197,537, mailed June 27, 2013, 18 pages
	L20	Copy of Office Action issued in corresponding Chinese Patent Application No. 201110221263.1, mailed June 26, 2013, 5 pages
	L21	
	L22	
	L23	
	L24	

EXAMINER	/Dady Chery/	DATE CONSIDERED	08/17/2013

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /D.C./

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/581,575	09/17/2013	8537779	13674-213	2875

93823 7590 08/28/2013

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ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

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