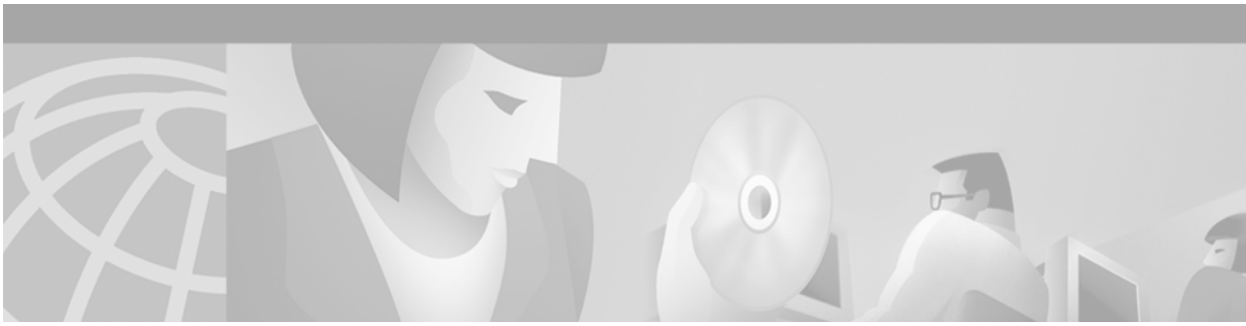

Managing Port Services on the Cisco AS5800 Universal Access Server

This feature module describes Managing Port Services on the Cisco AS5800 Universal Access Server. It includes software commands required for port service management and includes the following sections:

Note The Command Reference and Glossary are in a seperate document.

Feature Overview

The Managing Port Services on the Cisco AS5800 Universal Access Server feature implements the port service management for the Cisco AS5800 using the Universal Port Card (UPC). A universal port is a port that can carry the equivalent of one DS0 of network traffic. Network traffic can be a modem or fax connection. The 324 universal port card (UPC) uses NextPort hardware and firmware to provide universal ports for the Cisco AS5800. These ports are grouped into 54 service processing elements (SPEs). Each SPE supports six universal ports. To find the total number of ports supported by a UPC, multiply the 54 SPEs by the six ports supported on each SPE. The total number of universal ports supported by a single UPC is 324. Configuration, management, and troubleshooting of universal ports can be done at the UPC, SPE, and port level. Each UPC also has a minimum of a 64 MB SDRAM card.

The Cisco AS5800 can be equipped with a maximum of 7 UPCs with upgradable firmware. The UPC supports data traffic, and depending on the software and platform is universal port capable. Each UPC plugs directly into the dial shelf backplane and does not need any external connections. Each UPC has three LEDs, which indicate card status.

The Cisco AS5800 is capable of terminating up to 2,048 incoming modem connections (slightly more than an OC3) when equipped with 7 UPCs and 3 CT3 trunk cards. A split shelf configuration with a second router shelf and second dial shelf controller are required to achieve full capacity. A single router

and a standard configuration supports up to 1,344 port connections. Cisco IOS Release 12.1(3)T or higher is required for the UPC. Unless your system shipped with UPCs installed, you need to upgrade the Cisco IOS image on the dial shelf and router shelf or shelves.

SPE for the Universal Port Card

Instead of the traditional line/modem one-to-one correspondence, lines are mapped to a SPE that resides on the Cisco AS5800 UPC. Each SPE provides modem services for six ports. Busyout and shutdown can be configured at the SPE or port level. The UPC introduces the shelf, slot, and SPE software hierarchy. On the Cisco AS5800, the hierarchy designation is *shelf/slot/spe*. A UPC can be installed in slots numbered 2 to 11 on the dial shelf backplane. If installed in slots 0 or 1, the UPC automatically powers down. Slots 0 and 1 only accept trunk cards. They do not accept mixes of cards. We recommend that you install mixes of T3 and T1 cards, or E1 trunk cards in slots 2 to 5. You can use double-density modem cards, UPCs, and VoIP cards simultaneously. Trunk cards can operate in slots 0 to 5 and are required for call termination.

The UPC performs the following functions:

- Converts pulse code modulation (PCM) bitstreams to digital packet data.
- Forwards converted and packetized data to the dial shelf main processor, which examines the data and forwards it to the router shelf. From the router shelf, the data is routed to the external network.
- Supports all modem standards (such as V.34 and V.42*bis*) and features, including dial-in and dial-out.
- Supports online insertion and removal (OIR), a feature that allows you to remove and replace UPCs while the system is operating. UPCs can be removed without disrupting the operation of other cards and their associated calls. If a UPC is removed while the system is operating, connections or current calls on that card are dropped. Calls being handled by other cards are not affected.

SPE Firmware

SPE firmware is automatically downloaded to a UPC from the router shelf Cisco IOS image when you boot the system for the first time or when you insert a UPC while the system is operating. When you insert a UPC while the system is operating, the Cisco IOS image recognizes the card and the dial shelf downloads the required portware to the cards. Cisco IOS Release 12.1(3)T or higher is required for the UPC.

The SPE firmware image (also known as *portware*) is bundled with the Cisco IOS UPC image. The SPE firmware image uses an *auto detect* mechanism, which enables the UPC to service multiple call types. An SPE detects the call type and automatically configures itself for that operation. For further information on upgrading SPE firmware from the Cisco IOS image, see the "Configuring SPEs to Use an Upgraded Firmware File" section on page 10.

The firmware is upgradable independent of Cisco IOS upgrades, and different firmware versions can be configured to run on SPEs in the same UPC. You can download firmware from the Cisco Connection Online (CCO) File Transfer Protocol (FTP) server. For further information on upgrading SPE firmware from the Cisco CCO FTP server, see the "Upgrading SPE Firmware from the Cisco CCO FTP Server" section on page 3.

Note All six ports on a SPE run the same firmware.

Upgrading SPE Firmware from the Cisco CCO FTP Server

Upgrading SPE firmware from the Cisco CCO FTP server can be done in two steps when it becomes available:

- Downloading SPE Firmware from the Cisco CCO FTP Server to a Local TFTP Server, page 3
- Copying the SPE Firmware File from the Local TFTP Server to the SPEs, page 4

Downloading SPE Firmware from the Cisco CCO FTP Server to a Local TFTP Server

Note You must be a registered Cisco user to log in to the Cisco Software Center.

You can download software from the Cisco Systems CCO FTP server using an Internet browser or using an FTP application. Both procedures are described.

Using an Internet Browser

Step 1 Launch an Internet browser.

Step 2 Log into the Cisco home page and click **Software Center** under the Service & Support heading.

Step 3 Click **Access Software** to open the Access Products window.

Step 4 Click **AS5800 Series**.

Step 5 Click the SPE firmware file you want to download, and then follow the remaining download instructions. If you are downloading the SPE firmware file to a PC, make sure that you download the file to the c:/tftpboot directory; otherwise, the download process does not work.

Step 6 When the SPE firmware is downloaded to your workstation, transfer the file to a Trivial File Transfer Protocol (TFTP) server in your LAN using a terminal emulation software application.

Using an FTP Application

Note The directory path leading to the SPE firmware files on cco.cisco.com is subject to change without notice. If you cannot access the files using an FTP application, try the Cisco Systems URL http://www.cisco.com/cgi-bin/ibld/all.pl?i=support&c=3.

Step 1 Log in to the Cisco CCO FTP server, called cco.cisco.com:

```
terminal> ftp cco.cisco.com
Connected to cio-sys.cisco.com.
```

Step 2 Enter your CCO registered username and password (for example, **harry** and **letmein**):

```
Name (cco.cisco.com:harry): harry
331 Password required for harry.
Password: letmein
230-###############################################################
230-#  Welcome to the Cisco Systems CCO FTP server.
230-#  This server has a number of restrictions.  If you are not familiar
230-#  with these, please first get and read the /README or /README.TXT file.
```

```
230-#  http://www.cisco.com/acs/info/cioesd.html for more info.
230-#################################################################
230-
```

Step 3 Specify the directory path that holds the SPE firmware you want to download. For example, the directory path for the Cisco AS5800 SPE firmware is /cisco/access/5800:

```
ftp> cd /cisco/access/5800
250-Please read the file README
250-  it was last modified on Tue May 27 10:07:38 1997 - 48 days ago
250-Please read the file README.txt
250-  it was last modified on Tue May 27 10:07:38 1997 - 48 days ago
250 CWD command successful.
```

Step 4 Enter the **ls** command to view the contents of the directory:

```
ftp> ls
227 Entering Passive Mode (192,31,7,130,218,128)
150 Opening ASCII mode data connection for /bin/ls.
total 2688
drwxr-s--T   2 ftpadmin ftpcio    512 Jun 30 18:11 .
drwxr-sr-t  19 ftpadmin ftpcio    512 Jun 23 10:26 ..
lrwxrwxrwx  1  root     3          10 Aug   6 1996     README ->README.txt
-rw-rw-r--   1 root     ftpcio   2304 May 27 10:07 README.txt
-r--r--r-- 1 ftpadmin ftpint 377112 Jul 10 18:08 np-spe-upw-1.0.1.2.bin
-r--r--r-- 1 ftpadmin ftpint 635 Jul 10 18:08 SPE-firmware.3.1.30.readme
```

Step 5 Specify a binary image transfer:

```
ftp> binary
200 Type set to I.
```

Step 6 Copy the SPE firmware files from the access server to your local environment with the **get** command.

Step 7 Quit your terminal session:

```
ftp> quit
Goodbye.
```

Step 8 Enter the **ls -al** command to verify that you successfully transferred the files to your local directory:

```
server% ls -al
total 596
-r--r--r-- 1 280208 Jul 10 18:08 np-spe-upw-1.0.1.2.bin
server% pwd
/auto/tftpboot
```

Step 9 Transfer these files to a local TFTP or remote copy protocol (RCP) server that your access server or router can access.

Copying the SPE Firmware File from the Local TFTP Server to the SPEs

The procedure for copying the SPE firmware file from your local TFTP server to the UPC is a two-step process. First, transfer the SPE firmware to the access server's Flash memory. Then, configure the SPEs to use the upgrade firmware. The upgrade occurs automatically, either as you leave configuration mode, or as specified in the configuration.

These two steps are performed only once. After you copy the SPE firmware file into Flash memory for the first time, you should not have to perform these steps again.

Note Because the SPE firmware is configurable for individual SPEs or ranges of SPEs, the Cisco IOS software automatically copies the SPE firmware to each SPE each time the access server restarts.

To transfer SPE firmware to Flash memory, follow these steps to download the Universal SPE firmware to Flash memory:

Step 1 Check the image in the access server Flash memory:

```
Router# show flash
System flash directory:
File  Length   Name/status
  1   4530624  c5800-js-mx
 [498776 bytes used, 16278440 available, 16777216 total]
16384K bytes of processor board System flash (Read/Write)
```

Step 2 Enter the **copy tftp flash** command to download the code file from the TFTP server into the access server Flash memory. You are prompted for the download destination and the remote host name.

```
Router# copy tftp flash
```

Step 3 Enter the **show flash** command to verify that the file has been copied into the access server Flash memory:

```
Router# show flash
```

Benefits

- Modem or digital service at the port level, resulting in greater flexibility of network configuration.
- Addressability at the slot, SPE, or port level, resulting in ease and scale of configuration tasks.
- High port density in the platform, resulting in scalability.
- SPE layer buffers the platform architecture from future changes, resulting in advanced port level technology.
- Modular architecture, resulting in ease and economy of maintenance.
- Designed to extend to additional port services, resulting in implementation on other Cisco access server platforms.

Restrictions

The UPC is not supported on other Cisco universal access servers.

Related Features and Technologies

- Call Tracker
- Redundant Link Manager

- Resource Pooling
- Virtual Private Digital Network (VPDN)
- In-band signaling/tone generation and detection
  - DTMF generation
  - DTMF detection
  - MF generation
  - MF detection
- PPP and SLIP framing

Related Documents

For further information about managing port services with UPC, see the following documents that ship with your Cisco AS5800. These documents are also available online and on the documentation CD. The most current documents are online.

- *Cisco AS5800 Universal Access Server Read Me First*
- *Cisco AS5800 Universal Access Server Hardware Installation Guide*
- *Cisco AS5800 Universal Access Server Dial Shelf Card Guide*
- *Cisco AS5800 Universal Access ServerOperations, Administrations, Maintenance, and Provisioning Guide*
- *Cisco AS5800 Universal Access Server Regulatory Compliance and Safety Information*

Note Also, see the *Cisco AS5800 IOS Software Compatibility Matrix*, available online.

For further information about dial technology, see the following documents:

- *Cisco IOS Dial Services Configuration Guide: Network Services,* Cisco IOS Release 12.1
- *Cisco IOS Dial Services Configuration Guide: Terminal Service*s, Cisco IOS Release 12.1
- *Cisco IOS Dial Services Command Reference,* Cisco IOS Release 12.1

Supported Platform

- Cisco AS5800

Note The SPE support is also available on the Cisco AS5400 NextPort dial feature card.

Supported Standards, MIBs, and RFCs

Standards

Carrier protocols

- ITU V.23 at 75/1200 bps

- Telcordia Technologies (formerly Bellcore) 103 at 300 bps
- ITU V.21 at 300 bps
- ITU V.22 at 1200 bps
- Telcordia Technologies (formerly Bellcore) 212A at 1200 bps
- ITU V.22*bis* at 2400 bps
- ITU V.32 up to 9600 bps
- ITU V.32*bis* up to 14,400 bps
- V.32 turbo up to 19,200 bps
- V.FC up to 28,800 bps
- V.34 up to 28,800 bps
- V.34+ up to 33.6 bps
- TIA/ITU V.90
- K56flex

Error-correcting link-access protocols

- V.42 LAPM, MNP 2-4

Compression protocols

- V.42*bis* (includes MNP 5)

MIBs

The following MIBs are supported on the Cisco AS5800:

- CHASSIS-MIB
- RFC1406-MIB(DS1 MIB)
- RFC1407-MIB(DS3 MIB)
- CISCO-MODEM-MGMT-MIB
- DIAL-CONTROL-MIB
- CISCO-DIAL-CONTROL-MIB
- IF MIB
- MIB II
- ENVMON MIB
- ACCESS-ENVMON MIB
- CISCO-CALL-HISTORY

To obtain lists of MIBs supported by platform and Cisco IOS release and to download MIB modules, go to the Cisco MIB web site on Cisco Connection Online (CCO) at http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml.

RFCs

No new or modified RFCs are supported by this feature.

Prerequisites

- Cisco IOS Release 12.1(3)T or later release for the Cisco AS5800
- Basic configuration of the Cisco AS5800
- Upgraded firmware

Note Firmware automatically upgrades with the Cisco IOS Release 12.1(3)T or higher.

- UPC installed

Caution Upgrade your Cisco IOS software before installing the UPC.

Configuration Tasks

See the following sections for configuration tasks for the UPC port service management feature. Configuring Country Code is a required step; all the other steps are optional:

Configuring Country Code

To set the UPC to be operational for call set up, you must specify the country name. To specify the country name, perform the following task in global configuration mode:

Command	Purpose
`Router(config)# spe country country name`	Specifies the country to set the UPC parameters (including country code and encoding). If you do not specify a country, the interface uses the default. If the access server is configured with T1 interfaces, the default is **usa**. If the access server is configured with E1 interfaces, the default is **e1-default**. Use the **no** form of this command to set the country code to the country default. **Note** All sessions in all UPCs in all slots must be in the idle state for this command to execute.

Configuring Split Dial Shelves

To achieve the maximum capacity of 2048 port connections using 7 UPCs and 3 T3 + 1 T1 trunks requires a split dial shelf configuration using two router shelves. A new configuration command is available to define the split point: **dial-shelf split backplane-ds0** *option*.

The options for this command come in pairs, varying according to the desired configuration. You will need to log in to each router shelf and separately configure the routers for the intended load. In most circumstances it is recommended that the predefined options are selected. These options are designed to be matched pairs as seen below.

	Router Shelf 1			Router Shelf 2			Total
Option Pair	Option	Maximum Calls	Unused T1	Option	Maximum Calls	Unused T1	
1	2ct3cas	1344		1ct3cas	672		2016
2	part2ct1ct3cas	1152	4	part1ct1ct3cas	888	3	2040
3	2ct3isdn	1288		part1ct1ct3isdn_b	644	7	1932
4	part2ct1ct3isdn	1150	2	part1ct1ct3isdn	897	1	2047
5[1]	3ce1	960		3ce1	960		1920
6	Default (no option entered)	1/2 of current input		Default (no option entered)	1/2 of current input		
7	no dial-shelf backplane-ds0	1024		no dial-shelf backplane-ds0	1024		2048

1. This option is used to revert to the default for an environment using 6 E1 lines.

The **dial-shelf split slot 0 3 4 5** command must be defined for the **dial-shelf split backplane-ds0** *option* command to be active. Users may also select the **user defined** option to define their own split.

Even if your system is already using a split dial shelf configuration, configuring one router shelf to handle two T3 trunks and the other router to handle the third trunk requires you to take the entire access server out of service. Busyout all connections before attempting to reconfigure. The configuration must be changed to setup one pool of TDM resources that can be used by either DMM cards or UPCs, and a second pool of two streams that contains TDM resources that can only be used by UPCs.

You may have more trunk capacity than 2048 calls. It is your decision how to provision the trunks so the backplane capacity is not exceeded. If more calls come in than backplane DS0 capacity for that half of the split, the call will be rejected and an error message printed for each call. This cannot be detected while a new configuration is being built because the router cannot tell which T1 trunks are provisioned and which are not. The user may want some trunks in hot standby.

The DMM, HMM, and VoIP cards can only use 1792 DS0 of the available 2048 backplane DS0. The UPC and trunk cards can use the full 2048 backplane DS0. The **show tdm splitbackplane** command will show the resources in two groups, the first 1792 accessible to all cards, and the remaining 256 accessible only to UPC and trunk cards.

Configuring SPEs to Use an Upgraded Firmware File

To configure the SPEs to use the upgraded firmware file, use the following steps beginning in EXEC mode:

	Command	Purpose
Step 1	`Router# show spe version`	Displays SPE firmware versions and the On-Flash firmware filename.
Step 2	`Router# config terminal`	Enters global configuration mode.
Step 3	`Router(config)# spe` *shelf/slot/spe* or `Router(config)# spe` *shelf/slot/spe shelf/slot/spe*	Enters the SPE configuration mode. You can choose to configure a single SPE or range of SPEs by specifying the first and last SPE in the range.
Step 4	`Router(config-spe)# firmware upgrade {busyout | download-maintenance | reboot}`	Specifies the upgrade method. Three methods of upgrade are available. The **busyout** keyword waits until all calls are terminated on an SPE before upgrading the SPE to the designated firmware. The **download-maintenance** keyword upgrades the firmware during the download maintenance time. The **reboot** keyword requests the access server to upgrade firmware at the next reboot.
Step 5	`Router(config-spe)# firmware location` *filename*	Specifies the SPE firmware file in Flash memory to use for the selected SPEs. Allows you to upgrade firmware for SPEs after the new SPE firmware image is copied to your Flash memory. Enter the **no firmware location** command to revert back to the default Cisco IOS bundled SPE firmware.
Step 6	`Router(config-spe)# exit`	Exits SPE configuration mode.
Step 7	`Router(config)# exit`	Exits global configuration mode.
Step 8	`Router# copy running-config startup-config`	Saves your changes.

Note The **copy ios-bundled** command is not necessary with UPCs. By default, the version of SPE firmware bundled with the Cisco IOS software release transfers to all SPEs not specifically configured for a different SPE firmware file.

Disabling SPEs

To disable specific SPEs in the UPC, complete the following steps starting in global configuration mode:

	Command	Purpose

Step 1	`Router(config)# spe shelf/slot/spe`
	or
	`Router(config)# spe shelf/slot/spe shelf/slot/spe`
		Enters SPE configuration mode. You can also configure SPEs specifying the first and last SPE in the range.

Step 2	`Router(config-spe)# busyout`	Gracefully disables an SPE by waiting for all the active services on the specified SPE to terminate. You can perform auto-diagnostic tests and firmware upgrades when you put the SPEs in the Busied out state. Active ports on the specified SPE changes the state of the specified range of SPEs to the BusyoutPending state. The state changes from BusyoutPending to Busiedout when all calls end. Use the **show spe** command to see the state of the range of SPEs. Use the **no** form of this command to re-enable the SPEs.
Step 3	`Router(config-spe)# shutdown`	Clears active calls on all ports on the SPE. Calls can no longer be placed on the SPE because the SPE state is changed to Busied out. Use the **no** form of this command to re-enable the ports on the SPE.

Rebooting SPEs

To reboot specified SPEs, use the following command in privileged EXEC mode:

Command	Purpose
`Router# clear spe shelf/slot/spe`	Allows manual recovery of a port that is frozen in a suspended state. Reboots SPEs that are in suspended or Bad state. Downloads configured firmware to the specified SPE or range of SPEs and power-on self test (POST) is run. **Note** Depending on the problem, sometimes downloading the SPE firmware may not help recover a bad port or an SPE. This command can run regardless of the state of SPEs. All active ports running on the SPE are prematurely terminated, and messages are logged into the appropriate log.

Configuring Lines and Ports

To configure the lines and ports to dial in to your network, complete the following steps, beginning in global configuration mode:

	Command	Purpose
Step 1	`Router(config)# line shelf/slot/port shelf/slot/port`	Enters the line configuration mode. Specifies a range of slot and port numbers to configure. **Note** The UPC slot is defined as a value between 2 and 11. Each UPC provides 54 SPEs. The SPE value ranges from 0 to 53. Because each SPE has six ports, the UPC has a total of 324 ports. The port value ranges from 0 to 323. For example, if you want to configure 324 ports on slot 3, enter **line 1/3/00 1/3/323**. If you want to configure 972 ports on slots 3-5, enter **line 1/3/00 1/5/323**.
Step 2	`Router(config-line)# transport input all`	Allows all protocols when connecting to the line.

	Command	Purpose
Step 3	`Router(config-line)# autoselect ppp`	Enables remote IP users running a PPP application to dial in, bypass the EXEC facility, and connect directly to the network.
Step 4	`Router(config-line)# modem inout`	Enables incoming and outgoing calls.
Step 5	`Router(config-line)# modem autoconfigure type` *name*	Configures the attached modem using the entry for name.

Verifying SPE Lines and Port Configuration

To verify your SPE line configuration, perform the following steps:

Step 1 Enter the **show spe** command to display a summary for all the lines and ports:

```
Router# show spe
```

Step 2 Enter the **show line** command to display a summary for a single line:

```
Router# show line 1/1
```

Note If you are having trouble, make sure that you have turned on the protocols for connecting to the lines (**transport input all**) and that your access server is configured for incoming and outgoing calls (**modem inout**).

Configuring UPC Ports

This section describes how to configure UPC ports. You need to be in port configuration mode to configure the UPC ports. The port configuration mode allows you to shut down or put individual ports or ranges of ports in busyout mode. To configure UPC ports, perform the following steps beginning in global configuration mode:

	Command	Purpose
Step 1	`Router(config)# port` *shelf/slot/port*	Enters port configuration mode. Configures a single port.
Step 2	`Router(config-port)# port` *shelf/slot/port shelf/slot/port*	Configures a range of ports.

	Command	Purpose
Step 3	`Router(config-port)# busyout`	(Optional) Gracefully disables a port by waiting for the active services on the specified port to terminate. Use the **no** form of this command to re-enable the ports. Maintenance activities, such as testing, can still be performed while the port is in busyout mode. **Note** When a port is in busyout mode, the state of the SPE is changed to the consolidated states of all the underlying ports on that SPE.
Step 4	`Router(config-port)# shutdown`	(Optional) Clears active calls on the port. No more calls can be placed on the port in the shutdown mode. Use the **no** form of this command to re-enable the ports. **Note** When a port is in shutdown mode, the state of the SPE is changed to the consolidated states of all the underlying ports on that SPE.
Step 5	`Router(config-port)# exit`	Exits port configuration mode.

Clearing Ports

The following privileged EXEC mode commands allow you to clear ports on an SPE:

Command	Purpose
`Router# clear port 1/4/1` `Router# This will clear port 4/01 [confirm] yes`	Clears port 1 on slot 4 of the UPC port on the Cisco AS5800.
`Router# clear port 1/4` `Router# This will clear port 4/00 - 1/4/323 [confirm] yes`	Clears all active ports on slot 4 of the UPC port on the Cisco AS5800.

Configuring SPE Performance Statistics

Depending on the configuration, call record is displayed on the console, or the syslog, or on both. The log contains raw data in binary form, which must be viewed using the **show** commands listed in the "Monitoring SPE Performance Statistics" section on page 17. You can configure some aspects of history events by using the following commands in global configuration mode:

Command	Purpose
`Router(config)# spe call-record modem` *max-userid*	Requests the access server to generate a modem call record after a call is terminated. To disable this function, use the **no** form of this command.
`Router(config)# spe log-event-size` *number*	Sets the maximum size of the history event queue log entry for each port. The default is 50 events per port.

Clearing Log Events

The following privileged EXEC mode commands allow you to clear some or all of the log events relating to the SPEs:

Command	Purpose
`Router# clear spe log`	Clears all event entries in the slot history event log.
`Router# clear spe counters`	Clears statistical counters for all types of services for the specified SPE, a specified range of SPEs, or all SPEs. If you do not specify the range of SPEs or an SPE, the statistics for all SPEs are cleared.
`Router# clear port log`	Clears all event entries in the port level history event log. You cannot remove individual service events from the port log.

Troubleshooting SPEs

This section provides troubleshooting information for your SPEs regardless of service type mode.

Note SPE ports that pass the diagnostic test are marked as Pass, Fail, and Unkn. Ports that fail the diagnostic test are marked as Bad. These ports cannot be used for call connections. Depending on how many ports are installed, the diagnostic tests may take from 5 to 10 minutes to complete.

- Enter the **port modem startup-test** command to perform diagnostic testing for all modems during the system's initial startup or rebooting process. To disable the test, enter the **no port modem startup-test** command.

- Enter the **port modem autotest** command to perform diagnostic testing for all ports during the system's initial startup or rebooting process. To disable the test, enter the **no port modem autotest** command.

  You may additionally configure the following options:

  - Enter the **port modem autotest minimum** *ports* command to define the minimum number of free ports available for autotest to begin.
  - Enter the **port modem autotest time** *hh:mm interval* command to enable autotesting time and interval.
  - Enter the **port modem autotest error** *threshold* command to define the maximum number of errors detected for autotest to begin.

- Enter the **show port modem test** command to displays results of the SPE port startup test and SPE port auto-test.

When an SPE port is tested as Bad, you may perform additional testing by conducting a series of internal back-to-back connections and data transfers between two SPE ports. All port test connections occur inside the access server. For example, if mobile users cannot dial into port 1/2/5 (which is the sixth port on the UPC in the second chassis slot), attempt a back-to-back test with port 1/2/5 and a known-functioning port such as port 1/2/6.

- Enter the **test port modem back-to-back** *shelf/slot/port shelf/slot/port* command to perform internal back-to-back port tests between two ports sending test packets of the specified size.

Note You might need to enable this command on several different combinations of ports to determine which one is not functioning properly. A pair of operable ports successfully connects and completes transmitting data in both directions. An operable port and an inoperable port do not successfully connect with each other.

A sample back-to-back test might look like the following:

```
Router# test port modem back-to-back 1/2/10 1/3/20
Repetitions (of 10-byte packets) [1]:
*Mar  02 12:13:51.743:%PM_MODEM_MAINT-5-B2BCONNECT:Modems (2/10) and (3/20) connected
in back-to-back test:CONNECT33600/V34/LAP
*Mar  02 12:13:52.783:%PM_MODEM_MAINT-5-B2BMODEMS:Modems (3/20) and (2/10) completed
back-to-back test:success/packets = 2/2
```

Tips You may reboot the port that has problems using the **clear spe** command.

- Enter the **spe recovery** {**port-action** {**disable** | **recover** | **none**} | **port-threshold** *num-failures*} command to perform automatic recovery (removal from service and reloading of SPE firmware) of ports on an SPE at any available time.

  An SPE port failing to connect for a certain number of consecutive times indicates that a problem exists in a specific part or the whole of SPE firmware. Such SPEs have to be recovered by downloading firmware. Any port failing to connect *num-failures* times is moved to a state based on the **port-action** value, where you can choose to disable (mark the port as Bad) or recover the port when the SPE is in the idle state and has no active calls. The default for *num-failures* is 30 consecutive call failures.

Tips You may also schedule recovery using the **spe download maintenance** command.

- Enter the **spe download maintenance time** *hh:mm* | **stop-time** *hh:mm* | **max-spes** *number* | **window** *time-period* | **expired-window** {**drop-call** | **reschedule**} command to perform a scheduled recovery of SPEs.

  The download maintenance activity starts at the set start **time** and steps through all the SPEs that need recovery and the SPEs that need a firmware upgrade and starts maintenance on the maximum number of set SPEs for maintenance. The system waits for the **window** delay time for all the ports on the SPE to become inactive before moving the SPE to the Idle state. Immediately after the SPE moves to Idle state, the system starts to download firmware. If the ports are still in use by the end of **window** delay time, depending upon the **expired-window** setting, connections on the SPE ports are shutdown and the firmware is downloaded by choosing the **drop-call** option, or the firmware download is rescheduled to the next download maintenance time by choosing the **reschedule** option. This process continues until the number of SPEs under maintenance is below **max-spes,** or until **stop-time** (if set), or until all SPEs marked for recovery or upgrade have had their firmware reloaded.

Monitoring SPE Performance Statistics

This section documents various SPE performance statistics for the UPC:

SPE Events and Firmware Statistics

To view SPE events and firmware statistics for the UPCs, enter one or more of the following commands in privileged EXEC mode:

Command	Purpose
`Router# show spe shelf/slot/spe`	Displays the SPE status for the specified range of SPEs.
`Router# show spe log [reverse | slot]`	Displays the SPE system log.
`Router# show spe version`	Lists all SPEs and the SPE firmware files used. **Note** This list helps you decide if you need to update your SPE firmware files.

Port Statistics

To view port statistics for the UPCs, enter one or more of the following commands in privileged EXEC mode:

Command	Purpose
Router# **show port config** {*slot* | *shelf/slot/port*}	Displays the configuration information for specified ports or the specified port range. The port should have an active session associated at the time the command is executed.
Router# **show port digital log** [**reverse** *shelf/slot/port*] [*shelf/slot* | *shelf/slot/port*]	Displays the digital data event log.
Router# **show port modem log** [**reverse** *shelf/slot/port*] [*shelf/slot* | *shelf/slot/port*]	Displays the port history event log.
Router# **show port modem test** [*shelf/slot* | *shelf/slot/port*]	Displays the test log for the specified SPE port range or all the SPE ports.
Router# **show port operational-status** [*shelf/slot* | *shelf/slot/port*]	Displays the operational status of the specified ports or the specified port range. The port should have an active session associated at the time the command is executed.

Digital SPE Statistics

To view digital SPE statistics for the UPCs, enter one or more of the following commands in privileged EXEC mode:

Command	Purpose
Router# **show spe digital** [*shelf/slot* | *shelf/slot/spe*]	Displays history statistics of all digital SPEs.
Router# **show spe digital active** [*shelf/slot* | *shelf/slot/spe*]	Displays active digital statistics of a specified SPE, the specified range of SPEs, or all SPEs.
Router# **show spe digital csr** [**summary** | *shelf/slot* | *shelf/slot/spe*]	Displays the digital call success rate statistics for a specific SPE, a range of SPEs, or all SPEs.
Router# **show spe digital disconnect-reason** [**summary** | *shelf/slot* | *shelf/slot/spe*]	Displays the digital disconnect reasons for the specified SPE or range of SPEs. The disconnect reasons are displayed with Class boundaries.
Router# **show spe digital summary** [*shelf/slot* | *shelf/slot/spe*]	Displays digital history statistics of all SPEs, a specified SPE, or the specified range of SPEs for all service types.

SPE Modem Statistics

To view SPE modem statistics for the UPCs, enter one or more of the following commands in privileged EXEC mode:

Command	Purpose
Router# **show spe modem active** {shelf/slot | shelf/slot/spe}	Displays the active statistics of a specified SPE, a specified range of SPEs, or all SPEs serving modem traffic.
Router# **show spe modem csr** {**summary** | *shelf/slot* | *shelf/slot/spe*}	Displays the call success rate statistics for a specific SPE, a specified range of SPEs, or all the SPEs.
Router# **show spe modem disconnect-reason** {**summary** | *shelf/slot* | *shelf/slot/spe*}	Displays the disconnect reasons for the specified SPE or a specified range of SPEs. The disconnect reasons are displayed with Class boundaries.
Router# **show spe modem high speed** {**summary** | *shelf/slot* | *shelf/slot/spe*}	Shows the connect-speeds negotiated within each high speed modulation or codecs for a specific range of SPEs or all SPEs.
Router# **show spe modem low speed** {**summary** | *shelf/slot* | *shelf/slot/spe*}	Shows the connect-speeds negotiated within each low speed modulation or codecs for a specific range of SPEs or all SPEs.
Router# **show spe modem high standard** {**summary** | *shelf/slot* | *shelf/slot/spe*}	Displays the total number of connections within each low modulation or codec for a specific range of SPEs.
Router# **show spe modem low standard** {**summary** | *shelf/slot* | *shelf/slot/spe*}	Displays the total number of connections within each high modulation or codec for a specific range of SPEs.
Router# **show spe modem summary** {*shelf/slot* | *shelf/slot/spe*}	Displays the history statistics of all SPEs, specified SPE or the specified range of SPEs.

Note The cdp enable configuration command has changed. For the Async and group async interfaces, the default is now disabled. Most other interfaces are enabled by default.

Configuration Example

The universal port card (UPC) provides port service management for the Cisco AS5800.

For further information on configuration examples for the Cisco AS5800, see the *Cisco AS5800 Universal Access Server Operations, Administration, Maintenance, and Provisioning Guide*.

Note The Command Reference and Glossary are in a seperate document.