

IBM Flex System FC3171 8 Gb SAN Switch and Pass-thru



Installation and User's Guide

IBM Flex System FC3171 8 Gb SAN Switch and Pass-thru



Installation and User's Guide

Note: Before using this information and the product it supports, read the general information in Appendix B, "Notices, on page 43, the *IBM Safety Information and Environmental Notices and User Guide* documents on the *IBM Flex System Notices for Network Devices* CD, and the *Warranty Information* document that comes with the product.

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Contents

Safety	vii
Chapter 1. The IBM Flex System FC3171 8 Gb SAN Switch	1
Features, specifications, and standards	4
Related documentation	8
Inventory checklist	10
Notices and statements in this document	10
Major components of the switch	11
Chapter 2. Installing, removing, replacing, and enabling a switch	13
Switch preinstallation checklist	13
Network adapter requirements	14
Installation guidelines	15
System reliability guidelines	15
Handling static-sensitive devices	16
Installing a switch	16
Enabling the switch and its external ports	17
Chapter 3. Information panel LEDs and external Fibre Channel ports	19
Information panel and internal connectors	19
Information LEDs	20
LED states and colors	21
System status LEDs	22
Fibre Channel external port status LEDs	22
Ethernet port LEDs	23
LED activities and diagnostic flash patterns	23
Chapter 4. Configuring the switch through an SSH interface	25
Connecting to the switch	26
Accessing the switch through a terminal emulator program	26
Accessing the switch directly	27
Switch Ethernet connection	27
Switch serial connection	29
CLI command format	30
Chapter 5. Configuring the switch through the QuickTools Web interface	31
Connecting to the switch	32
Establishing a Web-interface session through a Web browser	32
Chapter 6. Parts listing	35
Chapter 7. Solving problems	37
Running POST	37
POST errors	37
Troubleshooting checklist	38

Appendix A. Getting help and technical assistance.	41
Before you call	41
Using the documentation	41
Getting help and information from the World Wide Web	41
Software service and support	42
Hardware service and support	42
IBM Taiwan product service	42
Appendix B. Notices	43
Trademarks	44
Important notes	44
Documentation format	45
Electronic emission notices	45
Index	49

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 přečtete 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.

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.

Important:

Each caution and danger statement in this document 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 document before you perform the procedures. Read any additional safety information that comes with the server or optional device before you install the device.

This device is intended for use with UL Listed IBM devices.

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 3:



CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:



DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.



Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil À Laser de Classe 1

Statement 8:



CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

UL regulatory information

This device is for use only with listed IBM Flex System Enterprise chassis.

Chapter 1. The IBM Flex System FC3171 8 Gb SAN Switch

This *Installation and User's Guide* contains the following instructions and information:

- Installing, removing, and replacing the IBM Flex System FC3171 8 Gb SAN Switch
- Enabling the switch and its external ports
- Using the information panel, LEDs, and external ports on the switch
- Configuring the switch through an SSH interface
- Configuring the switch through a Web browser interface
- Upgrading and expanding the functionality of the switch
- Performing basic troubleshooting tasks and solving problems with the switch
- Getting help, service, and technical assistance

Note:

- Throughout this document, including the references to screen contents, the IBM Flex System FC3171 8 Gb SAN Switch is generically referred to as the switch. With respect to certain screen contents or titles, a switch might be referred to as a switch module or switch, because the term switch module or switch appears on those screens. A switch in transparent mode is referred to as a pass-thru module.
- Unless otherwise stated, references to the IBM Flex System Enterprise Chassis apply to all chassis that support the switch. At the time of publication, the following devices are examples of applicable IBM Flex System chassis:
 - IBM Flex System type 8721
 - IBM Flex System type 8724
 - IBM Flex System type 8725
- Unless otherwise stated, references to the compute node apply to all compute nodes that support the switch and expansion card.
- The illustrations in this document might differ slightly from your hardware.
- The screens that are described or referred to in this document might differ from the screens that are displayed by your system. Screen content varies according to the type of IBM Flex System chassis and the firmware versions and optional devices that are installed.
- Unless otherwise stated, references to the management module apply only to the IBM Flex System Chassis Management Module (CMM), which is the only type of management module that supports the switch.

The IBM Flex System FC3171 8 Gb Pass-thru supports a fully interoperable solution for seamless integration of the Fibre Channel initiators to an existing fabric. The pass-thru module uses industry-standard N_Port ID virtualization (NPIV) technology to provide a cost-effective connectivity solution for the IBM Flex System chassis.

The pass-thru module is a Fibre Channel component that contains the following 20 ports:

- Fourteen internal transparent host (TH) ports to connect to the blade-server bays in the IBM Flex System chassis
- Six external transparent fabric (TF) Fibre Channel user ports to connect to external Fibre Channel switches

The IBM Flex System FC3171 8 Gb SAN Switch is a full-fabric Fibre Channel component with expanded functionality. The SAN switch supports a higher speed switch for IBM Flex System configurations and offers scalability in external-SAN size and complexity, and enhanced system-management capabilities.

The full-fabric SAN switch has the following ports:

- Fourteen internal ports to connect to the blade-server bays in the IBM Flex System chassis
- Six external Fibre Channel user ports to connect to external Fibre Channel devices or switches

Note:

For additional information about the ports, see “Features, specifications, and standards” on page 4 and Chapter 3, “Information panel LEDs and external Fibre Channel ports” on page 19.

You can manage and configure the switch through multiple interfaces.

- An SSH connection to the embedded command-line interface (CLI). For additional information, see Chapter 4, “Configuring the switch through an SSH interface” on page 25.
- A Web browser (QuickTools) interface. For additional information, see Chapter 5, “Configuring the switch through the QuickTools Web interface” on page 31.

For additional information about the ports, see Chapter 3, “Information panel LEDs and external Fibre Channel ports” on page 19.

For installation details, see Chapter 2, “Installing, removing, replacing, and enabling a switch” on page 13. For details about the status of the switch and its external ports and network connections, see Chapter 3, “Information panel LEDs and external Fibre Channel ports” on page 19. For additional information about switches and other IBM Flex System chassis components, see the IBM Flex System chassis documentation that comes with these devices.

To support each switch that you install in the IBM Flex System chassis, you must also install a compatible network adapter in each compute node that you want to communicate with the switch. In this environment, the network adapter operates as a host bus adapter (HBA). For additional information, see “Network adapter requirements” on page 14.

The following types of optional devices are compatible with the IBM Flex System FC3171 8 Gb SAN Switch:

- Fibre Channel network adapters
- 8 Gb SFP+ Short Wave Optic Transceiver, also known as an SFP+ module or short wave optical transceiver

You can obtain up-to-date information about the IBM Flex System FC3171 8 Gb SAN Switch and other IBM products at <http://www.ibm.com/systems/support/>.

At <http://www.ibm.com/support/mysupport/>, you can create a personalized support page by identifying IBM products that are of interest to you. From this personalized page, you can subscribe to weekly e-mail notifications about new technical documents, search for information and downloads, and access various administrative services.

If firmware and documentation updates are available, you can download them from the IBM Web site. To check for updates, complete the following steps:

1. Go to www.ibm.com.
2. Click **Support & downloads**.
3. Click **Fixes, updates, and drivers**, and then follow the instructions.

Note:

- Changes are made periodically to the IBM Web site. Procedures for locating firmware and documentation might vary slightly from what is described in this document.
- Contact your IBM marketing representative or authorized reseller for information about the types of compatible IBM Flex System chassis, compute nodes, network adapters, and optional compatible devices for the switches, IBM Flex System chassis, and compute nodes.
- See <http://www.ibm.com/servers/eserver/serverproven/compat/us/> for a list of supported IBM Flex System chassis, compute nodes, network adapters, and optional compatible devices for the switches, IBM Flex System chassis, and compute nodes.
- For details about installation, configuration, and use of compatible devices, see the documentation that comes with these devices.
- This document might contain references or links to other companies' Web sites, also known as non-IBM Web sites. As of the date of this document, the addresses of non-IBM Web sites are correct. However, these addresses might be updated after this document has been published. Certain conditions apply to the use of non-IBM Web sites. For additional information, see Appendix B, "Notices" on page 43.
- Do not mix SAN switches and pass-thru modules in the same IBM Flex System chassis.
- You can find detailed hardware and software information, including documentation, about IBM products at <http://publib.boulder.ibm.com/infocenter/systems/index.jsp>.
- You can find detailed hardware and software information, including documentation, about IBM Flex System devices at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>

Enter information about the switch in Table 1. You can find this information on the labels on the switch. For an illustration of the locations of these labels, see “Major components of the switch” on page 11. You will need this information when you register the switch with IBM. You can register the switch at <http://www.ibm.com/support/mysupport/>. The product name and serial number are required for registration. Depending on the type of product, additional information might be required for registration.

Table 1. Product information

Product Name	IBM Flex System FC3171 8 Gb SAN Switch
Model Number	
Serial Number	
Worldwide Name	
Note: The worldwide name (WWN) is on the same label as the media access control (MAC) address.	
Media access control (MAC) address 1	
Other MAC Addresses	

If you participate in the IBM client reference program, you can share information about your use of technology, best practices, and innovative solutions; build a professional network; and gain visibility for your business. For more information about the IBM client reference program, see <http://www.ibm.com/ibm/clientreference/>.

Features, specifications, and standards

This section summarizes the features, specifications, and standards that apply to the switch. The switch has the following features:

- **Firmware installation**
Use the QuickTools Web interface or CLI to install and activate new firmware.
- **Support for Non-Disruptive Code Load Activation (NDCLA)**
- **Registered State Change Notification (RSCN)**
The switch supports RSCN as described in FC-FLA. RSCN enables an agent to register for change events in the fabric and attached devices.
- **Interoperability**
The switch supports standards-based FC-SW2 interoperability. Fibre Channel switches that connect to the switch external ports must support NPIV.
- **Transparent mode**
The pass-thru module is a 20-port Fibre Channel NPIV switch with 6 external ports and 14 internal ports. The pass-thru module concentrates multiple compute nodes into the external ports. The external ports connect to external Fibre Channel switches that support NPIV. The internal ports connect directly to compute nodes through the enclosure backplanes.

The pass-thru module presents one or more compute nodes per port to the fabric. The pass-thru module expands the fabric, but, unlike a full fabric switch, it does not count against the fabric domain.

Note: A node port is also known as an N_port.

- Error detection

The switch supports the following error-detection methods:

- Cyclic redundancy check (CRC)
- 8-byte and 10-byte conversion
- Parity
- Long frame and short frame
- D_ID mismatch
- S_ID mismatch

- Frame bundling

The switch supports the following frame bundling methods:

- No frame bundling. Frames are intermixed from different sources at will.
- Soft lockdown. The switch waits for the sequence to be completed or a gap in the frame traffic to occur before it services requests from a different port.

- Configurable Fabric Address Notification (FAN)

A FAN, as described in FC-FLA, is sent out by the fabric after an initialization event (usually a loop initialization port) to each attached NL_Port. The purpose of the FAN is to inform the attached NL_Ports of the fabric node name, port name, and fabric address.

- Support for Call Home function
- Support for Domain Name Service (DNS)
- Support for Internet protocol (IP) Version 4
- Support for Internet protocol (IP) Version 6
- Support for Internet protocol security (IPsec)
- Support for separate trap community strings for each trap address
- Support for Simple Network Management Protocol (SNMP) Version 3
- Support for vital product data (VPD)

Table 2 contains a summary of the specifications, standards, and protocols that apply to the switch.

Table 2. Switch specifications, standards, and protocols

Fibre Channel standards:

- C-PH version 4.3
- FC-PH-2
- FC-PH-3
- FC-AL version 4.5
- FC-AL-2 Rev 7.0
- FC-FLA
- FC-GS-3
- FC-FG
- FC-PLDA
- FC-Tape
- FC-VI
- FC-SW-2
- Fibre Channel Element MIB RFC 2837
- Fibre Alliance MIB version 4.0

Fibre Channel protocols:

- Fibre Channel service classes: Class 2 and class 3
- Operation modes: Fibre Channel class 2 and class 3, connectionless
- External port type:
 - Full-fabric mode: Generic loop port (GL_port)
 - Transparent mode: Transparent fabric port (TF_Port)
- Internal port type:
 - Full fabric mode: Fabric port (F_port)
 - Transparent mode: Transparent host port/NPIV mode (TH_port)
 - Support for up to 255 host NPIV logins
- Port characteristics:
 - External ports are automatically detected and self configuring
 - Port LEDs illuminate at startup
 - Number of Fibre Channel ports: 6 external ports and 14 internal ports
 - Scalability: Up to 239 switches (maximum) depending on your configuration
 - Buffer credits: 16 buffer credits per port
 - Maximum frame size: 2148 bytes (2112 byte payload)
 - Standards-based FC FC-SW2 Interoperability
 - Support for up to a 255-to-1 port-mapping ratio
 - Media type: Small form-factor pluggable plus (SFP+) module
 - System processor: PowerPC®
 - Fabric point-to-point bandwidth: 2, 4, or 8 Gbps at full duplex
 - Non-blocking architecture to prevent latency
 - Fabric Latency: Less than 4 ms
 - 2 Gb port speed 2.125 Gbps: 200 MBps full duplex
 - 4 Gb port speed 4.250 Gbps: 400 MBps full duplex
 - 8 Gb port speed 8.500 Gbps: 800 MBps full duplex
 - Aggregate switch fabric bandwidth (2, 4, 8 Gb): 80, 160, 320 GBps
 - Maximum frame size: 2148 bytes (2112 byte payload)

Table 2. Switch specifications, standards, and protocols (Continued)

<p>Switch maintainability:</p> <ul style="list-style-type: none">• Diagnosis: Power-on self-test (POST) is performed on all functional components except the SFP or SFP+ module. Port operational tests include internal, external, and online tests.• User interface: Light-emitting diode (LED) indicators <p>Fabric management:</p> <ul style="list-style-type: none">• Management methods:<ul style="list-style-type: none">— Command line interface through SSH (default) or Telnet— QuickTools Web interface• Switch simple network management protocol (SNMP) version 3 agent: Enables a network management workstation to receive configuration values, traffic information, and Fibre Channel failure data through SNMP and the Ethernet interface• Ethernet connection: RJ-45 connector; 10/100 Base-T cable• Serial connection: RS-232, USB Type B connector, null-modem FF USB-to-DB9 cable <p>Dimensions:</p> <ul style="list-style-type: none">• Width: 401.6 mm (15.81 in.)• Height: 30.0 mm (1.18 in.)• Depth: 316.7 mm (12.47 in.)• Weight: 3.0 kg (6.60 lb) <p>Environmental:</p> <p>See the documentation that came with your IBM chassis for information about the environmental conditions and specifications that are supported by the system.</p> <p>Switch regulatory certifications:</p> <ul style="list-style-type: none">• Electrical:<ul style="list-style-type: none">— Power source loading: 3.75 amps maximum at 12 V dc— Heat output: 35 watts maximum— Operating voltage: 12 V dc— Circuit protection: Internally fused• Emissions standards:<ul style="list-style-type: none">— FCC Title 47 CFR Part 15 Subpart B Class A (USA)— VCCI Class A ITE, April 2003 (Japan)— ICES-003 issue 3 (Canada)— A4EN55022 level A (EC)— Voltage fluctuations: EN 61000-3-3— Harmonics: EN 61000-3-2— Immunity: EN55024: 1998— C-Tick - AS/NZS CISPR 22 (Australia/New Zealand)— CE Mark - EN55022:1998 + A2:2003 and EN55024:1998 + A1:2001 + A2:2003— MIC Notice No. 2001-115 and No. 2001-116 (Korea)— GOST 29216-91 (Russia)— CISPR 22 Class A— BSMI CNS 13438 (Taiwan)— Communique No. 2004/9 and No. 2004/22 (Turkey)— EMC.CVG, 28 October 2002 (Saudi Arabia)— GB 9524:1998 (China)
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Related documentation

This *User's Guide* contains instructions for setting up, installing, removing, configuring, and troubleshooting the switch. This document also contains general information about the switch and information about upgrading and expanding the capabilities of the switch. Follow the instructions in this *Installation and User's Guide* after you read the *IBM Important Notices* document that comes with the switch.

Note: The most recent versions of this *Installation and User's Guide* and all other IBM Flex System documentation are on the IBM Flex Manager management node and at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.

Before you install your system, read the following documents that come with your IBM Flex System product.

- *IBM Important Notices*

Read this document before you install the switch in the IBM Flex System chassis. This document contains the legally required notices that must ship in printed format.

- *IBM Warranty Information*

Read this document before you install the switch in the IBM Flex System chassis. This document contains product warranty information in print format.

The following documentation contains important, useful information to help you with the setup, installation, configuration, operation, and troubleshooting processes for these devices. This documentation is preloaded on the IBM Flex System Manager management node and is also available at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>:

- IBM Flex System network device *User's Guides*

Each type of network adapter has a customized *Installation and User's Guide* that contains detailed information about the expansion card, which is compatible with the 8 Gb switches. These switches contain connectors for the compute nodes in which the network adapter is installed.

- *IBM Flex System Enterprise Chassis Installation and Service Guide*

Each type of IBM Flex System chassis has a customized *Installation and Service Guide*.

- IBM Flex System compute node *Installation and Service Guides*

Each type of compute node has a customized *Installation and Service Guide*.

- *IBM Notices for Network Devices CD*

This CD ships with networking products (adapters, switches, and pass-thru modules). It contains license documentation and the following documents:

- *IBM Safety Information*

This multilingual document contains translated versions of the caution and danger statements that appear in the documentation for your server. Each caution and danger statement has an assigned number, which you can use to locate the corresponding statement in your language.

- *IBM Environmental Notices and User's Guide*

- *IBM Flex System Basic Troubleshooting Information for Network Devices*

- *IBM Flex System FC3171 8 Gb SAN Switch Command Line Interface User's Guide*

This document explains how to manage the SAN switch using the CLI.

- *IBM Flex System FC3171 8 Gb Pass-thru Command Line Interface User's Guide*
This document explains how to manage the pass-thru module using the CLI.
- *IBM Flex System FC3171 8 Gb SAN Switch QuickTools User's Guide*
This document explains how to manage the SAN switch using the QuickTools application.
- *IBM Flex System FC3171 8 Gb Pass-thru QuickTools User's Guide*
This document explains how to manage the pass-thru module using the QuickTools application.
- *IBM Flex System FC3171 8 Gb SAN Switch and Pass-thru CIM Agent Reference Guide*
This document describes how the Common Interface Model (CIM) Agent functions as an implementation of the Storage Management Initiative (SMI)-Specification 1.1
- *IBM Flex System FC3171 8 Gb SAN Switch and Pass-thru Event Message Guide*
This document lists the event messages for the IBM Flex System FC3171 8 Gb SAN Switch
- *IBM Flex System FC3171 8 Gb SAN Switch and Pass-thru Simple Network Management Protocol Reference Guide*
This document describes the support for Simple Network Management Protocol (SNMP) and how to use SNMP to manage and monitor the IBM Flex System FC3171 8 Gb SAN Switch.

The updated IBM Flex System documentation is available on the IBM Flex System Manager management node and from the IBM Flex System Information Center at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.

Inventory checklist

Make sure that the shipping carton contains the following items:

- IBM Flex System FC3171 8 Gb SAN Switch or IBM Flex System FC3171 8 Gb Pass-thru
- *IBM Warranty Information*
- *IBM Important Notices* document
- License documentation
- *IBM Notices for Network Devices* CD, which contains the multilingual *IBM Safety Information*, *IBM Environmental Notices and User's Guide*, *IBM Flex System Basic Troubleshooting Information for Network Devices*, and some license documentation.

If any of these items are missing or damaged, contact your authorized reseller for replacement.

Notices and statements in this document

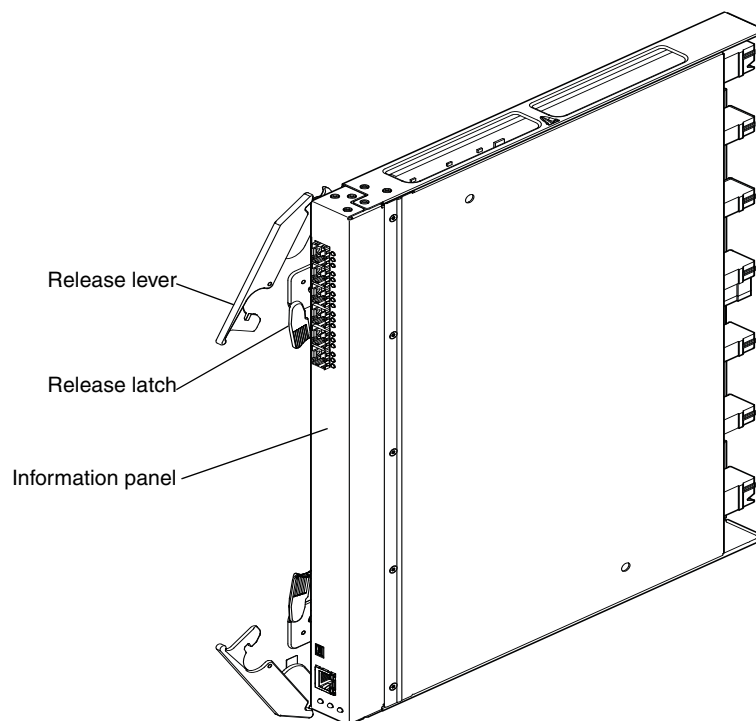
The caution and danger statements in this document are also in the multilingual *Safety Information* document, which is provided on the *IBM Notices for Network Device* CD. Each statement is numbered for reference to the corresponding statement in your language in the *Safety Information* document.

The following notices and statements are used in this document:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate potential damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Major components of the switch

The following illustration shows the major components of the switch.



Notes:

1. The illustrations in this document might differ slightly from your hardware.
2. Your switch might have labels that are not shown in the illustration. For example, the worldwide name (WWN) is on the same label as the media access control (MAC) address.

For more information about the components of the information panel, see Chapter 3, “Information panel LEDs and external Fibre Channel ports” on page 19. For more information about the MAC address, see the *IBM Flex System FC3171 8 Gb SAN Switch QuickTools User’s Guide* or the *IBM Flex System FC3171 8 Gb Pass-thru QuickTools User’s Guide* in the IBM Flex System Manager management node or at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.

Chapter 2. Installing, removing, replacing, and enabling a switch

This chapter provides instructions for installing, removing, replacing, and enabling a switch in the IBM Flex System chassis.

Switch preinstallation checklist

The following items are switch preinstallation requirements and considerations.

- Make sure that you are using IBM Flex System components that are compatible with the switches, IBM Flex System chassis, and compute nodes.

For a list of the types of supported IBM Flex System chassis, see Chapter 1, “The IBM Flex System FC3171 8 Gb SAN Switch” on page 1. See

<http://www.ibm.com/servers/eserver/serverproven/compat/us/> for a list of supported compute nodes, network adapters, and optional compatible devices.

Contact your IBM marketing representative or authorized reseller for information about the types of compatible IBM Flex System chassis, compute nodes, network adapters, and optional compatible devices for the switches, IBM Flex System chassis, and compute nodes.

For details about installation, configuration, and use of compatible devices, see the documentation that comes with these devices.

- Make sure that you are using the latest version of firmware code for the Chassis Management Module and all other IBM Flex System components.

If necessary, install the latest version of firmware code for the Chassis Management Module or other IBM Flex System components. To download the most recent firmware updates, go to <http://www.ibm.com/systems/support/> for the latest information about upgrading the firmware code for IBM Flex System components. The instructions are in the documentation that comes with the updates.

- Make sure that compatible Fibre Channel adapters are installed in the compute nodes or other blade devices that you want to communicate with the switches. For additional information about the network adapter requirements for switches, see “Network adapter requirements” on page 14.
- For details about switch bay requirements and bay locations, see the documentation for your IBM Flex System chassis, the compute nodes, and the applicable device.
- Configuration requirements for the switch and the IBM Flex System chassis may vary. You can obtain up-to-date information about the switch and the IBM Flex System chassis at <http://www.ibm.com/systems/support/>.
- The compute nodes or IBM Flex System chassis that are described or shown in this document might be different from your compute node or IBM Flex System chassis. For additional information, see the documentation that comes with your compute node or IBM Flex System chassis.
- If you encounter a problem with using the IBM Flex System components or during the switch installation procedure, see “Troubleshooting checklist” on page 38 for additional information.

Network adapter requirements

A compatible Fibre Channel adapter or host bus adapter (HBA) must be installed in each compute node or other blade device that you want to communicate with the switch. The following devices are examples of compatible network adapters for the switch:

For additional information about these network adapters, see the applicable *Installation and User's Guide* on the *Support CD* that comes with these products.

Network adapters determine the IBM Flex System chassis switch bays that can support each switch. The network adapter has two Fibre Channel ports. To enable the switch to communicate with a compute node or other blade device, at least one of the previously specified supported types of switches must be installed in the IBM Flex System chassis. For details about installation, configuration, and use of a network adapter, see the documentation that comes with the network adapter.

Table 3 summarizes the bay and port interconnections for each switch and network adapter. In this table, the bay numbers correspond to the switch bays in the IBM Flex System chassis. Installing a second switch enables a redundant path and a separate Fibre Channel connection from the compute node or other blade device to the external devices on the Fibre Channel network and SAN. Thus, the second switch port connection in Table 3 allows for dual paths from the compute node or other blade device to the external Fibre Channel devices.

Installing a second switch in the IBM Flex System chassis provides a backup switch in case one switch fails. You must install the second switch such that two switches occupy bays 1 and 2, or 3 and 4.

Table 3. Switch bay/expansion-card port correlation

Standard switch bay in IBM Flex System chassis	Fibre Channel switch function
1	Port 0 connection on the Fibre Channel network adapter in the IBM Flex System chassis
2	Port 1 connection on the Fibre Channel network adapter in the IBM Flex System chassis
3	Port 0 connection on the Fibre Channel network adapter in the IBM Flex System chassis
4	Port 1 connection on the Fibre Channel network adapter in the IBM Flex System chassis

For additional information about the applicable switch bays and expansion-card ports, see the documentation that comes with the IBM Flex System chassis and the network adapter.

Installation guidelines

Before you install the switch in the IBM Flex System chassis, consider the following information:

- Read the safety information that begins on page v, “Handling static-sensitive devices” on page 19, and the safety statements in the IBM Flex System chassis documentation. This information will help you work safely.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the compute node or IBM Flex System chassis, open or close a latch, and so on.
- Orange on a component or an orange label on or near a component on the switch, compute node, or IBM Flex System chassis indicates that the component can be hot-swapped, which means that if the IBM Flex System chassis and operating system support hot-swap capability, you can remove or install the component while the IBM Flex System chassis is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.
- You do not have to turn off the IBM Flex System chassis to install or replace any of the hot-swap modules on the rear of the IBM Flex System chassis.
- When you install a switch in the IBM Flex System chassis, you must also install a compatible I/O network adapter in the compute node to support the switch.
- When you are finished working on the compute node or IBM Flex System chassis, reinstall all safety shields, guards, labels, and ground wires.
- For a list of supported optional devices for the IBM Flex System chassis and other IBM products, see <http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

System reliability guidelines

To help ensure proper cooling, performance, and system reliability, make sure that the following requirements are met:

- Each of the switch bays on the rear of the IBM Flex System chassis contains either a switch or a filler switch.
- A removed hot-swap switch is replaced with an identical switch or filler switch within 1 minute of removal.
- A removed hot-swap compute node is replaced with another compute node or filler blade within 1 minute of removal.
- The ventilation areas on the sides of the compute node are not blocked.
- You have followed the reliability guidelines in the documentation that comes with the IBM Flex System chassis.

Cable requirements for the switch are described in the *IBM Configuration and Options Guide* at <http://www.ibm.com/servers/eserver/xseries/cog/>. See the documentation that comes with the compute node for cable-routing information.

Handling static-sensitive devices

Attention: Static electricity can damage the IBM Flex System chassis and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where it can be handled and damaged by others.
- While the device is still in its static-protective package, touch it (for at least two seconds) to an unpainted metal surface of the IBM Flex System chassis or an unpainted metal surface on any other grounded rack component in the rack where you are installing the device. This action drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the IBM Flex System chassis without setting down the device. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the IBM Flex System chassis or on a metal surface.
- Take additional care when you handle devices during cold weather. Heating reduces indoor humidity and increases static electricity.
- Some types of IBM Flex System chassis come with electrostatic discharge (ESD) connectors. If the IBM Flex System chassis is equipped with an ESD connector, see the documentation that comes with the IBM Flex System chassis for using the ESD connector.

Installing a switch

To determine which small form-factor pluggable plus (SFP+) modules and cables are required to connect the switch to other fabric or storage devices, see <http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/>.

To install a switch, see the installation instructions in the *IBM Flex System Enterprise Chassis Installation and Service Guide*, which is available at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.

Enabling the switch and its external ports

After you install a switch, the switch and its six external ports are enabled, and you are ready to configure the Fibre Channel fabric through the switch using the Chassis Management Module.

Note:

- For additional information about the management module and its configuration requirements, including the requirements for enabling ports, see the following documents at <http://www.ibm.com/systems/support/>:
 - *IBM Flex System Enterprise Chassis Installation and Service Guide*
 - *IBM Flex System Chassis Management Module Installation Guide*
 - *IBM Flex System Chassis Management Module User's Guide*
 - *IBM Flex System Chassis Management Module Command-Line Interface Reference Guide*
- The contents of all management-module Web-interface pages vary according to the type of IBM Flex System chassis that you are using and the firmware versions and optional devices that are installed.
- The 14 internal switch ports correspond to the connectors for the compute nodes that you can attach to the IBM Flex System chassis.
- For the location of the six external ports, see the illustrations in Chapter 3, “Information panel LEDs and external Fibre Channel ports” on page 19.

Chapter 3. Information panel LEDs and external Fibre Channel ports

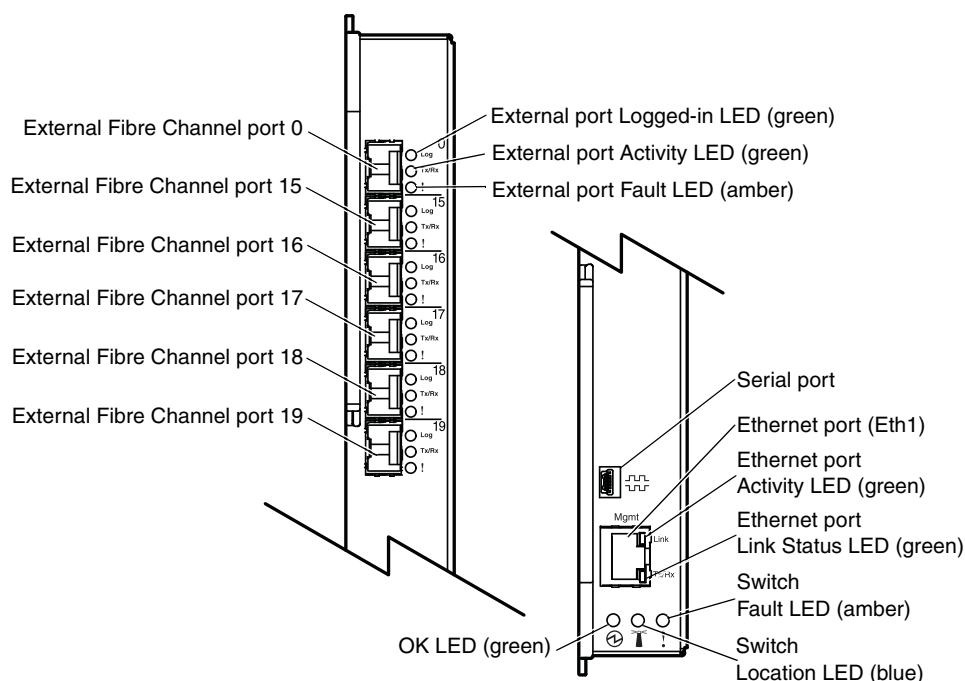
This chapter describes the information panel and LEDs on the switch and identifies the external Fibre Channel ports on the information panel. For additional information about the ports, see “Features, specifications, and standards” on page 4.

Note: The illustrations in this document might differ slightly from your hardware.

Information panel and internal connectors

The front panel of the switch contains the following components, as shown in the following illustration:

- Information LEDs that display the status of the switch and its network connections. For additional information, see “Information LEDs” on page 28.
- Six external Fibre Channel ports to connect Fibre Channel devices and switches. These ports are identified as ports 0, 15, 16, 17, 18, and 19 in the switch configuration menus and are labeled 0, 15, 16, 17, 18, and 19 (from top to bottom) on the switch.
- An RS-232 serial port provides a connection to a management workstation through a serial cable (null-modem F/F USB Type B to DB9) by which to manage the switch using the CLI.
- An RJ-45 Ethernet management port (Eth0) provides a connection to a management workstation through a 10/100 Base-T Ethernet cable. A management workstation can be a Windows® or a Linux® workstation. You can manage the switch over an Ethernet connection using the CLI, QuickTools, or SNMP.



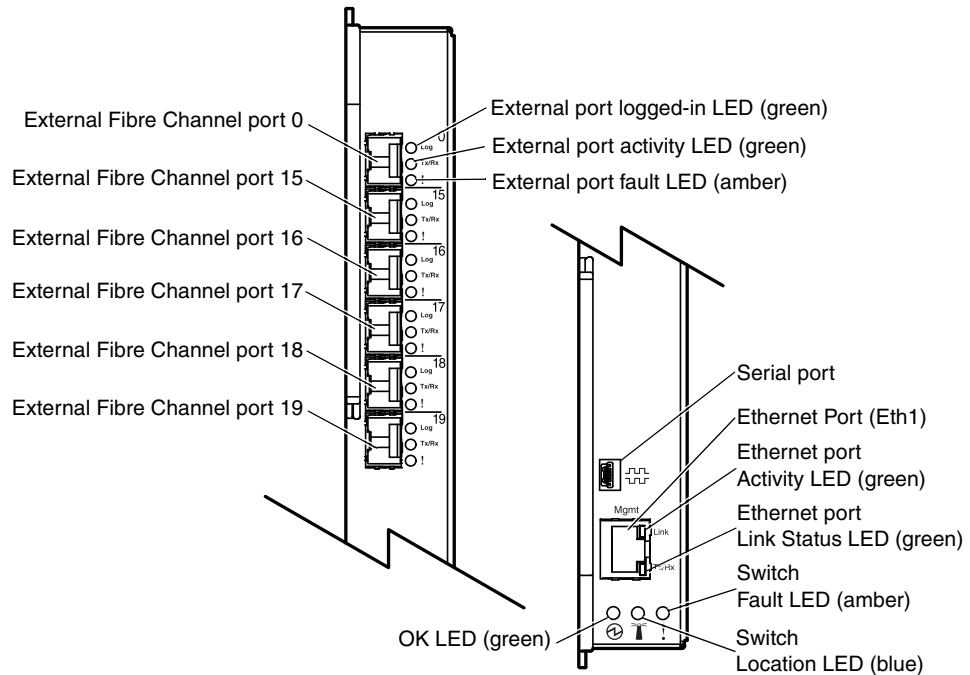
In the switch configuration menus, the internal connectors are numbered 1 through 14 on the pass-thru module and the full-fabric module.

Note:

- The information panel is also known as the front panel.
- In the pass-thru module, the internal ports are logically mapped to the external ports. Use the management tools to view and modify the default internal to external logical port mapping. For additional information, see the applicable management guide for your switch.

Information LEDs

The front panel of the switch has multiple sets of LEDs. The OK, Location, and ! (switch fault) LEDs at the bottom of the switch represent switch status. The other sets of LEDs represent the status of each external Fibre Channel port. The port LEDs are external port logged-in (LOG), external port activity (TX/RX), and external port fault (!). The Ethernet port LEDs represent the link status and activity of the Ethernet port. The following illustration shows the locations of these LEDs on the switch.



Note:

- An amber LED on the IBM Flex System chassis is lit when a system error or event has occurred. To identify the error or event, check the other LEDs on the switch, and check the chassis management-module event log or the switch system log.
- When the switch is turned on, an LED test occurs. All LEDs are lit and remain lit for approximately five seconds; then, all the LEDs except the OK LED turn off. The OK LED is lit at startup; then, POST proceeds.
- Before you can use the switch and its external ports, you must make sure that these devices are enabled. For additional information, see “Enabling the switch and its external ports” on page 17.

- If an external port on a SAN switch is disabled, the corresponding LED continues to flash synchronously until the port is enabled through the chassis management module, QuickTools, or the switch CLI.

For additional information about the chassis management module and enabling ports through the chassis management module, see the following documents at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>:

- *IBM Flex System Enterprise Chassis Installation and Service Guide*
- *IBM Flex System Chassis Management Module Installation Guide*
- *IBM Flex System Chassis Management Module User's Guide*
- For additional information about diagnostics, see the applicable documentation at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>:
 - *IBM Flex System Enterprise Chassis Installation and Service Guide*
 - *Problem Determination and Service Guide*
 - *Hardware Maintenance Manual and Troubleshooting Guide*
 - *IBM Flex System FC3171 8 Gb SAN Switch and Pass-thru Event Message Guide*
 - *IBM Flex System FC3171 8 Gb SAN Switch QuickTools User's Guide*
 - *IBM Flex System FC3171 8 Gb Pass-thru QuickTools User's Guide*

LED states and colors

After you install the switch in the IBM Flex System chassis, the switch LEDs become active. There are four possible LED states: off, lit, flickering, and flashing. The lit (steady) LEDs and flashing LEDs can be green, amber, or blue. A flickering LED can only be green.

The LEDs might display any of these states and colors during startup, POST, or other diagnostic tests. This behavior is typical and does not indicate a problem, unless the LEDs indicate a problem after all the startup (boot) processes and diagnostic tests have been completed.



- Any errors that are detected during POST are written to the system log. This log is accessible through the **show logging logfile** command in the switch CLI. For information about this command, see the applicable command-line interface guide at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>:
- For information about error messages, see the *IBM Flex System FC3171 8 Gb SAN Switch and Pass-thru Event Message Guide* at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>:

Note: You can also use the chassis management module to make sure that the switch is operating correctly. For more information, see the documentation for the IBM Flex System chassis.

System status LEDs

The three LEDs at the bottom of the switch represent the switch status. These LEDs are the green OK LED, the blue location LED, and the amber switch fault LED. Table 4 contains a description of each system status LED on the information panel of the switch.

Table 4. Switch system status LED descriptions

LED name	LED description
 OK	This green LED is located at the bottom left of the switch on the front panel. This LED is lit at startup and remains lit while the switch is powered on.
 Location	This blue LED is located at the bottom center of the switch on the front panel. This LED is lit or flashing depending on the enabled by the Chassis Management Module web interface or CLI interface to assist in locating the switch in the IBM Flex System chassis.
! (Switch fault)	This amber LED is located at the bottom right of the switch on the front panel. This LED indicates that the switch has a fault. If the switch fails the POST, this fault LED is lit. Note: This LED is also known as the system-error LED or the switch fault LED.

Fibre Channel external port status LEDs

There are three port LEDs directly to the right of each of the six Fibre Channel external ports on the front panel of the switch. These LEDs indicate the logged-in, activity, and fault status of that Fibre Channel external port.

Table 5 contains a description of each port LED on the information panel.

Table 5. Switch Fibre Channel external port status LED descriptions

LED name	LED description
External port Logged-in (LOG)	There are six green external port logged-in (LOG) LEDs. The external port logged-in LED is the top LED directly to the right of the corresponding port. When one of these LEDs is lit, it indicates that there is a connection (or link) to a device on that port.
External port Activity (TX/RX)	There are six green external port activity (TX/RX) LEDs. The external port activity LED is the middle LED directly to the right of the corresponding external port. When one of these LEDs flashes, it indicates that data is being received or transmitted (that is, activity is occurring) on that port. The flash frequency is proportional to the amount of traffic on that port.
External port Fault (!)	There are six amber external port fault (!) LEDs. The external port fault LED is the bottom LED directly to the right of the corresponding external port. When an external port fault LED is lit, it indicates that the external port has failed the internal, external, or online port diagnostics tests that are performed with the QuickTools interface application or CLI.

Ethernet port LEDs

There are two LEDs built into the Ethernet port that indicate the transmission activity over the Ethernet connection and link status.

Table 6 contains a description of Ethernet port LEDs.

Table 6. Ethernet port LEDs

LED name	LED description
Activity LED	The Activity LED is lit when data is transmitted or received over the Ethernet connection.
Link Status LED	The Link Status LED is lit when an Ethernet connection is established.

LED activities and diagnostic flash patterns

Table 7 contains descriptions of the activities and corresponding diagnostic flash patterns for the switch LEDs.

Table 7. Switch LED activities and diagnostic flash patterns



LED name	LED activity/diagnostic flash pattern
 OK	This LED is lit at startup and remains lit while the switch is powered on.
 Location	This LED is lit when enabled by the Chassis Management Module web interface or command line interface.
! (Switch Fault)	This LED operates as follows: <ul style="list-style-type: none"> The LED is off during initialization or when the switch is in normal operation. The LED is lit during LED test or to indicate a system fault during a POST failure, thermal fault, or other critical switch fault.
External port Logged-in (LOG)	This LED operates as follows: <ul style="list-style-type: none"> The LED is off when the corresponding external port is not logged in. The LED is lit when the corresponding external port is logged in or during the LED test. The LED pattern indicates the following conditions: <ul style="list-style-type: none"> — Logged in: The LED is lit. — Logging in: The LED flashes at 1-second intervals. — Beacon location: The LED flashes at 1-second intervals. — Error: The LED flashes two times per second. — The corresponding external port is disabled: The LED flashes at 1-second intervals.

Table 7. Switch LED activities and diagnostic flash patterns (Continued)

LED name	LED activity/diagnostic flash pattern
External port Activity (TX/RX)	<p>This LED operates as follows:</p> <ul style="list-style-type: none"> • The LED is off when the corresponding external port is not logged in or when the port is logged in and there is no external port activity. • The LED is lit during the LED test. • The LED flashes when external port activity performs a normal send or receive operation.
External port fault (!)	<p>This LED operates as follows:</p> <ul style="list-style-type: none"> • The LED is off when external port diagnostics starts and is completed without error. • The LED is lit when external port diagnostics discover an external port error.
Ethernet port activity	<p>This LED operates as follows:</p> <ul style="list-style-type: none"> • The LED is off when no data is being transmitted or received across the Ethernet connection. • The LED is lit when data is being transmitted or received across the Ethernet connection.
Ethernet port link status	<p>This LED operates as follows:</p> <ul style="list-style-type: none"> • The LED is off when there is no Ethernet connection. • The LED is lit when an Ethernet connection is established.

Chapter 4. Configuring the switch through an SSH interface

The switch contains an SSH server. This server enables an SSH client to establish an SSH session with the switch to retrieve information or to configure parameters through the command-line interface (CLI). You can perform a variety of fabric and switch-management tasks through an Ethernet connection by using the CLI.

You can access an SSH interface in the following ways:

- Through a terminal emulator program on a network-management workstation
- Through a terminal emulator program on a management workstation connected to the switch Ethernet port
- Through a terminal emulator program on a management workstation connected to the switch serial port

For you to access the switch through an SSH interface, the IP address and subnet masks must be compatible with the network-management workstation, and the network-management workstation must be connected to an external chassis management-module Ethernet port.

Before you can configure the Fibre Channel fabric through the switch, the following configuration settings must be enabled in the management module:

- External ports
- External management over all ports

For information about enabling the configuration settings in the Chassis Management Module Web interface, see the *IBM Flex System Chassis Management Module User's Guide*.

Attention: Before you configure the switch, make sure that the management modules in the IBM Flex System chassis or workstations are correctly configured. The Chassis Management Module or workstations and the switch must be on the same IP subnet. For more information, see the applicable documents at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>. For more detailed information about configuring the switch, see the *IBM Flex System FC3171 8 Gb SAN Switch QuickTools User's Guide*.

Note:

- Throughout this document, the management-module Web-based user interface is also known as the chassis management-module Web interface.
- Throughout this document, the user name is also known as the login name or user ID for logging on to interfaces or programs.
- The screens that are described or referred to in this document might differ slightly from the screens that are displayed by your system. Screen content varies according to the type of IBM Flex System chassis and the firmware versions and options that are installed.
- When you are using an SSH interface to configure the switch, be sure to configure your switch with the correct date and time information. For additional information about setting the date and time of the switch, see steps 7 through 9 on page 28.

Connecting to the switch

To access and control the switch over an SSH interface, you can connect the switch to the workstation through the Ethernet port or the serial port. To establish an Ethernet connection, you must know the IP address of the switch and have either an indirect connection from the workstation to the switch through the management module or a direct connection from the workstation to the switch Ethernet port. If you have to obtain the IP address for the switch or establish a connection, contact your system or network administrator. Be sure to use the correct IP address in the required commands. You can connect the switch Ethernet port to the workstation using a 10/100 Base-T straight cable or a 10/100 Base-T cross-over cable.

To establish a serial connection, connect the switch serial port to the workstation using a null-modem, F/F, USB type B-to-DB9 serial cable. For more details, see “Switch serial connection” on page 29.

Table 8 describes the serial port pin mapping.

Table 8. Switch serial port (USB) to workstation (DB9) pin mapping

USB type B		DB9	
Pin Number	Name	Pin Number	Name
1	+5V		N/A
2	Data +	2	TD
3	Data –	3	RD
4	ID		N/A
5	Ground	5	Common

Accessing the switch through a terminal emulator program

You can access the switch through IP-enabled devices that are connected to the Chassis Management Module. For more information, see the following documents at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>:

- *IBM Flex System Enterprise Chassis Installation and Service Guide*
- *IBM Flex System Chassis Management Module Installation Guide*
- *IBM Flex System Chassis Management Module Command-Line Interface Reference Guide*
- *IBM Flex System Chassis Management Module User's Guide*

To access the switch through a terminal emulator program on the network management workstation, complete the following steps:

1. Open an SSH session and provide a switch bay IP address. For information about IBM Flex System switch bay IP addresses, see the *IBM Flex System Enterprise Chassis Installation and Service Guide*.
 - For a Windows® platform, use an SSH client such as PUTTY.
 - For a Linux® platform, type `ssh USERID@xxx.xxx.xxx.xxx`, where `xxx.xxx.xxx.xxx` is the switch bay IP address.

2. Press Enter.

A command-prompt window opens.

3. At the login prompt, type the management-module user name (Windows only). At the password prompt, type the management-module password. The user name and password are case sensitive and are the same as those that are used for management-module Web access. The default management-module user name is `USERID`, and the default password is `PASSWORD`. (Note that the sixth character in `PASSWORD` is the number zero (0), not the letter O.)

The Command Line Interface Shell window opens.

4. Type `admin start` and press Enter to obtain administrator privileges.
5. Normally, the date and time are set by the CMM through the Network Time Protocol (NTP). However, as an option, you can set the date and time of the switch by typing `date [MMDDhhmmCCYY]` where:

[MM] is the month

[DD] is the day

[hh] is the hour in 24-hour format

[mm] is the minute

[CC] is the century identifier

[YY] is the last two numbers of the year

For example, the format for 28 November 28 2011 8:46 p.m. is `date 112820462011`.

Press Enter.

6. Type `admin end` and press Enter to exit from the administrator operating mode and return to the standard operating mode.

Note: For more information about password requirements and using the CLI, see the applicable documentation that is listed in “CLI command format” on page 30.

Accessing the switch directly

You can access the switch through devices that are connected directly to the switch Ethernet port or serial port.

Switch Ethernet connection

To access the switch through the switch Ethernet port, complete following steps:

1. Connect a 10/100 Base-T straight or cross-over cable from the workstation to the switch external Ethernet port.
2. Open an SSH session using the default switch IP address 10.0.0.1. For information about IBM Flex System switch bay IP addresses, see the *IBM Flex System Enterprise Chassis Installation and Service Guide*.
 - For a Windows platform, use an SSH client such as PUTTY.
 - For a Linux platform, type `ssh USERID@10.0.0.1`
3. Press Enter.

A command-prompt window opens.

4. At the login prompt, type the management-module user name (Windows only). At the password prompt, type the management-module password. The user name and password are case sensitive and are the same as those that are used for management-module Web access. The default management-module user name is `USERID`, and the default password is `PASSWORD`. (Note that the sixth character in `PASSWORD` is the number zero (0), not the letter O.)

The Command Line Interface Shell window opens.

5. Press Enter.

A command-prompt window opens.

6. At the login prompt, type the management-module user name. At the password prompt, type the management-module password. The user name and password are case sensitive and are the same as those that are used for management-module Web access. The default management-module user name is `USERID`, and the default password is `PASSWORD`. (Note that the sixth character in `PASSWORD` is the number zero (0), not the letter O.)

The Command Line Interface Shell window opens.

7. Type `admin start` and press Enter to obtain administrator privileges.

8. Normally, the date and time are set by the CMM through NTP. However, as an option, you can set the date and time of the switch by typing `date [MMDDhhmmCCYY]` where:

`[MM]` is the month

`[DD]` is the day

`[hh]` is the hour in 24-hour format

`[mm]` is the minute

`[CC]` represents the century identifier

`[YY]` represents the last two numbers of the year

For example, the format for 28 March 28 2011 8:46 p.m. is `date 032820462011`.

Press Enter.

9. Type `admin end` and press Enter to exit from the administrator operating mode and return to the standard operating mode.

Note: For more information about password requirements and using the CLI, see the applicable documentation that is listed in “CLI command format” on page 30.

Switch serial connection

Note: An optional cable kit with adapters is available to convert the mini-USB port for RJ-45, DB-9, or standard USB cable connection. For more information about IBM Flex System options, see

<http://www.ibm.com/servers/eserver/serverproven/compat/us/>.

To access the switch through a terminal emulator program over a serial connection, complete the following steps:

1. Configure the workstation serial connection.

For Windows:

- a. Click **Start**→**All Programs**→**Communications** →**Hyperterminal**.
- b. Choose a COM port connection, and then click **OK**.
- c. Type a name for the switch connection, and then choose an icon in the Connection Description window. Click **OK**.
- d. Type the following COM port values:
 - Bits per second: 9600
 - Data Bits: 8
 - Parity: None
 - Stop Bits: 1
 - Flow Control: None

For Linux:

- a. Set up minicom to use the serial port. Create or modify the `/etc/minirc.dfl` file with the following content.

```
pr portdev/ttyS0
pu minit
pu mreset
pu mhangup
```
- b. Verify that all users have permission to run minicom. Review the `/etc/minicom.users` file and confirm that the line ALL exists, or that there are specific user entries.

2. Connect a null-modem, F/F, USB type B-to-DB9 serial cable from the switch to the workstation serial port or to a serial management system.
3. Open a command-line window on the local workstation.
 - For Windows, click **Start, All Programs, Accessories, Communications, Hyperterminal**. Select the connection that you created earlier, and then click **OK**.
 - For Linux, open a command window, type `minicom`, and then press Enter. A command-prompt window opens.
4. Type `admin start` and press Enter to obtain administrator privileges.

5. Normally, the date and time are set by the CMM through NTP. However, as an option, you can set the date and time of the switch by typing `date [MMDDhhmmCCYY]` where:

`[MM]` is the month

`[DD]` is the day

`[hh]` is the hour in 24-hour format

`[mm]` is the minute

`[CC]` represents the century identifier

`[YY]` represents the last two numbers of the year

For example, the format for November 28 2011 8:46 p.m. is `date 112820462011`.

Press Enter.

6. Type `admin end` and press Enter to exit from the administrator operating mode and return to the standard operating mode.

Note: For more information about password requirements and using the CLI, see the applicable documentation that is listed in “CLI command format” on page 30.

CLI command format

The information in this section is an overview of the CLI command format. For detailed information about using CLI commands, see the applicable documentation at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.

- *IBM Flex System Chassis Management Module Command-Line Interface Reference Guide*
- *IBM Flex System FC3171 8 Gb SAN Switch Command Line Interface User's Guide*
- *IBM Flex System FC3171 8 Gb Pass-thru Command Line Interface User's Guide*

A command is followed by one or more keywords. The following rules apply when you type keywords:

- Commands and keywords are lowercase and case sensitive.
- Required keyword values are shown in standard font: `[value]`. Optional values are shown in italics *[value]*.
- The underlined portion of each keyword indicates the abbreviated form that can be used. For example, the Delete keyword can be abbreviated as `Del`.

The CLI command syntax is as follows:

- `keyword`
- `keyword [value]`
- `keyword [value 1][value 2]`

You can change items in brackets ([]) by typing a new value. You can use the Backspace and Delete keys to erase characters behind and in front of the cursor.

Chapter 5. Configuring the switch through the QuickTools Web interface

The switch contains a Web server interface known as QuickTools. This server enables a Web-based client to establish a Web-interface session with the switch to retrieve information or to configure parameters through a Web browser. You can perform a variety of fabric and switch-management tasks through an Ethernet connection through a Web browser.

You can access the management-module Web interface in the following ways:

- Through a Web browser on a network-management workstation
- Through a Web browser on a management workstation connected to the switch Ethernet port

QuickTools is a graphical interface that requires a Web browser to view and manage the switch. For information about system requirements and supported Web browsers, see the following documents at

<http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.

- *IBM Flex System Chassis Management Module Installation Guide*
- *IBM Flex System Chassis Management Module Command-Line Interface Reference Guide*
- *IBM Flex System Chassis Management Module User's Guide*

For you to access the switch through the Web interface, the IP address and subnet masks must be compatible with the network-management workstation, and the network-management workstation must be connected to an external chassis management-module Ethernet port.

Before you can configure the Fibre Channel fabric through the switch, the following configuration settings must be enabled in the management module:

- External ports
- External management over all ports

For information about enabling the configuration settings in the management-module Web interface, see the *IBM Flex System Chassis Management Module User's Guide*.

Attention: Before you configure the switch, make sure that the management modules in the IBM Flex System chassis or workstations are correctly configured. The management module or workstation and the switch must be on the same IP subnet. For more information, see the applicable *IBM Flex System Enterprise Chassis Installation and Service Guide* and *QuickTools User's Guide* at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.

Note:

- Throughout this document, the management-module Web-based user interface is also known as the chassis management-module Web interface.
- Throughout this document, the user name is also known as the login name or user ID for logging on to interfaces or programs.
- The screens that are described or referred to in this document might differ slightly from the screens that are displayed by your system. Screen content varies according to the type of IBM Flex System chassis and the firmware versions and options that are installed.

Connecting to the switch

To use the QuickTools Web interface to access and control the switch, you must know the IP address for the switch and have an existing network connection to the management module or to the switch Ethernet port. If you have to obtain the IP address of the switch or establish a network connection, contact your system or network administrator. You can connect the switch Ethernet port to the workstation using a 10/100 Base-T straight cable or a 10/100 Base-T cross-over cable.

Establishing a Web-interface session through a Web browser

You can access the switch by IP-enabled devices that are connected to the Chassis Management Module or to the switch Ethernet port. An Ethernet connection to the chassis management-module external ports on the IBM Flex System chassis is required. For more information, see the following documents at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>:

- *IBM Flex System Enterprise Chassis Installation and Service Guide*
- *IBM Flex System Chassis Management Module Installation Guide*
- *IBM Flex System Chassis Management Module User's Guide*

To establish a Web-interface session through a Web browser, complete the following steps:

1. Open a supported Web browser on the network or local management workstation and type a switch bay IP address in the address field. For information about IBM Flex System switch bay IP addresses, see the *IBM Flex System Enterprise Chassis Installation and Service Guide*.

For example, type `https://xxx.xxx.xxx.xxx` in the address field, where `xxx.xxx.xxx.xxx` is the switch bay IP address.

2. Press Enter.
3. Click **Yes** to accept the security certificate.

The QuickTools Web interface Add a New Fabric window opens.

4. At the login name prompt, type the management-module user name. At the password prompt, type the management-module password. The login name and password are case sensitive and are the same as the user name and password that are used for management-module Web access. The default management-module user name is `USERID`, and the default password is `PASSWORD`. (Note that the sixth character in `PASSWORD` is the number zero (0), not the letter O.)
5. Click the **Add Fabric** button.

6. If you receive a message indicating that the switch failed to respond to a request for a secure connection, click Yes to establish a nonsecure connection.

The QuickTools Web interface topology window opens.

In the switch pane, a faceplate graphic is displayed. This graphic shows the IBM Flex System chassis and the switch external ports.

For more information about using the QuickTools Web interface and the CLI, see the applicable documentation at

<http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.

- *IBM Flex System Chassis Management Module Command-Line Interface Reference Guide*
- *IBM Flex System FC3171 8 Gb SAN Switch Command Line Interface User's Guide*
- *IBM Flex System FC3171 8 Gb Pass-thru Command Line Interface User's Guide*
- *IBM Flex System FC3171 8 Gb SAN Switch QuickTools User's Guide*
- *IBM Flex System FC3171 8 Gb Pass-thru QuickTools User's Guide*

Chapter 6. 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 replaced only by a trained service technician.

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

The replaceable components in Table 9 are Tier 1 CRUs. If other components require replacement, see the documentation that came with those devices for instructions.

Table 9. Replaceable components and corresponding CRU/FRU identifiers

Name of component	CRU/FRU identifier
IBM Flex System FC3171 8 Gb SAN Switch	<ul style="list-style-type: none">• 69Y1930 (Option)• 69Y1933 (FRU)
IBM Flex System FC3171 8 Gb Pass-thru	<ul style="list-style-type: none">• 69Y1934 (Option)• 69Y1937 (FRU)
Switch filler	(Tier 1 CRU)

If other IBM Flex System components require replacement, see the following documentation that comes with these devices:

- *IBM Flex System Problem Determination and Service Guide or Hardware Maintenance Manual and Troubleshooting Guide*
- *Installation and User's Guide or Installation Guide*

Note:

- The latest versions of these documents are at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.
- Cable requirements for the switch are described in the IBM Configuration and Options Guide at <http://www.ibm.com/servers/eserver/xseries/cog/>. See the documentation that comes with the compute node for cable-routing information.

Chapter 7. Solving problems

This chapter provides basic troubleshooting information to help you solve some problems that might occur while you are setting up the switch. For more detailed information about troubleshooting the switch, see the applicable command-line interface guide and the *IBM Flex System FC3171 8 Gb SAN Switch and Pass-thru Event Message Guide* at <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.

If you cannot locate and correct a problem by using the information in this section, see Appendix A, “Getting help and technical assistance” on page 41.

Running POST

To ensure that it is fully operational, the switch processes a series of tests during power-up or a restart (power-on self-test, or POST). These tests take approximately 90 seconds to complete. The Chassis Management Module reads the test results and displays them for you. The green OK LED is lit at startup; then, POST proceeds and continues until all of the required tests are completed. If the switch fails POST, the amber switch Fault LED and the system-error LED on the IBM Flex System chassis are lit. An event is stored in the event log in the system status panel of the Chassis Management Module. The specific failure is displayed on the system status switch panel of the Chassis Management Module.

Note: For the locations and descriptions of the switch LEDs, see Chapter 3, “Information panel LEDs and external Fibre Channel ports” on page 19.

POST errors

There are two types of errors: noncritical and critical. A noncritical error applies to one port, and the switch is operational. You can continue to operate the switch; however, you must replace it as soon as possible. When a critical error occurs, the switch does not operate. To view POST results, complete the following steps:

1. Log on to the Chassis Management Module as described in the *IBM Flex System Chassis Management Module Command-Line Interface Reference Guide*. If necessary, obtain the IP address of the Chassis Management Module from your system administrator. The login window opens.

Note: For the latest version of the *IBM Flex System Chassis Management Module Command-Line Interface Reference Guide*, go to <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.

2. After POST is completed, the Chassis Management Module displays the results. Refresh the window to view the POST results. If a critical error occurs, replace the switch. If a noncritical error occurs, see the switch error log for additional details.

Table 9 describes the basic critical and noncritical failures. This abbreviated list is representative; it is not an exhaustive list. An error code is associated with each failure. Error codes are displayed on the Management Module Switch Information window. Be sure to note the applicable error code and corresponding failure. You might have to provide this information when you call for service. For details, see Appendix B, “Getting help and technical assistance,” on page 51.

Table 10. Abbreviated list of error codes for switch critical and noncritical failures

Diagnostic indicator (in hex)	Failing functional area	Failure criticality
00 - 7F	Base internal functions	Critical
80 - 9F	Internal interface failures	Noncritical
A0 - AF	External interface errors	Noncritical
B0 - FE	Reserved	Noncritical
FF	Switch “good” indicator	Operation

Troubleshooting checklist

To reduce problems during system installation, configuration, and operation, observe the following guidelines:

- Make sure that the IBM Flex System chassis supports the 8 Gb switches and the types of compute nodes that support the network adapters.

Note:

- Contact your IBM marketing representative or authorized reseller for information about the types of compatible IBM Flex System chassis, compute nodes, and optional devices for the switches, IBM Flex System chassis, and compute nodes.
 - See <http://www.ibm.com/servers/eserver/serverproven/compat/us/> for a list of supported IBM Flex System chassis, compute nodes, and optional devices for the switches, IBM Flex System chassis, and compute nodes.
 - For details about installation, configuration, and use of compatible devices, see the documentation that comes with these devices.
- Before you install an network adapter in a compute node, make sure that you are using a compute node that supports the network adapter.

Note: If the network adapter is installed in a supported IBM Flex System compute node, see the documentation that comes with the compute node for information about displaying attached Fibre Channel devices.

- Make sure that the 8 Gb switches are compatible with the target network adapters that you want to communicate with the 8 Gb switches. Where applicable, the 8 Gb switches in the IBM Flex System chassis must support the target network adapters in the compute node.
- Make sure that the other switches are compatible with the target network adapters that you want to communicate with these switches. Where applicable, certain other switches in the IBM Flex System chassis must support the target network adapters in the compute node.

- Make sure that the 8 Gb switches and all other switches are correctly installed in the supported switch bays of the IBM Flex System chassis. For detailed instructions and additional information about installing switches into the IBM Flex System chassis, see your IBM Flex System documentation and Chapter 2, “Installing, removing, replacing, and enabling a switch” on page 13.
- Make sure that all network adapters are installed correctly in a supported compute node. For instructions and additional information, see the *Installation and User’s Guide* that comes with the compute node and the documentation that comes with the network adapters.
- Make sure that the compute node is correctly installed in the IBM Flex System chassis. For instructions and additional information, see the *Installation and User’s Guide* that comes with the compute node and the *Installation and User’s Guide* that comes with the IBM Flex System chassis.
- Make sure that you are using the latest versions of device drivers, utilities, and firmware for the following devices. If these items are not at the latest levels, the IBM Flex System chassis might not recognize one or more of the following devices, and the IBM Flex System chassis or these devices might not be able to start.
 - The network adapters in the IBM Flex System chassis and in the compute nodes
 - The compute nodes
 - The Chassis Management Module
 - The Gb switches and controller that are used by the network adapter in the IBM Flex System chassis
 - Other switches that are used by other network adapters in the compute nodes

If necessary, install the latest versions of device drivers, utilities, and firmware for these devices.

To download the most recent IBM Flex System device drivers, utilities, firmware updates, and network-adapter boot code updates, go to <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp> for the latest information about upgrading these IBM Flex System components. The instructions are in the documentation that comes with the updates. Also see the *Installation and User’s Guide* for your compute node for additional information.

Note: For the latest version of the *IBM Flex System Chassis Management Module Command-Line Interface Reference Guide*, go to <http://publib.boulder.ibm.com/infocenter/flexsys/information/index.jsp>.

- Make sure that the IBM Flex System chassis, compute node, and all other IBM Flex System components are correctly configured. Also determine whether the system board in the compute node requires a special configuration.

When you are using an SSH interface to configure the switch, be sure to configure your switch with the correct date and time information. See steps 7 through 9 on page 28 for additional information about setting the date and time of the switch.

For additional information about configuration requirements, see the documentation that comes with your IBM Flex System chassis, compute node, and other IBM Flex System components.

- Make sure that all parameters, internal devices, and external devices have been enabled, where required. These devices include the switch and its external ports (see “Enabling the switch and its external ports” on page 17).

For additional information, see the documentation that comes with the Chassis Management Module and the applicable utility programs and devices.

- Make sure that all peripheral devices are correctly connected to the switches, turned on, and operating correctly.

Note: For additional information, see the documentation that comes with the peripheral devices.

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This section contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system and any optional devices are turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system.
- Go to the IBM support website at <http://www.ibm.com/supportportal/> to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the documentation that is provided with your IBM product. The documentation that comes with IBM systems also describes the diagnostic tests that you can perform. Most systems, operating systems, and programs come with documentation that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the documentation for the operating system or program.

Using the documentation

Information about your IBM system and preinstalled software, if any, or optional device is available in the documentation that comes with the product. That documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.ibm.com/supportportal/> and follow the instructions.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM website has up-to-date information about IBM systems, optional devices, services, and support. You can find service information for IBM systems and optional devices at <http://www.ibm.com/supportportal/>.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems. For information about which products are supported by Support Line in your country or region, see <http://www.ibm.com/services/supline/products/>.

For more information about Support Line and other IBM services, see <http://www.ibm.com/services/>, or see <http://www.ibm.com/planetwide/> for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through your IBM reseller or IBM Services. To locate a reseller authorized by IBM to provide warranty service, go to <http://www.ibm.com/partnerworld/> and click **Find Business Partners** on the right side of the page. For IBM support telephone numbers, see <http://www.ibm.com/planetwide/>. In the U.S. and Canada call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

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台灣國際商業機器股份有限公司
台北市松仁路 7 號 3 樓
電話：0800-016-888

IBM Taiwan product service contact information:

IBM Taiwan Corporation
3F, No 7, Song Ren Rd.
Taipei, Taiwan
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IBM-Allee 1, 71137 Ehningen, Germany
Telephone: +49 7032 15-2937
E-mail: tjahn@de.ibm.com

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Index

A

Activity LED
 Ethernet port 23, 24
 Fibre Channel port 22, 24
adapter requirements 14

B

bay-port correlation 14

C

Call Home 5
certifications 7
checklist
 inventory 10
 preinstallation 13
 troubleshooting 38
command format 30
command line interface (CLI) 30
components 11
Configurable Fabric Address Notification (FAN) 5
critical error 37, 38
customer replaceable unit (CRU) 35

D

date 28, 30
Dimensions 7
documentation 8
 access 41
 related 8
 updates 3
Domain Name Service (DNS) 5

E

Environmental conditions 7
error
 detection 5
 log 37
 POST 37
 system 20

Ethernet
 connection 26, 27
 port description 19
 port Link Status LED 24
external ports 2, 17, 19

F

Fabric management 7
fault LED
 port 22, 24
 switch 22
features 4
Fibre Channel
 port status LEDs 22
 ports 19
 protocols 6
 standards 6
field replaceable unit (FRU) 35
Frame bundling 5

G

getting help 41
guidelines
 installation 15
 system reliability 15

H

hardware service and support 42

I

IBM documentation 8
information
 LEDs 20
 panel 19
installing a switch 15, 16
internal ports 2, 19
Internet protocol security (IPsec) 5
Interoperability 4
inventory checklist 10
IP address 27, 32
IPv4 5

IPv6 5

L

LED

- activities and flash patterns 23

- Ethernet port 23

- states and colors 21

- system status 22

Link Status LED 24

Location LED 23

log 37

Logged-in LED 22, 23

M

major components 11

management interfaces 2

management-module user name and password 28, 32

N

N_Port ID virtualization (NPIV) 1

network adapter requirements 14

noncritical error 37, 38

Non-Disruptive Code Load Activation (NDCLA) 4

notices and statements 10, 43

O

OK LED 23

P

parts listing 35

pass-thru module 2

password 28, 32

port

- Activity LED 22

- external 19

- fault LED 22, 24

- internal 2, 19

- numbering 19

- status LEDs 22

Power-on self test (POST) 20, 37

preinstallation checklist 13

problem resolution 37

product information 4

Q

QuickTools web interface 2, 31

R

Registered State Change Notification (RSCN) 4

related documentation 8

reliability guidelines 15

replaceable components 35

RJ-45 port 19

RS-232 port 19

S

safety vii

SAN Switch 2

Secure Shell (SSH) 2, 25

serial

- connection 26, 29

- port 19

service 42

Simple Network Management Protocol (SNMP) 5

software service and support 42

solving problems 37

specifications 4

standards 4

static electricity precautions 16

support 3, 42

switch

- access through terminal emulator 26

- bay-port correlation 14

- components 11

- configuration with QuickTools 31

- configuration with SSH 25

- direct access 27

- direct serial connection 29

- enable 17

- error log 37

- Ethernet connection 26, 27, 32

- fault LED 23

- installation 16

- IP address 32

- maintainability 7

- password 28

- serial connection 26

- user name 27

switch fault LED 22

system

- error 20

- status LEDs 22

T

Taiwan product service 42
technical assistance 41
terminal emulator program 26
terminology 1
trademarks 44
Transparent mode 4
trap community strings 5
troubleshooting checklist 38

U

user name 27, 28, 32

V

vital product data (VPD) 5

W

web-interface session 32
World Wide Web 41



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