



SRP Commands on the Cisco IOS XR Software

This module provides command line interface (CLI) commands for configuring Spatial Reuse Protocol (SRP) on supported Cisco Dynamic Packet Transport (DPT) interfaces.

SRP is a MAC-layer protocol developed by Cisco and is used in conjunction with Cisco DPT products. DPT products deliver scalable Internet service, reliable IP-aware optical transport, and simplified network operations. These solutions allow you to scale and distribute your IP services across a reliable optical packet ring infrastructure.



Note Throughout the remainder of this publication, the term SRP is used to describe features related to the DPT product family.

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clear srp counters

To clear the SRP counters, use the **clear srp counters** command in EXEC mode.

clear srp counters interface srp *interface-path-id* | **location** *node-id*

Syntax Description

interface srp Specifies the SRP interface.

interface-path-id Physical interface or virtual interface.

Note Use the **show interfaces** command to see a list of all interfaces currently configured on the router.

For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

No default behavior or values

Command Modes

EXEC

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------------------------------------|
| Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| Release 3.4.0 | This command was introduced on the 16-port OC-48c/STM-16c POS/DPT PLIM. |

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For the *interface-path-id* argument, use the following guidelines:

- If specifying a physical interface, the naming notation is *rack/slot/module/port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:
 - *rack*: Chassis number of the rack.
 - *slot*: Physical slot number of the line card.
 - *module*: Module number. A physical layer interface module (PLIM) is always 0.
 - *port*: Physical port number of the interface.
- If specifying a virtual interface, the number range varies, depending on interface type.

The **clear srp counters** command clears the counters displayed in the following commands:

- show controllers srp rac-error
- show srp counters
- show srp counters source
- show srp transit

| Task ID | Task Operations ID |
|---------|------------------------|
| | pos-dpt read, write |

Examples

The following example shows how to use the **clear srp counters** command to make the counts displayed from the **show srp source-counters** command return to zero:

```
RP/0/RP0/CPU0:router# show srp counters interface srp 0/7/0/0

Data Traffic Counters for Interface SRP0/7/0/0
Side A:
Transit
  Total Low Priority:          Packets      Bytes
  Total High Priority:        183          768543
  Total Multicast:            174          767913
  Total Unicast:              9            630
Host Receive
  Unicast Low Priority:        6            648
  Unicast High Priority:       0            0
  Multicast Low Priority:      0            0
  Multicast High Priority:     1            41
Total Receive
  Unicast Low Priority:        6            648
  Unicast High Priority:       9            630
  Multicast Low Priority:      3            144
  Multicast High Priority:     174          767913
Host Transmit
  Unicast Low Priority:        4            480
  Unicast High Priority:       0            0
  Multicast Low Priority:      0            0
  Multicast High Priority:     0            0
Total Transmit
  Unicast Low Priority:        4            480
  Unicast High Priority:       0            0
  Multicast Low Priority:      0            0
  Multicast High Priority:     772          1575090
Traffic Rate (5 Minutes)
  Transit Low Priority          packets/sec  bits/sec
  Transit High Priority         0           0
  Transit Multicast             0           0
  Transit Unicast               0           0
  Host Receive                  0           0
  Total Receive                 0           0
  Host Transmit                 0           0
  Total Transmit                0           0
Received Errors:
  0 input errors, 0 CRC, 0 ignored,
  0 framer runts, 0 framer giants, 0 framer aborts,
  0 mac runts, 0 mac giants, 0 mac ttl strips

Side B:
Transit
  Total Low Priority:          Packets      Bytes
  Total High Priority:        772          1575090
  Total Multicast:            772          1575090
  Total Unicast:              0            0
Host Receive
  Unicast Low Priority:        6            648
```

clear srp counters

```

Unicast High Priority:          0          0
Multicast Low Priority:         0          0
Multicast High Priority:        1          41
Total Receive                   Packets    Bytes
Unicast Low Priority:           6        648
Unicast High Priority:          0          0
Multicast Low Priority:         0          0
Multicast High Priority:        772       1575090
Host Transmit                   Packets    Bytes
Unicast Low Priority:           6        720
Unicast High Priority:          0          0
Multicast Low Priority:         3        144
Multicast High Priority:        0          0
Total Transmit                  Packets    Bytes
Unicast Low Priority:           6        720
Unicast High Priority:          9        630
Multicast Low Priority:         3        144
Multicast High Priority:        174       767913
Traffic Rate (5 Minutes)        packets/sec  bits/sec
Transit Low Priority             0          0
Transit High Priority            0          0
Transit Multicast                0          0
Transit Unicast                 0          0
Host Receive                    0          0
Total Receive                   0          0
Host Transmit                   0          0
Total Transmit                  0          0

Received Errors:
  0 input errors, 0 CRC, 0 ignored,
  0 framer runts, 0 framer giants, 0 framer aborts,
  0 mac runts, 0 mac giants, 0 mac ttl strips

```

```

RP/0/RP0/CPU0:router# clear srp counters interface srp 0/7/0/0
RP/0/RP0/CPU0:router# show srp counters interface srp 0/7/0/0

```

```

Data Traffic Counters for Interface SRP0/7/0/0
Side A:
Transit                   Packets    Bytes
Total Low Priority:       0          0
Total High Priority:      0          0
Total Multicast:          0          0
Total Unicast:            0          0
Host Receive              Packets    Bytes
Unicast Low Priority:     0          0
Unicast High Priority:    0          0
Multicast Low Priority:   0          0
Multicast High Priority:  0          0
Total Receive             Packets    Bytes
Unicast Low Priority:     0          0
Unicast High Priority:    0          0
Multicast Low Priority:   0          0
Multicast High Priority:  0          0
Host Transmit             Packets    Bytes
Unicast Low Priority:     0          0
Unicast High Priority:    0          0
Multicast Low Priority:   0          0
Multicast High Priority:  0          0
Total Transmit            Packets    Bytes
Unicast Low Priority:     0          0
Unicast High Priority:    0          0
Multicast Low Priority:   0          0
Multicast High Priority:  0          0
Traffic Rate (5 Minutes)  packets/sec  bits/sec
Transit Low Priority       0          0

```

```

Transit High Priority          0          0
Transit Multicast             0          0
Transit Unicast               0          0
Host Receive                  0          0
Total Receive                 0          0
Host Transmit                 0          0
Total Transmit                0          0
Received Errors:
  0 input errors, 0 CRC, 0 ignored,
  0 framer runts, 0 framer giants, 0 framer aborts,
  0 mac runts, 0 mac giants, 0 mac ttl strips

Side B:
Transit
  Total Low Priority:          0          0
  Total High Priority:         0          0
  Total Multicast:            0          0
  Total Unicast:              0          0
Host Receive
  Unicast Low Priority:        0          0
  Unicast High Priority:       0          0
  Multicast Low Priority:      0          0
  Multicast High Priority:     0          0
Total Receive
  Unicast Low Priority:        0          0
  Unicast High Priority:       0          0
  Multicast Low Priority:      0          0
  Multicast High Priority:     0          0
Host Transmit
  Unicast Low Priority:        0          0
  Unicast High Priority:       0          0
  Multicast Low Priority:      0          0
  Multicast High Priority:     0          0
Total Transmit
  Unicast Low Priority:        0          0
  Unicast High Priority:       0          0
  Multicast Low Priority:      0          0
  Multicast High Priority:     0          0
Traffic Rate (5 Minutes)
  Transit Low Priority          0          0
  Transit High Priority         0          0
  Transit Multicast            0          0
  Transit Unicast              0          0
  Host Receive                  0          0
  Total Receive                 0          0
  Host Transmit                 0          0
  Total Transmit                0          0
Received Errors:
  0 input errors, 0 CRC, 0 ignored,
  0 framer runts, 0 framer giants, 0 framer aborts,
  0 mac runts, 0 mac giants, 0 mac ttl strips

```

hw-module port

To enable a port to be used for SRP, use the **hw-module port** command in global configuration mode. To disable SRP and enable the port for Packet over SONET (POS), use the **no** form of this command.

hw-module port *port-number* **srp** **location** *node-id* **spa-bay** *number*
no hw-module port *port-number* **srp** **location** *node-id* **spa-bay** *number*

Syntax Description

port-number Number of the physical interface on the PLIM or SPA.

srp Specifies an SRP interface.

location Specifies the location of the module.

node-id Location of the PLIM or SPA, in the *rack/slot/module* notation.

spa-bay Bay number of one of the following:

- 16-port OC-48c/STM-16c POS/DPT PLIM
- 4-port OC-192c/STM-64c POS/DPT PLIM
- 1-port OC-192/STM-64 POS/RPR SPA XFP optics
- 4-port OC-48/STM-16 POS/RPR SPA
- 2-port OC-48/STM-16 POS/RPR SPA

Note After this command is executed, the SPA must be reloaded to apply the configuration and create the SRP ports. On the OC-192 SPAs, both SPAs at each end of the SRP interface must be reloaded.

number Number of the SPA bay.

Command Default

When there is no **hw-module port** configuration, ports are enabled for POS by default.

Command Modes

Global configuration

Command History

| Release | Modification |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |
| Release 3.8.0 | This command was first supported on the following SPAs: <ul style="list-style-type: none"> • 1-port OC-192/STM-64 POS/RPR SPA XFP optics • 4-port OC-48/STM-16 POS/RPR SPA • 2-port OC-48/STM-16 POS/RPR SPA The spa-bay keyword was added. |

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

POS is the default port mode on POS/DPT PLIMs and SPAs. Use the **hw-module port** command to allow the ports to be configured for SRP use.

SRP requires two consecutive physical ports for use as a single SRP interface. The first port must be even numbered and the second port must be odd numbered. No other combinations are allowed. You must use this command on both of the ports to be used as an SRP interface. SRP interfaces take the number of the lower, even-numbered port. For example, if ports 0/1/0/2 and 0/1/0/3 are enabled as an SRP interface, the interface would be referred to as SRP0/1/0/2.

On the 16-port OC-48c/STM-16c POS/DPT PLIM, groups of four consecutive ports must be configured the same. Ports 0 through 3 must all be configured as either SRP or POS. The same is true for ports 4 through 7, 8 through 11, and 12 through 15. All four ports must be on the same SPA bay.

On the 4-port OC-192c/STM-64c POS/DPT PLIM, groups of two ports must be configured the same; either as SRP or POS. The two ports must be on different SPA bays; either 0, 1, or 2 or 3, 4, or 5.

After using the **hw-module port** command, you must save the configuration and reload the PLIM or SPA to enable this configuration change and create the SRP or POS interface. For the PLIMs, use the **hw-module location reload** command in EXEC mode. For all SPAs except for the 1-port OC-192/STM-64 POS/RPR SPA XFP optics, use the **hw-module subslot reload** command in EXEC mode. For the OC-192/STM-64 POS/RPR SPA, use the **hw-module subslot shutdown** command in global configuration mode to shut down the SPA, then the **no hw-module subslot shutdown** command in the same mode to return the SPA to the up state. We do not recommend using the **hw-module subslot reload** command to reload the OC-192/STM-64 POS/RPR SPA, because doing so can cause synchronization problems with the two SPAs and processes that comprise a SRP interface.

To disable SRP and reenble POS on the port, use the **no** form of the command.

**Note**

Internal clocking is required for SRP interfaces. Use the clock source internal command in SONET configuration mode to configure the clock source.

Task ID**Task Operations**

| Task ID | Operations |
|---------|----------------|
| root-lr | read, write |

Examples

In the following example, ports 0 through 3 are enabled for SRP on the PLIM:

```
RP/0/RP0/CPU0:Router(config)# hw-module port 0 srp location 0/1/cpu0
RP/0/RP0/CPU0:Router(config)# hw-module port 1 srp location 0/1/cpu0
RP/0/RP0/CPU0:Router(config)# hw-module port 2 srp location 0/1/cpu0
RP/0/RP0/CPU0:Router(config)# hw-module port 3 srp location 0/1/cpu0
RP/0/RP0/CPU0:Router(config)# exit
RP/0/RP0/CPU0:Router# hw-module location 0/1/CPU0 reload
```

In the following example, ports 0 and 1 are enabled for SRP on the PLIM:

```
RP/0/RP0/CPU0:Router(config)# hw-module port 0 srp location 0/1/cpu0
RP/0/RP0/CPU0:Router(config)# hw-module port 1 srp location 0/1/cpu0
RP/0/RP0/CPU0:Router(config)# exit
RP/0/RP0/CPU0:Router# hw-module location 0/1/CPU0 reload
```

In the following example, ports 0, 1, 2, and 3 are enabled for SRP on the SPA:

```
RP/0/RP0/CPU0:router(config)# hw-module port 0 srp location 0/3/CPU0 spa-bay 2
RP/0/RP0/CPU0:router(config)# hw-module port 1 srp location 0/3/CPU0 spa-bay 2
RP/0/RP0/CPU0:router(config)# hw-module port 2 srp location 0/3/CPU0 spa-bay 2
RP/0/RP0/CPU0:router(config)# hw-module port 3 srp location 0/3/CPU0 spa-bay 2
RP/0/RP0/CPU0:router(config)# commit
RP/0/RP0/CPU0:router(config)# end
RP/0/RP0/CPU0:router# hw-module subslot 0/3/CPU0 reload
```

```
RP/0/RP0/CPU0:router(config)# hw-module port 0 srp location 0/3/CPU0 spa-bay 0
RP/0/RP0/CPU0:router(config)# hw-module port 0 srp location 0/3/CPU0 spa-bay 1
RP/0/RP0/CPU0:router(config)# commit
RP/0/RP0/CPU0:router(config)# hw-module subslot 0/3/0 shutdown
RP/0/RP0/CPU0:router(config)# hw-module subslot 0/3/1 shutdown
RP/0/RP0/CPU0:router(config)# commit
RP/0/RP0/CPU0:router(config)# no hw-module subslot 0/3/0 shutdown
RP/0/RP0/CPU0:router(config)# no hw-module subslot 0/3/1 shutdown
RP/0/RP0/CPU0:router(config)# commit
```

Related Commands

| Command | Description |
|--------------------------------------|----------------------------------------------------------------------------------|
| clock source internal | Configures SONET clocking as internal. |
| hw-module location reload | Reloads all PLIMs. |
| hw-module subslot reload | Reloads all SPAs except the for the 1-port OC-192/STM-64 POS/RPR SPA XFP optics. |
| hw-module subslot shutdown | Administratively shuts down a SPA. |
| no hw-module subslot shutdown | Returns a SPA to the up state. |

interface srp

To configure the SRP protocol on a DPT interface and enter interface configuration mode, use the **interface srp** command in global configuration mode.

```
interface srp interface-path-id [arp | bandwidth | cdp | dampening | description | flow | ipv4 | ipv6 | load-interval | mac-address | mpls | mtu | ppp | proxy-arp | service-policy | shutdown | srp | vrf]
```

Syntax Description

interface-path-id Physical interface or virtual interface.

Note Use the **show interfaces** command to see a list of all interfaces currently configured on the router.

For more information about the syntax for the router, use the question mark (?) online help function.

arp Configures Address Resolution Protocol (ARP) on the interface.

bandwidth Sets the bandwidth for the interface.

cdp Enables Cisco Discovery Protocol (CDP) on the interface.

dampening Configures state dampening on the interface.

description Sets the description for this interface.

flow Enables NetFlow configuration on the interface.

ipv4 Enables IPv4 address subcommands on the interface.

ipv6 Enables IPv6 address subcommands on the interface.

load-interval Configures the interval for load calculation on the interface.

mac-address Sets the Mac address (*xxx.xxxx.xxx*) on the interface.

mpls Enables MPLS subcommands on the interface.

mtu Sets the maximum transmission unit (MTU) for the interface.

ppp Enables Point-to-Point Protocol (PPP) on the interface.

proxy-arp Enables proxy Address Resolution Protocol (ARP) on the interface.

service-policy Configures a QoS policy on the interface.

shutdown Shuts down the interface.

srp Enables SRP parameters on the interface.

vrf Sets the VRF in which the interface operates.

Command Default

No default behavior or values

Command Modes Global configuration

| Command History | Release | Modification |
|-----------------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| | Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |
| | Release 3.8.0 | The following new keywords were added, arp, bandwidth, cdp, dampening, description, flow, ipv4, ipv6, load-interval, mac-address, mpls, mtu, ppp, proxy-arp, service-policy, shutdown, srp, vrf. |

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For the *interface-path-id* argument, use the following guidelines:

- If specifying a physical interface, the naming notation is *rack/slot/module/port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:
 - *rack*: Chassis number of the rack.
 - *slot*: Physical slot number of the line card.
 - *module*: Module number. A physical layer interface module (PLIM) is always 0.
 - *port*: Physical port number of the interface.
- If specifying a virtual interface, the number range varies, depending on interface type.

| Task ID | Task ID | Operations |
|---------|-----------|----------------|
| | interface | read, write |

Examples

The following example shows how to enter srp interface mode:

```
RP/0/RP0/CPU0:router(config)# interface srp 0/1/0/0
RP/0/RP0/CPU0:router(config-if)#
```

show controllers srp

To display information on the SRP controllers, use the **show controllers srp** command in EXEC mode.

show controllers srp *interface-path-id* **side** **a** | **b** **rac-error** | **rac-reg** | **ucode-inst** | **ucode-reg**

| Syntax Description | |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>interface-path-id</i> | Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function. |
| side | Specify the side of the node. |
| a | The side of a node that has outer ring receive fiber is identified as side A. |
| b | The side of a node that has inner ring receive fiber is identified as side B. |
| rac-error | Displays the error reported by the Ring Access Controller (RAC) device. |
| rac-reg | Displays the value of the RAC device register set. |
| ucode-inst | Displays the RAC micro-controller binary code instruction set (currently loaded or executing) in hexadecimal format. Note This is an intrusive command that will cause adjacent nodes to detect a MAC keepalive failure and then wrap. |
| ucode-reg | Displays the RAC micro-controller register set. |

Command Default No default behavior or values

Command Modes EXEC

| Command History | Release | Modification |
|-----------------|---------------|-----------------------------------------------------------------------------------------------|
| | Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| | Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For the *interface-path-id* argument, use the following guidelines:

- If specifying a physical interface, the naming notation is *rack/slot/module/port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

- *rack*: Chassis number of the rack.
 - *slot*: Physical slot number of the line card.
 - *module*: Module number. A physical layer interface module (PLIM) is always 0.
 - *port*: Physical port number of the interface.
- If specifying a virtual interface, the number range varies, depending on interface type.

| Task ID | Task ID | Operations |
|---------|-----------|------------|
| | interface | read |

Examples

This example shows how to display the RAC registers for a specified SRP interface:

```
RP/0/RP0/CPU0:router# show controllers srp 0/5/0/0 side a rac-reg
```

| Related Commands | Command | Description |
|------------------|--------------------------------------|----------------------------------------------|
| | show srp, on page 13 | Displays information about an SRP interface. |

show srp

To display information about an SRP interface, use the **show srp** command in EXEC mode.

```
show srp [counters [source] | failures | ips | platform | srr | topology | transit] [interface srp
interface-path-id | location node-id]
```

| Syntax | Description | | | | | | |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|--------------|---------------|-----------------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------|
| counters | (Optional) Displays counters for the packets received, transmitted, and transited on both sides of an SRP node. | | | | | | |
| source | (Optional) Displays the counters for the SRP source address. | | | | | | |
| failures | (Optional) Displays all SRP failures that were detected by the router. | | | | | | |
| ips | (Optional) Displays the Intelligent Protection Switching (IPS) status. | | | | | | |
| platform | (Optional) Displays platform-specific SRP interface details. | | | | | | |
| srr | (Optional) Displays single ring recovery (SRR) information. | | | | | | |
| topology | (Optional) Identifies the nodes on the ring. | | | | | | |
| transit | (Optional) Displays transit delays (in nanoseconds) between the time that a packet enters the transit buffer and the time it comes back on the ring. | | | | | | |
| interface | (Optional) Specifies the interface for which to display the counters. | | | | | | |
| srp | (Optional) Specifies an SRP interface. | | | | | | |
| <i>interface-path-id</i> | Physical interface or virtual interface. | | | | | | |
| | <p>Note Use the show interfaces command to see a list of all interfaces currently configured on the router.</p> <p>For more information about the syntax for the router, use the question mark (?) online help function.</p> | | | | | | |
| location | (Optional) Specifies the location of the module. | | | | | | |
| <i>node-id</i> | Location of the module in the <i>rack/slot/module</i> notation. | | | | | | |
| Command Default | No default behavior or values | | | | | | |
| Command Modes | EXEC | | | | | | |
| Command History | <table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 3.2.2</td> <td>This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM.</td> </tr> <tr> <td>Release 3.4.0</td> <td>This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM.</td> </tr> </tbody> </table> | Release | Modification | Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. | Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |
| Release | Modification | | | | | | |
| Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. | | | | | | |
| Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. | | | | | | |

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To clear the SRP counters, use the [clear srp counters, on page 2](#) command. The **show srp** command with the **counters** keyword reports the per-side counters and rates for various packet paths.

The **show srp** command with the **failures** keyword reports the SRP failures that were detected by the router. Use the **failures** keyword when an SRP interface is wrapped and you want to display information about the cause of the failure.

Use the **transit** keyword to determine the approximate latency when transmitting a packet, which due to higher latency, gives the approximation of congestion at this interface. If there is no latency, there is no congestion. Latency indicates that traffic transiting the ring and transmitted from the host are competing, meaning there is congestion.

Regarding the **topology** keyword, Address Resolution Protocol (ARP) is independent of the Layer 2 topology mapping. In other words, the absence of a MAC address in the topology map does not prevent ARP or any Layer 3 protocol from reaching the node. Alternatively, the presence of a MAC address in the topology map does not mean that it is possible to resolve the Layer 3 address. The topology map is used to determine the most efficient side (in hops) to use to reach any given MAC address.

For the *interface-path-id* argument, use the following guidelines:

- If specifying a physical interface, the naming notation is *rack/slot/module/port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:
 - *rack*: Chassis number of the rack.
 - *slot*: Physical slot number of the line card.
 - *module*: Module number. A physical layer interface module (PLIM) is always 0.
 - *port*: Physical port number of the interface.
- If specifying a virtual interface, the number range varies, depending on interface type.

Task ID

| Task ID | Operations |
|---------|------------|
| pos-dpt | read |

Examples

In the following example, output from the **show srp** command with the **counters** keyword is displayed:

```
RP/0/RP0/CPU0:router# show srp counters interface srp 0/7/0/0
```

```
Data Traffic Counters for Interface SRP0/7/0/0
```

```
Side A:
```

| Transit | Packets | Bytes |
|-------------------------|---------|--------|
| Total Low Priority: | 0 | 0 |
| Total High Priority: | 183 | 768543 |
| Total Multicast: | 174 | 767913 |
| Total Unicast: | 9 | 630 |
| Host Receive | Packets | Bytes |
| Unicast Low Priority: | 6 | 648 |
| Unicast High Priority: | 0 | 0 |
| Multicast Low Priority: | 0 | 0 |

| | | |
|---------------------------------------------------|-------------|----------|
| Multicast High Priority: | 1 | 41 |
| Total Receive | Packets | Bytes |
| Unicast Low Priority: | 6 | 648 |
| Unicast High Priority: | 9 | 630 |
| Multicast Low Priority: | 3 | 144 |
| Multicast High Priority: | 174 | 767913 |
| Host Transmit | Packets | Bytes |
| Unicast Low Priority: | 4 | 480 |
| Unicast High Priority: | 0 | 0 |
| Multicast Low Priority: | 0 | 0 |
| Multicast High Priority: | 0 | 0 |
| Total Transmit | Packets | Bytes |
| Unicast Low Priority: | 4 | 480 |
| Unicast High Priority: | 0 | 0 |
| Multicast Low Priority: | 0 | 0 |
| Multicast High Priority: | 772 | 1575090 |
| Traffic Rate (5 Minutes) | packets/sec | bits/sec |
| Transit Low Priority | 0 | 0 |
| Transit High Priority | 0 | 0 |
| Transit Multicast | 0 | 0 |
| Transit Unicast | 0 | 0 |
| Host Receive | 0 | 0 |
| Total Receive | 0 | 0 |
| Host Transmit | 0 | 0 |
| Total Transmit | 0 | 0 |
| Received Errors: | | |
| 0 input errors, 0 CRC, 0 ignored, | | |
| 0 framer runts, 0 framer giants, 0 framer aborts, | | |
| 0 mac runts, 0 mac giants, 0 mac ttl strips | | |

Side B:

| | | |
|--------------------------|-------------|----------|
| Transit | Packets | Bytes |
| Total Low Priority: | 0 | 0 |
| Total High Priority: | 772 | 1575090 |
| Total Multicast: | 772 | 1575090 |
| Total Unicast: | 0 | 0 |
| Host Receive | Packets | Bytes |
| Unicast Low Priority: | 6 | 648 |
| Unicast High Priority: | 0 | 0 |
| Multicast Low Priority: | 0 | 0 |
| Multicast High Priority: | 1 | 41 |
| Total Receive | Packets | Bytes |
| Unicast Low Priority: | 6 | 648 |
| Unicast High Priority: | 0 | 0 |
| Multicast Low Priority: | 0 | 0 |
| Multicast High Priority: | 772 | 1575090 |
| Host Transmit | Packets | Bytes |
| Unicast Low Priority: | 6 | 720 |
| Unicast High Priority: | 0 | 0 |
| Multicast Low Priority: | 3 | 144 |
| Multicast High Priority: | 0 | 0 |
| Total Transmit | Packets | Bytes |
| Unicast Low Priority: | 6 | 720 |
| Unicast High Priority: | 9 | 630 |
| Multicast Low Priority: | 3 | 144 |
| Multicast High Priority: | 174 | 767913 |
| Traffic Rate (5 Minutes) | packets/sec | bits/sec |
| Transit Low Priority | 0 | 0 |
| Transit High Priority | 0 | 0 |
| Transit Multicast | 0 | 0 |
| Transit Unicast | 0 | 0 |
| Host Receive | 0 | 0 |
| Total Receive | 0 | 0 |
| Host Transmit | 0 | 0 |

```

Total Transmit                                0                0
Received Errors:
  0 input errors, 0 CRC, 0 ignored,
  0 framer runts, 0 framer giants, 0 framer aborts,
  0 mac runts, 0 mac giants, 0 mac ttl strips

```

Table 1: show srp counters Command Output Fields

| Field | Description |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Side A | Header for packets received, transmitted, and transited by the Resource Availability Confirmation (RAC) device on side A. |
| Side B | Header for packets received, transmitted, and transited by the RAC device on side B. |
| TransitTotal Low Priority | Total number of unicast and multicast packets marked as SRP low priority (based on the SRP priority mapping) that transit the router and are counted in the transmit low-priority counters. |
| TransitTotal High Priority | Total number of unicast and multicast packets marked as SRP high priority (based on the SRP priority mapping) that transit the router and are counted in the transmit high-priority counters. |
| TransitTotal Multicast | Total number of low- and high-priority multicast packets that transit the router and are counted in the transmit multicast counters. |
| TransitTotal Unicast | Total number of low- and high-priority unicast packets that transit the router and are counted in the transmit unicast counters. |
| Host ReceiveUnicast Low/High priority | Total number of low- and high-priority unicast packets received by the router. |
| Host ReceiveMulticast Low/High priority | Total number of low- and high-priority multicast packets received by the router. |
| Total ReceiveUnicast Low/High priority | Total number of low- and high-priority unicast packets that transit or are received by the router. |
| Total ReceiveMulticast Low/High priority | Total number of low- and high-priority multicast packets that transit or are received by the router. |
| Host TransmitUnicast Low/High priority | Total number of low- and high-priority unicast packets sourced onto the ring by the router. |
| Host TransmitMulticast Low/High priority | Total number of low- and high-priority multicast packets sourced onto the ring by the router. |
| Total TransmitUnicast Low/High priority | Total number of low- and high-priority unicast packets transmitted by this side and transited out of the other side of the node. |
| Total TransmitMulticast Low/High priority | Total number of low- and high-priority multicast packets transmitted by this side and transited out of the other side of the node. |

| Field | Description |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Traffic Rate (5 Minutes) | <p>Average number of packets and bits transmitted per second during the last 5 minutes.</p> <p>The 5-minute traffic rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average is within two percent of the instantaneous rate of a uniform stream of traffic over that period.</p> <p>The 5-minute value is the load interval, and it is configurable using the load-interval command.</p> |
| input errors | Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum might not balance with the other counts. |
| CRC | Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of a station transmitting bad data. |
| ignored | Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased. |
| framer runts | Number of packets dropped by the framer as runts, that are smaller than 16 bytes. |
| framer giants | Number of packets dropped by the framer as giants, whose size is greater than the MTU. |
| framer aborts | <p>Number of packets dropped by the framer due to an error in packet insertion from the SONET frame. Normally a framer abort is caused by a delimiter inserted at the transmit framer that forces the receive framer to drop the packet on reception because it is bad. The delimiter is inserted by the transmit framer when it cannot transmit a packet due to a transmission error. A runt or CRC error may also result. A framer abort can be caused by any of the following:</p> <ul style="list-style-type: none"> • A bad transmit framer at the neighbor node (upstream) • BIP errors in the SONET frame that cause a false abort delimiter (often due to intermediate equipment failure or clocking issues) • A bad receive framer at this node |
| mac runts | Packets dropped by the MAC controller as runts, that are smaller than 24 bytes. |
| mac giants | Packets dropped by the MAC controller as giants, whose size is greater than the MTU. |

| Field | Description |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| mac ttl strips | Packets stripped by the MAC controller when the SRP Time to Live value expires. (TTL value is 1 when a packet arrives.) These packets are removed from the ring because the TTL value cannot be decreased. As a result, the packet is dropped if it is not destined for the node that strips it. |

In the following example, self-detected failures in the SRP interface configured on slot 7, subslot 0, and port 0 are displayed:

```
RP/0/RP0/CPU0:router# show srp failures
```

```
Self Detected Failures Information for Interface SRP0/7/0/0
Side A:
      Reported  Debounced  Current  Stable  Debounce
      state     state       state    for(sec) delay(sec)
HW missing      IDLE       IDLE     IDLE    778     0
L1 Admin State  IDLE       IDLE     IDLE    777     0
Layer 1         IDLE       IDLE     IDLE    778     0
MAC Keepalive   IDLE       IDLE     IDLE    477     5
Link quality    IDLE       IDLE     IDLE    778     0
Mate interface  IDLE       IDLE     IDLE    778    10
Side mismatch   IDLE       IDLE     IDLE    477     5
Result Self Detect = IDLE

Side B:
      Reported  Debounced  Current  Stable  Debounce
      state     state       state    for(sec) delay(sec)
HW missing      IDLE       IDLE     IDLE    778     0
L1 Admin State  IDLE       IDLE     IDLE    775     0
Layer 1         IDLE       IDLE     IDLE    778     0
MAC Keepalive   IDLE       IDLE     IDLE    477     5
Link quality    IDLE       IDLE     IDLE    778     0
Mate interface  IDLE       IDLE     IDLE    778    10
Side mismatch   IDLE       IDLE     IDLE    477     5
Result Self Detect = IDLE
```

Table 2: show srp failures Command Output Fields

| Field | Description |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HW missing | Presence of this side's hardware port. Possible states: IDLE—No error or failureSF—Port is not installed or is still booting |
| L1 Admin State | Layer 1 administrative state. Possible states:IDLE—SONET controller is configured as upFS—SONET controller is configured as administratively down Note This is the only field in which the status is related to a user-configurable state. |
| Layer 1 | Operating state of the SONET controller. Possible states:IDLE—No alarms, etc.SF—Some alarms, such as section loss of signal (SLOS), section loss of frame (SLOF), or line alarm indicator signal (LAIS) Note For detailed information about a Layer 1 failure, use the show controllers sonet command. |

| Field | Description |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MAC keepalive | The MAC keepalive timer has expired. |
| Link quality | The SONET B3 bit error rate (BER) threshold has been crossed. To configure SRP signal degrade detection and signal fail detection, use the srp priority-threshold, on page 35 command. |
| Mate interface | The external mate cable on a line card interface is missing or malfunctioning. Note This is only applicable to one-port PLIMs or SPAs that would require a second PLIM or SPA to create an SRP interface. |
| Side mismatch | Side A of the node is connected to side A of the neighbor node, or side B of the node is connected to side B of the neighbor node. |
| Result Self Detect | IPS state requested for this side. The state is the highest IPS request listed under "Reported state." |
| Reported state | State that is reported to the IPS engine. |
| Debounce state | Current SF/FS state or the current IDLE state if IDLE has been stable for the amount of time of the debounce delay. |
| Current state | Current state as reported by the source. |
| Stable for (sec) | Amount of time the current state has been stable. |
| Debounce delay (sec) | Amount of time to wait when transitioning from SF to IDLE. The IDLE state must be stable for this amount of time before getting debounced or reported. This is to prevent flapping and is similar to higher-level WTR values. |

In the following example, the display from the **show srp** command with the **interface** keyword is shown:

```
RP/0/RP0/CPU0:router# show srp interface srp 0/5/0/0

IPS Information for Interface SRP0/5/0/0
MAC Addresses
  Side A (Outer ring RX) neighbor 0009.11d8.3c66
  Side B (Inner ring RX) neighbor 0012.da6a.f664
  Node MAC address 0800.453d.8644
IPS State
  Side A not wrapped
  Side B not wrapped
  Side A (Inner ring TX) IPS pkt. sent every 1 sec. (next pkt. after 1 sec.)
  Side B (Outer ring TX) IPS pkt. sent every 1 sec. (next pkt. after 1 sec.)
  inter card bus disabled
  IPS WTR period is 60 sec. (timer is inactive)
  Node IPS State: idle
IPS Self Detected Requests          IPS Remote Requests
  Side A IDLE                       Side A IDLE
  Side B IDLE                       Side B IDLE
  Side A Failures: none
  Side B Failures: none
IPS messages received
  Side A (Outer ring RX) { 0009.11d8.3c66, IDLE, SHORT}, TTL 255
```

```

    Side B (Inner ring RX) { 0012.da6a.f664, IDLE, SHORT}, TTL 255
IPS messages transmitted
    Side A (Inner ring TX) { 0800.453d.8644, IDLE, SHORT}, TTL 255
    Side B (Outer ring TX) { 0800.453d.8644, IDLE, SHORT}, TTL 255
IPS delay trigger keepalive
    Side A: 0 milliseconds
    Side B: 0 milliseconds

Topology Map for Interface: SRP0/5/0/0
Topology pkt. sent every 5 sec. (next pkt. after 1 sec.)
Last received topology pkt. 00:00:05
Last topology change was 00:01:59 ago.
Nodes on the ring: 3
Hops (outer ring)      MAC          IP Address      Wrapped SRR      Name
    0                0800.453d.8644 0.0.0.0         No               -      ios
    1                0012.da6a.f664 0.0.0.0         No               -      gsr
    2                0009.11d8.3c66 0.0.0.0         No               -      gsre

SRR not enabled for Interface SRP0/5/0/0

Rate Limit Information for Interface SRP0/5/0/0
    Minimum SRP priority value of high priority outgoing/transit traffic: 2

```

Fields from the **show srp** command output with the **interface** keyword are described in [Table 3: show srp ips Command Output Fields, on page 21](#) and [Table 4: show srp topology Command Output Fields, on page 22](#). The minimum SRP priority value for high-priority traffic is set to 2 by default.

The following example shows the display from the **show srp** command with the **ips** keyword:

```

RP/0/RP0/CPU0:router# show srp ips

IPS Information for Interface SRP0/7/0/0
MAC Addresses
    Side A (Outer ring RX) neighbor 000e.3900.4800
    Side B (Inner ring RX) neighbor 000a.8b08.9600
    Node MAC address 0800.453c.f882
IPS State
    Side A not wrapped
    Side B not wrapped
    Side A (Inner ring TX) IPS pkt. sent every 1 sec. (next pkt. after 1 sec.)
    Side B (Outer ring TX) IPS pkt. sent every 1 sec. (next pkt. after 1 sec.)
    inter card bus disabled
    IPS WTR period is 60 sec. (timer is inactive)
    Node IPS State: idle
IPS Self Detected Requests          IPS Remote Requests
    Side A IDLE                      Side A IDLE
    Side B IDLE                      Side B IDLE
    Side A Failures: none
    Side B Failures: none
IPS messages received
    Side A (Outer ring RX) { 000e.3900.4800, IDLE, SHORT}, TTL 255
    Side B (Inner ring RX) { 000a.8b08.9600, IDLE, SHORT}, TTL 255
IPS messages transmitted
    Side A (Inner ring TX) { 0800.453c.f882, IDLE, SHORT}, TTL 255
    Side B (Outer ring TX) { 0800.453c.f882, IDLE, SHORT}, TTL 255
IPS delay trigger keepalive
    Side A: 0 milliseconds
    Side B: 0 milliseconds

```

Table 3: show srp ips Command Output Fields

| Field | Description |
|--------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IPS Information for Interface | IPS (Intelligent Protection Switching) identifies the status of an SRP interface on the SRP ring. |
| MAC AddressesSide A (Outer ring RX) neighbor | MAC address of the next SRP node on the outer ring. |
| MAC AddressesSide B (Inner ring RX) neighbor | MAC address of the next SRP node on the inner ring. |
| Node MAC address | MAC address of this SRP node. |
| IPS State | Reports whether or not a wrap exists on side A or side B of the SRP ring. |
| IPS WTR period is 60 seconds (timer is inactive) | Displays the current WTR (Wait to Restore) timer value. If a timer is active, the time remaining before the timer expires also is given. |
| Node IPS State IDLE | Displays the current IPS state of the node. IDLE is the normal state. Other states are WRAPPED and UNKNOWN. Unknown means that the node is in pass-through mode. |
| IPS self-detected requests | Indicates any locally generated requests. Displays local IPS requests, as well as IDLE status. Possible requests include the following:FS — Forced SwitchSF — Signal FailSD — Signal DegradeMS — Manual SwitchWTR — Wait to Restore |
| IPS remote requests | Indicates any remotely generated requests. Displays remote IPS requests, as well as IDLE status. Possible requests include the following:FS — Forced SwitchSF — Signal FailSD — Signal DegradeMS — Manual SwitchWTR — Wait to Restore |
| IPS messages received | Provides details of the last IPS messages received. Fields within the braces ({}) are the MAC addresses of the sending node and the IPS state (IDLE, FS, and so on). It also indicates either a short or long path. |
| IPS messages transmitted | Provides details of the last IPS messages transmitted, in the format used for received messages. |
| IPS delay trigger keepalive | Configured value of the srp ips delay trigger-keepalive command. The default value is 0. |

The following example shows the display from the **show srp** command with the **topology** keyword:

```
RP/0/RP0/CPU0:router# show srp topology

Topology Map for Interface SRP0/7/0/0
Topology pkt. sent every 5 sec. (next pkt. after 5 sec.)
Last received topology pkt. 00:00:01
Last topology change was 00:09:44 ago.
Nodes on the ring: 3
Hops (outer ring)      MAC          IP Address      Wrapped SRR     Name
```

```

0          0800.453c.f882 30.30.30.2      No    -   crs1
1          000a.8b08.9600 30.30.30.1      No    -   gsra
2          000e.3900.4800 30.30.30.3      No    -   gsrb

```

Table 4: `show srp topology` Command Output Fields, on page 22 describes the significant fields shown in the display.

Table 4: `show srp topology` Command Output Fields

| Field | Description |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Topology map for interface | Displays SRP topology information that identifies the SRP interface. |
| Topology packet sent every 10 seconds (next packet after 5 seconds) | Displays the interval between successive topology packets sent from this node and the time until the next one is to be sent (rounded down to the nearest second). |
| Last received topology packet 00:00:04 | Displays the time since the last topology packet was received at this node. |
| Nodes on the ring: 4 | Displays the number of nodes in the current ring topology. |
| Hops | Displays the number of hops to the destination node along the outer ring (from side B). The local node is at hop count zero. |
| MAC | Displays the MAC address of the node. |
| IP Address | Displays the IP address of the SRP interface on the node. If the address is not known, the text string “unknown” is displayed. The IP address information is gathered by the ARP table. When a ring is first established, it is normal for the IP address of a node to remain unknown until some time after the MAC address is known. |
| Wrapped | Uses Yes or No to indicate whether the SRP ring is wrapped at that node. |
| SRR | Indicates whether SRR is enabled on the node. |
| Name | Displays the hostname of the router. If the name is not known, this field is left blank. The hostname is obtained from information that is broadcast on the ring at a slower rate than other topology information. When a ring is first established, it is normal for the hostname of a remote node to remain unknown until some time after the MAC address is known. |

The following example shows the display from the `show srp` command with the `transit` keyword:

```

RP/0/RP0/CPU0:router# show srp transit interface srp 0/7/0/0

Transit Buffer Delay Counters for Interface SRP0/7/0/0
Side A:
Transit Delay (5 Minutes)           Nanoseconds
Low TB Min Delay:                   0
Low TB Avg Delay:                   0
Low TB Max Delay:                   0
High TB Min Delay:                  569

```

```

High TB Avg Delay:          569
High TB Max Delay:         570

Side B:
Transit Delay (5 Minutes)   Nanoseconds
Low TB Min Delay:           0
Low TB Avg Delay:           0
Low TB Max Delay:           0
High TB Min Delay:          15
High TB Avg Delay:          261
High TB Max Delay:          574

```

Table 5: show srp transit Command Output Fields

| Field | Description |
|-------------------|--------------------------------------------------------------------------------------|
| Low TB Min Delay | Minimum value for the low transit buffer as calculated over the last load interval. |
| Low TB Avg Delay | Average value for the low transit buffer as calculated over the last load interval. |
| Low TB Max Delay | Maximum value for the low transit buffer as calculated over the last load interval. |
| High TB Min Delay | Minimum value for the high transit buffer as calculated over the last load interval. |
| High TB Avg Delay | Average value for the high transit buffer as calculated over the last load interval. |
| High TB Max Delay | Maximum value for the high transit buffer as calculated over the last load interval. |

Related Commands

| Command | Description |
|--------------------------------------------------|-------------------------------------------------------------------------------|
| clear srp counters, on page 2 | Clears the various SRP packet counters. |
| load-interval | Sets the time (in seconds) used to gather data for computing load statistics. |
| show controllers sonet | Displays the SONET controller information for the interface. |
| show controllers srp, on page 11 | Displays the current controller configuration on an SRP interface. |
| show interfaces srp | Displays current IPS wrap state, along with other SRP interface information. |

srp ips delay trigger-keepalive

To specify a delay for the IPS keepalive value, use the **srp ips delay keep-alive** command in interface configuration mode. To restore the default value, use the **no** form of this command.

```
srp ips delay trigger-keepalive value a | b
no srp ips delay trigger-keepalive value a | b
```

Syntax Description

value Time in milliseconds of the trigger keepalive. Values can range from 51 to 200.

a The side of a node that has outer ring receive fiber is identified as side A.

b The side of a node that has inner ring receive fiber is identified as side B.

Command Default

The default IPS keepalive delay value is 0.

Command Modes

Interface configuration

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------------------------------------|
| Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The default keepalive value is 1 ms. Use the **srp ips delay trigger-keepalive** command to delay this 1 ms up to the configured delay value. You should use this command only if the Layer 1 (SONET) is already protected (for example, with SONET APS). This delay gives the first protection mechanism time to protect, before the Layer 2 protection is enabled. For example, if an SRP side is connected to an Add-Drop Multiplexer (ADM) that utilizes dual SONET ring and APS, you should delay the Layer 2 keepalive value using this command.

Task ID

| Task ID | Operations |
|---------|----------------|
| pos-dpt | read, write |

Examples

The following example indicates how to set the trigger keepalive timer to 60 milliseconds:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface srp 0/5/0/0
RP/0/RP0/CPU0:router(config-if)# srp ips delay trigger-keepalive 60 a
```


| Related Commands | Command | Description |
|------------------|--------------------------------------|----------------------------------------------|
| | show srp, on page 13 | Displays information about an SRP interface. |

srp ips request forced-switch

To initiate a forced-switch wrap on a ring, use the **srp ips request forced-switch** command in interface configuration mode. To remove the wrap, use the **no** form of this command.

```
srp ips request forced-switch a | b
no srp ips request forced-switch a | b
```

Syntax Description

aThe side of a node that has outer ring receive fiber is identified as side A.

bThe side of a node that has inner ring receive fiber is identified as side B.

Command Default

No default behavior or values

Command Modes

Interface configuration

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------------------------------------|
| Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

| Task ID | Operations |
|---------|----------------|
| pos-dpt | read, write |

Examples

The following example shows how to insert a forced-switch wrap on side A of the interface by entering the **srp ips request forced-switch** command:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface srp 0/5/0/0
RP/0/RP0/CPU0:router(config-if)# srp ips request forced-switch a
```

Related Commands

| Command | Description |
|----------------------------|------------------------------------------------------------------------------|
| show interfaces srp | Displays current IPS wrap state, along with other SRP interface information. |

| Command | Description |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| show srp, on page 13 | Displays information about SRP interfaces on the ring, including MAC addresses of neighboring nodes, IPS status, source-counters, and topology map. |
| srp ips wtr-timer, on page 30 | Determines how long a wrap remains on the fiber after the original cause of the wrap is removed. |
| srp manual-switch, on page 33 | Inserts a manual-switch wrap on the ring. |
| srp shutdown, on page 37 | Provides an alternative form of the srp ips request forced-switch command. |

srp ips timer

To control the frequency of the transmission of Intelligent Protection Switching (IPS) requests, use the **srp ips timer** command in interface configuration mode. To restore the default value, use the **no** form of this command.

```
srp ips timer value
no srp ips timer value
```

| | |
|---------------------------|-------------------------------------------------------------------------------------------------------------|
| Syntax Description | <i>value</i> Amount of time in seconds between transmission of IPS requests. Values can range from 1 to 60. |
|---------------------------|-------------------------------------------------------------------------------------------------------------|

| | |
|------------------------|------------------------------------------|
| Command Default | The default IPS timer value is 1 second. |
|------------------------|------------------------------------------|

| | |
|----------------------|-------------------------|
| Command Modes | Interface configuration |
|----------------------|-------------------------|

| Command History | Release | Modification |
|------------------------|----------------|-----------------------------------------------------------------------------------------------|
| | Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| | Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |

| | |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Usage Guidelines | To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance. |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

In general, you should not need to adjust the IPS timer value.

We recommend that you configure the same IPS timer value on all nodes on an SRP ring. This means that if you modify the IPS timer setting on one node, you must reconfigure all other nodes on the ring with the same IPS timer value.

| Task ID | Task Operations ID |
|----------------|---------------------------|
| | pos-dpt read, write |

| | |
|-----------------|----------------------------------------------------------------------------|
| Examples | The following example indicates how to change the IPS timer to 30 seconds: |
|-----------------|----------------------------------------------------------------------------|

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface srp 0/5/0/0
RP/0/RP0/CPU0:router(config-if)# srp ips timer 30
```

| Related Commands | Command | Description |
|-------------------------|--------------------------------------|----------------------------------------------|
| | show srp, on page 13 | Displays information about an SRP interface. |

| Command | Description |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------------|
| srp ips wtr-timer, on page 30 | Controls the amount of time to wait before a wrap is removed after there is no more reason for the wrap. |

srp ips wtr-timer

To control the amount of time to wait before a wrap is removed after there is no more reason for the wrap, use the **srp ips wtr-timer** command in interface configuration mode. To restore the default value, use the **no** form of this command.

```
srp ips wtr-timer value
no srp ips wtr-timer value
```

| | |
|---------------------------|--------------------------------------------------------------------------------------------------------------|
| Syntax Description | <i>value</i> Amount of time in seconds for the wait-to-restore (WTR) timer. Values can range from 10 to 600. |
|---------------------------|--------------------------------------------------------------------------------------------------------------|

| | |
|------------------------|--------------------------------------------|
| Command Default | The default WTR timer value is 60 seconds. |
|------------------------|--------------------------------------------|

| | |
|----------------------|-------------------------|
| Command Modes | Interface configuration |
|----------------------|-------------------------|

| Command History | Release | Modification |
|------------------------|----------------|-----------------------------------------------------------------------------------------------|
| | Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| | Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |

| | |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Usage Guidelines | To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance. |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

In general, you should not need to adjust the Intelligent Protection Switching (IPS) wait-to-restore (WTR) timer value.

| Task ID | Task ID | Operations |
|----------------|----------------|-------------------|
| | pos-dpt | read, write |

| | |
|-----------------|---------------------------------------------------------------------------------------------|
| Examples | The following example indicates how to change the IPS wait-to-restore timer to 120 seconds: |
|-----------------|---------------------------------------------------------------------------------------------|

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface srp 0/5/0/0
RP/0/RP0/CPU0:router(config-if)# srp ips wtr-timer 120
```

| Related Commands | Command | Description |
|-------------------------|-------------------------------------------|-------------------------------------------------------------|
| | show srp, on page 13 | Displays information about an SRP interface. |
| | srp ips timer, on page 28 | Controls the frequency of the transmission of IPS requests. |

srp mac-count

To keep track of the number of SRP packets from a specific source MAC address, use the **srp mac-count** command in interface configuration mode. To disable counting by MAC address, use the **no** form of this command.

```
srp mac-count mac-address
no srp mac-count mac-address
```

Syntax Description

mac-address 48-bit source MAC address from which to count SRP packets.

Command Default

The **srp mac-count** command is disabled by default.

Command Modes

Interface configuration

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------------------------------------|
| Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

| Task ID | Operations |
|---------|----------------|
| pos-dpt | read, write |

Examples

The following example shows how to count SRP packets from the source with MAC address 2.2.2:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface srp 0/5/0/0
RP/0/RP0/CPU0:router(config-if)# srp mac-count 2.2.2
```

Related Commands

| Command | Description |
|-----------------------------------------------|----------------------------------------------|
| clear srp counters, on page 2 | Clears the SRP counters. |
| show srp, on page 13 | Displays information about an SRP interface. |

srp mac-reject

To reject SRP packets from a specific source MAC address, use the **srp mac-reject** command in interface configuration mode. To disable rejection by MAC address, use the **no** form of this command.

```
srp mac-reject mac-address
no srp mac-reject mac-address
```

Syntax Description

mac-address 48-bit source MAC address from which to reject SRP packets.

Command Default

The **srp mac-reject** command is disabled by default.

Command Modes

Interface configuration

Command History

| Release | Modification |
|---------------|------------------------------------------------------------------------------------------|
| Release 3.2.2 | This command was introduced and is supported on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use **srp mac-reject** command to control a node that cannot be fixed because it is owned or administered by someone else. For example, if such a node is flooding your node with packets, you can use this command to limit the amount of traffic that is processed.

Task ID

| Task ID | Operations |
|---------|----------------|
| pos-dpt | read, write |

Examples

The following example shows how to reject SRP packets from the source with MAC address 2.2.2:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface srp 0/5/0/0
RP/0/RP0/CPU0:router(config-if)# srp mac-reject 2.2.2
```

Related Commands

| Command | Description |
|-----------------------------------------------|----------------------------------------------|
| clear srp counters, on page 2 | Clears the SRP counters. |
| show srp, on page 13 | Displays information about an SRP interface. |

srp manual-switch

To initiate or remove a manual switch wrap on a ring, use the **srp manual-switch** command in EXEC mode.

```
srp request | remove manual-switch a | b interface srp interface-path-id
```

| Syntax Description | request | Initiate a manual switch wrap on the interface. |
|--------------------|--------------------------|------------------------------------------------------------------------------------------------------------|
| | remove | Remove a manual switch wrap on the interface. |
| | a | The side of a node that has outer ring receive fiber is identified as side A. |
| | b | The side of a node that has inner ring receive fiber is identified as side B. |
| | interface | Specifies the interface for which to display the counters. |
| | srp | Specifies an SRP interface. |
| | <i>interface-path-id</i> | Physical interface or virtual interface. |
| | Note | Use the show interfaces command to see a list of all interfaces currently configured on the router. |
| | | For more information about the syntax for the router, use the question mark (?) online help function. |

Command Default No default behavior or values

Command Modes EXEC

| Command History | Release | Modification |
|-----------------|---------------|-----------------------------------------------------------------------------------------------|
| | Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| | Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

For the *interface-path-id* argument, use the following guidelines:

- If specifying a physical interface, the naming notation is *rack/slot/module/port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:
 - *rack*: Chassis number of the rack.
 - *slot*: Physical slot number of the line card.
 - *module*: Module number. A physical layer interface module (PLIM) is always 0.
 - *port*: Physical port number of the interface.

- If specifying a virtual interface, the number range varies, depending on interface type.

Task ID**Task ID Operations**

pos-dpt read,
write

Examples

The following example shows how to insert a manual switch wrap on side A of the interface:

```
RP/0/RP0/CPU0:router# srp request manual-switch a interface srp 0/5/0/0
```

Related Commands

| Command | Description |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| show interfaces srp | Displays current IPS wrap state, along with other SRP interface information. |
| show srp, on page 13 | Displays information about SRP interfaces on the ring, including MAC addresses of neighboring nodes, IPS status, source-counters, and topology map. |
| srp ips request forced-switch, on page 26 | Inserts a forced switch wrap on the ring; this command is an alternate form of the srp shutdown command. |
| srp ips wtr-timer, on page 30 | Determines how long a wrap remains on the fiber after the original cause of the wrap is removed. |
| srp shutdown, on page 37 | Provides an alternative form of the srp ips request forced-switch command. |

srp priority-threshold

To specify the RAC threshold for placing packets in the high-priority queue, use the **srp priority-threshold** command in Interface configuration mode. To return the priority threshold to its default value, use the **no** form of this command.

srp priority-threshold [*RAC-threshold* | **non-high**]
no srp priority-threshold [*RAC-threshold* | **non-high**]

Syntax Description

RAC-threshold RAC priority slicing point threshold ranging from 1 to 7.

non-high Specifies not to place any packets into the RAC high priority transmit queue.

Command Default

No default behavior or values

Command Modes

Interface configuration

Command History

Release Modification

3.2.2 This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Examples

The following example shows how to qualify traffic with a RAC of 5 or greater into the high-priority transmit queue:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface srp 0/5/0/0
RP/0/RP0/CPU0:router(config-if)# srp priority-threshold 5
```

Related Commands

| Command | Description |
|--------------------------------------|----------------------------------------------|
| show srp, on page 13 | Displays information about an SRP interface. |

srp rate-limit

To configure the amount of high- and low-priority traffic being transmitted from the router onto the SRP ring, use the **srp rate-limit** command in Interface configuration mode. To disable rate limiting, use the **no** form of this command.

rate-limit [**high** | **low**] *limit*
no rate-limit [**high** | **low**] *limit*

| | |
|---------------------------|-------------------------------------------------------------------------------|
| Syntax Description | high Specifies the SRP high priority transmit queue rate limit. |
| | low Specifies the SRP low priority transmit queue rate limit. |
| | limit Rate limit in Mbps. The value can range from 0 to 4,294,967,295. |

Command Default No default behavior or values

Command Modes Interface configuration

| Command History | Release | Modification |
|------------------------|----------------|------------------------------|
| | 3.2.2 | This command was introduced. |

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Examples The following example shows how to limit the traffic in the high and low priority traffic to the SRP ring:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface srp 0/5/0/0
RP/0/RP0/CPU0:router(config-if)# srp rate-limit high 622
RP/0/RP0/CPU0:router(config-if)# srp rate-limit low 1866
```

| Related Commands | Command | Description |
|-------------------------|--------------------------------------|----------------------------------------------|
| | show srp, on page 13 | Displays information about an SRP interface. |

srp shutdown

To shut down an interface by entering a forced switch, use the **srp shutdown** command in interface configuration mode. To remove the forced switch wrap near the interface, use the **no** form of this command.

srp shutdown
no srp shutdown

Syntax Description This command has no keywords or arguments.

Command Default No default behavior or values

Command Modes Interface configuration

| Command History | Release | Modification |
|-----------------|---------------|-----------------------------------------------------------------------------------------------|
| | Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| | Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

| Task ID | Task | Operations |
|---------|---------|----------------|
| | pos-dpt | read, write |

Examples The following example shows how to enter a forced switch on the interface:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface srp 0/5/0/0
RP/0/RP0/CPU0:router(config-if)# srp shutdown
```

| Related Commands | Command | Description |
|------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| | show interfaces srp | Displays current IPS wrap state along with other SRP interface information. |
| | show srp, on page 13 | Displays information about SRP interfaces on the ring, including MAC addresses of neighboring nodes, IPS status, source-counters, and topology map. |

| Command | Description |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| srp ips request forced-switch, on page 26 | Inserts a forced switch wrap on the ring; this command is an alternate form of the srp shutdown command. |

srp topology-timer

To specify the frequency of the topology timer, use the **srp topology-timer** command in interface configuration mode. To restore the default value, use the **no** form of this command.

srp topology-timer *value*
no srp topology-timer *value*

Syntax Description

value Value of topology timer in seconds, ranging from 1 to 600.

Command Default

The default topology timer value is 10 seconds.

Command Modes

Interface configuration

Command History

| Release | Modification |
|---------------|-----------------------------------------------------------------------------------------------|
| Release 3.2.2 | This command was introduced and is supported only on the 4-port OC-192c/STM-64c POS/DPT PLIM. |
| Release 3.4.0 | This command was first supported on the 16-port OC-48c/STM-16c POS/DPT PLIM. |

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **srp topology-timer** interface configuration command determines how frequently topology discovery messages are sent around the ring to identify the current nodes on the SRP ring.

In general, you should not need to adjust the topology timer value.

Task ID

| Task ID | Operations |
|---------|----------------|
| pos-dpt | read, write |

Examples

The following example indicates how to change the topology timer to 300 seconds:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface srp 0/5/0/0
RP/0/RP0/CPU0:router(config-if)# srp topology-timer 1
```

Related Commands

| Command | Description |
|--------------------------------------|----------------------------------------------|
| show srp, on page 13 | Displays information about an SRP interface. |

