# CoreBuilder® 9000
# Enterprise Switch
# Getting Started Guide

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# ABOUT THIS GUIDE

This *CoreBuilder 9000 Enterprise Switch Getting Started Guide* provides an overview of your CoreBuilder® 9000 Enterprise Switch and its components, describes the power management subsystem, provides information about what occurs when you start up your Switch, explains how to use the documentation 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 3Com's CoreBuilder 9000 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: `SETDefault !<port> -RIPIP CONTrol = Listen` In this example, you must supply a port number for <port>. |

**Table 2** Text Conventions (continued)

| Convention | Description |
|---|---|
| `Commands` | The word "command" means that you must enter the command exactly as shown and then press Return or Enter. Commands appear in bold. Example: |
| | To remove the IP address, enter the following command: |
| | `SETDefault !0 -IP NETaddr = 0.0.0.0` |
| 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 | If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: |
| | Press Ctrl+Alt+Del |
| Words in *italics* | Italics are used to: |
| | ■ 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: |
| | From the *Help* menu, select *Contents*. |
| | Click *OK*. |

## Related Documentation

The following documents compose the CoreBuilder 9000 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 CoreBuilder 9000 Documentation CD-ROM contains online versions of the paper documents as well as other CoreBuilder 9000 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, 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 complete list of all CoreBuilder 9000 documents, see the *CoreBuilder 9000 Documentation Overview*.

**Paper Documents**

These documents are shipped with the CoreBuilder 9000 chassis:

- *Chassis Quick Installation* Guides

  Instructions for installing the 7-slot chassis, 8-slot chassis, and 16-slot chassis in a rack, on a table, or on a shelf, including prerequisites

- *CoreBuilder 9000 Enterprise Switch Getting Started Guide* (this guide)

  An overview of the Switch and its components for the 7-slot chassis, 8-slot chassis, and 16-slot chassis; a description of the power management subsystem; information about what occurs when you start up your Switch; how to use the documentation CD-ROM; and important safety, location, and preinstallation information

- *Power Supply Installation* Guides

  Instructions for installing and removing a power supply for the 7-slot chassis, the 8-slot chassis, and the 16-slot chassis

- *Web Management User Guide*

  Overview, installation, and troubleshooting information for the Web Management suite of applications that help you manage your Switch with a Web browser

- *CoreBuilder 9000 Documentation Overview*

  A list of all CoreBuilder 9000 documents

These documents are shipped with their individual modules or field-replaceable units:

- Module *Quick Start* Guides or *Getting Started* Guides

  An overview, LED status information, and installation instructions for each interface module, switch fabric module, and management module

- Module *Command Quick Reference* cards or booklets

  A list of the commands that are used on each module

- *Fan Tray Removal and Replacement* Guides

  Instructions for removing a faulty fan tray and installing a new one in the 7-slot chassis, the 8-slot chassis, and the 16-slot chassis

- Module *Release Notes*

  An explanation of software issues and documentation issues in the current release

**Documents on CD-ROM**

The Documentation CD-ROM contains online versions of the paper guides that are shipped with your chassis and other CoreBuilder 9000 documents in online format only, such as:

- *CoreBuilder 9000 Enterprise Management Engine User Guide*

  How to use the CoreBuilder 9000 Enterprise Management Engine (EME) to manage the chassis and the modules in the chassis.

■ *CoreBuilder 9000 Implementation Guide*

   Information about using features of the
   CoreBuilder 9000 Enterprise Switch after you
   install it and attach it to your network.

■ *Command Reference Guide*

   Information about the Administration Console
   commands that you use to configure the Switch.
   This multiplatform guide documents commands
   for the CoreBuilder 9000 as well as other 3Com
   systems.

■ *CoreBuilder ATM Enterprise Switch Management
   Guide*

   How to use, configure, and network the ATM
   Switch Fabric Module.

**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:

**http://support.3com.com/**

In the *Select by Product Name* list under *Support
Tools, Documents and Information*, select
*CoreBuilder*.

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us make our documentation more useful to you.

Please send e-mail comments about this guide to:

**sdtechpubs_comments@ne.3com.com**

Please include the following information when
commenting:

■ Document title

■ Document part number (found on the front or
   back page of the document)

■ Page number (if appropriate)

   Example:

   *CoreBuilder 9000 Enterprise Switch Getting
   Started Guide*

   *Part Number 10012166*

   *Page 30*

**Year 2000 Compliance**

For information on Year 2000 compliance and 3Com
products, visit the 3Com Year 2000 Web page:

**http://www.3com.com/products/yr2000.html**
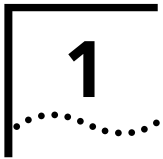
# 1 COREBUILDER 9000 ENTERPRISE SWITCH 7-SLOT CHASSIS

This chapter contains an overview of 3Com's CoreBuilder® 9000 Enterprise Switch 7-slot chassis.

The topics in this chapter include:

- Overview
- Switch Features
- Management Features
- Switch Backplane Architecture
- Hardware Components

## Overview

The CoreBuilder 9000 Enterprise Switch 7-slot chassis (Model Number 3CB9E7) is a high-performance switch that consists of:

- A chassis.
- A power subsystem.
- A combination of a switch fabric module and interface modules that form a network infrastructure.

The media and internetworking backplane and the power distribution function are physically located on a single backplane unit.

The 7-slot 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 CoreBuilder 9000 Enterprise Switch 7-slot chassis.

**Figure 1**   CoreBuilder 9000 7-slot Chassis Front View



Management
module slots

Fan tray
slot

Switch
fabric module slot

Interface
module slots
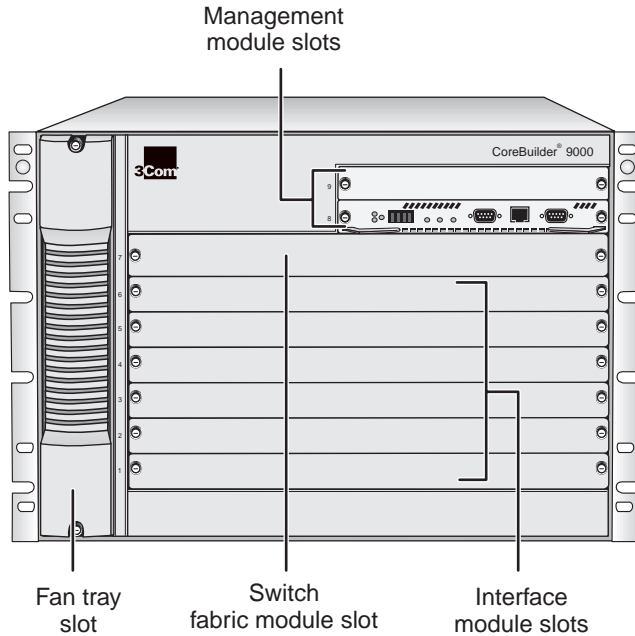
**Figure 2**   CoreBuilder 9000 7-slot Chassis Rear View
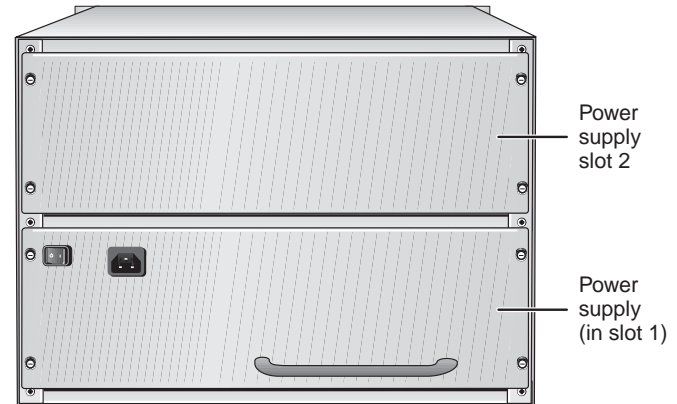


Power
supply
slot 2

Power
supply
(in slot 1)

## Switch Features

The CoreBuilder 9000 7-slot Enterprise Switch 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 management modules that do not take up interface module or switch fabric module space

You can fill the management module slots with an Enterprise Management Engine (EME) and an Enterprise Management Controller (EMC), or with two EMEs to provide standby management support. You can also run the 7-slot Switch with one EME installed.

The EME 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

■ 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

■ Power supplies that you can add or replace while the chassis is running (referred to as *warm swapping*)

■ Slots for six interface modules

■ 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 CoreBuilder 9000 Enterprise Switch through:

■ An out-of-band terminal interface

■ The Simple Network Management Protocol (SNMP)

■ The 3Com Transcend Network Control Services

■ The standard Telnet client-to-server application

■ The 3Com Web Management suite of applications

This section contains the following topics:

■ EME Management Architecture

■ EME Network Management Functions

### EME Management Architecture

The Enterprise Management Engine (EME) is the primary communication mechanism into the 7-slot chassis and any installed switch fabric modules and interface modules.

The EME is an SNMP-based network management module that manages and controls the 3Com CoreBuilder 9000 chassis and its modules.

The EME has the following features:

- **Chassis Management Architecture** — Provides a cost-efficient management architecture that:

  - Provides a central point of contact for chassis management

  - Provides Enterprise Management Controller (EMC) functions, as well as EME functions with performance enhancements

- **Intelligent Power Management** — Works with the EMC to protect network integrity using power management. The EME manages power use in the chassis by:

  - Preventing newly installed interface modules, switch fabric modules, and management 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.

**EME Network Management Functions**

The EME provides the following management and control capabilities:

- **Configurations** — When you are logged in using the Administer password, you can configure the EME and monitor the chassis environment.

- **Inventory** — The EME 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 EME display.

- **Power Management** — With EME commands, you can manage how the Switch reacts to low power situations. The Switch can also provide fault-tolerant power, which protects the Switch against power supply failures.

- **SNMP Support** — SNMP (Simple Network Management Protocol) is a protocol that the Internet Engineering Task Force defined. The EME acts as an agent in an SNMP-managed environment. The agent responds to SNMP requests and generates SNMP traps.

- **Telnet Support** — With the EME `telnet` command, you can connect an EME to any other Telnet device. The EME also supports incoming Telnet sessions so that you can manage an EME from a workstation with Telnet support or from another EME.

- **In-Band and Out-of-Band Download** — The EME 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 EME. The EME allows you to download to multiple modules using a single command.

- **Web Management Support** — You can monitor and manage the EME through the CoreBuilder 9000 Web Management suite of applications.

- **Transcend Network Control Services Support** — You can also monitor and manage the EME through the 3Com Transcend Network Control Services.

## Switch Backplane Architecture

The backplane of the CoreBuilder 9000 7-slot Enterprise Switch incorporates 60 Gbps of bandwidth switching capacity. The backplane uses a dual, star-wired interconnect scheme to connect each payload slot to the switch fabric module.

The backplane of the CoreBuilder 9000 7-slot Enterprise Switch is constructed from a non-blocking, passive, and redundant design.

Five of these links (5 traces, each 2 Gbps) are star-wired to the slot for the switch fabric module, providing five primary high-speed links for each interface module.

The backplane:

- Supports one slot for a switch fabric module.
- Supports automatic configuration detection.
- Provides central clock distribution.

### Backplane Connector Architecture

The backplane connector provides easy access to all the services from the CoreBuilder 9000, including two 10-Mbps MLAN (Management LAN) channels, one UART channel, a number of system clocks, and the SCI (Serial Communication Interface) communications channel.

The backplane connector consists of the:

- **Common signals bus** — The common signals bus consists of all the signals that are used for system-wide functions. These include power supply monitoring and control, backplane reset, system clock signals, and an LED test signal.

- **Power delivery** — The power delivery connector provides the following voltage: +2.1V, +3.5V, +5.2V, and +12V.

- **System communications channels** — The management system uses two types of busses to communicate with other modules in the Switch:

  - **Serial Communication Interface (SCI)** — The SCI bus serves as a communications path between management modules.

■ **Management LANs** — The MLANs are high-speed management busses that provide intermodule communication and network connectivity to the System Management Component (SMC). Each MLAN runs at 10 Mbps.

A power management channel informs the Switch of the power requirements for all modules. If the EME determines that there is not enough power in the Switch for that module, then the module does not power on.

The connector in the slot for the switch fabric module is a 948-pin version of the internetworking connector. This connector supports connections up to 30 high-speed, full-duplex, serial links on the backplane and all the other chassis services that are available to the switch fabric module.

Interface modules and the switch fabric module access Switch services through connectors to the backplane.

## Hardware Components

This section describes the following chassis components:

■ Power Supplies

  ■ 930-watt AC

  ■ –48-volt DC

■ Fan Tray

■ Modules

## Power Supplies

The CoreBuilder 9000 7-slot chassis can contain two back-loading, 930-watt, modular AC power supplies (Model Number 3CB9EP9) or two –48-volt DC power supplies (Model Number 3CB9EP8D7). 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 CoreBuilder 9000 7-slot chassis.

**Figure 3** 930-watt AC Power Supply in the CoreBuilder 9000 7-slot Chassis



Power supply slot 2

Power supply (in slot 1)

You can add or replace power supplies while the chassis is running (referred to as *warm swapping*). See Chapter 7, "Maintenance for the 7-Slot Chassis," for instructions about how to replace a faulty power supply.

**930-watt AC Power Supply**

CoreBuilder 9000 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 CoreBuilder 9000 7-slot chassis.

**Figure 4** 930-watt AC Power Supply for the CoreBuilder 9000 7-slot Chassis



Standby/On switch  AC input socket  Spring-loaded screw

Power supply handle
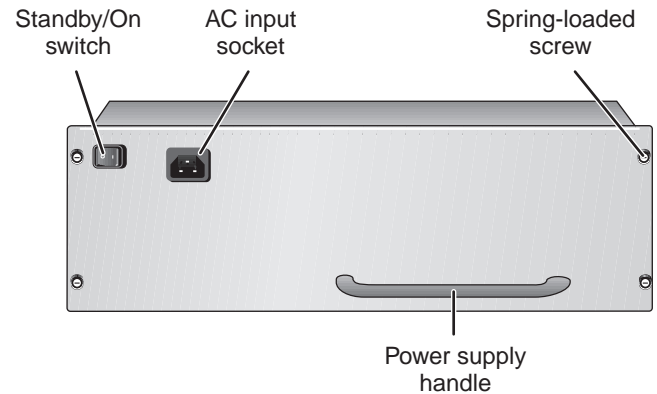
**–48-volt DC Power Supply**

The CoreBuilder 9000 7-slot chassis can also contain two modular load-sharing –48-volt DC power supplies (Model Number 3CB9EP8D7).

Figure 5 shows a –48-volt DC power supply in a CoreBuilder 9000 7-slot chassis.

**Figure 5** –48-volt DC Power Supply in a CoreBuilder 9000 7-slot Chassis
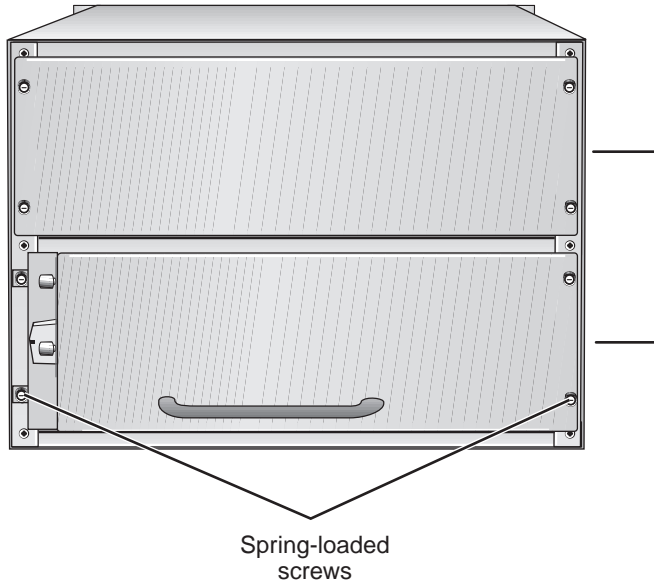


Spring-loaded screws

The –48-volt DC power supply has its own connector. The type of cable that you use depends on your configuration. Figure 6 shows the –48-volt DC power supply for the CoreBuilder 9000 7-slot chassis.

**Figure 6** CoreBuilder 9000 7-slot Chassis –48-volt DC Power Supply



Standby/On switch

Spring-loaded screw

DC input connector

Handle
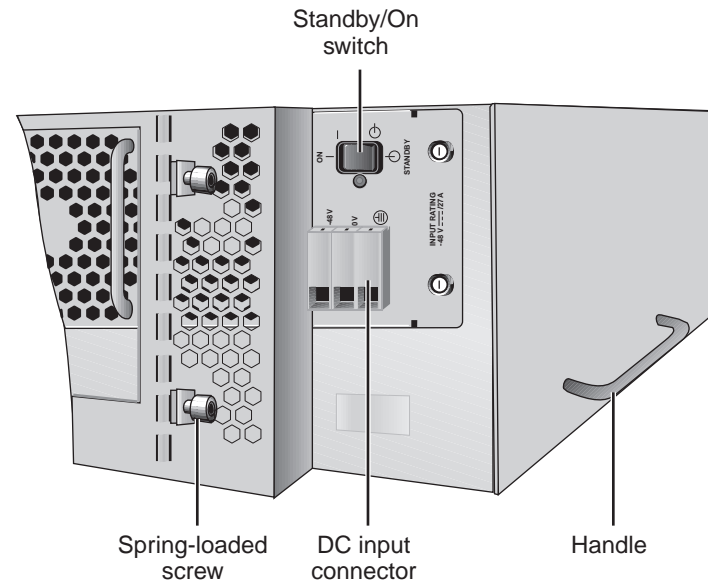
## Fan Tray

The CoreBuilder 9000 7-slot 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 7** CoreBuilder 9000 7-slot Chassis Fan Tray
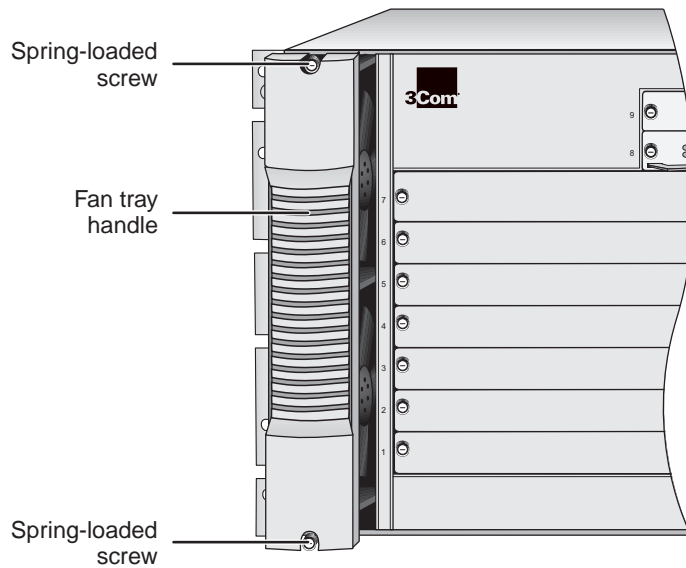


## Modules

You insert modules horizontally into the 7-slot chassis. Slots are numbered from bottom to top, with the bottom slot being number 1.

The 7-slot chassis can contain the following modules:

- **Management** — 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 CoreBuilder 9000 Enterprise Switch and its modules. The EME is the primary communication mechanism into the Switch and modules. You manage other intelligent modules within the chassis through the EME.

  - The Enterprise Management Controller (EMC) module provides standby controller functions for an EME in a CoreBuilder 9000 Enterprise Switch.

- **Interface** — 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** — There is one slot (slot 7) for a switch fabric module. You can select one or the other of the modules. You cannot mix one type of module with the other type of module.

  - Gigabit Ethernet Switch Fabric Modules

    The Gigabit Ethernet (GEN) Switch Fabric Module is the central backplane aggregator for the Switch.

  - ATM Switch Fabric Modules

    The ATM Switch Fabric Module is the core cell switching engine of the CoreBuilder 9000 ATM Enterprise Switch. This module controls and monitors passive backplane and ATM activity.
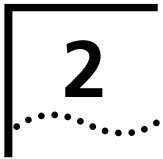
# 2 CoreBuilder 9000 Enterprise Switch 8-Slot Chassis

This chapter contains an overview of 3Com's CoreBuilder® 9000 Enterprise Switch 8-slot chassis.

The topics in this chapter include:

- Overview
- Switch Features
- Management Features
- Switch Backplane Architecture
- Hardware Components

## Overview

The CoreBuilder 9000 Enterprise Switch 8-slot chassis (Model Number 3CB9E8) is a high-performance switch that consists of:

- A chassis.
- A power subsystem.
- A combination of switch fabric modules and interface modules that form a network infrastructure.

The media and internetworking backplane and the power distribution function are physically located on a single backplane unit.

The 8-slot chassis contains:

- Two fan trays, each with three fans.
- A power supply bay that holds up to three power supplies and facilitates load sharing and redundancy.
- Two slots for management modules.
- A payload bay with slots for:
    - Six interface modules.
    - Two switch fabric modules.

Figure 8 and Figure 9 show the front and the rear, respectively, of the CoreBuilder 9000 Enterprise Switch 8-slot chassis.

**Figure 8** CoreBuilder 9000 8-slot Chassis Front View

Switch fabric
module slots

Interface
module slots

Management
module slots

Power supply slots
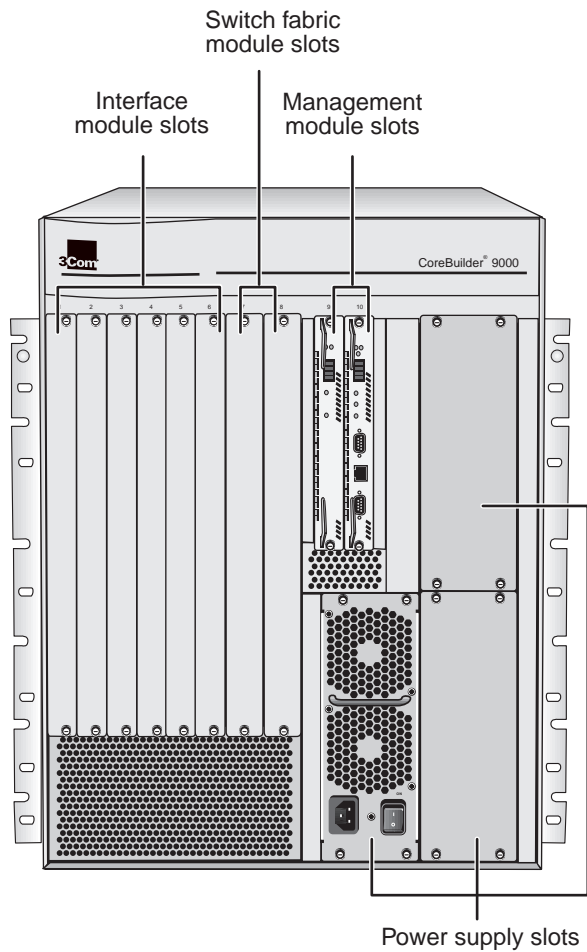
**Figure 9** CoreBuilder 9000 8-slot Chassis Rear View

Module and
power supply
fan trays

Spring-loaded
screw

## Switch Features

The CoreBuilder 9000 8-slot Enterprise Switch 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 fan trays 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 management modules that do not take up interface module or switch fabric module space

  You can fill the management module slots with an Enterprise Management Engine (EME) and an Enterprise Management Controller (EMC), or with two EMEs to provide standby management support. You can also run the 8-slot Switch with one EME installed.

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

- A single passive backplane that is capable of 70 redundant serial links and that enables the use of multiple networking technologies, defined by the type of switch fabric module that is installed

- Two switch fabric module slots in the chassis to provide complete redundancy and optimal network performance

- Slots for three power supplies to supply from 820 watts to 1640 watts with n + 1 redundancy and 2460 watts without n + 1 redundancy, depending on the type and quantity of installed modules

- Power supplies that you can add or replace while the chassis is running (referred to as *warm swapping*)

- Slots for six interface modules

- Cell or packet switching at an aggregated bandwidth of up to 280 Gbps (primary and backup interconnects)

- Power fault-tolerant mode where you can reserve the power of a single power supply (820 watts) to act as a backup if one of the other power supplies fails

- Two triple operation exhaust fan trays (with the power and reliability of six fans) to make sure that the chassis maintains the optimal temperature for operation

## Management Features

You can manage the CoreBuilder 9000 Enterprise Switch through:

- An out-of-band terminal interface
- The Simple Network Management Protocol (SNMP)
- The 3Com Transcend Network Control Services
- The standard Telnet client-to-server application
- The 3Com Web Management suite of applications

This section contains the following topics:

- EME Management Architecture
- EME Network Management Functions

### EME Management Architecture

The Enterprise Management Engine (EME) is the primary communication mechanism into the 8-slot chassis and any installed switch fabric modules and interface modules.

The EME is an SNMP-based network management module that manages and controls the 3Com CoreBuilder 9000 chassis and its modules.

The EME has the following features:

- **Chassis Management Architecture** — Provides a cost-efficient management architecture that provides:

  - A central point of contact for chassis management

  - Enterprise Management Controller (EMC) functions, as well as EME functions with performance enhancements

- **Intelligent Power Management** — Works with the EMC to protect network integrity using power management. The EME manages power use in the chassis by:

  - Preventing newly installed interface modules, switch fabric modules, and management 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.

**EME Network Management Functions**

The EME provides the following management and control capabilities:

- **Configurations** — When you are logged in using the Administer password, you can configure the EME and monitor the chassis environment.

- **Inventory** — The EME 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 EME display.

- **Power Management** — With EME commands, you can manage how the Switch reacts to low power situations. The Switch can also provide fault-tolerant power, which protects the Switch against power supply failures.

- **SNMP Support** — SNMP (Simple Network Management Protocol) is a protocol that the Internet Engineering Task Force defined. The EME acts as an agent in an SNMP-managed environment. The agent responds to SNMP requests and generates SNMP traps.

- **Telnet Support** — With the EME `telnet` command, you can connect an EME to any other Telnet device. The EME also supports incoming Telnet sessions so that you can manage an EME from a workstation with Telnet support or from another EME.

- **In-Band and Out-of-Band Download** — The EME 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 EME. The EME allows you to download to multiple modules using a single command.

- **Web Management Support** — You can monitor and manage the EME through the CoreBuilder 9000 Web Management suite of applications.

- **Transcend Network Control Services Support** — You can also monitor and manage the EME through the 3Com Transcend Network Control Services.

## Switch Backplane Architecture

The backplane of the CoreBuilder 9000 8-slot Enterprise Switch incorporates 280 Gbps of bandwidth capacity in a passive and redundant design. The backplane uses a dual, star-wired interconnect scheme to connect each payload slot to the primary and backup switch fabric module.

The backplane of the CoreBuilder 9000 8-slot Enterprise Switch is constructed from a non-blocking, passive, fully redundant design.

Five of these links (5 traces, each 2 Gbps) are star-wired to each of the slots for the switch fabric

modules, providing five primary and five redundant high-speed links for each interface module.

The backplane:

- Supports two slots for switch fabric modules.
- Supports automatic configuration detection.
- Provides central clock distribution.

## Backplane Connector Architecture

The backplane connector provides easy access to all the services from the CoreBuilder 9000, including two 10-Mbps MLAN (Management LAN) channels, one UART channel, a number of system clocks, and the SCI (Serial Communication Interface) communications channel.

The backplane connector consists of the:

- **Common signals bus** — The common signals bus consists of all the signals that are used for system-wide functions. These include power supply monitoring and control, backplane reset, system clock signals, and an LED test signal.
- **Power delivery** — The power delivery connector provides the following voltage: +2V, +3.5V, +5V, +12V, -5V, and -12V.

- **System communications channels** — The management system uses two types of busses to communicate with other modules in the Switch:
  - **Serial Communication Interface (SCI)** — The SCI bus serves as a communications path between management modules.
  - **Management LANs** — The MLANs are high-speed management busses that provide intermodule communication and network connectivity to the System Management Component (SMC). Each MLAN runs at 10 Mbps.

A power management channel informs the Switch of the power requirements for all modules. If the EME determines that there is not enough power in the Switch for that module, then the module does not power on.

The connector in the slots for the switch fabric modules is a 948-pin version of the internetworking connector. This connector supports connections up to 70 high-speed, full-duplex, serial links on the backplane and all the other chassis services that are available to the switch fabric modules.

Interface modules and switch fabric modules access Switch services through connectors to the backplane.

## Hardware Components

This section describes the following chassis components:

- Power Supplies
  - 820-watt AC
  - –48-volt DC
- Fan Trays
- Modules

### Power Supplies

The CoreBuilder 9000 8-slot chassis can contain three front-loading, 820-watt, modular AC power supplies (Model Number 3CB9EP8) or three –48-volt DC power supplies (Model Number 3CB9EP8D). The power supplies provide power to the management modules, switch fabric modules, interface modules, fans, and backplane.

You can add or replace power supplies while the chassis is running (referred to as *warm swapping*). See Chapter 8 "Maintenance for the 8-Slot Chassis and 16-Slot Chassis" for instructions about how to replace a faulty power supply.

#### 820-watt AC Power Supply

CoreBuilder 9000 power supplies are autosensing. Each power supply (Figure 10) 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 820-watt power supply (Figure 10) has its own power cord and is shipped separately from the chassis. The type of power cord depends on your country location.

**Figure 10**   CoreBuilder 9000 820-watt AC Power Supply
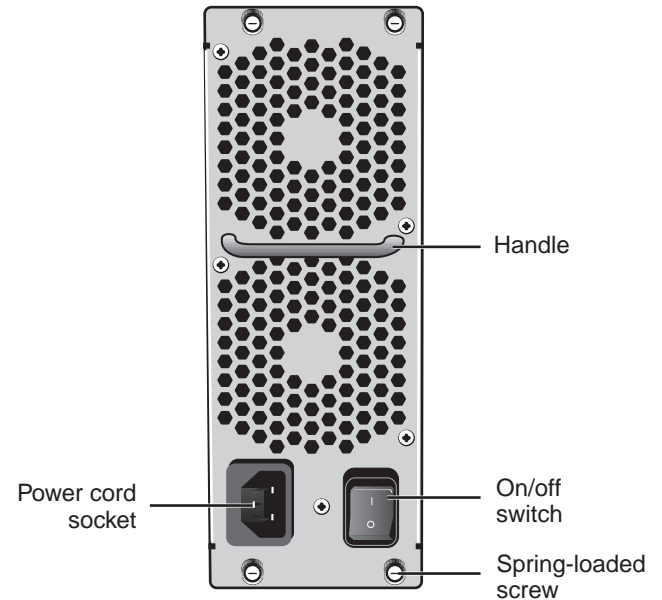
Figure 11 shows an 820-watt AC power supply in a CoreBuilder 9000 8-slot chassis.

**Figure 11**   CoreBuilder 9000 8-slot Chassis with an 820-watt AC Power Supply Installed
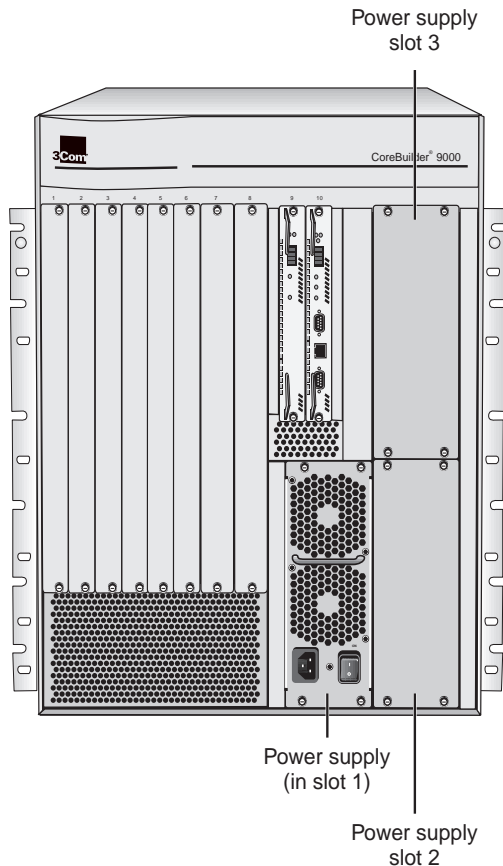


**–48-volt DC Power Supply**

The –48-volt DC power supply (Model Number 3CB9EP8D) (Figure 12) is a DC version of the 820-watt AC power supply and provides the identical power output of the 3CB9EP8 power supply. Each –48-volt DC power supply has its own connector. The type of cable that you use depends on your configuration.

**Figure 12**   CoreBuilder 9000 –48-volt DC Power Supply
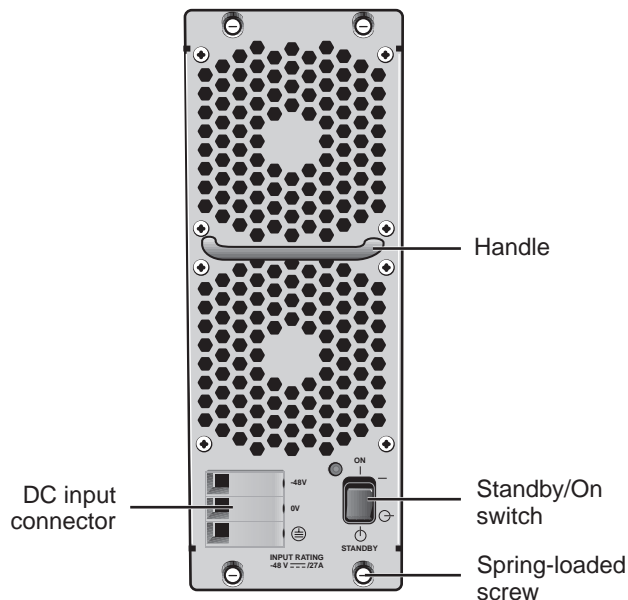
Figure 13 shows a –48-volt DC power supply in a
CoreBuilder 9000 8-slot chassis.

**Figure 13**   CoreBuilder 9000 8-slot Chassis with a –48-volt DC
Power Supply Installed



Power supply
slot 3

Power supply
(in slot 1)

Power supply
slot 2
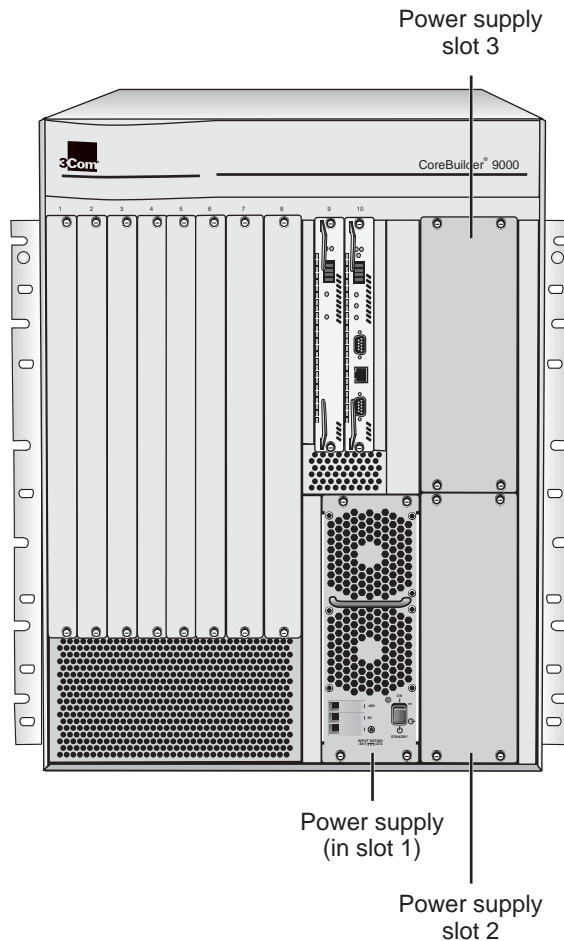
**Fan Trays**

The CoreBuilder 9000 8-slot chassis contains two fan
trays, each of which contains three fans (Model
Number 3CB9EF). Four fans cool the interface
modules, switch fabric modules, and management
modules. The remaining two fans cool the power
supplies.

Figure 14 shows the location of the fan trays in the
CoreBuilder 8-slot chassis.

**Figure 14**   CoreBuilder 9000 8-slot Chassis Rear View with
Fan Trays



Module and
power supply
fan trays

Spring-loaded
screw
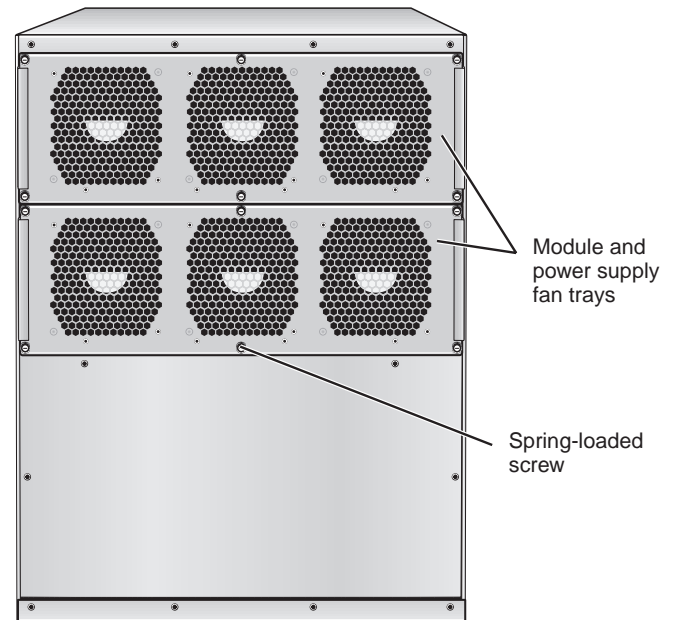
## Modules

You insert modules vertically into the 8-slot chassis. Slots are numbered from left to right, with the left slot being number 1.

The 8-slot chassis can contain the following modules:

- **Management** — There are two slots (slot 9 and slot 10) for management modules:

    - The Enterprise Management Engine (EME) is an SNMP-based network management module that manages and controls the CoreBuilder 9000 Enterprise Switch and its modules. The EME is the primary communication mechanism into the Switch and modules. You manage other intelligent modules within the chassis through the EME.

    - The Enterprise Management Controller (EMC) module provides standby controller functions for an EME in a CoreBuilder 9000 Enterprise Switch.

- **Interface** — There are six slots (slot 1 through slot 6) for interface modules. The interface modules offer a selection of packet-based and cell-based interfaces that work with the switch fabric modules.

- **Switch fabric** — There are two slots (slot 7 and slot 8) for switch fabric modules. You can select one or the other of the modules. You cannot mix one type of module with the other type of module.

    - Gigabit Ethernet Switch Fabric Modules

        The Gigabit Ethernet (GEN) Switch Fabric Module is the central backplane aggregator for the Switch.

    - ATM Switch Fabric Modules

        The ATM Switch Fabric Module is the core cell switching engine of the CoreBuilder 9000 ATM Enterprise Switch. This module controls and monitors passive backplane and ATM activity.

# 3

# CoreBuilder 9000 Enterprise Switch 16-Slot Chassis

This chapter contains an overview of 3Com's CoreBuilder® 9000 Enterprise Switch 16-slot chassis.

The topics in this chapter include:

- Overview
- Switch Features
- Management Features
- Switch Backplane Architecture
- Hardware Components

## Overview

The CoreBuilder 9000 Enterprise Switch 16-slot chassis (Model Number 3CB9E16) is a high-performance switch that consists of:

- A chassis.
- A power subsystem.
- A combination of switch fabric modules and interface modules that form a network infrastructure.

The media and internetworking backplane and the power distribution function are physically located on a single backplane unit.

The 16-slot chassis contains:

- Three fan trays, each with three fans.
- A power supply bay that holds up to four power supplies and facilitates load sharing and redundancy.
- Two slots for management modules.
- A payload bay with slots for:
    - Fourteen interface modules.
    - Two switch fabric modules.

Figure 15 and Figure 16 show the front and the rear, respectively, of the CoreBuilder 9000 Enterprise Switch 16-slot chassis.

**Figure 15**   CoreBuilder 9000 16-slot Chassis Front View

Interface module slots

Switch fabric module slots

Interface module slots

Power supply slots

Management module slots
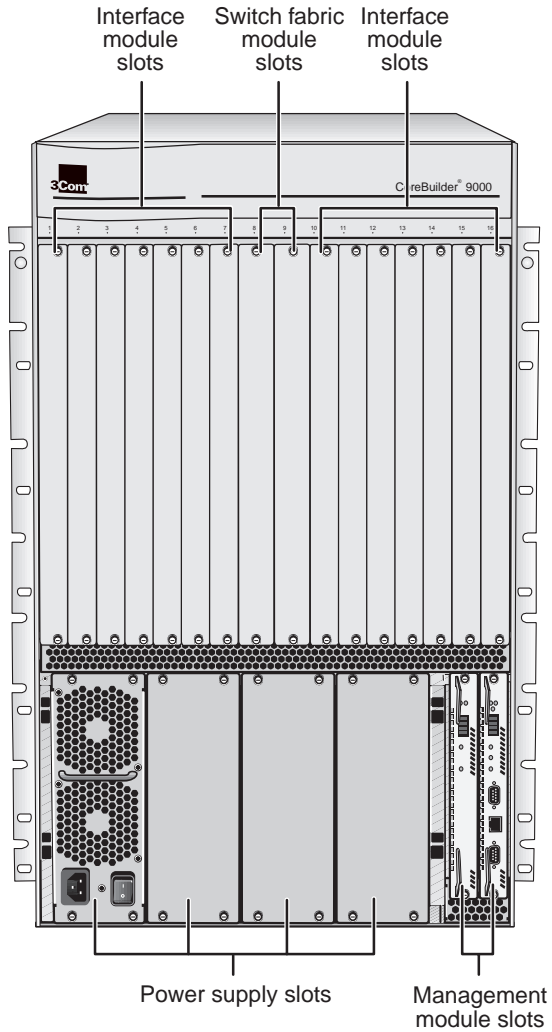
**Figure 16**   CoreBuilder 9000 16-slot Chassis Rear View

Fan trays for interface modules and switch fabric modules

Fan tray for power supplies and management modules

## Switch Features

The CoreBuilder 9000 16-slot Enterprise Switch 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 fan trays 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 management modules that do not take up interface module or switch fabric module space

  You can fill the management module slots with an Enterprise Management Engine (EME) and an Enterprise Management Controller (EMC), or with two EMEs to provide standby management support. You can also run the 16-slot Switch with one EME installed.

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

- A single passive backplane that is capable of 70 redundant serial links and that enables the use of multiple networking technologies, defined by the type of switch fabric module that is installed

- Two switch fabric module slots that are centered in the chassis to provide complete redundancy and optimal network performance

- Slots for four power supplies to supply from 820 watts to 2460 watts with n + 1 redundancy and 3280 watts without n + 1 redundancy, depending on the type and quantity of installed modules

- Power supplies that you can add or replace while the chassis is running (referred to as *warm swapping*)

- Slots for 14 interface modules

- Cell or packet switching at an aggregated bandwidth of up to 280 Gbps (primary and backup interconnects)

- Power fault-tolerant mode where you can reserve the power of a single power supply (820 watts) to act as a backup if one of the other power supplies fails

- Three triple operation exhaust fan trays (with the power and reliability of nine fans) to make sure that the chassis maintains the optimal temperature for operation

## Management Features

You can manage the CoreBuilder 9000 Enterprise
Switch through:

- An out-of-band terminal interface

- The Simple Network Management Protocol (SNMP)

- The 3Com Transcend Network Control Services

- The standard Telnet client-to-server application

- The 3Com Web Management suite of applications

This section contains the following topics:

- EME Management Architecture

- EME Network Management Functions

### EME Management Architecture

The Enterprise Management Engine (EME) is the
primary communication mechanism into the 16-slot
chassis and any installed switch fabric modules and
interface modules.

The EME is an SNMP-based network management
module that manages and controls the 3Com
CoreBuilder 9000 chassis and its modules.

The EME has the following features:

- **Chassis Management Architecture** — Provides a
  cost-efficient management architecture that:

  - Provides a central point of contact for chassis
    management

  - Provides Enterprise Management Controller
    (EMC) functions, as well as EME functions with
    performance enhancements

- **Intelligent Power Management** — Works with
  the EMC to protect network integrity using power
  management. The EME manages power use in the
  chassis by:

  - Preventing newly installed interface modules,
    switch fabric modules, and management mod-
    ules 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.

### EME Network Management Functions

The EME provides the following management and
control capabilities:

- **Configurations** — When you are logged in using
  the Administer password, you can configure the
  EME and monitor the chassis environment.

- **Inventory** — The EME 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 EME display.

■ **Power Management** — With EME commands, you can manage how the Switch reacts to low power situations. The Switch can also provide fault-tolerant power, which protects the Switch against power supply failures.

■ **SNMP Support** — SNMP (Simple Network Management Protocol) is a protocol that the Internet Engineering Task Force defined. The EME acts as an agent in an SNMP-managed environment. The agent responds to SNMP requests and generates SNMP traps.

■ **Telnet Support** — With the EME `telnet` command, you can connect an EME to any other Telnet device. The EME also supports incoming Telnet sessions so that you can manage an EME from a workstation with Telnet support or from another EME.

■ **In-Band and Out-of-Band Download** — The EME 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 EME. The EME allows you to download to multiple modules using a single command.

■ **Web Management Support** — You can monitor and manage the EME through the CoreBuilder 9000 Web Management suite of applications.

■ **Transcend Network Control Services Support** — You can also monitor and manage the EME through the 3Com Transcend Network Control Services.

## Switch Backplane Architecture

The backplane of the CoreBuilder 9000 16-slot Enterprise Switch incorporates 280 Gbps of bandwidth capacity in a passive and redundant design. The backplane uses a dual, star-wired interconnect scheme to connect each payload slot to the primary and backup switch fabric module.

The backplane of the CoreBuilder 9000 16-slot Enterprise Switch is constructed from a non-blocking, passive, fully redundant design.

Five of these links (5 traces, each 2 Gbps) are star-wired to each of the slots for the switch fabric modules, providing five primary and five redundant high-speed links for each interface module.

The backplane:

■ Supports two slots for switch fabric modules.

■ Supports automatic configuration detection.

■ Provides central clock distribution.

**Backplane Connector Architecture**

The backplane connector provides easy access to all the services from the CoreBuilder 9000, including two 10-Mbps MLAN (Management LAN) channels, one UART channel, a number of system clocks, and the SCI (Serial Communication Interface) communications channel.

The backplane connector consists of the:

- **Common signals bus** — The common signals bus consists of all the signals that are used for system-wide functions. These include power supply monitoring and control, backplane reset, system clock signals, and an LED test signal.

- **Power delivery** — The power delivery connector provides the following voltage: +2V, +3.5V, +5V, +12V, -5V, and -12V.

- **System communications channels** — The management system uses two types of busses to communicate with other modules in the Switch:

  - **Serial Communication Interface (SCI)** — The SCI bus serves as a communications path between management modules.

  - **Management LANs** — The MLANs are high-speed management busses that provide intermodule communication and network con-nectivity to the System Management Compo-nent (SMC). Each MLAN runs at 10 Mbps.

A power management channel informs the Switch of the power requirements for all modules. If the EME determines that there is not enough power in the Switch for that module, then the module does not power on.

The connector in the slots for the switch fabric modules is a 948-pin version of the internetworking connector. This connector supports connections up to 70 high-speed, full-duplex, serial links on the backplane and all the other chassis services that are available to the switch fabric modules.

Interface modules and switch fabric modules access Switch services through connectors to the backplane.

## Hardware Components

This section describes the following chassis components:

- Power Supplies
  - 820-watt AC
  - –48-volt DC
- Fan Trays
- Modules

**Power Supplies**

The CoreBuilder 9000 16-slot chassis can contain four front-loading, 820-watt, modular AC power supplies (Model Number 3CB9EP8) or four –48-volt DC power supplies (Model Number 3CB9EP8D). The power supplies provide power to the management modules, switch fabric modules, interface modules, fans, and backplane.

You can add or replace power supplies while the chassis is running (referred to as *warm swapping*). See Chapter 8, "Maintenance for the 8-Slot Chassis and 16-Slot Chassis" for instructions about how to replace a faulty power supply.

**820-watt AC Power Supply**

CoreBuilder 9000 power supplies are autosensing. Each power supply (Figure 17) can automatically sense the type of input voltage to which it is being connected at the electrical outlet.

The 820-watt AC power supplies are load sharing in that all power supplies provide an equal amount of the load current. Each 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 17**   CoreBuilder 9000 820-watt AC Power Supply



Handle

Power cord socket

On/off switch

Spring-loaded screw
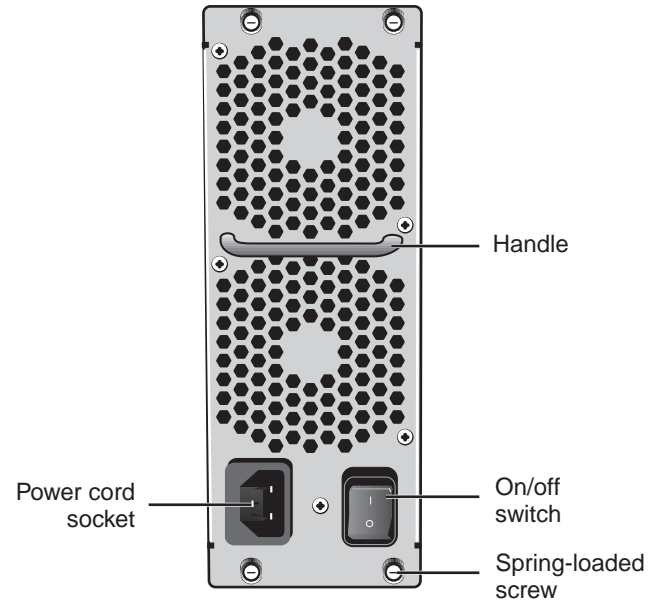
Figure 18 shows an 820-watt AC power supply in a CoreBuilder 9000 16-slot chassis.

**Figure 18**  CoreBuilder 9000 16-slot Chassis with an 820-watt AC Power Supply Installed



Power supply (in slot 1)

Power supply slot 2

Power supply slot 3
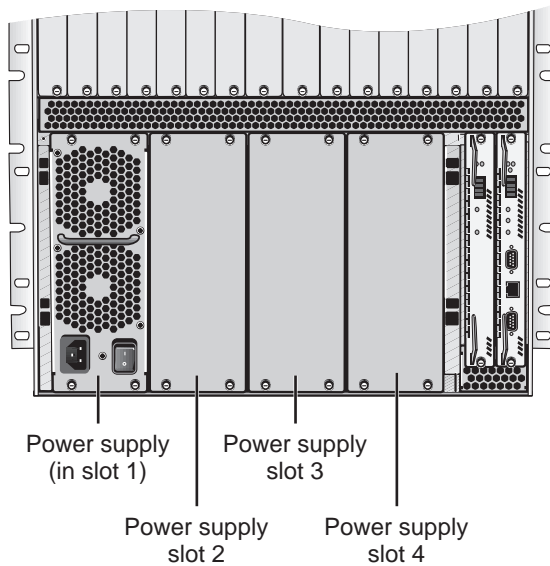
Power supply slot 4

### –48-volt DC Power Supply

The –48-volt DC power supply (Model Number 3CB9EP8D) (Figure 19) is a DC version of the 820-watt AC power supply and provides the identical power output of the 3CB9EP8 power supply. Each –48-volt DC power supply has its own connector. The type of cable that you use depends on your configuration.

**Figure 19**  CoreBuilder 9000 –48-volt DC Power Supply



Handle

DC input connector

Standby/On switch

Spring-loaded screw
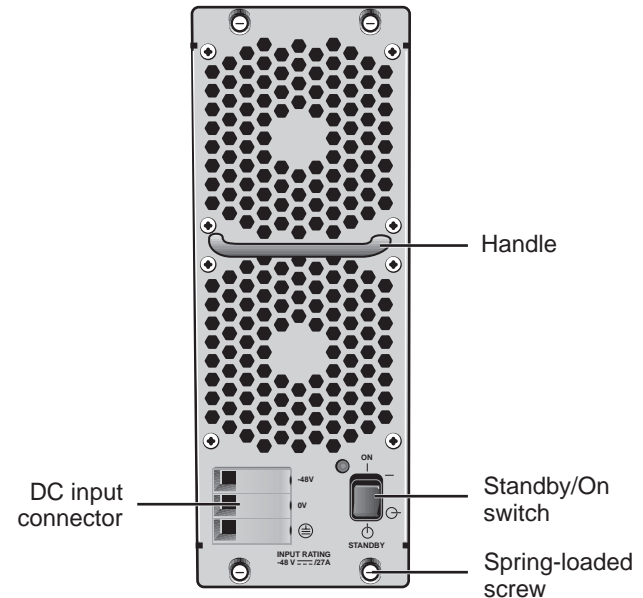
Figure 20 shows a –48-volt DC power supply in a CoreBuilder 9000 16-slot chassis.

**Figure 20** CoreBuilder 9000 16-slot Chassis with a –48-volt DC Power Supply Installed



Power supply (in slot 1)

Power supply slot 3

Power supply slot 2
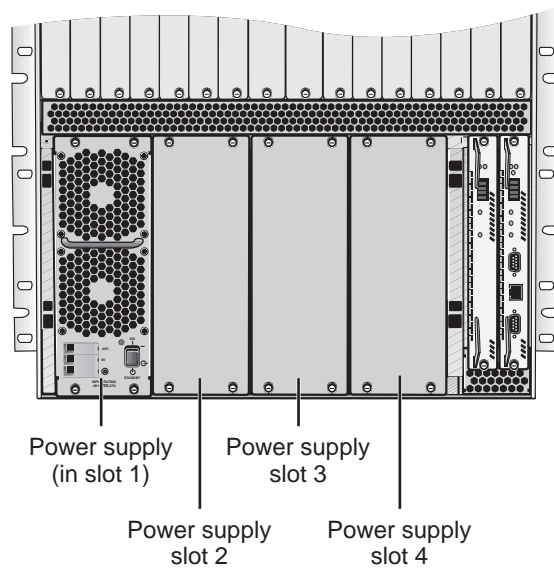
Power supply slot 4

**Fan Trays**

The CoreBuilder 9000 16-slot chassis contains three fan trays, each of which contains three fans (Model Number 3CB9EF). Six fans (two trays) cool the interface modules and switch fabric modules. Three fans (one tray) cool the power supplies and management modules (Figure 21).

**Figure 21** CoreBuilder 9000 16-slot Chassis Rear View with Fan Trays



Module fan trays

Spring-loaded screw

Power supply and management module fan tray
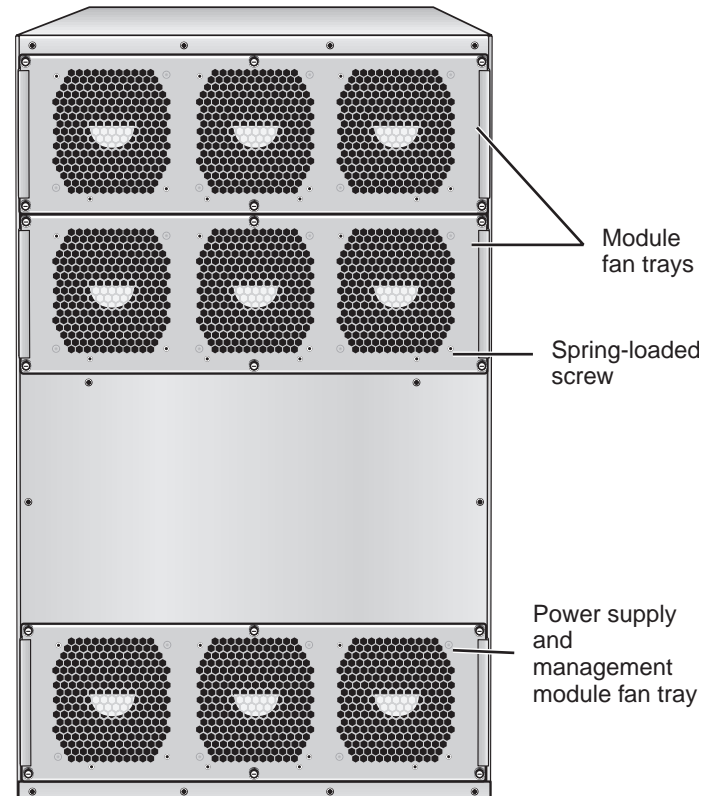
## Modules

You insert modules vertically. Slots are numbered from left to right, with the left slot being number 1.

The 16-slot chassis can contain the following modules:

- **Management** — There are two slots (slot 17 and slot 18) for management modules:

  - The Enterprise Management Engine (EME) is an SNMP-based network management module that manages and controls the CoreBuilder 9000 Enterprise Switch and its modules. The EME is the primary communication mechanism into the Switch and modules. You manage other intelligent modules within the chassis through the EME.

  - The Enterprise Management Controller (EMC) module provides standby controller functions for an EME in a CoreBuilder 9000 Enterprise Switch.

- **Interface** — There are 14 slots (slot 1 through slot 7 and slot 10 through slot 16) for interface modules. The interface modules offer a selection of packet-based and cell-based interfaces that work with one of the switch fabric modules.

- **Switch fabric** — There are two slots (slot 8 and slot 9) for switch fabric modules. You can select one or the other of the modules. You cannot mix one type of module with the other type of module.

  - Gigabit Ethernet Switch Fabric Modules

    The Gigabit Ethernet (GEN) Switch Fabric Module is the central backplane aggregator for the Switch.

  - ATM Switch Fabric Modules

    The ATM Switch Fabric Module is the core cell switching engine of the CoreBuilder 9000 ATM Enterprise Switch. This module controls and monitors passive backplane and ATM activity.

For more information about modules for the CoreBuilder 9000 chassis, see Chapter 4.

# 4 COREBUILDER 9000 ENTERPRISE SWITCH MODULES

The CoreBuilder® 9000 Enterprise Switch is a high performance, high-density, campus switch. There are three CoreBuilder 9000 chassis:

- 7-slot
- 8-slot
- 16-slot

The 7-slot chassis contains slots for the following types of modules:

- One switch fabric module
- Two management modules
- Six interface modules

The 8-slot chassis contains slots for the following types of modules:

- Two switch fabric modules
- Two management modules
- Six interface modules

The 16-slot chassis contains slots for the following types of modules:

- Two switch fabric modules
- Two management modules
- Fourteen interface modules

Each CoreBuilder 9000 Enterprise Switch is required to have a minimum of one EME (Enterprise Management Engine) (Model Number 3CB9EME).

You can install one EMC (Enterprise Management Controller) (Model Number 3CB9EMC) or a second EME in place of the EMC for redundant management operation.

This chapter contains the following topics:

- Switch Fabric Modules
- Management Modules
- Interface Modules
- Slot Restrictions
- Management Access
- Where to Go from Here

In the CoreBuilder 9000 Enterprise Switch:

- The Gigabit Ethernet (GEN) switch fabric module is the central backplane aggregator for the CoreBuilder 9000 Enterprise Switch 7-slot chassis, 8-slot chassis, and 16-slot chassis. The GEN switch fabric module has 24 non-blocking Gigabit Ethernet ports on the backplane for high-speed, low-latency interconnectivity between CoreBuilder 9000 interface modules.

■ The ATM switch fabric module is the core cell switching engine of the CoreBuilder 9000 ATM Enterprise Switch, controlling and monitoring passive backplane and ATM activity.

■ 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.

■ 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.

## Switch Fabric Modules

Switch fabric modules fit into the CoreBuilder 9000 chassis. The scalable design of the CoreBuilder 9000 platform provides the Switch with the highest bandwidths.

You can select the switch fabric module based on technology:

■ **Gigabit Ethernet, packet-based interface** — This high-performance, packet switch fabric module has an initial aggregate switching capacity of 48 Gbps.

■ **ATM, cell-based interface** — The ATM Switch Fabric Module has an initial aggregate switching capacity of 30 Gbps.

The CoreBuilder 9000 7-slot chassis contains one slot (slot 7) for a switch fabric module. The 7-slot chassis is shipped with slot 7 open and not covered by a blank faceplate.

The CoreBuilder 9000 8-slot chassis contains two slots (slot 7 and slot 8) for switch fabric modules. The 8-slot chassis is shipped with slot 7 open and not covered by a blank faceplate; slot 8 is covered with a blank faceplate. You usually install the first switch fabric module in slot 7.

The CoreBuilder 9000 16-slot chassis contains two slots (slot 8 and slot 9) for switch fabric modules. The 16-slot chassis is shipped with slot 8 open and not covered by a blank faceplate; slot 9 is covered with a blank faceplate. You usually install the first switch fabric module in slot 8.

## Gigabit Ethernet Switch Fabric Modules

The following Gigabit Ethernet switch fabric modules operate in the CoreBuilder 9000 Enterprise Switch:

- The Gigabit Ethernet (GEN) Switch Fabric Module (Model Number 3CB9FG24T) is a central backplane aggregator for the CoreBuilder 9000 Enterprise Switch. The GEN Switch Fabric Module has 24 non-blocking Gigabit Ethernet ports that connect to the chassis backplane to provide high-speed, low-latency connectivity between CoreBuilder 9000 interface modules.

- The 9-port Gigabit Ethernet Switch Fabric Module (Model Number 3CB9FG9) is a switch fabric module that is optimized for the CoreBuilder 9000 7-slot chassis and 8-slot chassis. The 9-port Gigabit Ethernet Switch Fabric Module has six non-blocking Gigabit Ethernet ports that connect directly to the chassis backplane to provide high-speed, low-latency connectivity between CoreBuilder 9000 interface modules. It also features three Gigabit Interface Connector (GBIC) interface ports located on the front panel that accept optional GBIC transceivers. These GBIC transceivers provide Gigabit Ethernet downlinks into the chassis. You can install the 9-port Switch Fabric Module in either the 7-slot chassis or the 8-slot chassis.

The GEN Switch Fabric Module supports the following key features:

- 48 Gbps switching capacity
- Redundant operation when two identical GEN Switch Fabric Modules are installed (8-slot chassis and 16-slot chassis)
- 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
- Management using the CoreBuilder 9000 Administration Console (a command line interface), through the Web Management suite of applications, or from Simple Network Management Protocol (SNMP) applications by connecting through the Gigabit Ethernet Switch Fabric Module

For information about how to install the GEN Switch Fabric Module, see the *Gigabit Ethernet Switch Fabric Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch.*

**ATM Switch Fabric Module**

The CoreBuilder 9000 ATM Enterprise Switch ATM switch fabric module supports enterprise backbones and high-density data center applications. It can switch up to 15 Gbps full-duplex of cell traffic and provides non-blocking throughput on all interfaces. The module supports up to 22 OC-12c/STM-4 622-Mbps ATM ports per chassis, up to 44 OC-3c/STM-1 Single-Mode Long Reach ports, and up to 88 OC-3c/STM-1 155-Mbps SONET/SDH ports per chassis.

The ATM switch fabric module is a high-performance ATM switch that is designed to increase the capacity and manageability of enterprise networks. The line-rate, non-blocking ATM Switch Fabric module features highly integrated ASICs that account for its scalable, leading-edge performance and functionality.

The ATM switch fabric module supports the following features:

- Initial ATM switch fabric capacity: 15 Gbps
- Maximum capacity: 70 Gbps
- Hot-swappable components
- Multiple management polling
- Distributed management agents
- Load-sharing links
- Resilient links/Spanning Tree
- Automatic link fail-over
- Autonegotiation

- Multiple VLAN (virtual LAN) modes
- Layer 3 OSPF (Open Shortest Path First)
- Port Densities
  - Initial OC-3c/STM-1 ports: 88
  - Maximum OC-3c/STM-1 ports: 280
  - Initial OC-12c/STM-4 MM ports: 22
  - Initial OC-12c/STM-4 SM ports: 22
  - Maximum OC-12c/STM-4 ports: 112
  - Maximum OC-48 ports: 28
- Bandwidth management/congestion control (EPD/PPD, CLP support)
- QoS/CoS: UBR, ABR, VBR, CBR, 802.1P, FIRE-based flow control
- ATM Forum LANE 1.0 and 2.0 Clients and Services
- VLANs, LANE-based ELANs, 802.1Q
- Broadcast and Multicast control: IGMP, LANE 2
- PVC, S-PVC, SVC, UNI 3.0/3.1/4.0

For information about how to install the ATM switch fabric module, see the *CoreBuilder 9000 ATM Switch Fabric Module Getting Started Guide.*

**Redundant Operation in the 8-slot Chassis and 16-slot Chassis**

You can install two switch fabric modules in an 8-slot chassis and a 16-slot chassis to provide redundancy for the CoreBuilder 9000 Enterprise Switch. The secondary (standby) switch fabric module mirrors all configuration and operation parameters of the primary (active) switch fabric module. If a problem occurs with the primary module, the system software immediately switches to the secondary module, keeping the network up and running.

A switch fabric module becomes the primary switch under the following conditions:

■ It is the only switch fabric module in the chassis.

■ It has a lower slot number, and the other switch fabric module is not primary or is in a primary transition state.

■ The original primary switch fabric module fails.

A second switch fabric module becomes the secondary switch under the following conditions:

■ The other switch fabric module is already the primary switch.

■ The other switch fabric module is installed in the lower slot of the chassis.

For the 8-slot chassis, you must install a switch fabric module in the specific slot in which all switch port connections meet. In the CoreBuilder 9000 Enterprise Switch 8-slot chassis, slot 7 and slot 8 are dedicated to the Gigabit Ethernet or ATM switch fabric module; slot 7 holds the active module and slot 8 holds the redundant module. The switch fabric module provides connectivity between several groups of ports simultaneously.

For the 16-slot chassis, you must install a switch fabric module in the specific slot in which all switch port connections meet.

In the CoreBuilder 9000 Enterprise Switch 16-slot chassis, slot 8 and slot 9 are dedicated to the Gigabit Ethernet or ATM switch fabric module; slot 8 holds the active module and slot 9 holds the redundant module. The switch fabric module provides connectivity between several groups of ports simultaneously.

After you reset the chassis, the switch fabric module in slot 8 of the 8-slot chassis and in slot 9 of the 16-slot chassis becomes the primary switch fabric module.

Because Gigabit Ethernet switch fabric modules and ATM switch fabric modules are the core switching engine of the CoreBuilder 9000 Enterprise Switch, they require priority for power and management. The modules control and monitor passive backplane, Gigabit Ethernet, and ATM activity.

The switch fabric modules connect to every interface module slot in the chassis and provide the interconnection between interface modules.

The interface modules may have front panel ports or have an out-of-band Ethernet port.

For detailed information about the GEN Switch Fabric Module, see the *Gigabit Ethernet Switch Fabric Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch.*

For detailed information about the ATM switch fabric module, see the *CoreBuilder 9000 ATM Switch Fabric Module Getting Started Guide.*

## Management Modules

The CoreBuilder 9000 7-slot chassis, 8-slot chassis, and 16-slot chassis contain two slots for these management modules:

- Enterprise Management Engine (EME)
- Enterprise Management Controller (EMC)

These modules do not occupy module payload slots.

Table 3 lists the slots that the management modules occupy in each of the CoreBuilder 9000 chassis.

**Table 3**   CoreBuilder 9000 Management Module Slots

| Chassis | Management Module Slots |
| --- | --- |
| 7-slot | 8 and 9 |
| 8-slot | 9 and 10 |
| 16-slot | 17 and 18 |

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 EME backplane services generate, control, and monitor the Switch. The management modules provide power management functions.

### Enterprise Management Engine (EME)

The 3Com CoreBuilder 9000 EME is an SNMP-based network management module that allows you to configure and manage the 3Com CoreBuilder 9000 Enterprise Switch (chassis and modules).

- You manage the Switch through the EME command interface, which you access through the serial port, or through SNMP (Simple Network Management Protocol).

- You can monitor and manage the EME through the CoreBuilder 9000 Web Management suite of applications.

- You can monitor and manage the EME through the 3Com Transcend Network Control Services.

An EME combines the functions of a management module and a controller module. You can install a second EME in the 7-slot chassis, 8-slot chassis and 16-slot chassis to provide standby management support if the first EME is unavailable for any reason. Or, you can install an Enterprise Management Controller (EMC) instead of a second EME for standby controller support.

Table 4 describes the EME access mechanisms.

**Table 4**   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 CoreBuilder® SNMP agent. | 10BASE-T Ethernet port assigned to an IP interface |

The EME contains the following software components:

■ System Controller Component (SCC), which supports Switch monitoring, module inventory management, and power management.

■ System Management Component (SMC), which is the central network management agent and provides network management operations within the Switch.

For information about how to install the EME and how to perform an initial configuration, see the *Enterprise Management Engine Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*.

**Enterprise Management Controller (EMC)**

The 3Com CoreBuilder 9000 EMC module provides standby controller functions for an EME in a CoreBuilder 9000 7-slot chassis, 8-slot chassis, and 16-slot chassis. The EMC maintains Switch operation in the event of an SMC failure.

For information about how to install the EMC, see the *Enterprise Management Controller Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*.

**Interface Modules**

The CoreBuilder 9000 7-slot Switch contains six slots for interface modules. Fast Ethernet modules, Gigabit Ethernet modules, or ATM modules can occupy every slot, except slot 7, in the 7-slot chassis. The six interface modules in the 7-slot Switch access five 2 Gbps serial channels, which are wired to one dedicated switch fabric module slot.

The 8-slot Switch contains six slots for interface modules. Fast Ethernet modules, Gigabit Ethernet modules, or ATM modules can occupy every slot, except slot 7 and slot 8, in the 8-slot chassis. The six interface modules in the 8-slot Switch access five 2 Gbps serial channels, which are wired to two dedicated switch fabric module slots.

The CoreBuilder 9000 16-slot Switch contains 14 slots for interface modules. Fast Ethernet modules, Gigabit Ethernet modules, or ATM modules can occupy every slot, except slot 8 and slot 9, in the 16-slot chassis. The 14 interface modules in the 16-slot Switch access five 2 Gbps serial channels, which are star-wired to two dedicated switch fabric module slots.

There are two types of CoreBuilder 9000 interface modules. Interface modules provide network connectivity functions.

The module families are associated with the corresponding choice of a switch fabric module technology: Gigabit Ethernet or ATM.

- **Frame-based interface modules** — Support 10/100 Fast Ethernet and Gigabit Ethernet. The following interface modules are supported:
  - Fast Ethernet Switching Modules
  - Gigabit Ethernet Interface Modules
- **Cell-based interface modules** — Support ATM switching and frame-based Fast Ethernet and Gigabit Ethernet (GEN) switching.

  The cell-based interface modules are available in:
  - OC-3c/STM-1, 4-port
  - OC-3c/STM-1, 3-port multi-mode and 1-port single-mode
  - OC-12c/STM-4, 1-port (single-mode or multi-mode)
  - 155 Mbps-over-UTP5, 4-port

**i** ▷ *You cannot mix ATM modules and Ethernet modules in the same chassis.*

## Fast Ethernet Switching 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.

The following Layer 2 switching modules are designed for the CoreBuilder 9000 7-slot chassis, 8-slot chassis, and 16-slot chassis:

- The 10-port 100BASE-FX Fast Ethernet Layer 2 Switching Module (Model Number 3CB9LF10MC) has ten 100 Mbps Ethernet fiber-optic front panel ports. These ports interface to two 1-Gigabit non-blocking ports on the backplane.
- The 20-port 10/100BASE-TX Fast Ethernet Layer 2 Switching Module (Model Number 3CB9LF20R) has twenty 10/100 Mbps RJ-45 front panel ports. These ports interface to a maximum of two 1-Gigabit non-blocking ports on the backplane.
- The 36-port 10/100BASE-TX Fast Ethernet Telco Layer 2 Switching Module (Model Number 3CB9LF36T) has thirty-six 10/100 Mbps Telco front panel ports. These ports interface to a maximum of two 1–Gigabit non-blocking ports on the backplane.

- The 36-port 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module (Model Number 3CB9LF36R) has thirty-six 10/100 Mbps RJ-45 front panel ports. These ports interface to a maximum of two 1–Gigabit non-blocking ports on the backplane.

- The 20-port 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module (Model Number 3CB9LF20MM) has twenty 100 Mbps Ethernet fiber-optic ports with MT-RJ connectors on its front panel and two 1-Gigabit ports on the back for connection to the chassis backplane.

The following Layer 3 router switching modules are designed for the CoreBuilder 9000 7-slot chassis, 8-slot chassis, and 16-slot chassis:

- The 12-port 10/100BASE-TX Fast Ethernet Layer 3 Module (multiprotocol module) (Model Number 3CB9RF12R) has twelve 10/100BASE-TX Fast Ethernet front panel ports that provide a 100 Mbps connection over UTP-Category 5 cables with lengths up to 100 meters (328 ft.). These ports interface to one Gigabit Ethernet non-blocking port that connects through the backplane to the switch fabric module.

- The 10-port 100BASE-FX Fast Ethernet Layer 3 Module (multiprotocol module) (Model Number 3CB9RF10MC) has 10 front-panel external ports of full-duplex 100BASE-FX, using SC (Subscriber Connector) connectors over MMF (multi-mode fiber). These ports interface to one Gigabit Ethernet (GEN) port that connects to the backplane.

- The 6-port SAS (3-port DAS) FDDI Layer 3 Switching Module (Model Number 3CB9RD6MC) has six ports with Subscriber Connectors (SC) on the front panel that provide up to six Single Attached Station (SAS) connections or up to three Dual Attached Station (DAS) connections with either single mode fiber or multimode fiber. One Gigabit Ethernet port connects the module to the chassis backplane.

- The 4-port GBIC Gigabit Ethernet Layer 3 Switching Module (Model Number 3CB9RG4) has four Gigabit Ethernet Interface Converter (GBIC) front panel ports, which interface to four Gigabit Ethernet backplane ports. The 4-Port Gigabit Ethernet Layer 3 Switching Module includes its own embedded management agent that supports standard Simple Network Management Protocol (SNMP) Management Information Bases (MIBs).

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**

The Gigabit Ethernet (GEN) Interface Modules are two-port interface modules for the 3Com CoreBuilder 9000 Enterprise Switch. 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.

Gigabit Ethernet Interface Modules are available in these port configurations:

- The 2-port 1000BASE-SX Gigabit Ethernet Interface Module (Model Number 3CB9LG2MC). Ports on this module use an 850-nanometer, multimode, optical transceiver (black).

- The 2-port 1000BASE-LX Gigabit Ethernet Interface Module (Model Number 3CB9LG2SC). Ports on this module use a 1300-nanometer, multimode/single-mode, optical transceiver (blue).

- The 4-Port GBIC Gigabit Ethernet Interface Module (Model Number 3CB9LG4), supports 1000BASE-LX and 1000BASE-SX Gigabit Interface Converter (GBIC) transceivers.

- The 9-Port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module (Model Number 3CB9LG9MC) has nine 1000BASE-SX Gigabit Ethernet front panel ports, which interface to backplane ports in the CoreBuilder 9000 Enterprise Switch.

The Gigabit Ethernet interface modules support the following key features:

- Two front panel 802.3z–compliant Gigabit Ethernet fiber-optic ports that connect to a dedicated, non-blocking, redundant Gigabit Ethernet backplane channel

- Management using the CoreBuilder 9000 Administration Console (a command line interface), through the Web Management suite of applications, or from Simple Network Management Protocol (SNMP) applications by connecting through the Gigabit Ethernet Switch Fabric Module

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.

**ATM Interface Modules**

The ATM Interface Module is a high-performance ATM switch that is designed to increase the capacity and manageability of enterprise networks. It allows you to scale performance to extremely high levels as your network grows and evolves.

The ATM Interface Module supports demanding enterprise backbones and high-density data center applications, providing high-performance ATM switching at both the network core and boundary. It can switch up to 15 Gbps of cell traffic and provides non-blocking throughput on all interfaces.

For information about how to install this module, see the *CoreBuilder 9000 ATM Interface Module Getting Started Guide.*

## Slot Restrictions

Table 5 lists slot restrictions in the CoreBuilder 9000 7-slot chassis.

**Table 5** CoreBuilder 9000 7-slot Chassis Slot Restrictions

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

Table 6 lists slot restrictions in the CoreBuilder 9000 8-slot chassis.

**Table 6** CoreBuilder 9000 8-slot Chassis Slot Restrictions

| Module type | Slot number |
| --- | --- |
| Management modules | 9 and 10 |
| Active switch fabric module | 7 |
| Standby switch fabric module | 8 |
| Interface modules | 1, 2, 3, 4, 5, 6 |

Table 7 lists slot restrictions in the CoreBuilder 9000 16-slot chassis.

**Table 7** CoreBuilder 9000 16-slot Chassis Slot Restrictions

| Module type | Slot number |
| --- | --- |
| Management modules | 17 and 18 |
| Active switch fabric module | 8 |
| Standby switch fabric module | 9 |
| Interface modules | 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16 |

## Management Access

You can access and manage your modules using several methods:

- The Administration Console
- The Web Management suite of applications
- An external SNMP-based network management application such as 3Com's 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 *CoreBuilder 9000 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. 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 the CoreBuilder 9000 Enterprise Switch*.

For additional information about Web Management, see the *Web Management User Guide for the CoreBuilder 9000 Enterprise Switch*.

## Where to Go from Here

For more information about CoreBuilder 9000:

- Management modules, see the following documents:
    - *CoreBuilder 9000 Enterprise Management Engine User Guide*
    - *Enterprise Management Engine Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*
    - *Enterprise Management Controller Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

- Interface modules, see the following documents:

  - *10-Port 100BASE-FX and 20-Port 10/100BASE-TX Fast Ethernet Layer 2 Switching Modules Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *12-Port 10/100BASE-TX Fast Ethernet Layer 3 Switching Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *10-Port 100BASE-FX Fast Ethernet Layer 3 Switching Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *6-Port SAS (3-Port DAS) FDDI Layer 3 Switching Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *4-Port GBIC Gigabit Ethernet Layer 3 Switching Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *36-Port 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *36-Port 10/100BASE-TX Fast Ethernet Telco Layer 2 Switching Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *2-Port 1000BASE-SX and 1000BASE-LX Gigabit Ethernet Interface Modules Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *20-Port 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *CoreBuilder 9000 ATM Interface Module User Guide*

  - *CoreBuilder 9000 ATM Interface Module Getting Started Guide*

- Switch fabric modules, see the following documents:

  - *Gigabit Ethernet Switch Fabric Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *9-port Gigabit Ethernet Switch Fabric Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*

  - *CoreBuilder 9000 ATM Enterprise Switch Management Guide*

  - *CoreBuilder 9000 ATM Enterprise Switch Operations Guide*

  - *CoreBuilder 9000 ATM Switch Fabric Module Getting Started Guide*

- Commands, see the following documents:

  - *Command Reference Guide*

  - *CoreBuilder 9000 Implementation Guide*

# 5

# START THE SWITCH

This chapter summarizes what happens when you power on your CoreBuilder® 9000 Enterprise Switch after you have installed all the Switch components.

Before you power on the Switch, review the setup tasks (Figure 22 for the 7-slot chassis and Figure 23 for the 8-slot chassis and the 16-slot chassis) 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

*i* *To verify that the CoreBuilder 9000 Enterprise Switch 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 8 shows the sequence of characters that appear on the EME LED character display during a Switch power-on.

**Table 8** 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:
```

To continue operating and configuring your Switch, see the *CoreBuilder 9000 Enterprise Management Engine User Guide*.

## Where to Go from Here

To verify that the CoreBuilder 9000 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.

Table 9 indicates what to do after you power on the Switch.

For detailed information about the tasks that are listed in Table 9, see the *Enterprise Management Engine Quick Start Guide for the CoreBuilder 9000 Enterprise Switch* or the *CoreBuilder 9000 Enterprise Management Engine User Guide*.

**Table 9**  Tasks to Perform After You Power On the Switch

| Task | Description |
| --- | --- |
| Configure the Enterprise Management Engine | To configure the EME, set:<br>■ Terminal settings<br>■ Time and date<br>■ Device (Contact, Diagnostics, Location, and Name)<br>■ SNMP parameters to enable network access<br>■ 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.<br><br>You can manage your Switch locally through a terminal connection or remotely using a Telnet or modem con-nection. |
| Perform initial management access | Initially you access the Switch through the RS-232 port.<br><br>With network access, you can manage the CoreBuilder® 9000 Enterprise Switch from a remote terminal or SNMP manager. |

**Figure 22**  Setup Tasks for the CoreBuilder 9000 Enterprise Switch 7-slot Chassis



**Determine Site Requirements**
• *Enterprise Switch Getting Started Guide*, Appendix B
1

**Unpack the CoreBuilder 9000 7- Slot Chassis**
• "Unpacking Instructions" (In this guide)
2

**Administer and Operate the Switch**
• *Enterprise Management Engine User Guide*, Chapter 4 and Chapter 5
12

**Troubleshoot Problems**
• *Enterprise Management Engine User Guide*, Chapter 8
11

**Install the Chassis and Optional Devices**
• *7-Slot Chassis Quick Installation Guide*
3

**Configure the Switch for Management**
• *Enterprise Management Engine User Guide*, Chapter 4 and Chapter 5
10

**Install a Power Supply**
• *7-Slot Chassis Power Supply Installation Guide*
4

**Power On the Switch**
• *Enterprise Switch Getting Started Guide*, Chapter 5
9

**Install a Power Cable**
• *7-Slot Chassis Power Supply Installation Guide*
5

**CoreBuilder® 9000 7-slot Chassis**

**Install Interface Modules**
• Interface module quick start or getting started guides
• Interface module user guides (if available)
8

**Install an EME Management Module**
• *Enterprise Management Engine Quick Start Guide*
• *Enterprise Management Engine User Guide*
6

**Install a Switch Fabric Module**
• Switch fabric module quick start or getting started guides
• Switch fabric module user guides (if available)
7

**Figure 23**   Setup Tasks for the CoreBuilder 9000 Enterprise Switch 8-slot Chassis and 16-slot Chassis

**Determine Site Requirements**
• *Enterprise Switch Getting Started Guide*, Appendix B
1

**Unpack the CoreBuilder 9000 Chassis**
• "Unpacking Instructions"
 (On the shipping box and
 in this guide)
2

**Administer and Operate the Switch**
• *Enterprise Management Engine User Guide*, Chapter 4 and Chapter 5
13

**Troubleshoot Problems**
• *Enterprise Management Engine User Guide*, Chapter 8
12

**Install the Universal Mounting Shelf** (for a rack installation)
• *Chassis Quick Installation Guide for the 8-slot Chassis and the 16-slot Chassis*
3

**Install the Chassis and Optional Devices**
• *Chassis Quick Installation Guide for the 8-slot Chassis and the 16-slot Chassis*
4

**Configure the Switch for Management**
• *Enterprise Management Engine User Guide*, Chapter 4 and Chapter 5
11

**Power On the Switch**
• *Enterprise Switch Getting Started Guide*, Chapter 5
10

**Install a Power Supply and the Power Cable**
• *Power Supply Installation Guide for the 8-slot Chassis and 16-slot Chassis*
5

**CoreBuilder® 9000 16-slot Chassis**

**CoreBuilder® 9000 8-slot Chassis**

**Install Interface Modules**
• Interface module quick start or getting started guides
• Interface module user guides (if available)
9

**Install the Plastic Power Supply Air Grille Bezel** (for the 16-slot chassis only)
• *Chassis Quick Installation Guide for the 8-slot Chassis and the 16-slot Chassis*
6

**Install a Switch Fabric Module**
• Switch fabric module quick start or getting started guides
• Switch fabric module user guides (if available)
8

**Install an EME Management Module**
• *Enterprise Management Engine Quick Start Guide*
• *Enterprise Management Engine User Guide*
7

# 6

# NAVIGATING THE DOCUMENTATION CD-ROM

This chapter provides an overview of how to use the Documentation CD-ROM and the Web to find information. After you install and start the Documentation CD-ROM, you can review the list of available documents and begin reading.

This section contains the following topics:

- Viewing PDF (Portable Document Format) files
- Using Bookmarks
- Searching Documents
- Browsing the Web

## Viewing PDF Files

The Documentation CD-ROM contains:

- 3Com CoreBuilder® 9000 documentation in Adobe Acrobat format
- Adobe Acrobat Reader and Reader installation instructions

If you have difficulty installing the Acrobat Reader, use an Internet browser to download the reader from the Adobe home page at:
**http://www.Adobe.com**

You can view additional 3Com technical documentation on the 3Com home page at:
**http://www.3com.com**

Click *Support* and look under *Documents and Information*.

After you have installed your CD-ROM, open the roadmap.pdf file and click the desired document title. The Adobe Acrobat Reader automatically launches that document and the PDF version then appears in the window.

## Using Bookmarks

Each document on the CD-ROM displays a table of contents in the left side of the PDF file. These are *bookmarks*. When you click an entry, the linked text is automatically displayed or another subset of the bookmarks appears.

## Searching Documents

You can search within a document for a word or phrase. To search within a single document for a specific word or phrase, use the Find command as follows:

**1** From the *Tools* menu, select the *Find* menu option.

**2** In the Find text box, enter the text that you want to find. You can select how to use the search engine.

You can select:

- Match whole word only
- Match case
- Find backwards

**3** Click the *Find* button.

If the text is found, it is highlighted. If it is not found, a message indicates that no occurrences of the word were found.

## Browsing on the Web

If you have access to the Internet, the documentation on the CD-ROM is available from the 3Com Web site in PDF and HTML. You can print and view individual document pages in the PDF files using the provided Adobe Acrobat Reader application.

Use the provided browser to access different information about 3Com and the most current version of 3Com technical documentation.

# 7

# MAINTENANCE FOR THE 7-SLOT CHASSIS

This chapter describes the routine maintenance to perform to keep your CoreBuilder® 9000 Enterprise Switch 7-slot 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 section provides information about the CoreBuilder 9000 Enterprise Switch 7-slot chassis and contains the following topics:

- Routine Maintenance
- Removing and Replacing a Power Supply
- Removing and Replacing a Fan Tray

## Routine Maintenance

On a regular basis, inspect your 7-slot chassis to verify that:

- All blank faceplates are securely attached to the chassis.
- The fan tray is running.

**CAUTION:** *The CoreBuilder 9000 7-slot Switch 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 7-slot Switch with all four fans operating in the fan tray.*

- 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 your rack.

## Removing and Replacing a Power Supply

This section describes how to remove and then replace the following power supplies in the 7-slot chassis:

- 930-watt AC power supply (Model Number 3CB9EP9)

- –48-volt DC power supply (Model Number 3CB9EP8D7)

*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 CoreBuilder 9000 Enterprise Switch. 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.*

*WARNING: Before you attempt to remove a –48-volt DC power supply from the chassis, to protect the power supply that you want to remove, set the power supply's Standby/On switch to the Standby position and turn off the building power source circuit breaker.*

*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 CoreBuilder 9000 Enterprise Switch 7-slot chassis can accommodate up to two 930-watt modular load-sharing power supplies or two –48-volt DC power supplies.

To remove a 930-watt power supply from a 7-slot chassis:

**1** Set the power supply's Standby/On switch (Figure 24), which is located on the front of the power supply, to the Standby position.

**Figure 24**   930-watt Power Supply Standby/On Switch



Standby position    On position

Standby/On switch
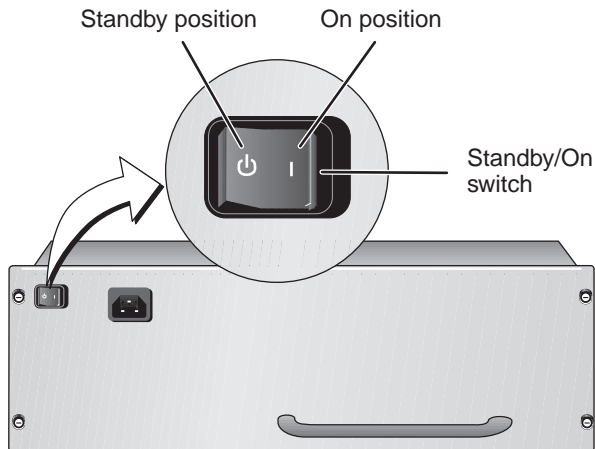
**2** Remove the power cord from the electrical outlet.

**3** Remove the power cord from the power supply's AC input socket.

**4** Remove the power supply. See Figure 25.

   **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 chassis 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.*
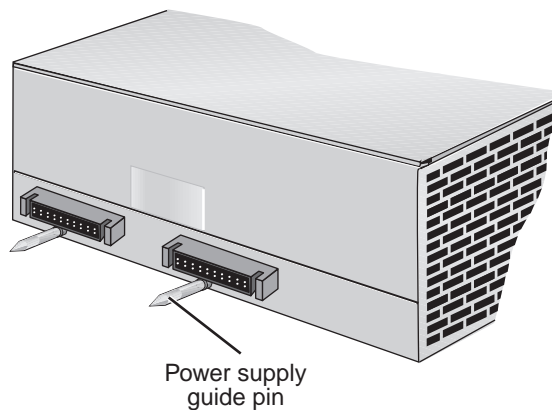
**Figure 25**   Removing the Power Supply Using the Handle



Power
supply
slot 2

Power
supply
(in slot 1)
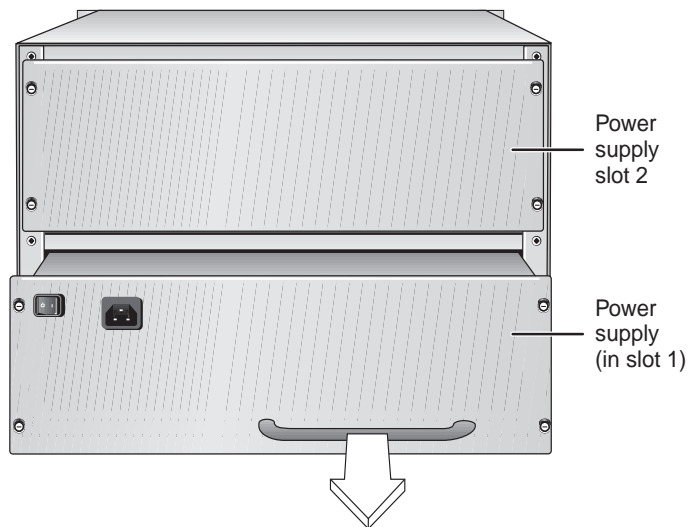
## Replacing a 930-watt Power Supply

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 26)
and carefully slide the power supply unit into the
selected power supply slot.

**Figure 26**   Guide Pins for the CoreBuilder 9000 7-slot Chassis
Power Supply



Power supply
guide pin

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

**Figure 27** Installing a 930-watt Power Supply Using the Handle
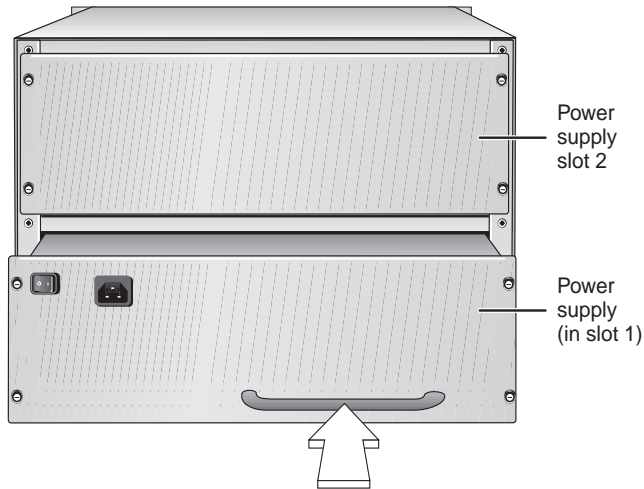


Power supply slot 2

Power supply (in slot 1)

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 24).

### Removing a –48-volt DC Power Supply

The CoreBuilder 9000 Enterprise Switch 7-slot chassis can accommodate up to two –48-volt DC power supplies.

To remove a –48-volt DC power supply from a 7-slot chassis:

**1** Set the power supply's Standby/On switch (Figure 28), which is located on the side of the power supply, to the Standby position.

**Figure 28** –48-volt DC Power Supply Standby/On Switch
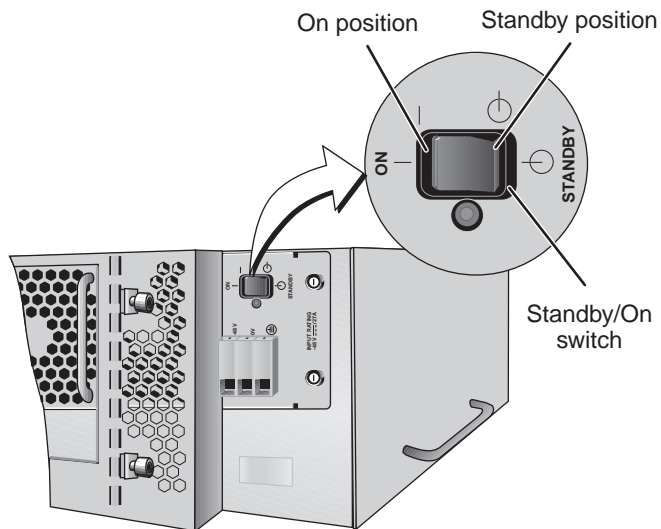


**2** To protect the power supply that you want to remove, turn off the building's power source circuit breaker.

**3** Remove each wire from the DC power source electrical outlet.

**4** Remove the 8 AWG wires from DC input connector on the –48-volt DC power supply.

**a** Label the polarity of both ends of each wire (Figure 29).

**Figure 29** Label Each 8 AWG Gauge Wire
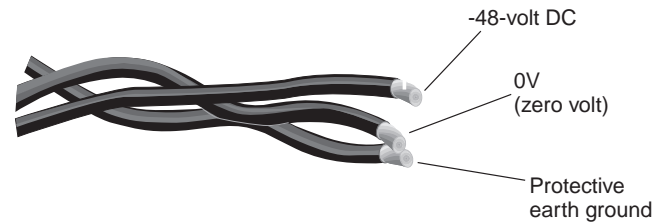


**b** Loosen the three wires with a slotted-blade screwdriver.

**c** Gently pull the three wires out of the DC input connector.

**d** Place the wires aside until you are ready to connect them again.

**5** Remove the power supply.

    **a** Using a flat-blade screwdriver, loosen the spring-loaded screws that secure the power supply to the back of the chassis.

    **b** Grasp the power supply handle.

    **c** Pull the power supply straight out from the chassis, making certain that you do not damage the connectors on the rear of the power supply or the connectors on the chassis backplane.

⚠ *CAUTION: To ensure against damage to the connectors, while you pull the power supply straight out of the chassis, put one hand under the bottom of the power supply to support it.*

### Replacing a –48-volt DC Power Supply

To install a new –48-volt DC power supply:

**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** Carefully slide the power supply unit into the selected power supply slot.

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

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 inch-pounds.

**5** Before you attach the 8 AWG gauge wire to the power supply, verify that the power supply's Standby/On switch is in the Standby position.

**6** Remove the recommended amount of insulation from the 8 AWG gauge wire (Figure 30).

**Figure 30**   8 AWG Gauge Wire and Recommended Strip-back

8 AWG gauge

9mm
(.36 in.)
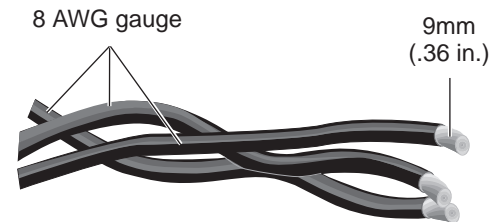
**7** Insert each of the three end wires into the slots of the DC input connector (Figure 31).

**Figure 31**   –48-volt DC Power Supply Labels
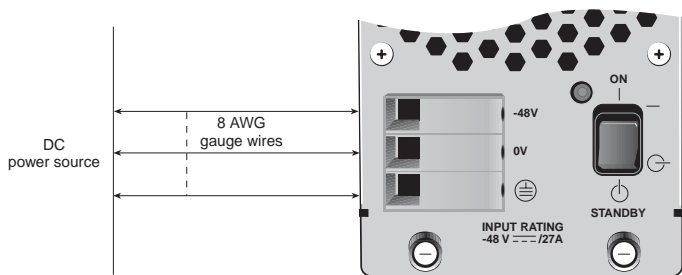


**8** Using a slotted-blade screwdriver, secure each wire to the DC input connector.

**9** Attach the other end of the 8 AWG gauge wires to the building's DC power source, then verify that all connections at the power supply and the power source are security attached.

⚠ **WARNING:** *Make certain that the polarity orientation from the DC power source to the –48-volt DC power supply connector is the same.*

**10** Turn on the building's power source circuit breaker that connects to the –48-volt DC power supply.

**11** Set the power supply's Standby/On switch to the On ( | ) position and follow the normal operating procedure for your CoreBuilder 9000 7-slot chassis.

## Removing and Replacing a Fan Tray

This section describes how to remove and then replace a fan tray for the 7-slot chassis:

⚠ **CAUTION:** *The CoreBuilder 9000 7-slot Switch 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 7-slot 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.*

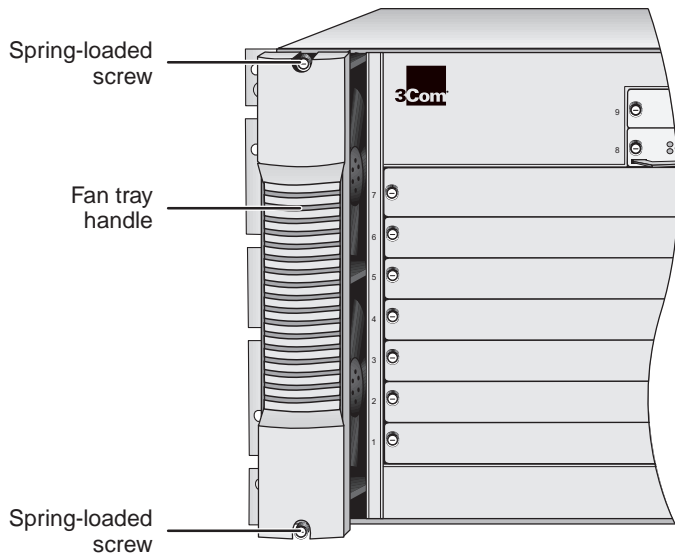### Removing the Fan Tray from a 7-slot Chassis

The CoreBuilder 9000 Enterprise Switch 7-slot 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 the 7-slot chassis, follow these steps:
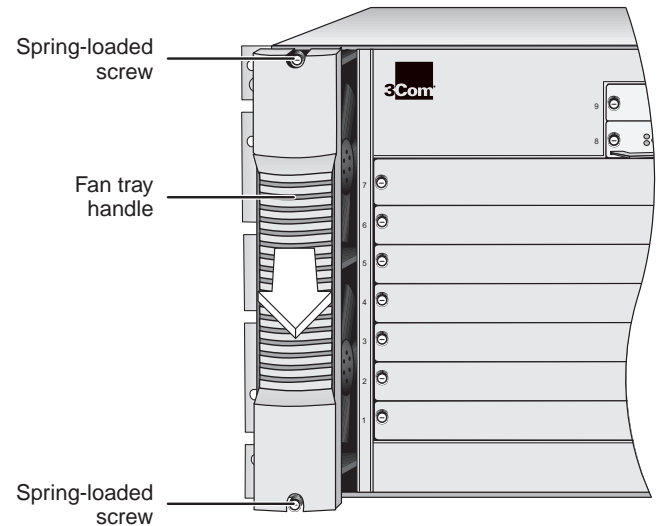
1 Using a flat-blade screwdriver, loosen the two spring-loaded screws that attach the fan tray to the front of the chassis (Figure 32).

**Figure 32**   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 33).

**Figure 33**   Removing the Fan Tray from the 7-slot 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.
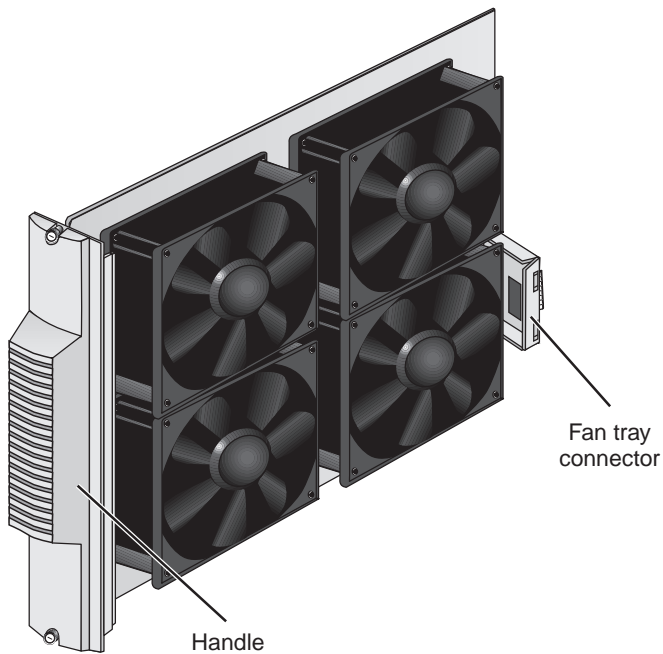
### Replacing the Fan Tray in a 7-slot Chassis

You can install a fan tray in your CoreBuilder 9000 7-slot 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 34).

**Figure 34** Connector on the Fan Tray



Fan tray connector

Handle

**3** Slide the fan tray into the chassis (Figure 35).

**Figure 35** Installing the Fan Tray into the 7-slot Chassis Using the Handle



Spring-loaded screw

Fan tray handle

Spring-loaded screw
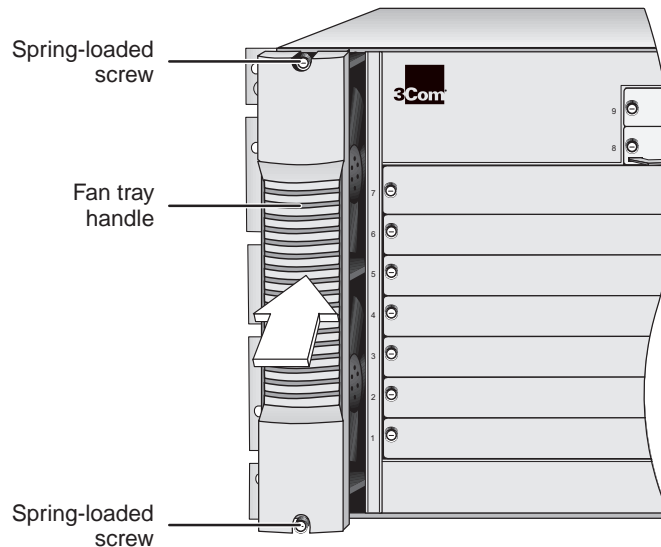
**4** Align the fan tray connector and the backplane connector.

**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 reseat 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 35).

*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.

# 8 MAINTENANCE FOR THE 8-SLOT CHASSIS AND THE 16-SLOT CHASSIS

This chapter describes the routine maintenance to perform to keep your CoreBuilder® 9000 Enterprise Switch 8-slot chassis and 16-slot chassis working at their 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 contains the following topics:

- Routine Maintenance
- Removing and Replacing a Power Supply
- Removing and Replacing a Fan Tray

## Routine Maintenance

On a regular basis, inspect your CoreBuilder 9000 chassis to verify that:

- All blank faceplates are securely attached to the chassis.
- Two fans trays are running in the 8-slot chassis and three fan trays are running in the 16-slot chassis.

**CAUTION:** *The CoreBuilder 9000 8-slot Switch and 16-slot Switch send a trap message and can continue to run if one fan fails in one fan tray. However, if a second or third fan fails, in that same 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 a full complement of fan trays.*

- 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 your rack.

## Removing and Replacing a Power Supply

This section describes how to remove and then replace the following power supplies in the 8-slot chassis and 16-slot chassis:

- 820-watt AC power supply (Model Number 3CB9EP8)

- –48-volt DC power supply (Model Number 3CB9EP8D)

You install and remove the 820-watt power supply in the same manner, using the same steps for the 8-slot chassis and the 16-slot 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 CoreBuilder 9000 Enterprise Switch. 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 an 820-watt AC power supply from the chassis, to avoid contact with hazardous energy, be sure to set the power supply's On/Off switch to the Off (O) position and to disconnect the power cord from both the electrical outlet and then the power supply.*

*WARNING: Before you attempt to remove a –48-volt DC power supply from the chassis, to protect the power supply that you want to remove, set the power supply's Standby/On switch to the Standby position and turn off the building power source circuit breaker.*

*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 they are available if needed.*

## Removing an 820-watt Power Supply

The CoreBuilder 9000 Enterprise Switch can accommodate the following number of 820-watt power supplies:

- The 8-slot chassis can accommodate up to three 820-watt modular load-sharing power supplies.

- The 16-slot chassis can accommodate up to four 820-watt modular load-sharing power supplies.

Figure 36 shows an 820-watt AC power supply in the 16-slot chassis. Figure 37 shows an 820-watt AC power supply in an 8-slot chassis.

*The figures in this section illustrate the 16-slot chassis. Unless otherwise noted, the same procedures apply to the 8-slot chassis, except that the power supplies are located in a different area in the chassis. You install and remove power supplies in the same manner, using the same steps.*

**Figure 36**   CoreBuilder 9000 16-slot Chassis Power Supply Location with an 820-watt Power Supply Installed



Power supply (in slot 1)

Power supply slot 2

Power supply slot 3
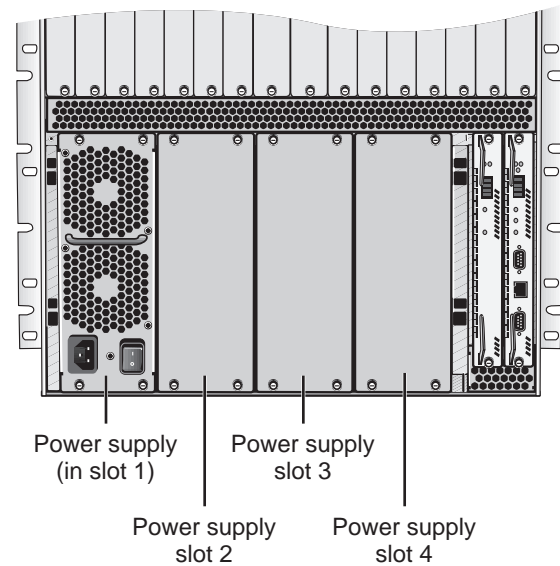
Power supply slot 4

**Figure 37** CoreBuilder 9000 8-slot Chassis Power Supply Location with a 820-watt Power Supply Installed



Power supply slot 3

Power supply (in slot 1)
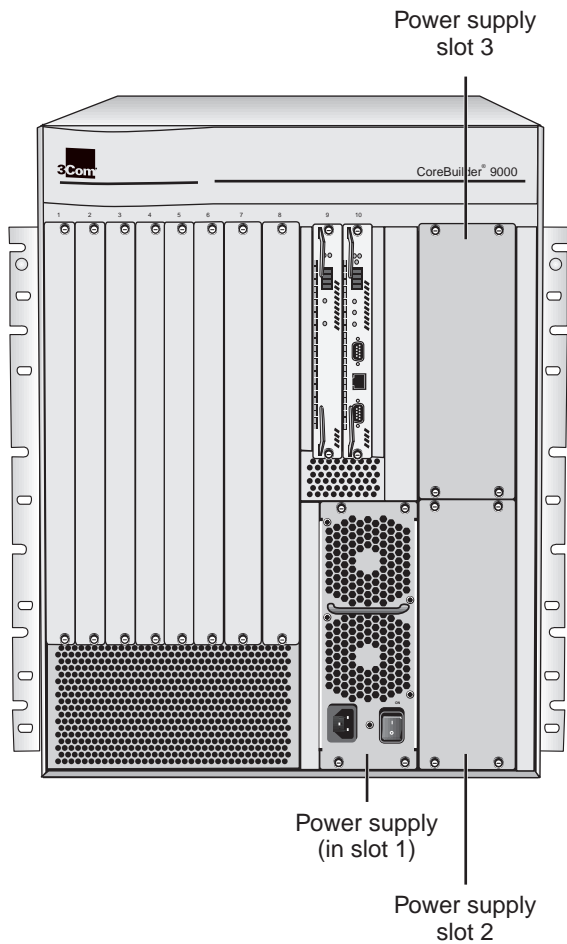
Power supply slot 2

To remove an 820-watt power supply from a CoreBuilder 9000 8-slot chassis or 16-slot chassis, follow these steps:

1 For the 16-slot chassis only, to gain access to the power supply slots, remove the plastic air grille bezel that covers the power supply bay (Figure 38).

   a With both hands, hold each side of the bezel and push down on the top of the bezel with your thumbs.

   b Gently snap the bottom of the bezel off and then the top.

**Figure 38** Removing the Plastic Air Grille Bezel That Covers the Power Supply Slots



Power supply plastic air grille bezel
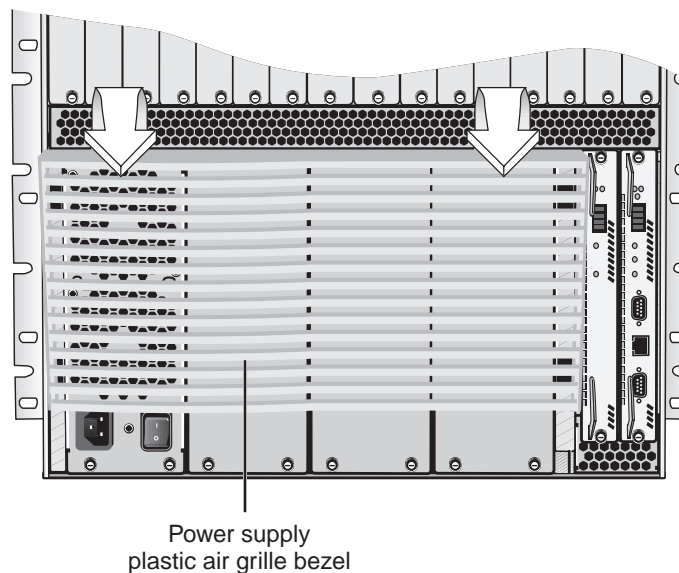
**2** For both the 8-slot chassis and the 16-slot chassis, set the 820-watt power supply's On/Off switch ( | / O ), which is located on the front of the power supply, to the Off ( O ) position (Figure 39).

**Figure 39** CoreBuilder 9000 Chassis 820-watt AC Power Supply
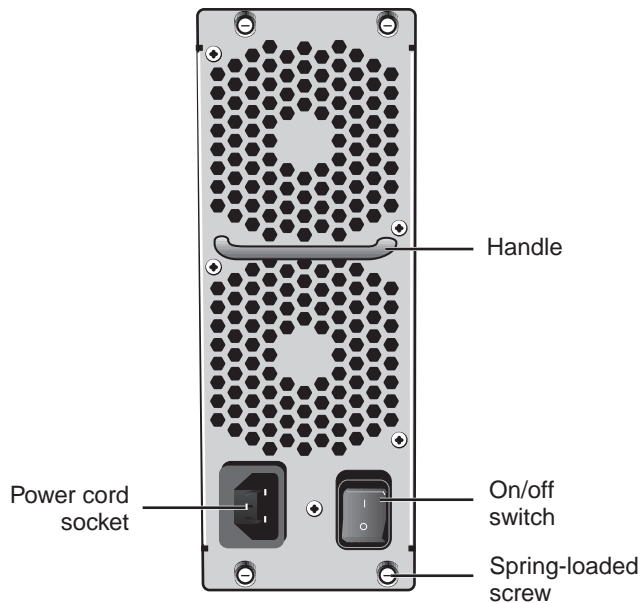


Handle

Power cord socket

On/off switch

Spring-loaded screw

**3** Remove the power cord from the electrical outlet.

**4** Remove the power cord from the power supply socket.

**5** Remove the power supply (Figure 40).

   **a** Using a flat-blade screwdriver, loosen the spring-loaded screws that secure the power supply to the front of the chassis.

   **b** Face the front of the chassis and grasp the power supply handle (Figure 40).

   **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 chassis 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.*

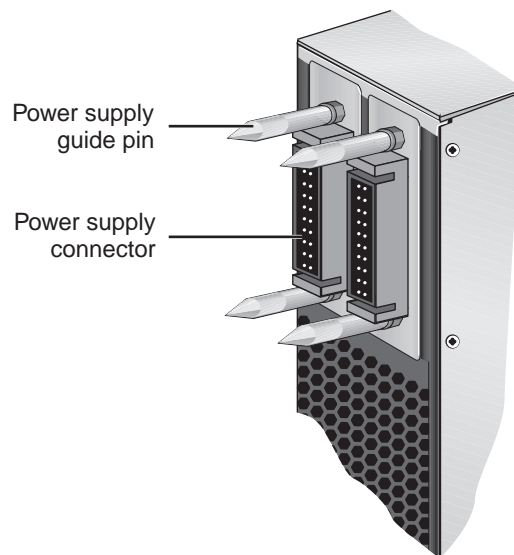**Figure 40**   Removing an 820-watt Power Supply Using the Handle



Spring-loaded screw
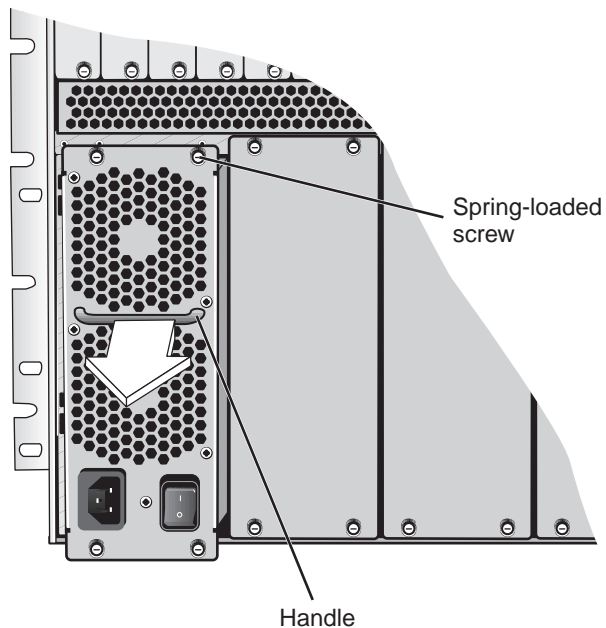
Handle

## Replacing an 820-watt Power Supply

To install a new 820-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 front of the chassis.

2 Use the four guide pins on the power supply (Figure 41) and carefully slide the power supply unit into the selected power supply slot.

**Figure 41**   Guide Pins for the CoreBuilder 9000 Power Supply



Power supply guide pin

Power supply connector

3 With the handle (Figure 42), gently push the power supply inward until the connectors engage.

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.*

**Figure 42**  Installing an 820-watt Power Supply Using the Handle



Spring-loaded screw

Handle
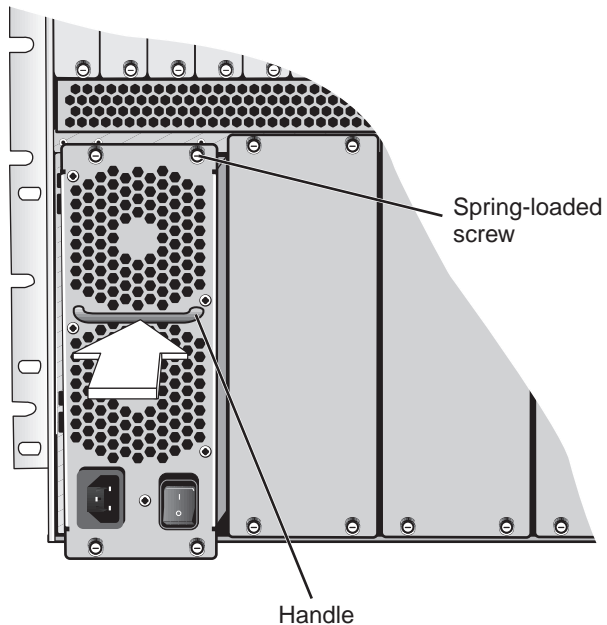
**4** To secure the power supply to the chassis, tighten the four spring-loaded screws (Figure 42) to a Torque Specification of from 5 to 7 in/lb (inch-pounds).

**5** Plug one end of the power cord into the socket on the power supply and then plug the other end into the electrical outlet.

**6** Set the power supply's On/Off switch ( | / O ) to the On ( | ) position.

**7** For the 16-slot chassis, attach the power supply plastic air grille bezel:

**a** With both hands, grasp the bezel and face the front of the chassis.

**b** Use the guide pins on the bezel and push the bezel straight in to secure it to the front of the chassis.

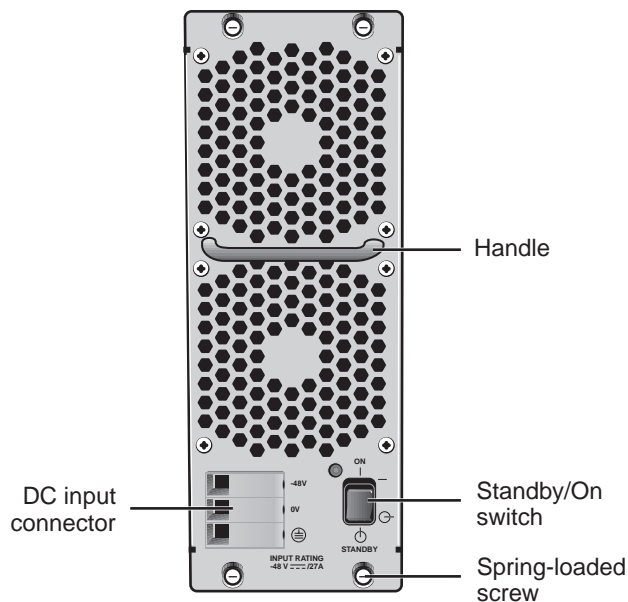## Removing a –48-volt DC Power Supply

The CoreBuilder 9000 Enterprise Switch 8-slot chassis can accommodate up to three –48-volt DC power supplies. The 16-slot chassis can accommodate up to four –48-volt DC power supplies.

**Figure 43**   Location of the –48-volt DC Power Supply in an 8-slot Chassis
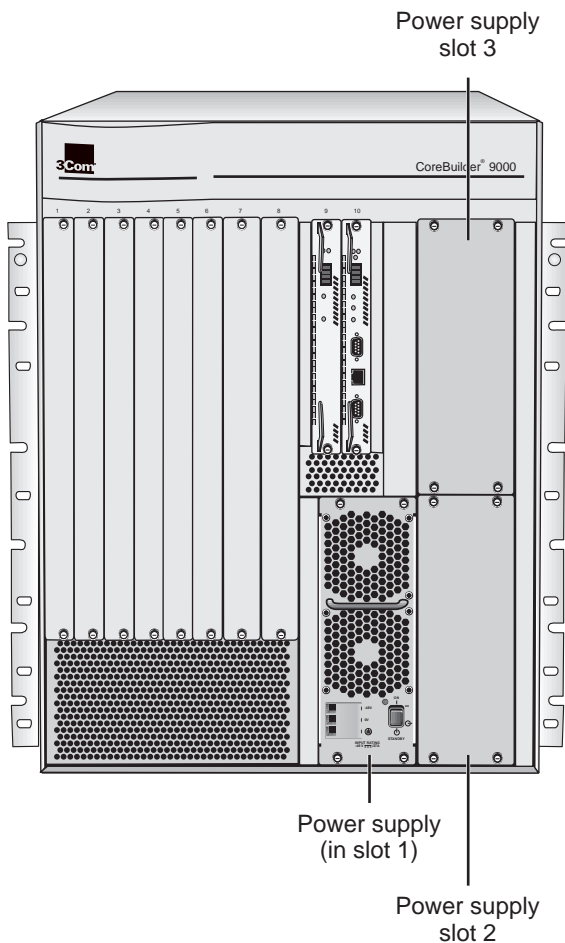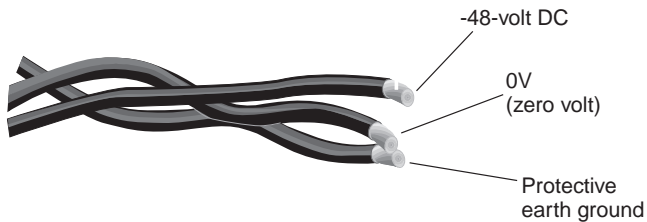


Power supply slot 3

Power supply (in slot 1)

Power supply slot 2

1 For the 16-slot chassis only, to gain access to the power supply slots, remove the plastic air grille bezel that covers the power supply bay (Figure 37).

   a With both hands, hold each side of the bezel and push down on the top of the bezel with your thumbs.

   b Gently snap the bottom of the bezel off and then the top.

2 For both an 8-slot chassis or 16-slot chassis, set the power supply's Standby/On switch (Figure 44), which is located on the front of the power supply, to the Standby position.

**Figure 44**   –48-volt DC Power Supply Standby/On Switch



Handle

DC input connector

Standby/On switch

Spring-loaded screw

**3** To protect the power supply that you want to remove, turn off the building's power source circuit breaker.

**4** Remove each wire from the DC power source electrical outlet.

**5** Remove the 8 AWG wires from the DC input connector on the –48-volt DC power supply.

   **a** Label the polarity at both ends of each wire.

**Figure 45**   Label Each 8 AWG Gauge Wire



-48-volt DC

0V
(zero volt)

Protective
earth ground

   **b** Loosen the three wires with a slotted-blade screwdriver.

   **c** Gently pull the three wires out of the DC input connector.

   **d** Place the wires aside until you are ready to connect them again.

**6** Remove the power supply.

   **a** Using a flat-blade screwdriver, loosen the spring-loaded screws that secure the power supply to the chassis.

   **b** Grasp the power supply handle.

   **c** Pull the power supply straight out from the chassis, making certain that you do not damage the connectors on the rear of the power supply or the connectors on the chassis backplane.

⚠ **CAUTION:** *To ensure against damage to the connectors, while you pull the power supply straight out of the chassis, put one hand under the bottom of the power supply to support it.*

**Replacing a –48-volt DC Power Supply**
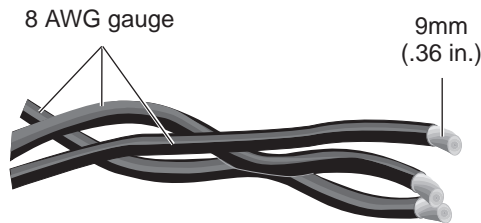
To install a –48-volt DC power supply:

**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 front of the chassis.

**2** Carefully slide the power supply unit into the selected power supply slot.

**3** With the handle (Figure 44), gently push the power supply inward until the connectors engage.

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 attach the 8 AWG gauge wires to the power supply, verify that the power supply's Standby/On switch is in the Standby position.

**6** Remove the recommended amount of insulation from the 8 AWG gauge wire (Figure 46).

**Figure 46** 8 AWG Gauge Wire and Recommended Strip-back



8 AWG gauge

9mm (.36 in.)

**7** Insert each of the three end wires into the slots on the DC input connector (Figure 47).

**Figure 47** –48-volt DC Power Supply Labels
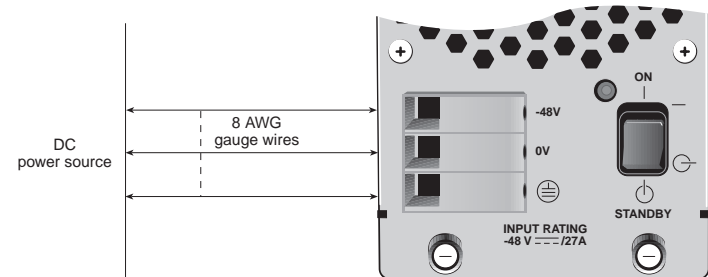


DC power source

8 AWG gauge wires

-48V

0V

ON

STANDBY

INPUT RATING
-48 V ⎓/27A

**8** Using a slotted-blade screwdriver, secure each wire to the DC input connector.

**9** Attach the other end of the 8 AWG gauge wires to the building's DC power source, then verify that all connections at the power supply and the power source are securly attached.

⚠ **WARNING:** *Make certain that the polarity orientation from the DC power source to the –48-volt DC power supply connector is the same.*

**10** Turn on the building's power source circuit breaker that connects to the –48-volt DC power supply.

**11** Set the power supply's Standby/On switch to the On ( | ) position and follow the normal operating procedure for your CoreBuilder 9000 8-slot chassis and 16-slot chassis.

**12** For the 16-slot chassis, attach the power supply plastic air grille bezel:

    **a** With both hands, grasp the bezel and face the front of the chassis.

    **b** Use the guide pins on the bezel and push the bezel straight in to secure it to the front of the chassis.

## Removing and Replacing a Fan Tray

This section describes how to remove and then replace a fan tray for the CoreBuilder 9000 8-slot chassis and the 16-slot chassis.

⚠️ *CAUTION: The CoreBuilder 9000 Enterprise Switch generates a fan fault message and can continue to run if one fan fails in one fan tray. However, if a second or third fan fails, in that same fan tray, no trap message is generated. Replace the fan tray within 48 hours of failure notification or contact your service representative.*

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

ℹ️ *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.*
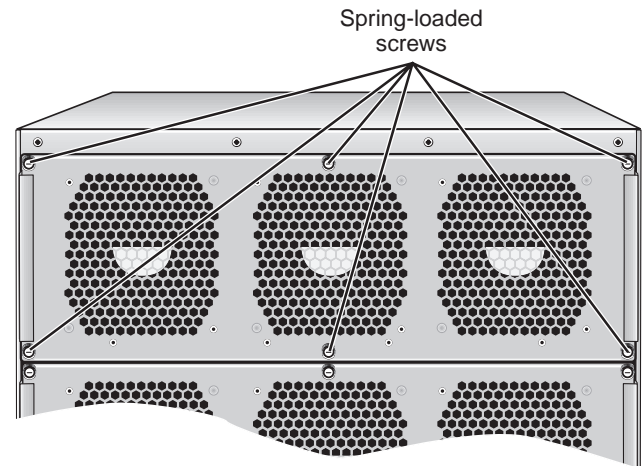
### Removing a Fan Tray from the Chassis

The CoreBuilder 9000 Enterprise Switch 8-slot chassis can accommodate up to two fan trays. The 16-slot chassis can accommodate up to three fan trays. Each fan tray contains three fans.

To remove a fan tray from the 8-slot chassis or 16-slot chassis, follow these steps:
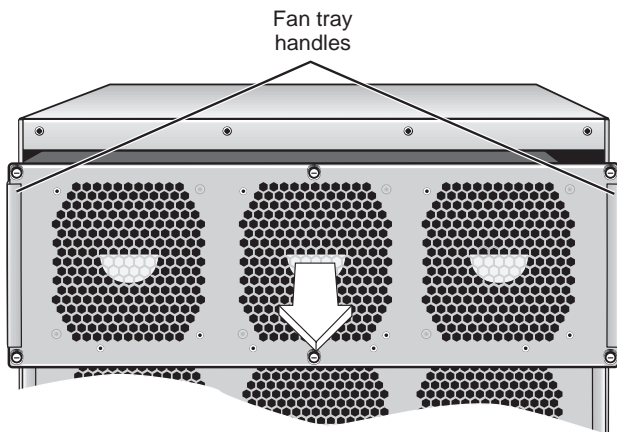
**1** Using a flat-blade screwdriver, loosen the six spring-loaded screws that attach the fan tray to the rear of the chassis (Figure 48).

**Figure 48**   The Six Spring-loaded Screws on the Fan Tray

**2** Grasp the two handles on the fan tray and firmly pull the fan tray toward you (Figure 49).

**Figure 49**   Removing the Fan Tray from the CoreBuilder 9000 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, making sure that you do not damage the connector and guide pin on the rear of the fan tray (Figure 50).
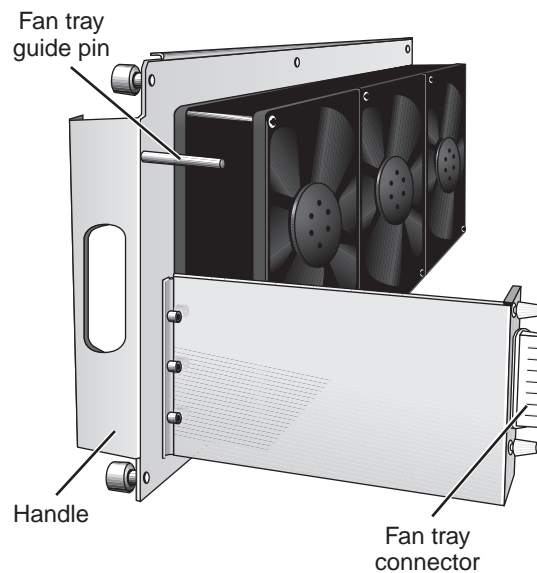
## Replacing a Fan Tray in a Chassis

You can install a fan tray in your CoreBuilder 9000 8-slot chassis or 16-slot chassis while the power is still on.

To install a new fan tray:

**1** Grasp the two handles on the fan tray and then face the rear of the chassis.

**2** Locate the guide pin and the connector on the fan tray (Figure 50).

**Figure 50**   Guide Pin and Connector on the Fan Tray

**3** Slide the fan tray into the chassis (Figure 51).

**Figure 51**   Installing the Fan Tray into the 8-slot Chassis or 16-slot Chassis Using the Handles
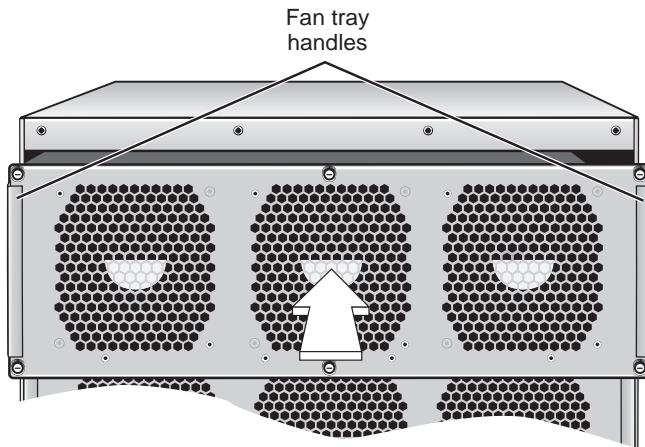


**4** Align the fan tray connector and the backplane connector.

**5** Use the guide pin on the fan tray and the guide pin holes on the back of the chassis and gently push the fan tray inward until the fan tray connector and backplane connector 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 back of the chassis. If the fan tray and the chassis are not aligned, remove the fan tray and reseat it.

**7** Using a flat-blade screwdriver, tighten the six spring-loaded screws to secure the fan tray to the rear of the chassis (Figure 48).
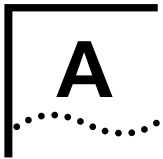
> *The fans begin rotating the moment that you power on the chassis or insert a fan tray into a powered-on chassis.*

**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.

# A SPECIFICATIONS

This appendix lists the following specifications for the 3Com CoreBuilder® 9000 Enterprise Switch:

- Physical
- Environmental
- Power
- Regulatory Compliance
- Interfaces

The specifications apply to the following:

- 7-slot chassis
- 8-slot chassis
- 16-slot chassis
- Power supplies:
  - 930-watt
  - 820-watt
  - –48-volt DC

## 7-slot Chassis Specifications

This section contains specifications for the CoreBuilder 9000 Enterprise Switch 7-slot chassis.

### 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 temperature**[1] | 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 7-slot Switch 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 strom 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: |
|---|---|
| | ■ EMC EN55022 |
| | ■ EN61000-3, 2 |
| | Immunity: |
| | ■ EN50082-1 |

*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

## 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 |

# 8-slot Chassis Specifications

This section contains specifications for the CoreBuilder 9000 Enterprise Switch 8-slot chassis.

## Physical

| Height | 57.6 cm | 22.7 inches (13 Rack Units) |
|---|---|---|
| Width | 48.3 cm | 19 inches (including rack-mount flanges) |
| | 44.4 cm | 17.5 inches (not including rack-mount flanges) |
| Depth | 51.2 cm | 20.2 inches (from rack mount) |
| | 54.1 cm | 21.3 inches (with fan trays) |
| Weight | 51.2 kg | 112.9 pounds (chassis and backplane) |
| | 71.7 kg | 158 pounds (fully loaded) |
| Mounting | Tabletop, shelf, or 19-inch rack mount | |

## Environmental

| Operating temperature[1] | 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 remove and replace fan trays and to maintain proper ventilation for the 8-slot chassis, keep the rear of the 8-slot Switch at least 91.4 cm (36 inches) from a wall or other obstruction.*

## Power

| | |
|---|---|
| **Total power consumption** | 1304 watts, 4449 BTU/hour |
| **Output voltage** | +5.2 V @ 115 A, +3.5 V @ 175 A, +12 V @ 2 A, -5 V @ 4 A, +2 V @ 8 A |
| | (+5.2V and +3.5V output is shared) |
| **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 3CB9EP8 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 3CB9EP8 stromforsyning modtage strom 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: |
| | ■ EMC EN55022 |
| | ■ EN61000-3, 2 |
| | Immunity: |
| | ■ EN50082-1 |

*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

## Interfaces

| Network Interfaces | 622 Mbps OC-12c/STM-4 |
|---|---|
| | 155 Mbps OC-3c/STM-1 |
| | 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 |

# 16-slot Chassis Specifications

This section contains specifications for the CoreBuilder 9000 Enterprise Switch 16-slot chassis.

## Physical

| Height | 75.4 cm | 29.7 inches (17 Rack Units) |
|---|---|---|
| Width | 44.4 cm | 17.5 inches (not including rack-mount flanges) |
| Depth | 51.1 cm | 20.1 inches (from rack mount) |
| | 54.1 cm | 21.3 inches (with fan trays) |
| Weight | 43.1 kg | 95 pounds (chassis and backplane) |
| | 88.5 kg | 195 pounds (fully loaded) |
| Mounting | Tabletop, shelf, or 19-inch rack mount | |

## Environmental

| Operating temperature[1] | 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 remove and replace fan trays and to maintain proper ventilation for the 16-slot chassis, keep the rear of the 16-slot Switch at least 91.4 cm (36 inches) from a wall or other obstruction.*

## Power

| | |
|---|---|
| **Total power consumption** | 1325 watts, 4505 BTU/hour |
| **Output voltage** | +5.2 V @ 115 A, +3.5 V @ 175 A, +12 V @ 2 A, -5 V @ 4 A, +2 V @ 8 A<br><br>(+5.2V and +3.5V output is shared) |
| **Input voltage range** | United States — 85 to 132 VAC<br>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 3CB9EP8 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 3CB9EP8 stromforsyning modtage strom 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: |
| | ■ EMC EN55022 |
| | ■ EN61000-3, 2 |
| | Immunity: |
| | ■ EN50082-1 |

*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

**Interfaces**

| Network interfaces | 622 Mbps OC-12c/STM-4 |
|---|---|
| | 155 Mbps OC-3c/STM-1 |
| | 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 CoreBuilder 9000 Enterprise Switch power supplies:

- 820-watt AC for the 8-slot chassis and 16-slot chassis
- 930-watt AC for the 7-slot chassis
- –48-volt DC for the 7-slot chassis, 8-slot chassis, and 16-slot chassis

**820-watt and 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. |

**–48-volt DC Power Supply**

| Safety | CSA 22.2 No. 950-95 |
|---|---|
| | UL1950 |
| | TUV GS mark |
| | IEC950, CB Certificate |
| | EN60950, with amendments |
| | AUSTEL technical Standard, 001/AS 3260 |
| 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. |
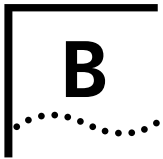
# B SITE REQUIREMENTS, SAFETY, AND PREINSTALLATION INFORMATION

This appendix contains the following topics:

- Site Requirements for the Switch
- Power Requirements
- Safety Information
- Preinstallation Information

## Site Requirements for the Switch

This section describes the following site requirements for setting up your CoreBuilder® 9000 Enterprise Switch (7-slot chassis, 8-slot chassis, and 16-slot chassis):

- Location Requirements
- Precautionary Guidelines
- Ventilation Requirements

### Location Requirements

Install a CoreBuilder 9000 Enterprise Switch 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 CoreBuilder 9000 Switch 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 7-slot 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 7-slot 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 in the 7-slot chassis.
  - Remove and replace the fan trays in the 8-slot chassis and 16-slot chassis.
  - 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 CoreBuilder 9000 chassis.

- 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 CoreBuilder 9000 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 CoreBuilder 9000 Switch must not exceed 50 °C (122 °F).

- Safety regulations stipulate that for a:

  - 7-slot 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 7-slot chassis.

  - 8-slot chassis, the table, shelf, or rack on which the Switch rests can support at least 215 kg (474 lb), which is three times the weight of a fully loaded 8-slot chassis.

  - 16-slot chassis, the table, shelf, or rack on which the Switch rests can support at least 265.5 kg (585 lb), which is three times the weight of a fully loaded 16-slot 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 7-slot 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 7-slot chassis, and to remove and replace fan trays in the 8-slot chassis and 16-slot chassis.

  - Provide sufficient space on the sides of a 7-slot chassis and at the top or bottom of the 8-slot chassis and the 16-slot chassis to allow for bend radius for cables when using a cable management device.

■ 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

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

Table 8 indicates the amount of rack space that is needed to install a CoreBuilder 9000 7-slot chassis, 8-slot chassis, and 16-slot chassis in a Telco rack or a Metric rack.

**Table 10**  Metric and Telco Rack Space Requirements

| Chassis Model | Height[1] | Telco Rack[2] | Metric Rack[3] | Front Clearance[4] |
|---|---|---|---|---|
| 7-slot chassis | 30.98 cm 12.2 in. | 7 RU | 12.5 SU | 8 cm 3 in. |
| 8-slot chassis | 57.6 cm 22.69 in. | 13 RU | 23 SU | 8 cm 3 in. |
| 16-slot chassis | 75.4 cm 29.7 in. | 17 RU | 28 SU | 8 cm 3 in. |

[1] The height of the chassis, allowing for some extension beyond the location of the upper and lower unit dividing lines.
[2] The unit of measure is 1 Rack Unit (1.75 in. or 4.45 cm).
[3] The unit of measure is 1 System Unit (25 millimeters).
[4] 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**

Follow these recommendations when you install the chassis in a rack:

■ Before you install the optional cable management device for the 7-slot chassis, install the 7-slot chassis in the rack.

■ Install the supplied mounting shelves into the rack for the 8-slot chassis and 16-slot chassis.

■ Before you mount the 8-slot chassis and 16-slot chassis in the rack, install the optional cable management device.

■ Install the cable management device for the 8-slot chassis and 16-slot chassis either above or below where the chassis is located in the rack.

■ Use at least two people to install any chassis.

> **i** *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.*

**Ventilation Requirements**

This section describes ventilation requirements for the:

■ 7-slot chassis

■ 8-slot chassis

■ 16-slot chassis

**Ventilation Requirements for the 7-slot Chassis**

The CoreBuilder 9000 Switch 7-slot 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 7-slot 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 7-slot chassis.

When you face the front of the 7-slot chassis, the inlet is on the right and the exhaust is on the left.

⚠ *CAUTION: Operate a CoreBuilder 9000 Enterprise Switch 7-slot chassis with four fans running. If one fan in the fan tray fails, replace the fan tray as soon as possible.*

**Ventilation Requirements for the 8-slot Chassis and 16-slot Chassis**

The CoreBuilder 9000 Enterprise Switch 8-slot chassis contains two fan trays. The 16-slot chassis contains three fan trays. Each fan tray contains three fans.

To remove and replace the fan trays in the 8-slot chassis and 16-slot chassis, and to maintain proper cooling, make certain that there is at least 91.4 cm (36 in.) between the rear of the 8-slot chassis or 16-slot chassis and the nearest wall (or other vertical surface).

ⓘ *The vent holes at the back of the 8-slot chassis and 16-slot chassis are exhaust vents that cool the power supply bay. Do not block these vents.*

⚠ *CAUTION: Do not operate a CoreBuilder 9000 Enterprise Switch 16-slot chassis with fewer than two fan trays running. Operate the 7-slot chassis and the 8-slot chassis with a full complement of fans.*

## Power Requirements

This section list power requirements for the following power supplies:

- 930-watt AC (Model Number 3CB9EP9) for the 7-slot chassis
- 820-watt AC (Model Number 3CB9EP8) for the 8-slot chassis and the 16-slot chassis
- –48-volt DC:
    - Model Number 3CB9EP8D7 for the 7-slot chassis
    - Model Number 3CB9EP8D for the 8-slot chassis and 16-slot chassis

### 930-watt AC Power Supply

The CoreBuilder 9000 7-slot 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 11 lists power requirements for each country.

**Table 11**  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 12 lists the power cords for each country.

**Table 12**  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 |

**820-watt AC Power Supply**

The CoreBuilder 9000 8-slot chassis can contain three modular 820-watt AC front-loading load-sharing power supplies and the 16-slot chassis can contain four modular 820-watt AC front-loading load-sharing power supplies.

The 820-watt AC power supplies are autosensing and provide AC power to the Switch. Each power supply can automatically sense the type of input voltage to which it is being connected at the wall outlet.

See Table 11 and Table 12 for power requirements and power cords for each country.

**–48-volt DC Power Supply**

The CoreBuilder 9000 7-slot chassis, 8-slot chassis, and 16-slot chassis can contain –48-volt DC power supplies.

- The CoreBuilder 9000 7-slot chassis can contain two rear-loading modular –48-volt DC power supplies (Model Number 3CB9EP8D7).

- The CoreBuilder 9000 8-slot chassis can contain three front-loading –48-volt DC power supplies (Model Number 3CB9EP8D) and the 16-slot chassis can contain four front-loading –48-volt DC power supplies (Model Number 3CB9EP8D).

**CAUTION:** *Connect the –48-volt DC power supply to a Safety Extra Low Voltage supply (SELV) only. Carefully read the safety label that is attached to the power supply unit that you received.*

**Safety Information**

This section lists warning notices to read before you install the CoreBuilder 9000 Enterprise Switch and its components.

**WARNING:** *The CoreBuilder 9000 Enterprise Switch 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:** *When you install the chassis on a table or shelf, do not use the optional cable management device for the 8-slot chassis or 16-slot chassis. The 8-slot chassis or 16-slot chassis can tip over under certain conditions. Hardware damage or personal injury can result.*

**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:*

- *7-slot chassis weighs approximately 38.55 kg (85 lb). Therefore, the selected table or shelf must support at least 115.65 kg (255 lb).*

- *8-slot chassis weighs approximately 71.7 kg (158 lb). Therefore, the selected table or shelf must support at least 215.1 kg (474 lb).*

- *16-slot chassis weighs approximately 88.5 kg (195 lb). Therefore, the selected table or shelf must support at least 265.5 kg (585 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 strom 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 CoreBuilder 9000 Enterprise Switch:

**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.*

CLASS 1
LASER PRODUCT

**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 CoreBuilder 9000 Enterprise Switch:

*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.*

CLASS 1
LED PRODUCT

**Preinstallation Information**

Use the following rack-mount installation guidelines to ensure your safety and optimal performance. Review all guidelines before you install the chassis in a rack.

Before you attempt to mount the chassis in a rack:

■ To help support the 8-slot chassis and 16-slot chassis while you install it in a rack, install the mounting shelves that are shipped with the 8-slot chassis and 16-slot chassis.

■ For a 7-slot chassis, select a rack that can support at least 115.65 kg (255 lb), which is three times the weight of a fully loaded 7-slot chassis and that provides sufficient vertical space for each chassis that you want to install.

■ For an 8-slot chassis, select a rack that can support at least 215.1 kg (474 lb), which is three times the weight of a fully loaded 8-slot chassis, and that provides sufficient vertical space for each chassis that you want to install.

■ For a 16-slot chassis, select a rack that can support at least 265.5 kg (585 lb), which is three times the weight of a fully loaded 16-slot 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.

■ Bolt the rack to the floor.

■ Brace the top of the rack against the wall.

Figure 52 shows two types of racks that you may use to install the 7-slot chassis, 8-slot chassis, or 16-slot chassis.

**Figure 52**   Rack Types
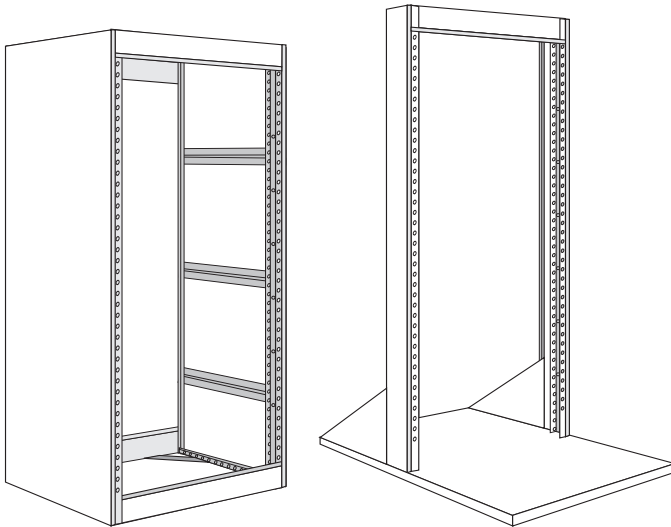


- If you install more than one chassis in a rack, install the bottom chassis first. Make certain that there is sufficient space between the bottom chassis and the top chassis.

- 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 53 shows the Telco and Metric slots and the location of the preinstalled rack-mount flange on a 7-slot chassis.

**Figure 53**   Preinstalled Rack-mount Flange Location and Slot Types on the CoreBuilder 9000 7-slot Chassis
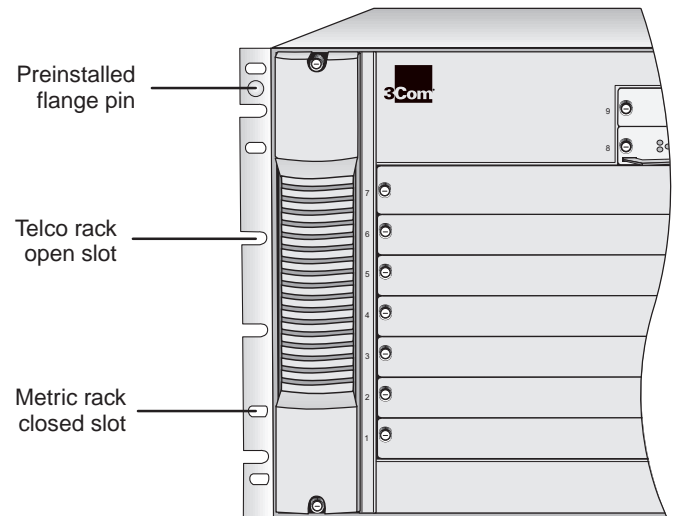


- If you want to use the optional cable management device on a 7-slot chassis, install it on the right side of the chassis, as you look at it from the front. Install the chassis in the rack before you install a cable management device. For detailed information about installing a cable management device, see the *7-Slot Chassis Quick Installation Guide for the CoreBuilder 9000 Enterprise Switch*.

Figure 54 shows the Telco and Metric slots and the location of the preinstalled rack-mount flange on an 8-slot chassis.

**Figure 54**   Preinstalled Rack-mount Flange Location and Slot Types on the CoreBuilder 9000 8-slot Chassis
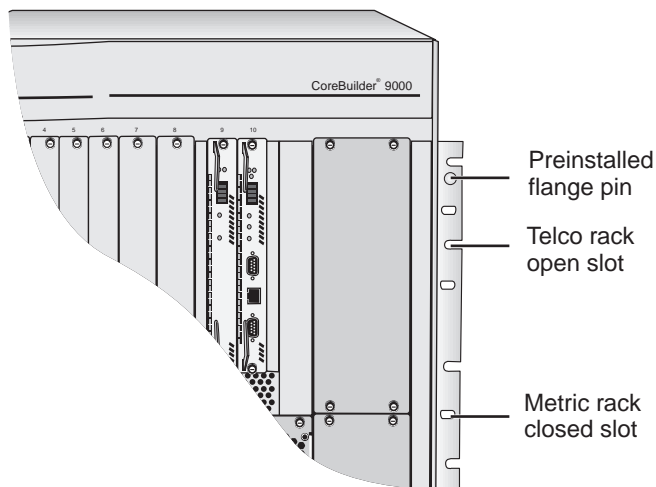


Figure 55 shows the Telco and Metric slots and the location of the preinstalled rack-mount flange on a 16-slot chassis.

**Figure 55**   Preinstalled Rack-mount Flange Location and Slot Types on the CoreBuilder 9000 16-slot Chassis
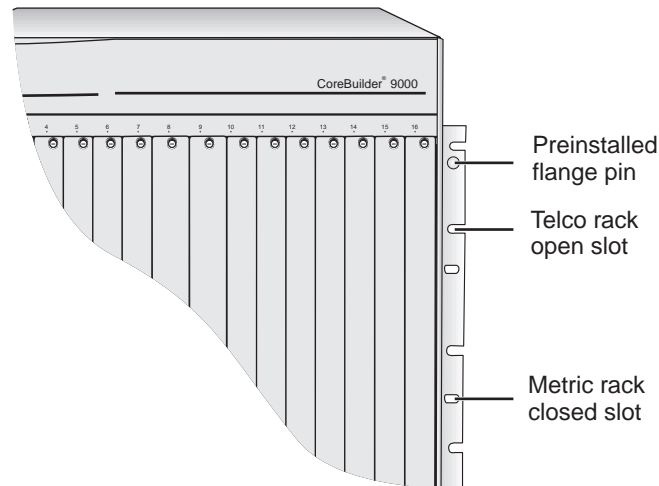


- If you want to use an optional cable management device on a 8-slot chassis or a 16-slot chassis, install it above or below the chassis (depending on which type of device you choose). You can install the chassis in the rack either before or after you install a cable management device.

  For detailed information about installing a cable management device, see the *Chassis Quick Installation Guide for the CoreBuilder 9000 Enterprise Switch 8-slot Chassis and 16-slot Chassis*.
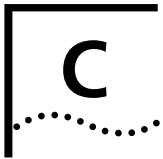
# C
# INTELLIGENT POWER SUBSYSTEM

The CoreBuilder® 9000 Enterprise Switch provides a fault-tolerant, intelligent power supply subsystem. The CoreBuilder 9000 7-slot chassis can contain two power supplies, the 8-slot chassis can contain three power supplies and the 16-slot chassis can contain four power supplies.

The CoreBuilder 9000 intelligent power subsystem supports:

- 930-watt and 820-watt AC load-sharing power supplies

- –48-volt DC power supplies

- High power availability

- Controller-based power verification features that are designed to ensure optimal performance

This appendix contains the following topics:

- CoreBuilder 9000 Power Supply Models

- Intelligent Power Subsystem Features

- Power Management

- Power Supply Modes

- Power Availability and Power Supply Capacity

## CoreBuilder 9000 Power Supply Models

Table 13 lists the power supplies that the CoreBuilder 9000 Enterprise Switch supports.

**Table 13**   CoreBuilder 9000 Power Supply Models

| Model Number | Chassis | Watts | Input Power Type |
|---|---|---|---|
| 3CB9EP9 | 7-slot | 930 | AC |
| 3CB9EP8 | 8-slot 16-slot | 820 | AC |
| 3CB9EP8D7 | 7-slot | –48-volt (930-watt) | DC |
| 3CB9EP8D | 8-slot 16-slot | –48-volt (820-watt) | DC |

*You cannot mix AC and DC input power supplies in any CoreBuilder 9000 chassis.*

## Intelligent Power Subsystem Features

Table 14 lists the intelligent power management features.

**Table 14**   Intelligent Power Subsystem Features

| Feature | Description |
| --- | --- |
| Load-sharing power supplies | Provides evenly distributed power consumption among all installed power supplies. Enterprise Switch 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 front of the 8-slot chassis and 16-slot chassis, and 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 14**   Intelligent Power Subsystem Features (continued)

| Feature | Description |
| --- | --- |
| Controller module-based, software-driven, power management | Confirms that there is enough power for a new CoreBuilder® 9000 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) CoreBuilder 9000 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 with the Enterprise Management Controller (EMC) to protect network integrity using power management. The EME determines how much power a CoreBuilder 9000 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 Supply Modes

The CoreBuilder 9000 Enterprise Switch runs in either of two power supply modes:

■ Power Fault Tolerant

■ Power Non-Fault-Tolerant

**i** *For optimal power redundancy in either power mode, run the CoreBuilder 9000 Enterprise Switch with at least one power supply more than the minimum number that is required to operate all installed modules and all modules that you plan to install.*

**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 CoreBuilder 9000 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 CoreBuilder 9000 Enterprise Switch 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 CoreBuilder 9000 Enterprise Switch 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 CoreBuilder 9000 Enterprise Switch 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 CoreBuilder 9000 Enterprise Switch sets to power fault-tolerant mode.

- If there is insufficient unallocated power budget, the CoreBuilder 9000 Enterprise Switch 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 the number of installed power supplies is equal to or greater than n-2 (two extra power supplies). In a CoreBuilder 9000 Enterprise Switch with at least two extra installed power supplies, n-1 power supplies continue to be available to run the system in power fault-tolerant mode, even after a single power supply fails.*
*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 CoreBuilder 9000 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.

## 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 CoreBuilder 9000 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 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.

For information about how to manage power in your Switch, see Chapter 5, "Configuring the Chassis Using Management Commands" in the *CoreBuilder 9000 Enterprise Management Engine User Guide* that is on the Documentation CD-ROM.
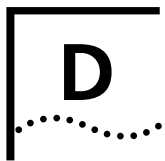
# D TECHNICAL SUPPORT

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 Facts℠ 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<br>(not toll-free) | 1 408 326 3355<br>(not toll-free) |
| U.S.A. and Canada | 1 800 NET 3Com<br>(1 800 638 3266) | 1 408 326 7120<br>(not toll-free) |
|  | Enterprise Customers:<br>1 800 876 3266 |  |

# GLOSSARY

**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.

**ATM**

Asynchronous Transfer Mode. A transfer method used for LAN and WAN. ATM carries voice, video, and data at speeds up to 2.2 Gbps and can integrate geographically distant disparate networks. Also called *cell relay*.

**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.

**cell**

An ATM Layer protocol data unit (PDU) that has fixed, rather than variable, length payloads.

**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.

**connection**

The concatenation of ATM Layer links to provide an end-to-end information transfer capability to access points.

**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.

**EMC**

Enterprise Management Controller module. Provides standby controller functions for an Enterprise Management Engine (EME) in the CoreBuilder 9000 chassis.

**EME**

Enterprise Management Engine. An SNMP-based network management module that enables you to configure and manage the 3Com CoreBuilder 9000 chassis and their modules.

**end system / end station**

A system where an ATM connection is terminated or initiated. An originating end system initiates the ATM connection, and a terminating end system terminates the ATM connection.

**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.

**LANE**

LAN Emulation. A way for legacy LANs and all higher-layer protocols and applications to integrate transparently with ATM networks.

**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 CoreBuilder® systems. 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.

**Network-to-Network Interface (NNI)**

The interface between two network nodes.

**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 CoreBuilder 9000 Enterprise Switch.

**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 7-slot chassis when the Standby/On switch is in the Standby position or remove and replace a power supply in the 8-slot chassis or 16-slot chassis when the On/Off switch is in the Off position, without disconnecting the AC input power cord.

**wiring closet**

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

**10/100**

Both 10 Mbps and 100 Mbps on the same port.

**100BASE-FX**

A 100BASE-FX Fast Ethernet Switching Module that has ten 100 Mbps Ethernet fiber-optic front panel ports. These ports interface to one 1-Gigabit non-blocking port on the backplane. It is an intelligent module that has its own embedded agent.

A 100BASE-FX (MMF-SC) Fast Ethernet Multiprotocol Router Module that has ten 100 Mbps front-panel external ports of full-duplex 100BASE-FX, using SC (Subscriber Connector) connectors over MMF

(multi-mode fiber) and one Gigabit Ethernet (GEN) port that connects to the backplane.

**10/100BASE-TX**

10/100BASE-TX Fast Ethernet Switching Modules that have twenty or thirty-six 10/100 Mbps RJ-45 front panel ports. These ports interface to a maximum of two 1–Gigabit non-blocking ports on the backplane. They are intelligent modules that have their own embedded agent.

A 10/100BASE-TX Fast Ethernet Multiprotocol Router Module that has twelve 10/100 Mbps RJ-45 front panel ports. These ports interface to a maximum of two 1–Gigabit non-blocking ports on the backplane. It is an intelligent module that has its own embedded agent.

**1000BASE-SX**

A Gigabit Ethernet (GEN) Interface Module that serves 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. Ports on this module use an 850-nanometer, multimode, optical transceiver.

**1000BASE-LX**

A Gigabit Ethernet (GEN) Interface Module that serves 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. Ports on this module use an 1300-nanometer, multi/single-mode, optical transceiver.

# INDEX

# 3Com Corporation LIMITED WARRANTY

## CoreBuilder® 9000 Enterprise Switch

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