Table of Contents

Chapter 1 Product Overview

The HP A6600 routers are a new-generation high-performance routers developed to meet different service requirements.

The HP A6602 router (hereinafter referred to as the A6602) is a high-performance service gateway router developed for enterprise networks. The A6602 uses an advanced high-performance multi-core microprocessor as the data forwarding and service processing engine and also has a built-in 10 Gbps wire-speed hardware encryption engine. The A6602 adopts an industry-leading hardware architecture and runs on Comware V5 platform. Abundant optional modules are available so that the A6602 can have a higher processing capability and can support more flexible configuration to fully meet the requirements of enterprise networks.

The A6602 can serve as not only a gateway connecting an enterprise network to a WAN/MAN, but also a service gateway (for example, VPN gateway, NAT gateway, or IPSec gateway) in an enterprise network. In addition, the A6602 can work together with other HP network devices to provide full network solutions for governments and departments in electric power, finance, tax, public security, railway, and education, as well as medium- and large-sized enterprises. The full compliance with the active national and international standards ensures the interoperability with products of other manufacturers at different layers.

The A6602 supports high-speed interface modules (HIMs) and provides a bus processing capability of up to 10 Gbps, which can meet the high-speed performance requirements of users. In addition, the A6602 is compatible with some multi-functional interface modules (MIMs) of the HP A-MSR series routers to guarantee the smooth upgrade from narrowband access to broadband access, protecting your investment.

Chapter 2 Product Characteristics

Developed by HP, the A6602 is a new-generation multi-core router providing high performance services and high density accessing capacity for enterprise networks.

- The A6602 supports aggregation access to WANs at a rate of DS0 (64Kbps) to OC3/STM-1 (155Mbps) as well as access to Ethernets at a rate of 10/100/1000/10000Mbps.
- Providing a data encryption processing capacity up to 3Gbps and high-capacity GRE/L2TP channelized interfaces, the A6602 can serve as the VPN gateway device of enterprise networks.
- Providing large NAT processing capacity (supporting million-level connections), the A6602 can also serve as the NAT gateway device of enterprise networks
- By inheriting powerful routing and MPLS capabilities of HP routers, the A6602 can act as the PE device of MPLS networks; furthermore, the A6602 supports IPv4/IPv6 dual protocol stack, transition technologies, and IPv6-related protocols, therefore can work in IPv6 application scenarios.

Industry's First Multi-Core High-End Router

As the first high-end router that employs the multi-core multi-thread processor, the A6600 features in high-performance, easy programmability, and flexible adaptation to L4-L7 services. The multi-core multi-thread CPU endows the A6600 with high-performance and high flexibility. Moreover, due to the CPU's easy

programmability and operation, the A6600 is able to quickly respond and adapt to new services, thus meeting the requirements of managing application-layer services on routers. In the system architecture design phase, the A6600 attaches importance to hardware speedup for link layer and security services so that the multi-core CPU can use its precious resources for processing core L4-L7 services.

Powerful Routing Capacity

The A6602 supports IPv4/Ipv6 static routing and dynamic routing protocols, such as RIP/RIPng, OSPF/OSPFv3, IS-IS/IS-ISv6, and BGP/BGP4+.

With standard configuration, the A6602 have a large routing table capacity and a large forwarding table capacity. In addition, the A6602 support diversified policy-based functions and route policies, allowing for flexible control and scheduling of network traffic, thus meeting different routing requirements of enterprise networks and carrier networks.

Dynamic Virtual Private Network

DVPN (Dynamic Virtual Private Network) collects, maintains, and distributes dynamic public addresses through the VPN Address Management (VAM) protocol, making VPN establishment available among enterprise's headquarters and branches that use dynamic addresses to access the public network. Compared to traditional VPN technologies, DVPN technology has more flexible and richer features, such as NAT traversal of DVPN packets, AAA identity authentication, IPSec protection of data packets, multiple VPN domains etc.

Powerful MPLS

The A6602 support MPLS, including L2 VPN, L3 VPN services, and MPLS TE. In addition, the A6602 can work together with other HP network devices to form a powerful MPLS network, providing a high-performance, secure and hierarchical MPLS VPN solution.

Industry-Leading Encryption

The A6602 has a built-in hardware encryption engine to provide a data encryption processing capacity greater than 3 Gbps, ensuring data security in WANs and intranets. Therefore, the A6602 is typically suitable for serving as an enterprise egress gateway and aggregation gateway.

PPP Multi-link Bundling

The A6602 provides two types of high-speed CPOS interfaces (CL2P and CL1P) to allow for hardware MP. When the A6602 serves as an aggregation node of a WAN, you can implement PPP multi-link bundling on the downlink E1 or T1 through CPOS interfaces. You can also implement reassembly and fragmentation of MP packets without affecting traffic forwarding. The system can implement 10 groups of 12E1 MP bundling and 14 groups of 12T1s MP bundling at wire-speed, thus providing sufficient bandwidth for narrowband aggregation networks.

Abundant Interface Types

The A6602 provides 100/1000 Mbps and 10Gbps Ethernet interfaces and POS OC-48/OC-12/OC-3, CPOS OC-3 (channelized to E3/T3 or E1/T1), ATM OC-3, E3/T3, E1/T1, and serial interfaces. By providing diversified interface types, the A6602 can serve as both the distribution access of WANs and the access of LANs. This allows a flat network and simplifies the network, thus protecting your investment.

Diversified Features

The A6602 provides high-performance selective QoS solutions which are the technical basis of network services. In addition, the A6602 provides advanced queue scheduling, congestion avoidance, congestion management, traffic policing, traffic shaping, and priority mark/remark, ensuring the bandwidth, delay, jitter, and packet loss rate of different services, thus providing distinguished services by user and service level.

The A6602 supports service features such as high-performance NAT, L2TP, GRE, and security features such as Firewall, ASPF, and URPF. It provides the NetStream traffic statistics function to collect statistics for different streams, allowing you to learn the network traffic and perform network planning, security supervision, and traffic accounting.

IPv6

The Internet is operating based on IPv4. With rapid development of the Internet however, the number of IPv4-defined IP addresses are running out, which hampers the further development of IP technology and networks. As the basis of next-generation networks, IPv6 has the following advantages over IPv4:

- Flexible packet format
- Greater number of IP addresses
- Effective hierarchical addressing and routing system

- Stateful and stateless address configuration
- Built-in security
- QoS
- Powerful protocol mechanism for neighbor discovery (ND)
- Scalability
- Mobility available (3GPP has decided to use IPv6 to build the next-generation IPv6 core networks)

The A6602 supports the following IPv6 features:

- IPv6 address
- Link-local unicast address
- Site-local unicast address
- Global unicast address
- Multicast address
- IPv6 Neighbor Discovery (ND)
- ND host
- ND router
- IPv6 Path MTU
- IPv6 ACL
- IPv6 routing protocols
- Transition from IPv4 to IPv6
- Message translation
- IPv6-IPv4 tunnel
- NAT-PT
- IPv6 multicast
- 6PE
- 6VPE

High-density Narrowband Aggregation Access

The A6602 can provide high-density narrowband aggregation access. For example, A6602 can support 4*OC-3/STM-1 channelized POS interfaces, and each port can channelize to E1/T1 or DS0 interfaces. The system can accommodate up to 2K physical interfaces and more than 189 E1s at wire-speed, providing industry-leading narrowband accessing density and performance.

Large-capacity Broadband User Access

The A6602 supports PPPoE Server, allowing the access of up to 18,000 PPPoE broadband users with standard configuration.

Excellent Scalability

The A6602 has excellent scalability and provides two HIM/MIM slots, in which you can insert an HIM and an MIM, or two HIMs, or two MIMs.

As for file system, the A6602 provides abundant storage media, supporting external CF card, USB interfaces. In addition to meeting your increasing storage requirements, the A6602 provides flexible storage methods to allow for file management through different interfaces.

Perfect Security Mechanism

The A6602 supports hierarchical user management and password protection, packet filter, unicast reverse path forwarding (URPF), attack prevention, and control panel restrictions, authenticating logon users and assigning access rights by user level. User authentication methods include local authentication, RADIUS authentication, and TACACS authentication to ensure security of devices in networks. In particular, the A6602 has built-in firewall, which provides abundant security features, such as ASPF, attack detection and protection, packet filtering etc. Built-in firewall function can be applied on different WAN interfaces, such as Ethernet, POS, ATM etc.

High Reliability

The A6602 provides high reliability.

As for hardware, the A6602 supports AC and RPS power supplies, ensuring normal operation of the device in case of a power failure. In addition, all the interfaces of the A6602 are hot-swappable, ensuring swapping or replacing an individual interface with no services interrupted.

The A6602 ensures reliability in both hardware and software, supporting the following features:

- Virtual router redundancy protocol (VRRP)
- MPLS TE FRR
- IGP fast routing convergence
- Bidirectional forwarding detection (BFD)
- Hot patching for software
- OSPF/IS-IS/BGP/MPLS LDP/MPLS RSVP-TE GR (Graceful Restart)
- OSPF/IS-IS IP FRR
- IS-IS NSR
- LDP NSR

Environmental Protection Throughout the Product Lifecycle

The A6600 routers adhere to HP green design requirements and implement green design throughout the product Lifecycle.

- The routers are designed to reduce the burden to the environment throughout the lifecycle, including design, purchase, manufacture, logistics, sale, use, and recycle.

- During design, we reduce use of poisonous and hazardous substances and raw materials, increase product energy efficiency, prolong the product life span, and reduce generation of wastes, thus making continuous contribution to environmental protection.

All the A6600 routers use green components, and multiple technologies are used to ensure recycling.

- According to the standards such as RoHS, HP has established its own environmental protection standards and supply system. The A6600 routers take advantage of the system to ensure all the devices comply with those standards.

- According to WEEE directive requirements, the A6600 routers use multiple technologies to ensure recycling, including: choose suitable, recyclable materials, minimize using materials, avoid poisonous and hazardous raw materials, use single material instead of different mixed materials, mark each material type and its life span for later classification and recycling.

Energy-saving Technology in a Full Scale

The A6600 routers use compact design to reduce resource consumption, providing benefits by:

- Providing powerful functions while reducing space occupation. A single rack can accommodate multiple A6600 devices .

- Using methods such as texturing instead of electroplating, printing or bronzing to reduce energy cost.

- Adopting energy-saving design to effectively reduce energy consumption and device operating costs, and high-efficiency primary power to ensure a power transform efficiency of more than 85% during normal operation.

- Adopting an intelligent heat dissipation solution. The device frame adopts advanced dissipation design and fans adopt multiple-level, automatic speed control technology. The fans operating at low speeds consume only 25% of the designed power.

- Using the chips of industry-leading manufacturers, which feature advanced craft, high integration, and low power consumption. Based on the low power consumption feature of chips, intelligent management software was developed to greatly reduce whole power

consumption and improve system performance.

Chapter 3 Architecture

3.1 Physical Description

I. Front view

Figure 3-1 Front view of the A6602

II. Rear view

Figure 3-2 Rear view of the A6602

- Using an integrated chassis, the A6602 is of a compact design and provides centralized processing;
- The width of the A6602 is suitable for a standard 19-inch rack and its height is 1UL, thus increasing the interface density;
- In the front of the router are operation and management interfaces for ease of daily maintenance and management, while service interfaces are located on the rear panel to connect cables;
- On the left of the front panel is the power module, supplying AC and RPS power input;
- On the right of the front panel are the console port, AUX port, CF card, USB interface, LEDs, and RESET button;
- On the left of the rear panel are four fixed GE combo interfaces;

- There are two interface module slots on the rear panel of the router to provide two HIMs/MIMs;
- Interfaces hot-swappable;
- The fans of the A6602 draw air in through the inlet vents on the left and out through the exhaust vents on the right.

3.2 Technical Specifications

Table 3-1 Processor and storages of the A6602

Item	Specification
Processor	Multi-core MIPS CPU 1 GHz
Flash	4 MB
Memory type and size	DDR2 PC2-4300 2 GB (default), 4GB (maximum; with two 2GB memory modules)
Console port	1 (9600 bps to 115200 bps)
AUX port	1 (9600 bps to 115200 bps)
USB interface	2 (USB 0: operating in the host mode; USB 1: operating in the device mode)
Compact flash (CF) card	• 256 MB by default for the built-in CF card • Maximum 1 GB for an optional external CF card
Interface module slots	2 (Two HIMs or two MIMs can be inserted at the same time.)
Interface type	10/100/1000BASE-T RJ45 10/100BASE-T RJ45 1000BASE-X-SFP 10000BASE-XFP E1/CE1 SAE (synchronous) OC3-CPOS OC3-POS OC12-POS OC48-POS OC3-ATM OC-48-RPR
Dimensions without feet and rack-mounting ears (H x W x D)	44 x 442 x 460 mm (1.73 x 17.40 x 18.11 in.)
Weight	7.5 kg (16.53 lb)
Rated voltage range	100 VAC to 240 VAC; 50 Hz or 60 Hz

Item	Specification
Max. power consumption	150 W
Operating temperature	0°C to 45°C (32°F to 113°F)
Operating humidity	0% to 95%, noncondensing
Operating altitude	– 60 m to 3 km (–196.85 ft. to +1.87 mi.)

 Note:

- The Flash is used for storing the boot file—the BootWare program.
- The memory module is used for storing the data exchanged between the system and the CPU.
- Independent of Flash, the system files and configuration files are stored in the CF card.
- The CF card is hot-swappable. When the router is performing a file read or write operation on the CF card (the CF card LED is flashing), do not eject the CF card. Otherwise, the file system on the CF card will be damaged.

3.3 Management/Service Interface

3.3.1 Introduction to Management Interface

I. Management interface

(1): AUX port
(2): Console port
(3): USB0: Host
(4): USB1: USB LED
(5): Operating status LEDs
(6): RESET button
(7): CF card slot and CF LED
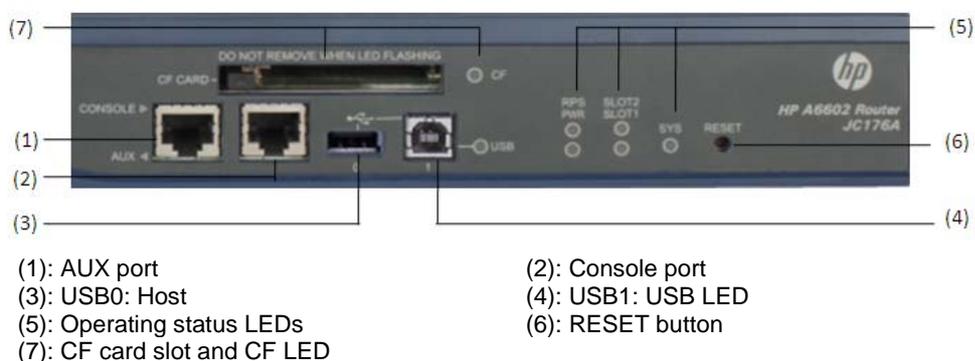
Figure 3-3 Front panel of the A6602

II. Console port

The Console port uses an RJ-45 connector through which you can connect to a background terminal PC for system debugging, configuration, maintenance, management, and software loading.

Table 3-2 Technical specifications for the console port

Item	Specification
Connector type	RJ-45
Compliant standard	Asynchronous EIA/TIA-232
Baud rate	9600 bps to 115200 bps, 9600 bps (default)
Transmission distance	≤ 15 m (49.2 ft.)
Services	Connection to the serial interface of a local PC to run the terminal emulation program

III. AUX port

The AUX port uses an RJ-45 connector through which (serving as the backup interface of the Console port) you can connect to a background terminal or a Modem for remote system debugging, configuration, maintenance, and management. You can also connect the AUX port to a background terminal PC.

Table 3-3 Technical specifications for the AUX port

Item	Specification
Connector type	RJ-45
Compliant standard	Asynchronous EIA/TIA-232
Baud rate	9600 bps to 115200 bps, 9600 bps (default)
Services	Used to connect the serial port of a remote PC through a pair of modems to establish a dial-up connection with the PC

IV. USB

Universal Serial Bus (USB) supports multiple-device connection at a transmission rate faster than parallel ports and serial ports. USB is hot-swappable, plug-and-play. USB is of two versions: USB 1.1 and USB 2.0.

Currently, the A6602 supports USB 1.1. The USB interfaces provide key storage, providing large external flash storage spaces for applications and configuration files.

You can connect the USB interfaces to an external flash disk (USB disk), which allows you to backup and recovers your files with ease.

1)   USB0: Host

Figure 3-4 USB interfaces of the A6602

Interface USB0 provided by the A6602 is a USB 1.1-compliant A interface, through which you can connect the host to other external USB devices. You can also connect an external USB disk through interface USB0 to expand your storage capacity for file exchange, file storage, and log recording.

2)   USB1: Device

Interface USB1 provided by the A6602 is a USB 1.1-compliant B interface, through which you can connect a device or PC host to operate on the CF card of the device.

The following table describes USB interface 1 LED:

Table 3-4 Description of USB interface 1 LED

LED	Status	Description
USB1(green)	OFF	No host is connected to the USB interface.
	Solid green	A host is connected to the USB interface. You can remove the USB cable in this state.
	Flashing green	Data is being received or transmitted. Do not remove the USB cable in this state.

 Note:

● To ensure compatibility and reliability, you are recommended to use USB disks provided by HP only.
● To avoid damages to the file system, do not remove the USB disk from the A6602 while the LED on the USB disk is flashing.

V. Operating status LEDs

Figure 3-5 Operating status LEDs of the A6602

There are five operating status LEDs on the A6602: RPS, PWR, SLOT1, SLOT2, and SYS to indicate running statuses of the current devices (modules).

The following table describes the operating status LEDs:

Table 3-5 Description of operating status LEDs

LED	Status	Meaning
PWR (green)	OFF	The power module does not supply power to the system.
	ON	The power module supplies power to the system normally.
RPS (yellow/green)	OFF	There is no RPS DC power output.
	Solid green	Both AC power input and RPS DC output are normal.
	Solid yellow	AC power input is abnormal, and RPS DC output is normal.
SLOT1 (green)	OFF	No interface module is in slot 1 or the interface module is faulty.
	ON	An interface module is in slot 1 and operates normally.
SLOT2 (green)	OFF	No interface module is in slot 2 or the interface module is faulty.
	ON	An interface module is in slot 2 and operates normally.
SYS (green)	OFF	The system is powered off or the board is faulty.
	Flashing fast (1 Hz)	The board operates normally as configured.
	Flashing slowly (1 Hz)	Software is being loaded or the board does not start working yet.

VI. RESET button

To reset the router, you can press the RESET button. The SYS LED goes off when the router is reset, flashes fast (at 8 Hz) when it is booting, and flashes slowly (at 1 Hz) when it operates normally.

 Note:

- If you perform no save operation before resetting the router, the current system configuration will not be saved after the router is reset.
- Never press the RESET button when the router is booting (when the SYS LED is flashing fast). Otherwise, the file system of the router may be damaged.

VII. CF card slot and CF LED

Figure 3-6 CF card slot and CF LED of the A6602

A compact flash (CF) card is used for storing logs, host files, and configuration files.

The A6602 is equipped with a built-in 256 MB CF card, which is identified with **cfa0**. In addition, the A6602 provides an external CF card slot to expand the local storage space. By adopting an external CF card design, the A6602 allows you to upgrade and replace your CF card with ease.

To meet abundant service requirements, HP provides different sizes of CF cards to protect your investment and allow for service scalability.

The following table describes the CF card LED:

Table 3-6 Description of CF card LED

LED	Status	Meaning
CF (green)	OFF	No CF card is in position or the CF card cannot be identified.
	Solid green	A CF card is in position and the host has detected the CF card. You can remove the card in this state.
	Flashing green	The system is accessing the CF card. Do not remove the card in this state.

 Note:

- The A6602 only supports the CF cards provided by HP and may not be compatible with those provided by other manufacturers.
- The CF card is hot-swappable. When the router is performing a file read or write operation on the CF card (the CF card LED is flashing), do not eject the CF card. Otherwise, the file system on the CF card will be damaged.

3.3.2 Service Interfaces

I. Fixed interfaces
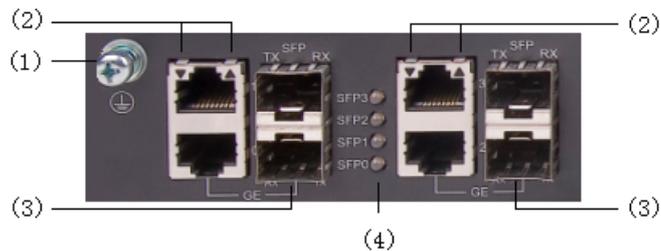
(1): Grounding screw and grounding sign   (2): Ethernet electrical interface
(3): Ethernet optical interface (SFP)   (4): Ethernet optical interface LEDs

Figure 3-7 Rear panel LEDs of the A6602

The A6602 provides four fixed GE combo interfaces. Each combo interface consists of an Ethernet electrical interface and an Ethernet optical interface, supporting MDI/MDI-X autosensing. The 10/100/1000 Mbps Ethernet electrical interfaces of the A6602 support half duplex/full duplex. The Ethernet electrical interface LEDs are above the RJ-45 ports. The LEDs in triangle and inverted triangle indicate the status of the lower and upper Ethernet electrical interfaces, respectively. Each Ethernet optical interface supports a rate of 1000 Mbps in full-duplex mode. The Ethernet optical interface LEDs are in the middle of the four GE combo interfaces and use separate LEDs to indicate the status of the corresponding SFP interfaces.

The following table describes the rear panel LEDs of the fixed GE interfaces:

Table 3-7 Description of rear panel LEDs

LED	Status	Meaning
GE0 to GE3 (yellow/green)	OFF	No link is present.
	Solid green	A 1000 Mbps link is present.
	Flashing green	Data is being received or transmitted at a rate of 1000 Mbps.
	Solid yellow	A 10/100 Mbps link is present.
	Flashing yellow	Data is being received or transmitted at a rate of 10/100 Mbps.
SFP0 to SFP3 (yellow/green)	OFF	No link is present.
	Solid green	A 1000 Mbps link is present.
	Flashing green	Data is being received or transmitted at a rate of 1000 Mbps.
	Solid yellow	The system fails to detect the SFP port.

Table 3-8 Technical specifications for Ethernet electrical interfaces

Item	Meaning	
Connector type	RJ-45	
Interface type	Autosensing	
Frame format	Ethernet_II Ethernet_SNAP	
Rate and duplex	10 Mbps	Half/full-duplex auto-negotiation
	100 Mbps	Half/full-duplex auto-negotiation
	1000 Mbps	Full-duplex

Table 3-9 Technical specifications for Ethernet optical interfaces

Item		Meaning				
Connector		SFP/LC				
Compliant standard		802.3, 802.3u, and 802.3ab				
Optical transmit power	Type	Short-haul multimode optical module (850 nm)	Medium-haul single-mode optical module (1310 nm)	Long-haul optical module (1310 nm)	Long-haul optical module (1550 nm)	Ultra-long haul optical module
	Min	-9.5 dBm	-9 dBm	-2 dBm	-4 dBm	-4 dBm
	Max	0 dBm	-3 dBm	5 dBm	1 dBm	2 dBm
Receiving sensitivity		-17 dBm	-20 dBm	-23 dBm	-21 dBm	-22 dBm
Central wavelength		850 nm	1310 nm	1310 nm	1550 nm	1550 nm
Fiber type		62.5/125 µm multimode fiber	9/125 µm single-mode fiber	9/125 µm single-mode fiber	9/125 µm single-mode fiber	9/125 µm single-mode fiber
Maximum transmission distance		0.55 km (0.34 mi.)	10 km (6.2 mi.)	40 km (24.9 mi.)	40 km (24.9 mi.)	70 km (43.5 mi.)
Duplex		1000 Mbps in full-duplex				

Note:

- For a GE combo interface, the default operating interface is the Ethernet electrical interface. You can switch between the Ethernet optical interface and the Ethernet electrical interface by using the **combo enable** command in interface view.
- A rate of 1000 Mbps is not available in half duplex mode.

II. Interface slots
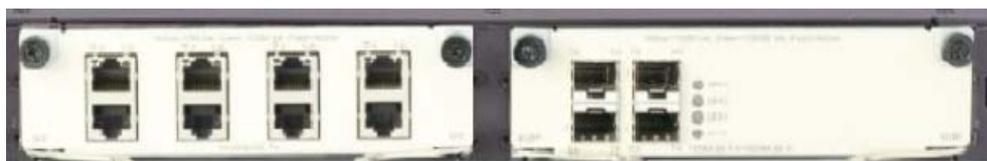
**Figure 3-8** Rear panel of interface slots

The A6602 provides two HIM/MIM slots, in which you can insert a HIM and a MIM, or two HIMs, or two MIMs. From left to right, they are slot 1 and slot 2.

3.4 Interface Modules

3.4.1 10 GE

I. JC168A (RT-HIM-1EXP)

Figure 3-9 JC168A (RT-HIM-1EXP)
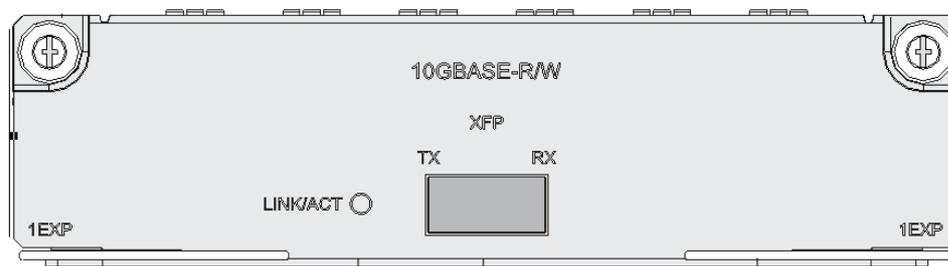
II. Introduction

JC168A (RT-HIM-1EXP) is a 1-port 10 GE optical transceiver. A JC168A (RT-HIM-1EXP) module provides one 10 Gigabit Small Form-Factor Pluggable (XFP) interface and supports switchover between LAN/WAN PHY modes. An LED is provided on the front panel and indicates the operation state.

Table 3-10 Description of the LED on the front panel of JC168A (RT-HIM-1EXP)

Status	Meaning
Off	No link is present.
Solid green	A link is present, but no data is being received or transmitted.
Flashing green	The XFP interface is receiving or sending data.

III. Interface specifications

Table 3-11 Interface specifications of JC168A (RT-HIM-1EXP)

Item	Specification
Protocol	802.3ae
Connector type	XFP/LC
Number of interfaces	1
Supported frame format	10GBASE-R/W
Interface speed	LAN PHY mode: 10.3125 Gbps
	WAN PHY mode: 9.95328 Gbps

3.4.2 FE and GE

I. JC164A (RT-HIM-8GBE)
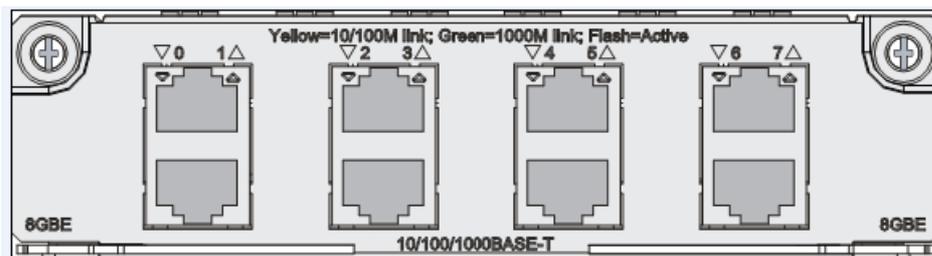
Figure 3-10 JC164A (RT-HIM-8GBE)

JC164A (RT-HIM-8GBE) is a high-speed Layer 3 Gigabit Ethernet interface module developed by HP for the A6600 routers. A JC164A (RT-HIM-8GBE) module provides eight RJ-45 electrical interfaces that support half/full-duplex auto-negotiation at the rate of 10/100/1000 Mbps and the Layer 3 routing function. Each interface is provided with a dual-color LED indicating the running status of the interface. JC164A (RT-HIM-8GBE) is connected to the processor through a 10-Gbps high-speed bus and can provide all the high-performance Layer 3 Ethernet interface functionalities.

Table 3-12 Description of the LEDs on the front panel of JC164A (RT-HIM-8GBE)

Status	Meaning
OFF	No link is present.
Solid green	A 1000 Mbps link is present.
Flashing green	Data is being received or transmitted at a rate of 1000 Mbps.
Solid yellow	A 10/100 Mbps link is present.
Flashing yellow	Data is being received or transmitted at a rate of 10/100 Mbps.

## II. JC163A (RT-HIM-4GBE)
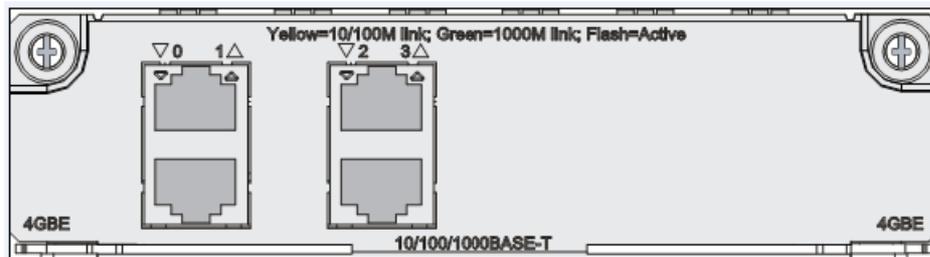
Figure 3-11 JC163A (RT-HIM-4GBE)

JC163A (RT-HIM-4GBE) is similar to JC164A (RT-HIM-8GBE) in function, except that it provides four RJ-45 electrical interfaces.

III. JC171A (RT-HIM-4GBP)
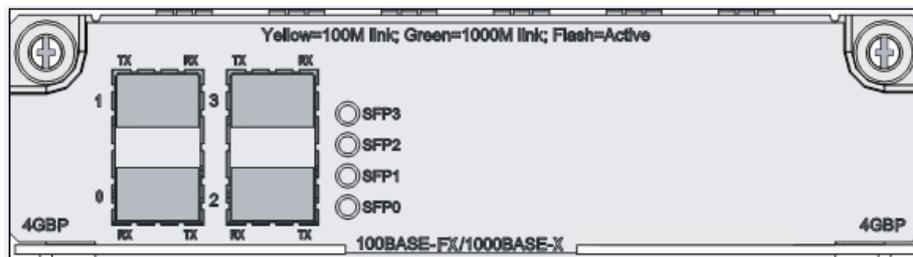
Figure 3-12 JC171A (RT-HIM-4GBP)

JC171A (RT-HIM-4GBP) is similar to JC163A (RT-HIM-4GBE) in function, except that it provides four SFP optical interfaces by accommodating 100/1000 Mbps SFP optical interface modules and 10/100/1000 Mbps autosensing SFP-T electrical interface modules.

IV. JC174A (RT-HIM-8GBP)
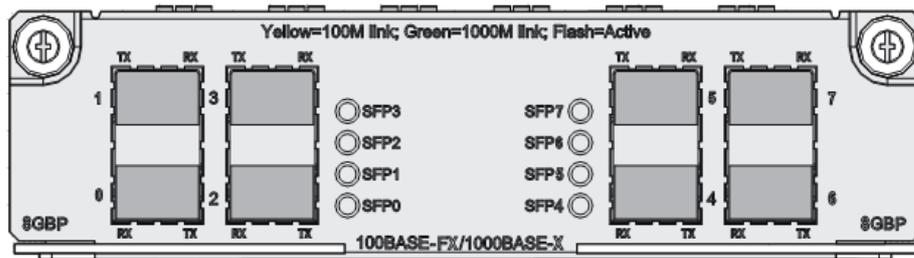
Figure 3-13 JC174A (RT-HIM-8GBP)

JC174A (RT-HIM-8GBP) is similar to JC164A (RT-HIM-8GBE) in function, except that it provides eight SFP optical interfaces by accommodating 100/1000 Mbps SFP optical interface modules and 10/100/1000 Mbps autosensing SFP-T electrical interface modules.

V. Specifications

Table 3-13 Gigabit Ethernet interface specifications

| Item	Specification
Protocol	802.3, 802.3u, 802.3ab
Interface type	Electrical interface: RJ-45 Optical interface: SFP
Cable	MDI/MDI-X autosensing
Interface speed	10 Mbps 100 Mbps 1000 Mbps
Transmission distance	100 m (328 ft.) over category 5 twisted pairs
Duplex mode	Half/full-duplex (10/100 Mbps) auto-negotiation

I. JC575A (RT-HIM-8FE)
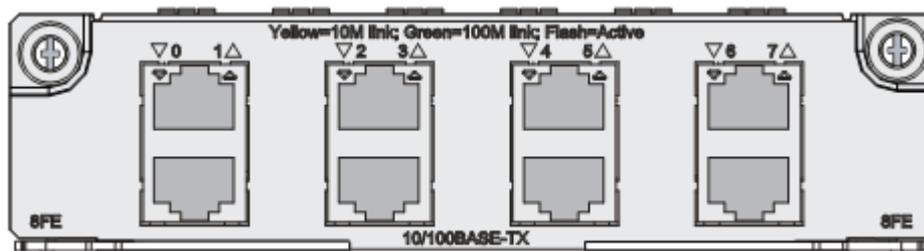
Figure 3-14 JC575A (RT-HIM-8FE)

JC575A (RT-HIM-8FE) is a Layer 3 100M Ethernet interface module developed by HP for the A6600 routers. A JC575A (RT-HIM-8FE) module provides eight RJ-45 electrical interfaces that support half/full-duplex auto-negotiation at the rate of 10/100Mbps and the Layer 3 routing function. Each interface is provided with a dual-color LED indicating the running status of the interface.

II. Specifications

Table 3-14 100M Ethernet interface specifications

Item	Specification
Protocol	802.3, 802.3u
Interface type	Electrical interface: RJ-45
Cable	MDI/MDI-X autosensing
Interface speed	10 Mbps 100 Mbps
Transmission distance	100 m (328 ft.) over category 5 twisted pairs
Duplex mode	Half/full-duplex (10/100 Mbps) auto-negotiation

3.4.3 OC-3/STM-1 CPOS (Channelized to E1/T1/DS0)

I. JC162A (RT-HIM-CL2P)
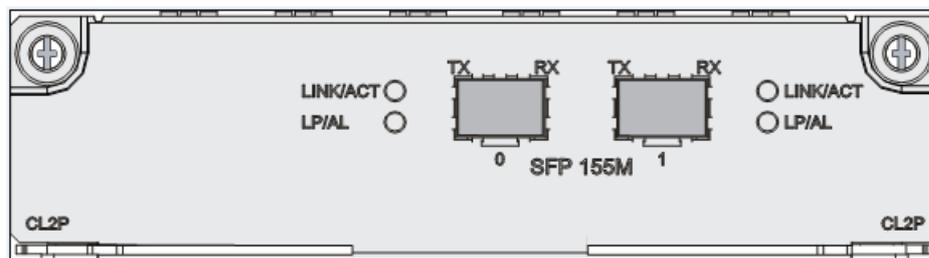
Figure 3-15 JC162A (RT-HIM-CL2P)

JC162A (RT-HIM-CL2P) is a high-speed OC-3/STM-1(155 Mbps) channelized packet over SONET/SDH (CPOS) interface module developed for A6600 routers by HP. A JC162A (RT-HIM-CL2P) provides two small form-factor pluggable (SFP) interfaces and each interface is provided with two LEDs, which indicate the running status and fault status, respectively.

A JC162A (RT-HIM-CL2P) has the following characteristics:

- JC162A (RT-HIM-CL2P) is connected to the processor through a 10-Gbps high-speed bus. Each CPOS interface can be channelized into 63 E1s or 84 T1s, and it can be channelized into 512 DS0s.
- JC162A (RT-HIM-CL2P) can receive multiplexed E1/T1 circuits on a pair of fibers through a channelized interface, largely saving the link resource, the occupied area, and the cost of local networks and devices for telecommunication service providers and large enterprises.
- JC162A (RT-HIM-CL2P) supports IP and MPLS traffic and the Multi-link Point-to-Point Protocol (MP), and it supports a maximum of 126 channelized E1s or 168 channelized T1s, up to 12 E1s or T1s in each MP bundle.

Adopting hardware-based MP bundling, JC162A (RT-HIM-CL2P) solves the problem of low efficiency of MP bundling, and therefore improves the per-device access density.

II. JC161A (RT-HIM-CL1P)
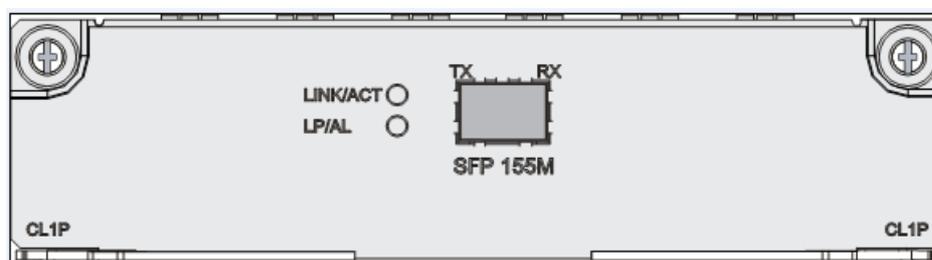
Figure 3-16 JC161A (RT-HIM-CL1P)

JC161A (RT-HIM-CL1P) is similar to JC162A (RT-HIM-CL2P) in function. JC161A (RT-HIM-CL1P) provides one SFP interface only.

Table 3-15 Description of the LEDs on the front panel of JC161A (RT-HIM-CL1P)/JC162A (RT-HIM-CL2P)

LED	Status	Meaning
LINK/ACT (green)	OFF	No link is present.
	ON	A 155.52 Mbps link is present.
	Flashing (8 Hz)	The SFP interface is receiving or sending data at a rate of 155.52 Mbps.
LP/AL (yellow)	OFF	No loopback or alarm.
	ON	The interface is in the loopback state.
	Flashing (8 Hz)	There is at least one alarm. Alarms are defined differently for different ports. For example, a reported alarm for a T1 port can be AIS, LFA or RAI.

III. SDH/SONET physical layer features and standards supported

- SONET/SDH frame optional
- Internal clock/line clock optional
- Switchover between E1 and T1
- Near-end (diagnosis) loopback and network (line) loopback
- Performance and error statistics monitoring
- Receiving/transmitting alarms, performance and error statistics monitoring
- a. LOS, LOF, OOF, LAIS, PAIS, LOP, LRDI, PRDI, SF, SD, LREI (line FEBE), PREI (channel FEBE), STIM, PTIM, and PLSM
- b. B1, B2, B3, M1, and G1 error statistics

📝 **Note**

- JC162A (RT-HIM-CL2P)/JC161A (RT-HIM-CL1P) does not support cascading, non-channelized SDH or SONET.
- JC162A (RT-HIM-CL2P)/JC161A (RT-HIM-CL1P) does not support channelizing OC-3/STM-1 into DS3s or E3s.

3.4.4 OC-3/STM-1 CPOS (Channelized to E3/T3)

I. JC169A (RT-HIM-CLS2P)
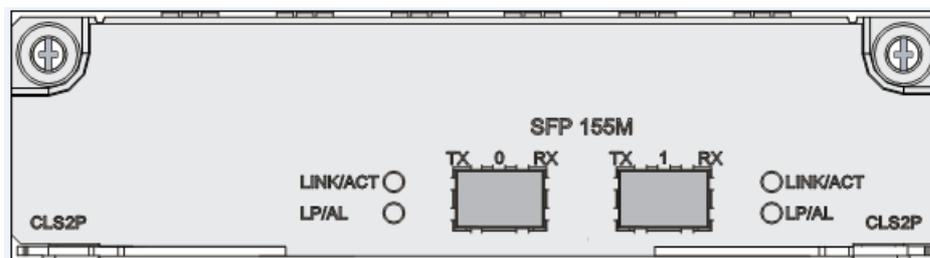
Figure 3-17 JC169A (RT-HIM-CLS2P)

JC169A (RT-HIM-CLS2P) is a high-speed OC-3/STM-1 (155 Mbps) channelized POS E3/T3 interface module developed for A6600 routers by HP. A JC169A (RT-HIM-CLS2P) provides two SFP interfaces and each interface is provided with two LEDs, which indicate the running status and fault status respectively.

The JC169A (RT-HIM-CLS2P) has the following features:

- It is connected to the processor through a 10-Gbps high-speed bus. Each OC-3/STM-1 POS interface can be channelized into three E3 or three T3 channels.

Each E3/T3 channel supports the subrate processing capability, providing users with a variety of bandwidth options.

- A channelized interface can be used to connect multiplexed E3/T3 circuits over a pair of fibers, largely saving resources and investment costs, and reducing the occupied area for telecommunication service providers and large enterprises.
- It supports IP and MPLS traffic forwarding and the Multi-link Point-to-Point Protocol (MP).

Table 3-16 Description of the LEDs on the front panel of JC169A (RT-HIM-CLS2P)

LED	Status	Meaning
LINK/ACT (green)	OFF	No link is present.
	ON	A 155.52 Mbps link is present.
	Blinking	The SFP interface is receiving or sending data at a rate of 155.52 Mbps.
LP/AL (yellow)	OFF	No loopback or alarm exists.
	ON	The interface is in the loopback state.
	Blinking	There is at least one alarm.

II. JC170A (RT-HIM-CLS1P)
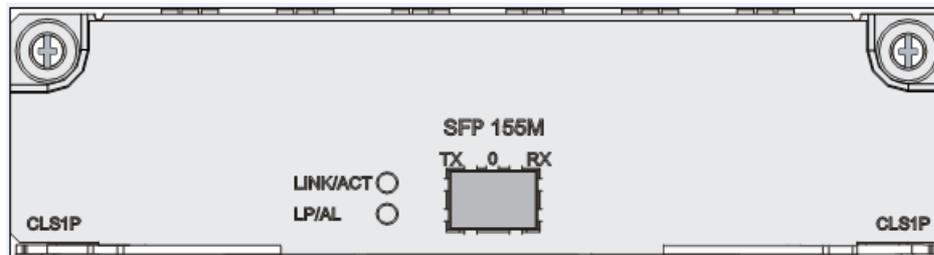
Figure 3-18 JC170A (RT-HIM-CLS1P)

JC170A (RT-HIM-CLS1P) is similar to JC169A (RT-HIM-CLS2P) in function, except that it provides one SFP interface.

III. SDH/SONET physical layer features and standards supported

- SONET/SDH frame optional
- Internal clock/line clock optional
- Switchover between E3 and T3
- Near-end (diagnosis) loopback and network (line) loopback
- Performance and error statistics monitoring
- Receiving/transmitting alarms, performance and error statistics monitoring

- a. LOS, LOF, OOF, LAIS, PAIS, LOP, LRDI, PRDI, SF, SD, LREI (line FEBE),
  PREI (channel FEBE), STIM, PTIM, and PLSM
- b. B1, B2, B3, M1, and G1 error statistics

 Note:

- JC169A (RT-HIM-CLS2P)/JC170A (RT-HIM-CLS1P) does not support channelizing
  OC-3/STM-1 into T1s or E1s.

3.4.5 OC-3/STM-1 POS

I. JC172A (RT-HIM-MSP4P)
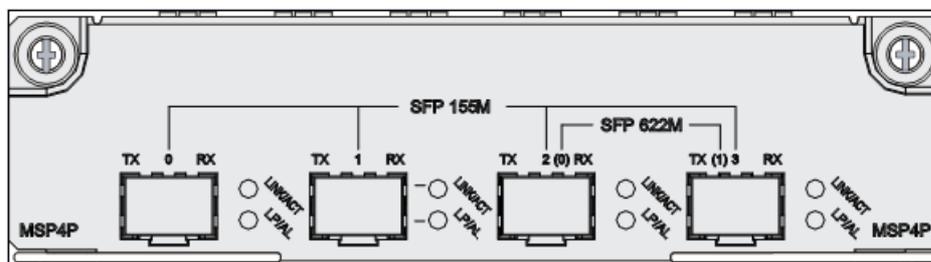
Figure 3-19 JC172A (RT-HIM-MSP4P)

JC172A (RT-HIM-MSP4P) is a high-speed OC-3/STM-1 (155 Mbps) and OC-12/STM-4 (622 Mbps) non-channelized POS module developed for A6600 routers by HP. The JC172A (RT-HIM-MSP4P) module supports PPP, Frame Relay, and HDLC at the data link layer and IP at the network layer. It provides POS interfaces for direct transmission of data packets over SONET/SDH.

The JC172A (RT-HIM-MSP4P) module has the following features:

- A POS interface can be configured through the command line interface to work in OC-3/STM-1 POS or OC-12/STM-4 POS mode.
- The module supports the following types of hot-swappable SFP optical transceivers: multi-mode short haul (1310 nm) optical transceivers, single-mode medium haul (1310 nm) optical transceivers, single-mode long haul (1310 nm) optical transceivers, and single-mode ultra-long haul (1550 nm) optical transceivers.

Table 3-17 Description of the LEDs of JC172A (RT-HIM-MSP4P)

LED	Status	Meaning
LINK/ACT	OFF	No link is present.

| LED	Status	Meaning
(green)	ON	A 155.52 Mbps/622.08 Mbps link is present.
	Blinking	The SFP interface is sending or receiving data at a rate of 155.52 Mbps/622.08 Mbps.
LP/AL (yellow)	OFF	No loopback or alarm exists.
	ON	The interface is in the loopback state.
	Blinking	There is at least one alarm.

II. JC173A (RT-HIM-MSP2P)
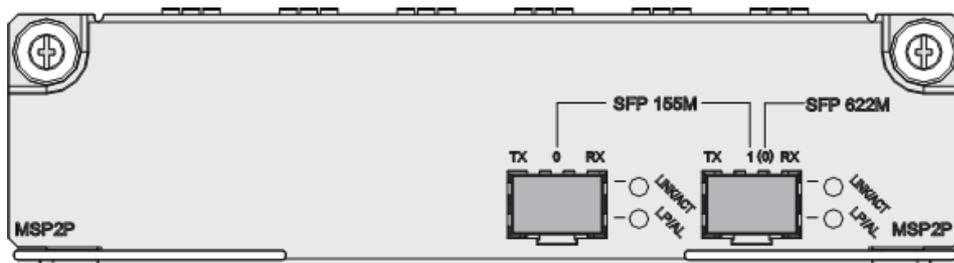
Figure 3-20 JC173A (RT-HIM-MSP2P)

JC173A (RT-HIM-MSP2P) is similar to JC172A (RT-HIM-MSP4P) in function, except that it provides two SFP interface.

III. SDH/SONET physical layer features and standards supported

- SONET/SDH frame optional
- Internal clock/line clock optional
- Switchover between 155M and 622M operating rates
- Near-end (diagnosis) loopback and network (line) loopback
- Performance and error statistics monitoring
- Receiving/transmitting alarms, performance and error statistics monitoring
- a. LOS, LOF, OOF, LAIS, PAIS, LOP, LRDI, PRDI, SF, SD, LREI (line FEBE), PREI (channel FEBE), STIM, PTIM, and PLSM
- b. B1, B2, B3, M1, and G1 error statistics

3.4.6 OC-48/STM-16 POS

Figure 3-21 JC494A (RT-HIM-PS1P)

I. Introduction

JC494A (RT-HIM-PS1P) is a high-speed OC-48/STM-16 (2.5 Gbps) POS module developed by HP. JC494A (RT-HIM-PS1P) supports PPP, Frame Relay, and HDLC at the data link layer and IP at the network layer. It provides POS interfaces for direct transmission of data packets over SONET/SDH.

The JC494A (RT-HIM-PS1P) module has the following features:

- The module runs in OC-48/STM-16 POS mode.
- The module supports both clear channel mode and channelized mode. In channelized mode, the module can provide eight OC-3/STM-1 POS channels or four OC-12/STM-4 POS channels. Additionally, it supports the mixture of OC-3/STM-1 POS channels and OC-12/STM-4 POS channels.
- The module supports the following SFP optical transceivers: multi-mode short haul (1310 nm) optical transceivers, single-mode medium haul (1310 nm) optical transceivers, single-mode long haul (1310 nm) optical transceivers, and single-mode ultra-long haul (1550 nm) optical transceivers.

Table 3-18 Description of the LEDs of JC494A (RT-HIM-PS1P)

LED	Status	Meaning
LINK/ACT (green)	OFF	No link is present.
	ON	A 2488.32 Mbps link is present.
	Blinking	The SFP interface is sending or receiving data at a rate of 2488.32 Mbps.
LP/AL (yellow)	OFF	No loopback or alarm exists.
	ON	The interface is in the loopback state.
	Blinking	There is at least one alarm.

#### II. SDH/SONET physical layer features and standards supported

- SONET/SDH frame optional

- Internal clock/line clock optional
- Near-end (diagnosis) loopback and network (line) loopback
- Performance and error statistics monitoring
- Receiving/transmitting alarms, performance and error statistics monitoring
- a. LOS, LOF, OOF, LAIS, PAIS, LOP, LRDI, PRDI, SF, SD, LREI (line FEBE), PREI (channel FEBE), STIM, PTIM, and PLSM
- b. B1, B2, B3, M1, and G1 error statistics

3.4.7 OC-3/STM-1 ATM

I. JC495A (RT-HIM-AL2P)

JC495A (RT-HIM-AL2P)
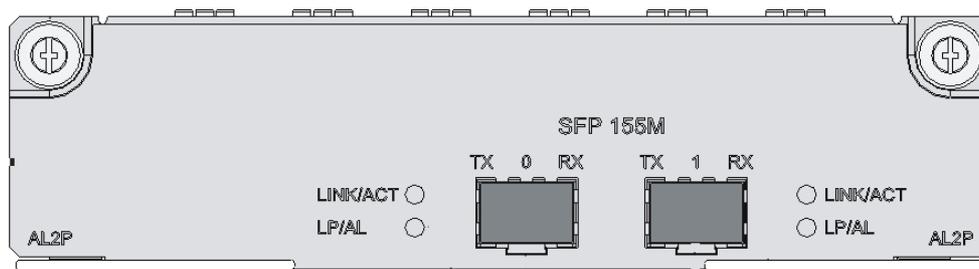
A JC495A (RT-HIM-AL2P) module is an OC-3/STM-1 (155 Mbps) Asynchronous Transfer Mode (ATM) interface module developed by HP. It provides two SFP interfaces and each interface is provided with two LEDs, which indicate interface running status and fault detecting status respectively.

The JC495A (RT-HIM-AL2P) has the following features:

Support two frame formats, namely, SDH STM-1 and SONET OC-3C.

Allow data scrambling transmission.

Support line clock mode and internal clock mode.

Provide self loopback testing measures such as internal cell loopback, external

SONET/SDH loopback, and remote loopback.

Support hot-swap.

Description of the LEDs

LED	Status	Meaning
LINK/ACT (green)	Off	No link is present.
	On	A 155.52 Mbps link is present.
	Flashing	The SFP interface is receiving or sending data at 155.52 Mbps.
LP/AL (yellow)	Off	No loopback or alarm exists.
	On	The interface is in the loopback state.
	Flashing	There is at least one alarm.

II. JC175A (RT-HIM-AL1P)
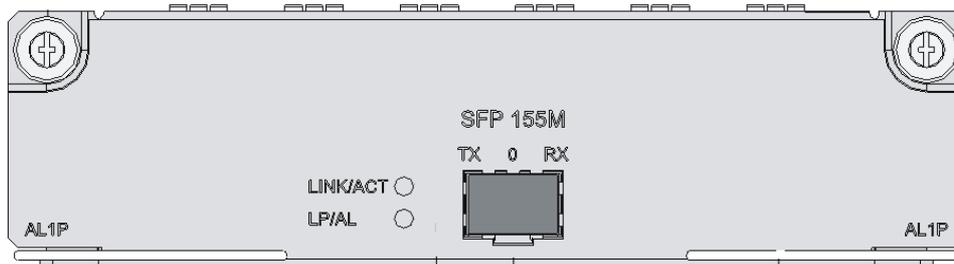
JC175A (RT-HIM-AL1P)

JC175A (RT-HIM-AL1P) is similar to JC495A (RT-HIM-AL2P) in function, except that it provides one SFP interface.

3.4.8 OC-48/STM-16 RPR

JC576A (RT-HIM-RS2P)
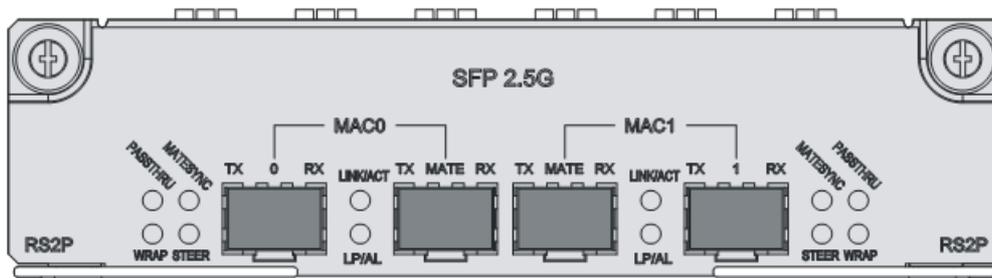
I. Introduction

The JC576A (RT-HIM-RS2P) is a 2.5Gbps OC-48/STM-16 Resilient Packet Ring (RPR) module developed by HP. It provides two SFP RPR interfaces and two SFP Mate interfaces. .Each RPR interface is provided with six status LEDs, which show the running status and fault detecting status of RPR and optical interface physical layer.

The JC576A (RT-HIM-RS2P) supports:

Two frame formats SDH STM-16 and SONET OC-48 at the physical layer.

Both line clock mode and internal clock mode.

Loopback tests such as data loopback test, external SONET/SDH loopback test, and external line loopback test.

Hot swapping.

Description of the JC576A (RT-HIM-RS2P) LEDs

LED		Status	Meaning
RPR	PASSTHRU (green)	Off	The node is not in PASSTHRU.

LED		Status	Meaning
		On	The node is in PASSTHRU.
	MATESYNC (green)	Off	The mate interface is not synchronized.
		On	The mate port is synchronized.
	WRAP (yellow)	Off	No WRAP exists.
		On	WRAP occurs on this node.
		Flashing (0.5 Hz)	WRAP occurs on another node.
	STEER (yellow)	Off	No STEER exists.
		On	STEER occurs on this node.
		Flashing (0.5 Hz)	STEER occurs on another node.
External optical interface SDH/SONET at physical layer	LINK/ACT (green)	Off	No carrier signal is being received.
		On	Carrier signals are being received.
		Flashing (4 Hz)	The interface module is receiving or sending data.
	LP/AL (yellow)	Off	No loopback or alarm exists.
		On	The interface is in the loopback state.
		Flashing (0.5 Hz)	There is at least one alarm.

II. Features supported

SONET/SDH frame formats

Internal clock and line clock modes

Near-end (diagnosis) loopback and network (line) loopback

Performance and error statistics monitoring

Receiving/transmitting of alarms, and monitoring of performance and error statistics

a. LOS, LOF, OOF, LAIS, PAIS, LOP, LRDI, PRDI, SF, SD, LREI (line FEBE), PREI (channel FEBE), STIM, PTIM, and PLSM

b. B1, B2, B3, M1, and G1 error statistics

3.4.9 MIMs supported by the A6602

The A6602 provides two HIM/MIM slots, in which you can insert a HIM and a MIM, or two HIMs, or two MIMs. The following table describes the MIMs supported by the A6602.

For details, refer to *HP A6602 Router Installation Manual.*

Table 3-19 HIMs supported by the A6602

Module name	Description
JD552A ①	HP A-MSR 8-port Enhanced Sync/Async Serial MIM Module
JD541A ①	HP A-MSR 4-port Enhanced Sync/Async Serial MIM Module
JD540A ①	HP A-MSR 2-port Enhanced Sync/Async Serial MIM Module
JD630A	HP A-MSR 1-port E3/CE3/FE3 MIM Module
JD628A	HP A-MSR 1-port T3/CT3/FT3 MIM Module
JD563A ②	HP A-MSR 8-port E1/CE1/PRI (75ohm) MIM Module
JF255A ②	HP A-MSR 8-port E1/Fractional E1 (75ohm) MIM Module
JC160A③	HP A-MSR 8-port T1/CT1/PRI MIM Module
JC159A③	HP A-MSR 8-port T1/Fractional T1 MIM Module

 Note

- ①JD552A/JD541A/JD540A does not support asynchronous serial interface modules.
- ②JD563A/JF255A does not support PRI. The two modules do not support E1 (120 ohm) interfaces. To do so, you need a 75-120 ohm adaptor.
- ③JC160A/JC159A does not support PRI.

Chapter 4 System Software Features

4.1 Features

Table 4-1 Feature description of the A6602

Feature	Description
Layer 2 protocol	ARP: Dynamic/static ARP, proxy ARP, gratuitous ARP Ethernet, sub-interface VLAN PPPoE server PPP, software MP, hardware MP FR, MFR, FRF12 fragment, FR switching HDLC ATM: IPoA, PPPoA server, IPoEoA, PPPoEoA server QinQ terminating LLDP Port mirroring
IP unicast routing	Static routing RIP(Routing Information Protocol) v1/v2, RIPng OSPF (Open Shortest Path First) v2/v3 BGP (Border Gateway Protocol), BGP4+ IS-IS (Intermediate System-to-Intermediate System intra-domain routing information exchange protocol), ISISv6 ECMP Route recursion Route policy Policy routing UCMP BGP support GTSM ISIS MTR
IP multicast routing	Internet Group Management Protocol (IGMP) v1/v2/v3 Protocol Independent Multicast (PIM) DM/SM Multicast Source Discovery Protocol (MSDP) MBGP Multicast static routing Multicast host tracking

Feature	Description
Network protocol	DHCP Server DHCP Relay DHCP Client DNS Client IPv6 NTP Server NTP Client Telnet Server Telnet Client TFTP Client FTP Server FTP Client UDP Helper NQA
QoS (Quality of Service)	Traffic classification: based on port, IP address, IP priority, DSCP priority, TCP/UDP port number, and protocol type Traffic policing: CAR rate limiting, granularity configurable GTS Priority Mark/Remark Queue scheduling mechanism: FIFO, PQ, CQ, WFQ, CBWFQ Congestion avoidance algorithm: Tail-Drop, WRED LR FR QoS Nested QoS MPLS QoS IPv6 QoS QPPB（QoS policy propagation on BGP）

Feature	Description
Security	ACL
	ACL acceleration
	Time-based access control
	Packet filter firewall
	Stateful firewall ASPF
	TCP attack prevention on local host
	Control plane rate limiting
	Virtual fragment reassembly
	URPF
	Web filtering
	Hierarchical user management and password protection
	AAA
	RADIUS
	TACACS
	Portal
	PKI Certification
	SSH v1.5/2.0
	RSA
	BGP/BGP4+ support GTSM
	IPSec, IPSec multi-instance, IKE
	Password Control
	Attack detection and prevention
Service	NAT, NAT multi-instance, VPN-NAT,NAT session log
	Connection limit
	GRE tunnel (point to multi-point)
	L2TP tunnel
	NetStream (support v5/v8/v9 packet frames; support IPv4,IPv6 and MPLS packets)
	DVPN (Dynamic VPN)
MPLS (Multiprotocol Label Switching)	L3VPN: Inter-domain MPLS VPN (OptionA/B/C), nested MPLS VPN, Hierarchy PE (HoPE), CE dual homing, MCE, multi-role host, GRE tunnel
	L2VPN: VPLS,Martini, Kompella, CCC, and SVC
	VPLS/H-VPLS
	MPLS TE, RSVP TE
	Multicast VPN

Feature	Description
Ipv6	Basic functions: IPv6 ND, IPv6 PMTU, dual-stack forwarding, IPv6 ACL,DHCPv6 Server/Proxy
	IPv6 tunnel: manually configured IPv6 tunnel, configured IPv6 over IPv4 tunnel, automatic IPv6 over IPv4 tunnel, 6to4 tunnel, ISATAP tunnel, 6PE, GRE tunnel
	6VPE（IPv6 MPLS L3VPN）
	NAT-PT
	Static routing
	Dynamic routing protocols: RIPng, OSPFv3, IS-ISv6, BGP4+
	IPv6 multicast:MLDv1/v2,PIM6-DM,PIM6-SM,PIM6-SSM
Reliability	VRRP/VRRPv3
	VRRP-Enhanced (VRRPE)
	MPLS TE FRR
	IP FRR: static routing/policy routing/RIP/IS-IS/OSPF
	IGP fast routing convergence
	BFD: Static Route/RIP/OSPF/ISIS/BGP/VRRP/TE FRR/IPv6
	GR: OSFP/BGP/IS-IS/ LDP/RSVP
	Software Hotfix
Management and maintenance	Configuration through the CLI
	Configuration through the console port
	Telnet for configuration and remote maintenance through Ethernet port
	Dialing up for configuration and remote maintenance via Modem through AUX port
	SNMP (v1, v2c, v3)
	RMON (group 1, 2, 3 and 9 MIB)
	System logs
	Hierarchical alarms
	Ping and Tracert
	NQA: Network Quality Analysis, supporting collaboration with VRRP, policy-based routing, and static routing
	Fan detection, maintenance, and alarm
	Power supply detection, maintenance, and alarm
	CF card detection, maintenance, and alarm
	Temperature detection, alarm
File system	FAT format
	CF card
	USB storage device
	Dual image

| Feature	Description
Loading/upgrading	Loading/upgrading through the Xmodem protocol
	Loading/upgrading through File Transfer Protocol (FTP), and Trivial File Transfer Protocol (TFTP)

Chapter 5 Typical Applications

As a new-generation multi-core router, the A6602 enhances both the forwarding performance and service capacity compared to traditional routers. The A6602 optimizes the aggregation function of WANs. Providing a data IPSec encryption processing capacity up to 3 Gbps, the A6602 can serve as the service aggregation device of enterprise networks, providing high-density access and secure application environments.

In addition, the A6602 provides high-density Layer 3 GE interfaces and 155 Mbps POS interfaces. With high performance NAT, GRE, and high capacity access, the A6602 can also serve as the egress gateway device of enterprise networks and campus area networks (CAN).

The A6602 is a compact router that provides high performance and powerful services. It saves your investment (multiple services supported, traditional MIMs compatible), eases your management (abundant network management approaches and extensible storage media available), and simplifies your maintenance (abundant logs and remote maintenance available).

5.1 Typical Networking Scheme of IPSec VPN
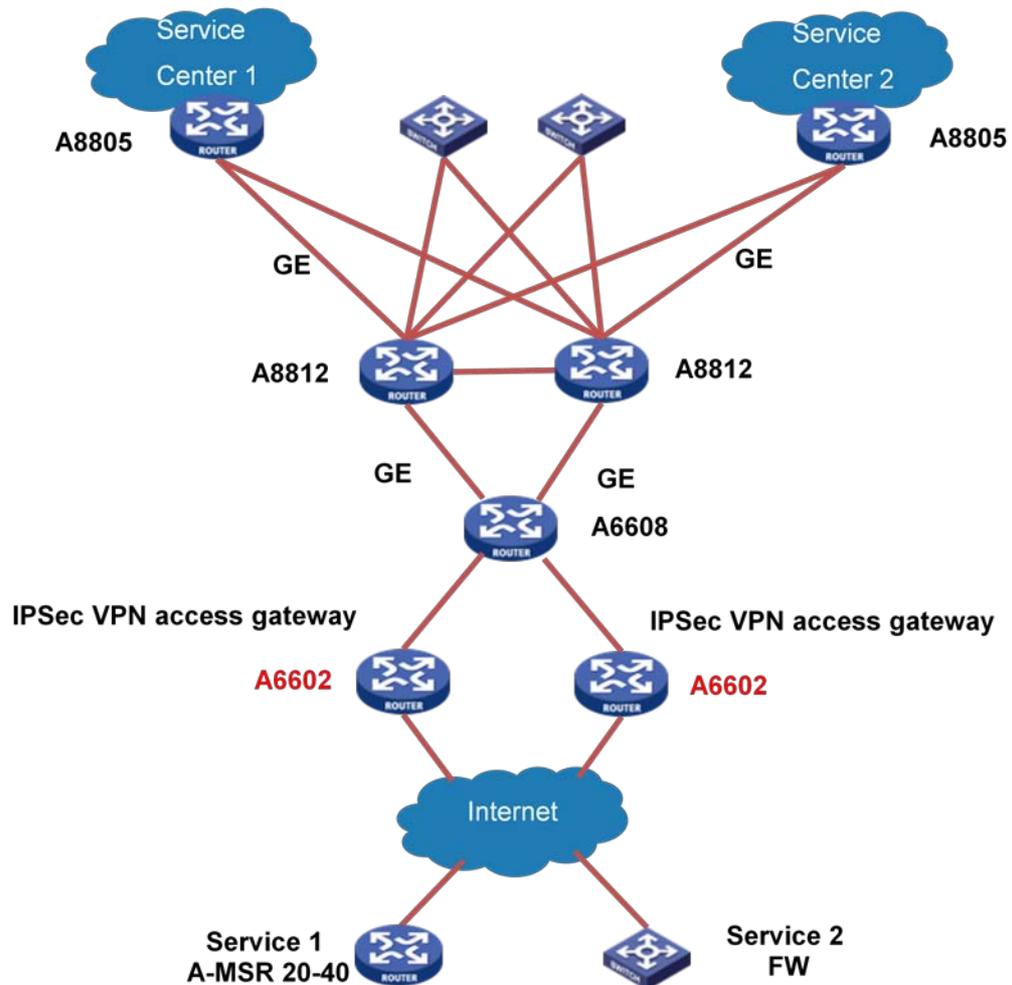
Figure 5-1 A typical application network diagram with the A6602 acting as an IPSec VPN access gateway

This figure shows a typical application where the A6602 serves as an IPSec VPN gateway. The A6602 provides a powerful hardware encryption and forwarding performance and therefore can serve as an IPSec VPN gateway. As MPLS VPN and traditional IP VPN are more widely used in enterprise networks, integration of MPLS VPN and IP VPN is required. The VPE technology supported by the A6600 routers is therefore developed. The A6600 routers can integrate traditional IP VPNs with MPLS VPNs. In the network:

- The A6602 accesses branches that have a large number of Internet connections. To ensure security of branches, the A6602 needs to establish an IPSec tunnel connection with each branch.
- The IPSec tunnels of branches terminate on the A6602. The link between the A6602 and backbone can be an IP interconnection or MPLS VPN running.

- You can use the VPE technology to connect IPSec VPNs to MPLS VPNs directly. In this way, you can access branches to their corresponding VPNs on the A6602 to implement seamless integration.

## 5.2 Typical Application and Networking Scheme of NAT
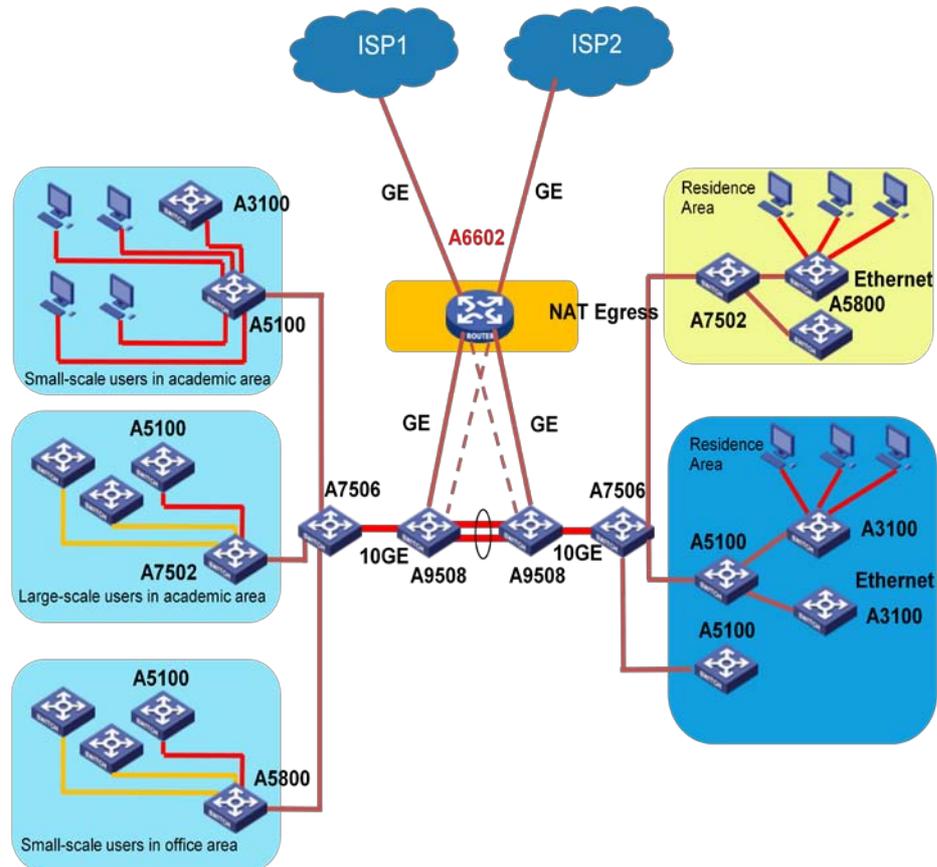
Figure 5-2 A typical NAT application network diagram with A6602s deployed

This figure shows a typical application where the A6602 serves as an egress router of a CAN. To ensure high reliability, you need to deploy two routers (A6602 backup to each other). You can also implement load balancing between the two routers by configuring policy-based routing. In the CAN, the two routers (A6602) are connected to two A9500 core switches in full-mesh mode to implement load balancing and link backup between the switches and the egress routers. In the network:

- The two routers are connected to the egresses of the ISP1 and ISP2 respectively. Load balancing or link backup can be implemented between the two egresses as required.
- The two routers (A6602) are connected to two A9500 core switches in full-mesh mode to implement load balancing and link backup between the switches and the egress routers.

- In addition to high performance NAT, the A6602 also provides abundant NAT ALG features, ensuring that applications in a CAN can pass through the egress routers, thus providing a perfect NAT application solution.

Chapter 6 Ordering Information

6.1 Host

Consider the following when purchasing the host:

I. Networking requirement

- Location of the router in the network;
- Uplink/downlink traffic to be processed by the router;
- Reliability.

II. Power supply

- Confirm whether an RPS power supply is required.

Table 6-1 The HP A6602 host

Model	Description
JC176A	HP A6602 Router

6.2 Modules

6.2.1 High-speed Interface Module

Table 6-2 High-speed interface modules of the HP A6602

High-speed interface module(HIM)	Description
JC168A	HP A6600 1-port 10-GbE XFP HIM Module
JC164A	HP A6600 8-port Gig-T HIM Module
JC174A	HP A6600 8-port GbE SFP HIM Module
JC163A	HP A6600 4-port Gig-T HIM Module
JC171A	HP A6600 4-port GbE SFP HIM Module
JC575A	HP A6600 8-port 10/100Base-T HIM Module
JC169A	HP A6600 2-port OC-3/STM-1 (E3/T3) CPOS SFP HIM Module
JC170A	HP A6600 1-port OC-3/STM-1 (E3/T3) CPOS SFP HIM Module
JC161A	HP A6600 1-port OC-3/STM-1 (E1/T1) CPOS SFP HIM Module

High-speed interface module(HIM)	Description
JC162A	HP A6600 2-port OC-3/STM-1 (E1/T1) CPOS SFP HIM Module
JC172A	HP A6600 4-port OC-3c/STM-1c or 2-port OC-12c/STM-4c POS SFP HIM Module
JC173A	HP A6600 2-port OC-3c/STM-1c or 1-port OC-12c/STM-4c POS SFP HIM Module
JC494A	HP A6600 1-port OC-48c/STM-16c POS/CPOS SFP HIM Module
JC495A	HP A6600 2-port OC-3c/STM-1c ATM SFP HIM Module
JC175A	HP A6600 1-port OC-3c/STM-1c ATM SFP HIM Module
JC576A	HP A6600 2-port OC-48c/STM-16c RPR SFP HIM Module

6.2.2 Multifunction Interface Module

Table 6-3 Multifunctional interface modules of the HP A6602

Multifunction interface module	Description
JD552A ①	HP A-MSR 8-port Enhanced Sync/Async Serial MIM Module
JD541A ①	HP A-MSR 4-port Enhanced Sync/Async Serial MIM Module
JD540A ①	HP A-MSR 2-port Enhanced Sync/Async Serial MIM Module
JD563A ②	HP A-MSR 8-port E1/CE1/PRI (75ohm) MIM Module
JF255A ②	HP A-MSR 8-port E1/Fractional E1 (75ohm) MIM Module
JD630A	HP A-MSR 1-port E3/CE3/FE3 MIM Module
JD628A	HP A-MSR 1-port T3/CT3/FT3 MIM Module
JC160A③	HP A-MSR 8-port T1/CT1/PRI MIM Module
JC159A③	HP A-MSR 8-port T1/Fractional T1 MIM Module

Note:

- ①JD552A/JD541A/JD540A does not support asynchronous serial interface modules.

- ②JD563A/JF255A does not support PRI. The two modules do not support E1 (120 ohm) interfaces. To do so, you need a 75-120 ohm adaptor.

- ③JC160A/JC159A does not support PRI.

6.2.3 Power Module

Table 6-4 Power supply of the HP A6602

Multifunction interface module	Description
JD183A	HP A-RPS800 Redundant Power System