Troubleshooting an MSC

This chapter describes techniques that you can use to troubleshoot the operation of your MSCs.

It includes the following sections:

The first section provides information about basic interface troubleshooting. If you are having a problem with your SPA, use the steps in the "General Troubleshooting Information" section to begin your investigation of a possible interface configuration problem.

To perform more advanced troubleshooting, see the other sections in this chapter.

General Troubleshooting Information

This section describes general information for troubleshooting MSCs and SPAs. It includes the following sections:

Interpreting Console Error Messages

To view the explanations and recommended actions for Cisco 7304 router error messages, including messages related to Cisco 7304 router MSCs and SPAs, refer to the following documents:

• *System Error Messages for Cisco 7304 Routers* (for error messages on Early Deployment trains)

• *System Error Messages for Cisco IOS Release 12.2S* (for error messages in Cisco IOS Release 12.2S)

System error messages are organized in the documentation according to the particular system facility that produces the messages. The MSC and error messages use the following facility names:

- Cisco 7304 MSC-100: MSC100_SPA_CC
- 4-Port 10/100 Fast Ethernet SPA: SPA_ETHER

Using debug Commands

Along with the other **debug** commands supported on the Cisco 7304 router, you can obtain specific debug information for SPAs on the Cisco 7304 router using the **debug hw-module subslot** privileged EXEC command.

The **debug hw-module subslot** command is intended for use by Cisco Systems technical support personnel. For more information about the **debug hw-module subslot** command, see Chapter 18, "Command Reference."

Caution Because debugging output is assigned high priority in the CPU process, it can render the system unusable. For this reason, use **debug** commands only to troubleshoot specific problems or during troubleshooting sessions with Cisco technical support staff. Moreover, it is best to use **debug** commands during periods of lower network traffic and fewer users. Debugging during these periods decreases the likelihood that increased **debug** command processing overhead will affect system use.

For information about other **debug** commands supported on the Cisco 7304 router, refer to the *Cisco IOS Debug Command Reference, Release 12.2* and any related feature documents for Cisco IOS Release 12.2 S.

Using test Commands

The SPAs on the Cisco 7304 router also implement certain **test** commands.

Caution The **test hw-module subslot** commands are not intended for production use and should be used only under the supervision of Cisco Systems technical support personnel. These commands can produce unexpected operation of your SPA.

For more information about the **test hw-module subslot** commands, see Chapter 18, "Command Reference."

Using show Commands

There are several **show** commands that you can use to monitor and troubleshoot the MSCs and SPAs on the Cisco 7304 router. This chapter describes using the **show interfaces** and **show controllers** commands to perform troubleshooting of your SPA.

For more information about **show** commands to verify and monitor MSCs and SPAs, see the following chapters of this guide:

- Chapter 6, "Configuring the Fast Ethernet SPA and Gigabit Ethernet SPA"
- Chapter 8, "Command Summary for Fast Ethernet and Gigabit Ethernet SPAs"
- Chapter 18, "Command Reference"

Using the show controllers Command to Troubleshoot Problems

To display diagnostic information and verify the performance of the hardware devices on a SPA on the Cisco 7304 router, you can use the **show controllers** and **show hw-module subslot** privileged EXEC commands.

The following is an example of the **show controllers fastethernet** command output for the 4-Port 10/100 Fast Ethernet SPA:

```
Router# show controllers fastethernet 4/0/0
Interface FastEthernet4/0/0
  Hardware is SPA-4FE-7304
  Connection mode is auto-negotiation
  Interface state is up, link is up
  Configuration is Auto Speed, Auto Duplex
  Selected media-type is RJ45
  Promiscuous mode is off, VLAN filtering is enabled
  MDI crossover status: MDI
  Auto-negotiation configuration and status:
    Auto-negotiation is enabled and is completed
    Speed/duplex is resolved to 100 Mbps, full duplex
    Advertised capabilities: 10M/HD 10M/FD 100M/HD 100M/FD Pause capable (Asymmetric)
    Partner capabilities: 10M/HD 10M/FD 100M/HD 100M/FD Pause capable
MAC counters:
  Input: packets = 15, bytes = 1776
         FIFO full/reset removed = 0, error drop = 0
  Output: packets = 18, bytes = 2622
          FIFO full/reset removed = 0, error drop = 0
  Total pause frames: transmitted = 0, received = 0
FPGA counters:
  Input: Total (good & bad) packets: 15, TCAM drops: 4
         Satisfy (host-backpressure) drops: 0, CRC drops: 0
         PL3 RERRs: 0
  Output: EOP (SPI4) errors: 0
SPA carrier card counters:
  Input: packets = 11, bytes = 1476, drops = 0
  Output: packets = 18, bytes = 2550, drops = 0
  Egress flow control status: XON
  Per bay counters:
  General errors: input = 0, output = 0
  SPI4 errors: ingress dip4 = 0, egress dip2 = 0
MAC destination address filtering table:
  Table entries: Total = 512, Used = 4, Available = 508
  Index MAC destination address       Mask
  ----- ----------------------  --------------
  1     0007.0ed3.ba80          ffff.ffff.ffff
```

```
  2     ffff.ffff.ffff           ffff.ffff.ffff
  3     0100.0000.0000           0100.0000.0000
  4     0100.0ccc.cccc           ffff.ffff.ffff
VLAN filtering table:
  Number of VLANs configured on this interface = 0
  Table entries: Total = 1024, Used = 2, Available = 1022
  Index  VLAN identifier  Enabled  Tunnel
  -----  ---------------  -------  ------
  1           0             No      No
  2           0             Yes     No
Platform details:
  PXF tif number: 0x10
```

Note None of the SPA SPI4 error counters appear in **show controllers fastethernet** command output until at least one of those types of SPI4 errors occurs.

The following is an example of the **show controllers fastethernet** command output for the 4-Port 10/100 Fast Ethernet SPA, where the "SPA Error counters" section appears reflecting the occurrence of certain System Packet Interface Level 4 (SPI4) errors on the SPA:

```
Router# show controllers fastethernet 4/0/0
.
.
SPA carrier card counters:
  Input: packets = 0, bytes = 0, drops = 0
  Output: packets = 1, bytes = 60, drops = 0
  Egress flow control status: XON
  Per bay counters:
  General errors: input = 0, output = 0
  SPI4 errors: ingress dip4 = 0, egress dip2 = 0
SPA Error counters:
  SPI4 TX out of frame error = 2 (00:02:31 ago)
  SPI4 TX Train valid error = 1 (00:02:11 ago)
  SPI4 TX DIP4 error = 1 (00:01:30 ago)
  SPI4 RX out of frame error = 1 (00:00:36 ago)
  SPI4 RX DIP2 error = 1 (00:00:13 ago)
MAC destination address filtering table:
  Table entries: Total = 1024, Used = 3, Available = 1021
```

Table 3-1 describes the significant fields of the **show controllers fastethernet** command that might require further action during troubleshooting.

Table 3-1 Significant Output Fields in show controllers Command for Troubleshooting

Output Field	Problem Description	Recommended Action
FPGA counters: Satisfy (host-backpressure) drops	Indicates back pressure from the Route Processor (RP), possibly due to higher bandwidth line cards on the router.	Use the **show c7300**, **show pxf accounting**, and **show pxf interface** commands to obtain more information. See the "Troubleshooting Oversubscription" section on page 3-5.
SPA Error counters: SPI4 TX out of frame SPI4 TX train valid SPI4 TX DIP4 SPI4 TX out of frame SPI4 RX DIP2 errors	Indicates errors on the SPI4 path between the MSC and the FPGA device on the SPA. TX errors occur on the path from the MSC to the FPGA for egress traffic heading toward the network. RX errors occur on the path from the FPGA to the MSC for ingress traffic being received from the network. For more information on the SPI4 path, see the "SPA Architecture" section on page 5-4. For a description of the SPI4 errors, see the **show controllers fastethernet** command descriptions in Chapter 18, "Command Reference."	When the SPA reaches a threshold for these errors, it begins automatic recovery. Unless automatic recovery fails, no action is required. For more information about automatic recovery, and additional troubleshooting if automatic recovery fails, see the "Understanding SPA Automatic Recovery" section on page 3-7.

Troubleshooting Oversubscription

When the "Satisfy (host-backpressure) drops" counter increments in the output of the **show controllers fastethernet** and command, it indicates oversubscription on the RP.

To troubleshoot further, perform the following steps:

Step 1 Use the **show c7300** command to verify whether you have exceeded the maximum allowed aggregate throughput for any line cards or interfaces.

The following output shows an example of exceeding the aggregate throughput for the SPAs on a Cisco 7304 router with an NSE-100:

```
Router# show c7300
Slot      Card Type           Status          Insertion time
----      ---------           ------          --------------
0,1       NSE100              Active          00:11:28 ago
2         7304-MSC-100        Active          00:05:38 ago
3         7304-MSC-100        Active          00:00:42 ago
4         1OC48-POS           Active          00:05:39 ago

Shared Port Adapter information:
Slot/Subslot  SPA Type             Status          Insertion time
------------  --------             ------          --------------
2/0           SPA-4FE-7304         ok              00:05:12 ago
2/1           SPA-4FE-7304         ok              00:05:12 ago
3/0           SPA-4FE-7304         ok              00:00:10 ago
3/1           SPA-4FE-7304         ok              00:00:09 ago
```

```
%NOTE: Line cards present violate configuration guidelines for this NSE.

Maximum allowed aggregate throughput of the line cards
for a system with this NSE is 3200000 kbps

Maximum throughput for line cards in system
Slot      Card Type           Throughput (kbps)
----      ---------           -----------------
0,1       NSE100              0
2         7304-MSC-100        800000
3         7304-MSC-100        800000
4         1OC48-POS           2488000

Maximum throughput for SPAs in the system
Slot/Subslot  SPA Type
Slot/Subslot  SPA Type        Throughput (kbps)
------------  --------        -----------------
2/0           SPA-4FE-7304    400000
2/1           SPA-4FE-7304    400000
3/0           SPA-4FE-7304    400000
3/1           SPA-4FE-7304    400000

%WARNING: The following FPGAs in the system may need an update.

Slot      Card Type           Hardware Version  Current FPGA  Bundled FPGA
----      ---------           ----------------  ------------  ------------
2         7304-MSC-100             00.11           00.23         00.22
3         7304-MSC-100             00.10           00.23         00.22
4         1OC48-POS                01.05           00.13          None

Network IO Interrupt Throttling:
 throttle count=101112, timer count=101111
 active=0, configured=1
 netint usec=3999, netint mask usec=200
```

Step 2 To verify oversubscription on the NSE-100, use the **show pxf accounting** and **show pxf interface** commands.

Note For Parallel Express Forwarding (PXF) information for SPA interfaces on the 4-Port 10/100 Fast Ethernet SPA, you can use the **show pxf interface fastethernet** *slot/subslot/port* version of the command.

Step 3 To verify oversubscription on the NPE-G100, use the **show interfaces** command.

Understanding SPA Automatic Recovery

When the 4-Port 10/100 Fast Ethernet SPA encounters thresholds for certain types of errors and identifies a fatal error, the SPA initiates an automatic recovery process.

You do not need to take any action unless the error counters reach a certain threshold, and multiple attempts for automatic recovery by the SPA fail.

The 4-Port 10/100 Fast Ethernet SPA might perform automatic recovery for the following types of errors:

- SPI4 TX/RX out of frame
- SPI4 TX train valid
- SPI4 TX DIP4
- SPI4 RX DIP2

Note These SPA error counters do not appear in the **show controllers fastethernet** command output until at least one SPI4 error occurs.

When Automatic Recovery Occurs

If the SPI4 errors occur more than 25 times within 10 milliseconds, the SPA automatically deactivates and reactivates itself. Error messages are logged on the console indicating the source of the error and the status of the recovery.

If Automatic Recovery Fails

If the SPA attempts automatic recovery more than five times in an hour, then the SPA deactivates itself and remains deactivated.

To troubleshoot automatic recovery failure for a SPA, perform the following steps:

Step 1 Use the **show c7300** command to verify the status of the SPA. The status is shown as “failed” if the SPA has been powered off due to five consecutive failures, as shown in the following example:

```
Router# show c7300
.
.
.
The FPGA versions for the cards listed above are current

Shared Port Adapter information:
Slot/Subslot  SPA Type            Status          Insertion time
------------  --------            ------          --------------
.
.
.
3/0           SPA-4FE-7304        failed          00:00:08 ago
.
.
.
```

Step 2 If you verify that automatic recovery has failed, perform OIR of the SPA. For information about performing an OIR, see the "Preparing for Online Insertion and Removal of MSCs and SPAs on the Cisco 7304 Router" section on page 3-8.

Step 3 If reseating the SPA after OIR does not resolve the problem, replace the SPA hardware.

Preparing for Online Insertion and Removal of MSCs and SPAs on the Cisco 7304 Router

The Cisco 7304 router supports online insertion and removal (OIR) of the modular services card (MSC), in addition to each of the shared port adapters (SPAs). Therefore, you can remove an MSC with its SPAs still intact, or you can remove a SPA independently from the MSC, leaving the MSC installed in the router.

This section includes the following topics on OIR support:

Preparing for Online Removal of an MSC

The Cisco 7304 router supports OIR of the MSC. To do this, you can stop an MSC (which automatically deactivates any installed SPAs) and remove the MSC with the SPAs still intact.

If you plan to remove an MSC, we recommend that you deactivate the MSC first, using the **hw-module slot** privileged EXEC command. When you deactivate an MSC using this command, it automatically deactivates each of the SPAs that are installed in that MSC. Therefore, it is not necessary to deactivate each of the SPAs prior to deactivating the MSC.

Although graceful deactivation of an MSC or SPA is preferred using the **hw-module slot stop** command or **hw-module subslot stop** command, the Cisco 7304 router supports removal of an MSC or SPA without deactivating it first.

For more information about the recommended procedures for physical removal of the MSC, refer to the *Cisco 7304 Router Modular Services Card and Shared Port Adapter Hardware Installation Guide*.

Deactivating an MSC

To deactivate an MSC and its installed SPAs prior to removal of the MSC, use the following command in privileged EXEC configuration mode:

Command	Purpose
Router# **hw-module slot** *slot-number* **stop**	Stops traffic, shuts down any installed interfaces, and deactivates the MSC in the specified slot, where: • *slot-number*—Specifies the slot (2 through 5) on the Cisco 7304 router in which the MSC that contains SPAs is installed.

Reactivating an MSC

Note You do not need to reactivate an MSC after an OIR. If the router is running, then the MSC and its installed SPAs automatically reactivate with insertion of the MSC into the Cisco 7304 router.

If for some reason you deactivate an MSC and need to reactivate it without performing an OIR, you need to use the **hw-module slot start** privileged EXEC command to reactivate the MSC and its SPAs.

To activate an MSC and its installed SPAs after the MSC has been deactivated, use the following command in privileged EXEC configuration mode:

Command	Purpose
Router# **hw-module slot** *slot-number* **start**	Activates the MSC in the specified slot and its installed SPAs, where: • *slot-number*—Specifies the slot (2 through 5) on the Cisco 7304 router in which the MSC that contains SPAs is installed.

Preparing for Online Removal of a SPA

The Cisco 7304 router supports OIR of a SPA independently of removing the MSC. This means that an MSC can remain installed in the router with one SPA remaining active while you remove another SPA from one of the MSC subslots. If you are not planning to immediately replace a SPA into the MSC, then be sure to install a blank filler plate in the subslot. The MSC should always be fully installed with either functional SPAs or blank filler plates.

If you are planning to remove an MSC along with its SPAs, then you do not need to follow the instructions in this section. To remove an MSC, see the "Preparing for Online Removal of an MSC" section on page 3-8.

Deactivating a SPA

Note If you are preparing for an OIR of a SPA, it is not necessary to independently shut down each of the interfaces prior to deactivation of the SPA. The **hw-module subslot stop** command automatically stops traffic on the interfaces and deactivates them along with the SPA in preparation for OIR. In similar fashion, you do not need to independently restart any interfaces on a SPA after OIR of a SPA or MSC.

To deactivate a SPA and all of its interfaces prior to removal of the SPA, use the following command in privileged EXEC configuration mode:

Command	Purpose
Router# **hw-module subslot** *slot/subslot* **stop**	Stops traffic and deactivates the SPA in the specified slot and subslot of the MSC, where: • *slot*—Specifies the slot (2 through 5) on the Cisco 7304 router in which the MSC containing the SPA is installed. • *subslot*—Specifies the secondary slot (top [0] or bottom [1]) on the MSC where the SPA that you want to select is installed. A Cisco 7304 MSC-100 can contain up to two SPAs.

Reactivating a SPA

Note You do not need to reactivate a SPA after an OIR of either the MSC or a SPA. If the router is running, then the SPAs automatically start upon insertion into the MSC or with insertion of an MSC into the Cisco 7304 router.

If for some reason you deactivate a SPA using the **hw-module subslot stop** privileged EXEC command and need to reactivate it without performing an OIR, you need to use the **hw-module subslot start** privileged EXEC command to reactivate the SPA and its interfaces.

To activate a SPA and its interfaces after the SPA has been deactivated without performing an OIR, use the following command in privileged EXEC configuration mode:

Command	Purpose
Router# **hw-module subslot** *slot/subslot* **start**	Activates the SPA and its interfaces in the specified slot and subslot of the MSC, where: • *slot*—Specifies the slot (2 through 5) on the Cisco 7304 router in which the MSC containing the SPA is installed. • *subslot*—Specifies the secondary slot (top [0] or bottom [1]) on the MSC where the SPA that you want to select is installed. An Cisco 7304 MSC-100 can contain up to two SPAs.

Verifying Deactivation

When you deactivate an MSC or a SPA, the corresponding interfaces are also deactivated. This means that these interfaces will no longer appear in the output of the **show ip interfaces** commands. However, you can use the **show c7300** command to verify the presence of a SPA in an MSC subslot.

To verify the deactivation of interfaces on a SPA, perform the following steps beginning in privileged EXEC configuration mode prior to deactivating the SPA:

Step 1 Enter the **show ip interface brief** command and observe the list of interfaces associated with the SPA that you plan to deactivate. The following example shows that the four interfaces (0 through 3) are up for the SPA in the top subslot (0) of the MSC that is installed in slot 3 on the Cisco 7304 router:

```
Router# show ip interface brief
Interface                  IP-Address      OK? Method Status                Protocol
FastEthernet0              13.2.11.100     YES NVRAM  up                    up
GigabitEthernet0/0         172.16.4.2     YES NVRAM  up                   up
GigabitEthernet0/1         unassigned      YES NVRAM  up                    down
FastEthernet3/0/0          192.168.50.2    YES NVRAM  up                    up
FastEthernet3/0/1          192.168.51.2    YES NVRAM  up                    up
FastEthernet3/0/2          192.168.52.2    YES NVRAM  up                    up
FastEthernet3/0/3          192.168.53.2    YES NVRAM  up                    up
FastEthernet3/1/0          192.168.54.2    YES NVRAM  up                    up
FastEthernet3/1/1          192.168.55.2    YES NVRAM  up                    up
FastEthernet3/1/2          192.168.56.2    YES NVRAM  up                    up
FastEthernet3/1/3          192.168.57.2    YES NVRAM  up                    up
```

Step 2 Deactivate the SPA using the **hw-module subslot stop** command. The following example shows deactivation of the SPA in the top subslot (0) of the MSC that is installed in slot 3 on the Cisco 7304 router, and all of its interfaces being shut down:

```
Router# hw-module subslot 3/0 stop
*Sep  3 07:27:47.775: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/0,
changed state to down
*Sep  3 07:27:47.783: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/1,
changed state to down
*Sep  3 07:27:47.791: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/2,
changed state to down
*Sep  3 07:27:47.799: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/3,
changed state to down
```

Step 3 Enter the **show ip interface brief** command again, and observe that the interfaces associated with the SPA that you deactivated no longer appear in the output. The following example shows that the four interfaces (FastEthernet3/0/0, FastEthernet3/0/1, FastEthernet3/0/2, and FastEthernet3/0/3) no longer appear in the **show** command output:

```
Router# show ip interface brief
Interface                  IP-Address      OK? Method Status                Protocol
FastEthernet0              13.2.11.100     YES NVRAM  up                    up
GigabitEthernet0/0         172.16.4.2      YES NVRAM  up                    up
GigabitEthernet0/1         unassigned      YES NVRAM  up                    down
FastEthernet3/1/0          192.168.54.2    YES NVRAM  up                    up
FastEthernet3/1/1          192.168.55.2    YES NVRAM  up                    up
FastEthernet3/1/2          192.168.56.2    YES NVRAM  up                    up
FastEthernet3/1/3          192.168.57.2    YES NVRAM  up                    up
```

Note Although deactivating a SPA shows that the interfaces are being changed to the down state, the **show ip interface** commands do not show deactivated interfaces as being down. A deactivated interface does not appear in the **show** output.

Step 4 To verify the physical configuration status of your MSCs and SPAs, you can use the **show c7300** privileged EXEC command. If the SPA is not present in an MSC subslot, the **show c7300** command displays a value of "missing" for the SPA status.

In the following example, the MSC-100 in slot 3 is active, but there is no SPA installed in the top subslot (0):

```
Router# show c7300
Slot      Card Type           Status          Insertion time
----      ---------           ------          --------------
0,1       NSE100              Active          00:45:29 ago
.
.
.
3         7304-MSC-100        Active          00:44:36 ago
.
.
.
The FPGA versions for the cards listed above are current

Shared Port Adapter information:
Slot/Subslot  SPA Type            Status          Insertion time
------------  --------            ------          --------------
.
.
3/0           not present         missing         never
.
```

Deactivation and Activation Configuration Examples

This section provides the following examples of deactivating and activating MSCs and SPAs:

- Deactivation of an MSC Configuration Example, page 3-12
- Activation of an MSC Configuration Example, page 3-13
- Deactivation of a SPA Configuration Example, page 3-13
- Activation of a SPA Configuration Example, page 3-14

Deactivation of an MSC Configuration Example

Deactivate an MSC when you want to perform OIR of the MSC. The following example deactivates the MSC that is installed in slot 3 of the Cisco 7304 router, its SPA, and all of the interfaces. The corresponding console messages are shown:

```
Router# hw-module slot 3 stop

*Sep  3 06:53:47.275: %WS_ALARM-6-INFO: ASSERT CRITICAL slot 3 Card Stopped Responding OIR
Alarm
*Sep  3 06:53:48.055: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/0,
changed state to down
*Sep  3 06:53:48.059: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/1,
changed state to down
*Sep  3 06:53:48.099: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/2,
changed state to down
*Sep  3 06:53:48.103: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/3,
changed state to down
```

Activation of an MSC Configuration Example

Activate an MSC if you have previously deactivated it without performing an OIR of the MSC, and you need to reactivate the MSC and its SPAs. Recall that an MSC and its SPAs automatically reactivate with reinsertion during OIR.

The following example activates the MSC that is installed in slot 3 of the Cisco 7304 router, its two SPAs, and all of the interfaces. The corresponding console messages are shown:

```
Router# hw-module slot 3 start

*Sep  3 06:54:20.119: %WS_ALARM-6-INFO: CLEAR CRITICAL slot 3 Card Stopped Responding OIR
Alarm
*Sep  3 06:54:21.887: %LINK-3-UPDOWN: Interface FastEthernet3/0/0, changed state to up
*Sep  3 06:54:21.895: %LINK-3-UPDOWN: Interface FastEthernet3/0/1, changed state to up
*Sep  3 06:54:21.899: %LINK-3-UPDOWN: Interface FastEthernet3/0/2, changed state to up
*Sep  3 06:54:21.899: %LINK-3-UPDOWN: Interface FastEthernet3/0/3, changed state to up
*Sep  3 06:54:21.903: %LINK-3-UPDOWN: Interface FastEthernet3/1/0, changed state to up
*Sep  3 06:54:21.903: %LINK-3-UPDOWN: Interface FastEthernet3/1/1, changed state to up
*Sep  3 06:54:21.907: %LINK-3-UPDOWN: Interface FastEthernet3/1/2, changed state to up
*Sep  3 06:54:21.907: %LINK-3-UPDOWN: Interface FastEthernet3/1/3, changed state to up
*Sep  3 06:54:22.887: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/0,
changed state to up
*Sep  3 06:54:22.899: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/1,
changed state to up
*Sep  3 06:54:22.903: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/2,
changed state to up
*Sep  3 06:54:22.903: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/3,
changed state to up
*Sep  3 06:54:22.907: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/1/0,
changed state to up
*Sep  3 06:54:22.907: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/1/1,
changed state to up
*Sep  3 06:54:22.911: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/1/2,
changed state to up
*Sep  3 06:54:22.911: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/1/3,
changed state to up
```

Deactivation of a SPA Configuration Example

Deactivate a SPA when you want to perform OIR of that SPA. The following example deactivates the SPA (and its four interfaces) that is installed in the top subslot (0) of the MSC located in slot 3 of the Cisco 7304 router. The corresponding console messages are shown:

```
Router# hw-module subslot 3/0 stop

*Sep  3 06:48:47.239: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/0,
changed state to down
*Sep  3 06:48:47.243: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/1,
changed state to down
*Sep  3 06:48:47.243: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/2,
changed state to down
*Sep  3 06:48:47.243: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/3,
changed state to down
```

Activation of a SPA Configuration Example

Activate a SPA if you have previously deactivated it without performing an OIR of the SPA, and you need to reactivate the SPA and all of its interfaces. Recall that a SPA and its interfaces automatically reactivate with reinsertion during OIR.

The following example activates the SPA (and its four interfaces) that is installed in the top subslot (0) of the MSC located in slot 3 of the Cisco 7304 router. The corresponding console messages are shown:

```
Router# hw-module subslot 3/0 start

*Sep  3 06:49:23.479: %LINK-3-UPDOWN: Interface FastEthernet3/0/0, changed state to up
*Sep  3 06:49:23.483: %LINK-3-UPDOWN: Interface FastEthernet3/0/1, changed state to up
*Sep  3 06:49:23.483: %LINK-3-UPDOWN: Interface FastEthernet3/0/2, changed state to up
*Sep  3 06:49:23.483: %LINK-3-UPDOWN: Interface FastEthernet3/0/3, changed state to up
*Sep  3 06:49:28.095: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/0,
changed state to up
*Sep  3 06:49:28.951: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/3,
changed state to up
*Sep  3 06:49:28.951: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/1,
changed state to up
*Sep  3 06:49:28.955: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet3/0/2,
changed state to up
```