



# Managing Port Services on the Cisco AS5850 Universal Gateway

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## Feature History

Release	Modification
12.1(3)T	This feature was introduced on the Cisco AS5400 and Cisco AS5800 Universal Gateways.
12.1(5)XM	This feature was added to the Cisco AS5350 Universal Gateway.
12.1(5)XV	This feature was added to the Cisco AS5850 Universal Gateway.

This feature module describes the Managing Port Services on the Cisco AS5850 Universal Gateway feature, and includes the following sections:

- [Feature Overview, page 1](#)
- [Supported Platforms, page 4](#)
- [Supported Standards, MIBs, and RFCs, page 4](#)
- [Prerequisites, page 5](#)
- [Configuration Tasks, page 6](#)
- [Monitoring and Maintaining SPE Performance Statistics, page 16](#)
- [Configuration Examples, page 19](#)
- [Command Reference, page 19](#)
- [Glossary, page 139](#)

## Feature Overview

Port services on the Cisco AS5850 universal gateway include the Cisco AS5800 324 UPC, T3 card, and E1 card. This document describes the T3 and E1 cards. Refer to Managing Port Services on the Cisco AS5800 universal gateway for information on the 324 UPC.

The Cisco AS5850 has both modems and trunk ports. The T3 card has one channelized T3 port as an external connection and 216 universal ports. The E1 card has 24 trunk ports as an external connection and 216 universal ports. Configuration, management, and troubleshooting of the universal ports can be done at the feature board, SPE, and port level.

The T3 and E1 cards have thirty-six service processing elements (SPE). Each SPE supports six universal ports. To find the total number of ports supported, multiply the number of SPEs by the six ports supported on each SPE.

**Note**

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The Cisco AS5850 Universal Gateway was formerly known as the Cisco AS5850 Universal Access Server.

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## SPE for the Universal Port

Instead of the traditional line/modem one-to-one correspondence, lines are mapped to an SPE that resides on the Cisco AS5850 T3 or E1 card. Each SPE provides modem services for six ports. Busyout and shutdown can be configured at the SPE or port level. The T3 and E1 cards use the slot and SPE software hierarchy. On the Cisco AS5850, the hierarchy designation is *slot/spe*.

The universal port performs the following functions:

- Converts pulse code modulation (PCM) bitstreams to digital packet data.
- Forwards converted and packetized data to the server main processor, which examines the data and forwards it to the route switch controller. From the route switch controller, 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 feature boards while the system is operating. Feature boards can be removed without disrupting the operation of other cards and their associated calls. If a feature board is removed while the system is operating, connections or current calls on that card are dropped. Calls being handled by other boards are not affected.

## SPE Firmware

SPE firmware is automatically downloaded to the T3 or E1 card from the route switch controller Cisco IOS image, when you boot the system for the first time or when you insert a feature board while the system is operating. When you insert a feature board while the system is operating, the Cisco IOS image recognizes the board and the server downloads the required portware to the cards.

The SPE firmware image (also known as *portware*) is bundled with the Cisco IOS image. The SPE firmware image uses an *auto detect* mechanism, which enables the universal port 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 9](#).

The firmware is upgradable independent of Cisco IOS upgrades, and different firmware versions can be configured to run on SPEs in the same feature board. You can download firmware from the Cisco.com File Transfer Protocol (FTP) server. For further information on upgrading SPE firmware from the Cisco.com FTP server, see the [“Upgrading SPE Firmware from the Cisco.com FTP Server” section on page 7](#).

**Note**

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Cisco.com was formally Cisco Connection Online (CCO).

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**Note**

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A SPE runs the same firmware on all six ports.

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## 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.
- Includes trunk ports and modem ports on one feature board.

## Restrictions

To service the E1 card, all 24-port E1 interfaces must be taken out of service.

## 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, see the following documents that ship with your Cisco AS5850. These documents are also available online and on the documentation CD. The most current documents are online.

- [AS585 Universal Gateway Commissioning Guideline](#)

- [Cisco AS5850 Universal Gateway Operations, Administration, Maintenance, and Provisioning Guide](#)

**Note**

Also, see the [Cisco AS5850 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 Services*, Cisco IOS Release 12.1
- *Cisco IOS Dial Services Command Reference*, Cisco IOS Release 12.1

## Supported Platforms

- Cisco AS5850

**Note**

The SPE support is also available on the Cisco AS5400, Cisco AS5350, and Cisco AS5800.

## 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.22bis at 2400 bps
- ITU V.32 up to 9600 bps
- ITU V.32bis 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.42bis (includes MNP 5)

**MIBs**

- 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.com 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(5)XV or later release for the Cisco AS5850
- Basic configuration of the Cisco AS5850
- Upgraded firmware

**Note**

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

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- The T3 or E1 card installed

**Caution**

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Upgrade your Cisco IOS software before installing the cards.

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## Configuration Tasks

See the following sections for configuration tasks for the port services management feature. Each task in the list is identified as either optional or required:

- [Configuring Country Code](#) (required)
- [Upgrading SPE Firmware from the Cisco.com FTP Server](#) (optional)
- [Configuring SPEs to Use an Upgraded Firmware File](#) (optional)
- [Disabling SPEs](#) (optional)
- [Rebooting SPEs](#) (optional)
- [Configuring Lines and Ports](#) (optional)
- [Verifying SPE Lines and Port Configuration](#) (optional)
- [Configuring Ports](#) (optional)
- [Clearing Ports](#) (optional)
- [Configuring SPE Performance Statistics](#) (optional)
- [Clearing Log Events](#) (optional)
- [Troubleshooting Tips](#) (optional)

## Configuring Country Code

To set the cards 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)# <b>spe country</b> <i>country name</i>	<p>Specifies the country to set the feature board parameters (including country code and encoding). If you do not specify a country, the interface uses the default. If the gateway is configured with T1 interfaces, the default is <b>usa</b>. If the gateway is configured with E1 interfaces, the default is <b>e1-default</b>. Use the <b>no</b> form of this command to set the country code to the country default.</p> <p> <b>Note</b> All sessions in all feature boards in all slots must be in the idle state for this command to run.</p>

## Upgrading SPE Firmware from the Cisco.com FTP Server



**Note** Unbundled firmware is not currently available.

You can upgrade SPE firmware from the Cisco.com FTP server by performing the following:

- [Downloading SPE Firmware from the Cisco.com FTP Server to a Local TFTP Server, page 7](#)
- [Copying the SPE Firmware File from the Local TFTP Server to the SPEs, page 8](#)

## Downloading SPE Firmware from the Cisco.com 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.com FTP server using an Internet browser or using an FTP application. Both procedures are described.

### Using an Internet Browser

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- 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 Cisco **AS5850 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.
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### Using an FTP Application



**Note** The directory path leading to the SPE firmware files on 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.com FTP server, called Cisco.com:
- ```
terminal> ftp cisco.com
Connected to cio-sys.cisco.com.
```
- Step 2** Enter your Cisco.com registered username and password (for example, **harry** and **letmein**):
- ```
Name (cisco.com:harry): harry
331 Password required for harry.
Password: letmein
```

```

230-#####
230-# Welcome to the Cisco Systems 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-# #####

```

- Step 3** Specify the directory path that holds the SPE firmware you want to download. For example, the directory path for the Cisco AS5850 SPE firmware is `/cisco/access/5850`:

```

ftp> cd /cisco/access/5850
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 gateway to your local environment with the `get` command.

```

ftp> get

```

- 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 gateway can access.
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## 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 T3 or E1 card includes two-steps. First, transfer the SPE firmware to the gateway'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 gateway restarts.

Follow these steps to download the SPE firmware to Flash memory:

**Step 1** Check the image in the gateway Flash memory:

```
Router# dir flash:
Directory of disk0:/
 3  -rw-      8654900  Dec 19 2000 13:30:42  c5850-p6-mz
31916032 bytes total (23023616 bytes free)
```

**Step 2** Enter the **copy tftp flash** command to download the code file from the TFTP server into the gateway 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 was copied into the gateway Flash memory:

```
Router# dir flash:
```

## 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# <b>show spe version</b>	Displays SPE firmware versions and the On-Flash firmware filename.
Step 2	Router# <b>config terminal</b>	Enters global configuration mode.
Step 3	Router(config)# <b>spe slot/spe</b> or Router(config)# <b>spe slot/spe slot/spe</b>	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)# <b>firmware upgrade {busyout   download-maintenance   reboot}</b>	Specifies the upgrade method (three methods are available). <ul style="list-style-type: none"> <li>• The <b>busyout</b> keyword waits until all calls are terminated on an SPE before upgrading the SPE to the designated firmware.</li> <li>• The <b>download-maintenance</b> keyword upgrades the firmware during the download maintenance time.</li> <li>• The <b>reboot</b> keyword requests the gateway to upgrade firmware at the next reboot.</li> </ul>

	Command	Purpose
Step 5	Router(config-spe)# <b>firmware location filename</b>	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 <b>no firmware location</b> command to revert back to the default Cisco IOS bundled SPE firmware.
Step 6	Router(config-spe)# <b>exit</b>	Exits SPE configuration mode.
Step 7	Router(config)# <b>exit</b>	Exits global configuration mode.
Step 8	Router# <b>copy running-config startup-config</b>	Saves your changes.

**Note**

The **copy ios-bundled** command is not necessary with T3/E1 cards. 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, complete the following steps starting in global configuration mode:

	Command	Purpose
Step 1	Router(config)# <b>spe slot/spe</b> or Router(config)# <b>spe slot/spe slot/spe</b>	Enters SPE configuration mode. You can also configure SPEs specifying the first and last SPE in the range.
Step 2	Router(config-spe)# <b>busyout</b>	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 Busyout 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 Busidout when all calls end. Use the <b>show spe</b> command to see the state of the range of SPEs.  Use the <b>no</b> form of this command to re-enable the SPEs.
Step 3	Router(config-spe)# <b>shutdown</b>	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 <b>no</b> 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# <code>clear spe slot/spe</code>	<p>Allows manual recovery of a port that is frozen in a suspended state. Reboots SPEs in suspended or Bad state. Downloads configured firmware to the specified SPE or range of SPEs and power-on self test (POST) is run.</p> <p> <b>Note</b> Depending on the problem, sometimes downloading the SPE firmware might not help recover a bad port or an SPE.</p> <p>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.</p>

## 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)# <code>line slot/port slot/port</code>	<p>Enters the line configuration mode. Specifies a range of slot and port numbers to configure.</p> <p> <b>Note</b> The T3/E1 card slots are defined as a value between 0 and 5, and 8 and 14. Each T3/E1 card provides 36 SPEs. The SPE value ranges from 0 to 35. Because each SPE has six ports, each card has a total of 216 ports. The port value ranges from 0 to 215.</p> <p>For example, if you want to configure 216 ports on slot 3, enter <code>line 3/0 3/215</code>. If you want to configure 648 ports on slots 3-5, enter <code>line 3/0 5/215</code>.</p>
Step 2	Router(config-line)# <code>transport input all</code>	Allows all protocols when connecting to the line.

	Command	Purpose
Step 3	Router(config-line)# <b>autoselect ppp</b>	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)# <b>modem inout</b>	Enables incoming and outgoing calls.
Step 5	Router(config-line)# <b>modem autoconfigure type name</b>	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 gateway is configured for incoming and outgoing calls (**modem inout**).

## Configuring Ports

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

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

	Command	Purpose
Step 3	Router(config-port)# <b>busyout</b>	<p>(Optional) Gracefully disables a port by waiting for the active services on the specified port to terminate. Use the <b>no</b> form of this command to re-enable the ports.</p> <p>Maintenance activities, such as testing, can still be performed while the port is in busyout mode.</p> <p> <b>Note</b> 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.</p>
Step 4	Router(config-port)# <b>shutdown</b>	<p>(Optional) Clears active calls on the port. No more calls can be placed on the port in the shutdown mode. Use the <b>no</b> form of this command to re-enable the ports.</p> <p> <b>Note</b> 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.</p>
Step 5	Router(config-port)# <b>exit</b>	Exits port configuration mode.

## Clearing Ports

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

Command	Purpose
Router# <b>clear port 4/1</b> Router# This will clear port 4/01 [confirm] <b>yes</b>	Clears slot 4, port 1 of the T3/E1 card in the Cisco AS5850.
Router# <b>clear port 0</b> Router# This will clear port 0/00 - 0/215 [confirm] <b>yes</b>	Clears all active ports on slot 0 of the T3/E1 card in the Cisco AS5850.

## 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 and Maintaining SPE Performance Statistics](#)” section on page 16. You can configure some aspects of history events by using the following commands in global configuration mode:

Command	Purpose
Router(config)# <b>spe call-record</b> <i>modem max-userid</i>	Requests the gateway to generate a modem call record after a call is terminated. To disable this function, use the <b>no</b> form of this command.
Router(config)# <b>spe log-size</b> <i>number</i>	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# <b>clear spe log</b>	Clears all event entries in the slot history event log.
Router# <b>clear spe counters</b>	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# <b>clear port log</b>	Clears all event entries in the port level history event log. You cannot remove individual service events from the port log.

## Troubleshooting Tips

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 can 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 can also 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 display results of the SPE port startup test and SPE port auto-test.

When an SPE port is tested as Bad, you can 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 gateway. For example, if mobile users cannot dial in to port 2/5 (which is the sixth port in the second chassis slot), attempt a back-to-back test with port 2/5 and a known-functioning port such as port 2/6.

- Enter the **test port modem back-to-back slot/port 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 2/10 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:CONN33600/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 can 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 can also schedule recovery using the **spe download maintenance** command.

- Enter the **spe download maintenance time** *hh:mm* | **stop-time** *hh:mm* | **max-specs** *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 on 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-specs**, or until **stop-time** (if set), or until all SPEs marked for recovery or upgrade have had their firmware reloaded.


## Monitoring and Maintaining SPE Performance Statistics

This section documents various SPE performance statistics:

- [SPE Events and Firmware Statistics, page 17](#)
- [Port Statistics, page 17](#)
- [Digital SPE Statistics, page 18](#)
- [SPE Modem Statistics, page 18](#)

## SPE Events and Firmware Statistics

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

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

## Port Statistics

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

Command	Purpose
Router# <code>show port config {slot   slot/port}</code>	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 run.
Router# <code>show port digital log [reverse slot/port] [slot   slot/port]</code>	Displays the digital data event log.
Router# <code>show port modem log [reverse slot/port] [slot   slot/port]</code>	Displays the port history event log.
Router# <code>show port modem test [slot   slot/port]</code>	Displays the test log for the specified SPE port range or all the SPE ports.
Router# <code>show port operational-status [slot   slot/port]</code>	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 run.

## Digital SPE Statistics

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

Command	Purpose
Router# <b>show spe digital</b> [ <i>slot</i>   <i>slot/spe</i> ]	Displays history statistics of all digital SPEs.
Router# <b>show spe digital active</b> [ <i>slot</i>   <i>slot/spe</i> ]	Displays active digital statistics of a specified SPE, the specified range of SPEs, or all SPEs.
Router# <b>show spe digital csr</b> [ <b>summary</b>   <i>slot</i>   <i>slot/spe</i> ]	Displays the digital call success rate statistics for a specific SPE, a range of SPEs, or all SPEs.
Router# <b>show spe digital disconnect-reason</b> [ <b>summary</b>   <i>slot</i>   <i>slot/spe</i> ]	Displays the digital disconnect reasons for the specified SPE or range of SPEs. The disconnect reasons are displayed with Class boundaries.
Router# <b>show spe digital summary</b> [ <i>slot</i>   <i>slot/spe</i> ]	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, enter one or more of the following commands in privileged EXEC mode:

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

Command	Purpose
Router# <code>show spe modem low standard {summary   slot   slot/spe}</code>	Displays the total number of connections within each high modulation or codec for a specific range of SPEs.
Router# <code>show spe modem summary {slot   slot/spe}</code>	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 Examples

For further information on configuration examples for the Cisco AS5850, see the [Cisco AS5850 Universal Gateway Operations, Administration, Maintenance, and Provisioning Guide](#).

**Note**

The Command Reference and Glossary are in a separate document.