

Cisco Nexus B22 Fabric Extender for IBM Flex System Getting Started Guide

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 **Safety Information**
(安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας
(safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

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Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

ཐོན་ཁུངས་འདི་བདེ་སྤྱོད་མ་བྱས་གོང་། རྒྱ་ལྷོ་ཡིད་གཟབ་
བྱ་འདུ་མིན་ཡོད་པའི་འོད་སྤེར་བལྟ་དགོས།

Bu ürünü kurmadan önce güvenlik bilgilerini okuyun.

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canjbinj soengq cungj vahgangj ancien siusik.

Safety statements

This section provides the caution and danger information.

Important:

Each caution and danger statement in this documentation is labeled with a number. This number is used to cross reference an English-language caution or danger statement with translated versions of the caution or danger statement in the *Safety Information* document.

For example, if a caution statement is labeled Statement 1, translations for that caution statement are in the *Safety Information* document under Statement 1.

Be sure to read all caution and danger statements in this documentation before you perform the procedures. Read any additional safety information that comes with your system or optional device before you install the device.

Statement 1



DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that will be attached to this product.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.

To Connect:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect:

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Statement 28



CAUTION:

The battery is a lithium ion battery. To avoid possible explosion, do not burn the battery. Exchange it only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call.

UL Regulatory Information

This device is for use only with Listed IBM Flex System Enterprise Chassis.



Cisco Nexus B22 Fabric Extender for IBM Flex System Getting Started Guide

This Getting Started Guide describes the Cisco B22 Fabric Extender for IBM Flex System and how to start using it. This Getting Started Guide includes the following sections:

- [Information about the Cisco Nexus B22 Fabric Extender for IBM Flex System, page 1](#)
- [Shipping Box Contents, page 2](#)
- [IBM Flex System Architecture, page 3](#)
- [Installing the Cisco Nexus B22 Fabric Extender for IBM Flex System, page 4](#)
- [Updating NX-OS, page 5](#)
- [Configuring the Cisco Nexus B22 Fabric Extender for IBM Flex System, page 6](#)
- [Verifying the Configuration, page 18](#)
- [Additional Information, page 19](#)
- [Technical Support, page 19](#)

Information about the Cisco Nexus B22 Fabric Extender for IBM Flex System

The Cisco Nexus B22 Fabric Extender for IBM Flex System provides an extension of the Cisco Nexus switch fabric to IBM Flex System devices.

The Cisco Nexus B22 Fabric Extenders behave as remote line cards for a parent Cisco Nexus switch. The Fabric Extenders are essentially extensions of the parent Cisco Nexus switch fabric, with the Fabric Extenders and the parent Cisco Nexus switch together forming a distributed modular system.

Each Cisco Nexus B22 Fabric Extender connects via 10-Gigabit Ethernet to up to 14 servers within an IBM Flex System and contains 8 10-Gigabit Ethernet fabric uplinks towards the parent Cisco Nexus switch. Multiple low cost options are available for fabric interconnections between the Cisco Nexus B22 and the parent Cisco Nexus switches. Low-cost connections up to 10 meters can be made with copper



Twin-ax cables with longer connections up to 100 meters that can use the Fabric Extender Transceiver. Other standard 10 Gigabit Ethernet optics such as 10Gbase-SR, 10Gbase-LR, and 10Gbase-ER are also supported for these fabric connections.

The Cisco Nexus B22 Fabric Extender for IBM Flex System is an 8 SFP+ port, 14 10G KR port fabric extender which connects to the N5K/N6K family of switches. The Cisco Nexus B22 Fabric Extender offers a solution in high-end data centers where server virtualization and IO consolidation is desired. The Cisco Nexus B22 Fabric Extender for IBM Flex System enables the usage of a single network interface to carry disparate traffic such as CE (Classic Ethernet) and SAN. An advantage of the Cisco Nexus B22 Fabric Extender is the ability to encapsulate and carry Fibre Channel traffic on an Ethernet link (FCoE) while continuing to honor the behavior of the Fibre Channel protocol.

The Cisco Nexus B22 Fabric Extender for IBM Flex System has the following features:

- 14 x 1/10 GE server interfaces
- 8 x 10 GE network interfaces
- Host vPC (virtual Port-Channel)
- DCB and FCoE in 10G mode
- 8 QoS queues (6 configurable)
- Performance: 380Gbps
- IBM vNIC functionality
- Fabric link interconnects:
 - Fabric Extender Transceiver (FET)
 - Same Cisco Twinax as other FEX
 - Optics: SR, LR, ER
- NX-OS version 6.0(2)N2(1a) or greater for the Nexus 5500/6000
- Upstream Nexus platform supports FEX mix & match
- Supported with the IBM Flex System Enterprise Chassis

Finding the Latest Documentation Online

Use the following links to check for the latest documentation for your server product:

- http://www.cisco.com/en/US/products/ps10110/tsd_products_support_series_home.html
- http://www.cisco.com/en/US/prod/collateral/switches/ps9441/ps10110/ps11975/data_sheet_c78-685265.html
- <http://pic.dhe.ibm.com/infocenter/flexsys/information/index.jsp>

Check these links often to verify that your documentation is up to date.

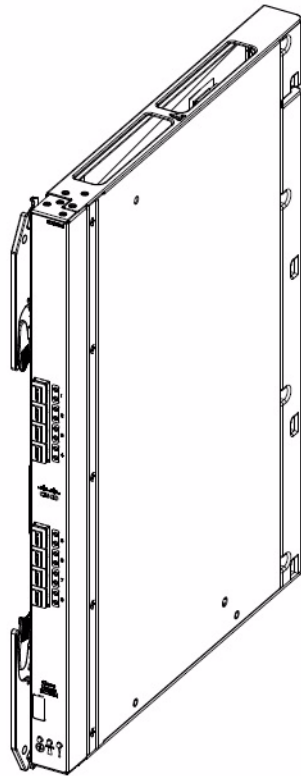
Shipping Box Contents

The Cisco Nexus B22 Fabric Extender for IBM Flex System shipping box contains:

- Cisco Nexus B22 Fabric Extender for IBM Flex System (N2K-B22IBM-P), with 14 internal host ports and 8 external network ports. (Partner Part Number is 94Y5350)

- (Optional) 16 Fabric Extender Transceivers. The product ID of the bundle with the Cisco Nexus B22 Fabric Extender and the Fabric Extender Transceiver is N2K-B22IBM-F (Partner Part Number is 94Y5355). [Figure 1](#) shows the Cisco Nexus B22 Fabric Extender for IBM Flex System.

Figure 1 Cisco Nexus B22 Fabric Extender for IBM Flex System



IBM Flex System Architecture

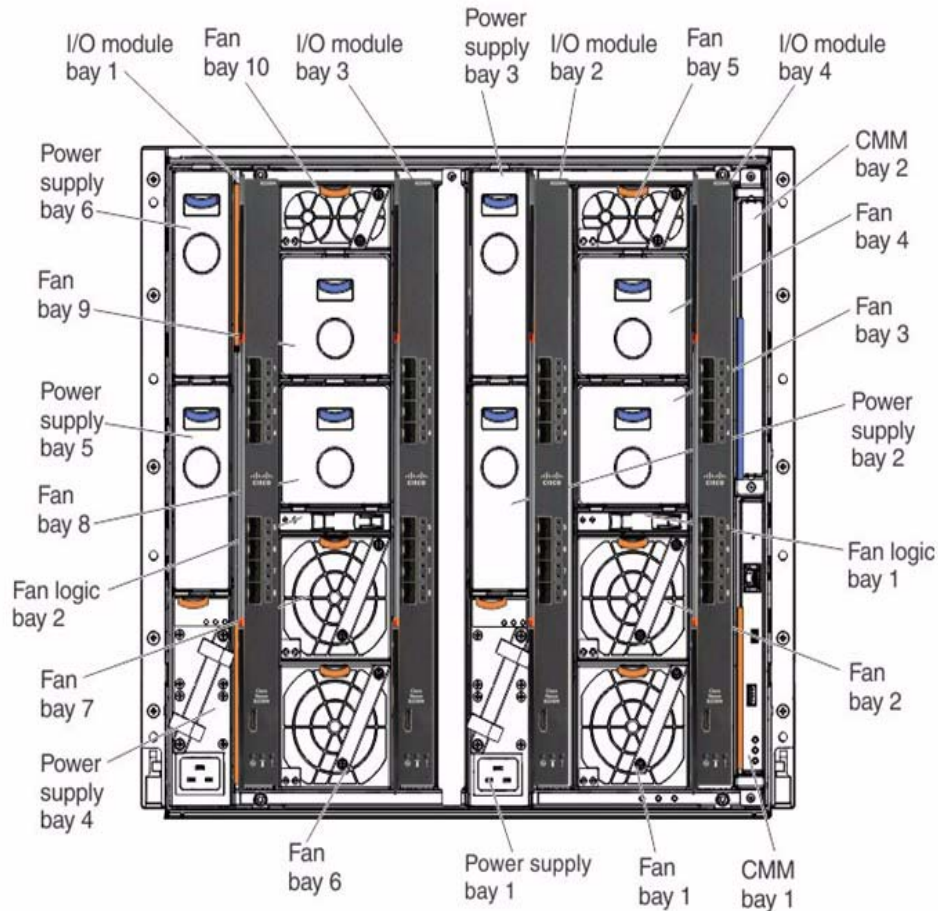
Consider these prerequisites before you install the switch:

Fill any unoccupied interconnect bays or any unoccupied power module bays in the Flex System chassis with blanks.

Identify the bays in which you will insert the switches. The bay in which you choose to install each switch depends on whether network adapters are installed and the type of LAN on Motherboard (LOM) in the enclosures. See the IBM Flex System chassis documentation information about installing and configuring the network adapters.

See the IBM Flex System documentation for information on the port mapping between the Flex System chassis and the switches. [Figure 2](#) shows the rear view of the Flex System chassis, in which you install the switch.

Figure 2 View of the Flex System Chassis



Installing the Cisco Nexus B22 Fabric Extender for IBM Flex System

Populate all the chassis interconnect bays. Use one of the blank panels provided with the chassis, if needed.

To install the Cisco Nexus B22 Fabric Extender for IBM Flex System in the chassis:

1. Locate the appropriate interconnect bay at the rear of the chassis. See the setup and installation guide provided with the chassis.
2. Press the handle latch to release the handle.

**Note**

The Cisco Nexus B22 Fabric Extender for IBM Flex System is a hot-pluggable device. The chassis may be on or off during installation.

3. Align the Cisco Nexus B22 Fabric Extender for IBM Flex System with the appropriate interconnect bay, according to the specific configuration for the chassis. Push the switch firmly into the interconnect bay.
4. Press the installation handle into the latch to lock the switch into place.
5. Connect the cables.
6. Configure the parent Cisco Nexus switch to recognize and boot up the Cisco Nexus B22 Fabric Extender for IBM Flex System.

Updating NX-OS

To achieve the best performance, update to the latest NX-OS software version.

**Note**

The minimum version of NX-OS is 6.0(2)N2(1a) or greater for the Cisco Nexus 5500 and the Cisco Nexus 6000 Series switches.

The NX-OS image is pushed down from the parent switch automatically and the NX-OS can be updated in an ISSU mode. All configuration and monitoring is done from parent switch. The Cisco Nexus B22 image is part of parent switch image.

The Cisco Nexus B22 Fabric Extender for IBM Flex System downloads the necessary firmware from the connected Cisco Nexus switch. You can update the Cisco Nexus Switch without any disruptions using the **install all** command. Contact the company from whom your Cisco Nexus Switch was purchased.

You can download NX-OS software from the Cisco website:

<http://www.cisco.com/cisco/software/navigator.html?mdfid=282076290&i=rm>

If your units are purchased through Cisco, see [Cisco Nexus 5000 Series NX-OS Software Upgrade and Downgrade Guide](#) for instructions on how to download NX-OS from Cisco.

The Cisco Nexus B22 Fabric Extender for IBM Flex System is managed by its parent Cisco Nexus switch over the fabric interfaces through a zero-touch configuration model. You upgrade the Fabric Extender by upgrading the software on the parent Cisco Nexus switch.

When a Fabric Extender is properly associated with a parent switch, the following upgrade operations are performed:

- The switch checks the software image compatibility and upgrades the Fabric Extender if necessary.
- The switch pushes the configuration data to the fabric extender. The Fabric Extender does not store any configuration locally.
- The Fabric Extender updates the switch with its operational status. All fabric extender information is displayed using the switch commands for monitoring and troubleshooting.

In-Service Software Upgrades (ISSUs) are supported on the parent Cisco Nexus switches. An ISSU can update the software images on your device without disrupting data traffic. An ISSU updates the Kickstart, System, and Fabric Extender image.

The **install all** command triggers the ISSU on the parent Cisco Nexus switches and the Cisco Nexus B22 Fabric Extender for IBM Flex System. The command provides the following benefits:

- You can upgrade the parent Cisco Nexus switches and the Cisco Nexus B22 Fabric Extender for IBM Flex System using just one command.
- You can receive descriptive information about the intended changes to your system before you continue with the installation. For example, it identifies potential disruptive upgrades.
- You can continue or cancel the upgrade when you see this question (the default is **no**):

```
Do you want to continue (y/n) [n] : y
```
- You can upgrade the Cisco NX-OS software using a nondisruptive procedure.
- The command automatically checks the image integrity, which includes the running kickstart and system images. The command sets the kickstart and system boot variables.
- The command performs a platform validity check to verify that a wrong image is not used.
- The Ctrl-c escape sequence gracefully ends the **install all** command. The command sequence completes the update step in progress and returns to the EXEC prompt.
- After issuing the **install all** command, if any step in the sequence fails, the upgrade ends.
- The following message appears to warn you about the impact of upgrading the power sequencer:

```
Warning: please do not remove or power off the module at this time.
Note: Power-seq upgrade needs a power-cycle to take into effect.
On success of power-seq upgrade, SWITCH OFF THE POWER to the system and then, power it up.
```
- You can force a disruptive upgrade.

For additional information, see the [Cisco Nexus 5000 Series NX-OS Software Upgrade and Downgrade Guide](#).

Configuring the Cisco Nexus B22 Fabric Extender for IBM Flex System

This section describes how to configure a Cisco Nexus B22 Fabric Extender for IBM Flex System with a Cisco Nexus 5000 Series switch and includes the following sections:

- [Associating a Fabric Extender to a Fabric Interface, page 6](#)
- [Configuring the Fabric Extender, page 9](#)
- [Redistributing the Links, page 10](#)
- [Displaying Fabric Extender Information, page 11](#)

Associating a Fabric Extender to a Fabric Interface

A Fabric Extender is connected to the switch through physical Ethernet interfaces or an EtherChannel. By default, the switch does not allow the attached Fabric Extender to connect until it has been assigned a chassis ID and is associated with the connected interface.



Note

The Fabric Extender may connect to the switch through a number of separate physical Ethernet interfaces or at most one EtherChannel interface.

This section includes the following topics:

- [Associating a Fabric Extender to an Ethernet Interface, page 7](#)

- [Associating a Fabric Extender to an EtherChannel, page 7](#)
- [Disassociating a Fabric Extender from an Interface, page 9](#)

Associating a Fabric Extender to an Ethernet Interface

To associate the Fabric Extender to an Ethernet interface, perform this task:

	Command	Purpose
Step 1	switch# configure terminal	Enters configuration mode.
Step 2	switch(config)# interface ethernet slot/port	Specifies an Ethernet interface to configure.
Step 3	switch(config-if)# switchport mode fex-fabric	Sets the interface to support an external Fabric Extender.
Step 4	switch(config-if)# fex associate chassis	Associates the chassis ID to the Fabric Extender unit attached to the interface. The range of the chassis ID is from 100 to 199.
Step 5	switch# show interface ethernet port/slot fex-intf	(Optional) Displays the association of a Fabric Extender to an Ethernet interface.

This example shows how to associate the Fabric Extender to an Ethernet interface on the switch:

```
switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface ethernet 1/19
switch(config-if)# switchport mode fex-fabric
switch(config-if)# fex associate 102
```

This example shows how to display the association of the Fabric Extender and the switch:

```
switch# show interface ethernet 1/19 fex-intf
Fabric          FEX
Interface       Interfaces
-----
Eth1/19         Eth100/1/16  Eth100/1/15  Eth100/1/14  Eth100/1/13
                  Eth100/1/12  Eth100/1/11  Eth100/1/10  Eth100/1/9
                  Eth100/1/8   Eth100/1/7   Eth100/1/6   Eth100/1/5
                  Eth100/1/4   Eth100/1/3   Eth100/1/2   Eth100/1/1
```

Associating a Fabric Extender to an EtherChannel

To associate the Fabric Extender to an EtherChannel, perform this task:

	Command	Purpose
Step 1	switch# configure terminal	Enters configuration mode.
Step 2	switch(config)# interface port-channel channel	Specifies an EtherChannel to configure.
Step 3	switch(config-if)# switchport mode fex-fabric	Sets the EtherChannel to support an external Fabric Extender.

	Command	Purpose
Step 4	switch(config-if)# fex associate <i>chassis</i>	Associates the chassis ID to the Fabric Extender unit attached to the interface. The range of the chassis ID is from 100 to 199.
Step 5	switch# show interface port-channel <i>channel</i> fex-intf	(Optional) Displays the association of a Fabric Extender to an EtherChannel interface.

This example shows how to associate the Fabric Extender to an EtherChannel interface on the switch:

```
switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
switch(config)# interface port-channel 2
switch(config-if)# switchport mode fex-fabric
switch(config-if)# fex associate 100
switch(config-if)# exit
switch(config)# interface ethernet 1/19
switch(config-if)# switchport mode fex-fabric
switch(config-if)# fex associate 100
switch(config-if)# channel-group 2
switch(config-if)# exit
switch(config)# interface ethernet 1/20
switch(config-if)# switchport mode fex-fabric
switch(config-if)# fex associate 100
switch(config-if)# channel-group 2
switch(config-if)# exit
switch(config)# interface ethernet 1/21
switch(config-if)# switchport mode fex-fabric
switch(config-if)# fex associate 100
switch(config-if)# channel-group 2
switch(config-if)# exit
switch(config)# interface ethernet 1/22
switch(config-if)# switchport mode fex-fabric
switch(config-if)# fex associate 100
switch(config-if)# channel-group 2
switch(config-if)# exit
```



Note

You have to associate each Ethernet interface that is a member of the EtherChannel as a fabric interface as shown in the above example.

This example shows how to display the association of the Fabric Extender and the switch:

```
switch# show interface port-channel 2 fex-intf
Fabric          FEX
Interface       Interfaces
-----
Po2             Eth100/1/1   Eth100/1/2   Eth100/1/3   Eth100/1/4
                Eth100/1/5   Eth100/1/6   Eth100/1/7   Eth100/1/8
                Eth100/1/9   Eth100/1/10  Eth100/1/11  Eth100/1/12
                Eth100/1/13  Eth100/1/14  Eth100/1/15  Eth100/1/16
```

Disassociating a Fabric Extender from an Interface

To disassociate the Fabric Extender from an interface, perform this task:

Command	Purpose
switch(config-if)# no fex associate	Disassociates the Fabric Extender unit attached to the interface.

Configuring the Fabric Extender

To configure global features for a Fabric Extender, perform this tasks:

	Command	Purpose
Step 1	switch# configure terminal	Enters configuration mode.
Step 2	switch(config)# fex chassis	Enters configuration mode for the specified Fabric Extender chassis ID. The range of the chassis ID is from 100 to 199.
Step 3	switch(config-fex)# description desc	Specifies the description. The default is the string FEXxxx where xxx is the chassis ID. If the chassis ID is 123, the description is FEX0123.
	switch(config-fex)# no description	Deletes the description.
	switch(config-fex)# pinning max-links uplinks	Defines the number of uplinks. The default is 1. The range is from 1 to 8. This command is only applicable if the Fabric Extender is connected to its parent switch using one or more statically pinned fabric interfaces. There can only be one EtherChannel connection.
	switch(config-fex)# no pinning max-links	Resets the number of uplinks to the default.
	switch(config-fex)# serial serial	Defines a serial number string. If this command is configured, then a switch will only allow the corresponding chassis ID to associate (using the fex associate command) if the Fabric Extender reports a matching serial number string. Configuring a serial number other than that of the given Fabric Extender will force the Fabric Extender offline.
	switch(config-fex)# no serial	Deletes the serial number string.
	switch(config-fex)# beacon	Turns on the beacon LED. This LED allows you to locate a specific Fabric Extender in a rack.
switch(config-fex)# no beacon	Turns off the beacon LED.	

command disrupts all the host interface ports of the Fabric Extender.

Redistributing the Links

When you provision the Fabric Extender with statically pinned interfaces, the downlink host interfaces on the Fabric Extender are pinned to the fabric interfaces in the order they were initially configured. If you want to maintain a specific relationship of host interfaces to fabric interface across reboots, you should re-pin the links.

You may want to perform this function in these two situations:

- A change in the max-links configuration.
- If you need to maintain the pinning order of host interfaces to fabric interfaces.

Changing the Number of Links

If you initially configured port 19 on the parent switch as your only fabric interface, all 16 host interfaces are pinned to this port. If you provision another port, for example 20, then you must enter the **pinning max-links 2** command to redistribute the host interfaces. All host interfaces are brought down and host interfaces 1 to 8 are pinned to fabric interface 19 and host interfaces 9 to 16 are pinned to fabric interface 20.

Maintaining the Pinning Order

The pinning order of the host interfaces is initially determined by the order in which the fabric interfaces were configured. In this example, four fabric interfaces were configured in the following order:

```
switch(config-fex)#
switch(config-fex)#
switch(config-fex)# show interface ethernet 1/19 fex-intf
Fabric          FEX
Interface       Interfaces
-----
Eth1/19         Eth100/1/4     Eth100/1/3     Eth100/1/2     Eth100/1/1

switch(config-fex)# show interface ethernet 1/20 fex-intf
Fabric          FEX
Interface       Interfaces
-----
Eth1/20         Eth100/1/8     Eth100/1/7     Eth100/1/6     Eth100/1/5

switch(config-fex)# show interface ethernet 1/21 fex-intf
Fabric          FEX
Interface       Interfaces
-----
Eth1/21         Eth100/1/12    Eth100/1/11    Eth100/1/10    Eth100/1/9

switch(config-fex)# show interface ethernet 1/22 fex-intf
Fabric          FEX
Interface       Interfaces
-----
Eth1/22         Eth100/1/16    Eth100/1/15    Eth100/1/14    Eth100/1/13
```

The next time that you reboot the Fabric Extender, the configured fabric interfaces are pinned to the host interfaces in an ascending order by port number of the fabric interface. If you want to configure the same fixed distribution of host interfaces without restarting the Fabric Extender, enter the **fex pinning redistribute** command.

To redistribute the host interfaces on the Fabric Extender, perform this task:

Command	Purpose
switch# fex pinning redistribute <i>chassis</i>	Redistributes the host connections. The range of the chassis ID is from 100 to 199.

This example shows how to redistribute the host interfaces on a Fabric Extender:

```
switch# fex pinning redistribute 100
```

For additional information about configuring the Cisco Nexus B22 Fabric Extender for IBM Flex System and parent Cisco Nexus Switches, see the following documentation:

- **Cisco Nexus 2000 Series Fabric Extender Software Configuration Guide**
http://www.cisco.com/en/US/products/ps10110/tsd_products_support_configure.html
- **Cisco Nexus 5000 Series NX-OS Software Configuration Guide**
http://www.cisco.com/en/US/products/ps9670/tsd_products_support_configure.html

Displaying Fabric Extender Information

This section describes the **show** commands that are available to display the configuration and status of the Fabric Extender and includes the following topics:

- [Displaying Configuration Information, page 11](#)
- [Displaying Chassis Management Information, page 14](#)

Displaying Configuration Information

To display configuration information about the defined interfaces, perform one of these tasks:

Command	Purpose
switch# show fex [<i>chassis</i> [<i>detail</i>]]	Displays information about a specific Fabric Extender or all attached units.
switch# show interface <i>type number fex-intf</i>	Displays the Fabric Extender ports pinned to a specific switch interface.
switch# show interface fex-fabric	Displays the switch interfaces that have detected a Fabric Extender uplink.

This example shows how to display all the attached Fabric Extender units:

```
N5596-2-B22# show fex
FEX          FEX          FEX          FEX          Fex
Number      Description    State         Model         Serial
-----
191         FEX0191       Online        N2K-B22IBM-P  FOC1730R0XQ
192         FEX0192       Online        N2K-B22IBM-P  FOC1730R0XM
193         FEX0193       Online        N2K-B22IBM-P  FOC1730R0WU
194         FEX0194       Online        N2K-B22IBM-P  FOC1720R0VV
N5596-2-B22#
```

This example shows how to display the detailed status of a specific Fabric Extender:

```
N5596-2-B22#
N5596-2-B22#
N5596-2-B22# show fex 191 detail
FEX: 191 Description: FEX0191 state: Online
  FEX version: 6.0(2)N2(1a) [Switch version: 6.0(2)N2(1a)]
  FEX Interim version: 6.0(2)N2(1a)
  Switch Interim version: 6.0(2)N2(1a)
  Extender Serial: FOC1730R0XQ
  Extender Model: N2K-B22IBM-P, Part No: 73-15000-03
  Bay: 1
  Machine Type/Model: 8721HC1
  Machine Serial Number: 06MVGY8
  UUID: 100E 4829 C606 45B1 A8E1 D697 BCCD 2884
  Card Id: 211, Mac Addr: f8:4f:57:ce:36:42, Num Macs: 64
  Module Sw Gen: 21 [Switch Sw Gen: 21]
  post level: complete
  Pinning-mode: static Max-links: 1
  Fabric port for control traffic: Eth1/21
  FCoE Admin: false
  FCoE Oper: true
  FCoE FEX AA Configured: false
  Fabric interface state:
    Eth1/21 - Interface Up. State: Active
  Fex Port      State Fabric Port
    Eth191/1/1  Up    Eth1/21
    Eth191/1/2  Down  Eth1/21
    Eth191/1/3  Up    Eth1/21
    Eth191/1/4  Down  Eth1/21
    Eth191/1/5  Up    Eth1/21
    Eth191/1/6  Down  Eth1/21
    Eth191/1/7  Up    Eth1/21
    Eth191/1/8  Down  Eth1/21
    Eth191/1/9  Down  Eth1/21
    Eth191/1/10 Down  Eth1/21
    Eth191/1/11 Down  Eth1/21
    Eth191/1/12 Down  Eth1/21
    Eth191/1/13 Up    Eth1/21
    Eth191/1/14 Up    Eth1/21
  Logs:
    08/26/2013 14:42:02.726132: Module register received
    08/26/2013 14:42:02.728723: Registration response sent
    08/26/2013 14:42:02.892344: create module inserted event.
    08/26/2013 14:42:02.893229: Module Online Sequence
    08/26/2013 14:42:05.660279: Module Online
```

This example shows how to display the Fabric Extender interfaces pinned to a specific switch interface:

```
N5596-2-B22# show interface ethernet 1/21 fex-intf
Fabric          FEX
Interface       Interfaces
```

```

-----
Eth1/21      Eth191/1/1  Eth191/1/2  Eth191/1/3  Eth191/1/4
              Eth191/1/5  Eth191/1/6  Eth191/1/7  Eth191/1/8
              Eth191/1/9  Eth191/1/10 Eth191/1/11 Eth191/1/12
              Eth191/1/13 Eth191/1/14
N5596-2-B22#

```

This example shows how to display the switch interfaces that are connected to a Fabric Extender uplink:

```

N5596-2-B22# show inter fex-fabric

```

Fex	Fabric Port	Fabric Port State	Fex Uplink	FEX Model	Fex Serial
191	Eth1/21	Active	1	N2K-B22IBM-P	FOC1730R0XQ
192	Eth1/22	Active	1	N2K-B22IBM-P	FOC1730R0XM
193	Eth1/23	Active	1	N2K-B22IBM-P	FOC1730R0WU
194	Eth1/24	Active	1	N2K-B22IBM-P	FOC1720R0VV
192	Eth1/26	Active	2	N2K-B22IBM-P	FOC1730R0XM
193	Eth1/27	Active	3	N2K-B22IBM-P	FOC1730R0WU



Note

The above example shows a Fabric Extender with four uplink connections.

This example shows how to display the SFP+ transceiver and diagnostic optical monitoring (DOM) information for Fabric Extender uplinks:

```

switch# show interface ethernet 1/40 transceiver
Ethernet1/40
  sfp is present
  name is CISCO-EXCELIGHT
  part number is SPP5101SR-C1
  revision is A
  serial number is ECL120901AV
  nominal bitrate is 10300 Mbits/sec
  Link length supported for 50/125mm fiber is 82 m(s)
  Link length supported for 62.5/125mm fiber is 26 m(s)
  cisco id is --
  cisco extended id number is 4

switch# show interface ethernet 1/40 transceiver fex-fabric
Ethernet1/40
  sfp is present
  name is CISCO-EXCELIGHT
  part number is SPP5101SR-C1
  revision is A
  serial number is ECL120601U0
  nominal bitrate is 10300 Mbits/sec
  Link length supported for 50/125mm fiber is 82 m(s)
  Link length supported for 62.5/125mm fiber is 26 m(s)
  cisco id is --
  cisco extended id number is 4

```



Note

The first **show** command above shows the SFP+ transceiver that is plugged into the parent switch interface. The second **show** command displays the SFP+ transceiver that is plugged into the uplink port on the Fabric Extender.

Displaying Chassis Management Information

To display configuration information used on the switch supervisor to manage the Fabric Extender, perform one of these tasks:

Command	Purpose
switch# show diagnostic result fex chassis	Displays results from the diagnostic test for a Fabric Extender chassis.
switch# show inventory fex chassis	Displays inventory information for a Fabric Extender chassis.
switch# show module fex chassis	Displays module information about a Fabric Extender chassis.

This example shows how to display the module information about all connected Fabric Extender units:

```
N5596-2-B22# show module fex
FEX Mod Ports Card Type                               Model                               Status
-----
191 1 14 Fabric Extender 14x10GE + 8x10G Module N2K-B22IBM-P present
192 1 14 Fabric Extender 14x10GE + 8x10G Module N2K-B22IBM-P present
193 1 14 Fabric Extender 14x10GE + 8x10G Module N2K-B22IBM-P present
194 1 14 Fabric Extender 14x10GE + 8x10G Module N2K-B22IBM-P present

FEX Mod Sw                Hw                World-Wide-Name(s) (WWN)
-----
191 1 6.0(2)N2(1a) 0.301 --
192 1 6.0(2)N2(1a) 0.301 --
193 1 6.0(2)N2(1a) 0.301 --
194 1 6.0(2)N2(1a) 0.202 --

FEX Mod MAC-Address(es)                               Serial-Num
-----
191 1 f84f.57ce.3640 to f84f.57ce.364d FOC1730R0XQ
192 1 f84f.57ce.34c0 to f84f.57ce.34cd FOC1730R0XM
193 1 f84f.57ce.2d40 to f84f.57ce.2d4d FOC1730R0WU
194 1 0c27.2408.0ac0 to 0c27.2408.0acd FOC1720R0VV

N5596-2-B22# show module fex 191
FEX Mod Ports Card Type                               Model                               Status
-----
191 1 14 Fabric Extender 14x10GE + 8x10G Module N2K-B22IBM-P present

FEX Mod Sw                Hw                World-Wide-Name(s) (WWN)
-----
191 1 6.0(2)N2(1a) 0.301 --

FEX Mod MAC-Address(es)                               Serial-Num
-----
191 1 f84f.57ce.3640 to f84f.57ce.364d FOC1730R0XQ
N5596-2-B22#
```

This example shows how to display the inventory information about a specific Fabric Extender unit:

```
N5596-2-B22# show inventory fex 191
NAME: "FEX 191 CHASSIS", DESCR: "N2K-B22IBM-P CHASSIS"
PID: N2K-B22IBM-P , VID: V00 , SN: FOC1730R0XQ
```



```
NAME: "FEX 191 Module 1", DESCR: "Fabric Extender Module: 14x10GE, 8x10GE Supervisor"
PID: N2K-B22IBM-P , VID: V00 , SN: FOC17292T02
```

```
N5596-2-B22#
```

This example shows how to display diagnostic test results for a specific Fabric Extender unit:

```
N5596-2-B22# show diagnostic result fex 191
FEX-191: Fabric Extender 14x10GE + 8x10G Module SerialNo : FOC1730R0XQ
Overall Diagnostic Result for FEX-191 : OK
```

```
Test results: (. = Pass, F = Fail, U = Untested)
```

```
TestPlatform:
```

```
0)          SPROM: -----> .
1) Inband interface: -----> .
2)          Fan: -----> U
3)          Power Supply: -----> U
4) Temperature Sensor: -----> .
```

```
Eth  1  2  3  4  5  6  7
Port -----
. . . . .
```

```
Eth  8  9 10 11 12 13 14
Port -----
. . . . .
```

```
TestFabricPorts:
```

```
Fabric 1  2  3  4  5  6  7  8
Port -----
. . . . .
```

```
N5596-2-B22#
```

This example shows how to display the environment status for a specific Fabric Extender unit:

```
switch(config-fex)# show environment fex 100
Temperature Fex 100:
```

Module	Sensor	MajorThresh (Celsius)	MinorThres (Celsius)	CurTemp (Celsius)	Status
1	Outlet-1	85	75	39	ok
1	Outlet-2	85	75	48	ok
1	Inlet-1	85	75	36	ok
1	Inlet-2	85	75	27	ok
1	Die-1	110	105	55	ok

```
switch(config-fex)#
```

This example shows how to display the SPROM for a specific Fabric Extender unit:

```
N5596-2-B22#
N5596-2-B22# show sprom fex 191 all
DISPLAY FEX 191 SUP sprom contents
Common block:
Block Signature : 0xabab
Block Version   : 3
Block Length    : 160
Block Checksum  : 0x17c3
EEPROM Size     : 65535
Block Count     : 3
FRU Major Type  : 0x6002
FRU Minor Type  : 0x0
OEM String      : Cisco Systems, Inc.
Product Number  : N2K-B22IBM-P
Serial Number   : FOC17292T02
```

```

Part Number      : 73-15000-03
Part Revision    : 03
Mfg Deviation    : 0
H/W Version      : 0.301
Mfg Bits         : 0
Engineer Use     : 0
snmpOID         : 9.12.3.1.9.78.16.0
Power Consump    : 625
RMA Code         : 0-0-0-0
CLEI Code        : CMUCAEKBA
VID              : V00
Supervisor Module specific block:
Block Signature  : 0x6002
Block Version    : 2
Block Length     : 103
Block Checksum   : 0x25f3
Feature Bits     : 0x0
HW Changes Bits  : 0x0
Card Index       : 11075
MAC Addresses    : 00-00-00-00-00-00
Number of MACs   : 0
Number of EPLD  : 0
Port Type-Num    : 1-8
Sensor #1        : 80,65
Sensor #2        : 80,65
Sensor #3        : 65,50
Sensor #4        : 65,50
Sensor #5        : -128,-128
Sensor #6        : -128,-128
Sensor #7        : -128,-128
Sensor #8        : -128,-128
Max Connector Power: 625
Cooling Requirement: 9
Ambient Temperature: 40

```

DISPLAY FEX 191 backplane sprom contents:

```

Common block:
Block Signature  : 0xabab
Block Version    : 3
Block Length     : 160
Block Checksum   : 0x1746
EEPROM Size      : 65535
Block Count      : 5
FRU Major Type   : 0x6001
FRU Minor Type   : 0x0
OEM String       : Cisco Systems, Inc.
Product Number   : N2K-B22IBM-P
Serial Number    : FOC1730R0XQ
Part Number      : 68-5034-01
Part Revision    : 09
Mfg Deviation    : 0
H/W Version      : 0.301
Mfg Bits         : 0
Engineer Use     : 0
snmpOID         : 9.12.3.1.3.1339.0.0
Power Consump    : 0
RMA Code         : 0-0-0-0
CLEI Code        : CMUCAEKBA
VID              : V00
Chassis specific block:
Block Signature  : 0x6001
Block Version    : 3
Block Length     : 39
Block Checksum   : 0x3ad

```



```

OEM String      :
Product Number  :
Serial Number   :
Part Number     :
Part Revision   :
Mfg Deviation   :
H/W Version    : 0.0
Mfg Bits       : 0
Engineer Use    : 0
snmpOID        : 0.0.0.0.0.0.0.0
Power Consump   : 0
RMA Code       : 0-0-0-0
CLEI Code      :
VID            : V00
Supervisor Module specific block:
Block Signature : 0x0
Block Version   : 0
Block Length    : 0
Block Checksum  : 0x0
Feature Bits    : 0x0
HW Changes Bits : 0x0
Card Index      : 0
MAC Addresses   : 00-00-00-00-00-00
Number of MACs  : 0
Number of EPLD  : 0
Port Type-Num   : 0-0
Sensor #1       : 0,0
Sensor #2       : 0,0
Sensor #3       : 0,0
Sensor #4       : 0,0
Sensor #5       : 0,0
Sensor #6       : 0,0
Sensor #7       : 0,0
Sensor #8       : 0,0
Max Connector Power: 0
Cooling Requirement: 0
Ambient Temperature: 0
N5596-2-B22#
    
```

Verifying the Configuration

To verify the configuration,

1. Locate the LEDs.
2. Check the LEDs and refer to the indicators described in the following table.

Item	Description	Indicators
1	UID LED—Helps locate a specific module in the Flex System, such as for replacement.	Off
2	Health LED—Indicates normal operation.	Steady green light

Additional Information

For more information on the association between the network adapters and the chassis interconnect bays, see the setup and installation guide provided with your chassis. For more information see the IBM websites:

- <http://pic.dhe.ibm.com/infocenter/flexsys/information/index.jsp>

Documentation for Cisco Nexus 5000 Series Switches is available at the following URL:
http://www.cisco.com/en/US/products/ps9670/tsd_products_support_series_home.html

Documentation for the Cisco Nexus 2000 Series Fabric Extenders is available at the following URL:
http://www.cisco.com/en/US/products/ps10110/tsd_products_support_series_home.html

Technical Support

Technical support for the Cisco Nexus B22 Fabric Extender for IBM Flex System can be obtained from either Cisco or IBM. This topic includes the following sections:

- [For IBM Support, page 19](#)
- [For Cisco Support, page 19](#)

For IBM Support

For hardware replacement under warranty, contact IBM.

For support information, see the IBM support and downloads page at:
<http://pic.dhe.ibm.com/infocenter/flexsys/information/index.jsp>

IBM offers country specific support. Use the country selector on the IBM support and downloads page to find support or contact information.

For contact options in the United States, see <http://www.ibm.com/us/support/>.

To contact IBM by phone call 1-888-IBM. This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.

For Cisco Support

For configuration or troubleshooting assistance, the Cisco Nexus B22 Fabric Extender for IBM is covered under the Cisco support contract of the parent Cisco Nexus switch.

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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Appendix A. Parts listing

Replaceable components are of three types:

- **Tier 1 customer replaceable unit (CRU):** Replacement of Tier 1 CRUs is your responsibility. If IBM installs a Tier 1 CRU at your request, you will be charged for the installation.
- **Tier 2 customer replaceable unit (CRU):** You may install a Tier 2 CRU yourself or request IBM to install it, at no additional charge, under the type of warranty service that is designated for your server.
- **Field replaceable unit (FRU):** FRUs must be installed only by trained service technicians.

For information about the terms of the warranty, see the Warranty Information document.

The replaceable components in the following table are Tier 1 CRUs. If other components require replacement, see the documentation that came with those devices for instructions.

Table 1.

Part	CRU number (Tier 1)
Cisco Nexus B22 Fabric Extender for IBM Flex System	94Y5353
FET for the Cisco Nexus B22 Fabric Extender for IBM Flex System	94Y5367

Appendix B. Notices

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Particulate contamination

Attention: Airborne particulates (including metal flakes or particles) and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the device that is described in this document.

Risks that are posed by the presence of excessive particulate levels or concentrations of harmful gases include damage that might cause the device to malfunction or cease functioning altogether. This specification sets forth limits for particulates and gases that are intended to avoid such damage. The limits must not be viewed or used as definitive limits, because numerous other factors, such as temperature or moisture content of the air, can influence the impact of particulates or environmental corrosives and gaseous contaminant transfer. In the absence of specific limits that are set forth in this document, you must implement practices that maintain particulate and gas levels that are consistent with the protection of human health and safety. If IBM determines that the levels of particulates or gases in your environment have caused damage to the device, IBM may condition provision of repair or replacement of devices or parts on implementation of appropriate remedial measures to mitigate such environmental contamination. Implementation of such remedial measures is a customer responsibility.

Table 2. Limits for particulates and gases

Contaminant	Limits
Particulate	<ul style="list-style-type: none">• The room air must be continuously filtered with 40% atmospheric dust spot efficiency (MERV 9) according to ASHRAE Standard 52.2¹.• Air that enters a data center must be filtered to 99.97% efficiency or greater, using high-efficiency particulate air (HEPA) filters that meet MIL-STD-282.• The deliquescent relative humidity of the particulate contamination must be more than 60%².• The room must be free of conductive contamination such as zinc whiskers.
Gaseous	<ul style="list-style-type: none">• Copper: Class G1 as per ANSI/ISA 71.04-1985³• Silver: Corrosion rate of less than 300 Å in 30 days
<p>¹ ASHRAE 52.2-2008 - <i>Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size</i>. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.</p> <p>² The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.</p> <p>³ ANSI/ISA-71.04-1985. <i>Environmental conditions for process measurement and control systems: Airborne contaminants</i>. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.</p>	

Telecommunication regulatory statement

This product may not be certified in your country for connection by any means whatsoever to interfaces of public telecommunications networks. Further certification may be required by law prior to making any such connection. Contact an IBM representative or reseller for any questions.

Electronic emission notices

When you attach a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices that are supplied with the monitor.

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that might cause undesired operation.

Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Australia and New Zealand Class A statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a nonrecommended modification of the product, including the fitting of non-IBM option cards.

Attention: This is an EN 55022 Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Responsible manufacturer:

International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
914-499-1900

European Community contact:

IBM Deutschland GmbH
Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Telephone: +49 7032 15 2941
Email: lugi@de.ibm.com

Germany Class A statement

Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

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Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten

Dieses Produkt entspricht dem Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG). Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:

International Business Machines Corp.
New Orchard Road
Armonk, New York 10504
914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:

IBM Deutschland GmbH
Technical Regulations, Abteilung M372
IBM-Allee 1, 71139 Ehningen, Germany
Telephone: +49 7032 15 2941
Email: lugi@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

Japan VCCI Class A statement

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI-A

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case the user may be required to take corrective actions.

Korea Communications Commission (KCC) statement

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This is electromagnetic wave compatibility equipment for business (Type A). Sellers and users need to pay attention to it. This is for any areas other than home.

Russia Electromagnetic Interference (EMI) Class A statement

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People's Republic of China Class A electronic emission statement

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声明
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Part Number: 47C9166

(1P) P/N: 47C9166

