



Release Notes: Version 07.6.00 Operating System

for the HP ProCurve Routing Switch 9304M, 9308M, and 9315M
with Redundant Management (MII and MIV)

Software release 07.6.00 supersedes earlier software releases in the 07.x software branch. (For more on software branches, see “Software Branches” on page 1.)

Minimum S/W Version:	HP ProCurve Series 9300 Routing Switch Modules:
07.1.10	These Redundant Management Modules: <ul style="list-style-type: none">• J4845A ProCurve 9300 GigLX Redundant Management Module (8-port, MII)• J4846A ProCurve 9300 GigSX Redundant Management Module (8-port, MII)• J4847A ProCurve 9300 Redundant Management Module (0-port, MII)
07.1.19	These Redundant Management Modules: <ul style="list-style-type: none">• All of the modules listed for release 7.1.10.• J4857A HP ProCurve 9300 Mini-GBIC Redundant Management Module (8-port, MIV)
07.5.4	These Redundant Management Modules <ul style="list-style-type: none">• J4879A HP ProCurve 9300 T-Flow Redundant Management Module
7.6.00	These Redundant Management Modules <ul style="list-style-type: none">• J4885A HP ProCurve 9300 EP Mini GBIC Redundant Management Module

These release notes:

- Provide useful procedures, information, and notes for routing switch operation and management.
- Summarize the new operating system enhancements available in software release 07.6.00.
- Summarize earlier software operating problems fixed in software release 07.6.00.

These release notes describe of the enhancements in release 07.6.00. For documentation describing the other features available in the Series 9300 routing switches, refer to the Documentation CD_ROM you received with your modules. For the latest version of any documentation, visit: <http://www.hp.com/go/procurve>

Mini-GBIC ports: Hewlett-Packard offers and supports only mini-GBICs having an HP label (with product number J4858A, J4859A, or J4860A) for use with the HP ProCurve Series 9300 Mini-GBIC Modules (J4856A, J4894A, J4857A and J4885A). Use of other brands of mini-GBICs is not supported.

Flash Images: The flash image files for this software release differ depending on the type of management module you use. Refer to “Software Image Files” on page 3.

SNMP: Beginning with software release 05.2.16, the software does not have a default read-write SNMP community. If you use the default community name “private” as the password for web management access or for read-write access through a network management application, you need to use the CLI to add the read-write community string first.

Devices Without Redundant Management: For information on upgrading the software on the 9304M and 9308M routing switches WITHOUT redundant management, refer to the latest 6.6.x release notes. (Refer to “Downloading the Latest Software and Documentation” on page 5.)

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Applicable Products

HP ProCurve 9304M Routing Switch (J4139A)
HP ProCurve 9308M Routing Switch (J4138A)
HP ProCurve 9315M Routing Switch (J4874A)

HP ProCurve 9300 10/100 Module (J4140A)
HP ProCurve 9300 100Base FX Module (J4142A)
HP ProCurve 9300 1000Base-T Module (J4842A)
HP ProCurve 9300 Mini-GBIC Module (J4856A)
HP ProCurve 9300 Mini-GBIC Redundant Management Module (J4857A)
HP ProCurve 9300 10-Gigabit 10km Module (J4891A)
HP ProCurve 9300 EP Mini GBIC Redundant Management Module (J4885A)
HP ProCurve 9300 EP 10/100 RJ-45 Module (J4881A)
HP ProCurve 9300 EP 10/100 Telco (RJ-21) Module (J4889A)
HP ProCurve 9300 EP Mini-GBIC Module (J4894A)
HP ProCurve 9300 EP 100/1000-T Module (J4895A)

HP ProCurve Gigabit-SX-LC Mini-GBIC (J4858A)
HP ProCurve Gigabit-LX-LC Mini-GBIC (J4859A)
HP ProCurve Gigabit-LH-LC Mini-GBIC (J4860A)

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Software Branches

HP offers four software (Operating System) branches for the Series 9300 routing Switches:

Software Version:	Typically Include:	Operate On:
06.6.28 and later 06.x releases	Bug Fixes	<ul style="list-style-type: none"> HP 9304M and 9308M routing switches <i>without</i> redundant management (that is, with MI modules) HP 6308M-SX routing switch HP 6208M-SX switch
07.1.10 and Greater 07.1.x Releases	New Features, Enhancements to Existing Features, and Bug Fixes	HP 9304M and 9308M routing switches WITH redundant management (MII or higher modules)
07.5.04 and Greater 07.x Releases	New Features, Enhancements to Existing Features, and Bug Fixes	HP 9304M, 9308M, and 9315 routing switches WITH redundant management (MII or higher modules)
07.6.00 and Greater Releases	New Features, Enhancements to Existing Features, and Bug Fixes	HP 9304M, 9308M, and 9315 routing switches WITH redundant management (MII or higher modules) and Enhanced Performance (EP) Modules

Summary of Enhancements

NOTE: Release 07.6.00 is a maintenance release only and contains all the enhancements in 07.5.04.

System-Level Enhancements

Enhancement	Description	See Page
New option to disable TCP access by HP TOP-TOOLS	The no web-management hp-top-tools command disables TCP port 280, used by HP TOP-TOOLS, without also disabling TCP port 80 (HTTP), used by the Web management interface.	23
Changes to the Ethernet Port Utilization table	Addition of a port load interval value to the Ethernet Port Utilization table affect the following: <ul style="list-style-type: none"> Web management interface for the table. The column heading for "5 minute period average values" have also been changed. Port Utilization table in the HP ProCurve SNMP MIB 	23
Ability to change UDP port used by SNMP traps	You can now change the UDP port to which SNMP traps are sent. The following have been updated for this feature: <ul style="list-style-type: none"> snmp-server host CLI command Trap receiver page of the device Web management interface HP ProCurve SNMP MIB 	24

Enhancement	Description	See Page
New SNMP MIB Objects	New MIB objects are included for the following: <ul style="list-style-type: none"> Banner commands Telnet login timeout 	26

New Hardware in 7.6.00

New Hardware	Description	See Page
New module	This release provides support for the following new module: <ul style="list-style-type: none"> HP ProCurve 9300 10-Gigabit 10km Module (J4891A) 	27
New Enhanced Performance (EP) modules	This release provides support for the following new EP modules: <ul style="list-style-type: none"> HP ProCurve 9300 EP 8-Port Mini-GBIC Redundant Management Module (J4885A) HP ProCurve 9300 EP 48-port 10/100 RJ-45 Module (J4881A) HP ProCurve 9300 EP 48-port 10/100 Telco Module(J4889A) HP ProCurve 9300 EP 16-port Mini-GBIC Module (J4894A) HP ProCurve 9300 EP 16-port 100/1000-T Module (J4895A) 	29

Already Using a 9304M or 9308M with Redundant Management? Here's New Information!

If you received a 9304M or 9308M before software release 07.5.04 began shipping, and you are updating the device to release 07.5.04 (or greater), then you may want to examine the new product manuals that became available beginning with the 07.5.04 release. To view (and freely download) PDF versions of these manuals (whole manual, or chapter-by-chapter files). See "To Download Product Documentation:" on page 5.

Also, if you are upgrading a redundant management module to software release 07.5.04 (or greater) from a 7.1.x (or earlier) release, you will need to boot the routing switch from a TFTP server to perform this task. Refer to "Upgrading a Management Module to Release 07.5.0x (or Greater) for the First Time" on page 7.

Software/Device Compatibility

Table 1. Device Compatibility with Software Versions

Devices	Software Versions:				
	04791 05084	H2R07504.BIN	H2R05216.BIN H2R06605.BIN H2R06616.BIN H2R07110.BIN H2R07122.BIN H2R07124.BIN	HPR05216.BIN HPR06605.BIN HPR06616.BIN HPR06628.BIN HPR06633.BIN HPR06636.BIN	HPS05216.BIN HPS06605.BIN HPS06616.BIN HPS06628.BIN HPS06633.BIN HPS06636.BIN
HP ProCurve 9315M (J4174A) Routing Switch with Redundant Management Modules (MII or MIV)	No	Yes	No	No	No
HP ProCurve Routing Switches <i>WITH Redundant Management Module(s)</i> (MII or MIV): <ul style="list-style-type: none"> • 9304M (J4139A) • 9308M (J4138A) 	No	Yes	Yes	No	No
HP ProCurve Routing Switch 9304M (J4139A) and 9308M (J4138A) <i>WITHOUT Redundant Management Modules (MI)</i>	Yes	No	No	Yes	No
HP ProCurve Routing Switch 6308M-SX (J4840A)	n/a	n/a	No	Yes	No
HP ProCurve Switch 6208M-SX (J4841A)	n/a	n/a	No	No	Yes

If you have a 9304M or 9308M routing switch that was shipped before the software versions described in this document were available, you may want to download either of these releases from HP's ProCurve website. To do so, see the chapter titled "Using Redundant Management Modules" in the *Installation and Getting Started Guide* included on the CD-ROM shipped with your management module(s) and also available on the HP ProCurve website. (Refer to "Downloading the Latest Software and Documentation" on page 5.) Also, for information on how to update your routing switch software, refer to the chapter titled "Updating Software Images and Configuration Files" in the same *Installation and Getting Started Guide*.

Software Image Files

To run software release 07.5.04 (or greater), you need the indicated boot and flash images listed below.

NOTE: This software release operates only with Redundant Management (MII and MIV) modules. You cannot install and run this software on non-redundant (MI) management modules.

The 9315M Routing Switch requires a minimum of one Redundant Management Module running software release 07.5.x or greater. This is true regardless of whether you plan to install a management module from a 9304M or 9308M that has been running an earlier release.

Due to the size of the 07.5.x (or greater) OS software image, you cannot directly upgrade the OS image in a Redundant Management Module if that module does not already have an 07.5.x (or greater) image in flash memory. Thus to upgrade a Redundant Management Module to release 07.5.x (or greater) for the first time (for use in the 9304M, 9308M, or the 9315M with Redundant Management), you must use the switch's BOOT MONITOR feature and initially boot the switch using 07.5.x (or greater) code residing in an TFTP server. To upgrade an MII or MIV management module from a release earlier than 07.5.04, refer to "Upgrading a Management Module to Release 07.5.0x (or Greater) for the First Time" on page 7.

NOTE: Release 07.5.04 includes Secure Shell (SSH) version 1 (HP 9304M, HP 9308M, and HP 9315M only).

SSH is not available for the 9304M or 9308M with a 32MB management module ("Management I" module). Also, Management I modules cannot be used with the 9315M.

Product	Boot Image	Flash Image
HP 9304M HP 9308M With one of these MI modules; that is, WITHOUT Redundant Management: <ul style="list-style-type: none"> • J4140A • J4144A • J4146A 	M1B07108.bin or greater recommended	HPR06636.bin*
HP 9304M HP 9308M HP 9315M With any one or two of these MII or MIV modules; that is, WITH Redundant Management: <ul style="list-style-type: none"> • J4846A • J4845A • J4847A • J4857A 	M2B07501.bin or greater recommended	H2R07504.bin
HP 6308M-SX	<ul style="list-style-type: none"> • M1B07108.bin or greater recommended 	<ul style="list-style-type: none"> • HPR06636.bin*
HP 6208M-SX	<ul style="list-style-type: none"> • M1B07108.bin or greater recommended 	<ul style="list-style-type: none"> • HPS06636.bin*

Product	Boot Image	Flash Image
10 Gigabit Ethernet modules	The Gigabit Ethernet modules do not have boot code separate from the management module. However, they do have Field-Programmable Gate Arrays (FPGAs). See the next column.	<p>The modules do not have flash code separate from the management module. However, they do have Field-Programmable Gate Arrays (FPGAs).</p> <p>FPGA revision numbers:</p> <ul style="list-style-type: none"> • rxbmgr.bin – 6 • rxpp.bin – 9 • txaccum.bin – 6 • txpp.bin – 6 • ageram.bin – 5 <p>Note: To determine the revisions that are running on the modules, enter the show flash command. The revision information is listed separately for each 10 Gigabit Ethernet module in the chassis. See “Displaying the Installed FPGA Revisions” on page 29.</p>

*Does not support Secure Shell (SSH) version 1.

NOTE: If you are adding a Gigabit Copper module to a 9304M or 9308M routing switch chassis, boot code version M2B07108.bin or later must already be installed in the routing switch.

Downloading the Latest Software and Documentation

You can download software version 07.5.04 and the corresponding product documentation from HP's ProCurve website as described below.

To Download a Software Version:

1. Go to HP's ProCurve website at <http://www.hp.com/go/hpprocurve>
2. Click on **software** (in the sidebar).
3. Under “latest software”, click on **switches**.

Note: If you are downloading software for a 9304M, 9308M, or 9515M, select the option that matches the type of management module(s) you are using in the device (WITH redundant management or WITHOUT redundant management).

To Download Product Documentation:

NOTE: The documentation for release 07.5.04 is included on the Product Documentation CD-ROM shipped with management modules after May, 2002.

For the latest version of product documentation for the HP ProCurve routing switches:

1. Go to HP's ProCurve website at <http://www.hp.com/go/hpprocurve>

2. Click on **technical support**, then **manuals**.
3. Click on the name of the product for which you want manuals.
4. On the page listing the manuals, find the latest manuals under the heading "**For software version 7.5.04 or greater**".

You will need the Adobe® Acrobat® Reader (version 4.0 or greater) to view and/or print the manuals.

Upgrading the Routing Switch to a New Software Release

For easy software image management, all HP devices support the download and upload of software images between the flash modules on the devices and a Trivial File Transfer Protocol (TFTP) server on the network.

The management module contains two flash memory segments:

Primary flash — The default local storage device for image files and configuration files.

Secondary flash — A second flash storage device. You can use the secondary flash to store redundant images for additional booting reliability or to preserve one software image while testing another one.

Only one flash device is active at a time. By default, the primary image will become active upon reload.

You can update the software contained on a flash module using TFTP to copy the update image from a TFTP server onto the flash module. In addition, you can copy software images and configuration files from a flash module to a TFTP server.

NOTE: The 9304M, 9308M, and 9315M routing switches are TFTP clients but not TFTP servers. You must perform the TFTP transaction from the routing switch. You cannot "put" a file onto the routing switch using the interface of your TFTP server.

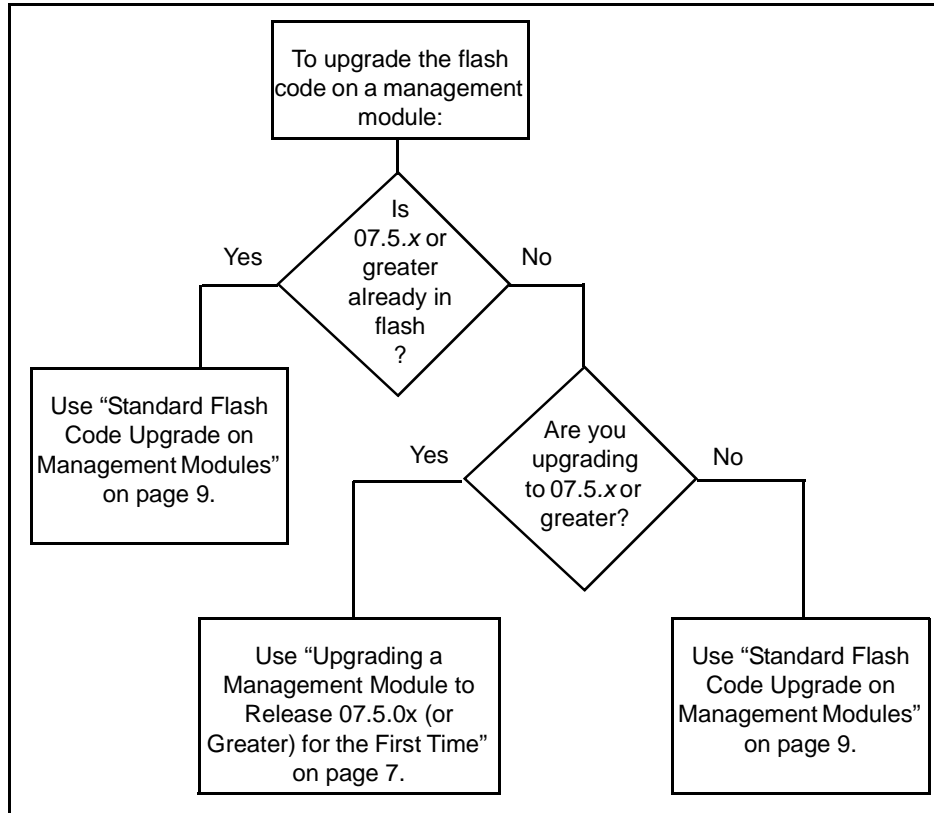
The 9304M, 9308M, and 9315M TFTP client supports 8 x 3 file names. If you try to copy a file with more than eight characters and up to three characters in the extension, the interface reports that the file was not found on the TFTP server.

If you are upgrading redundant management modules, the flash code is automatically copied from the active management module to the standby module when you reload. However, the boot code is not automatically copied. See the "Using Redundant Management Modules" chapter in the *Installation and Configuration Guide* included on the Documentation CD-ROM shipped with your management module(s). (For the latest version of this guide, visit <http://www.hp.com/go/hpprocurve> and click on **technical support | manuals**.)

Upgrading the Flash Code

Choosing the Upgrade Process

The process to use for upgrading software in a management module depends on (1) the latest version you have previously loaded into the module and (2) the version with which you want to upgrade the module. Use this flowchart to determine the upgrade process to use.



Upgrading a Management Module to Release 07.5.0x (or Greater) for the First Time

NOTE: The 9315M Routing Switch requires a minimum of one Redundant Management Module running software release 07.5.x or greater.

Due to the size of the 07.5.x (or greater) OS software image, you cannot directly upgrade the OS image in a Redundant Management Module if that module does not already have an 07.5.x (or greater) image in flash memory. Thus to upgrade a Redundant Management Module to release 07.5.x (or greater) for the first time (for use in the 9304M, 9308M, or the 9315M with Redundant Management), you must use the switch's BOOT MONITOR feature and initially boot the switch using 07.5.x (or greater) code residing in an TFTP server.

Management modules shipped from the factory after May, 2002 include the minimum OS and boot code software required to operate a 9315M routing switch. (These modules can be installed in a 9304M, 9308M, or 9315M chassis). However, there are instances where you may be planning to use a management module with release 07.5.x, but that module's OS and/or boot code is earlier than release 07.5.x. For example:

- A module has been in prior service in a 9304M or 9308M chassis without upgrading to release 07.5.x.
- A module was shipped from the factory before release 07.5.x was released.

In these cases, it is necessary to upgrade the management module to 07.5.0x (or greater) OS and boot code. The following table provides a guide for this operation.

Hardware and Software Configuration	Software Upgrade Steps
MII or MIV Redundant Management Module installed in a 9304M or 9308M Chassis with: <ul style="list-style-type: none">• Boot Code Earlier than 07.5.0x• OS Code Earlier than 07.5.0x	<ol style="list-style-type: none">1. Copy the 07.5.x OS software to a TFTP server and note the file name and path.2. Upgrade the boot code in the management module to release 07.5.0x or greater. (Refer to the chapter titled “Updating Software Images and Configuration Files” in the <i>Installation and Getting Started Guide for the HP ProCurve Routing Switches 9304M, 9308M, and 9315M.</i>)3. Reboot the routing switch as follows.<ol style="list-style-type: none">a. Execute the reload command.b. Immediately after executing the boot command, enter Boot Monitor mode by pressing and holding the [B] key. You will then see this prompt: BOOT MONITOR >c. Assign an IP address to the routing switch: BOOT MONITOR > ip address < ip-address > < subnet-mask >d. If necessary, assign a default gateway IP address to the routing switch: BOOT MONITOR > ip default_gateway < ip-address >4. Boot the switch using the 07.5.x OS you previously copied into the TFTP server:<ol style="list-style-type: none">a. BOOT MONITOR > boot system tftp < server-ip-address > < file-name >b. Upgrade the OS to 07.5.x. (Refer to the chapter titled “Updating Software Images and Configuration Files” in the <i>Installation and Getting Started Guide for the HP ProCurve Routing Switches 9304M, 9308M, and 9315M.</i>)

Hardware and Software Configuration	Software Upgrade Steps
MII or MIV Redundant Management Module installed in a 9315M chassis, and: <ul style="list-style-type: none"> • Boot Code 07.5.0x or greater. • OS Code Earlier than 07.5.0x 	<ol style="list-style-type: none"> 1. Copy the 07.5.x OS software to a TFTP server and note the file name and path. 2. Reboot the 9315M as follows. <ol style="list-style-type: none"> a. Execute the reload command. b. Immediately after executing the boot command, enter Boot Monitor mode by pressing and holding the [B] key. You will then see this prompt: BOOT MONITOR > c. Assign an IP address to the 9315M: BOOT MONITOR > ip address < ip-address > < subnet-mask > d. If necessary, assign a default gateway IP address to the 9315M: BOOT MONITOR > ip default_gateway < ip-address > 3. Boot the switch using the 07.5.x OS you previously copied into the TFTP server: <ol style="list-style-type: none"> a. BOOT MONITOR > boot system tftp < server-ip-address > < file-name > b. Upgrade the OS to 07.5.x. (Refer to the chapter titled “Updating Software Images and Configuration Files” in the <i>Installation and Getting Started Guide for the HP ProCurve Routing Switches 9304M, 9308M, and 9315M.</i>)
MII or MIV Redundant Management Module installed in a 9315M chassis, and: <ul style="list-style-type: none"> • Boot Code earlier than 07.5.0x • OS Code earlier than 07.5.0x 	You will need assistance. Contact your HP support representative.
MII or MIV Redundant Management Module installed in a 9315M chassis, and: <ul style="list-style-type: none"> • Boot Code 07.5.0x or greater • OS Code 07.5.0x or greater 	No upgrade necessary to use release 07.5.x OS and boot code. (For the latest code release, visit http://www.hp.com/go/hpprocurve and click on software.)

Standard Flash Code Upgrade on Management Modules

Use this procedure when you are **not** upgrading a management module from a release earlier than 07.5.x.

When you upgrade the flash code, you must upgrade the flash code on the management module to the same software release **before** you reboot.

To upgrade the flash code on a management module:

1. Place the new flash code on a TFTP server to which the routing switch has access.
2. Enter either of the following commands at the Privileged EXEC level of the CLI (example: HP9300#) to copy the flash code from the TFTP server into the flash memory of the management module:
 - `copy tftp flash <ip-addr> <image-file-name> <primary | secondary>`
 - `ncopy tftp <ip-addr> <image-file-name> flash <primary | secondary>`

3. Verify that the flash code has been successfully copied by entering the following command at any level of the CLI:

```
show flash
```

The line that begins “Compressed Pri Code size” lists the flash code version in the primary flash, at the end of the line. Similarly, the line that begins “Compressed Sec Code size” lists the flash code version in the secondary flash.

4. If the flash code version is correct, go to Step 5. Otherwise, go to Step 1.
5. Reload the software by entering one of the following commands:
 - `reload` (This command boots from the default boot source, which is the primary flash area by default.)
 - `boot system flash <primary | secondary>`

For information on changing the block size for TFTP transfers or using the web management interface to transfer software images, refer to *Book 1: Installation and Getting Started Guide* for the routing switches. For an electronic version of the latest release of this guide, visit <http://www.hp.com/go/hpprocurve> and click on **technical support | manuals**.)

Using SNMP to Upgrade Software

You can use a third-party SNMP management application such as HP OpenView to upgrade software on a HP ProCurve device.

NOTE: Make sure you use the correct procedure for your device and processor type. For example, do not use the Management Processor procedure to upgrade the Switching Processors on a module.

NOTE: The syntax shown in this section assumes that you have installed HP OpenView in the “/usr” directory.

Use this procedure to upgrade a management II or IV module.

To upgrade flash code on a module:

1. Configure a read-write community string on the HP ProCurve device, if one is not already configured. To configure a read-write community string, enter the following command from the global CONFIG level of the CLI:

```
snmp-server community <string> ro | rw
```

where <string> is the community string and can be up to 32 characters long.

2. On the HP ProCurve device, enter the following command from the global CONFIG level of the CLI:

```
no snmp-server pw-check
```

This command disables password checking for SNMP set requests. If a third-party SNMP management application does not add a password to the password field when it sends SNMP set requests to a HP ProCurve device, by default the HP ProCurve device rejects the request.

3. From the command prompt in the UNIX shell, enter the following command:

```
/usr/OV/bin/snmpset -c <rw-community-string> <ip-addr> 1.3.6.1.4.1.1991.1.1.2.1.5.0  
ipaddress <tftp-ip-addr> 1.3.6.1.4.1.1991.1.1.2.1.6.0 octetstringascii <file-name>  
1.3.6.1.4.1.1991.1.1.2.1.7.0 integer <command-integer>
```

where:

<rw-community-string> is a read-write community string configured on the HP ProCurve device.

<HP-ip-addr> is the HP ProCurve device’s IP address.

<ftp-ip-addr> is the TFTP server's IP address.

<file-name> is the image file name.

<command-integer> is one of the following:

20 – Download the flash code into the device's primary flash area.

22 – Download the flash code into the device's secondary flash area.

Updating Boot Code

Under certain conditions, HP ProCurve support personnel may request you to update the boot code on a routing switch management module. Because the boot code is essential for the management module to operate, and because no backup copy is stored on the module, extreme caution is necessary when updating this code. Use the following steps to verify TFTP operation and to update the boot code.

1. Use the **show flash** command to verify the current boot code version. The last line in this example shows the verification output for boot code version 06.05.00:

```
HP9300> enable
HP9300# show flash
Active management module:
Code Flash Type: AMD 29F032B, Size: 64 * 65536 = 4194304, Unit: 2
Boot Flash Type: AMD 29F040, Size: 8 * 65536 = 524288
Compressed Primary Code size = 2579100, Version 07.1.10T53
Compressed Secondary Code size = 2053824, Version 06.6.16T53
Maximum Code Image Size Supported: 2817536 (0x002afe00)
Boot Image Version 06.05.00
```

2. Verify that your TFTP server interoperates properly with the routing switch. To do so, copy the software image stored in secondary flash to a TFTP server, delete the image from secondary flash, and then copy the image you saved onto the TFTP server back into secondary flash. For example, if the IP address of the TFTP server is 192.168.1.1 and the file name you will use to store the image is H2R06616.bin:
 - a. Copy the software image stored in secondary flash to the TFTP server.

```
HP9300# copy flash tftp 192.168.1.1 H2R06616.bin sec
HP9300#Flash to TFTP Done.
```

- b. On the routing switch, delete the software image stored in secondary flash and verify that secondary flash is empty. (If secondary flash is empty, you will see "size = 0" in the "Compressed Secondary Code" line of the **show flash** command output.) For example:

```
HP9300# erase flash secondary
Flash Erase HP9300#-----Erase flash Done.
HP9300# show flash
Active management module:
Code Flash Type: AMD 29F032B, Size: 64 * 65536 = 4194304, Unit: 2
Boot Flash Type: AMD 29F040, Size: 8 * 65536 = 524288
Compressed Primary Code size = 2579100, Version 07.1.10T53
Compressed Secondary Code size = 0, Version
Maximum Code Image Size Supported: 2817536 (0x002afe00)
Boot Image Version 06.05.00
```

- c. Copy the software image file you just saved (in step a) from the TFTP server back to secondary flash on the routing switch and verify that the code is stored in secondary flash. For example:

```
HP9300# copy tftp flash 192.168.1.1 H2R06616.bin sec
HP9300# Flash Erase -----
Flash Memory Write (8192 bytes per dot)
```

```
.....  
.....TFTP to Flash Done.
```

```
HP9300# show flash  
Active management module:  
Code Flash Type: AMD 29F032B, Size: 64 * 65536 = 4194304, Unit: 2  
Boot Flash Type: AMD 29F040, Size: 8 * 65536 = 524288  
Compressed Primary Code size = 2579100, Version 07.1.10T53  
Compressed Secondary Code size = 2053824, Version 06.6.16T53  
Maximum Code Image Size Supported: 2817536 (0x002afe00)  
Boot Image Version 07.01.01
```

The “size” and “Version” values in the “Compressed Secondary Code” line, above, indicate that the software image file has been successfully reloaded into secondary flash. You have now verified that your communication with the TFTP server is working properly.

3. Download the appropriate boot code from the HP ProCurve ProCurve website to your TFTP server. (Go to <http://www.hp.com/go/hpprocurve> and click on **software**.)
4. Use the (undocumented) boot command shown below to initiate the TFTP download. For example, to download the M2B07105.bin boot code from a TFTP server at 192.168.1.1.

CAUTION: It is extremely important that the TFTP download of the boot code is not interrupted. An interruption in this process can result in a non-bootable system. If for any reason the boot code download is not successful, please do not use the **reload** command in the next step. Instead, contact an HP ProCurve Customer Care Center immediately. To find the HP ProCurve Customer Care Center for your area, see the support and warranty booklet shipped with your routing switch product, or see the *HP ProCurve Networking Service and Support Guide* available on HP ProCurve’s ProCurve website at <http://www.hp.com/go/hpprocurve>. (Click on **technical support** and then **support services**.)

```
HP9308# copy tftp flash 192.168.1.1 M2B07108.bin boot  
HP9308# Writing to flash, please wait ... Done
```

```
HP9308# show flash  
Active management module:  
Code Flash Type: AMD 29F032B, Size: 64 * 65536 = 4194304, Unit: 2  
Boot Flash Type: AMD 29F040, Size: 8 * 65536 = 524288  
Compressed Primary Code size = 2579100, Version 07.1.10T53  
Compressed Secondary Code size = 2053824, Version 06.6.16T53  
Maximum Code Image Size Supported: 2817536 (0x002afe00)  
Boot Image Version 07.01.08
```

Note that in the preceding example, the Boot Image Version number (07.01.08) at the end of step 4, above, is a later (higher) version than the Boot Image Version number (06.05.00) at the end of step 1. This indicates a successful download of a new boot image to the routing switch.

5. Execute the **reload** command to ensure that the boot code operates properly:

```
HP9308# reload
```

Upgrading an FPGA on a 10 Gigabit Ethernet Module

1. Complete the upgrades of the boot code and flash code, if required.
2. Enter the following command at Privileged EXEC level of the CLI:
 - **10gig copy tftp flash** <ip-addr> <filename> [**module** <slotnum>]

where:

- **tftp** – specifies the location of the FPGA file. The **tftp** parameter indicates that the file is on a TFTP server.

- <ip-addr> – specifies the IP address of the TFTP server, if you specify **tftp**.
- <filename> – specifies the FPGA file name.

NOTE: You can store and copy the FPGA files using any valid filename. You are not required to store and copy the files using the names listed in “Software Image Files” on page 3. The device uses information within the files to install them in the correct FPGAs, and the **show flash** command lists the FPGAs according to the names in “Software Image Files” on page 3. For an example of the **show flash** output, see “Displaying the Installed FPGA Revisions” on page 29.

- **module** <slotnum> – optionally, specifies the modules on which you want to install the upgrade. If you do not specify a slot number, the command upgrades the FPGA on all 10 Gigabit Ethernet modules in the chassis.
3. Reload the software by entering one of the following commands:
- **reload** (this command boots from the default boot source, which is the primary flash area by default)
 - **boot system flash primary | secondary**

NOTE: The **show flash** command will list the new FPGA code versions but the new versions do not take effect until you reload the software.

Note Regarding Removing Chassis Modules

Before you remove a module from a chassis, disable the module. Disabling the module before removing it prevents a brief service interruption on other modules. The brief interruption can be caused by the chassis re-initializing other modules in the chassis when you remove an enabled module.

NOTE: This section does not apply to the active or standby Redundant Management modules. The **disable module** and **enable module** commands are not applicable to management modules.

To disable a module, enter a command such as the following at the Privileged EXEC level of the CLI:

```
HP9300# disable module 3
```

This command disables the module in slot 3.

Syntax: disable module <slot-num>

The <slot-num> parameter specifies the slot number.

- Slots in a 4-slot chassis are numbered 1 – 4, from top to bottom.
- Slots in an 8-slot chassis are numbered 1 – 8, from left to right.

NOTE: If you remove the module without first disabling it, the chassis re-initializes the other modules in the chassis, causing a brief interruption in service after which the chassis resumes normal operation.

If, after disabling a module, you decide not to remove the module, re-enable the module using the following command:

Syntax: enable module <slot-num>

For example, to re-enable a module in slot 3:

```
HP9300# enable module 3
```

NOTE: You do not need to enable a module after inserting it in the chassis. The module is automatically enabled when you insert the module into a live chassis or when you power on the chassis.

NOTE: If you plan to replace the removed module with a different type of module, you must configure the slot for the module. To configure a slot for a module, use the **module** command at the global CONFIG level of the CLI.

Redundant Management on the 9304M, 9308M, and 9315M Routing Switches

Redundant Management means that the device can operate with two management modules installed; one active and one standby. If the active management module becomes unavailable, the standby management module automatically takes over system operation.

Management modules WITHOUT Redundant Management are sometimes termed “MI” modules (for “Management I”). MI modules include:

- J4141A HP ProCurve 9300 10/100 Management Module (16-port)
- J4144A HP ProCurve 9300 Gigabit SX Management Module (8-port)
- J4146A HP ProCurve 9300 Gigabit 4LX/4SX Management Module (8-port)
- J4840A HP ProCurve 6308M-SX Routing Switch

NOTE: MI management modules do not operate in the 9315M routing switch.

Also, if you are using a management module without redundant management in a 9304M or 9308M, only one management module can be installed in the routing switch.

Management modules WITH Redundant Management capabilities are sometimes termed “MII” or “MIV” modules (for “Management 2” or “Management 4”). These modules include:

- J4845A ProCurve 9300 GigLX Redundant Management Module (8-port, MII)
- J4846A ProCurve 9300 GigSX Redundant Management Module (8-port, MII)
- J4847A ProCurve 9300 Redundant Management Module (0-port, MII)
- J4857A HP ProCurve 9300 Mini-GBIC Redundant Management Module (8-port, MIV)

If you are using a Redundant Management module, you can install either one or two such modules in the routing switch.

NOTE: MI management modules and MII/MIV redundant management modules *are mutually exclusive*. That is, a 9304M or 9308M does not operate if an MII or MIV redundant management module is installed while an MI management module is also installed. Also, as noted above, MI management modules do not operate in a 9315M routing switch.

For more information, see the chapter titled “Using Redundant Management Modules” in the *Installation and Getting Started Guide* that is included on the *Documentation CD-ROM* shipped with your management module, and also downloadable from the HP ProCurve website. (Refer to “To Download Product Documentation:” on page 5.)

These notes also contain information regarding what happens when you disable BGP4, OSPF, or VRRP. See “Usage Guidelines for Access Control Lists (ACLs)” on page 16.

Maximum File Sizes for Startup-Config and Running-Config Files

Each HP ProCurve device has a maximum allowable size for the running-config and the startup-config file. If you use TFTP to load additional information into a device’s running-config or startup-config file, it is possible to exceed the maximum allowable size. If this occurs, you will not be able to save the configuration changes.

The following table lists the maximum size for the running-config and the startup-config file on HP ProCurve devices.

Product type	Maximum running-config and startup-config file sizes ^a
A 9315 using Management II or higher	256K
A 9304M or 9308M using Management II or higher	256K
A 9304M or 9308M using Management I	128K
A 6308M-SX or 6208M-SX	64K

a.The running-config and startup-config file can each be the size listed. The maximum size is not the maximum combined size for the running-config and startup-config files.

To determine the size of an HP ProCurve device's running-config or startup-config file, copy it to a TFTP server, then use the directory services on the server to list the size of the copied file. To copy the running-config or startup-config file to a TFTP server, use one of the following commands.

- Command to copy the running-config to a TFTP server:
copy running-config tftp <ip-addr> <filename>
- Command to copy the startup-config file to a TFTP server:
copy startup-config tftp <ip-addr> <filename>

Configuration Considerations for the 15-Slot Chassis (9315M)

Use the following considerations when configuring your 15-slot Chassis device.

Upgrading from Earlier Software

The 15-slot chassis requires software release 07.5.04 or higher. This is true regardless of whether you plan to install a management module from a 4-slot or 8-slot chassis that has been running an earlier software release.

To upgrade a management module from a release earlier than 07.5.04, refer to “Upgrading a Management Module to Release 07.5.0x (or Greater) for the First Time” on page 7.)

Removing a Module from an Active Chassis

To remove a module from a chassis, disable the module first before removing the module from the chassis. Refer to “Note Regarding Removing Chassis Modules” on page 13.

NOTE: If you remove a module without first disabling it, the chassis re-initializes other modules in the chassis, causing a brief interruption in service after which the chassis resumes normal operation.

Slot Locations for Redundant Management Modules

The 15 slots in the chassis are divided among 4 internal regions. Slots 1 – 4 belong to the same region; slots 5 – 8 belong to the same region; slots 9 – 12 belong to the same region, and slots 13 – 15 belong to the same region. If you are using redundant management modules, HP ProCurve recommends that you place both management modules in slots belonging to the same region. For example, if you place one management module in slot 5, HP ProCurve recommends that you place the other management module in slot 6, 7, or 8.

MAC Addresses

The 15-slot chassis makes use of locally administered MAC addresses. If your site already uses locally administered MAC addresses of the HP ProCurve OUI, which is 00e052, there could be a MAC address conflict with one of the ports on the HP ProCurve device.

Using Modules That Also Have Their Own Software

Some forwarding modules use their own on-board boot code and flash code in addition to using the boot code and flash code installed on the management module.

To use this type of module in a 15-slot chassis, you must install version 07.5.04 or greater of the module's flash code on the module. Otherwise, the module will not operate in the 15-slot chassis. For the current software versions, refer to "Software Image Files" on page 3.

Server Trunk Groups

If you plan to configure ports on a module into a server trunk group, use the following guidelines:

- The management module(s) and the module that has the server trunk group's ports must be in the same set of slots (slots 1 – 7 or 9 – 15). Do not place the management module(s) and the module containing the trunk ports in separate sets of slots.
- Do not place the management module(s) or the module that has the server trunk group's ports in slot 8.

NOTE: These guidelines apply to a server trunk group that is configured on a single module or on a pair of modules (multi-slot trunk group). You do not need to follow these guidelines for a switch trunk group.

Change to the Maximum Number of VLANs and Virtual Interfaces on 128M Devices

To support added features in software release 07.5.04 and greater, the maximum number of VLANs and virtual interfaces (VEs) that you can configure on devices with 128M management modules is changed in software release 07.5.4 and greater.

Table 1 lists the default and configurable maximum numbers of VLANs and virtual interfaces for routing switches in software release 07.5.04 and later. Unless otherwise noted, the values apply to both types of switches.

Table 1: VLAN and Virtual Interface Support

Product	VLANs		Virtual Interfaces	
	Default Maximum	Configurable Maximum	Default Maximum	Configurable Maximum
Series 9300 routing switch M4 management module with 256MB	32	4095	255	4095
Series 9300 routing switch M2 management module with 128MB	16	512 (routing switch code) 2048 (Layer 2 Switch code)	255	512

Usage Guidelines for Access Control Lists (ACLs)

This section provides some guidelines for implementing ACLs to ensure wire-speed ACL performance.

For optimal ACL performance, use the following guidelines:

- Apply ACLs to inbound traffic rather than outbound traffic.
- Use the default filtering behavior as much as possible. For example, if you are concerned with filtering only a few specific addresses, create deny entries for those addresses, then create a single entry to permit all other traffic. For tighter control, create explicit permit entries and use the default deny action for all other addresses.
- Use deny ACLs sparingly. When a deny ACL is applied to an interface, the software sends all packets sent or received on the interface (depending on the traffic direction of the ACL) to the CPU for examination.

- Adjust system resources if needed:
 - If IP traffic is going to be high, increase the size of the IP forwarding cache to allow more routes. To do so, use the **system-max ip-cache <num>** command at the global CONFIG level of the CLI.
 - If much of the IP traffic you are filtering is UDP traffic, increase the size of the session table to allow more ACL sessions. To do so, use the **system-max session-limit <num>** command at the global CONFIG level of the CLI.

Avoid the following implementations when possible:

- Do not apply ACLs to outbound traffic. The system creates separate inbound ACLs to ensure that an outbound ACL is honored for traffic that normally would be forwarded to other ports.
- Do not enable the strict TCP ACL mode unless you need it for tighter security.
- Avoid ICMP-based ACLs where possible. If you are interested in providing protection against ICMP Denial of Service (DoS) attacks, use HP ProCurve's DoS protection features. See the chapter titled "Protecting Against Denial of Service Attacks" in the *Advanced Configuration and Management Guide* included on the Documentation CD-ROM shipped with your management module(s). Also, the latest version of this guide is available on the HP ProCurve website. (Refer to "Downloading the Latest Software and Documentation" on page 5.)

If the IP traffic in your network is characterized by a high volume of short sessions, this also can affect ACL performance, since this traffic initially must go to the CPU. All ICMP ACLs go to the CPU, as do all TCP SYN, SYN/ACK, FIN, and RST packets and the first UDP packet of a session.

ACL Support on the HP ProCurve Products

HP ProCurve ACLs have two basic types of uses:

- Filtering forwarded traffic through the device
- Controlling management access to the device itself

In general, routing switches support both types of ACLs. However, the 6208M-SX switch supports ACLs only for access control.

The following table lists the ACL functions supported on each HP ProCurve routing switch and Layer 2 Switch supported in this software release.

Product	Packet Forwarding ACLs Supported	Management Access ACLs Supported
9304M	Yes	Yes
9308M	Yes	Yes
6308M-SX	Yes	Yes
6208M-SX	No	Yes

Using ACLs and Network Address Translation (NAT) on the Same Interface

You can use ACLs and NAT on the same interface, so long as you follow these guidelines:

- Do not enable NAT on an interface until you have applied ACLs (as described below) to the interface. If NAT is already enabled, you must disable it, apply the ACLs, then re-enable NAT on the interface.
- Enable the strict TCP mode.
- On the inside NAT interface (the one connected to the private addresses), apply inbound ACLs that permit TCP, UDP, and ICMP traffic to enter the device from the private sub-net.

You can use a standard ACL to permit all traffic (including TCP, UDP, and ICMP traffic) or an extended ACL with separate entries to explicitly permit TCP, UDP, and ICMP traffic.

NOTE: You do not need to apply ACLs to permit TCP, UDP, and ICMP traffic unless you are applying other ACLs to the interface as well. If you do not plan to apply any ACLs to a NAT interface, then you do not need to apply the ACLs to permit TCP, UDP, and ICMP traffic.

Here is an example of how to configure a device to use ACLs and NAT on the same interfaces. In this example, the inside NAT interface is port 1/1 and the outside NAT interface is port 2/2.

The following commands enable the strict TCP mode and configure an ACL to permit all traffic from the 10.10.200.x sub-net. A second ACL denies traffic from a specific host on the Internet.

```
HP9300(config)# ip strict-acl-tcp
HP9300(config)# access-list 1 permit 10.10.200.0 0.0.0.255
HP9300(config)# access-list 2 deny 209.157.2.184
```

The following commands configure global NAT parameters.

```
HP9300(config)# ip nat inside source list 1 pool outadds overload
HP9300(config)# ip nat pool outadds 204.168.2.1 204.168.2.254 netmask 255.255.255.0
```

The following commands configure the inside and outside NAT interfaces. Notice that the ACLs are applied to the inbound direction on the inside NAT interface, and are applied *before* NAT is enabled. In this example, ACL 1 permits all traffic to come into the inside interface from the private sub-net. ACL 2 denies traffic from a specific host from going out the interface to the private sub-net.

```
HP9300(config)# interface ethernet 1/1
HP9300(config-if-e1000-1/1)# ip address 10.10.200.1 255.255.255.0
HP9300(config-if-e1000-1/1)# ip access-group 1 in
HP9300(config-if-e1000-1/1)# ip access-group 2 out
HP9300(config-if-e1000-1/1)# ip nat inside
HP9300(config-if-e1000-1/1)# interface ethernet 2/2
HP9300(config-if-e1000-2/2)# ip address 204.168.2.78 255.255.255.0
HP9300(config-if-e1000-2/2)# ip nat outside
```

Where to Find More Information

- For traffic filtering ACLs, refer to the chapter titled “IP Access Control Lists (ACLs)” in the *Advanced Configuration and Management Guide*.
- For management access ACLs, refer to the chapter titled “Securing Access to Management Functions” in the *Security Guide*.
- For DoS protection features, refer to the chapter titled “Protecting Against Denial of Service Attacks” in the *Advanced Configuration and Management Guide*.
- For information about IP access policies, see the “IP Access Policies” section in the “Policies and Filters” appendix in the *Advanced Configuration and Management Guide*.
- For NAT configuration information, see the “Network Address Translation” chapter in the *Advanced Configuration and Management Guide*.

Where To Find Documentation: All of the above manuals are included on the *Documentation CD-ROM* shipped with your management module(s). Also, the latest version of these guides are available on the HP ProCurve website. (Refer to “Downloading the Latest Software and Documentation” on page 5.)

Jumbo Packet Support

The default Maximum Transmission Unit (MTU) size on all HP ProCurve Ethernet ports is 1518, including the data and the Ethernet header. You can configure ports on a 10 Gigabit Ethernet module or Enhanced Performance (EP) module to support jumbo Ethernet frames up to 14336 bytes long.

You can enable jumbo support globally, on individual ports, or both. The MTU setting on an individual port overrides the global setting.

NOTE: To place an MTU change into effect, you must save the change to the startup-config file and reload the software.

NOTE: Jumbo packets are not supported on a 10 Gigabit Ethernet module if you use the module in a chassis that contains non-EP modules.

Configuration Considerations

- Use the same MTU for all ports enabled for jumbo support. A port that receives an Ethernet frame that is longer than the port's MTU will drop the frame.
- The jumbo support described in this section applies only to 10 Gigabit Ethernet modules and EP modules. To configure other devices or module types to support jumbo frames (up to 1920 bytes not including the frame header), see the *Release Notes for Software Release 07.5.04* or the "Changing the Global Maximum Transmission Unit (MTU)" section in the "Configuring IP" chapter of the *Advanced Configuration and Management Guide provided for software release 07.5.x (or greater)*

Enabling Jumbo Support

To globally enable jumbo support on all ports, enter commands such as the following:

```
HP9300(config)# default-mtu 14336
HP9300(config)# write memory
HP9300(config)# end
HP9300# reload
```

Syntax: [no] default-mtu <num>

The <num> parameter specifies the maximum number of bytes an Ethernet frame can have in order to be forwarded on a port. You can specify from 64 – 14436. The default is 1518.

To enable jumbo support on an individual 10 Gigabit Ethernet port, enter commands such as the following:

```
HP9300(config)# interface ethernet 1/1
HP9300(config-mif-1/1)# mtu 14336
HP9300(config-mif-1/1)# write memory
HP9300(config-mif-1/1)# end
HP9300# reload
```

Syntax: [no] mtu <num>

These commands change the MTU on port 1/1 to 14436. When you set the MTU on an individual port or group of ports, this setting overrides the global MTU setting.

Displaying Jumbo Support Information

To display jumbo support information for the device, enter the following command:

```
HP9300(config)# show mtu
Port  MTU
1/1   14436
2/1   1518
2/2   14436
2/3   1518
2/4   1518
2/5   1518
2/6   1518
2/7   1518
2/8   1518
3/1   14436
display continues for remaining ports in chassis...
```

The command lists the MTU for each port in the chassis. In this example, some ports have been configured to use MTU 14436, while other ports are using the default MTU.

Note Regarding Disabling BGP4, OSPF, or VRRP

You can easily disable a routing protocol using the CLI or Web management interface. However, be careful when you disable BGP4, OSPF, or VRRP. When you disable these protocols, the routing switch removes all the configuration information for the disabled protocol from the running-config. Moreover, when you save the configuration to the startup-config file after disabling one of these protocols, all the configuration information for the disabled protocol is removed from the startup-config file.

The CLI displays a warning message such as the following:

```
HP9300(config-bgp-router)# no router bgp
router bgp mode now disabled. All bgp config data will be lost when writing to
flash!
```

The Web management interface does not display a warning message.

If you have disabled the protocol but have not yet saved the configuration to the startup-config file, you can restore the configuration information by re-entering the command to enable the protocol (ex: **router bgp**), or by selecting the web management option to enable the protocol. If you have already saved the configuration to the startup-config file, the information has been destroyed.

If you are testing a BGP4, OSPF, or VRRP configuration and are likely to disable and re-enable the protocol, you might want to make a backup copy of the startup-config file containing the protocol's configuration information. This way, if you remove the configuration information by saving the configuration after disabling the protocol, you can restore the configuration by copying the backup copy of the startup-config file onto the flash memory.

Note to IP Multicast Users

HP routing switches support the following IP multicast versions:

- IGMP V2
- PIM Dense mode (PIM-DM) V1
- PIM Sparse mode (PIM-SM) V2
- DVMRP V2

For configuration information, see the "Configuring IP Multicast Protocols" chapter in the *Advanced Configuration and Management Guide* provided for software release 07.5.x (or greater).

Clarification On Trunk Load Sharing

HP ProCurve devices load share traffic across the ports in a trunk group. The method used for the load sharing depends on the following:

- Device type – 9304M/9308M/9315M (chassis) or 6308M-SX and 6208M-SX (fixed-port)
- Traffic type – Layer 2 or Layer 3
- Trunk type – Switch or server
- For certain traffic, port type on which the traffic enters the HP ProCurve device (Gigabit or 10/100)

NOTE: The port type applies only to Layer 2 traffic on a server trunk group.

Table 2 lists how HP ProCurve devices load share traffic across the ports in a trunk group on a 9304M, 9308M, or 9315M.

Table 2: HP ProCurve Trunk Group Load Sharing – 9304M/9308M/9315M

Traffic Layer	Trunk Group Type	Traffic Type	Load-Sharing Basis
Layer 2	Server	All traffic types	Destination MAC address
		IP received on 10/100 port	Hash value derived from source and destination IP addresses
		IPX received on 10/100 port	Hash value derived from source and destination IPX addresses
		AppleTalk received on 10/100 port	Hash value derived from source and destination AppleTalk addresses
		Other traffic types received on 10/100 port	Hash value derived from source and destination MAC address
		All traffic types received on Gigabit port	Gigabit Port number on which traffic was received
Layer 3	Switch	IP	Destination IP address
		IPX	Destination IPX address
		AppleTalk	Destination AppleTalk address
		All other traffic types	Destination MAC address
	Server	IP	Destination IP address
		IPX	Destination IPX address
		AppleTalk	Destination AppleTalk address
		All other traffic types	Destination MAC address

Table 3 lists how HP ProCurve devices load share traffic across the ports in a trunk group on a 6308M-SX or 6208M-SX.

NOTE: The 6308M-SX and 6208M-SX use the 06.x software branch (page 1) and are no longer offered by Hewlett-Packard.

Table 3: HP ProCurve Trunk Group Load Sharing – 6308M-SX or 6208M-SX

Traffic Layer	Trunk Group Type	Traffic Type	Load-Sharing Basis
Layer 2	Switch	All traffic types	Destination MAC address
	Server	IP	Hash value derived from source and destination IP addresses
		IPX	Hash value derived from source and destination IPX addresses
		AppleTalk	Hash value derived from source and destination AppleTalk addresses
		Other traffic types	Hash value derived from source and destination MAC address
Layer 3	Switch	IP	Source and destination IP addresses
		IPX	Source and destination IPX addresses
		AppleTalk	Source and destination AppleTalk addresses
		Other traffic types	Source and destination MAC address
	Server	IP	Source and destination IP addresses
		IPX	Source and destination IPX addresses
		AppleTalk	Source and destination AppleTalk addresses
		All other	Source and destination MAC address

Recovering from a Lost Password

By default, the CLI does not require passwords. However, if someone has configured a password for the HP ProCurve device but the password has been lost, you can regain super-user access to the device using the following procedure.

NOTE: Recovery from a lost password requires direct access to the serial port and a system reset.

To recover from a lost password:

1. Start a CLI session over the serial interface to the device.
2. Reboot the device.
3. While the system is booting, before the initial system prompt appears, enter **B** to enter the boot monitor mode.
4. Enter **no password** at the prompt. (You cannot abbreviate this command.) This command causes the device to bypass the system password check.
5. Enter **boot system flash primary** at the prompt.
6. After the console prompt reappears, assign a new password.

Summaries of SW Enhancements

This section summarizes the operating system enhancements in software releases 07.1.10 through 7.5.04. These enhancements are described in the product documentation for software release 07.5.04 or greater, included on the *Documentation CD-ROM* shipped with management modules after May, 2002. The latest version of this documentation is available on the HP ProCurve website. (Refer to "Downloading the Latest Software and Documentation" on page 5.)

System-Level Enhancements in 07.6.00

Disabling Web Management Access by HP TOP-TOOLS

By default, TCP ports 80 and 280 are enabled on the HP ProCurve device. TCP port 80 (HTTP) allows access to the device's Web management interface. TCP port 280 allows access to the device by HP TOP-TOOLS.

The **no web-management** command disables both TCP ports. However, if you want to disable only port 280 and leave port 80 enabled, use the **hp-top-tools** option with the command. Here is an example.

```
HP9300(config)# no web-management hp-top-tools
```

Syntax: [no] web-management [allow-no-password | enable [vlan <vlan-id>] | front-panel | hp-top-tools | list-menu]

The **hp-top-tools** parameter disables TCP port 280. For information about the other parameters, see the Command Line Interface Reference

Changes to the Ethernet Port Utilization Table

In the Web management interface Ethernet Port Utilization table (displayed using the Monitor-> Port->Utilization-Ethernet option), the following enhancements have been added:

- The column header "5 minute Period average value" in the Port Utilization table has been replaced with the column header "Average value".
- A new column that displays the load interval for the port has been added.

The following figure is an example of the new Port Utilization Web management interface page. (Note, only the top part of the page is shown.)

[\[ETHERNET Port Configuration\]](#)
[\[ETHERNET Port Attribute\]](#)
[\[ETHERNET Port Statistic\]](#)
[\[RMON ETHERNET Statistics\]](#)
[\[Error\]](#)
[\[History\]](#)

ETHERNET Port Utilization - Polling Interval 30 sec

Port	Load Interval (secs)	Average Value						5 Second Period											
		Bits/Sec		Pkts/Sec		Utilization		Bits/Sec			Pkts/Sec			Utilization					
		Rx	Tx	Rx	Tx	Rx	Tx	Rx	Peak Rx	Tx	Peak Tx	Rx	Peak Rx	Tx	Peak Tx	Rx	Peak Rx	Tx	Peak Tx
1	180	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
2	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
3	210	3168	3048	4	0	0.00%	0.00%	3120	24352	0	50352	3	21	0	22	0.00%	0.02%	0.00%	0.05%
4	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
5	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
6	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
7	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
8	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
9	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
10	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
11	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
12	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
13	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
14	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
15	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
16	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%
17	300	0	0	0	0	0.00%	0.00%	0	0	0	0	0	0	0	0	0.00%	0.00%	0.00%	0.00%

The following SNMP object for port load interval has also been added to the HP ProCurve MIB.

Name, OID, and Syntax	Access	Description
snSwPortLoadInterval 1.3.6.1.4.1.1991.1.1.3.3.1.1.56 Syntax: Integer	Read-write	The number of seconds used to calculate the average port utilization values. This object can have a value from 30 to 300, in 30 second increments. The default is 300 seconds.

Changing a UDP Port for a Trap Receiver

By default HP ProCurve devices sends traps to UDP port 162 of the trap manager. You can now configure which UDP port will be used by the trap receiver.

USING THE CLI

To specify an SNMP trap receiver and change the UDP port that will be used to receive traps, enter a command such as the following:

```
HP9300(config)# # snmp-server host 2.2.2.2 0 mypublic port 200
HP9300(config)# write memory
```

Syntax: snmp-server host <ip-addr> [0 | 1] <string> [port <value>]

The <ip-addr> parameter specifies the IP address of the trap receiver.

The **0** | **1** parameter specifies whether you want the software to encrypt the string (**1**) or show the string in the clear (**0**). The default is **0**.

The <string> parameter specifies an SNMP community string configured on the HP ProCurve device. The string can be a read-only string or a read-write string. The string is not used to authenticate access to the trap host but is instead a useful method for filtering traps on the host. For example, if you configure each of your HP ProCurve devices that use the trap host to send a different community string, you can easily distinguish among the traps from different HP ProCurve devices based on the community strings.

The command in the example above adds trap receiver 2.2.2.2 and configures the software to encrypt display of the community string. When you save the new community string to the startup-config file (using the **write memory** command), the software adds the following command to the file:

```
snmp-server host 2.2.2.2 1 <encrypted-string>
```

To add a trap receiver and configure the software to encrypt display of the community string in the CLI and Web management interface, enter commands such as the following:

```
HP9300(config)# snmp-server host 2.2.2.2 0 HP9300-12
HP9300(config)# write memory
```

The **port** <value> parameter allows you to specify which UDP port will be used by the trap receiver. This parameter allows you to configure several trap receivers in a system. With this parameter, Advanced Stack Network Manager and another network management application can coexist in the same system. HP ProCurve Series 9300 devices can be configured to send copies of traps to more than one network management application.

USING THE WEB MANAGEMENT INTERFACE

1. Log on to the device using a valid user name and password for read-write access.
2. Click the [Management](#) link to display the Management configuration panel.
3. Click the [Trap Receiver](#) link to display the Trap Receiver panel.

The screenshot shows a table titled "Trap Receiver" with the following data:

IP Address	UDP Port Number	Community String	Encrypt		
207.95.6.75	200	public	no	Delete	Modify
207.95.6.75	162	public	no	Delete	Modify
207.95.6.75	300	mypublic	no	Delete	Modify
IP Address	UDP Port Number	Community String	Encrypt		

Below the table is a link: [\[Add Trap Receiver\]](#)

At the bottom of the panel are navigation links: [\[Home\]](#) [\[Site Map\]](#) [\[Logout\]](#) [\[Save\]](#) [\[Frame Enable\]](#) [\[Disable\]](#) [\[TELNET\]](#)

4. Click [Add Trap Receiver](#) link to add a new trap receiver and display the following panel.

The screenshot shows a form titled "Trap Receiver" with the following fields and buttons:

IP Address:

UDP Port Number:

Community String:

Encrypt:

Buttons: [Add](#) [Delete](#) [Reset](#)

Link: [\[Show\]](#)

Navigation links: [\[Home\]](#) [\[Site Map\]](#) [\[Logout\]](#) [\[Save\]](#) [\[Frame Enable\]](#) [\[Disable\]](#) [\[TELNET\]](#)

5. Enter the IP address of the receiver in the IP Address field.
6. Enter the UDP port number that will be used to receive traps. If no port number is entered, then UDP port 162 will be used by trap receivers.
7. Enter the community string you want the routing switch to send in traps sent to this host in the Community String field.
8. Select the Encrypt checkbox to remove the checkmark if you want to disable encryption of the string display. Encryption prevents other users from seeing the string in the CLI or Web management interface. If you disable encryption, other users can view the community string. Encryption is enabled by default.
To re-enable encryption, select the checkbox to place a checkmark in the box.
9. Click Add to apply the change to the device's running-config file.
10. Select the [Save](#) link at the bottom of the panel. Select Yes when prompted to save the configuration change to the startup-config file on the device's flash memory.

SNMP MIB Object

A new SNMP object has been added to the HP ProCurve MIB that allows you to change trap receiver ports using SNMP.

Name, OID, and Syntax	Access	Description
snAgTrpRcvrUDPPort 1.3.6.1.4.1.1991.1.1.2.3.1.1.5	Read-write	The UDP port number used as the trap receiver. The default is 162.
Syntax: Integer		

SNMP Banner Command Objects

New SNMP MIB objects have been added for configuring CLI banners.

Object Name and Identifier	Access	Description
snAgGblBannerExec 1.3.6.1.4.1.1991.1.1.2.1.61	Read-write	Enter a message that will be displayed when a user enters the Privileged EXEC CLI level of a device. Enter up to 2048 characters for this banner. Use the character "\n" within the string to start a new line. Leave this object blank if no message is to be displayed.
snAgGblBannerIncoming 1.3.6.1.4.1.1991.1.1.2.1.62	Read-write	Enter a message that will be displayed on the Console when a user establishes a Telnet session. This message includes the location where the user is connecting from. and displays a configurable text message. Enter up to 2048 characters for this banner. Use the character "\n" within the string to start a new line. Leave this object blank if no message is to be displayed.
snAgGblBannerMotd 1.3.6.1.4.1.1991.1.1.2.1.63	Read-write	Enter the message of the day that will be displayed on a user's terminal when he or she establishes a Telnet CLI session. Enter up to 2048 characters for this banner. Use the character "\n" within the string to start a new line. Leave this object blank if no message is to be displayed.

SNMP Telnet Login Timeout Object

A new SNMP MIB object has been added for the Telnet login timeout.

Object Name and Identifier	Access	Description
snAgGblTelnetLoginTimeout 1.3.6.1.1.1991.1.1.2.1.60	Read-write	Indicates how many minutes you have to log in before Telnet is disconnected. The value of this object can be from 1 to 10 minutes. The default is 1 minute.

New Hardware Support in 07.6.00

Model	Description	Ports	Interface Type
J4891A	Forwarding module	1-Port 10-Gigabit 10km	
J4885A	EP Management module	8-Port Mini-GBIC	Mini-GBIC slots for 1000BaseSX, 1000BaseLX or 1000BaseLH fiber
J4881A	EP Forwarding module	48 10/100 Ethernet Copper ports	RJ-45s for Cat-5 copper (10/100 Mbps)
J4889A	EP Forwarding module	48 10/100 Ethernet Copper ports	RJ-21s for Cat-5 copper (10/100);
J4894A	EP Forwarding module	16-port Mini-GBIC	Mini-GBIC slots for 1000BaseSX, 1000BaseLX or 1000BaseLH fiber
J4895A	EP Forwarding module	16-port 100/1000 Ethernet copper ports	RJ-45s for Cat-5 copper (100/1000 Mbps)

HP ProCurve 10 Gigabit Ethernet Modules

HP ProCurve provides only the 1310nm serial for single-mode fiber 10 Gigabit Ethernet interface. (J4891A)

Figure 1 shows the front panel of a 10 Gigabit Ethernet module.



Figure 1 Front panel of 10 Gigabit Ethernet module

Each 10 Gigabit Ethernet module provides one 10 Gigabit interface. The interfaces operate at full duplex. For the serial port types listed above, use the matching fiber type with an SC connector. For example, if you are using the 1310nm serial module for single-mode fiber, attach a 1310nm single-mode fiber cable that has an SC connector.

HP ProCurve 10 Gigabit Ethernet modules are compliant with IEEE 802.3ae draft 3.3.

System Requirements

The 10 Gigabit Ethernet modules are supported in the following products:

- 9304M, 9308M, and 9315M

You need an M2, M3, or M4 management module that supports redundancy.

Hardware

Each 10 Gigabit Ethernet module uses a single 10 Gigabit Ethernet MAC controller, separate transmit and receive controllers, and five Field-Programmable Gate Arrays (FPGAs). The FPGAs enable you to easily implement architecture upgrades without changing the hardware. The software includes a CLI command you can use to upgrade the FPGAs if needed. See “Upgrading an FPGA on a 10 Gigabit Ethernet Module” on page 12.

The 10 Gigabit Ethernet standard does not include link auto-negotiation. A HP ProCurve 10 Gigabit Ethernet port is unable to detect a link failure at the other end of the link if the failure is on the receive side of the remote link. However, the HP ProCurve 10 Gigabit Ethernet port can detect a link failure if the failure occurs on the transmit side of the remote link.

Port LEDs

The LEDs listed in Table 1 provide status information for the 10 Gigabit Ethernet port. All types of HP ProCurve 10 Gigabit Ethernet modules use the same port LEDs.

Table 1: LEDs for 10 Gigabit Ethernet Ports

LED	Position	State	Meaning
Link	Top	On	Port is connected.
		Off	No port connection exists.
Activity	Bottom	Off	No traffic is being transmitted.
		Blinking	Traffic is being transmitted and received on that port.

Feature Support

The 10 Gigabit Ethernet modules support all of the applicable Layer 2 and Layer 3 features in software release 07.6.00 and earlier. In addition to the software release 07.6.00 features, the 10 Gigabit Ethernet modules support the following:

- Jumbo packets – You can configure ports to forward Ethernet frames up to 14336 bytes long, including the data and the Ethernet header. See “Jumbo Packet Support” on page 18.

NOTE: Jumbo packets are not supported if you use the module in a chassis that contains non-EP modules. For example, jumbo packets are supported in the Series 9300 with the HP ProCurve 9300 EP Mini GBIC Redundant Management Module (J4885A) but are not supported in a Series 9300 chassis using any other management modules.

Features That Are Not Supported

The following features are not supported in this release:

- Rate limiting
- QoS
- Trunking
- sFlow Export
- IP multicast on tagged ports
- Jumbo packets, if the module is used in a chassis that contains non-EP modules. When you use the module in a chassis containing EP modules, jumbo packets are supported.

Feature Documentation

For feature descriptions and configuration information, see the remaining sections in these release notes and the HP ProCurve user documentation listed in "Downloading the Latest Software and Documentation" on page 5.

Displaying the Installed FPGA Revisions

To display the software versions installed in flash memory on the management module and the FPGA revisions installed on the 10 Gigabit Ethernet modules, enter the following command:

```
HP9300#show flash
Active management module:
Code Flash Type: AMD 29F032B, Size: 64 * 65536 = 4194304, Unit: 2
Boot Flash Type: AMD 29F040, Size: 8 * 65536 = 524288
Compressed Pri Code size = 2022863, Version 07.5.00b1T51 (b2s07500b1.bin)
Compressed Sec Code size = 1990253, Version 07.5.02b1T51 (b2r075~1.bin)
Maximum Code Image Size Supported: 3866112 (0x003afe00)
Boot Image size = 162664, Version 07.03.00 (m2b07300b3.bin)
Monitor Image Version 4, for DRAM size 268435456

10 GIG module slot 2
X10G RXBMGR FGPA   version: 0 revision: 6   2001/11/15   15:38:43
X10G RXPP FGPA     version: 0 revision: 9   2001/11/30   23:29:42
X10G TXACCUM FGPA  version: 0 revision: 6   2001/11/29   00:11:55
X10G TXPP FGPA     version: 0 revision: 6   2001/12/01   21:48:22
X10G AGERAM FGPA   version: 0 revision: 5   2001/10/26   19:53:24
```

Syntax: show flash

The boot code and flash code versions are listed in the "Compressed Pri Code size", "Compressed Sec Code size", and "Boot Image size" lines of the display. The FPGA versions are listed separately for each 10 Gigabit Ethernet module. In this example, the chassis contains one 10 Gigabit Ethernet module, in slot 2. Notice that the FPGA names match the file names listed in "Software Image Files" on page 3.

Enhanced Performance (EP) Management Module

Figure 2 shows the front panel of a 9300 EP Mini GBIC Redundant Management Module. The J4885A is based on MIV technology for greater performance.

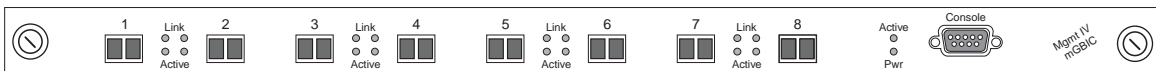


Figure 2 HP ProCurve 9300 EP Mini GBIC Redundant Management Module (J4885A)

Enhanced Performance ASICs

EP module ports are managed by the following custom ASICs:

- Integrated Gigabit Controllers (IGCs) – Ethernet packet controllers for Gigabit ports. Each Gigabit Ethernet module contains two IGCs.
- Integrated Packet Controllers (IPCs) – Ethernet packet controllers for 10/100 ports. Each 10/100 Ethernet module contains two IPCs.

These custom ASICs perform address lookup, data formatting and data movement for Ethernet packets. The Gigabit Ethernet modules use IGCs. The 10/100 modules use IPCs.

Each Gigabit Ethernet management or forwarding module has two IGCs.

- IGC 1 manages ports 1 – 4 on the module.
- IGC 2 manages ports 5 – 8 on the module.

Each 10/100 forwarding module has two IPCs:

- IPC 1 manages ports 1 – 24 on the module.

- IPC 2 manages ports 25 – 48 on the module.

Generally, you do not need to know which IGC or IPC is managing a port. However, the information is useful for a few features such as jumbo support and port monitoring. The documentation repeats the IGC and IPC port mapping information where needed.

System Status LEDs

The LEDs listed in Table 1 provide status information for the management processor and system power.

Table 1: System Status LEDs

LED	Position	State	Meaning
Active	Left side of serial interface, top	On	The management processor is active.
		Off	The management processor is not active.
Pwr	Left side of serial interface, bottom	On	The power status is good.
		Off	The power status problem.

Serial Management Interface

On management modules, the serial management interface enables you to configure and manage the device using a third-party terminal emulation application on a directly connected PC. A straight-through EIA/TIA DB-9 serial cable (M/F) is shipped with the device.

Reset Button

On management modules, the reset button allows you to restart the system. The button is recessed to prevent it from being pushed accidentally.

Temperature Sensor

Every EP module contains a temperature sensor. Depending on the temperature reported by the sensor, the software can send a warning if the temperature exceeds the normal threshold and can even shut the device down if the temperature exceeds the safe threshold. The software reads the temperature sensor according to the system poll time, which is 60 seconds by default.

You can display the temperature of the device. You also can change the warning and shutdown temperatures and the chassis poll time. See the Installation and Getting Started Guide.

Gigabit Ethernet Network Interfaces

The EP Gigabit Ethernet management modules provide eight miniature Gigabit Interface Converter (mini-GBIC) slots. You can insert a 1000BaseSX or 1000BaseLX fiber connector into each slot, in any combination.

The LEDs listed in Table 2 provide status information for the ports.

Table 2: LEDs for 1000 Mbps Ports

LED	Position	State	Meaning
Link	Top	On	Port is connected.
		Off	No port connection exists.
Activity	Bottom	Off	No traffic is being transmitted.
		Blinking	Traffic is being transmitted and received on that port.

Enhanced Performance Forwarding Modules

EP 10/100 Ethernet Forwarding Modules

Figure 3 shows the front panel of a HP ProCurve 9300 EP 10/100 RJ-45 Module (J4881A). This module occupies two chassis slots.

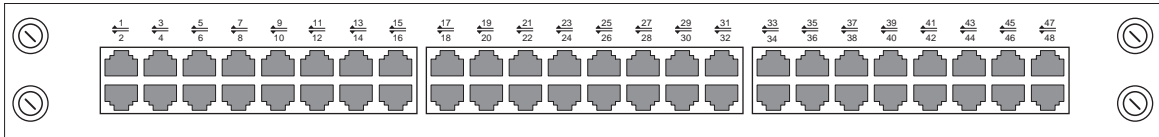


Figure 3 HP ProCurve 9300 EP 10/100 RJ-45 Module (J4881A)

Figure 4 shows the front panel of a HP ProCurve 9300 EP 10/100 Telco (RJ-21) Module (J4889A). This module occupies one chassis slot.

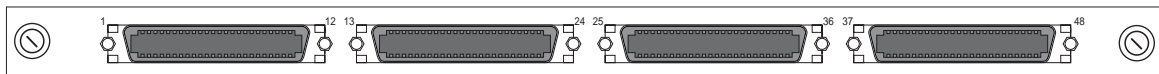


Figure 4 HP ProCurve 9300 EP 10/100 Telco (RJ-21) Module (J4889A)

All EP 10/100 modules have two IPCs for managing the ports. See “Enhanced Performance ASICs” on page 29.

10/100 Ethernet Network Interfaces

EP 10/100 modules provide the following types of interfaces:

- RJ-45 – provided on the J4881A
- RJ-21 – provided on the J4889A

Each 10/100 port on the J4881A modules has its own RJ-45 connector. Each connector supports a 10/100 Ethernet network segment on Cat5 cabling.

- Use a crossover cable to connect to another Layer 2 Switch or routing switch. A crossover cable swaps the wires so that the send signal on one port connects to the receive signal on the other port, and so on.
- Use a straight-through cable to connect to an end station or server. A straight-through cable does not swap the wires.

For the pin assignments and signalling for crossover connections on the 10/100 ports, see Figure 9.

The LEDs listed in Table 1 provide status information for the 10/100 ports.

Table 1: LEDs for 10/100 Mbps Ports

LED	Position	State	Meaning
Link/Activity	Left	Off	No port connection exists.
		Blinking	Traffic is being transmitted and received on that port.
FDX	Right	On	The port is operating at full-duplex.
		Off	The port is operating at half-duplex.

RJ-21 Interfaces

The EP Telco modules provide four 50-pin connectors for attaching to 48 10/100 Ethernet segments. The connectors use the RJ-21 wiring standard, which uses four wires for each network segment. Each connector supports 12 segments. Figure 5 shows an example of a Telco serial cable.

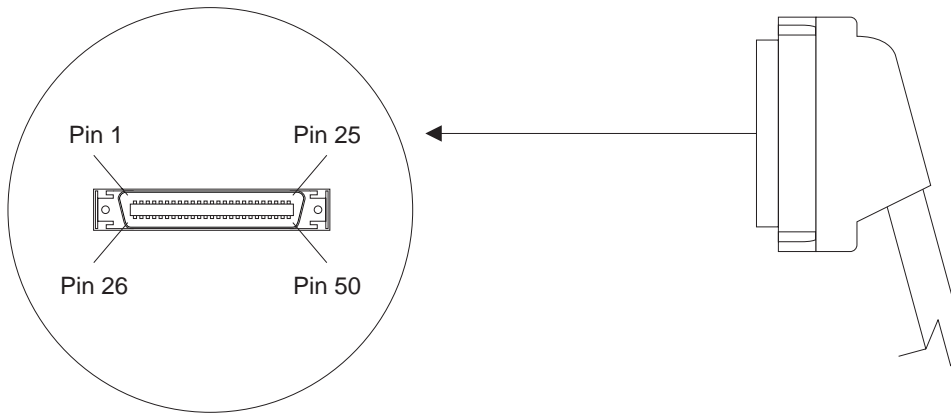


Figure 5 RJ-21 Telco serial cable

To connect the EP module to the network, you can use a cable that terminates in another 50-pin connector or one that terminates in 12 RJ-45 connectors, depending on the patch panel you are using.

Figure 6 shows an example of a patch panel that accepts a 50-pin connector, and converts the signals to 12 RJ-45 sockets. Each of the RJ-45 sockets uses four signals per the RJ-21 wiring standard. You can use Cat5 cables with RJ-45 connectors to plug your network devices into the patch panel.

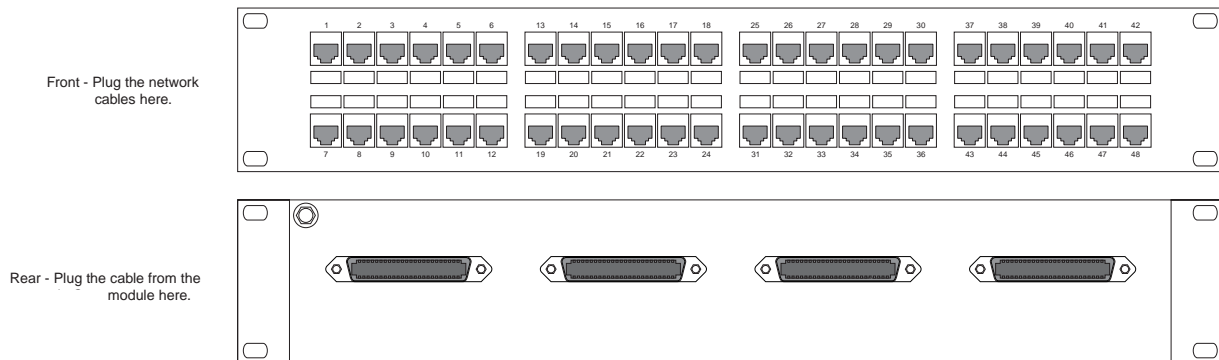


Figure 6 Telco patch panel

Table 1 shows the output signals on each EP Telco 50-pin connector. Notice that each 10/100 port uses four signals. Two of the signals are for transmit and the other two are for receive. Signals 25 and 50 are not used.

Table 1: Output Signals for RJ-21

10/100 Port	Pin Number	Signal	Pin Number	Signal
1	1	RxD (-)	26	RxD (+)
	2	TxD (-)	27	TxD (+)
2	3	RxD (-)	28	RxD (+)
	4	TxD (-)	29	TxD (+)

Table 1: Output Signals for RJ-21 (Continued)

10/100 Port	Pin Number	Signal	Pin Number	Signal
3	5	RxD (-)	30	RxD (+)
	6	TxD (-)	31	TxD (+)
4	7	RxD (-)	32	RxD (+)
	8	TxD (-)	33	TxD (+)
5	9	RxD (-)	34	RxD (+)
	10	TxD (-)	35	TxD (+)
6	11	RxD (-)	36	RxD (+)
	12	TxD (-)	37	TxD (+)
7	13	RxD (-)	38	RxD (+)
	14	TxD (-)	39	TxD (+)
8	15	RxD (-)	40	RxD (+)
	16	TxD (-)	41	TxD (+)
9	17	RxD (-)	42	RxD (+)
	18	TxD (-)	43	TxD (+)
10	19	RxD (-)	44	RxD (+)
	20	TxD (-)	45	TxD (+)
11	21	RxD (-)	46	RxD (+)
	22	TxD (-)	47	TxD (+)
12	23	RxD (-)	48	RxD (+)
	24	TxD (-)	49	TxD (+)
N/A	25	Not used	50	Not used

16-Port Gigabit Ethernet Forwarding Modules

Software release 07.6.00 supports the following new EP Gigabit Ethernet forwarding modules:

- HP ProCurve 9300 EP 100/1000-T Module (J4895A)
- HP ProCurve 9300 EP Mini-GBIC Module (J4894A)

Figure 7 shows the front panel of a HP ProCurve 9300 EP 100/1000-T Module (J4895A).

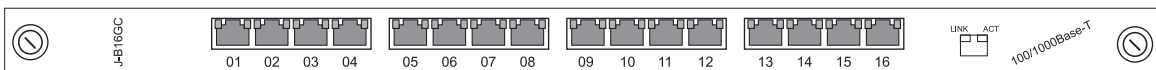


Figure 7 HP ProCurve 9300 EP 100/1000-T Module (J4895A)

The J4895A module provides 16 RJ-45 connectors for Cat5 cabling. Each port connects to a 100 Mbps or 1000 Mbps segment. The ports automatically detect the speed of the network and configure themselves accordingly. Each port can be manually configured for 100 Mbps or 1000 Mbps. The pin assignments and the status LEDs are

the same as the ones for the 100 and 1000 Mbps ports on other HP ProCurve modules. See Table 2, “LEDs for 1000 Mbps Ports,” on page 35.

Figure 8 shows the front panel of a HP ProCurve 9300 EP Mini-GBIC Module (J4894A).

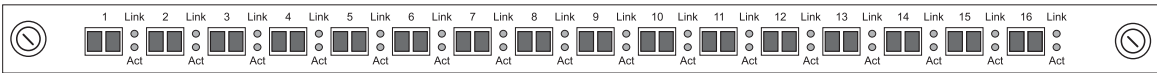


Figure 8 HP ProCurve 9300 EP Mini-GBIC Module (J4894A)

The J4894A module provide 16 slots for mini-GBIC connectors. You can insert mini-GBICs for 1000BaseSX, 1000BaseLX or 1000BaseLH fiber cables.

For information about the status LEDs, see Table 2, “LEDs for 1000 Mbps Ports,” on page 35. All these modules use the same status LEDs for Gigabit Ethernet ports.

Gigabit and 100/1000 Ethernet Network Interfaces

Twisted Pair Interfaces

The 9300 EP 100/1000-T Module (J4895A) provide 16 RJ-45 connectors for the 100/1000 interfaces. These connectors also use Category5 (Cat5) cabling. Figure 9 shows the pin assignments and signalling for crossover connections on the Gigabit Copper (100/1000BaseT) ports.

NOTE: For comparison, the figure also shows 10BaseT pin and signal information.

Figure 9 Crossover pin assignment and signalling for 100BaseTX and 1000BaseTX ports

Pin Assignment	10BaseT		100BaseTX and 1000BaseT	
	Pin Number	MDI-X ports	Pin Number	MDI-X ports
	1	RD+	1	RD+
	2	RD-	2	RD-
	3	TD+	3	TD+
	4	Not used	4	CMT
	5	Not used	5	CMT
	6	TD-	6	TD-
	7	Not used	7	CMT
	8	Not used	8	CMT

NOTE: The copper interfaces support autonegotiation but do not support half-duplex mode.

Forcing the Port Speed

The port’s autonegotiation selects the correct port speed for the link. However, you can force the port speed to be either 100 Mbps or 1000 Mbps.

- To force the port to run at 1000 Mbps, set one of the link's ports to be the master for the link. To set a port as a Gigabit master port, enter the following command at the interface configuration level for the port:
speed-duplex 1000-master
- To force a Gigabit port to run at 100 Mbps on a link where both ends support 1000 Mbps, use a crossover cable to connect to the remote end of the link, and set each end of the link to 100 Mbps. You need to use the crossover cable in addition to setting the port speed on each side of the link to 100 Mbps.

Fiber Interfaces

The 9300 EP Mini-GBIC Module (J4894A) provides 16 mini-GBIC connectors for 1000BaseSX, 1000BaseLX or 1000BaseLH transceivers.

The LEDs listed in Table 2 provide status information for the fiber and copper Gigabit ports.

Table 2: LEDs for 1000 Mbps Ports

LED	Position	State	Meaning
Link	Top	On	Port is connected.
		Off	No port connection exists.
Activity	Bottom	Off	No traffic is being transmitted.
		Blinking	Traffic is being transmitted and received on that port.

Feature Support

The EP modules support all of the applicable Layer 2 and Layer 3 features in software release 07.6.00. In addition to the software release 07.5.04 features, the EP modules support the following:

- Jumbo packets – You can configure ports to forward Ethernet frames up to 14336 bytes long, including the data and the Ethernet header. See “Jumbo Packet Support” on page 18.
- sFlow Export – You can remotely monitor port-level statistics with minimal performance impact. See “Using sFlow in 07.6.00” on page 35.

Feature Documentation

For feature descriptions and configuration information, see the remaining sections in these release notes and the HP ProCurve product documents listed in “Downloading the Latest Software and Documentation” on page 5.

Configuration Considerations

- Series 9300 EP modules do not require a new chassis. You can use the modules in your installed chassis.
- You cannot use EP modules and non-EP modules in the same chassis.

Using sFlow in 07.6.00

sFlow is a system for observing traffic flow patterns and quantities within and among a set of Layer 2 Switches and routing switches. To support sFlow, participating Layer 2 and Layer 3 devices:

- Sample packet flows
- Collect the packet headers from sampled packets and collect ingress-egress information on these packets
- Compose the collected information into flow sample messages
- Relay these messages to an external device known as a collector

Participating devices also relay byte and packet counter data for ports, called counter samples, to the collector.

sFlow is described in RFC 3176, “InMon Corporations' sFlow: A Method for Monitoring Traffic in Switched and Routed Networks”.

NOTE: The information in this section supersedes the information in earlier documentation, and applies only to Enhanced Performance Chassis devices running release 07.6.00 or later.

NOTE: Some of the configuration commands and defaults are different from those in previous releases. Even if you are familiar with configuring sFlow using an earlier software release, you might want to read this section.

Configuration Considerations

Data Collection

Sample data is collected from inbound traffic on ports enabled for sFlow. Outbound traffic is not sampled. However, both traffic directions are counted for byte and packet counter statistics sent to the collector.

Source Address

To use sFlow on a Layer 2 Switch, you must configure a management IP address on the switch. To use sFlow on a routing switch, you must configure a loopback interface or a router ID.

The sampled sFlow data sent to the collectors includes a MyIP field. This field identifies the device that sent the data. In sample data sent by a HP ProCurve device, the MyIP value is one of the following:

- On a Layer 2 Switch, MyIP is the Layer 2 Switch's management IP address.
- On a routing switch, MyIP is the router ID, if the router ID is also an IP interface configured on the device (on a port, virtual routing interface, or loopback interface).

If no router ID is configured or if the router ID is not also an IP interface configured on the device, MyIP is the first IP address configured on the first loopback interface that has an address.

NOTE: If the required IP address is not already configured when you enable sFlow, the feature uses the source address 0.0.0.0.

NOTE: If you change the address sFlow will use for MyIP, you must disable and re-enable sFlow to enable the feature to use the changed address.

Sampling Rate

sFlow sampling can affect performance in some configurations:

- When sFlow is enabled on a EP Ethernet port, sampling is enabled on the IPC that manages the port. You can enable sFlow on all the ports managed by the same IPC with minimal additional impact on performance.
- Changing the sampling rate affects performance for EP ports. A high sampling rate can reduce performance. Use a low sampling rate for better performance.
- Traffic associated with the operation of sFlow itself is part of the traffic counted on the sampled ports and may therefore be included in the sampled data.

Configuring and Enabling sFlow

To configure sFlow:

- Specify collector information. The collector is the external device to which you are exporting the sFlow data. You can specify up to four collectors.
- Optional – Change the polling interval.
- Optional – Change the sampling rate.
- Enable sFlow Export on individual interfaces.
- Enable sFlow Export globally.

NOTE: To make configuration changes to sFlow Export, you first must disable sFlow Export. After making the configuration changes, save the configuration changes to the startup-config file (**write memory** command), then re-enable sFlow Export.

Specifying the Collector

sFlow exports traffic statistics to an external collector. You can specify up to four collectors. You can specify more than one collector with the same IP address if the UDP port numbers are unique. You can have up to four unique combinations of IP address and UDP port number.

To specify sFlow collectors, enter a command such as the following:

```
HP9300(config)# sflow destination 10.10.10.1 6343
```

This command specifies a collector with IP address 10.10.10.1, listening for sFlow data on UDP port 6343.

Syntax: [no] sflow destination <ip-addr> <dest-udp-port>

The <ip-addr> parameter specifies the collector's IP address.

The <dest-udp-port> parameter specifies the UDP port on which the sFlow collector will be listening for exported sFlow data.

The sampled sFlow data sent to the collectors includes a MyIP field. This field identifies the device that sent the data. In sample data sent by a HP ProCurve device, the MyIP value is one of the following:

- On a Layer 2 Switch, MyIP is the Layer 2 Switch's management IP address.
- On a routing switch, MyIP is the router ID, if the router ID is also an IP interface configured on the device (on a port, virtual routing interface, or loopback interface).

If no router ID is configured or if the router ID is not also an IP interface configured on the device, MyIP is the first IP address configured on the first loopback interface that has an address.

NOTE: If the required IP address is not already configured when you enable sFlow, the feature uses the source address 0.0.0.0.

NOTE: If you change the address sFlow will use for MyIP, you must disable and re-enable sFlow to enable the feature to use the changed address.

Changing the Polling Interval

The polling interval defines how often sFlow byte and packet counter data for a port are sent to the sFlow collector(s). If multiple ports are enabled for sFlow, the HP ProCurve device staggers transmission of the counter data to smooth performance. For example, if sFlow is enabled on two ports and the polling interval is 20 seconds, the HP ProCurve device sends counter data every ten seconds. The counter data for one of the ports are sent after ten seconds, and counter data for the other port are sent after an additional ten seconds. Ten seconds later, new counter data for the first port are sent. Similarly, if sFlow is enabled on five ports and the polling interval is 20 seconds, the HP ProCurve device sends counter data every four seconds.

The default polling interval is 20 seconds. You can change the interval to a value from 1 to any higher value. The interval value applies to all interfaces on which sFlow is enabled. If you set the polling interval to 0, counter data sampling is disabled.

NOTE: sFlow uses CPU resources to poll for the information. If you enable sFlow on a lot of ports and set a low polling interval, CPU utilization can become high.

To change the polling interval, enter a command such as the following at the global CONFIG level of the CLI:

```
HP9300(config)# sflow polling-interval 30
```

Syntax: [no] sflow polling-interval <secs>

The <secs> parameter specifies the interval and can be from 1 to any higher value. The default is 20 seconds. If you specify 0, counter data sampling is disabled.

Changing the Sampling Rate

The sampling rate is the average ratio of the number of packets incoming on an sflow enabled port, to the number of flow samples taken from those packets. By setting the sampling rate to N, on average 1 in N packets in the monitored flows are sampled. The same sampling rate applies to all ports.

The default sampling rate is 512. On average, one in every 512 packets forwarded on an interface is sampled.

NOTE: HP ProCurve recommends that you do not change the sampling rate to a value lower than the default. Sampling requires CPU resources. Using a low sampling rate can cause high CPU utilization.

To change the sampling rate, enter a command such as the following at the global CONFIG level of the CLI:

```
HP9300(config)# sflow sample 2048
```

Syntax: [no] sflow sample <num>

The <num> parameter specifies the number of packets and can be one of the following:

- 1
- 2
- 8
- 32
- 128
- 512
- 2048
- 8192
- 32768
- 131072
- 524288
- 2097152
- 8388608
- 33554432
- 134217728
- 536870912
- 2147483648

The default is 512 packets.

Enabling sFlow Export

sFlow exports data only for the interfaces on which you enable Flow Switching. To enable sFlow export:

- Enable data export on individual interfaces.
- Enable the sFlow Export feature.

NOTE: Before you enable sFlow, make sure the device has an IP address that sFlow can use as its source address. See "Source Address" on page 36 for the source address requirements.

To enable sFlow Export on a Chassis device with only EP modules, enter:

```
HP9300(config)# interface ethernet 1/1 to 1/8
HP9300(config-mif-1/1-1/8)# sflow-forwarding
HP9300(config-mif-1/1-1/8)# exit
HP9300(config)# sflow enable
```

These commands enable sFlow Export on Ethernet ports 1/1 – 1/8, then enable the feature globally.

Syntax: [no] sflow-forwarding

Syntax: [no] sflow enable

Displaying sFlow Information

To display sFlow configuration information and statistics, enter the following command at any level of the CLI:

```
HP9300(config)# show sflow
S-Flow services are enabled.
S-Flow agent IP address: 192.168.2.3
2 collector destinations configured:
Collector IP 192.168.4.204, UDP 6344
Collector IP 192.168.4.201, UDP 6343
Polling interval is 20 seconds.
Configured average sampling rate: 1 per 2048 packets.
Average sampling rate: 1 per 2048 packets.
S-Flow ports: ethe 1/25 to 1/28
230 UDP packets exported
3 S-Flow samples collected.
```

This command shows the following information.

Table 3: Flow Cache Information

This Field...	Displays...
sFlow services	The feature state, which can be one of the following: <ul style="list-style-type: none"> disabled enabled
sFlow agent IP address	The MyIP address in the sFlow data packets sent to the collector. The MyIP value is one of the following: <ul style="list-style-type: none"> Switch management IP address (Layer 2 Switch) Router ID or the address of a loopback interface configured on the device (routing switch) See "Source Address" on page 36.
Collector	The collector information. The following information is displayed for each collector: <ul style="list-style-type: none"> IP address UDP port
Polling interval	The polling interval.
Configured average sampling rate	The configured sampling rate.
Average sampling rate	The actual sampling rate, which can differ slightly from the configured sampling rate. See the note in "Changing the Sampling Rate" on page 37.
sFlow ports	The ports on which you enabled sFlow.
UDP packets exported	The number of sFlow export packets the HP ProCurve device has sent.
sFlow samples collected	The number of packets that have been sent to the collector(s) as traffic samples.

Clearing sFlow Statistics

To clear the UDP packet and sFlow sample counters in the **show sflow** display, enter the following command:

```
HP9300(config)# clear statistics
```

This command clears the values in the following fields of the **show sflow** display:

- UDP packets exported
- sFlow samples collected

NOTE: This command also clears the statistics counters used by other features.

Summary of Enhancements in 07.5.04

New Hardware Support

Software release 07.5.04 provides the following new hardware support.

Enhancement	Description
New SNMP objects for Gigabit Interface Converters (GBIC) and mini-GBIC ports	Enables the use of SNMP to determine what type of mini-GBIC a port has.

Layer 3 Enhancements in 07.5.04

Enhancement	Description
New command, to enforce use of an EBGP neighbor's AS as the first AS in the path	The bgp enforce-first-as command causes the device to accept an AS path update from an EBGP neighbor only if the neighbor's AS is also the first AS in the AS_SEQUENCE field in the Update. If the ASs do not match, the device sends a Notification to the neighbor and closes the session.
Support for using an IP address as a BGP4 cluster ID	The bgp cluster-id command allows you to enter an IP address for the cluster ID, as an alternative to entering a number. Previous releases support entering a number only.
New interface options for the BGP4 neighbor update source	The neighbor command's update-source parameter now allows you to specify a physical port, a virtual routing interface, or an IP interface as the source for receiving BGP4 updates from a neighbor. Previous releases support specifying a loopback interface only.
New command, to change the BGP4 next-hop update timer	The update-time command changes the timer value for updating the BGP4 next-hop tables.
New commands, to change the BGP4 best path comparison	The following commands disable or enable specific comparisons used during selection of the best route path to a given destination: <ul style="list-style-type: none"> • as-path-ignore – disables or re-enables comparison of otherwise equal paths based on the length of the AS-Path. • compare-routerid – enables or disables comparison of otherwise equal paths based on the router ID of the neighbor that sent the path. <p>Note: Comparison of router IDs is applicable only when BGP4 load sharing is disabled.</p>
New command, to change the path types for which BGP4 load sharing is supported	The multi-path command lets you do the following: <ul style="list-style-type: none"> • Change load sharing support to apply to IBGP route paths only or to EBGP route paths only. By default, load sharing applies to both types of paths. • Enable load sharing among paths learned from different neighboring ASs. By default, load sharing applies only to paths that come from the same neighboring AS.
Static multicast groups	You can manually add a port to a multicast group. This is useful when a host is unable to use IGMP to advertise its group membership.
Unicast high-performance mode is enabled by default	The unicast high-performance mode, which enables the IP forwarding cache to contain more unique host route entries for unicast traffic, is enabled by default. In previous releases, the feature is disabled by default.
Increased route table capacity	You can configure the IP route table on a management module with 256M or higher to hold up to 400,000 entries. Previous releases support up to 256,000 routes. The default is still 128,000.
Support for configuring the ARP age on an individual interface	You can enter the ip arp-age command at the individual interface level to set ARP age for the interface. The interface's ARP age overrides the globally configured ARP age.
Support for enabling or disabling ICMP redirect messages on an individual interface	You can enter the ip icmp redirect command at the individual interface level to enable or disable ICMP redirect messages. <p>Note: The port forwards misdirected traffic to the appropriate router, even if you disable the redirect messages.</p>

Enhancement	Description
Changes to BGP4 Multi-Exit Discriminator (MED) comparison	<p>This release contains the following MED changes:</p> <ul style="list-style-type: none"> • Deterministic MED is always on and cannot be disabled. Deterministic MED compares MEDs if and only if the routes were learned from the same neighboring AS. • A new command, med-missing-as-worst, makes the routing switch regard a BGP route with a missing MED attribute as the least favorable route, when comparing the MEDs of the routes.
Cooperative BGP4 route filtering	<p>You can configure the routing switch to send IP prefix lists to a BGP4 neighbor and ask the neighbor to use the prefix lists to filter routes sent from the neighbor to the routing switch.</p>
New command to unsuppress a neighbor's routes	<p>You can use the neighbor <ip-addr> <peer-group-name> unsuppress-map <map-name> command to selectively unsuppress a route that has been suppressed due to aggregation, and enable advertisement of that route to a neighbor or peer group.</p>
New command to use the IP default route as a valid next hop for a BGP4 route	<p>You can use the next-hop-enable-default command to enable the device to use the IP default route to resolve the BGP4 next hop for a BGP4 route. By default, the default route is not used to resolve the BGP4 next hop.</p>
Named IP community and AS-path ACLs	<p>The CLI syntax for configuring IP community ACLs and AS-path ACLs is changed to accept a text string instead of a number as the ACL ID.</p>
New BGP4 route-map options	<p>This release provides the following new route-map options for BGP4 routes:</p> <ul style="list-style-type: none"> • match ip route-source <acl> prefix <name> – Matches based on the source of a route (the IP address of the neighbor from which the HP ProCurve device learned the route) • match community <acl> exact-match – Matches a route only if the route's community attributes field contains the same community numbers specified in the match statement • set metric-type internal – When advertising a BGP4 route to an EBGp neighbor, sets a route's MED to the same value as the IGP metric of the BGP4 next-hop route • set ip next-hop peer-address – Sets the BGP4 next hop for a route to a neighbor address (inbound filtering) or the local IP address of the BGP4 session (outbound filtering) • set comm-list <acl> delete – Deletes the specified communities from a route's communities attribute
Support for using regular expressions in BGP4 community ACLs	<p>You can use a regular expression in a community ACL. Previous releases support regular expressions only in an AS-path ACL or filter.</p>
New option to display the last packet from a BGP4 neighbor that contained an error	<p>You can use the last-packet-with-error option with the show ip bgp neighbor <ip-addr> command to display the last packet from the neighbor that contained an error. The packet's contents are displayed in decoded format.</p>
Support for OSPF RFC 2328 Appendix E	<p>The routing switch generates separate type-5 link-state advertisements (LSAs) for external networks that are the same network but have different network masks. Previous releases do not generate separate LSAs.</p>

Enhancement	Description
New IP interface options for OSPF	You can configure an IP interface to be ignored by OSPF or to be advertised in OSPF without the interface forming OSPF router adjacencies. By default, an IP interface on a port enabled for OSPF is advertised and forms OSPF adjacencies.
Dynamic memory allocation for IP multicast groups	The software dynamically allocates memory for up to 1024 PIM group memberships and 1024 DVMRP group memberships.
Support for PIM Sparse Mode (SM) on loopback interfaces	You can configure a PIM SM Bootstrap Router (BSR) or Rendezvous Point (RP) on a loopback interface. Previous releases support configuring BSRs and RPs on physical ports or virtual interfaces only.
Multi-protocol Border Gateway Protocol (MBGP) support	You can use MBGP to configure BGP4 routing features for exchanging IP multicast route information with other IP multicast routers.
Option to disregard OSPF MTU field	You can disable comparison of the MTU field when forming OSPF adjacencies.
Enhancement to OSPF route learning	If a new area is configured after the routing switch comes up, OSPF routers in the new area learn routes in other areas.
Disabling BGP4 removes the entire BGP4 configuration	In software releases earlier than 07.5.04, disabling BGP4 does not actually remove the configuration information for the protocol. <i>In software release 07.5.04 or greater, disabling BGP4 removes all the running configuration information for the protocol.</i>
Changes to how BGP4 compares route paths	The default method for comparing paths based on the Multi-Exit Discriminator is changed.
New option for BGP4 neighbors	You can specify a maximum number of network prefixes to learn from a given BGP4 neighbor, and optionally terminate the session with that neighbor if the maximum is exceeded.
Soft reconfiguration of BGP4 neighbor sessions	You can configure the routing switch to retain all route updates from a neighbor or peer group, and use those updates to change the BGP4 route table after you change route policies. This method avoids requesting the neighbor's entire BGP4 route table again or resetting the session with the neighbor.
Changes to route maps are retroactively implemented	If you change a route map that is used by the BGP4 network command or a BGP4 redistribution command, the software updates the routes to retroactively place the change into effect. You do not need to clear routes manually.
Easier method for deleting route maps	You can remove an entire route map using a single command. Previous software releases require you to delete each entry in the route map separately.
New display option for show ip route command	The new none-bgp option displays the most specific route (the route with the longest matching prefix) that was not learned from BGP4.
New command for clearing and re-installing BGP4 routes in the IP route table	The clear ip bgp routes [<ip-addr>/<prefix-length>] command clears BGP4 routes from the IP route table and re-installs routes.
Enhanced show ip bgp summary display	The display lists how many routes have been filtered out and thus not placed in the BGP4 route table.

Enhancement	Description
Enhanced display of summary route information	All show commands that display BGP4 route information in summary format have been enhanced to show the AS-path of the Network Layer Reachability Information (NLRI).
Option to display summary route information for all BGP4 neighbors	You can enter a single command, show ip bgp neighbor route-summary , to display summary route information for all BGP4 neighbors. Previous releases allow you to display the summary information for individual neighbors only.
Enhancement to route information shown when you specify a prefix	When you specify an IP address with a show ip bgp routes <ip-addr> or show ip bgp <ip-addr> command, the output now lists information about the paths installed in the IP route table and the neighbors to which the routes will be advertised.
Enhancements to show ip bgp routes command	<p>The show ip bgp routes command has the following enhancements:</p> <ul style="list-style-type: none"> • A new option, nexthop, for displaying the routes for a given next-hop IP address. • A new option, no-best, to display the BGP4 routes for which none of the routes to a given prefix were selected as the best route. • A new option, age <secs>, to display only the routes that have been received or updated more recently than the number of seconds you specify. • A new option, route-map <map-name>, to display only routes that match the match conditions in the route map. • Two new fields and enhanced display format for the detail option.
New command for displaying peer group information	The show ip bgp peer-group [<group-name>] command displays configuration information for the specified peer group or for all peer groups.
Enhanced show ip bgp neighbors <ip-addr> display	The display now lists the values for all the configurable parameters for the neighbor.
Option to display error packet information for all neighbors	You can enter a single command, show ip bgp neighbor last-packet-with-error , to display error packet information for all BGP4 neighbors. Previous releases allow you to display the information for individual neighbors only.
Route map support for OSPF redistribution	You can use route maps to more tightly control route redistribution into OSPF.
Configurable reference bandwidth for OSPF interface cost	You can change the basis (reference bandwidth) on which the software calculates the OSPF cost of an interface.
OSPF Link State Advertisement (LSA) filters	You can filter out type 3 LSAs from a given area and address range.
Graceful migration for OSPF authentication changes	The software supports both new and old (changed) authentication information for a brief, configurable interval to prevent disruption to adjacencies with neighbors.
Changes to the ACLs in distribution lists are implemented automatically	If you change an ACL that is used by an OSPF distribution list, the software automatically implements the change. Previous releases require you to clear the IP route table to place a change to an OSPF distribution list into effect.

Enhancement	Description
New Syslog messages for bad OSPF packets	The device generates a Syslog message if it receives a bad OSPF packet. The message provides details about the error.
New command to list routes redistributed into OSPF	The show ip ospf redistribute route command lists the routes that have been redistributed into OSPF and the source from which the routes were redistributed.
New option for decrypted display of OSPF link-state advertisements (LSAs)	The extensive option displays decrypted LSA information when you use the option with the following commands: <ul style="list-style-type: none"> show ip ospf database external-link-state show ip ospf database link-state
New command for displaying entries in the Content Addressable Memory (CAM)	You can use the show cam ethernet <portnum> command to display Layer 2 CAM entries and the show cam ip <portnum> command to display Layer 3 CAM entries.
Support for Protocol Independent Multicast, Dense Mode (PIM DM) version 2	You can enable PIM DM V2 or V1 on a routing switch interface. Previous software releases support V1 only.
Increased number of VRRP Virtual Router IDs (VRIDs) supported on an interface	You can configure up to 16 VRRP VRIDs on an interface. Previous releases support up to 12.
Support for Network Address Translation (NAT) of global (Internet) addresses into private addresses	You can configure inside destination NAT, which translates the global addresses of traffic received from those addresses into private addresses. Previous releases support translation only of private addresses into public addresses, for traffic generated by the private addresses.
Support for optimized forwarding on the default route	You can optimize a routing switch's Content Addressable Memory (CAM) to cache multiple forwarding entries for the default route, instead of caching entries for individual destination networks.
BGP4 next-hop recursion	You can enable BGP4 to recursively look up a route's next hop until the software finds an Interior Gateway Protocol (IGP) path to the route destination. By default, the software performs only one route lookup, regardless of whether the path to the next hop is an IGP path or a BGP path. Only BGP routes with IGP paths to the next-hop gateway are eligible to be installed in the IP route table.
New command for injecting a default route into an OSPF Not-So-Stubby Area (NSSA)	You can configure the routing switch to inject a Type-7 default route into an NSSA to provide a path out of the NSSA, when the routing switch is an Area Border Router (ABR).
New CLI command to display CPU utilization statistics	The show process cpu command shows the percentage of CPU processing that each Layer 3 protocol has used since startup and had used at various time intervals.
New SNMP objects for PIM Sparse Mode (SM)	You can manage PIM SM through an SNMP application by accessing new PIM SM MIB objects.
Higher maximum number of IP routes	Redundant management modules with 128MB or higher memory can have up to 256,000 IP routes. Previously, up to 200,000 routes were supported.
More control over route redistribution from OSPF into the IP route table	You can use a distribution list to deny specific OSPF routes from being eligible for insertion into the IP route table.

Enhancement	Description
Change to the default value for the IGMP maximum response time	The default IGMP maximum response time is 5 seconds in software release 07.5.04. In previous software releases, the default is 10 seconds.

Layer 2 Enhancements in 07.5.04

Enhancement	Description
New command to display SuperSpan™ customer ID information	The show super-span [cid <num>] command displays the boundary interface configuration and BPDU statistics for each SuperSpan customer ID configured on the device.
<u>SuperSpan™</u>	<u>You can configure HP ProCurve devices as a common STP backbone for a large number of separate customer spanning trees. The SuperSpan backbone allows a very large yet manageable Layer 2 network while still minimizing interruptions caused by topology or link-state changes.</u>
STP per VLAN group	You can configure a group of port-based VLANs to use the same instance of a spanning tree. Grouping VLANs for STP enables you to use STP in more VLANs on a device.
GARP VLAN Registration Protocol (GVRP)	GVRP enables a HP ProCurve device to dynamically create 802.1Q-compliant VLANs on links with other devices that are running GVRP. Note: This feature is supported in the B2R, B2S, and B2P images only.
Rapid Spanning Tree (RSTP)	This feature enhances STP by immediately failing over to an alternate root port if the root port becomes unavailable.
Protocol Independent Multicast Sparse Mode (PIM SM) traffic reduction	You can configure a Layer 2 Switch to listen for PIM SM join and prune messages on each port and forward PIM SM traffic only on those ports.
Spanning Tree (STP)	The valid range for the STP port priority has been changed from 0 – 255 to 8 – 255.

System-Level Enhancements in 07.5.04

Enhancement	Description
STP display enhancements	<p>This release contains the following enhancements to how STP information is displayed:</p> <ul style="list-style-type: none"> The show span detail command's output is condensed to show information in fewer lines. In addition, the display now shows the bridge identifier. New options with the show span detail command display detailed information for a single port in a specific VLAN. The show span display is more readable.
New commands, to display and clear ACL statistics	The show ip acl-traffic command lists the number of packets permitted and denied by ACLs. The clear ip acl-traffic command clears the statistics.
New command, to enable hardware filtering for packets denied by ACLs	You can use the hw-drop-acl-denied-packet command to enable the device to create Content Addressable Memory (CAM) entries for packets denied by ACLs. This causes the filtering to occur in hardware instead of in the CPU. By default, packets denied by ACLs are filtered by the CPU.
Port ranges and lists supported when disabling or re-enabling trunk ports	You can disable or re-enable a range or list of individual ports in a trunk group. Previous releases support disabling or re-enabling either a single trunk port or all ports in the trunk group, but do not support disabling or re-enabling a range or list of ports.
New command, to close a UDP port	The port aps bootp command closes a UDP port. Some UDP ports are left open by default on the device. In software release 07.5.02, you can close the BootP or APS UDP port to provide additional security for the device.
New SNMP traps in the HP ProCurve MIB	<p>Traps are generated for the following conditions:</p> <ul style="list-style-type: none"> Changes to the running configuration Changes to the start-up configuration User login User logout
Enhancements to SNMP version 3	<p>SNMP Version 3, the user-based security model, has been enhanced with the following additions:</p> <ul style="list-style-type: none"> Support for SNMP version 3 packet encryption using the Data Encryption Standards (DES) encryption key. Engine boots and engine time have been added to the SNMP version 3 packets. These parameters plus the engine ID provide replay protection of packets.
Addition of SNMP System Log Server Table	Servers where Syslog messages will be sent can be configured using the new SNMP object "snAgSysLogServerTable".
End-to-end link keepalive for trunk links	End-to-end link keepalive monitors the links between two HP ProCurve devices and brings the ports on both ends of the link down if the link goes down at any point between the two devices.
sFlow Export MIB support	The sFlow MIB (RFC 3176) enables you to configure and manage sFlow Export through SNMP.

Enhancement	Description
Simplified configuration of individual trunk ports	The config-trunk-ind command enables configuration of individual trunk ports. You can enable, disable, or monitor primary or secondary individual trunk ports after entering this command. The command is not required for renaming individual trunk ports.
Simplified show statistics and show statistics brief displays	The display of packet errors in the output of the show statistics and show statistics brief commands is simplified to list InErrors and OutErrors only. Detailed error information is still provided by the show statistics <portnum> command.
Additional parameters for the show span detail command	The show span detail command has the following new parameters: <ul style="list-style-type: none"> • vlan <num> – Specify detailed information only for the specified VLAN • <num> – Skip the display forward to display information for VLANs after the specified number of VLANS
New command, to display information about VLAN groups	The show vlan-group [<group-id>] command displays configuration information for VLAN groups.
The show process cpu command displays GARP VLAN Registration Protocol (GVRP) statistics	The show process cpu command now includes statistics for GVRP.
SNMP MIB objects for 10 Gigabit Ethernet modules	Objects that show the speed of incoming and outgoing traffic on interfaces that are 10 Gigabits or faster have been added to the HP ProCurve MIBs.
Support for Maximum Transmission Unit (MTU) of 1920 bytes.	A new command, jumbo , globally sets the MTU for Ethernet interfaces to 1920 bytes. Previous releases support up to 1500 bytes.
Trunk group enhancements	This release contains the following trunk group enhancements: <ul style="list-style-type: none"> • New command, trunk deploy, to activate trunk group configuration commands without reloading the software. • Support for up to eight 10/100 or Gigabit trunk ports supported per module • New commands for naming, disabling, and re-enabling individual ports in a trunk group • Support for monitoring individual ports in a trunk group • Enhanced trunk group information display
ACL packet and flow counters	The HP ProCurve device counts packets and flows matching a given ACL entry in an ACL list.
Option to add a comment to an ACL	You can optionally add comment text to describe entries in an ACL.
ACL permit logging	This release supports logging of packets that match the permit conditions of an ACL entry.

Enhancement	Description
Show command enhancements	<p>This release contains the following enhancements to show commands:</p> <ul style="list-style-type: none"> • You can display hardware serial numbers. • The show flash command has been enhanced to make the display of POS information consistent with management module information. • The show interfaces command displays an interface's input and output load in terms of bits per second, packets per second, and utilization percentage, averaged over a configurable interval. • The show ip interface command now displays the following IP parameters for each interface: <ul style="list-style-type: none"> • Proxy ARP • Split horizon • ARP age • IP ACLs applied to the interface • A new command, show ip vrrp vrid <num> [ethernet <num> ve <num>], displays information for a specific VRRP VRID and even for a specific port configured with the VRID. • The show interface [<portnum>] and show interfaces brief commands show a virtual interface's state as down if the interface's VLAN is down. • A new command, show ptrace, lists the ptraces that are enabled.
Support for searching and filtering output from show commands	You can filter CLI output from show commands and at the --More-- prompt.
Higher maximum number of Syslog buffer entries supported on routing switches	You can configure the Syslog buffer on a routing switch to contain up to 1000 entries. Previous releases support up to 100 entries. The maximum on Layer 2 Switches is still 100.
IPv6 protocol VLAN support	You can configure protocol-based VLANs to provide Layer 3 broadcast domains for IPv6 traffic.
Support for empty VLANs	You can configure a VLAN without ports or delete all the ports from a VLAN without the VLAN being removed from the configuration. Previous releases do not allow you to configure a VLAN with no ports, and delete a VLAN entirely if you remove all the ports from the VLAN.
Change to how SSH key pairs are stored on HP ProCurve devices	Starting this software release, RSA host key pairs are saved in internal memory on the HP ProCurve device and, by default, do not appear in the startup-config file. You can optionally configure the HP ProCurve device to hide or show the RSA host key pair in the running-config file.
Support for TFTP source interface	You can specify an IP address on the HP ProCurve device to use as the source address for all TFTP packets originated by the device.
More flexible command syntax for clearing MAC addresses	The clear mac-address command has new parameters that allow you to specify a module, VLAN, or individual port.
Support for Telneting to a specified port	The HP ProCurve device supports connecting to a Telnet server using a specified port number.

Enhancement	Description
Cancelling an outbound Telnet session	If you have established a Telnet session from the console to a remote Telnet server, you can terminate the Telnet at the console.
Support for reading Cisco Discovery Protocol (CDP) packets	You can enable a HP ProCurve device to capture and display the contents of a CDP packet, which contain information about the Cisco devices that send them.
Enhanced show span output	The show span detail and show span vlan <vlan-id> commands are enhanced to display more information.
Enhanced show span vlan output	The show span detail command is enhanced to display more information.
New port number format in Web management interface	Chassis port numbers in the Web management interface are displayed and can be selected as a single entity. For example, port 1/1 is a single item on the pulldown menu for a panel's Port field. In previous releases, separate fields were used for slot numbers and port numbers.
Change to the SNMP community strings command	Specific views of the MIB can be assigned to community strings.
Support for SNMP v3 (RFCs 2570 and 2575)	You can use SNMP v3 for tighter security when managing a HP ProCurve device.
New HP ProCurve MIB objects	This release contains new HP ProCurve MIB objects for the following: <ul style="list-style-type: none"> • CPU utilization • Memory utilization • Software loads • SNMP trap holddown
Enhancement to ptrace snmp command	The command now lists the SNMP portion of all incoming SNMP packets.
New HP ProCurve MIB object for CPU utilization	HP ProCurve MIB MIB07208.mib and later contains the snAgentCpuUtilTable object for CPU utilization.
Maximum number of local user accounts increased	You can configure up to 32 local user accounts for access authentication. Previous releases support up to 16 local user accounts.
New display options for the running-config	You can specify an interface or use the vlan option with the show running-config command to display configuration information specifically for the interface or for VLANs.
Displaying TCP memory usage	The show memory tcp command displays the amount of used and free memory for each of the four internal TCP buffers.
Displaying TCP connections	The show ip tcp connections command displays information about each TCP connection on the device, including the local IP address, local port number, remote IP address, remote port number and the state of the connection. In addition, the command displays the percentage of free memory for each of the internal TCP buffers.
Displaying information about individual TCP connections	The show ip tcp status command displays detailed information about a specified TCP connection, including the sequence and ACK numbers, window sizes, and available buffer sizes.
Displaying internal TCP buffer memory allocation	The debug ip tcp memory command causes messages to be displayed when memory is allocated or deallocated to the internal TCP buffers.

Enhancement	Description
Increased number of IGMP groups supported by Layer 2 Switches	The IP multicast traffic reduction feature supports up to 1024 IGMP groups. In previous releases, the feature supports up to 255 IGMP groups.
Options to specify ICMP message types upon which to filter in extended ACLs	You can use extended ACLs to more precisely filter ICMP traffic using new ICMP message type options.
Support for multiple ports on a Static MAC entry	When you configure a static MAC entry, you can associate the entry with multiple ports. Previous software releases allow you to associate a static MAC entry with only a single port.
Support for multiple mirror ports	You can configure and use more than one mirror port. Each mirror port can have its own set of monitored ports. Previous releases allow only one mirror port.
Increased maximum number of VLANs on 256MB redundant management modules	You can configure up to 4095 port-based VLANs on a redundant management module with 256MB. Previous releases allow up to 2048 VLANs.
Configurable holddown timer for SNMP traps	You can specify how many seconds SNMP waits following a software reload or device cold start, before beginning to send traps to an SNMP server. Previous software releases use a non-configurable holddown time of 60 seconds.
New MIB objects for dynamic memory utilization statistics	The HP ProCurve MIB has new objects that indicate the total amount of memory on the device, the amount that is free, and the percentage that is currently being used.
Support for SSH access control using ACLs	You can more tightly control management access to a device through SSH by using ACLs.
Configurable maximum idle time for SSH sessions	The maximum idle time for SSH sessions can be set to between 0 – 240 minutes.
Encryption of RADIUS and TACACS keys	When you display the configuration of the HP ProCurve device, the RADIUS and TACACS keys are encrypted. You can configure this feature using the CLI, Web management interface.
AAA security for commands pasted into a running-config file	If AAA security is enabled on the device, commands pasted into the running-config file are subject to the same AAA operations as if they were entered manually.
Ability to specify different servers for individual AAA functions	In a RADIUS or TACACS+ configuration, you can designate a server to handle a specific AAA task. You can configure this feature using the CLI, Web management interface.
Ability to enter Privileged EXEC Mode After a Telnet or SSH Login	By default, you enter User EXEC mode after a successful login through Telnet or SSH. Optionally, you can configure the device so that you enter Privileged EXEC mode after a Telnet or SSH login.
Telnet/SSH login prompt obtained from TACACS+ server	When TACACS+ authentication is configured, the HP ProCurve device now obtains from the TACACS+ server the login prompt, password prompt, as well as any other prompts specified by the TACACS+ server.

Enhancement	Description
Users can be prompted for Enable or Line password when TACACS+ server is unavailable	If a user attempts to login through Telnet or SSH, but none of the configured TACACS+ servers are available, the user can be prompted for the Enable or Line password if these methods are specified after TACACS+ in the authentication-method list.
Command authorization and accounting for console commands	The device now supports command authorization and command accounting for CLI commands entered at the console.
Backplane debugging commands	For debugging purposes, you can monitor information about the backplane hardware on a Chassis device.
Enhancement to BGP diagnostic command	The debug ip bgp update command can display debugging output for a specified IP prefix list.
Dynamic link aggregation	You can enable ports for IEEE 802.3ad link aggregation, a protocol that allows ports to automatically negotiate trunk group configuration with other devices.
Private VLANs	You can configure highly secure VLANs within port-based VLANs for very tight access control between ports.
Dual mode VLAN ports	You can configure a tagged port as a dual-mode port, which allows it to accept and transmit both tagged traffic and untagged traffic at the same time.
Configurable link hold-down timer	You can specify how many milliseconds you want the software to wait before bringing up a specific port following a software reload.
Dynamic configuration loading	You can load dynamic configuration commands from a configuration file on a TFTP server into the device's running-config. Note: This enhancement applies only to commands that do not require a software reload to take effect.
Rate limiting for ARP packets	You can limit the number of ARP packets the HP ProCurve device receives each second.
New CLI command to display detailed Spanning Tree Protocol (STP) information	The show span detail command displays detailed STP information for each port on the device.
Enhancement to show vlan command	The show vlan command orders the display of VLANs according to VLAN ID. In previous software releases, the command displayed the VLANs according to the order in which they were configured.
TACACS+ Exec authorization supports non-HP ProCurve A-V pairs	To set a user's privilege level using a TACACS+ server, the HP ProCurve device can accept either a HP ProCurve-specific A-V pair or a non-HP ProCurve-specific A-V pair.
Option to specify different servers for individual AAA functions	In a RADIUS or TACACS+ configuration, you can designate a server to handle a specific AAA task.
Encryption of RADIUS and TACACS keys	When you display the configuration of the HP ProCurve device, the RADIUS and TACACS keys are encrypted.
New HP ProCurve MIB objects for CPU utilization statistics	You can use SNMP to get average CPU utilization statistics for the latest one-second, five-second, and one-minute intervals.

Enhancement	Description
Higher maximum number of VLANs allowed in a spanning tree	You can configure up to the maximum number of port-based VLANs allowed on a device to be members of a single instance of the Spanning Tree Protocol (STP). Previously, you could configure up to 128 VLANs to use the same spanning tree.
Dynamic link aggregation	You can enable ports for IEEE 802.3ad link aggregation, a protocol that allows ports to automatically negotiate trunk group configuration with other devices.
Private VLANs	You can configure highly secure VLANs within port-based VLANs for very tight access control between ports.
Dual mode VLAN ports	You can configure a tagged port as a dual-mode port, which allows it to accept and transmit both tagged traffic and untagged traffic at the same time.
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Encryption of RADIUS and TACACS keys	When you display the configuration of the HP ProCurve device, the RADIUS and TACACS keys are encrypted.
Enhancement to ptrace snmp command	The command now lists the SNMP portion of all incoming SNMP packets.

Known Issues

Known Issues in Release 07.5.04

This software release contains the following issues.

- **Mini-GBIC ports** – Hewlett-Packard offers and supports only mini-GBICs that include an HP label (with product number J4858A, J4859A, or J4860A) for use with the J4856A HP ProCurve 9300 Mini-GBIC Module and the J4857A HP ProCurve 9300 Mini-GBIC Redundant Management Module. Use of other brands of mini-GBICs is not supported.
- **AppleTalk** – Appletalk does not work when the dual-mode VLAN feature (**dual-mode** command) is enabled

on an interface.

- **Jumbo packet support** – The default MTU of Ethernet interfaces will be displayed as 1500 bytes even if jumbo support is enabled. This is a display issue only and does not affect the operation of the jumbo packet support.
- **CLI display of ACLs** – The **show access-list all** command does not display more than around 300 ACL entries. If your configuration contains more ACL entries than this, not all of the ACL entries are displayed by the command.

Single STP Issues When Migrating from 06.6.x to 07.5.x or Greater

Software releases 07.x support up to 4095 port-based VLANs in a single spanning tree. This support required a change to the position of the port-based VLAN commands in the running-config and startup-config file.

- In software release 06.6.x, the VLAN commands are placed before the **spanning-tree single** command.
- In the 07.x software releases, the **spanning-tree single** command is placed before the VLAN configuration commands.

As a result of the changed command positions, if you boot a device using software release 07.5.x but also load a startup-config file created using software release 06.6.x, the CLI parser does not find the **spanning-tree single** command before the VLAN commands. The parser therefore assumes that the single STP feature is not enabled. When the device finishes booting, the device contains a separate spanning tree for each VLAN on which STP is enabled, instead of a single spanning tree consisting of all the VLANs on which STP is enabled.

Migration Procedure

NOTE: You need to use this procedure only if you are upgrading a device running software release 06.6.x (and using single STP) to the 07.x software releases.

To migrate your single STP configuration from 06.6.x to 07.5.x:

- Make a backup copy of the startup-config file. You will need this file if you decide to revert to the 06.6.x release for any reason.
- Boot the device using software release 07.5.x.
- Disable single STP.
- Enable STP (not single STP) in each of the port-based VLANs that you want to include in the single spanning tree.
- Enable single STP.
- Save the configuration. You cannot use the configuration you saved using 06.6.x on a device running 07.x.

Saving a Backup Copy of the Service's Startup-Config File

1. Make sure the device has IP access to a TFTP server.
2. Enter one of the following commands at the Privileged EXEC level of the CLI to copy the device's startup-config file onto the TFTP server:
 - **copy startup-config tftp** <ip-addr> <filename>
 - **ncopy startup-config tftp** <ip-addr> <from-name>

Completing the Migration

1. Boot the device using software release 07.5.x.
2. Enter the following command at the global CONFIG level of the CLI to disable single STP:
 - **no spanning-tree single**
3. Enable STP within the port-based VLANs that will be members of the single spanning tree. When you re-enable single STP, all the VLANs in which you enabled STP will become members of the single spanning tree. Other VLANs (in which STP is disabled), will not become part of the single spanning tree.

To enable STP in a VLAN, enter the following command at the global CONFIG level of the CLI to exchange the CLI to the configuration level for that VLAN:

- **vlan** <vlan-id>

To enable STP within the VLAN, enter the following command:

- **spanning-tree**
4. Enable single STP. To do so, enter the **exit** command to return to the global CONFIG level of the CLI, then enter the following command to enable single STP:
 - **spanning-tree single**
 5. Save the configuration changes to the startup-config file.
 6. Reload the 075.x software.

NOTE: When you reload, use the startup-config file you saved in Step 5. If you try to use a startup-config file saved while running 06.6.x, the single STP configuration will not be loaded.



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