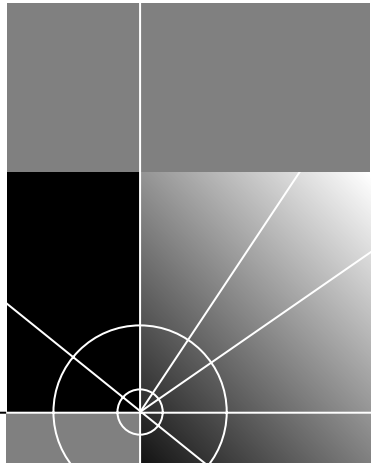
CoreBuilder® 9000 Release Notes

Fast Ethernet and Gigabit Ethernet Layer 2 Switching Modules, Release 3.0

- **20-port 10/100BASE-TX Fast Ethernet Layer 2 Switching Module (3CB9LF20R)**
- **36-port 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module (3CB9LF36R)**
- **36-port 10/100BASE-TX Fast Ethernet Telco Layer 2 Switching Module (3CB9LF36T)**
- **36-port 10/100BASE-TX Desktop Switching Module (RJ-45 Connectors) (3CB9LF36RL)**
- **36-port 10/100BASE-TX Desktop Switching Module (RJ-21 Telco Connectors) (3CB9LF36TL)**
- **10-port 100BASE-FX Fast Ethernet Layer 2 Switching Module (3CB9LF10MC)**
- **20-port 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module (3CB9LF20MM)**
- **9-Port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module (3CB9LG9MC)**



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CONTENTS

3 RELEASE ISSUES

1 OVERVIEW

These release notes summarize operational requirements and issues for CoreBuilder® 9000 Layer 2 switching module software Release 3.0.

Important Notices

Read these important notices before you begin.

For the most up-to-date release notes for the CoreBuilder 9000 management modules, switch fabric modules, Layer 3 interface modules, and other Layer 2 interface modules, visit the 3Com Web site:

`http://support.3com.com/nav/switches.htm`

CAUTION: *CoreBuilder 9000 software Release 3.0 requires that the Enterprise Management Engine (EME) have 20 MB of CPU RAM. To determine the CPU RAM size, enter* **`show eme`** *from the EME command line interface. The* `CPU Ram Size(MB)` *field on the left side of the screen indicates the amount of CPU RAM:* `8` *or* `20`*.*

If your EME has 8 MB of CPU RAM, you must replace the 4 MB DRAM card in your EME with a 16 MB DRAM card. Contact your network supplier or 3Com representative for information about how to obtain a 16 MB DRAM memory card.

CAUTION: *Except for the Enterprise Management Controller (EMC) boot file, you must upgrade all the modules in the CoreBuilder 9000 chassis, including the EME module, to major software Release 3.0. You cannot run Release 3.0 software on some modules and not on other modules. See Table 1 in this chapter for more information about the software version that each CoreBuilder 9000 component requires.*

The EMC boot file remains at software Release 2.1.0.

See "Installation and Upgrade Prerequisites", in Chapter 4 "Software Installation", for information about how to determine the software release on each module in the chassis.

CAUTION: *Before you attempt to download any module software, save the configuration file for the release that you are currently running to an external device using the EME* `upload` *command. See the* CoreBuilder 9000 Enterprise Management Engine User Guide *for an explanation of how to use the EME* `upload` *command.*

Supported Modules

Software Release 3.0 applies to the following 3Com CoreBuilder 9000 Layer 2 switching modules:

- 20-port 10/100BASE-TX Fast Ethernet Layer 2 Switching Module (Model Number 3CB9LF20R)
- 36-port 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module (Model Number 3CB9LF36R)
- 36-port 10/100BASE-TX Fast Ethernet Telco Layer 2 Switching Module (Model Number 3CB9LF36T)
- 36-port 10/100BASE-TX Desktop Switching Module (RJ-45 Connectors) (Model Number 3CB9LF36RL)
- 36-port 10/100BASE-TX Desktop Switching Module (RJ-21 Telco Connectors) (Model Number 3CB9LF36TL)
- 10-port 100BASE-FX Fast Ethernet Layer 2 Switching Module (Model Number 3CB9LF10MC)
- 20-port 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module (Model Number 3CB9LF20MM)
- 9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module (Model Number 3CB9LG9MC)

These Fast Ethernet and Gigabit Ethernet Layer 2 switching modules are intelligent LAN interface modules with embedded management agents that support standard Simple Network Management Protocol (SNMP) Management Information Bases (MIBs).

System Requirements

Each CoreBuilder 9000 Enterprise Switch has these minimum system requirements:

- One switch fabric module installed in the CoreBuilder 9000 chassis with appropriate software:
  - For all CoreBuilder 9000 chassis: One 24-port Gigabit Ethernet Switch Fabric Module (Model Number 3CB9FG24 or Model Number 3CB9FG24T)
  - For the 7-slot chassis and 8-slot chassis: One 9-port Gigabit Ethernet Switch Fabric Module (Model Number 3CB9FG9)
- One Enterprise Management Engine (Model Number 3CB9EME) installed in the CoreBuilder 9000 chassis with appropriate software

Boot Code and Operational Code

Table 1 lists the minimum compatible software releases for the switch fabric modules and management modules that are required for operation with any Fast Ethernet or Gigabit Ethernet Layer 2 switching module that has software Release 3.0 installed.

CAUTION: *Except for the EMC boot file, you must update all module software to Release 3.0.*

Table 1 Software Compatibility Requirements for Layer 2 Switching Modules

Module Name	Model Number	Minimum Software Requirements	Filename
20-port 10/100BASE-TX Fast Ethernet Layer 2 Switching Module	3CB9LF20R	3.0.0	lf20r30000.all
36-port 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module	3CB9LF36R	3.0.0	lf36r30000.all
36-port 10/100BASE-TX Fast Ethernet Telco Layer 2 Switching Module	3CB9LF36T	3.0.0	lf36t30000.all
36-port 10/100BASE-TX Desktop Switching Module (RJ-45 Connectors)	3CB9LF36RL	3.0.0	lf36rtl30000.all
36-port 10/100BASE-TX Desktop Switching Module (RJ-21 Telco Connectors)	3CB9LF36TL	3.0.0	lf36rtl30000.all
10-port 100BASE-FX Fast Ethernet Layer 2 Switching Module	3CB9LF10MC	3.0.0	lf10mc30000.all
20-port 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module	3CB9LF20MM	3.0.0	lf20mm30000.all

Table 1 Software Compatibility Requirements for Layer 2 Switching Modules (continued)

Module Name	Model Number	Minimum Software Requirements	Filename
9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module	3CB9LG9MC	3.0.0	lg9mc30000.all
24-port Gigabit Ethernet Switch Fabric Module, 4 trunks	3CB9FG24	3.0.0	fga2430000.all
24-port Gigabit Ethernet Switch Fabric Module, 12 trunks	3CB9FG24T	3.0.1	fga24t30001.all
9-port Gigabit Ethernet Switch Fabric Module	3CB9FG9	3.0.1	fg930001.all
Enterprise Management Engine (EME)	3CB9EME	Management boot code 3.0.0	eme30000.bt
		Management operational code 3.0.0	eme30000.op
		Controller boot code 2.1.0	emcv20100.bt
		Controller operational code 3.0.0	emc30000.op
Enterprise Management Controller (EMC)	3CB9EMC	Controller boot code 2.1.0	emcv20100.bt
		Controller operational code 3.0.0	emc30000.op

Optional Switch Fabric Module Redundancy

In the CoreBuilder 9000 8-slot chassis and 16-slot chassis, you can install a second Gigabit Ethernet Switch Fabric Module for redundancy.

CAUTION: *If you install a second Gigabit Ethernet Switch Fabric Module for redundancy, it must be the identical type of module as the one that is currently installed. For more information about switch fabric module redundancy, see the* 9-Port Gigabit Ethernet Switch Fabric Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*, and the* 24-Port Gigabit Ethernet Switch Fabric Module Quick Start Guide for the CoreBuilder 9000 Enterprise Switch*.*

Optional Management Redundancy

The required Enterprise Management Engine (EME) provides both management and controller functions in the chassis. To have redundant management and controller functions in any chassis type (7-slot chassis, 8-slot chassis, and 16-slot chassis), install a second EME. To have only redundant controller functions in any chassis type, install an Enterprise Management Controller (EMC).

2 Release Highlights

Software Release 3.0 includes the following changes:

- Web-based Management
- ISO Date and Time Format
- New Modules
- IGMP
- 10/100 Mbps Ethernet Port Monitoring
- RMON Monitoring Applications
- 802.1p CoS
- Loop Detection
- Bridge Address Learning Limits
- Secure Address Learning Mode
- Configuring One Untagged System VLAN
- Broadcast, Multicast, and Flood Rate Limiting

Web-based Management

Software Release 3.0 supports the Web Management suite of features, which consists of embedded Web Management applications and installable tools:

- **Embedded Web Management applications** — Use the embedded Web Management applications, which are part of the system software image, for most of your device configuration and management tasks. You can manage a single port or device, or, using multiple windows, you can manage multiple devices. This software contains:
  - **WebConsole** — An HTML-based set of configuration forms.
  - **DeviceView** — A Java-based application that displays a real-time image of the device. You can manage each port or module, or the entire system, by clicking the part of the image that you want to manage.
  - **Help** — Access to the configuration form on which you set up the installable Help, as well as access to links to support information on the 3Com Web site.
- **Installable tools** — The following optional tools are available from the *Software CD*:
  - **DeviceView accessories** — To set up e-mail notification for Status Logging.
  - **WebManage Framework** — To group your access links to the devices that you manage.
  - **Filter Builder** — To create filters for packets on your Layer 3 switching modules only.
  - **Form-specific Help** — To access hypertext information about the fields in the WebConsole and DeviceView applications.

For information about how to install and use the Web Management applications, see the *Web Management User Guide for the CoreBuilder 9000 Enterprise Switch*.

ISO Date and Time Format

The format for date and time has changed for Release 3.0 to the following syntax and now complies with ISO 8601:

`YYYY-MM-DDThh:mm:ss`

Table 2 Date and Time

Format	Description
YYYY	Year (1999 – 2098)
MM	Month (01 – 12)
DD	Day (01 – 31)
T	Time designator (the literal character "T")
hh	Hour (00 – 24)
mm	Minute (00 – 59)
ss	Second (00 – 59)

Example: `2000-02-05T03:25:34`

New Modules

Software Release 3.0 supports the following new modules:

- The 20-port 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module (Model Number 3CB9LF20MM). The module has twenty 100 Mbps Ethernet fiber-optic ports with MT-RJ connectors on its front panel and two 1-Gigabit port for connection to the chassis backplane. It occupies a single interface module slot in the CoreBuilder 9000 7-slot, 8-slot, and 16-slot chassis.
- The 36-port 10/100BASE-TX Desktop Switching Module (RJ-45 Connectors) (Model Number 3CB9LF36RL). The module has thirty-six 10/100 Mbps Ethernet ports with RJ-45 connectors on the front panel and one 1-Gigabit port for connection to the chassis backplane. It occupies a single interface module slot in the CoreBuilder 9000 7-slot, 8-slot, and 16-slot chassis.
- The 36-port 10/100BASE-TX Desktop Switching Module (RJ-21 Telco Connectors) (Model Number 3CB9LF36TL). The module has three RJ-21 connectors on the front panel. Each RJ-21 connector contains 12 switched 10/100 Mbps Ethernet ports, for a total of 36 switched ports. The module has one 1-Gigabit port for connection to the chassis backplane. It occupies a single interface module slot in the CoreBuilder 9000 7-slot, 8-slot, and 16-slot chassis.

IGMP

The Internet Group Management Protocol (IGMP) ensures that multicast traffic is forwarded from the local router to multicast group members on directly attached subnetworks. The Snooping function monitors IGMP packets to ensure that multicast traffic is *only* forwarded to areas of the network that contain multicast group members. Unlike the Distance Vector Multicast Routing Protocol (DVMRP), IGMP functions do not relate to multicast packet delivery between routers. IGMP functions include:

- Querying
- Snooping

10/100 Mbps Ethernet Port Monitoring

This feature, which is enabled by default, is designed to:

- Monitor 10/100 Mbps Ethernet ports for excessive collisions, multiple collisions, late collisions, runts, and FCS errors.
- Compare these error counters against predetermined thresholds.
- Disable a port that reaches an error threshold.
- Report the reason that a port is disabled to the Administration Console, MIB databases, and SNMP traps.
- Reenable the port after an initial backoff time interval.
- Continue monitoring.

See "Port Monitoring" in Chapter 5 "Ethernet" in the *CoreBuilder 9000 Implementation Guide* for information about the new Ethernet port monitoring feature.

RMON Monitoring Applications

New versions of LANsentry® Manager are being released. You can use LANsentry Manager to monitor traffic and error rates for hosts on a network, along with traffic flows between these hosts. When you set up LANsentry Manager with the CoreBuilder 9000, take these factors into consideration:

- To access a CoreBuilder 9000 module, use the community string plus extension format as follows:
  `<community string>@slot_<slot>.<subslot>`

  For switch fabric modules use this format:
  `<community string>@fabric`

  For example, to access a module in slot 4 using the read/write community string of "private", enter **`private@slot_4.1`**
- If you have any problems connecting to the CoreBuilder 9000 using LANsentry Manager, increase the SNMP timeout values.

See "Remote Monitoring (RMON)" in Chapter 21"Device Monitoring" of the *CoreBuilder 9000 Implementation Guide* for more details.

802.1p CoS

802.1p Class of Service (CoS) focuses on traffic class and dynamic multicast filtering services in bridged LANs. It addresses separate queuing of time-critical frames to reduce the jitter caused by multicast flooding. 802.1p uses the same tag format as 802.1Q, but uses three additional bits of the tag control information for setting a user priority level.

Loop Detection

The 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL) recognize Spanning Tree packets but these modules do not participate in Spanning Tree. Instead, the modules can implement a separate loop-detection algorithm on all of their front-panel ports.

This algorithm acts only on the 36-port 10/100BASE-TX Desktop Switching Module front-panel ports, and does not act on other Layer 2 modules in the CoreBuilder 9000 system.

You configure the front-panel ports to participate in this algorithm using three options in the `bridge loopdetectmode` menu:

- `disable` — This default setting disables the module's port-based algorithm.
- `enable` — When you configure the module using the `bridge loopdetectmode enable` option, the module searches for traffic loops by comparing Spanning Tree Bridge Protocol Data Unit (BPDU) packets that enter its backplane port with BPDU packets that enter its front-panel ports. If the module detects the same BPDU packet coming through both its backplane port and any front-panel port, the module:
  - Disables the front-panel port where the BPDU packet entered.
  - Sends a trap to the EME.
  - Displays `loop detect` for the port status in the `bridge port summary` and `bridge port detail` displays.
- `immediate` — When you configure the module using the `bridge loopdetectmode immediate` option, the module searches for any Spanning Tree BPDU packets that are received on its front-panel ports. If the module detects that a BPDU packet is received on any front-panel port, the module:
  - Disables the front-panel port where the BPDU packet entered.
  - Sends a trap to the EME.
  - Displays `bpdu detect` for the port status in the `bridge port summary` and `bridge port detail` displays.

When the module disables a front-panel port to eliminate a loop, you must bring the port back online manually.

Example:

```
CB9000@slot 5.1 [36L-E/FEN-TX-L2] (): bridge
Menu options (CoreBuilder 9000-10AD6C):
---------------------------------------
display         - Display bridge information
agingTime       - Set the bridge address aging time
cos             - Administer COS priority queues
port            - Administer bridge ports
multicast       - Administer multicast filtering
vlan            - Administer VLANs
loopDetectMode  - Set Loop Detect mode
learnMode       - Set the bridge learning mode

CB9000@slot 1.1 [36L-E/FEN-TX-L2] (bridge): loopdetectmode
Enter new value (disable,enable,immediate) [disable]: enable

CB9000@slot 1.1 [36L-E/FEN-TX-L2] (bridge): display

agingTime                mode        addrTableSize
      300       bridgeRepeater                  138

addressCount        peakAddrCount            learnMode
           2                    4               normal

multicastLimit       broadcastLimit           floodLimit
         50000                50000                50000

loopDetectMode loopDetectSrcAddress
        enable    08-00-8f-75-48-86

CB9000@slot 1.1 [36L-E/FEN-TX-L2] (bridge/port): summary 1

rxFrames           rxDiscards             txFrames
 5301100                    0              2688802

portNumber      loopDetectStatus
         1           loop detect

learnStatus         addressLimit
     active                    4
```

```
CB9000@slot 1.1 [36L-E/FEN-TX-L2] (bridge/port): detail 1

rxFrames                            rxSameSegDiscs
 5301100                                         0

rxNoDestDiscs         rxErrorDiscs     rxMcastLimitType
            0                    0           BcastOnly

rxMcastLimit      rxMcastExcDiscs       rxMcastExceeds
        4000                    0                    0

rxSecurityDiscs         rxOtherDiscs      rxForwardUcasts
              0                    0                13202

rxFloodUcasts      rxForwardMcasts             txFrames
            0              2675600              2688802

portNumber     loopDetectStatus          learnStatus
         1          loop detect               active

addressLimit
           4
```

Bridge Address Learning Limits

By default, the 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL) support two bridging addresses (learned plus static) per front-panel port. You can manually change this limit to a value from 1 through 36 addresses per port.

There is also a *module-wide* limit of 138 address-table entries, which is allocated as follows:

- 72 learned plus static addresses for the module's front-panel ports
  - 36 addresses are a guaranteed allocation of one static address per port.
  - 36 addresses are a pool of free addresses for all ports to use.

If you use the default limit of two *bridging addresses per port, the entire module is still restricted to a total of 72 learned and static addresses.*

However, for example, if you change the learning limit to 4 addresses per port, 1 address is guaranteed per port and 3 addresses come from the pool of 36 free addresses that all ports can use. Therefore, if 12 ports each learn 4 addresses and a 13th port learns 2 addresses, the module limit is exceeded because the 36-port pool of free addresses is exceeded.

- 2 addresses for the module's CPU
- 64 multicast addresses for the IGMP protocol

If a port exceeds its individual address limit, the module:

- Disables the port.
- Sends a trap to the EME.
- Displays `limitationsExceeded` for the learn status in the `bridge port summary` and `bridge port detail` displays.

If an address coming into a port causes the module's learned address limit to be exceeded, the module:

- Disables the port.
- Sends a trap to the EME.
- Displays `moduleLimitationsExceeded` for the learn status in the `bridge port summary` and `bridge port detail` displays.

If the module disables a front-panel port, you must bring the port back online manually.

The following example shows how to specify a maximum of six bridging addresses on port 1:

```
CB9000@slot 5.1 [36L-E/FEN-TX-L2] (): bridge
Menu options (CoreBuilder 9000-10AD6C):
---------------------------------------
display         - Display bridge information
agingTime       - Set the bridge address aging time
cos             - Administer COS priority queues
port            - Administer bridge ports
multicast       - Administer multicast filtering
vlan            - Administer VLANs
loopDetectMode  - Set Loop Detect mode
learnMode       - Set the bridge learning mode

CB9000@slot 5.1 [36L-E/FEN-TX-L2] (bridge): port
Menu options (CoreBuilder 9000-10AD6C):
---------------------------------------
summary         - Display summary information
detail          - Display detailed information
multicastLimit  - Set the multicast/broadcast packet rate
                  limit
multicastLimitMode - Set the Multicast Limit mode for a port
broadcastLimitMode - Set the Broadcast Limit mode for a port
floodLimitMode - Set the Unknown Flood Limit mode for a port
address         - Administer bridge addresses
addressLimit    - Set the port address limit

CB9000@slot 5.1 [36L-E/FEN-TX-L2] (bridge/port): addresslimit
Select bridge ports (1-36|all|?): 1
Enter address limit (1-36) [4]: 6
```

Secure Address Learning Mode

The 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL) can use static addresses to admit or stop packets that arrive at selected front-panel ports. These static addresses are taken from the per-port address allocations and module-wide limits. (For more details about these allocations and limits, see the previous section "Bridge Address Learning Limits".)

The source address in an incoming packet must match a static address that you have configured on a port before the packet can enter that port. If an incoming packet contains a different source address than the one set for the port, the module shuts the port down and you must bring the port back online manually.

In secure mode, the module does not learn "unauthorized" source addresses.

To use this command:

1 In the `bridge learnMode` menu, select whether you want to put the module into secure mode (or restore the module to normal mode).

The default setting is `normal`.

Example:

```
CB9000@slot 3.1 [36L-E/FEN-TX-L2] (): bridge
Menu options (CoreBuilder 9000-F5EAC):
---------------------------------------
display          - Display bridge information
agingTime        - Set the bridge address aging time
cos              - Administer COS priority queues
port             - Administer bridge ports
multicast        - Administer multicast filtering
vlan             - Administer VLANs
loopDetectMode   - Set Loop Detect mode
learnMode        - Set the bridge learning mode

CB9000@slot 3.1 [36L-E/FEN-TX-L2] (bridge): learnMode
Secure mode option will flush dynamic addresses.
(normal,secure) [normal]:
```

As shown in the above example, the system displays a warning that secure mode flushes existing dynamically learned addresses.

2 If you select the secure mode, you can then use the `bridge port address` command to configure static addresses for the individual ports that you want to secure. Any static addresses that you define on these ports are used to screen packets that arrive at these ports.

Configuring One Untagged System VLAN

The 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL) support a `backplanePortPVID` command that allows you to assign one virtual LAN (VLAN) to be an untagged system VLAN on the backplane. Tagged frames that the module sends to the backplane on the selected untagged system VLAN are stripped of their tags and priority bits. All frames that belong to other VLANs are sent to the backplane tagged.

This command applies only to packets that are sent to the backplane on the selected system VLAN.

To use this command:

1. From the CoreBuilder 9000 top-level menu, enter: **`backplanePortPVID`**

   The system displays the current setting for the untagged port VLAN ID (PVID) number, using the format `Current PVID = n` (where `n` is the current untagged VLAN ID). By default, this line displays the default VLAN (`PVID = 1`).

2. Select the PVID number of the VLAN that you want to be untagged on the backplane.

   Example:

```
Menu options (CoreBuilder 9000-153B6C):
---------------------------------------
module             - Administer module-level functions
ethernet           - Administer Ethernet ports
bridge             - Administer bridging/VLANs
snmp               - Administer SNMP
backplanePortPVID  - Set Backplane Port VLAN ID for untagged
                     VLAN
disconnect         - Disconnect and return to Management
                     Console

Type ? for help.
---------------------------------------

CB9000@slot 5.1 [36L-E/FEN-TX-L2] (): backplanePortPVID
Current PVID = 1
Enter new Value (1-4094) [1]: 3
```

Broadcast, Multicast, and Flood Rate Limiting

You can define rate limits for broadcast, multicast, and flood packet types on the 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL).

To participate in broadcast, multicast, and flood rate limiting, a front-panel port must be configured for each rate limit packet type. Front-panel ports that are not configured to participate in a particular module rate limit packet type are unaffected by the associated module limit for that packet type.

Flood-rate limits on unknown packets are applied to client egress frames. A packet is unknown *if the module has not learned the packet's destination address. An unknown packet that enters the module through a front-panel port is forwarded out through the backplane port. An unknown packet that enters the module through the backplane port is flooded out through all active front-panel ports assigned to the same VLAN as the arriving packet.*

You can apply rate limits to the number of unknown flood packets that are forwarded from the Gigabit backplane port to the participating front-panel ports. Unknown packets that arrive at a front-panel port are not forwarded to other front-panel ports and are only repeated through the backplane port.

Module Packet-egress Rate Limiting

Egress rate limiting is on a module-wide basis only. To set packet-egress limits for the module:

1. From the `bridge multicast` menu, select the module limit for the specific packet type.

   The possible packet types are:

   - `multicastLimit`
   - `broadcastLimit`
   - `floodLimit`

2. Enter the packet-egress limit.

   This is the maximum rate at which the module can forward the selected packet type out through the participating front-panel ports. The range of permitted values is 0 – 16,777,216 frames per second (fps). The default value is 50,000 fps.

Example:

```
CB9000@slot 5.1 [36L-E/FEN-TX-L2] (bridge): multicast
Menu options (CoreBuilder 9000-10AD6C):
igmp - Administer IGMP snooping
multicastLimit - Set the multicast packet rate limit
broadcastLimit - Set the broadcast packet rate limit
floodLimit - Set the flood packet rate limit
CB9000@slot 5.1 [36L-E/FEN-TX-L2] (bridge/multicast):
multicastlimit
Enter new value (0-16777216) [50000]: 100000
```

This example limits the total multicast traffic leaving participating front-panel ports to 100,000 fps.

3 Activate (or deactivate) multicast limiting.

- To activate multicast rate limiting (to turn limiting on), enter **McastBcast**
- To deactivate multicast rate limiting (to turn limiting off), enter **BcastOnly**

4 From the `bridge port` menu, enter the particular packet type, to configure each port to participate in either broadcast or flood module rate limiting (in addition to multicast rate limiting, which you configured in Step 3).

- To activate broadcast or flood-rate limiting (to turn limiting on), enter **enabled**
- To deactivate broadcast or flood-rate limiting (to turn limiting off), enter **disabled**

Example (broadcast rate limiting):

```
CB9000@slot 5.1 [36L-E/FEN-TX-L2] (bridge/port):
broadcastLimitMode
Select bridge ports (1-36|all|?) [1]: 1
Enter new value (disabled,enabled) [disabled]:
```

If you select `disabled` for a port, the port does not participate in the module broadcast rate limiting.

The following example illustrates what happens when, for example, you specify an egress threshold of 3,000 fps for the module's multicast rate limit. Ports 3 and 10 are configured to participate in module multicast rate limiting.

Example: If in a 1-second period, 3,500 fps are received from the backplane port, 3,000 packets are transmitted out ports 3 and 10. Port 11, however, which does not participate in module multicast rate limiting, transmits the entire 3,500 fps.

Port Multicast Packet-ingress Rate Limiting

You can define an ingress rate limit for multicast packets per port on the 36-port 10/100BASE-TX Desktop Switching Module. Ingress rate limiting is on a per-port basis only.

To set packet-ingress multicast thresholds for participating front-panel ports, in the `bridge port multicastLimit` menu:

1. Select the ports that you want to participate in multicast rate limiting and set their individual packet-ingress thresholds.
2. Specify whether you want to activate or deactivate multicast rate limits and packet-ingress thresholds on these ports:
   - `BcastOnly` — Deactivates multicast rate limits and the packet-ingress threshold on the selected ports.

     This setting removes the selected ports from participating in the module's multicast rate limiting.
   - `McastBcast` — Activates multicast rate limits and the packet-ingress threshold on the selected ports.

     This setting allows the selected ports to participate in the module's multicast rate limiting.

   These settings do not affect module broadcast or flood-rate limiting.
3. Enter the packet-ingress threshold that you want to use and the ports that you want to limit using this threshold.

   The range of permitted values is 0 to 200,000 fps. The default value is 4,000 fps. If incoming traffic exceeds the specified threshold on a participating port for 7 continuous seconds, the module permanently disables the port. User intervention is necessary to reenable the port.

   Example:

```
CB9000@slot 5.1 [36L-E/FEN-TX-L2] (bridge/port):
multicastLimit
Select bridge ports (1-36|all|?) [1]:
Enter new frame type (BcastOnly,McastBcast): McastBcast
Enter new value (frames/sec). Enter 0 to filter all
(0-200000): 1000
```

This example sets the port-ingress threshold to 1000 fps for port 1. If incoming traffic exceeds this 1,000-fps threshold on the port for 7 continuous seconds, the module permanently disables the port.

How Port Rate Limits and Thresholds Work

The following example illustrates what happens when, for example, you specify an ingress threshold of 2,000 fps for multicast packets on ports 3 and 10.

Example: If port 3 receives multicast packets at 1,500 fps and port 10 at 1,700 fps, both ports are functioning within the 2,000-fps ingress threshold. If either port begins to receive multicast packets at a rate greater than 2,000 fps, the module monitors the port for 1 second.

- If the monitored port's packet-ingress rate decreases to less than 2,000 fps during this 1-second period, the module resumes comparing its ingress rate against the 2,000-fps threshold.
- If the monitored port's packet-ingress rate remains more than 2,000 fps during the entire 1-second period, the module temporarily disables the port for 1 second. After this 1-second period, the module brings the port back online and resumes comparing its ingress rate against the 2,000-fps threshold.

If as a result of this process, a port exceeds the packet-ingress threshold for 7 continuous seconds, the module:

- Disables the port permanently.
- Sends a trap to the EME.
- Displays `ratelimitexceeded` for the port status in the `bridge port summary` and `bridge port detail` displays.

When the module disables a front-panel port, user intervention is required to reenable the port.

3 RELEASE ISSUES

This chapter discusses the following issues for major software Release 3.0:

- Corrected Problems
- System Issues
- Known Problems
- Documentation Changes

Corrected Problems

This section discusses problems that have been corrected in software Release 3.0.

The numbers that appear in parentheses at the end of some descriptions are for internal 3Com use only.

System

- The system no longer displays `os socket err` after you reset the chassis and during the system start-up procedures. (27650 and 29672)
- The 36-port 10/100BASE-TX Layer 2 modules (Model Numbers 3CB9LF36R and 3CB9LF36T) no longer experience port lockup due to high port errors. (28668)

Management

- Uploading a configuration file to a TFTP server no longer removes the file from the EME file system, as shown in the `show file` display. (23456)

Ethernet

- On Layer 2 modules with fiber interfaces, the port mode defaults to 100half, and no longer initially displays `100full` as the state when you enter an `ethernet portstate` command. (25985)
- The 36-port 10/100BASE-TX Layer 2 Fast Ethernet RJ-45 module (Model Number 3CB9LF36R) no longer asserts because of port duplex mode mismatch and TX underrun errors. (27365, 27362, and 29195)

- Current autonegotiation status is now correctly reflected the first time that you view the Ethernet summary and detail displays. (27864)
- Whenever a non-switch fabric module is reset (with the `module nvData reset` command, by inserting the module into a CoreBuilder 9000 chassis, by doing a warm reset, by running service diagnostics, and so forth) or a backplane port is disabled and then reenabled, the links to the switch fabric module no longer go down on some occasions and are now always reestablished. (30063)

Downloading Release 3.0.1 software to the 9-port Gigabit Ethernet Switch Fabric Module (Model Number 3CB9FG9) or 24-port Gigabit Ethernet Switch Fabric Module, 12 trunks (Model Number 3CB9FG24T) resolves this problem. (30063)

Bridging

- You can now list the bridge port address table and walk through MIBs without causing Trunk Control Message Protocol (TCMP) enabled trunk ports to go down, or causing Spanning Tree Protocol (STP) topology changes. (23076 and 24547)
- When a port enters the Spanning Tree forwarding state, the root bridge no longer erroneously sends a new root trap instead of a topology change trap. (28665)
- Enabling the Spanning Tree Protocol (STP) on a port that already had STP enabled no longer results in an erroneous Spanning Tree topology change trap. (28655)
- The 36-port 10/100BASE-TX Layer 2 modules (Model Numbers 3CB9LF36R and 3CB9LF36T) now correctly populate the address table for Transcend® Address Tracker. (26575)
- Transcend Address Tracker polling no longer causes STP convergence. (26879)
- On modules in slots 13 through 16 of a 16-slot chassis, the first backplane port no longer goes into the blocking state when the second backplane port is forwarding. (28737)

VLANs

- Removing the default VLAN before you create additional VLANs no longer causes modules to go down after a module reset. Previously, you had to move the module to another slot in the chassis to reinitialize. (26223)
- Previously, in some configurations, the system did not allow the proper number of VLANs to be defined, causing an out-of-resources message. The system now allows correct VLAN definition. (27137)

System Issues

This section describes operating considerations that apply to Layer 2 switching module operational software Release 3.0.

The numbers that appear in parentheses at the end of some descriptions are for internal 3Com use only.

Staging

- You cannot stage a module in one chassis type and then move this module to another chassis type, due to variations in the backplane port mapping.

System

- The 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL) are designed to switch traffic among desktop workstations that are connected to wiring closets. Do not connect the module's front-panel ports to routers, switches, or network hubs. You can connect a small repeater (only) if you stay within the address limits of the port. (The default limit is two addresses.)
- When you move a module from one chassis to another, the configuration of the module remains intact. (27113)
- After you enter an `nvdata reset` command (or initiate a trunk group definition or deletion), there is a delay before the module initiates the reset and returns to the Administration Console.
- When you first insert and initialize a Gigabit Ethernet Layer 2 Switching Module in a CoreBuilder 9000 chassis, the primary switch fabric module in the chassis generates the trap sequence: `Link Up... Link Down... Link Up`. This is normal.

Management

- You may experience slow performance (response time) when you perform a walk of the a3Com.29 MIB, particularly when you request the following fields:
  - a3ComBridgePortAddressBridgeIndex
  - a3ComBridgePortAddressPortIndex

  Performing a walk of this MIB may also affect the performance of the Administration Console interface and other management functions.
- The 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL) support RMON groups 1, 2, 3, and 9.

Web-based Management

- If you use Netscape as your browser, you must install the Help files on an external server, not on a local PC. For instructions on how to install and configure Help for the Netscape browser, see "Documentation Changes" later in this chapter. (29490)

SNMP

- The MIB object a3ComSysEthernetPortCount returns a value that is one (1) greater than the combined number of front panel ports and backplane ports.
- Do not configure or enable SNMP trap destinations from the Administration Console with the `snmp trap addModify` command on switch fabric modules or interface modules. Only configure and enable SNMP trap destinations on the EME with the `set trap_destination` command. See "Documentation Changes" in Chapter 3, "Release Issues" of the *CoreBuilder 9000 Release Notes for Management Modules* for information about how to do this. (29770)
- There is no SNMP support for creating or deleting trunks.
- To prevent timeouts of SNMP requests, 3Com recommends that you increase the default timeout for the network management station.
- The value returned by ifType for backplane interfaces (117) are specified as defined by the Internet Assigned Numbers Authority (IANA) and not as specified in RFC 1213 or RFC 1573.

Ethernet

- The 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL) are the only modules that currently support PACE®. Although you can change the PaceAccess setting to `enable` on other modules, they do not currently support PACE and the setting actually remains disabled.

- The rxFrameRate and rxBytes statistics in the `ethernet detail` display are incorrect. These statistics incorrectly add an extra 8 bytes to every packet that a 100 Mbps port receives. For example, when a 64 byte frame is sent into a 100 Mbit port, the value `72` is displayed in the `ethernet detail` rxBytes field. Also, when 148,880 frames per second are sent into a 100 Mbit port, the value `151,143` frames per second is displayed in the `ethernet detail` rxFrameRate field.
- For non-connected front panel ports, the Autonegotiation state displays `failed`. This is a display issue only. This condition applies to the 9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module (Model Number 3CB9LG9MC). (26528)

Bridging

- The following bridge commands may take a few minutes to complete when several VLANs are configured in the system in allClosed mode:
  - `bridge vlan mode`
  - `bridge vlan define`
  - `bridge vlan remove`
  - `bridge trunk define`

  To minimize this delay, configure VLANs in order of increasing VID and remove them in order of decreasing VID.
- The time that it takes for addresses to age out of address tables may be up to twice as long as the bridge aging time attribute indicates.
- Bridge port addresses in the address list display are not sorted numerically. If you need to find a specific MAC address, use the `bridge port address find` command.
- The txFrames statistic in the `bridge port summary` display increments on ports with a down link state. (27962)
- The bridge port address count, which is the count of the actual number of addresses in the address table, may not match the bridge port address list under certain conditions. The bridge port address list command does not list control addresses (MAC addresses for control frames that go directly to the processor). Control addresses are installed in the address table under the following circumstances:
  - Spanning tree for the bridge is enabled.
  - TCMP is enabled on any of the defined trunk groups.
  - An IP VLAN interface is defined (there is a control address in the address table for each port within the associated VLAN).

These control addresses are included in the bridge display address count field, but are not listed in the bridge port address list.

Resilient Links

- The 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL) do not support resilient links. The modules have only one backplane port.

IGMP

- Do not allow a 36-port 10/100BASE-TX Desktop Switching Module (Model Number 3CB9LF36RL or 3CB9LF36TL) to act as an IGMP Querier. If you do, the module floods multicast traffic if it does not receive report packets on its front-panel ports. Use the `bridge multicast igmp queryMode disable` option to turn off querying for the module. (29208)

Trunking

- Make trunking definitions and modifications only from the Administration Console command line interface, and not through SNMP.
- When you add ports to an existing trunk, and change the port mode in the same modify operation, you need to reset the module and modify the trunk twice to add the additional ports to the trunk. The port mode is updated after the first reset operation. You can add a port to a trunk without changing the port mode in a single modify operation. (29804)
- 3Com recommends that you enable the Trunk Control Message Protocol (TCMP) on each end station of a trunk. If this protocol is not enabled on both end stations, TCMP cannot correctly validate trunk configuration rules. (29581)
- The 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL) do not support port trunking.

VLANs

- The maximum number of virtual LANs (VLANs) that you can define in a CoreBuilder 9000 system is 127. You may not be able to add every bridge port in the system to every VLAN that you have defined.
- When the `vlan remove all` command is executing, it may take several minutes to remove all VLANs when the system is operating in allClosed mode.
- The 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL) support only open VLANs. The modules do not support closed VLANs.

- When shipped from the factory, the 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL), default to VLAN 1 and can communicate with all CoreBuilder 9000 ports on that VLAN.

  Each client (front panel) port on the 36-port 10/100BASE-TX Desktop Switching Module defaults to system VLAN 1, untagged. The module's backplane port also defaults to VLAN 1, untagged. And the port on the switch fabric module that connects to the 36-port 10/100BASE-TX Desktop Switching Module defaults to VLAN1, untagged.

- The 36-port 10/100BASE-TX Desktop Switching Module backplane port supports one untagged VLAN, and up to 64 tagged VLANs. Only the untagged VLAN requires configuration on the module backplane port. In most cases, the untagged VLAN is VLAN 1, the default VLAN. All additional VLANs traverse the backplane as tagged VLANs. You must configure the switch fabric module port that connects to the 36-port 10/100BASE-TX Desktop Switching Module to pass these additional VLANs as tagged.

- You can configure the 36-port 10/100BASE-TX Desktop Switching Module client (front panel) ports to participate in 1 untagged system VLAN and up to 64 tagged system VLANs. The tagged and untagged VLAN assignment for a client port is independent of the backplane port. If a connected station sends packets with 802.1q tags, assign that port to the VLAN as 802.1q tagged. If the connected station does not send 802.1q tagged packets, assign the client port to the VLAN as untagged.

Known Problems

This section describes problems that are known to exist in Layer 2 switching module operational software Release 3.0.

The numbers that appear in parentheses at the end of some descriptions are for internal 3Com use only.

System

- At the Administration Console, entering a seemingly valid command string (two or more commands taken from menus and nested submenus) may not work. If this situation occurs, enter commands separately from one menu prompt at a time.
- Some Release 3.0.x features may become unstable when the associated switch devices are polled by Enterprise VLAN Manager, Address Tracker, and other Transcend applications that poll the bridge address MIB tables. These features and protocols include Trunk Control Message Protocol (TCMP) and Spanning Tree Protocol (STP) topology changes.

  3Com recommends that you use these Transcend management applications only for configuration and problem isolation purposes. When you use these applications, SNMP polling can contribute to unexpected events in the configuration associated with TCMP and STP. (29371 and 29797)

For information about controlling the Transcend Enterprise VLAN Manager and Address Tracker management applications, see the "General Functional Limitations" section, problem NMDww04250, in the Transcend Network Control Services Readme files for the February 2000 Update.

Management

- When you are prompted to "wait" for a reset to take place, do not attempt to start a new connection during this delay. Wait until control returns you to the Administration Console prompt before you start a new connection.
- After you enter an `nvdata reset` command (or initiate a trunk group definition or deletion), there is a delay before the module resets.The following MIB-II counters do not increment:
  - inReceives
  - tcpOutRsts
  - udpOutDatagrams
  - udpNoPorts

  - snmpInASNParseErrs
  - snmpInBadVersion
  - snmpInBadCommunityNames
  - snmpInBadCommunityUses
- The following ifIndex objects return invalid index numbers:
  - ipAdEntIfIndex
  - ipRouteIfIndex
  - ipNetToMediaIfIndex
- An SNMP getnext ifIndex request with a very large instance ID returns the value ifIndex.1 rather than ifDescr.1, which is the next object in the MIB tree.
- An SNMP get request on entLPPhysicalIndex is not implemented. Only SNMP walks can be used to access this object.
- The following variables have incorrect write access:
  - ifAdminStatus
  - ipDefaultTTL
  - ipNetToMediaTable
  - etherStatsDataSource
  - ipRouteAge
- The Administration Console interface incorrectly displays the following unsupported traps:
  - `MIB-II: Authentication Failure`
  - `S2 Systems MIB: Address Threshold`
- Because the 64-bit counters in the ifXTable are read-only counters, you cannot reset them. Attempting to do so results in no response from the SNMP agent, and the values are not set.

- The following requests return incorrect or incomplete values for the 9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module:
  - The value of entPhysicalClass that is returned for the instance of the module itself (entPhysicalClass.4) is 13. The value should be 9, which represents the value for the module.
  - The value of entPhysicalVendorType that is returned for the instance of the module itself (entPhysicalVendorType.4) contains an incorrect cb9000 description.
  - The value of entPhysicalDescr that is returned for the module does not contain slot, subslot, and revision numbers as it should.
- The 9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module returns values for entPhysicalIndex and entLogicalIndex, but these objects are listed in the MIB as non-accessible objects.
- The following objects are not returned:
  - a3ComSysBridgePortTransmitBlockedDiscards
  - a3ComSysBridgePortReceiveAllPathFilteredFrames
  - a3ComSysBridgePortTransmitAllPathFilteredFrames
  - a3ComSysBridgePortReceiveMulticastPathFilteredFrames
  - a3ComSysBridgePortTransmitMulticastPathFilteredFrames
- The module agent does not return the ipNetToMediaPhysAddress MIB-II to the ipNetToMediaTable. Other objects in the ipNetToMediaTable are properly returned.
- If you reset the 9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module from the EME, you see MIB II Cold Start and Link Up traps from the module, but you do not see a Link Down trap. The normal `Link Up... Link Down... Link Up` sequence has probably occurred and the module has reset, even though you did not see a Link Down trap.
- The object cb9000BackplaneConnectIfIndex lists backplane port numbers in decreasing order for the 9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module. For other CoreBuilder 9000 modules, the backplane port numbers are listed in increasing order.

- The object a3ComSysBridgePortAddressStaticPort should return one of the following values:
  - The local bridge port index when a static address is configured for the port
  - The value 0 when a dynamic address is configured for the port

  However, the 9-port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module returns the following reversed values:
  - The local bridge port index when a dynamic address is configured for the port
  - The value 0 when a static address is configured for the port
- If there is a trunk on the switching module, an SNMP getnext request on the MIB object a3ComTrunkTcmpMacState incorrectly returns the first instance of this object. For example, a Gigabit Ethernet switching module that is located in slot 6 has two trunks:
  - Ports 1 and 9 — MIB objects a3ComTrunkTcmpMacState.14.1 and 3ComTrunkTcmpMacState.14.9
  - Ports 4 and 5 — MIB objects a3ComTrunkTcmpMacState.15.4 and 3ComTrunkTcmpMacState.15.5
- The objects in the a3ComTrunkMacTable are not accessible via SNMP.
- Through SNMP the object a3ComSysEthernetPortRequestedPortMode can be set to values out of range for the port, only use the values that are for 10 or 100. (30022)

Ethernet

- The following Ethernet statistics are not reset after you enter the `module baseline set` command:
  - rxPeakFrameRate
  - txPeakFrameRate
  - rxPeakByteRate
  - txPeakByteRate
- If a bridging loop exists on a switching module or switch fabric module, output from the `ethernet detail` command can take up to 30 minutes to display. This issue does not apply to the 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL). (30080)

Bridging

- The bridge incorrectly forwards frames that are sent to their own port MAC address.

Trunking

- Do not use special characters in trunk names. (25715)
- The Administration Console of the 36-port 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module (Model Number 3CB9LF36R) incorrectly allows you to add a roving analysis port when that port has already been defined as part of a trunk group. When you do this, the system removes the analyzer port from all VLANs.

  To recover from this situation, you must remove the roving analysis port with the `analyzer remove` command and modify the affected VLANs to add the trunk port back to the VLAN with the `bridge vlan modify` command. (29802)
- These TCMP trunk statistics in the `bridge trunk detail` display are not reset after you enter the `module baseline set` command:
  - rxFrames
  - rxHellos
  - txFrames
  - txHellos
  - rxBadVersion
  - rxBadType
  - rxSameTrunkId
  - rxOverflow
- If a trunk is configured on a module, the following fields in the `ethernet detail` display may show rates that are higher than the actual rates:
  - rxFrameRate
  - rxByteRate
  - rxPeakFrameRate
  - rxPeakByteRate
  - txFrameRate
  - txByteRate
  - txPeakFrameRate
  - txPeakByteRate

In addition, the port for which the report is requested does not have to be involved in the trunk for this situation to occur.

- On a CoreBuilder 9000 with a single switch fabric module installed, when you insert a switching module that supports trunks on the backplane into an unpopulated slot that has AutoMap enabled, only the first link of the trunk for that slot is in the *Up* state, and other links are in the *Down* state.

  There are two ways to avoid this problem:

  - Do not enable AutoMap on an unpopulated slot. Enable AutoMap after you insert the switching module.
  - Enable all backplane links in that slot that are in the *Down* state. (30041)

- In a redundant switch fabric module configuration, when AutoMap is enabled for an unpopulated switching module slot, the backplane trunk does not enter the *Up* state.

  There are two ways to avoid this problem:

  - Populate the switching module slot before you enable AutoMap.

    Always allow 90 seconds for the secondary switch fabric module to be updated before you reset the primary switch fabric module.

  - Remove the secondary switch fabric module before you enable AutoMap, then reinsert the secondary module, and reset the primary switch fabric module so that the AutoMap change takes effect and backplane trunks are created. (30051)

Documentation Changes

This section discusses issues that apply to CoreBuilder 9000 documentation.

Ethernet

Table 16, Ethernet Media Specifications, in Chapter 5 "Ethernet" on page 93 of the *CoreBuilder 9000 Implementation Guide,* the Recommended Distance column for the 100BASE-FX multimode fiber should read `412 m` and not `412 km`.

"Port Monitoring" of Chapter 5 "Ethernet" on page 92 of the *CoreBuilder 9000 Implementation Guide,* indicates that the `ethernet monitoring` option compares Ethernet error counters against *user-defined* thresholds. In fact, the `ethernet monitoring` option compares Ethernet error counters against *predetermined* thresholds.

Web-based Management

Chapter 2 of the *Web Management User Guide* for your system should include some additional notes and some filename changes:

- This notice should appear at the beginning of the "Windows Installation" section:

If you use Netscape as your browser, you must install the Help files on an external server, not on a local PC. To install the Help files on an external server, follow the instructions for installing on a PC.

- In the first paragraph of the section on installing supplemental tools and in the "Windows Installation" section, use the filename `Setup.exe` instead of `webmanagev30.exe`.
- In the section "Setting Up the Form-Specific Help Files," this notice should appear:

If you use Netscape as your browser, you must install the Help files on an external server. To configure the location of the Help files, use the sample URL syntax in the Help Server Configuration form in the software. Do not use the examples in Figure 12 in the guide.

4 SOFTWARE INSTALLATION

This chapter contains the following topics:

How to Obtain Software Image Files

To obtain image files for software Release 3.0, contact your network supplier or 3Com representative, or visit the 3Com Web site at:
`http://support.3com.com/infodeli/swlib/index.htm`

CAUTION: *Before you upgrade software on CoreBuilder 9000 switch fabric modules and interface modules to Release 3.0, you must upgrade management software on the EME module to Release 3.0. You must also upgrade the EMC operational file to Release 3.0 and the EMC boot file to software Release 2.1.0. See the* CoreBuilder 9000 Release Notes for Management Modules *for instructions.*

Installation and Upgrade Prerequisites

Before you upgrade the Fast Ethernet and Gigabit Ethernet Layer 2 switching modules to Release 3.0, read this section for important procedures that pertain to other modules in an existing chassis or to other modules in a new chassis.

CAUTION: *All modules in a CoreBuilder 9000 chassis must operate at compatible software levels. You must verify the software release on all new and existing modules in your chassis and upgrade as necessary. See Table 1 in Chapter 1 for module software compatibility requirements. See "Verifying and Updating Modules for an Existing Chassis" and "Verifying and Updating Modules for a New Chassis" next for procedures and important information.*

CAUTION: *Before you attempt to download any module software, save the configuration file for the release that you are currently running to an external device using the EME* `upload` *command. See the* CoreBuilder 9000 Enterprise Management Engine User Guide *for information about the EME* `upload` *command.*

CAUTION: *If the EME contains a Release 3.0.x configuration file for a switch fabric module slot or interface module slot, and if you want to install a module in that slot that already has Release 2.x.x software on it, delete the Release 3.0.x configuration file from the EME after you save the 3.0.x configuration file to the external device.*

Verifying and Updating Modules for an Existing Chassis

To verify whether modules in an existing, powered-on chassis are operating with software that is compatible with Release 3.0 software for your Fast Ethernet or Gigabit Ethernet Layer 2 switching module:

1. At the EME prompt, enter:

   ```
   show module all verbose
   ```

   Scroll through the resulting screens to find the software release numbers of all installed modules.

2. Compare the software release numbers in the display against the requirements in Table 1 in Chapter 1 to identify which existing modules you need to upgrade.

3. Have ready the software upgrades and associated release notes for all modules that you are upgrading.

   To obtain software upgrades and release notes, see your network supplier or 3Com representative, or visit the 3Com Web site at:
   `http://support.3com.com/infodeli/swlib/index.htm`

4. Download software to appropriate switch fabric modules and interface modules in any order.

   CAUTION: *Downloaded software does not become active on a module until you cycle the power to the module slot. If you are upgrading multiple modules, download software to all modules first and then cycle the power to these module slots.*

   For software download procedures and instructions about how to cycle power to module slots to activate the new software, see "Downloading Software" later in this chapter.

If you have a new module that uses software Release 3.0, you can now select a slot for your module and install it. See the *Quick Start Guide* for your module for guidelines and procedures.

Verifying and Updating Modules for a New Chassis

When you purchase a new chassis and modules, you may receive some modules that are loaded with software that is incompatible with other modules.

CAUTION: *All modules in a single chassis must operate at compatible software levels. When you purchase a new chassis and modules, you must verify the software release on all modules and upgrade as necessary in the order specified in the following procedure.*

To verify and update all modules to Release 3.0, follow these steps:

1. Install one EME module in the powered-off chassis.

   For the installation procedure, see the *Enterprise Management Engine Quick Start Guide for the CoreBuilder 9000 Enterprise Switch.*

2. Power on the chassis, if you have not already done so as part of the EME installation procedure.

3. At the EME prompt, enter:

   ```
   show eme
   ```

   The resulting display includes the software release number.

4. Compare the software release number in the display with the compatibility requirements in Table 1 in Chapter 1.

5. If necessary, upgrade the EME according to the procedures in the *CoreBuilder 9000 Release Notes for Management Modules*.

6. With the chassis powered on, select slots for all modules and install them.

   See the *Quick Start Guide* for each module for slot guidelines and an installation procedure.

7. Verify the software releases on all modules. At the EME prompt, enter:

   ```
   show module all verbose
   ```

8. Compare the software release numbers in the display with the module compatibility requirements table in each *CoreBuilder 9000 Release Notes* to identify which modules you need to upgrade.

9. Have ready the software upgrades and associated release notes for all modules that you are upgrading.

To obtain software upgrades and release notes, see your network supplier or 3Com representative, or visit the 3Com Web site at:
`http://support.3com.com/infodeli/swlib/index.htm`

10 Download software to appropriate switch fabric modules and interface modules in any order.

CAUTION: *Downloaded software does not become active on a module until you cycle the power to the module slot. If you are upgrading multiple modules, download software to all modules first and then cycle the power to these module slots.*

For software download procedures and instructions about how to cycle power to module slots to activate the new software, see "Downloading Software" next in this chapter.

Now that all new modules in your new chassis are operating with compatible software, you can proceed to configure and manage all modules.

Downloading Software

This section describes how to download software Release 3.0 and how to update emergency software download parameters so that the EME can perform an emergency software download if the operational code on a module becomes corrupted.

CAUTION: *Do not attempt to perform any management tasks while you are downloading software.*

Downloading Release 3.0 Software

The following procedure explains how to download software Release 3.0 to a switch fabric module or an interface module that is running Release 2.x.x software.

This software download process assumes that:

- *You have already determined the appropriate software release for your interface module, as well as the compatible software release for the switch fabric modules and management modules. See Table 1 in Chapter 1 for software compatibility requirements.*
- *You are running a TFTP server on a system in your network. This server may support download from any directory on this system or from a single default directory, usually named "tftp" or "tftpboot".*

- *You have loaded the boot image and the operational load image in the file server directory, usually named "tftp" or "tftpboot", from the Software CD-ROM or from the 3Com Web site at the following URL:*

  http://support.3com.com/infodeli/swlib/index.htm

- *The management modules (EME and EMC) that are installed in your chassis are running the compatible software release before you can attempt a module download. To determine which software release is running on a management module, enter:*

  show module <slot>**.all verbose**

  Where <slot> is the slot location of the module.

To download software Release 3.0:

1 From your TFTP file server, download the software to the appropriate switch fabric module or interface module.

At the system prompt, enter the following command:

download module <slot>**.1 all_image** <server address> <filename>

Where <slot> is the slot number of the module, <server address> is the IP address of the TFTP server archive where the software image resides, and <filename> is the name of the file that contains all of the appropriate software images for the particular module to which you are downloading.

This filename has the extension .all*. The filename may include a directory path to the directory within the file server if this directory is not the file server default directory.*

For downloads to take effect, you must reset the modules. Repeat step 1 for all modules in the chassis and proceed to step 2, or enter the command **reset module** <slot>**.1 cold** *after each module is updated. Where* <slot> *is the slot number of the module to which you downloaded software.*

2 At the system prompt, enter the following command:

reset module all cold

Doing this resets all the modules and loads the software that you downloaded from the EME to those modules.

3 Confirm that all of the downloads were successful.

To verify that the software releases that you downloaded are correct and that the information in the module's Auto Emergency Download fields is correct, enter the following command:

```
show module <slot>.1 verbose
```

4 Update the Emergency Download parameters.

See "Update Emergency Download Parameters" next and complete all the steps.

Update Emergency Download Parameters

The Update Emergency Download Parameters procedure allows you to change the filename and IP address of the emergency download parameters that are stored in NVRAM. These values are used if the operational code on a module that is installed in your chassis becomes corrupted. This code can become corrupted, for example, if a power cycle interrupts an operational code download. After the module resets, the boot code detects that the operational code is corrupted and automatically attempts to download a valid operational code image with the correct filename and IP address. This image is not stored in permanent memory. You must perform a normal download of this image at the EME prompt to download this image into flash.

CAUTION: *If you do not perform this normal download, the emergency download repeats each time that the module resets until the maximum number of module resets is reached.*

This procedure is only required the first time that you upgrade a module to software Release 3.0. From that point, any time that an operational (.OP) or all (.ALL) image is downloaded to the module, these parameters update automatically.

If the IP address of the file server that contains this file changes, or if the directory where it is located changes, or if the actual filename changes, you must use this procedure to update that information.

1 From the EME, connect to the module:

```
CB9000> connect <slot>.1
```

The CoreBuilder 9000 menu options screen appears.

2 At the prompt, enter **`module`**

The Module menu options screen appears.

3 At the prompt, enter **`nvData`**

The nvdata menu options screen appears.

4 At the prompt, enter **`emergencyDownload`**

The following prompt appears:

```
Enter file server IP address {?} [<IP address>]:
```

Where `<IP address>` is the location of the server where the non-corrupted software image file resides.

5 To modify the indicated IP address, enter an IP address, or to keep the existing IP address, press Enter.

The following prompt appears:

```
Enter image Name {?} [<image name>]:
```

Where `<image name>` is the stored image that you want to download.

6 Enter the <imagename> for the module to which you are connected.

<imagename> is the image name with the .ALL extension for this module.

The following prompt appears:

```
Enter file type {?} [file type]:
```

7 Enter **`all_image`** for `file type`.

8 Enter **`q`** and press Enter until you reach the top-level menu options screen.

9 To close the menu options screen, enter **`disconnect`**

10 To update the Automatic Emergency Download fields in the EME `show module <slot>.1` command display, reset the module using the following EME command:

```
CB9000> reset module <slot>.1
```

You must complete step 10 to ensure that the module is updated.

Downgrading Switching Modules to Software Release 2.1.0

Follow this procedure to downgrade the switching modules in your chassis that are running software Release 3.0 to software Release 2.1.0:

CAUTION: *The 36-port 10/100BASE-TX Desktop Switching Modules (Model Numbers 3CB9LF36RL and 3CB9LF36TL) cannot be downgraded to software releases earlier than Release 3.0.0.*

1. Download the operational code for your previous software Release 2.1.0 to all the switching modules that are installed in your chassis.
2. Download the boot code for your previous software Release 2.1.0 to all the switching modules that are installed in your chassis.
3. Download the diagnostic code for your previous software Release 2.1.0 to all the switching modules that are installed in your chassis.

Do not reset the modules after you complete the downgrade. You must now downgrade the software code on the switch fabric modules that are installed in your chassis. See the procedure in "Downgrading Switch Fabric Modules to Software Release 2.1.0" in the CoreBuilder 9000 Release Notes for Gigabit Ethernet (GEN) Switch Fabric Modules and GEN Interface Modules.

5 REFERENCE

This chapter contains the following topics:

- Identifying Modules in the Switch
- Applicable Documents
- MIB Files
- Entering Commands
- Understanding Autonegotiation
- Year 2000 Compliance

Identifying Modules in the Switch

The CoreBuilder 9000 Enterprise Switch uses an abbreviated version of each module name in various menu prompts and displays.

Table 3 lists the model numbers of modules, descriptions, and the corresponding abbreviated name.

Table 3 Identifying Modules in the CoreBuilder 9000

Model Number	Description	Abbreviated System Identification Name
3CB9RG4	4-Port Gigabit Ethernet Layer 3 Switching Module (GBIC)	4-GEN-GBIC-L3
3CB9RD6MC	6-Port SAS (3-Port DAS) FDDI Layer 3 Switching Module	6-FDDI-L3
3CB9RF12R	12-Port 10/100BASE-TX Fast Ethernet Multiprotocol Layer 3 Switching Module	12-E/FEN-TX-L3
3CB9RF10MC	10-Port 100BASE-FX Fast Ethernet Multiprotocol Layer 3 Switching Module	10-E/FEN-FX-L3
3CB9LF20R	20-Port 10/100BASE-TX Fast Ethernet Layer 2 Switching Module	20-E/FEN-TX-L2

Table 3 Identifying Modules in the CoreBuilder 9000 (continued)

Model Number	Description	Abbreviated System Identification Name
3CB9LF10MC	10-Port 100BASE-FX Fast Ethernet Layer 2 Switching Module	10-E/FEN-FX-L2
3CB9LF20MM	20-Port 100BASE-FX (MT-RJ) Fast Ethernet Layer 2 Switching Module	20-E/FEN-FX-L2
3CB9LF36R	36-Port 10/100BASE-TX Fast Ethernet RJ-45 Layer 2 Switching Module	36-E/FEN-TX-L2
3CB9LF36T	36-Port 10/100BASE-TX Fast Ethernet Telco Layer 2 Switching Module	36-E/FEN-TX-L2
3CB9LF36RL	36-Port 10/100BASE-TX Desktop Switching Module (RJ-45 Connectors)	36L-E/FEN-TX-L2
3CB9LF36TL	36-port 10/100BASE-TX Desktop Switching Module (RJ-21 Telco Connectors)	36L-E/FEN-TX-L2
3CB9LG9MC	9-Port 1000BASE-SX Gigabit Ethernet Layer 2 Switching Module	9-GEN-SX-L2
3CB9LG2MC	2-Port 1000BASE-SX Gigabit Ethernet Interface Module	Managed by the switch fabric module
3CB9LG2SC	2-Port 1000BASE-LX Gigabit Ethernet (GEN) Interface Module	Managed by the switch fabric module
3CB9LG4	4-Port Gigabit Ethernet Interface Module (GBIC)	Managed by the switch fabric module
3CB9FG9	9-Port Gigabit Ethernet (GEN) Switch Fabric Module	9G-FAB
3CB9FG24	24-Port Gigabit Ethernet Switch Fabric Module, 4 trunks	24G-FAB
3CB9FG24T	24-Port Gigabit Ethernet Switch Fabric Module, 12 trunks	24G-FAB-T
3CB9EME	Enterprise Management Engine	Management module
3CB9EMC	Enterprise Management Controller	Controller module

Applicable Documents

For information about installing, managing, and using the Layer 2 switching modules, as well as their specifications, see these documents:

- The *Quick Start Guide* that is shipped with each module
- *CoreBuilder 9000 Implementation Guide*
- *Command Reference Guide*, which covers the CoreBuilder 3500, 9000, and 9400, and the SuperStack® II Switch 3900 and 9300 products.
- *CoreBuilder 9000 Enterprise Management Engine User Guide*

MIB Files

The organization of a Management Information Base (MIB) allows a Simple Network Management Protocol (SNMP) network management package, such as the Transcend® Network Control Services application suite, to manage a network device without having a specific description of that device. 3Com ships the following MIB files with system software Release 3.0.0 as ASN.1 files:

- **BRIDGE-MIB.mib** — Bridge MIB, RFC 1493. Layer 2 and Layer 3.

  Unsupported groups and table in this MIB:

  - dot1dSr group
  - dot1dPortPair
  - dot1dStatic group
- **ENTITY-MIB.mib** — Entity MIB, RFC 2037.

  Unsupported table and groups in this MIB:

  - entAliasMappingTable
  - entity General group
  - entity Notifications group
- **ETHERNET.mib** — Ethernet MIB, RFC 1398.
- **IANAifType-MIB-V1SMI.mib** — Internet Assigned Numbers Authority MIB, SMI Version 1.

- **IF-MIB-V1SMI.mib** — IF MIB Version 1, RFC 1573.

  Unsupported tables in this MIB:

  - ifTestTable
  - ifRcvAddressTable
  - ifHC 64-bit counters
- **MIB2-MIB.mib** — MIB-II MIB, RFC 1213.

  Unsupported group in this MIB: egp group
- **RMON-MIB.mib** — RMON MIB, RFC 1757.

  Supported groups in this MIB:

  - statistics
  - history
  - alarm
  - event
- **SNMPv2-MIB.mib** — Used by other MIBs.
- **3Com Enterprise MIBs** — See "3Com Enterprise MIBs" next.

3Com Enterprise MIBs

3Com Enterprise MIBs allow you to manage unique and advanced functionality of 3Com devices. These MIBs are shipped with your Release 3.0.0 software. The following MIBs are included in 3Com(43):

- **3cigmpSnoop.mib** — 3Com IGMP Snooping MIB.
- **3com0304.mib** — 3Com Resilient Links MIB (43.10.15).
- **3cPoll.mib** — 3Com Remote Polling MIB (43.29.4.22).
- **3cProd.mib** — 3Com Transcend Product Management MIB (43.1).
- **3cSys.mib** — 3Com System MIB (43.29.4).

  Unsupported groups in this MIB:

  - a3ComSysSlot
  - a3ComSysControlPanel
  - a3ComSysSnmp
- **3cSysBridge.mib** — 3Com Bridging MIB (43.29.4.10).
- **3cSysFt.mib** — 3Com File Transfer MIB (43.29.4.14).
- **3cTrunk.mib** — 3Com Port Trunking MIB (43.10.1.15.1).

- **3cVlan.mib** — 3Com VLAN MIB (43.10.1.14.1).
- **3cWeb.mib** — 3Com Web Management MIB (43.29.4.24).
- **cb9000Mod.mib** — Layer 2 and Layer 3.

MIB names and numbers are usually retained when organizations restructure their businesses; therefore, some of the 3Com Enterprise MIB names may not contain the word "3Com."

Entering Commands

Before you enter any command, 3Com recommends that you:

- Examine all menus and submenus carefully to obtain the complete and correct command string.
- Consult the documentation for the valid minimum abbreviation for the command string.

Understanding Autonegotiation

The autonegotiation capability on CoreBuilder 9000 Fast Ethernet and Gigabit Ethernet Layer 2 switching modules functions in compliance with the IEEE 802.3z specification. In Gigabit Ethernet modules, autonegotiation coordinates flow control parameters between local and remote ports. Both ends of the Gigabit Ethernet connection must support autonegotiation and have it enabled for the connection to work properly.

If autonegotiation is implemented or configured differently on local and remote connected ports, unexpected results or link failures may result. For example:

- If a Gigabit Ethernet switching module port has autonegotiation enabled but the remote end of the connection does not support autonegotiation or has it disabled, the local module port does not come up (the module port state is off-line, the port LED is off, and the autonegotiation state is configuring).
- If a Gigabit Ethernet switching module port has autonegotiation disabled but the remote end of the connection has autonegotiation enabled, no traffic flows in either direction between the ports. However, the module port state and port status still display `online` and `enabled`, respectively. Also, if Spanning Tree is enabled, the linkstate is up and the module port state is forwarding.

- If a Gigabit Ethernet switching module port has autonegotiation enabled with the port enabled, but the remote end of the connection has autonegotiation enabled with the port disabled, the enabled port goes on-line and the port LED lights green. The disabled port stays off-line.

To avoid such problems, 3Com recommends that you always set the connected port pairs to the same mode, in one of the following ways:

- Enable autonegotiation at both ends of the connection.
- Disable autonegotiation at both ends of the connection and statically configure each endpoint identically.

Either way prevents mismatches and the associated errors.

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

6 TECHNICAL SUPPORT

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

Information contained in this chapter 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, 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
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	Country	Telephone Number
Asia, Pacific Rim			
Australia	1 800 678 515	P.R. of China	10800 61 00137 or
Hong Kong	800 933 486		021 6350 1590
India	+61 2 9937 5085	Singapore	800 6161 463
Indonesia	001 800 61 009	S. Korea	
Japan	0031 61 6439	From anywhere in S. Korea:	00798 611 2230
Malaysia	1800 801 777	From Seoul:	(0)2 3455 6455
New Zealand	0800 446 398	Taiwan, R.O.C.	0080 611 261
Pakistan	+61 2 9937 5085	Thailand	001 800 611 2000
Philippines	1235 61 266 2602		
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	Netherlands	0800 0227788
Belgium	0800 71429	Norway	800 11376
Denmark	800 17309	Poland	00800 3111206
Finland	0800 113153	Portugal	0800 831416
France	0800 917959	South Africa	0800 995014
Germany	0800 1821502	Spain	900 983125
Hungary	00800 12813	Sweden	020 795482
Ireland	1800 553117	Switzerland	0800 55 3072
Israel	1800 9453794	U.K.	0800 966197
Italy	1678 79489		
Latin America			
Argentina	AT&T +800 666 5065	Mexico	01 800 CARE (01 800
Brazil	0800 13 3266	Peru	2273)
Chile	1230 020 0645	Puerto Rico	AT&T +800 666 5065
Colombia	98012 2127	Venezuela	800 666 5065 AT&T +800 666 5065

Country	Telephone Number	Country	Telephone Number
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
Latin America	1 408 326 2927	1 408 326 3355
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	1800553117	
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	
U.S.A. and Canada	1 800 NET 3Com (1 800 638 3266) Enterprise Customers: 1 800 876 3266	1 408 326 7120 (not toll-free)