



3Com Switch 4007 Getting Started Guide

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ABOUT THIS GUIDE

This *Switch 4007 Getting Started Guide* provides an overview of your Switch 4007 and its components, describes the power management subsystem, provides information about what occurs when you start up your switch, explains how to use the online manuals on CD-ROM, and lists important safety and preinstallation information.

This guide is intended for the system or network administrator who is responsible for installing and managing the network hardware. It assumes a working knowledge of local area network (LAN) operations, but it does not assume prior knowledge of Switch 4007 high-performance networking equipment.



If release notes are shipped with your product and the information there differs from the information in this guide, follow the instructions in the release notes.

Most user guides and release notes are available in Adobe Acrobat Reader Portable Document Format (PDF) or HTML on the 3Com World Wide Web site:

<http://www.3com.com/>

Conventions

Table 1 and Table 2 list conventions that are used throughout this guide.

Table 1 Notice Icons




Icon	Notice Type	Description
	Information note	Information that describes important features or instructions
	Caution	Information that alerts you to potential loss of data or potential damage to an application, system, or device
	Warning	Information that alerts you to potential personal injury

Table 2 Text Conventions

Convention	Description
Screen displays	This typeface represents information as it appears on the screen.
Syntax	The word "syntax" means that you must evaluate the syntax provided and then supply the appropriate values for the placeholders that appear in angle brackets. Example: To enable RIPIP, use the following syntax: <code>SETDefault !<port> -RIPIP CONTRol = Listen</code> In this example, you must supply a port number for <port>.

Table 2 Text Conventions (continued)

Convention	Description
Commands	<p>The word “command” means that you must enter the command exactly as shown and then press Return or Enter. Commands appear in bold. Example:</p> <p>To remove the IP address, enter the following command:</p> <pre>SETDefault !0 -IP NETaddr = 0.0.0.0</pre>
The words “enter” and “type”	When you see the word “enter” in this guide, you must type something, and then press Return or Enter. Do not press Return or Enter when an instruction simply says “type.”
Keyboard key names	<p>If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example:</p> <p>Press Ctrl+Alt+Del</p>
Words in <i>italics</i>	<p>Italics are used to:</p> <ul style="list-style-type: none"> ■ Emphasize a point. ■ Denote a new term at the place where it is defined in the text. ■ Identify menu names, menu commands, and software button names. Examples: <p>From the <i>Help</i> menu, select <i>Contents</i>. Click <i>OK</i>.</p>

Related Documentation

The following documents compose the Switch 4007 documentation set.

Documents are available in three forms:

- Paper documents
 - This section lists the paper documents that are shipped with your system.
- CD-ROM
 - The Switch 4007 Online Manuals CD-ROM contains online versions of the paper documents as well as other Switch 4007 documents in online format only.
- World Wide Web and Fax Services
 - Various types of documentation and information are available from the 3Com Web site and fax services.

To order a paper copy of a document that you see on the CD-ROM, or to order additional CDs, contact your sales representative, or call the 3Com Customer Call Center at (800) 724-2447 and choose option 3.

For a list of Switch 4007 documents, see the *Switch 4007 Documentation Overview*.

Paper Documents

These documents are shipped with the Switch 4007 chassis:

- *Switch 4007 Getting Started Guide* (this guide)
 - An overview of the switch and its components
 - A description of the power subsystem
 - Important safety, location, and preinstallation information
 - How to install the chassis in a rack, on a table, or on a shelf, including prerequisites
 - How to install or remove a power supply
 - How to start up your Switch
 - How to use the documentation CD-ROM
 - An introduction to the Web Management suite of applications that help you manage your switch with a Web browser
- *Switch 4007 Documentation Overview*

A list of key Switch 4007 documents
- Quick Command Reference booklet

Outlines the commands in the Administration Console interface for switching modules and the command-line interface for the Enterprise Management Engine (EME) management module.

Module *Quick Start* Guides or *Getting Started* Guides are shipped with their individual modules or field-replaceable units, and on the Online Manuals CD-ROM. These guides provide an overview, LED status information, and installation instructions for each interface module, switch fabric module, and management module.

Documents on CD-ROM

The Documentation CD-ROM contains online versions of the paper guides that are shipped with your chassis and other Switch 4007 documents in online format only, such as:

- *Switch 4007 Implementation Guide*

Information about using features of the Switch 4007 after you install it and attach it to your network.
- *Switch 4007 Command Reference Guide*

Information about the Administration Console commands that you use to configure the Switch.

World Wide Web Site

Most user guides and release notes are available in Adobe Acrobat Reader Portable Document Format (PDF) or Hypertext Markup Language (HTML) from the 3Com World Wide Web support site at:

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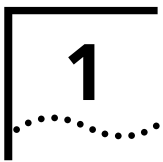
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ABOUT THE SWITCH 4007

This chapter contains an overview of the 3Com® Switch 4007 and describes the Gigabit Ethernet and Fast Ethernet starter kits.

The topics in this chapter include:

- Overview
- Switch 4007 Starter Kits
- Hardware Components

Overview

The Switch 4007 is a high-performance modular switch that is designed to aggregate wiring closet solutions for growing organizations.

The Switch 4007 supports redundant power supplies and management engines, and a variety of Layer 2 and multilayer 10/100 Fast Ethernet and Gigabit Ethernet media modules.

3Com enables you to simplify your installation by selecting from four pre-configured starter kits, each of which includes:

- One 930W AC Power Supply
- One EME management module
- One 9-port or 24-port Switching Fabric
- Two optional Fast Ethernet or Gigabit Ethernet modules
- Four empty payload slots for future expansion

For more information about Switch 4007 starter kits, see "Switch 4007 Starter Kits".

Physical Description

The chassis contains:

- One fan tray with four fans.
- A power supply bay that holds up to two power supplies and facilitates load sharing and redundancy.
- Two slots for management modules.
- A payload bay with slots for:
 - Six interface modules.
 - One switch fabric module.

Figure 1 and Figure 2 show the front and the rear, respectively, of the Switch 4007.

Figure 1 Switch 4007 Chassis Front View

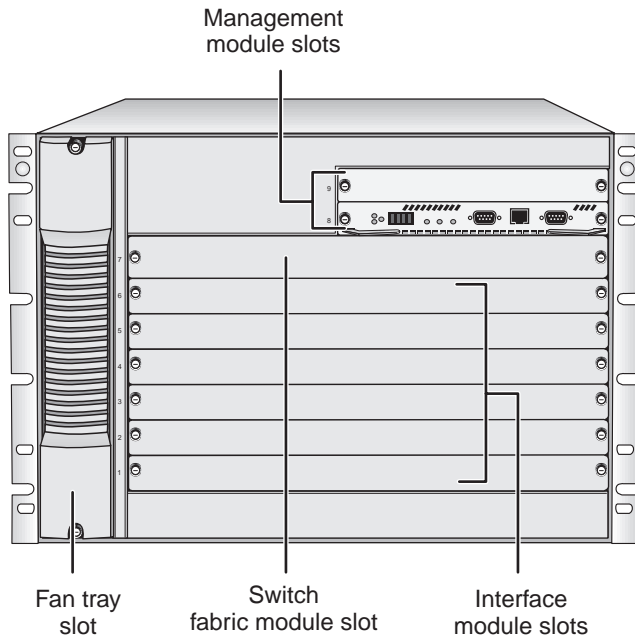


Figure 2 Switch 4007 Chassis Rear View



Switch Features

The Switch 4007 has the following features:

- An intelligent power management system.
- An intelligent system inventory management system.
- An integrated, high-performance, distributed network management system.
- Modules and a fan tray that you can install or remove while the switch is operating (called *hot swapping*), for field upgrades and service.
- Support for 3Com Transcend® Network Control Services for UNIX or for Windows.

- Slots for two Enterprise Management Engine (EME) management modules that do not take up interface module or switch fabric module space.

Switch 4007 starter kits are supplied with with one management module (Model Number: 3CB9EME) installed in the lower slot. You can install a second management module to provide standby management support.

The management module uses the management bus to send commands to all installed interface modules and the switch fabric module and to collect information from the modules.

- A single passive backplane that enables the use of multiple networking technologies, defined by the type of switch fabric module that is installed.
- One slot for a switch fabric module in the chassis to provide optimal network performance.
 - Gigabit Ethernet starter kits (Model Numbers 3C16810 and 3C16811) have one 24-port Switching Fabric (Model Number: 3CB9FG24T) preinstalled in slot 7.
 - Fast Ethernet starter kits (Model Numbers 3C16815 and 3C16816) have one 9-port Switching Fabric (Model Number: 3CB9FG9) preinstalled in slot 7.
- Slots for two power supplies to supply 930 watts with $n + 1$ redundancy and 1860 watts without $n + 1$ redundancy, depending on the type and quantity of installed modules.

Switch 4007 starter kits have one 930W AC Power Supply (Model Number: 3CB9EP9) preinstalled in the lower bay.

- Power supplies that you can add or replace while the chassis is running (referred to as *warm swapping*).
- Slots for six interface modules. In Switch 4007 starter kits, modules are preinstalled in slots 1 and 2, and the remaining slots are empty.
- Packet switching at an aggregated bandwidth of up to 30 Gbps.
- Power fault-tolerant mode where you can reserve the power of a single power supply (930 watts) to act as a backup if the other power supply fails.
- One exhaust fan tray (with the power and reliability of four fans) to make sure that the chassis maintains the optimal temperature for operation.

Management Features

You can manage the Switch 4007 through:

- An out-of-band terminal interface
- Simple Network Management Protocol (SNMP)
- 3Com Transcend Network Supervisor
- 3Com Transcend Network Control Services
- A standard Telnet client-to-server application
- Embedded Web-based management

To learn more about management features, see Chapter 5, "Management Tools".

Switch 4007 Starter Kits

3Com enables you to simplify your installation by selecting from four pre-configured starter kits.

Four configurations are available:

- Layer 2 Gigabit Ethernet Starter Kit
Model Number: 3C16810
- Layer 3 Gigabit Ethernet Starter Kit
Model Number: 3C16811
- Layer 3 Fast Ethernet (10/100BASE-TX) Starter Kit
Model Number: 3C16815
- Layer 3 Fast Ethernet (10/100BASE-TX and 100BASE-FX) Starter Kit
Model Number: 3C16816

Layer 2 Gigabit Ethernet Starter Kit

Model Number: 3C16810

The Layer 2 Gigabit Ethernet Starter Kit has 18 Gigabit Ethernet ports.

This starter kit is preinstalled with the following options:

- EME Management Module (Model Number: 3CB9EME) in the lower slot
- 930W AC Power Supply (Model Number: 3CB9EP9)
- One 24-port Switching Fabric (Model Number: 3CB9FG24T) in slot 7

- Two 9-port Gigabit Switching Modules (Model Number: 3CB9LG9MC) in slots 1 and 2
- 4 empty slots (slots 3,4,5,6)

You can expand the system to provide 54 Gigabit Ethernet ports by installing additional modules into the empty slots.

Layer 3 Gigabit Ethernet Starter Kit

Model Number: 3C16811

The Layer 3 Gigabit Ethernet Starter Kit has 13 Gigabit Ethernet ports.

This starter kit is preinstalled with the following options:

- EME Management Module (Model Number: 3CB9EME) in the lower slot
- 930W AC Power Supply (Model Number: 3CB9EP9)
- One 24-port Switching Fabric (Model Number: 3CB9FG24T) in slot 7
- One 9-port Gigabit Switching Module (Model Number: 3CB9LG9MC) in slot 1
- One 4-port Gigabit MultiLayer Switching Module (Model Number: 3CB9RG4) in slot 2
- 4 empty slots (slots 3,4,5,6)

You can expand the system to provide 49 Gigabit Ethernet ports by installing additional modules into the empty slots.

Layer 3 Fast Ethernet (10/100BASE-TX) Starter Kit

Model Number: 3C16815

The Layer 3 FEN (10/100BASE-TX) Starter Kit has 48 copper Fast Ethernet ports and 3 GBIC slots for uplinks.

This starter kit is preinstalled with the following options:

- EME Management Module (Model Number: 3CB9EME) in the lower slot
- 930W AC Power Supply (Model Number: 3CB9EP9)
- One 9-port Switching Fabric (Model Number: 3CB9FG9) in slot 7
- One 36-port 10/100BASE-TX Switching Module (Model Number: 3CB9LF36R) in slot 1
- One 12-port 10/100BASE-TX MultiLayer Switching Module (Model Number: 3CB9RF12R) in slot 2
- 4 empty slots (slots 3,4,5,6)

You can expand the system to provide 192 Fast Ethernet ports by installing additional modules into the empty slots.

Layer 3 Fast Ethernet (10/100BASE-TX and 100BASE-FX) Starter Kit

Model Number: 3C16816

The Layer 3 FEN (10/100BASE-TX and 100BASE-FX) Starter Kit has 12 copper and 20 fiber Fast Ethernet ports and 3 GBIC slots for uplinks.

This starter kit is preinstalled with the following options:

- EME Management Module (Model Number: 3CB9EME) in the lower slot
- 930W AC Power Supply (Model Number: 3CB9EP9)
- One 9-port Switching Fabric (Model Number: 3CB9FG9) in slot 7
- One 20-port 100BASE-FX Switching Module (Model Number: 3CB9LF20MM) in slot 1
- One 12-port 10/100BASE-TX MultiLayer Switching Module (Model Number: 3CB9RF12R) in slot 2
- 4 empty slots (slots 3,4,5,6)

You can expand the system to provide 112 Fast Ethernet ports by installing additional modules into the empty slots.

Hardware Components

This section describes the following chassis components:

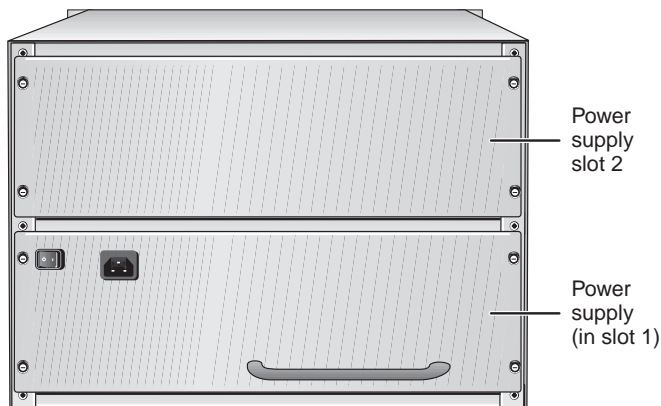
- Power Supplies
- Fan Tray
- Modules

Power Supplies

The Switch 4007 can contain two back-loading, 930-watt, modular AC power supplies (Model Number 3CB9EP9). The power supplies provide power to the management modules, switch fabric module, interface modules, fans, and backplane.

Figure 3 shows a 930-watt AC power supply in a Switch 4007 chassis.

Figure 3 930-watt AC Power Supply in the Switch 4007



You can add or replace power supplies while the chassis is running (referred to as *warm swapping*). See Chapter 6, “Maintaining the Switch 4007”, for instructions about how to replace a faulty power supply.

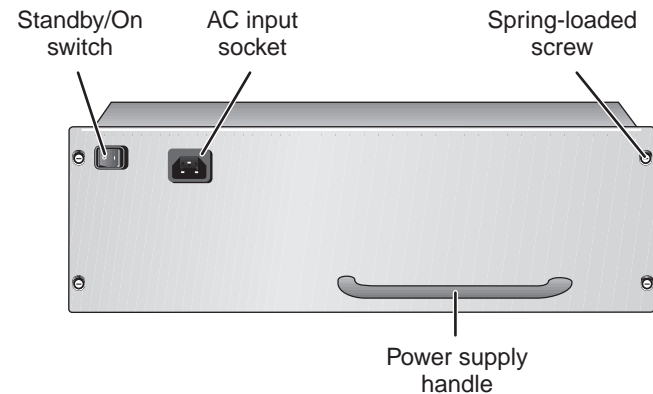
930-watt AC Power Supply

Switch 4007 power supplies are autosensing. Each power supply (Figure 3) can automatically sense the type of input voltage to which it is being connected at the electrical outlet.

The power supplies are load sharing in that all power supplies provide an equal amount of the load current. Each 930-watt power supply has its own power cord and is shipped separately from the chassis. The type of power cord depends on your country location.

Figure 4 shows the 930-watt AC power supply for the Switch 4007 chassis.

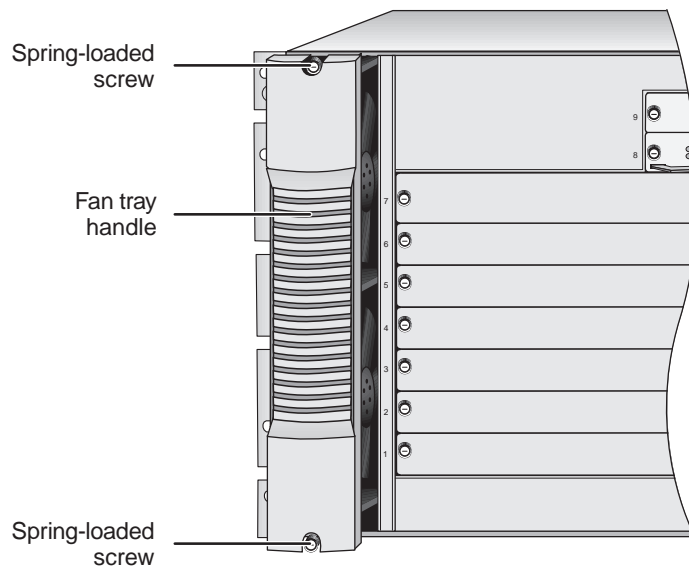
Figure 4 930-watt AC Power Supply for the Switch 4007



Fan Tray

The Switch 4007 chassis contains one fan tray, which contains four fans (Model Number 3CBEF7). The fans cool the interface modules, the switch fabric module, and the management modules.

Figure 5 Switch 4007 Chassis Fan Tray



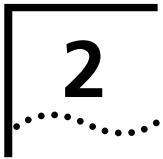
Module Slots in the Switch 4007 Chassis

You insert modules horizontally into the chassis. Slots are numbered from bottom to top, with the bottom slot being number 1.

The chassis contains:

- **Management slots** — There are two slots (slot 8 and slot 9) for management modules:
 - The Enterprise Management Engine (EME) is an SNMP-based network management module that manages and controls the Switch 4007 and its modules. The management module is the primary communication mechanism into the switch and modules. You manage other intelligent modules within the chassis through the management module.
 - The Enterprise Management Controller (EMC) module provides standby controller functions for an EME in a Switch 4007.
- **Payload slots** — There are six slots (slot 1 through slot 6) for interface modules. The interface modules offer a selection of packet-based or cell-based interfaces that work with the switch fabric module.
- **Switch fabric slots** — There is one slot (slot 7) for a Gigabit Ethernet Switch Fabric Module, which is the central backplane aggregator for the Switch.

To learn more about management, switch fabric, and Fast Ethernet and Gigabit Ethernet interface modules, see Chapter 2, “Switch 4007 Modules”.



SWITCH 4007 MODULES

This chapter contains the following topics:

- Overview
- Switch Fabric Modules
- Management Modules
- Fast Ethernet Modules
- Gigabit Ethernet Modules
- GBIC Transceivers
- Slot Restrictions
- Management Access
- Where to Go from Here

Overview

The 3Com® Switch 4007 is a high performance, high-density, aggregation switch. The Switch 4007 has a modular 7-slot chassis that contains slots for the following types of modules:

- Management Modules (see page 21)

The EME management module exchanges information with all modules through the management bus. The EME uses the management bus to send commands to all chassis modules and to collect information from interface modules.

The Switch 4007 is required to have a minimum of one EME (Enterprise Management Engine) management module. You can install a second EME for redundant management operation.

- Switch Fabric Modules (see page 20)

The Gigabit Ethernet (GEN) switch fabric module is the central backplane aggregator for the chassis. Switch fabric modules fit into slot 7 of the Switch 4007 chassis.

- Fast Ethernet Modules (see page 22) and Gigabit Ethernet Modules (see page 23)

Interface modules pass data through the switch fabric module. The data may get sent back out to other modules or sent out through a switch fabric module front panel port to another device.

The Switch 4007 contains six slots for interface modules. Fast Ethernet or Gigabit Ethernet modules can occupy every slot except slot 7. The six interface modules access five 2 Gbps serial channels, which are wired to one dedicated switch fabric module slot.

Switch Fabric Modules

The Switch 4007 supports 9-port and 24-port Gigabit Ethernet Switch Fabric modules. Both switch fabric modules fit into slot 7 of the Switch 4007 chassis.

3Com enables you to simplify your installation by selecting from four pre-configured starter kits.

- Fast Ethernet starter kits are pre-configured with one 9-port Switching Fabric (Model Number: 3CB9FG9) in slot 7.
- Gigabit Ethernet starter kits are pre-configured with one 24-port Switching Fabric (Model Number: 3CB9FG24T) in slot 7.

The Switch Fabric modules support the following key features:

- 18 Gbps or 48 Gbps switching capacity
- Hot-swapping of modules
- IEEE 802.1D Spanning Tree Protocol bridging for Gigabit Ethernet
- Multicast packet firewall to limit broadcast storms
- Port trunking support for 12 groups, with up to six ports in a group
- IEEE 802.1Q VLAN tagging for up to 126 groups of port-based virtual LANs (VLANs)
- Embedded Simple Network Management Protocol (SNMP) management agent
- Support for four RMON-1 groups: Ethernet Statistics, History, Events, and Alarms

9-port Gigabit Ethernet Switch Fabric

Model Number: 3CB9FG9

The 9-port Gigabit Ethernet (GEN) Switch Fabric Module is optimized for use in wiring closets. The module has six non-blocking Gigabit Ethernet ports that connect directly to the chassis backplane to provide high-speed, low-latency connectivity between Switch 4007 interface modules. Its front panel features three non-blocking Gigabit Interface Converter (GBIC) interface ports that accept optional GBIC transceivers (see “GBIC Transceivers” on page 25). Figure 6 shows the front panel.

Figure 6 Front Panel of 9-port Switch Fabric Module



To learn more about this module, refer to the *9-Port Gigabit Ethernet Switch Fabric Module Quick Start Guide* on the Online Manuals CD-ROM.

24-port Gigabit Ethernet Switch Fabric

Model Number: 3CB9FG24T

The 24-port Gigabit Ethernet (GEN) Switch Fabric Module is designed for use in network backbones, data centers, and other high-density network segments. The 24-port GEN Switch Fabric Module has 24 nonblocking Gigabit Ethernet ports that connect to the chassis backplane to provide high-speed, low-latency connectivity between Switch 4007 switching modules. Figure 7 shows the front panel.

Figure 7 Front Panel of 24-port Switch Fabric Module

To learn more about this module, refer to the *24-Port Gigabit Ethernet Switch Fabric Module Quick Start Guide* on the Online Manuals CD-ROM.

Management Modules

The Switch 4007 chassis contains two slots (slots 8 and 9) for Management Modules management modules. These modules do not occupy module payload slots. Figure 8 shows the front panel.

Figure 8 Front Panel of EME Management Module

You can communicate through an RS-232 connector (for connection to a terminal) or an RJ-45 port (for connection to Ethernet networks) on the front panel of the EME to configure and report on switch and module operation.

The Switch 4007 EME is an SNMP-based network management module that allows you to configure and manage the Switch 4007 chassis and modules. The EME backplane services generate, control, and monitor the Switch. The management modules provide power management functions.

You manage the switch through:

- The EME command interface, which you access through the serial port, or through SNMP (Simple Network Management Protocol).
- The Switch 4007 Web Management suite of applications.
- 3Com Transcend Network Control Services.

An EME combines the functions of a management module and a controller module. You can install a second EME to provide standby management support if the first EME is unavailable for any reason.

Table 3 describes the EME access mechanisms.

Table 3 EME Access Mechanisms

Access Mechanism	Allows you to	Using
Terminal	Connect directly to the command interface.	RS-232 serial port
Modem	Access the command interface from remote sites.	Auxiliary RS-232 serial port
IP	Access the command interface using the rlogin or telnet commands, or use an external SNMP management application to communicate with the embedded SNMP agent.	10BASE-T Ethernet port assigned to an IP interface

For information about how to install the EME and how to perform an initial configuration, see the *Enterprise Management Engine Quick Start Guide* on the Online Manuals CD-ROM.

Fast Ethernet Modules

The frame-based switching modules are intelligent Layer 2 and Layer 3 modules that have their own embedded agent. These modules are physically connected to the backplane ports of the switch fabric module in the chassis. These modules switch between the front panel ports and the backplane ports. Switching interface modules provide network connectivity functions.

Fast Ethernet Interface Modules are available in these port configurations:

- 20-port 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module
- 36-port 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module
- 12-port 10/100BASE-TX Fast Ethernet MultiLayer Switching Module

20-port 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module

Model Number: 3CB9LF20MM

The 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module has twenty 100 Mbps Ethernet fiber-optic ports with MT-RJ connectors on its front panel and two 1-Gigabit ports for connection to the

chassis backplane. It operates as a Layer 2 switch and occupies a single interface module slot in the Switch 4007 chassis.

Figure 9 identifies the components on the front panel of the module. The front panel ports on the module are numbered 1 through 20. The two 1-Gigabit ports on the back of the module are numbered 21 and 22.

Figure 9 Front Panel of Module 3CB9LF20MM



To learn more about this module, refer to the *20-Port 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module Quick Start Guide* on the Online Manuals CD-ROM.

36-port 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module

Model Number: 3CB9LF36R

The 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module (36-port FEN RJ-45 Switching Module) has thirty-six 10/100 Mbps Ethernet ports with RJ-45 connectors on its front panel, and two 1-Gigabit ports on the back for connection to the chassis backplane. It operates as a Layer 2 switch and occupies a single interface module slot in the Switch 4007 chassis.

Figure 10 identifies the components on the front panel of the module.

Figure 10 Front Panel of Module 3CB9LF36R



To learn more about this module, refer to the *36-Port 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module Quick Start Guide* on the Online Manuals CD-ROM.

12-port 10/100BASE-TX Fast Ethernet MultiLayer Switching Module

Model Number: 3CB9RF12R

The 12-port 10/100BASE-TX Fast Ethernet MultiLayer Switching Module is a multiprotocol module designed for the Switch 4007. The module has twelve 10/100BASE-TX Fast Ethernet front panel ports that provide a 100 Mbps connection over UTP-Category 5 cables, and one nonblocking Gigabit Ethernet port that connects through the backplane to the switch fabric module. The module has two groups of six ports, operates as a Layer 3 router switch, and occupies a single interface module slot in the Switch 4007 chassis.

Figure 11 identifies the components on the front panel of the module.

Figure 11 Front Panel of Module 3CB9RF12R



To learn more about this module, refer to the *12-Port 10/100BASE-TX Fast Ethernet Layer 3 Switching Module Quick Start Guide* on the Online Manuals CD-ROM.

Gigabit Ethernet Modules

The Gigabit Ethernet (GEN) Interface Modules are two-port interface modules for the 3Com Switch 4007. The GEN interface modules serve as a 2-Gigabit data channel between the Gigabit Ethernet Switch Fabric Module and other 802.3z-compliant Gigabit Ethernet devices. GEN Interface Modules use SC connectors.

Because Gigabit Ethernet interface modules are not intelligent, you cannot access them directly; all communication takes place through the switch fabric module. GEN interface modules serve as a two-Gigabit data channel between the GEN Switch Fabric Module and other 802.3z-compliant Ethernet devices.

For information about how to install these modules, see the module's *Quick Start Guide* that is shipped with each module.

Gigabit Ethernet Interface Modules are available in these port configurations:

- 4-port Gigabit Ethernet Interface Module
- 9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module
- 4-port Gigabit MultiLayer Switching Module

4-port Gigabit Ethernet Interface Module

Model Number: 3CB9LG4

The 4-port Gigabit Ethernet (GEN) Interface Module (GBIC) is an interface for gigabit rate data between the Switch 4007 chassis backplane and other 802.3z-compliant Gigabit Ethernet devices. The module provides four Gigabit Ethernet fiber-optic connections on the front panel, using plug-in Gigabit Interface Converter (GBIC) transceivers. The module occupies a single interface module slot in the Switch 4007 chassis.

Each module has four ports on the front panel. Figure 12 identifies the components on the front panel of the module.

Figure 12 Front Panel of Module 3CB9LG4



To learn more about this module, refer to the *4-Port Gigabit Ethernet Interface Module (GBIC) Quick Start Guide* on the Online Manuals CD-ROM.

9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module

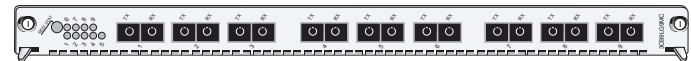
Model Number: 3CB9LG9MC

The 9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module can switch Gigabit Ethernet (GEN) connections to corporate backbones and servers. The module has nine 1000BASE-SX GEN front panel ports. It has 3 backplane ports for connection to the

24-port GEN Switch Fabric Module, and 1 backplane port for connection to the 9-port GEN Switch Fabric Module. The module occupies a single interface module slot in the Switch 4007 chassis.

Figure 13 identifies the components on the front panel of the module.

Figure 13 Front Panel of Module 3CB9LG9MC



To learn more about this module, refer to the *9-Port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module Quick Start Guide* on the Online Manuals CD-ROM.

4-port Gigabit MultiLayer Switching Module

Model Number: 3CB9RG4

The 4-port Gigabit Ethernet Layer 3 Switching Module (GBIC) for the Switch 4007 provides high-port-density, line speed, Gigabit Ethernet switching and routing on backbone networks running at Open Systems Interconnection (OSI) Layer 3.

The module provides 4 Gigabit Interface Converter (GBIC) ports on the front panel that can be either 1000BASE-LX (single-mode fiber) or 1000BASE-SX (multimode fiber). 4 Gigabit Ethernet ports connect the module to the chassis backplane.

Figure 14 identifies the components on the front panel of the module.

Figure 14 Front Panel of Module 3CB9RG4

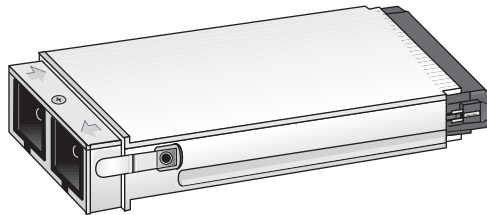


To learn more about this module, refer to the *4-Port Gigabit Ethernet Layer 3 Switching Module (GBIC) Quick Start Guide* on the Online Manuals CD-ROM.

GBIC Transceivers

The Gigabit Interface Converter (GBIC) ports on your system connect to Gigabit Ethernet networks through a GBIC transceiver (Figure 1), providing a high-speed connection over fiber-optic cable. The transceiver connects to the network using a fiber-optic duplex subscriber connector (SC). You can remove and replace the transceiver with the system powered on, which is called hot-swapping.

Figure 15 GBIC Fiber-Optic Transceiver



The following transceivers are available:

- SX GBIC Transceiver
- LX GBIC Transceiver
- 70-km Long Haul GBIC Transceiver

SX GBIC Transceiver

Model Number: 3CGBIC91

The 1000BASE-SX GBIC transceiver supports a direct connection to 62.5-micron or 50-micron multimode fiber-optic cable.

To learn more about this transceiver, refer to the *GBIC Transceiver Installation Guide* on the Online Manuals CD-ROM.

LX GBIC Transceiver

Model Number: 3CBGIC92

The 1000BASE-LX GBIC transceiver supports a direct connection to single-mode fiber-optic cable, or connection to multimode fiber through a conditioned launch cable.



To ensure optimal performance, compatibility, and regulatory compliance, use only conditioned launch cables that 3Com supports. For a list of supported conditioned launch cables, see this 3Com Web site:

http://www.3Com.com/gigabit_ethernet/gbics

To learn more about this transceiver, refer to the *GBIC Transceiver Installation Guide* on the Online Manuals CD-ROM.

70-km Long Haul GBIC Transceiver

Model Number: 3CGBIC97

The 70-km Gigabit Ethernet GBIC Fiber-Optic Transceiver connects to the network using a fiber-optic duplex SC connector.

To learn more about this transceiver, refer to the *70-km Gigabit Ethernet GBIC Transceiver Installation Guide* on the Online Manuals CD-ROM.

Slot Restrictions

Table 4 lists slot restrictions in the Switch 4007 chassis.

Table 4 Slot Restrictions

Module type	Slot number
Management modules	8 and 9
Switch fabric module	7
Interface modules	1, 2, 3, 4, 5, 6

Management Access

You can access and manage your Switch 4007 modules using several methods:

- Administration Console
- Web Management suite of applications
- External SNMP-based network management application, such as Transcend® Network Control Services

The Administration Console and most of Web Management are embedded parts of the software and are available for immediate use to manage your modules.

Administration Console Access

To manage the module from the Administration Console:

- 1 Log in to the EME.

For information about logging in to the EME, see the *Enterprise Management Engine User Guide*.

- 2 At the prompt, enter:

```
connect <slot>.1
```

Where `<slot>` is the chassis slot number of the module that you want to manage, and the number after the decimal point is a subslot number (which is always 1).

The Administration Console displays the top-level menu prompt. For example, if you installed a 20-port 100BASE-FX Fast Ethernet Switching Module in slot 4, then the prompt appears as follows:

```
CB9000@4.1 [20-E/FEN-FX-L2] ():
```

- 3 Enter commands to manage the module.

For example, to display a module baseline, enter:

```
module baseline display
```

For more information about Administration Console module commands, see the multiplatform *Command Reference Guide*.

Web Management Access

Web Management applications are an embedded part of the Switch 4007. They include Web Console, DeviceView, and Performance monitoring tools. Additional installable applications include online Help.

After you have set up your IP address for the Switch, you can access the Web Management applications directly in your Web browser by entering the IP address. For information about setting up your IP address, see the *Enterprise Management Engine Quick Start Guide*.

For additional information about Web Management, see Chapter 5, "Management Tools".

Where to Go from Here

For more information about Switch 4007 see the following documents, which are supplied in PDF format on the Online Manuals CD-ROM:

- Management modules
 - *Enterprise Management Engine Quick Start Guide*
 - *Switch 4007 Implementation Guide*
 - *Switch 4007 Command Reference Guide*
- Interface modules
 - *20-Port 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module Quick Start Guide*
 - *36-Port 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module Quick Start Guide*

- *12-Port 10/100BASE-TX Fast Ethernet Layer 3 Switching Module Quick Start Guide*
- *4-Port Gigabit Ethernet Interface Module (GBIC) Quick Start Guide*
- *9-Port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module Quick Start Guide*
- *4-Port Gigabit Ethernet Layer 3 Switching Module (GBIC) Quick Start Guide*
- Switch fabric modules
 - *24-Port Gigabit Ethernet Switch Fabric Module Quick Start Guide*
 - *9-port Gigabit Ethernet Switch Fabric Module Quick Start Guide*
- GBIC transceivers
 - *GBIC Transceiver Installation Guide*
 - *70-km Gigabit Ethernet GBIC Transceiver Installation Guide*



The Switch 4007 is based on 3Com CoreBuilder® 9000 technology and supports a range of CoreBuilder 9000 components.

The Quick Start Guides that are supplied with many product options describe installation and setup procedures for the CoreBuilder 9000. However, you can install supported components into a Switch 4007 chassis as you would install them into the CoreBuilder 9000 7-slot chassis.

3

INSTALLING THE SWITCH 4007

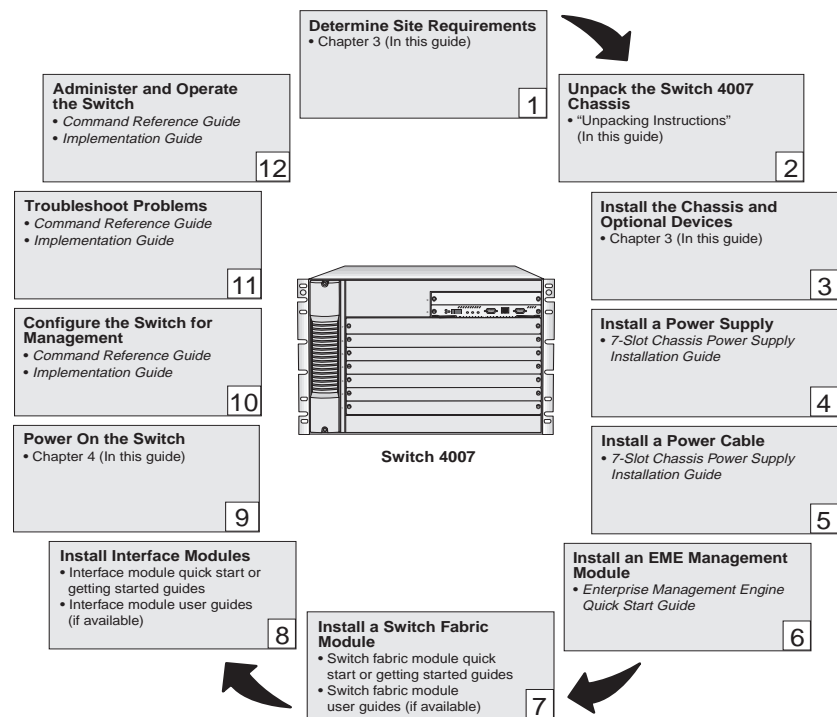
This chapter contains the following topics:

- Site Requirements for the Switch 4007
- Preinstallation Guidelines
- Installing the Chassis

Figure 16 summarizes the installation procedure.

For a Switch 4007 starter kit, you can simplify the installation procedure because the chassis is pre-configured with one power supply, one management module, one switch fabric module, and two interface modules.

Figure 16 Switch 4007 Installation Procedure



Site Requirements for the Switch 4007

This section describes the following site requirements for setting up your Switch 4007:

- Location Requirements
- Precautionary Guidelines
- Ventilation Requirements
- Power Requirements
- Safety Information

Location Requirements

Install a Switch 4007 in an area that meets the following requirements:

- Ambient (room) temperature: 0 °C to 50 °C (32 °F to 122 °F). The default internal operating temperature threshold for the Switch 4007 is approximately 60 °C (140 °F).
- Relative humidity: between 10 and 90 percent, noncondensing.
- The table or rack on which you mount the chassis supports at least three times the weight of a fully loaded chassis.
- The recommended minimum space that is required between the front of the chassis and another vertical surface (such as a rack door) is 8 cm (3 in.).
- There is a sufficient amount of space on each side of the Switch 4007 chassis to accommodate any cables along the side of the chassis.

- There is at least 7 cm (2.76 in.) on each side of the Switch 4007 chassis to ensure proper cooling in the chassis.
- There is at least 91.4 cm (36 in.) in back of the chassis to:
 - Remove and replace power supplies.
 - Maintain proper cooling.
- If the chassis is the first device in your rack, then mount it about 10.2 cm (4 in.) up from the floor.
- The power source is within approximately 2 meters (6.6 feet) of the location where you plan to install the Switch 4007.
- Each of the power supplies connects to a dedicated circuit. Do not connect the power supplies to a power strip.
- The surface on which you want to locate the Switch 4007 chassis is level.
- Have the required cables available at your site to make physical connections in your switch configuration.

Precautionary Guidelines

- Ambient temperature for the Switch 4007 must not exceed 50 °C (122 °F).
- Safety regulations stipulate that for a Switch 4007 chassis, the table, shelf, or rack on which the switch rests can support at least 115.65 kg (255 lb), which is three times the weight of a fully loaded Switch 4007 chassis.

- For rack installations, the selected rack is grounded in accordance with the rack manufacturer's recommendations.
- To reduce the possibility of personal injury or serious damage to the chassis, use *at least two people* to install the chassis. This is especially important for rack installations, because you must hold the chassis in place while you secure the chassis to the rack.
- Bolt the rack to the floor.
- Make certain that the rack is properly aligned and squared. Use a framing tool to ensure that the rack is squared.
- Brace the top of the rack against the wall.
- Provide sufficient space in front of and behind the chassis so that you can service it easily and provide proper ventilation.
 - Provide at least 7 cm (2.76 in.) on each side of the Switch 4007 chassis to ensure proper cooling in the chassis.
 - Provide at least 91.4 cm (36 in.) in back of the switch to remove and replace power supplies in the Switch 4007 chassis.
- Use the following guidelines to tighten screws to Torque Specification:
 - Faceplate thumbscrews — 3-5 in/lb (inch-pounds)
 - #10 screws for holding the chassis onto the rail — 22-25 in/lb
 - Power supplies to the chassis — 5-7 in/lb



To ensure that you tighten screws to Torque Specification, use a torque screwdriver.

The following list shows the amount of rack space that is needed to install a Switch 4007 chassis in a Telco rack or a Metric rack.

- **Height — 30.98 cm / 12.2 in.**

The height of the chassis, allowing for some extension beyond the location of the upper and lower unit dividing lines.

- **Telco Rack Unit — 7 RU**

The unit of measure is 1 Rack Unit (1.75 in. or 4.45 cm).

- **Metric Rack Unit — 12.5 SU**

The unit of measure is 1 System Unit (25 millimeters).

- **Front clearance — 8 cm / 3 in.**

This is the recommended minimum space required between the front of the chassis and another vertical surface (such as a rack door).

Rack-Mount Installation Recommendations

Use at least two people to install any chassis.



Before you install a chassis into a rack, make certain that the rack you are using is properly aligned and squared. Use a framing square to ensure that the rack is squared. Doing so makes installing the chassis into the rack easier.

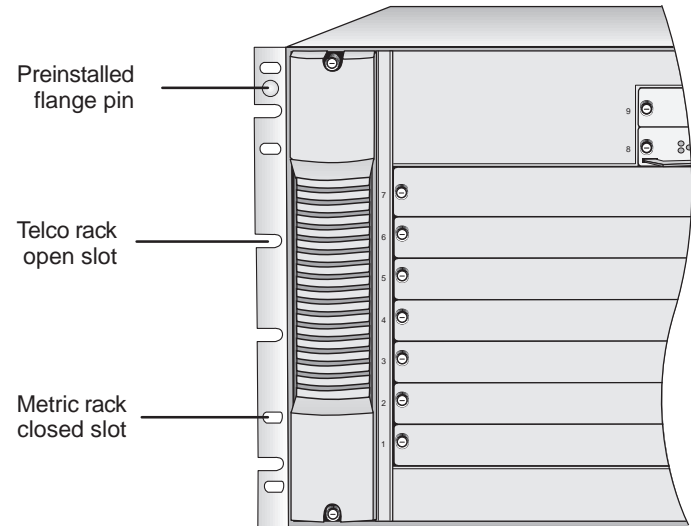


WARNING: To maintain proper cooling in the chassis and to maintain safety compliance, make certain that blank faceplates cover any empty slots.

- If you install more than one chassis in a rack, install the bottom chassis first. Make certain that there is sufficient space between the bottom chassis and the top chassis.
- If you install the chassis in a Metric rack slot, install the rack-mount clips and screws in the closed slots of the rack-mount flanges. If you install the chassis in Telco rack slots, position the chassis and then install the screws and rack-mount clips in the open slots.

Figure 17 shows the Telco and Metric slots and the location of the preinstalled rack-mount flange on a Switch 4007 chassis.

Figure 17 Preinstalled Rack-mount Flange Location and Slot Types on the Switch 4007 Chassis



Ventilation Requirements

This section describes ventilation requirements for the Switch 4007. The chassis contains one fan tray that contains four fans.

To ensure that installed fans are able to provide adequate ventilation, maintain at least 7 cm (2.76 in.) between the sides of the Switch 4007 chassis and the nearest wall (or other vertical surface). Also provide at least 91.4 cm (36 in.) behind the chassis to be able to remove and replace power supplies in the Switch 4007 chassis.

When you face the front of the Switch 4007 chassis, the inlet is on the right and the exhaust is on the left.



CAUTION: Operate a Switch 4007 chassis with four fans running. If one fan in the fan tray fails, replace the fan tray as soon as possible.

Power Requirements

This section list power requirements for the 930-watt AC (Model Number 3CB9EP9) power supply.

The Switch 4007 chassis can contain two modular 930-watt power supplies. The 930-watt power supplies provide AC power to the Switch. The 930-watt power supplies are autosensing. Each power supply can automatically sense the type of input voltage to which it is being connected at the electrical outlet.

Table 5 lists power requirements for each country.

Table 5 Power Requirements Per Country

Location	Volts	Hz	Ampere
Asia	220 - 240 Volts	50 Hz	15-ampere
Australia	220 - 240 Volts	50 Hz	10-ampere
Canada	120 Volts	60 Hz	20-ampere
Europe	220 - 230 Volts	50 Hz	16-ampere
Japan	100 Volts	50/60 Hz	15-ampere
South Africa	220 - 250 Volts	50 Hz	16-ampere
U.K.	240 Volts	50 Hz	13-ampere
U.S.A.	120 Volts	60 Hz	20-ampere

One power cord per power supply is required. The power cord that you require depends on your country location.

Table 6 lists the power cords for each country.

Table 6 Power Cord Description for Your Location

Location	Power Cord Type
Asia	C19/AS3112
Australia	C19/AS3112 special- 10A - C19
Canada	C19/NEMA 5-20P
Europe	C19/CEE7
Japan	C19/NEMA 5-15P
South Africa	C19/SABS164
U.K.	C19/BS1363A
U.S.A.	C19/NEMA 5-2 OP

Safety Information

This section lists warning notices to read before you install the Switch 4007 and its components.



WARNING: The Switch 4007 must be installed only by trained service personnel.



WARNING: To maintain proper cooling in the chassis and maintain safety compliance, make certain that blank faceplates cover any empty slots.



WARNING: Hazardous energy levels exist inside of the Switch. Do not place hands or objects into the switch or touch components on an inserted module.



WARNING: Safety regulations state that the selected table, shelf, or rack must be able to support at least three times the weight of a fully loaded Switch. A fully loaded Switch 4007 chassis weighs approximately 38.55 kg (85 lb). Therefore, the selected table or shelf must support at least 115.65 kg (255 lb).

Denmark Safety Certification

The following warning is required for Denmark safety certification:



WARNING: For use in Denmark, each 3CB9EP9 power supply must receive power from a separately dedicated socket outlet having a 16-ampere fuse in the installation. This product must be mounted in a fixed installation such as a permanent rack.



WARNING: Ved brug i Danmark, skal hver 3CB9EP9 stromforsyning modtage strøm fra en separat, dedikeret stikkontakt med en 16-ampere sikring i installationen.

Laser Warning

The following warning is required when you install fiber-optic communication modules into the Switch 4007:



WARNING: To ensure optical safety when you install a fiber-optic interface module, comply with the following precaution:

Although the data communication LEDs and Lasers used in this product meet the regulatory requirements for casual exposure to the eye, as with any source of bright light, 3Com® recommends that you do not look into the light source.

Laser Safety Information: IEC 825 and EN60825, Class 1 Laser Device. For connection only to Class 1 Laser Devices.



FDA Class 1 Laser Device

This product complies with U.S. Department of Health and Human Services Rules 21 CFR Subchapter J applicable at date of manufacture.

LED Warning

The following warning is required when you install fiber-optic communication modules into the Switch 4007:



WARNING: To ensure optical safety when you install a fiber-optic interface module, comply with the following precaution:

Although the data communication LEDs that are used in this product meet the regulatory requirements for casual exposure to the eye, as with any source of bright light, 3Com recommends that you do not look into the light source.

LED Safety Information: IEC 825, Class 1 LED Device. For connection only to Class 1 LED Devices.



Preinstallation Guidelines

Use the following installation guidelines to ensure your safety and optimal performance. Review all guidelines before you install the Switch 4007.

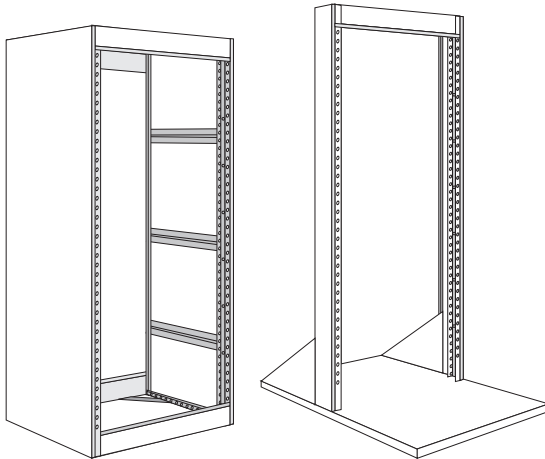
Rack-Mount Installation Guidelines

Before you attempt to mount the chassis in a rack:

- Select a rack that can support at least 115.65 kg (255 lb), which is three times the weight of a fully loaded Switch 4007 chassis, and that provides sufficient vertical space for each chassis that you want to install.
- Make certain that the rack that you use is properly aligned and is squared. Use a framing square to ensure that the rack is squared.
- To maintain proper cooling in the chassis and to maintain safety compliance, make certain that blank faceplates cover any empty slots.
- Bolt the rack to the floor.
- Brace the top of the rack against the wall.

Figure 18 shows two types of racks that you may use to install the Switch 4007 chassis.

Figure 18 Rack Types



- Move the Switch 4007 chassis close to where you plan to install it. Place the chassis in front of the rack, table, or shelf that you plan to use.
- For a rack installation, make certain that you have a Phillips screwdriver and a flat-blade screwdriver, and at least 8 of the 12 screws (from the hardware kit) available when you begin to install the chassis.
- Position the rack-mount clips if you are going to use them for the rack-mount installation.
- For a tabletop or shelf installation, make certain that you have a Phillips screwdriver or flat-blade screwdriver and the hardware kit available.

- Because the equipment rack environment can cause increased ambient temperatures and reduced air flow, review the chassis specifications and site requirements.

Use the following guidelines to tighten screws to Torque Specification:

- Faceplate thumbscrews — 5-7 in/lb (inches per pound)
- #10 screws for holding the chassis onto the rack rail — 22-25 in/lb

Installing the Chassis

This section contains:

- Installing the Chassis in a Rack
- Installing the Chassis Using Rack-Mount Clip Nuts
- Installing the Chassis on a Table or Shelf



You may have other types of racks at your site. Follow the manufacturer's suggested installation procedures.

Installing the Chassis in a Rack

Follow these steps to mount the chassis in a rack. Use at least two people to perform this installation.

- 1 Locate and mark the holes on the rack where you want to place the chassis.
- 2 Two people lift the chassis through the front of the rack, until both chassis rack-mount flanges are flush with the front of the rack.

- 3 Use the preinstalled flange pins in the Telco rack slot to position the chassis in the rack.

Support the back of the chassis until the two bottom screws are fully inserted.

- 4 While you support the back of the chassis, insert one *bottom* screw on each side of the chassis and then tighten the screw.



Tighten the #10 screws that hold the chassis onto the rail to a Torque Specification of 22-25 in/lb (inches per pound).

- 5 Insert one *top* screw on each side of the chassis and then tighten the screw.
- 6 Install all remaining screws and tighten them.

Installing the Chassis Using Rack-Mount Clip Nuts

Follow these steps to mount the chassis in a rack when you use rack-mount clip nuts.



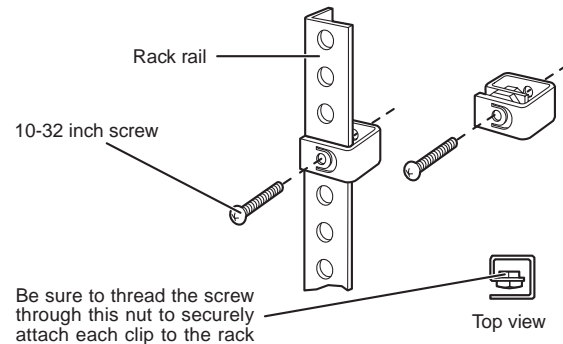
Not all racks require that you use rack-mount clips. Use whatever method of rack-mount equipment that you have to meet installation requirements in a rack.

Use at least two people to perform this installation.

- 1 Mark and locate the holes on the rack where you want to place the clip nuts.
- 2 Install the clip nuts on the rack in the positions that you selected. See Figure 8.

The rack slots are not equally spaced, so align the clip nuts to the slots properly for the screws to be easily installed.

Figure 19 Installing a Rack-mount Clip in the Rack



- 3 Two people lift the chassis through the front of the rack, until both chassis rack-mount flanges are up against the rack.
- 4 Using the preinstalled flange pins for guidance, match the slots on the rack-mount flange to each clip nut on the rack.



Support the back of the chassis until the two bottom screws are fully inserted.

- 5 Secure the chassis to the rack with the screws provided (eight 10-32 inch screws) and with the rack-mount clips.
 - a Install one screw on each side in the bottom slot on *each* rack-mount flange.
 - b Install the remaining screws.
 - c Tighten all screws completely.



Tighten the #10 screws that hold the chassis onto the rail to a Torque Specification of 22-25 in/lb (inches per pound).

Installing the Chassis on a Table or Shelf

This section describes how to attach plastic feet to the chassis and how to install the chassis on a table or a shelf.



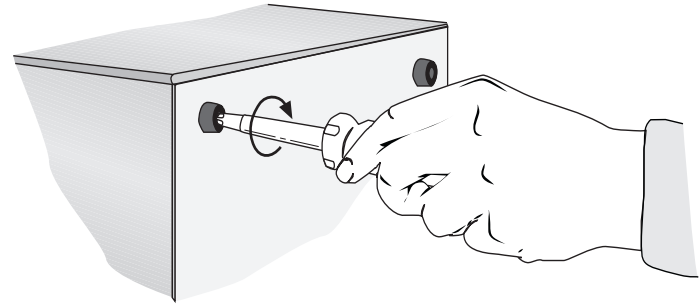
WARNING: Safety regulations state that the selected table or shelf must be able to support at least 115.6 kg (255 lb), which is three times the weight of a fully loaded chassis.

Attaching the Chassis Feet

To install plastic, molded feet on the Switch 4007 chassis, follow these steps:

- 1 Using two people, lift the chassis onto the table or shelf.
- 2 Position the chassis on its side so that you can access the bottom of the chassis.
- 3 Remove the four feet and the four 6-32 Phillips-head screws from the hardware kit.
- 4 Using a Phillips screwdriver, screw the feet to the bottom of the chassis. See Figure 9.

Figure 20 Attaching Plastic Feet to the Switch 4007 Chassis



Installing the Chassis on a Table or Shelf

To install the chassis on a table or on a shelf, follow these steps:

- 1 Lift and turn the chassis upright on its installed plastic feet.
- 2 Position the chassis on the table or shelf so that the chassis rests upright squarely on the table or on the shelf (on all four feet).
- 3 Ensure that the front, sides, and the rear of the chassis are unobstructed and easy to reach.

Where To Go from Here

After you have installed the chassis, use the following information to proceed:

Task	See this document
Install power supplies	<i>Power Supply Installation Guide</i>
Install an EME	<i>Enterprise Management Engine Quick Start Guide</i>
Install a switch fabric module	<i>Gigabit Ethernet Switch Fabric Module Quick Start Guide</i>
Install an interface module	<i>Module Quick Start Guide</i>
Configure the Switch	<i>Switch 4007 Implementation Guide</i> <i>Switch 4007 Command Reference Guide</i>

4

START THE SWITCH

This chapter summarizes what happens when you power on your Switch 4007 after you have installed all the switch components.

Before you power on the Switch 4007, review the setup tasks (Figure 16 on page 29) and make certain that all the tasks have been performed.

Power On the Switch

- 1 Attach the power supply cables to the connections on the Switch.
- 2 Plug the power cord into the electrical socket.
- 3 Turn on the power switch.
- 4 Watch the LEDs on installed modules



To verify that the Switch 4007 modules have been installed correctly, examine the LED status on each module. To obtain information about a module's LEDs and status indicators, see the User Guide, Getting Started Guide, or Quick Start Guide specific to that module.

What Occurs During Startup

After you turn on the power switch, the following occurs:

- The power supplies begin operating.
- The fans start rotating.
- The Enterprise Management Engine LEDs blink green.

Table 7 shows the sequence of characters that appear on the EME management module LED character display during a switch power-on.

Table 7 The EME LED Character Display During Power-on

Characters in Display	Indication
random characters	Power-on has begun.
none (blank display)	Power-on continues.
Diag	The EME is running self-diagnostic tests.
Cksm	The EME is calculating the checksum value.
Stby	The EME is in standby mode, if it is a backup.
Rdy	The EME is active and ready, if it is a master.

If you power on a power supply and it is not operating, the Character Display displays the following: PWR *x*.

Where *x* is the number of the power supply that is not operating. The installed switch fabric module Status LED flashes green.

When the power-on phase has completed successfully, normal operation begins and switch fabric module Status LEDs stop flashing and remain a steady green.

If one of the power-on diagnostic tests fails, then the switch fabric module Status LED turns a steady yellow.

The switch displays the following message when the management module is installed properly and the RS-232 connection is made:

```
CoreBuilder 9000 Enterprise Management Engine
(vx.xx)
Copyright (c) 1999 3Com Corporation.
```

Login:



The Switch 4007 software and management interfaces are based on CoreBuilder® 9000 switch technology. In Switch 4007 software releases 3.0.0 and 3.0.5, the prompts and displays in all interfaces may indicate this heritage.

To continue operating and configuring your Switch, see the *Switch 4007 Implementation Guide* and *Switch 4007 Command Reference Guide*.

Where to Go from Here

To verify that the Switch 4007 chassis and all modules have been installed correctly, examine the LED status on each module. To obtain information about a module's LEDs and status indicators, see the *User Guide*, *Getting Started Guide*, or *Quick Start Guide* for that module.

For detailed information about the tasks that are listed in Table 9, see the *Enterprise Management Engine Quick Start Guide*.

Table 8 Tasks to Perform After You Power On the Switch

Task	Description
Configure the Enterprise Management Engine	To configure the EME, set: <ul style="list-style-type: none"> ■ Terminal settings ■ Time and date ■ Device (Contact, Diagnostics, Location, and Name) ■ SNMP parameters to enable network access ■ Mastership priority, if you have two EMEs
Connect to a terminal or a modem	To configure and monitor your Switch, connect a PC, terminal, or modem to the EME console port. You can manage your switch locally through a terminal connection or remotely using a Telnet or modem connection.
Perform initial management access	Initially you access the switch through the RS-232 port. With network access, you can manage the Switch 4007 from a remote terminal or SNMP manager.



MANAGEMENT TOOLS

The Switch 4007 supports a range of network management methods and contains an embedded Web-based management agent.

This chapter contains:

- EME Management Module Architecture
- Switch 4007 Setup Wizard
- Transcend Network Supervisor
- Web Management Tools

EME Management Module Architecture

The Enterprise Management Engine (EME) management module is the primary communication mechanism into the chassis and any installed switch fabric modules and interface modules.

The EME is an SNMP-based network management module that manages and controls the Switch 4007 chassis and its modules.

The EME management module provides the following management and control capabilities:

- **Configurations** — When you are logged in using the Administer password, you can configure the management module and monitor the chassis environment.
- **Inventory** — The management module provides a complete inventory of switch contents, including fans and power supplies. The inventory lists current software revisions for all installed modules. The inventory system also supports a scratchpad feature so that you can add custom information to the management module display.
- **SNMP Support** — SNMP (Simple Network Management Protocol) is a protocol that the Internet Engineering Task Force defined. The management module acts as an agent in an SNMP-managed environment. The agent responds to SNMP requests and generates SNMP traps.
- **Telnet Support** — With the management module `telnet` command, you can connect a management module to any other Telnet device. The management module also supports incoming Telnet sessions so that you can manage a management module from a workstation with Telnet support, or from another management module.

- **In-Band and Out-of-Band Download** — The management module provides both in-band and out-of-band downloads. In-band download uses TFTP (Trivial File Transfer Protocol) through a network connection. Out-of-band download uses XMODEM software and the RS-232 serial port on the front panel of the management module. The management module allows you to download to multiple modules using a single command.
- **Web Management Support** — You can monitor and manage the management module through the Switch 4007 Web Management suite of applications.
- **Transcend® Network Control Services Support** — You can also monitor and manage the management module through the 3Com® Transcend Network Control Services.

Switch 4007 Setup Wizard

The Switch 4007 Setup Wizard, supplied on the Software CD-ROM, is an easy-to-use Windows-based application that helps you set up the Switch 4007 for the first time.

The Setup Wizard enables you to configure:

- Serial communication settings
- IP address, subnet mask, and default gateway for the EME management module
- Administrators who have management access
- SNMP community strings

Transcend Network Supervisor

3Com® Transcend Network Supervisor, supplied on the Software CD-ROM, provides easy-to-use network management tuned to the needs of small to medium enterprises. Network devices are automatically discovered and network activity and stress monitored through a graphical interface.

Transcend Network Supervisor features:

- **Network Discovery** — A Discovery wizard finds up to 500 IP devices on the network. The discovery works on the local subnet, the whole network or across specified subnets. Transcend Network Supervisor recognizes different types of device and polls them for information.
- **Network Map** — Discovered devices are automatically mapped using graphics and color to show links and network topology.
- **Device Stress Monitor** — Key network devices are detected and monitored. The user can add and tune monitors. Color stress bars show detailed stress monitoring.
- **Event Log** — Intelligent event monitoring provides a log of network activity. Unnecessary events are automatically filtered out. Events can be filtered and annotated, grouped, and sorted.
- **Network Alerts** — Alerts can be attached to any network event. The alerts can be by e-mail, audio or visual pop ups or can start applications.
- **Reports** — Generate reports on Network Inventory, Capacity Planning, and Network Topology.

Transcend Network Supervisor is included on the Switch 4007 Software CD. You can obtain the latest version from 3Com at:

<http://www.3com.com/>

Web Management Tools

The Web Management suite of features consists of embedded Web Management applications and installable tools.

This section contains:

- Features
- Browser and Platform Requirements
- Installing Supplemental Tools
- Setting Up the Form-specific Help Files
- Embedded Web Management Applications
- Interface Description

Features

Use the embedded Web Management applications, which are part of the system software image, for most of your device configuration and management tasks. You can manage a single port or device, or, using multiple windows, you can manage multiple devices.

This software contains:

- **WebConsole** — An HTML-based set of configuration forms.
- **DeviceView** — A Java-based application that displays a real-time image of the device. You can manage each port or module, or the entire system, by clicking the part of the image that you want to manage.
- **Installable tools** — Install some or all of these optional tools on your workstation from the *Software CD* that is shipped with your system:
 - **DeviceView accessories** — To set up e-mail notification for Status Logging.
 - **WebManage Framework** — To group your access links to the devices that you manage.
 - **Filter Builder** — To create and test filters for packets on your switch.
 - **Form-specific Help** — To access hypertext information about the fields in the WebConsole and DeviceView.

Browser and Platform Requirements

The Web Management suite of applications has certain dependencies, as described in this section.

Color Recommendations

The minimum graphics capability is SVGA (800x600 resolution). For best performance, use XGA (1024x768 resolution).

Browser Support

Web Management requires Microsoft Internet Explorer 4.01 or later OR Netscape Navigator 4.03 or later.

If you are using Netscape Navigator 4.03 or 4.04, be sure to install the Netscape JDK 1.1 Patch. Download the patch from this URL:

<http://help.netscape.com/filelib.html#smartupdate>

If you are using Internet Explorer, install the latest 4.01 Service Pack 1. This service pack makes Internet Explorer Year 2000-compliant and fixes other product support issues. Download the 4.01 Service Pack 1 from the following URL:

http://www.microsoft.com/msdownload/iebuild/ie4sp1_win32/en/ie4sp1_win32.htm

If the link is not available, download the service pack from the Microsoft home page:

<http://www.microsoft.com>

Platform Requirements

Table 9 lists the platforms that you need for each of the Web Management features.

Table 9 Platform Support for Web Management

Feature	PC	UNIX
<i>Embedded Web Management Applications</i>		
WebConsole	✓	✓
DeviceView	✓	✓
Configuration form to set up Help, plus 3Com support links	✓	✓
<i>Installable Tools</i>		
Form-specific Help	✓	✓
WebManage Framework, to customize your access to devices	✓	
DeviceView accessories, such as e-mail notification for Status Log	✓	
Filter Builder	✓	

Installing Supplemental Tools

The supplemental tools come with your product on the *Software CD*. Use the installation file `webmanagev30.exe` to launch the installation wizard.

Windows Installation

If you decide to install the additional Web Management files on a PC, copy them to a workstation that runs Windows 95 or Windows NT or to an NT server.

To download the installable Web Management tools:

- 1 Close all open programs and applications.
- 2 In the CD directory, locate the `webmanagev30.exe` file.
- 3 Double-click the file and follow the instructions in the installation wizard. Select one of these three types of installation:
 - **Custom** — Installs one or more supplemental Web Management components that you select from a checklist.
 - **Help Files Install** — Installs only the Help files for the Web Management embedded forms. You can select which of five 3Com switching product's Help files you want to install.
 - **Typical** — Installs all supplemental Web Management components, including the WebManage Framework, Filter Builder, DeviceView accessories (such as Status Logging), and the Help files for five 3Com switching products.



If you plan to group multiple devices in easily accessible folders, select the Typical installation or select the WebManage option in the Custom installation.

- 4 Decide whether to reboot:

- If you have selected Help Files Install or Typical and are using Windows 95, the wizard prompts you to confirm whether you want to reboot your system. If you click *Finish*, the system reboots to complete the installation process.



If you are running Windows NT, you do not need to reboot the system.

- If you have selected the Custom installation and installed only the Help files, you do not need to reboot your system.

The installation wizard installs the Web Management icon in the directory that you specified in step 3.

- 5 To configure your Help files, follow the instructions in "Setting Up the Form-specific Help Files".

UNIX Help Installation

A UNIX .TAR file that contains the Web Management Help system is available on the *Software CD*.

To install Help files on your UNIX workstation:

- 1 Locate the `HELP.TAR` file on the CD.
- 2 Extract the `.TAR` file into your Web server directory using the `tar -xvf HELP.TAR` command.
- 3 To configure your Help files, follow the instructions in "Setting Up the Form-specific Help Files".

Setting Up the Form-specific Help Files

To access Help, install the Help files on your workstation using Help Files Install or Typical in the installation wizard. See “Windows Installation” or “UNIX Help Installation”.

The first time that you access Help, the system displays the Help configuration form.

To configure the location of the Help files:

- 1 In the banner of the Web Management opening screen, select the Help tab.

The Help Server configuration form appears.

- 2 In the *Help Installation URL* box of the form, type the URL for the Help files. Do not end the URL with a slash (/) character.

- 3 Click *Apply*.

The system displays a message that the configuration has been successful.

- 4 To link the Help to Web Management on the Web-Console opening screen, select any item in the menu tree and then click the *Help* button on the form.

Help is now configured for your system.

- 5 To access Help on any form, click the form's *Help* button.



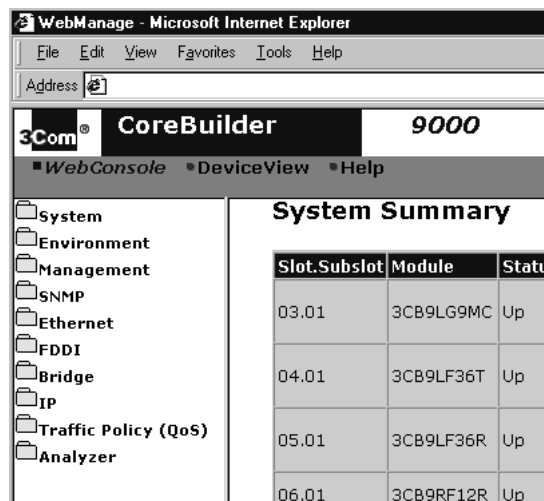
The banner at the top of each Help page and the row of links at the bottom of each Help page provide access to the Start page (containing Web Management overview information), Contents, Index, Technical Support, and the 3Com Corporation home page.

Embedded Web Management Applications

You can access these embedded Web Management applications from the Tabs panel of the opening screen (Figure 21):

- WebConsole (including configuration forms and wizards)
- DeviceView
- Help configuration form and 3Com support links

Figure 21 Parts of the Web Management Opening Screen



The Switch 4007 software and management interfaces are based on CoreBuilder® 9000 switch technology. In Switch 4007 software releases 3.0.0 and 3.0.5, the prompts and displays in all interfaces may indicate this heritage.

Interface Description

The screen for the embedded Web Management applications is divided into three areas (Figure 21):

- **Tabs panel** — At the top of the Web Management screen, the Tabs panel has three tabs:
 - **WebConsole tab** — When you select this tab, the menu tree lists folders for the parameters that you can configure for the device to which you are connected.
 - **DeviceView tab** — When you select this tab, you see an image of the device. You can configure some system and module parameters from this view.
 - **Help tab** — When you select this tab, the menu tree lists the Help configuration form and several links to 3Com support sites. The menu tree also displays links to the Help Contents and Index. Until you install and configure Help, these links connect you to the Help configuration form.

- **Menu tree** — The menu tree frame at the left of the interface lists the menu options. Many of these options are the same as those found in the Administration Console command line interface.
- **Configuration form icons** — Click a folder to view the menu options, which appear as configuration form icons. Click a form icon to view the associated form in the workspace.
- **Telnet icons** — To configure system parameters that are not supported through the WebConsole, click a Telnet icon on the menu tree to launch a Telnet session to the Administration Console on the device.
- **Workspace** — The workspace frame of the interface displays the configuration form for the menu option that you select.

Troubleshooting

This section covers the following topics:

- Web Management and Internet Explorer
- Improving DeviceView
- Improving DeviceView Download Speed
- Enabling Status Log E-mail Options on Internet Explorer
- Web Management and Netscape Navigator
- Troubleshooting the Web Management Software
- Examples of Good and Problematic CLASSPATH Settings
- Additional Resources for Solving Problems

Web Management and Internet Explorer

If you are using Microsoft Internet Explorer, install the latest 4.01 Service Pack 1. This service pack makes Internet Explorer Year 2000-compliant and fixes other product support issues. Download the 4.01 Service Pack 1 from the following URL:

http://www.microsoft.com/msdownload/iebuild/ie4sp1_win32/en/ie4sp1_win32.htm

If the link is not available, download the service pack from the Microsoft home page:

<http://www.microsoft.com>

Improving DeviceView

Certain Status Log options allow you to send e-mail messages regarding system, module, and port status changes to one or more e-mail addresses. To access these e-mail options, install the additional Web Management tools and enable Status Logging.

Improving DeviceView Download Speed

To improve download speed for DeviceView image in Internet Explorer, you change several security settings:

- 1 Open an Internet Explorer browser window.
- 2 From the *View* menu in the browser window, select *Internet Options*.
The Internet Options dialog box appears.
- 3 To view security options, select the Security tab.
- 4 In the *Zone* list box, select *Trusted sites zone*.
- 5 Click the *Add Sites* button.

- 6 In the *Add this Web site to the zone* box, type **http://** plus the IP address of the device that you want to manage through Web Management.
Example: **http://158.101.81.1**

This information is added to the *Web sites* box.

Clear the Require server verification (https:) for all sites in this zone *check box*.

- 7 When you have added all of the devices that you want to manage, click *OK*.

Enabling Status Log E-mail Options on Internet Explorer

To ensure that the e-mail option for Status Log is available, follow the steps in "Improving DeviceView" and then take these steps:

- 1 In the Internet Options dialog box, select the Security tab and then, to set custom security settings, click the *Custom* option button.
- 2 Click *Settings*.
- 3 In the *Reset to:* list box, select *Low security* and click *Reset*.

- 4 In the *Security Settings* area, scroll down to Java permissions and select the *Custom* option button.

The *Java Custom Settings* button at the bottom of the dialog box is now available.

- 5 Click *Java Custom Settings*.
- 6 Select the *Edit Permissions* tab.

*If you cannot configure the options that are listed under *Unsigned Content*, verify that you are using the latest version of Internet Explorer.*

- 7 In the *Run Unsigned Content* choices, click the *Enable* option button.
- 8 To close the *Trusted sites zone* dialog box, click *OK*. To close the *Security Settings* dialog box, click *OK*.
- 9 To apply the setting, in the *Internet Options* dialog box, click *Apply*. To close the *Internet Options* dialog box, click *OK*.

Web Management and Netscape Navigator

If you encounter problems accessing Help files from Filter Builder or from other Web Management applications when you use Netscape Navigator, clear the browser memory cache and disk cache and restart the browser.

To clear the cache in Netscape Navigator:

- 1 In the browser window, from the *Edit* menu, select *Preferences*.
- 2 In the *Category* menu tree, select *Advanced* and then, in the *Advanced* folder, select *Cache*.

The browser cache options appear to the right of the menu tree.

- 3 To clear the memory cache and disk cache, click the appropriate buttons on the cache options form.
- 4 Restart the browser.

*If the Netscape browser does not close, press *Ctrl+Alt+Delete* and end the Netscape browser task.*

Troubleshooting the Web Management Software

If you are unable to run the Web Management software, verify the accuracy of your `CLASSPATH` environment variable.

By default, the Web Management installation adds two directories above your existing `CLASSPATH`: `C:\3Com`.

Your directories may be different if you did not select the default `C:\3Com` directory during installation.

If your system already has an existing `CLASSPATH` before you install the additional Web Management files, the necessary `3Com` directories are added above yours. As a result, your classpath may look like this:

```
C:\3Com;C:\java\classes;C:\java\applets\myclasses;
```

If you modify your classpath and do not include the `3Com` directories (and possibly if you do not list them before any other directories in your classpath), the Web Management components may fail to run properly.

In Windows 95, your `CLASSPATH` is set in the `autoexec.bat` file. It usually appears in this format:

```
SET CLASSPATH=C:\3Com;
```

In Windows NT, your `CLASSPATH` is set through the System icon in the Control Panel. If you do not know how to change your environment variables, ask your system administrator.

Examples of Good and Problematic `CLASSPATH` Settings

This minimal setting is required for Web Management:

```
SET CLASSPATH=C:\3Com;
```

The following setting is also acceptable:

```
SET CLASSPATH=C:\3Com;C:\java\classes;
```

This setting can potentially cause problems:

```
SET  
CLASSPATH=C:\java\classes;C:\myclasses;C:\3Com;
```

The next setting results in unspecified behavior, because certain 3Com Web Management directories are not included. An unspecified `CLASSPATH` has similar results. In either case, the installed Web Management applications may fail to run:

```
SET CLASSPATH=C:Local Status Log
```

Additional Resources for Solving Problems

If you still encounter problems after you try the tips offered in this chapter, consult these sources of information:

- Any Web Management system issues and Web Management known problems in the *Release Notes* for the management modules, Layer 2 switching modules, Layer 3 switching modules, and switch fabric modules and I/O interface modules.
- Your network supplier
- The Technical Support appendix in the release notes

This chapter describes the routine maintenance to perform to keep your Switch 4007 chassis working at its best. This chapter also provides instructions for replacing power supplies and fan trays.



WARNING: Only trained electrical service personnel should perform switch connections and disconnections.



WARNING: Hazardous energy levels exist inside of the chassis. Do not place hands or objects into the switch or touch components on an inserted module.



There are no user-serviceable parts on either the load-sharing power supplies or on the fan trays. If these components fail, remove them as described in this chapter and return them to your supplier. Keep replacement power supply units and fan trays at your site so that they are available if needed.

This chapter provides information about the Switch 4007 chassis and contains the following topics:

- Routine Maintenance
- Removing and Replacing a Power Supply
- Removing and Replacing a Fan Tray
- Installing a 16 MB Expansion Memory Card

Routine Maintenance

On a regular basis, inspect your Switch 4007 chassis to verify that all blank faceplates are securely attached to the chassis, and the fans are running.



CAUTION: The Switch 4007 sends a fan fault message when one fan fails in the fan tray. However, the switch can continue to run if one fan fails in the fan tray. If a second or third fan fails, in that fan tray, no trap message is generated. Replace the fan tray within 48 hours of receiving the trap message or contact your service representative.

- Ventilation to the switch is unobstructed.
- All modules are securely seated in the backplane and firmly attached to the chassis.
- Module LEDs are functioning normally and show normal readings.
- Power requirements for all installed modules are met by the power supplies.
- Power cords from each power supply are not frayed or damaged.
- Cables that run from each installed module are securely attached and in good condition.
- If rack-mounted, the chassis and the cable management device are securely attached to the rack.

Removing and Replacing a Power Supply

This section describes how to remove and then replace the 930-watt AC power supply (Model Number 3CB9EP9) in the Switch 4007 chassis.



CAUTION: When you replace a power supply, leave a sufficient number of power supplies running at all times to satisfy the power requirements of installed modules. If you have an installed Enterprise Management Engine (EME), enter the `show power budget` command to display current power conditions for the Switch 4007. If you determine that removal of a defective, but still functioning, power supply will not cause a power deficit in the Switch, you can remove the faulty power supply without losing power to any modules.



WARNING: Before you attempt to remove a 930-watt AC power supply from the chassis, to avoid contact with hazardous energy, be sure to set the power supply's Standby/On switch (Figure 24) to the Standby position, and to disconnect the power cord from both the electrical outlet and then the power supply.



There are no user-serviceable parts on either the load-sharing power supplies or on the fan trays. If these components fail, remove them as described here and return the components to your supplier. Keep replacement power supply units and fan trays at your site so that they are available if needed.

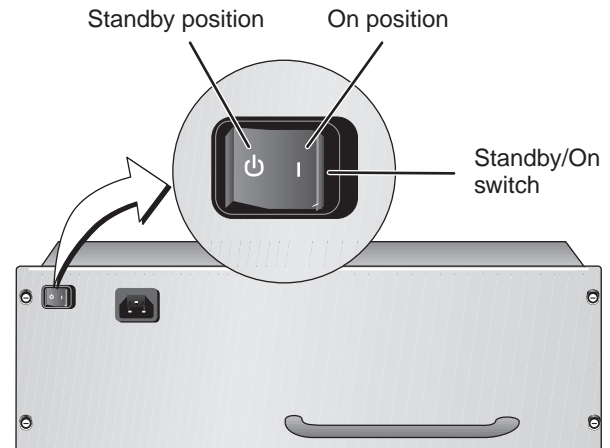
Removing a 930-watt Power Supply

The Switch 4007 chassis can accommodate up to two 930-watt modular load-sharing power supplies.

To remove a 930-watt power supply from a Switch 4007 chassis:

- 1 Set the power supply's Standby/On switch (Figure 22), which is located on the front of the power supply, to the Standby position.

Figure 22 930-watt Power Supply Standby/On Switch



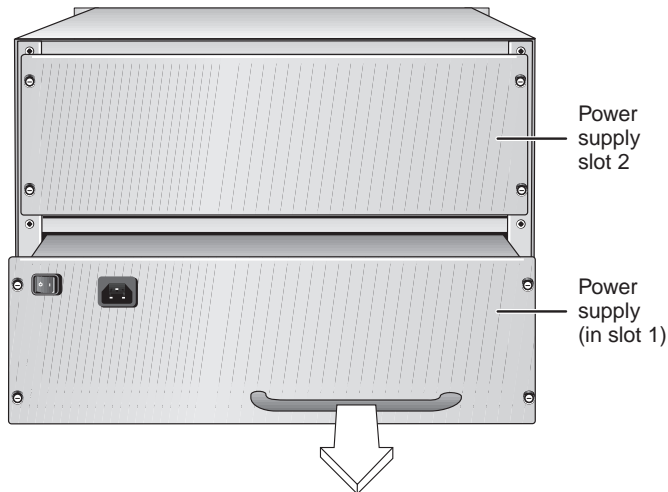
- 2 Remove the power cord from the electrical outlet.
- 3 Remove the power cord from the power supply's AC input socket.

- 4 Remove the power supply (Figure 23).
 - a Using a flat-blade screwdriver, loosen the spring-loaded screws that secure the power supply to the back of the chassis.
 - b Face the back of the chassis and grasp the power supply handle.
 - c Pull the power supply straight out from the chassis, making certain that you do not damage the connectors and guide pins on the rear of the power supply or the connectors on the backplane.



CAUTION: To prevent damage to the guide pins and connectors, while you pull the power supply straight out of the chassis, place one hand under the bottom of the power supply to support it.

Figure 23 Removing the Power Supply Using the Handle

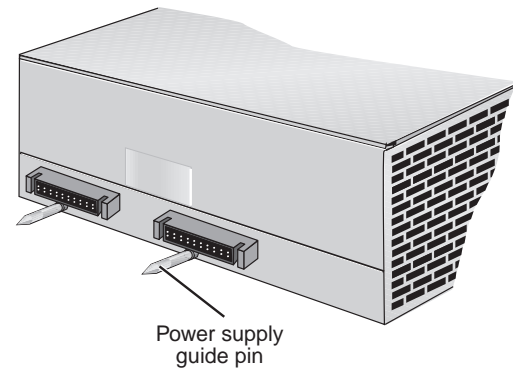


Replacing a 930-watt Power Supply

To install a new 930-watt power supply and power supply cord:

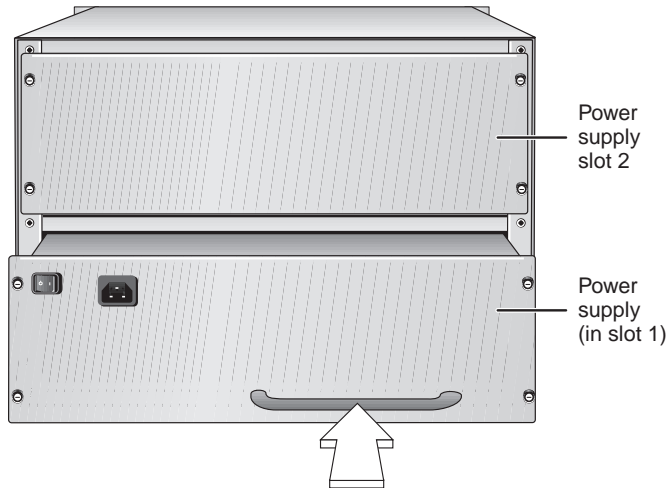
- 1 With one hand, grasp the power supply by the handle; put your other hand beneath the power supply to support it; and face the back of the chassis.
- 2 Use the guide pins on the power supply (Figure 24) and carefully slide the power supply unit into the selected power supply slot.

Figure 24 Guide Pins for the Switch 4007 Power Supply



- 3 With the handle, gently push the power supply inward (Figure 27) until the backplane connectors and power supply connectors engage.

Figure 25 Installing a 930-watt Power Supply Using the Handle



You feel a slight resistance as the connectors engage.



CAUTION: If the resistance is too great, the power supply connectors and the backplane connectors may not be aligned properly. Do not force the power supply into the slot or you can damage the connectors. If necessary, remove and reinsert the power supply, ensuring that the connectors are aligned.

- 4 To secure the power supply to the chassis, tighten the four spring-loaded screws to a Torque Specification of from 5 to 7 in/lb (inch-pounds).
- 5 Before you plug in the power cord, verify that the power supply's Standby/On switch is in the Standby position (Figure 24).

- 6 Plug one end of the power cord into the socket on the power supply and then plug the other end into the electrical outlet.
- 7 Set the power supply's Standby/On switch to the On position (Figure 22).

Removing and Replacing a Fan Tray

This section describes how to remove and then replace a fan tray for the Switch 4007 chassis:



CAUTION: The Switch 4007 sends a fan fault message when one fan fails in the fan tray. However, the switch can continue to run if one fan fails in the fan tray. If a second or third fan fails, in that fan tray, no trap message is generated. Replace the fan tray within 48 hours of receiving the trap message or contact your service representative. Run the switch with all four fans operating in the fan tray.



You can remove the fan trays and then install them without powering off the Switch. This is called hot swapping.



There are no user-serviceable parts on either the load-sharing power supplies or on the fan trays. If these components fail, remove them as described here and return the components to your supplier. Keep replacement power supply units and fan trays at your site so that they are available if needed.

Removing the Fan Tray from a Chassis

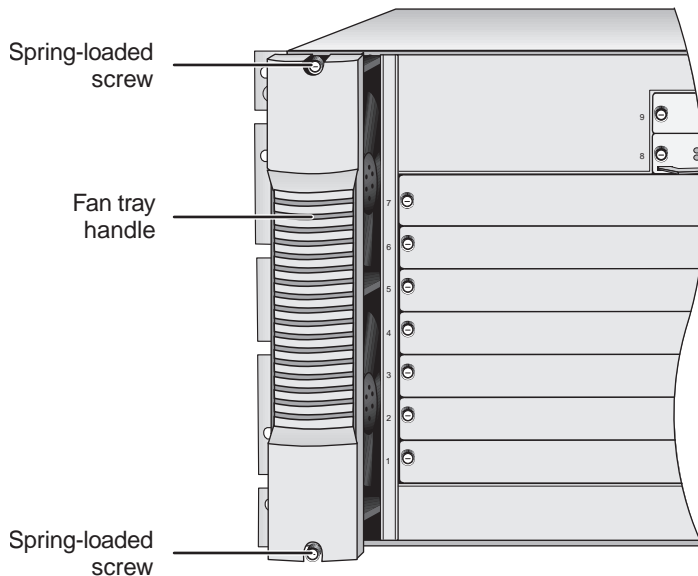
The Switch 4007 chassis contains one fan tray. The fan tray contains four fans.

Fans in the power supplies help to ventilate the Switch, but they are not designed to act as a substitute for the dedicated fan tray.

To remove the fan tray from Switch 4007 chassis, follow these steps:

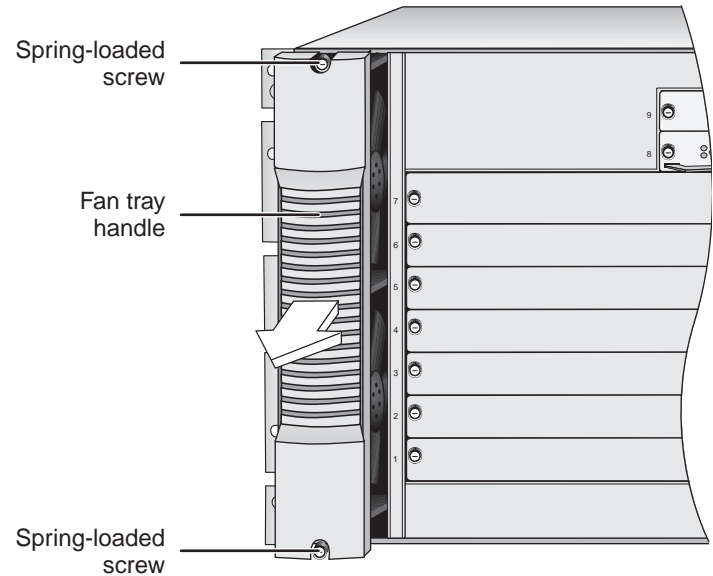
- 1 Using a flat-blade screwdriver, loosen the two spring-loaded screws that attach the fan tray to the front of the chassis (Figure 26).

Figure 26 The Two Spring-loaded Screws on the Fan Tray



- 2 Face the front of the chassis, grasp the handle on the fan tray, and firmly pull the fan tray toward you (Figure 27).

Figure 27 Removing the Fan Tray from the Chassis



CAUTION: Before you completely remove the fan tray, wait until all fans in the fan tray stop rotating.

- 3 Carefully pull the fan tray straight out from the chassis.

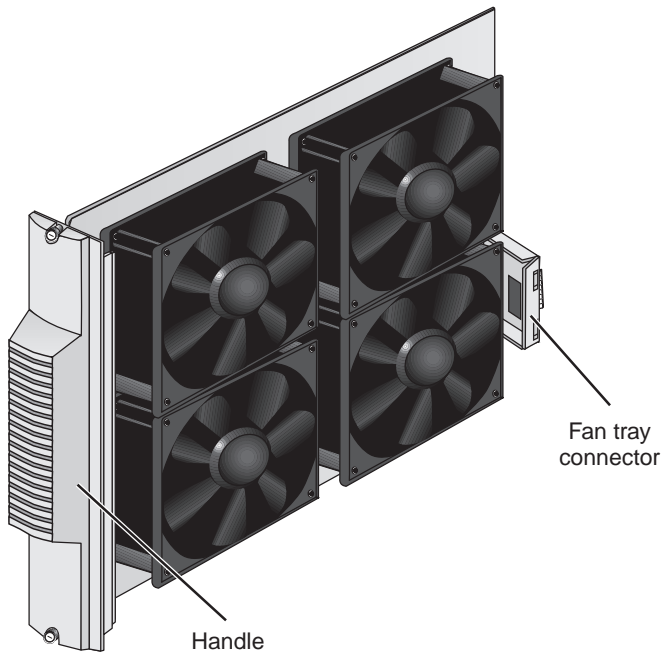
Replacing the Fan Tray in a Chassis

You can install a fan tray in your Switch 4007 chassis while the power is still on. This is called *hot swapping*.

To install a new fan tray:

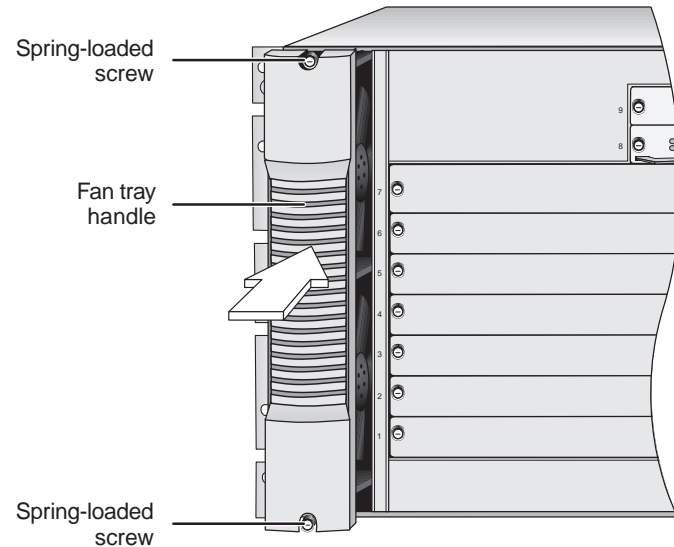
- 1 Grasp the handle on the fan tray and then face the front of the chassis.
- 2 Locate the connector on the fan tray (Figure 28).

Figure 28 Connector on the Fan Tray



- 3 Slide the fan tray into the chassis (Figure 29).

Figure 29 Installing the Fan Tray Using the Handle



- 4 Align the fan tray connector and the backplane connector.
- 5 Gently push the fan tray inward until the connectors engage.

You feel a slight resistance as the connectors engage.



CAUTION: If the resistance is too great, the fan tray connector and backplane connector may not be aligned properly. Do not force the fan tray inward or you can damage the connectors. If necessary, remove and reinsert the fan tray, ensuring that the connectors are properly aligned.

- 6 Verify that the fan tray is flush with the front of the chassis. If the fan tray and the chassis are not aligned, remove the fan tray and reseal it.
- 7 Using a flat-blade screwdriver, tighten the two spring-loaded screws to secure the fan tray to the front of the chassis (Figure 29).



The fans begin rotating the moment that you power on the Switch.

- 8 Visually inspect all installed fans to verify that each is turning without interruption. If a fan is not running, shut the power off and remove and reinsert the fan tray.

Installing a 16 MB Expansion Memory Card

Introduction

The 16 Megabyte (MB) expansion memory card for the Switch 4007 Enterprise Management Engine (EME) supports versions of EME software later than Version 2.0.1. Versions of software that are later than 2.0.1 require the 16 MB expansion memory card to run all features.



3Com® enables you to simplify your installation by selecting from four pre-configured starter kits. Each starter kit includes a 16 Megabyte (MB) expansion memory card. You do not need to install one.

This document provides the basic information that you need to install the 16 MB expansion memory card into the EME:

- 1 Unpack the 16 MB memory card.
- 2 Remove the currently installed EME from the chassis.
- 3 Remove the 4 MB card.
- 4 Insert the 16 MB card.
- 5 Reinstall the EME into the chassis.
- 6 Verify EME operation.



Before you remove the EME from the chassis, read "Safety Precautions" and "Handling Precautions" in this guide.

This guide is intended for *trained technical personnel* only. Do not attempt to remove, install, or replace a Switch 4007 EME or a memory card if you have not had the proper training from 3Com. For training information, call 1-800-NET-3COM.

Safety Precautions

Be sure that you follow all safety precautions when you install or replace components in a Switch 4007 system. To avoid electric shocks, burns, or equipment damage, read and follow these warnings:



WARNING: Allow only trained service personnel to install, remove, or replace an EME or a memory card.



WARNING: Before you open the chassis, always unplug the power cord.



WARNING: Hazardous energy exists within the Switch 4007 system. Use extreme caution when you install, remove, or replace the EME or a memory card.

When the system is on, never insert metal objects such as a screwdriver or a finger with jewelry into open module slots.

When the system is on, do not touch any connections within the chassis with your hands or fingers. Do not insert metal objects into the backplane.

ESD Safety Information

Electrostatic discharge (ESD) can damage components of the system. ESD, which occurs when the EME or a memory card is improperly handled, can cause complete or intermittent failures.



CAUTION: To prevent ESD-related damage:

- Use proper grounding techniques.
- Keep the memory card in its antistatic bag until you are ready to inspect or install it.

Handling Precautions

When you handle the EME, follow these precautions:

- Always handle the EME by the front panel only.
- Do not touch the components, pins, leads, or solder connections.
- When you insert the EME into the module guides, do not twist or otherwise force the module into the chassis.

- Before you push the module into the chassis, make sure that the module ejector handles are open.
- When you slide the module into place, match the left and right module guides.

Unpacking Procedure

Use the following procedure when you unpack the 16 MB expansion memory card:

- 1 Verify that the expansion memory card is the correct model by matching the model number that is listed on the shipping box (Model Number 3CB9UD16) to the model number that you ordered.
- 2 Remove the expansion memory card, in its antistatic bag, from the shipping box.
- 3 Ensure that the box also contains the *16 MB Expansion Memory Card Installation Guide* (this guide).



All shipping boxes are reusable. After you remove the contents, replace the packing materials and store the shipping box for future use.

- 4 Remove the expansion memory card from the antistatic bag and inspect it for damage. If the expansion memory card appears to be damaged, replace it in the antistatic bag, place it back in the shipping box, and contact your local supplier.

Removing an EME from the Chassis

If you have two EMEs in the chassis, upgrade the inactive (slave) EME first.

You do not need to power off the Switch 4007 chassis to install, remove, or replace the EME module. You can replace the module while the chassis is operating. (This is called a *hot swap*.)

- 1 Before you remove the EME, read "Safety Precautions" and "Handling Precautions" earlier in this guide.
- 2 If you are upgrading the active (master) EME, unplug the connection to the console port and the Telnet port.
- 3 Use a flat-blade screwdriver to loosen the top and bottom spring-loaded screws.
- 4 Open the module ejector handles and gently slide the EME out of the chassis.

Installing Expansion Memory

Follow these steps to remove the existing memory card from the EME and to install the new 16 MB expansion memory card:

- 1 Locate the expansion memory card on the EME module printed circuit board.



CAUTION: To avoid damage due to static discharge, handle the EME module by the front panel or edges only.

- 2 Remove the 4 MB expansion memory card from the memory card slot.

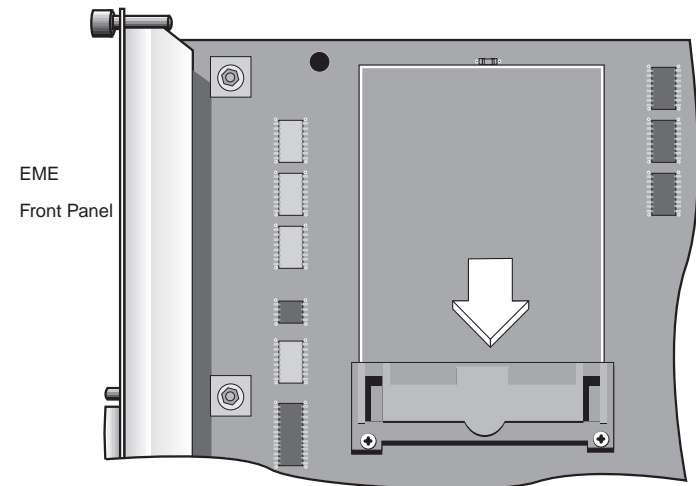
- 3 Insert the 16 MB expansion memory card into the expansion memory card slot on the EME module. Press the memory card in place so that it is firmly seated.

Figure 2 shows where to insert the expansion memory card in the expansion memory card slot.



The memory card is keyed to ensure that you insert it correctly.

Figure 30 The Expansion Memory Card Slot



Reinstalling the EME

To reinstall an EME module:

- 1 Before you start the reinstallation process, read “Safety Precautions” and “Handling Precautions” earlier in this document.

WARNING: Hazardous energy levels exist inside of the chassis. Do not place hands or objects into the chassis or touch components on an inserted module.

- 2 Open the module ejector handles.
- 3 Insert the module into the module guides. Hold the module horizontally with the LEDs at the left. The module guides are on the sides of the slot.



CAUTION: Be careful not to twist or bend the EME module as you insert it.

- 4 Slide the EME module into the chassis by pressing firmly on the front panel.
- 5 To engage the EME connectors and backplane connectors, apply pressure to the module front panel with one hand while you push the ejector handles inward toward the front panel with your other hand. You feel a slight resistance as the connectors engage.



CAUTION: If the resistance is too great, the EME connectors and backplane connectors may not be aligned. Forcing the EME inward can damage the module connectors or backplane connectors. If necessary, remove and reinsert the EME, ensuring that the connectors are properly aligned. Do not tighten the spring-loaded screws to seat the module.

Ensure that the module remains fully seated in the backplane connector while you close the ejector handles.

- 6 To secure the module to the chassis, use a flat-blade screwdriver to tighten the spring-loaded screws to Torque Specification 3 to 5 inch-pounds.



CAUTION: To ensure adequate cooling airflow, install blank faceplates over **all** empty slots.

Verifying EME Operation

To verify that your EME is operating correctly, watch the LED status display during system power-on. shows the sequence of characters that appears in the LED character display during a successful system power-on.

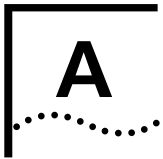
Table 10 LED Character Display During Power-on

Characters in Display	Indicate
random characters	Power-on has begun.
none (blank display)	Power-on continues.
Diag	The EME is running self-diagnostic tests.
Cksm	The EME is calculating the checksum value.
Stby	The EME is in standby mode, if it is a backup.
Rdy	The EME is active and ready, if it is a master.

If the character display on the EME shows `CARD` when you power on the EME, an error condition exists:

- The expansion card is incorrectly installed.
- The on-board DRAM failed.

If one of these error conditions exists, remove and reinstall the expansion memory card.



SPECIFICATIONS

This appendix lists the following specifications for the Switch 4007:

- Physical
- Environmental
- Power
- Regulatory Compliance
- Interfaces

Chassis Specifications

This section contains specifications for the Switch 4007.

Physical

Height	31 cm	12.2 inches (7 Rack Units)
Width	48.3 cm	19 inches (including rack-mount flanges)
	44.4 cm	17.5 inches (not including rack-mount flanges)
Depth	52.58 cm	20.7 inches
Weight	18.14 kg	40 pounds (chassis and backplane)
	38.55 kg	85 pounds (fully loaded)
Mounting	Tabletop, shelf, or 19-inch rack mount	

Environmental

Operating temperature¹	0 °C to 50 °C ambient ² (32 °F to 122 °F)
Operating humidity	10% to 90%, noncondensing
Storage temperature	-40 °C to 66 °C (-40 °F to 151 °F)
Storage humidity	10% to 90%, noncondensing

¹ Switch operating temperature is the temperature of the environment in which the switch is installed.

² Ambient air is room air (more specifically, the air drawn into the switch by installed fans to cool installed switch components). Ambient air temperature is *not* measured by chassis temperature sensors.



CAUTION: To maintain proper ventilation, keep the sides of the Switch 4007 at least 7 cm (2.76 in.) or greater from a wall or other obstruction. In addition, provide at least 91.4 cm (36 inches) in back of the switch to remove and replace the power supplies.

Power

Total power consumption	1431 watts, 4882 BTU/hour
Output voltage	+3.5 V @ 195 A, +5.2 V @ 46 A, +12 V @ 6 A, +2.1 V @ 4 A
Input voltage range	United States — 85 to 132 VAC International — 180 to 264 VAC
Inrush current	maximum 40 A at 110 VAC
Input frequency	47 to 63 Hz



WARNING: For use in Denmark, each 3CB9EP9 power supply must receive power from a separately dedicated socket outlet having a 16-ampere fuse in the installation. This product must be mounted in a fixed installation such as a permanent rack.



WARNING: Ved brug i Danmark, skal hver 3CB9EP9 stromforsyning modtage strøm fra en separat, dedikeret stikkontakt med en 16-ampere sikring i installationen.

Regulatory Compliance

Safety	CSA 22.2 No. 950 UL1950 TUV GS mark IEC950, CB Certificate EN60950, with amendments
Low Voltage Directive	For products declaring LVD compliance on the Declaration of Conformity This equipment was tested and found to conform to the Council Directive 72/23/EEC for safety of electrical equipment. Conformity with this directive is based upon compliance with the safety standard.
EMC Directive	Emissions: <ul style="list-style-type: none"> ■ EMC EN55022 ■ EN61000-3, 2 Immunity: <ul style="list-style-type: none"> ■ EN50082-1
<p>*EMC Directive Compliance This equipment was tested and found to conform to the Council Directive 72/23/EEC for safety of electrical equipment. Conformity with this directive is based upon compliance with the following harmonized standards: EN55022-Limits and Methods of Measurement of Radio Interference EN50082-1 Electromagnetic Compatibility Generic Immunity Standard: Residential, Commercial, and Light Industry</p>	

Interfaces

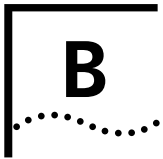
Network Interfaces	45 Mbps DS-3: BNC
	34 Mbps E3: BNC
	2.047 Mbps E1/nxE1 (IMA): RJ-48-c
	1.54 Mbps T1/nxT1 (IMA): RJ-48-c
	10/100BASE-TX
	100BASE-FX
	1000BASE-SX
Management interfaces	10/100BASE-T RJ-45 Fast Ethernet
	RS-232 (DB-9) serial port

Power Supply Regulatory Compliance

This section lists regulatory standards for the following Switch 4007 930-watt AC power supply.

930-watt AC Power Supply

Safety	CSA 22.2 No. 950
	UL1950
	TUV GS mark
	IEC950, CB Certificate
	EN60950, with amendments
Low Voltage Directive	For products declaring LVD compliance on the Declaration of Conformity
	This equipment was tested and found to conform to the Council Directive 72/23/EEC for safety of electrical equipment. Conformity with this directive is based upon compliance with the safety standard.



INTELLIGENT POWER SUBSYSTEM

The Switch 4007 provides a fault-tolerant, intelligent power supply subsystem. The Switch 4007 chassis can contain two power supplies.

The Switch 4007 intelligent power subsystem supports:

- 930-watt AC load-sharing power supply (Model Number: 3CB9EP9) with AC input power
- High power availability
- Controller-based power verification features that are designed to ensure optimal performance

This appendix contains the following topics:

- Intelligent Power Subsystem Features
- Intelligent Power Subsystem Features
- Power Management
- Power Supply Modes
- Power Availability and Power Supply Capacity

Intelligent Power Subsystem Features

Table 11 lists the intelligent power management features.

Table 11 Intelligent Power Subsystem Features

Feature	Description
Load-sharing power supplies	Provides evenly distributed power consumption among all installed power supplies. Switch 4007 activity is not disrupted if a power supply fails because there is no changeover (and hence, no changeover interval).
Front and rear loading accessibility	Provides easy access for upgrades. As your power needs increase over time, it is easy to upgrade by adding a power supply into the rear of the 7-slot chassis.
Dedicated power supply bay cooling	Cools the power supply bay. Vent holes and fan trays reduce the possibility that an overheat condition in the power supply bay may cause or contribute to a failure of the chassis or its modules. This feature works with other switch features to maintain normal chassis internal operating temperature.
High power capacity	Determines the current power limit. The power mode and the amount of power available determine the current power limit. The actual power that is delivered depends on whether you are running in non-fault-tolerant mode or in fault-tolerant mode.

Table 11 Intelligent Power Subsystem Features (continued)

Feature	Description
Controller module-based, software-driven, power management	Confirms that there is enough power for a new Switch 4007 module. Software-driven power management (Intelligent Power Management) also provides protection against the possibility of a catastrophic power failure. If the switch is operating in power fault-tolerant mode and a power supply fails, an installed EME powers off selected (low power class) Switch 4007 modules until the power deficit is corrected. Intelligent Power Management ensures that key components and resources continue to operate, even under extreme failure conditions.

Power Management

The Enterprise Management Engine (EME) works protects network integrity using power management. The EME determines how much power a Switch 4007 module requires before it permits the module to power on.

The EME manages power use in the chassis by:

- Preventing newly installed modules from receiving power when there is not enough power available.
- Allowing you to prioritize the order in which modules power off (if there is insufficient power available).

- Allowing you to implement fault-tolerant power, which allows the chassis to reserve some of its power capacity to protect against a power supply failure.

To support redundancy, install one or more power supplies beyond the minimum number that is required to support the chassis and its modules ($n + 1$ redundancy).

Power Availability and Power Supply Capacity

This section explains the following concepts concerning power supply management:

- **Power available to modules** — The amount of power that is available to Switch 4007 modules is determined by the number of power supplies that are installed.
- **Power capacity of a power supply** — The power capacity of a power supply unit is the maximum amount of power that the power supply delivers.

When you manage power in your Switch, consider the system overhead, that is, the power that the Switch 4007 itself (including fans, signalling, and EMEs) consumes. Before you install any new module into a chassis, assess the power budget by calculating the total power requirements for all installed modules, fans, and management modules.

See the documentation that is supplied with each module to determine your module power requirements. Take into account any modules that you plan to install, as well as those that are already installed.

Power Supply Modes

The Switch 4007 runs in either of two power supply modes:

- Fault-Tolerant Mode
- Non-Fault Tolerant Mode



For optimal power redundancy in either power mode, run the Switch 4007 with two power supplies.

Fault-Tolerant Mode

A user-selectable mode in which power that is equivalent to one power supply is held in reserve. This reserve power is not available to installed modules until a power supply fails, or until you switch the power mode from power fault-tolerant mode to power non-fault-tolerant mode.

While the chassis is running in fault-tolerant mode:

- All installed power supplies are functioning and contributing power to the chassis and modules.
No single power supply is a dedicated standby power supply.

Rather, a factory-defined power limit (which is based on the number of installed power supplies) ensures that power that is equivalent to at least one power supply is available to replace power that is lost when a power supply fails.

- The amount of power that installed modules in a chassis require must not be greater than the number of installed power supplies, minus one (n-1). When you reserve power that is equivalent to one power supply in power fault-tolerant mode, the failure of a single power supply has no impact on installed modules that are already powered on.

If a power supply fails while the switch is running in power fault-tolerant mode:

- EMEs respond by automatically disabling power fault-tolerant mode.
- Power formerly reserved (unavailable to installed modules) is made available by power class and slot location to power-enabled Switch 4007 modules to prevent them from powering off (as an attempt to bring power consumption under the now-reduced power budget).
- All modules that had power before the power supply failure continue to receive power without interruption.
- Upon power supply recovery, the EME automatically reenables power fault-tolerant mode.

Operate the Switch 4007 in power fault-tolerant mode to ensure that power that is equivalent to at least one power supply is available to replace power that is lost if a single power supply fails.

To set the Switch 4007 to power fault-tolerant mode or to power non-fault-tolerant mode, enter the `set power mode` command at the EME prompt.

When you attempt to set the Switch 4007 to power fault-tolerant mode, EMEs determine if there is sufficient unallocated power budget available to place power that is equivalent to one power supply in reserve.

- If there is sufficient unallocated power budget, the Switch 4007 sets to power fault-tolerant mode.
- If there is insufficient unallocated power budget, the Switch 4007 remains in power non-fault-tolerant mode.



To prevent management modules from automatically disabling power fault-tolerant mode in response to a power supply failure, ensure that two power supplies are installed. If a power supply failure occurs under any condition, an alert is sent to the management application.

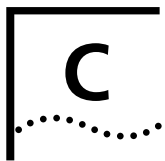
Non-Fault Tolerant Mode

A user-selectable mode in which 100 percent of the power that can be allocated to all modules is available to them (no power is held in reserve). This is the default mode for power supplies as shipped.

While the switch is running in power non-fault-tolerant mode, the amount of power that is available to modules is determined by the number and type of power supplies that are installed.

If a power supply fails while the chassis is running in power non-fault-tolerant mode:

- Installed management modules may shut down selected Switch 4007 interface modules and switch fabric modules in an attempt to bring installed module power consumption under the now-reduced power budget.
- Installed interface modules and switch fabric modules continue to operate without interruption if the output of remaining installed power supplies is sufficient to provide adequate power to all installed modules.



TECHNICAL SUPPORT

3Com® provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the most recent information, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com Knowledgebase Web Services
- 3Com FTP site
- 3Com Bulletin Board Service (3Com BBS)
- 3Com FactsSM Automated Fax Service

World Wide Web Site

To access the latest networking information on the 3Com Corporation World Wide Web site enter this URL into your Internet browser:

<http://www.3com.com/>

This service provides access to online support information such as technical documentation and software library, as well as support options that range from technical education to maintenance and professional services.

3Com Knowledgebase Web Services

This interactive tool contains technical product information compiled by 3Com expert technical engineers around the globe. Located on the World Wide Web at <http://knowledgebase.3com.com>, this service gives all 3Com customers and partners complementary, round-the-clock access to technical information on most 3Com products.

3Com FTP Site

Download drivers, patches, software, and MIBs across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Hostname: **ftp.3com.com**
- Username: **anonymous**
- Password: **<your Internet e-mail address>**



You do not need a user name and password with Web browser software such as Netscape Navigator and Internet Explorer.

3Com Bulletin Board Service

The 3Com BBS contains patches, software, and drivers for 3Com products. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	Up to 14,400 bps	61 2 9955 2073
Brazil	Up to 28,800 bps	55 11 5181 9666
France	Up to 14,400 bps	33 1 6986 6954
Germany	Up to 28,800 bps	4989 62732 188

Country	Data Rate	Telephone Number
Hong Kong	Up to 14,400 bps	852 2537 5601
Italy	Up to 14,400 bps	39 2 27300680
Japan	Up to 14,400 bps	81 3 5977 7977
Mexico	Up to 28,800 bps	52 5 520 7835
P.R. of China	Up to 14,400 bps	86 10 684 92351
Taiwan, R.O.C.	Up to 14,400 bps	886 2 377 5840
U.K.	Up to 28,800 bps	44 1442 438278
U.S.A.	Up to 53,333 bps	1 847 262 6000

Access by Digital Modem

ISDN users can dial in to the 3Com BBS using a digital modem for fast access up to 64 Kbps. To access the 3Com BBS using ISDN, call the following number:

1 847 262 6000

3Com Facts Automated Fax Service

The 3Com Facts automated fax service provides technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3Com Facts using your Touch-Tone telephone:

1 408 727 7021

Support from Your Network Supplier

If you require additional assistance, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, 3Com offers technical telephone support services. To find out more about your support options, call the 3Com technical telephone support phone number at the location nearest you.

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

Here is a list of worldwide technical telephone support numbers:

Country	Telephone Number
Asia Pacific Rim	
Australia	1 800 678 515
Hong Kong	800 933 486
India	+61 2 9937 5085
Indonesia	001 800 61 009
Japan	0031 61 6439
Malaysia	1800 801 777
New Zealand	0800 446 398
Pakistan	+61 2 9937 5085
Philippines	1235 61 266 2602
P.R. of China	10800 61 00137 or 021 6350 1590
Singapore	800 6161 463
S. Korea	
From anywhere in S. Korea:	00798 611 2230
From Seoul:	(0)2 3455 6455
Taiwan, R.O.C.	0080 611 261
Thailand	001 800 611 2000

Country	Telephone Number
Europe	
From anywhere in Europe, call: +31 (0)30 6029900 phone +31 (0)30 6029999 fax	
Europe, South Africa, and Middle East	
From the following countries, you may use the toll-free numbers:	
Austria	0800 297468
Belgium	0800 71429
Denmark	800 17309
Finland	0800 113153
France	0800 917959
Germany	0800 1821502
Hungary	00800 12813
Ireland	1800 553117
Israel	1800 9453794
Italy	1678 79489
Netherlands	0800 0227788
Norway	800 11376
Poland	00800 3111206
Portugal	0800 831416
South Africa	0800 995014
Spain	900 983125
Sweden	020 795482
Switzerland	0800 55 3072
U.K.	0800 966197
Latin America	
Argentina	AT&T +800 666 5065
Brazil	0800 13 3266
Chile	1230 020 0645
Colombia	98012 2127
Mexico	01 800 CARE (01 800 2273)
Peru	AT&T +800 666 5065
Puerto Rico	800 666 5065
Venezuela	AT&T +800 666 5065
North America	
	1 800 NET 3Com (1 800 638 3266)
	Enterprise Customers: 1 800 876-3266

Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain an authorization number. Products sent to 3Com without authorization numbers will be returned to the sender unopened, at the sender's expense.

To obtain an authorization number, call or fax:

Country	Telephone Number	Fax Number
Asia, Pacific Rim	+65 543 6500	+65 543 6348
Europe, South Africa, and Middle East	+31 30 6029900	+31 30 6029999
From the following countries, you may call the toll-free numbers; select option 2 and then option 2:		
Austria	0800 297468	
Belgium	0800 71429	
Denmark	800 17309	
Finland	0800 113153	
France	0800 917959	
Germany	0800 1821502	
Hungary	00800 12813	
Ireland	1800 553117	
Israel	1800 9453794	
Italy	1678 79489	
Netherlands	0800 0227788	
Norway	800 11376	
Poland	00800 3111206	
Portugal	0800 831416	
South Africa	0800 995014	
Spain	900 983125	
Sweden	020 795482	
Switzerland	0800 55 3072	
U.K.	0800 966197	

Country	Telephone Number	Fax Number
Latin America	1 408 326 2927 (not toll-free)	1 408 326 3355 (not toll-free)
U.S.A. and Canada	1 800 NET 3Com (1 800 638 3266)	1 408 326 7120 (not toll-free)
	Enterprise Customers: 1 800 876 3266	

GLOSSARY

10/100

Both 10 Mbps and 100 Mbps on the same port.

ambient air temperature

The temperature of air that surrounds any electrical part or device. Usually refers to the effect of such temperature in aiding or slowing down removal of heat by radiation and convection from the part or device in question.

ASIC

Application Specific Integrated Circuit. A chip that is custom designed for a specific application.

autonegotiation

A feature that allows some ports to automatically identify and negotiate speed and duplex mode with a receiving device.

backbone

The main segment of a campus network, to which are attached department networks, or *ribs*.

backplane

The main bus that carries data within a chassis.

bandwidth

Data measured in bits per second that a channel can transmit. The bandwidth of an Ethernet segment is 10 Mbps; the bandwidth for a Fast Ethernet and FDDI segment is 100 Mbps; and the bandwidth for Gigabit Ethernet is 1000 Mbps.

bridge

Equipment that connects different LANs, allowing communication between devices on separate LAN segments. Bridges are protocol-independent, but hardware-specific, with communication limited to the data link layer (Layer 1) and physical layer (Layer 2) of the OSI reference model.

BUS

The set of functions implemented in an ATM network that provides LAN-to-LAN transmission support while a LAN connection is being established.

bus topology

An architecture that has all of its nodes connected to a single cable.

campus network

A LAN that consists of several smaller LANs within and between buildings.

client/server

A single-user computer that requests application or network services from a server.

CoS

Class of Service. This feature differentiates traffic into classes and assigns prioritization to those classes.

collision

Overlapping transmission of two or more nodes onto media. All data is unusable.

connectionless communications

A form of packet-switching that relies on global addresses in each packet rather than on predefined virtual circuits.

connection-oriented communications

A form of packet-switching that requires a predefined circuit from source to destination to be established before data can be transferred.

Data Communications Equipment (DCE)

The equipment that establishes, maintains, and terminates a data transmission connection.

Data Terminal Equipment (DTE)

The equipment that is connected to the common carrier communications facility. The DTE is typically a computer system or terminal.

EME

Enterprise Management Engine. An SNMP-based network management module that enables you to configure and manage the Switch 4007 chassis and modules.

enterprise network

A large network that connects most major points in a company. Differs from a WAN in that it is typically private and contained within a single organization.

Ethernet

A CSMA/CD, 10 Mbps, local area data network, developed by Digital Equipment Corporation, Xerox Corporation, and Intel. It is one of the most popular baseband LANs in use.

Fast Ethernet

A 100 Mbps local area data network technology.

fault-tolerant

The ability to prevent a device from failing by supplying a backup device to take over in case of failure. For example, reserve the power of a single power supply to act as a backup if one of the other power supplies fails.

FDDI

Fiber Distributed Data Interface. LAN technology that permits data transfer on fiber-optic cable at up to 100 Mbps over a dual, counter-rotating Token Ring.

Gigabit Ethernet

The IEEE standard for 1000 Mbps Ethernet; compatible with existing 10/100 Ethernet standards.

The IEEE, with the help of the Gigabit Ethernet Alliance, defines the standard for full duplex over fiber-optic cable and short-haul copper cable.

header

Protocol control information that is located at the beginning of a protocol data unit.

hot swapping

A feature that allows specified components to be removed and replaced while the rest of the device continues to operate.

IEEE 802.3

The IEEE LAN protocol that specifies an implementation of the physical layer and the MAC sublayer of the data link layer. IEEE 802.3 uses CSMA/CD access at a variety of speeds over a variety of physical media. Extensions to the IEEE 802.3 standard specify implementations for Fast Ethernet.

IEEE 802.1D

The IEEE standard for bridging.

IGMP

Internet Group Management Protocol. The protocol that runs between hosts and their immediately neighboring multicast routers. The mechanisms of the protocol allow a host to inform its local router that it wants to receive transmissions addressed to a specific multicast group. Based on group membership information learned from the IGMP, a router can determine which, if any, multicast traffic needs to be forwarded to each of its "leaf" subnetworks.

in-band

Transmission of auxiliary information, for example, management messages, over the media that are also used by the system users.

interface module

Modules that manage data on LAN segments and receive commands from the EME through the management bus. Interface modules pass data through the switch fabric module. The data may get sent back out to other modules or sent out through a switch fabric module front panel port to another device.

Internet Protocol (IP)

The protocol that governs packet forwarding within the Transmission Control Protocol/Internet Protocol (TCP/IP) suite of standards that were developed for and are used on the Internet.

interoperability

The ability of computer equipment from one vendor to communicate and exchange information with equipment from other vendors.

IP address

Internet Protocol address. A unique identifier for a machine that is attached to a network that is made up of two or more interconnected local area or wide area networks.

LAN

Local Area Network. A data communications network that spans a limited geographical area, such as a single building or campus. It provides communication between computers and peripherals. LANs have small geographical size, high data rate, and low error rate.

Layer 2

Data-link layer of the OSI Reference Model. Defines the rules for sending and receiving data across the physical connection between two systems.

Layer 3

Network layer of the OSI Reference Model. Defines protocols for routing data by opening and maintaining a path on the network between systems to ensure that data arrives at the correct destination node.

LED

Light emitting diode. Semiconductor device that emits light produced by converting electrical energy. Status lights on hardware devices are typically LEDs.

load-sharing

The ability of a router to distribute traffic over all its network ports that are the same distance from the destination address. Good load-balancing algorithms use both line speed and reliability information. Load balancing increases the utilization of network segments, thus increasing effective network bandwidth.

local management

Local management of a network device via a connected terminal.

MIB

Management Information Base. A database of network management information that describes the specifics of individual network components.

MLAN

High speed management busses that provide intermodule communication and network and network connectivity to the SMC (System Management Component).

MMF

Multi-mode fiber. An optical fiber with a core diameter of from 50 to 100 microns. It is the most commonly used optical fiber for short distances such as LANs. Light can enter the core at different angles, making it easier to connect the light source. However, light rays bounce around within the core causing some distortion and providing less bandwidth than singlemode fiber.

modem

Modulator/demodulator. The device that converts serial digital data from a transmitting terminal to a signal suitable for transmission over a telephone (analog) channel. At the other end, another modem converts the analog signal to digital data for use by the computers. A modem port provides the interface for remote management of the Switch 4007. An external modem can be connected to the serial port of the system processor.

multicast

A special form of broadcast where copies of the packet are delivered only to a subset of all possible destinations.

multiplexing

A function within a layer that interleaves the information from multiple connections into one connection.

non-fault tolerant mode

When a device cannot reserve the power of a single power supply to act as backup if one of the other power supplies fails.

OSPF

Open Shortest Path First. Interior Gateway Protocol for TCP/IP networks; uses the Dijkstra algorithm, a link-state routing algorithm that calculates routes for packets based on a number of factors, including least hops, speed of transmission lines, and congestion delays.

out-of-band

Transmission of auxiliary information, for example, management messages, over a medium other than that used by the system users.

packet

Any logical block of data that is sent over a network. It contains a header that consists of control information such as senders, receivers, and error control data, as well as the message itself.

protocol

A set of rules for communicating between computers. The rules dictate format, timing, sequencing, and error control.

PDU

Protocol Data Unit. A unit of data that is specified in a layer protocol and consists of protocol control information and layer user data.

QoS

Quality of Service. Term to describe delay, throughput, bandwidth, and so forth of a virtual connection; a measure of the service quality provided to a user.

RJ-45 connector

A telephone connector that holds up to eight wires. RJ-45 plugs and sockets are used in 10Base-T Ethernet devices.

router

A device that connects two remote networks by selectively forwarding messages between them. A router differs from a bridge and a gateway in that it selectively forwards information between the networks. Routers can be implemented in pairs, or a router may communicate directly with a computer.

RS-232 serial port

A port that changes the parallel arrangement of data within computers to the serial (one after the other) form used on data transmission links. This port can be used for dedicated local management access.

SC connector

A fiber-optic cable connector that uses a push-pull latching mechanism similar to common audio and video cables. For bi-directional transmission, two fiber cables and two SC connectors are generally used.

SCC

System Controller Component. Supports switch monitoring, module inventory management, and power management.

SCI

Serial communication interface. An IEEE standard for a high-speed bus that uses wire or fiber-optic cable.

server

A computer that provides clients with application and network services. Servers are shared by multiple users.

SMC

System Management Component. The central network management agent that provides central network management operations within the Switch.

SNMP

Simple Network Management Protocol. A protocol originally designed to be used in managing TCP/IP internets.

SNMP is presently implemented on a wide variety of computers and networking equipment and may be used to manage many aspects of network and end station operation.

spanning tree

A technique that detects loops in a network and logically blocks the redundant paths, ensuring that only one route exists between any two LANs; used in an IEEE 802.1d bridged network.

star-wired

LAN topology in which end points on a network are connected to a common central switch by point-to-point links. A ring topology that is organized as a star implements a unidirectional closed-loop star, instead of point-to-point links.

switch fabric module

A central backplane aggregator for the Switch 4007.

topology

The physical or logical placement of stations on a network in relation to one another.

torque

The amount of force exerted to tighten a screw, bolt, or nut.

traces

Links that are star-wired to the slot with the switch fabric module, providing primary high-speed links for each interface module.

trunk

Physical and logical connection between two switches across which network traffic travels.

twisted pair

Two insulated wires that are wrapped around each other for protection against interference. Each wire is insulated, and the pair is usually covered by an overall casing. This type of wiring is generally used for connecting 10BASE-T, 100BASE-T, and FDDI systems.

UART

Universal asynchronous receiver/transmitter. A chip that is used as communications (COM) port in personal computers. It combines the transmitting and receiving circuitry needed for asynchronous communications over a serial line.

UTP

Unshielded Twisted Pair. Common, phone-grade, twisted pair wiring that is not provided with a protective shielding against outside interference.

WAN

Wide Area Network. A data communications network that spans very large geographical areas.

VLAN

Virtual LAN. A logical association that allows users to communicate as if they were physically connected to a single LAN, independent of the actual physical configuration of the network.

warm swapping

A feature that allows you to remove and replace a power supply in the Switch 4007 chassis when the Standby/On switch is in the Standby position, without disconnecting the AC input power cord.

wiring closet

A central area that is used for wiring networking systems and telephone communication systems.

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Switch 4007

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EN 60950 Safety of Information Technology Equipment

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UK General Approval Statement

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