

# show interfaces vlan mapping through show scp


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# show interface gigabitethernet

To display the first front panel interface (port 0) in a Cisco 4451 ISR, use the **showinterfaces gigabitethernet** command in privileged EXEC mode.

**show interfaces gigabitethernet** {**ports**}

## Syntax Description

| | |
|---|---|
| **interface gigabitethernet** | Displays interface hardware. |
| **ports** | Displays local and registered IPC ports. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| XE 16.11.1 | This command was introduced. |

## Usage Guidelines

You can use the **show interfaces gigabitethernet** command to display the first front panel interface (port 0) in a Cisco ISR4451-X router

## Examples

The following is sample output from the showcommand with the **ports**keyword displays he first front panel interface (port 0) in a Cisco ISR4451-X router::

```
Router# show interfaces gigabitethernet GigabitEthernet0/0/0 is down, line protocol is down

  Hardware is ISR4451-X-4x1GE, address is 003a.7d5e.8b40 (bia 003a.7d5e.8b40)
  Internet address is 10.20.30.40/24
  MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not supported
  Full Duplex, 1000Mbps, link type is auto, media type is SX
  output flow-control is off, input flow-control is off
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 02:45:34, output 02:00:47, output hang never
  Last clearing of "show interface" counters 1d16h
  Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  30 second input rate 0 bits/sec, 0 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
     618 packets input, 52156 bytes, 0 no buffer
     Received 447 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 145 multicast, 118 pause input
     189 packets output, 18556 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
     597 lost carrier, 0 no carrier, 0 pause output
     0 output buffer failures, 0 output buffers swapped out
```

The table below describes the significant fields shown in the display.

*Table 1: show interfaces gigabitethernet Field Descriptions-Front Panel Gigabit Ethernet Port*

| Field | Description |
|---|---|
| GigabitEthernet0/0/0 is down, line protocol is down | Indicates whether the interface hardware is currently active and if it has been taken down by an administrator.. |
| line protocol is | Indicates whether the software processes that handle the line protocol consider the line usable or if it has been taken down by an administrator. |
| Hardware | Hardware type and MAC address. |
| Description | Alphanumeric string identifying the interface. This appears only if the description interface configuration command has been configured on the interface. |
| Internet address | Sequence number of the in-sequence message that was last heard. |
| MTU | Maximum transmission unit of the interface. |
| BW | Bandwidth of the interface in kilobits per second. |
| DLY | Delay of the interface in microseconds. |
| Reliability | Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes |
| Rxload and Rxload | Load on the interface (in the transmit “tx” and receive “rx” directions) as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. |
| Encapsulation | Encapsulation method assigned to the interface. |
| Loopback | Indicates whether loopback is set. |
| Keepalive | Indicates whether keepalives are set, and the time interval. |
| Half-duplex, Full-duplex | Indicates the duplex mode for the interface. |
| 1Gb/s | Speed of the interface in Gigabits per second. |
| Input Flow Rate… | Specifies if input flow control is on or off. |
| ARP Type | Type of ARP assigned and the timeout period. |
| Last input | Number of hours, minutes, and seconds since the last packet was successfully received by an interface and processed locally on the router. Useful for knowing when a dead interface failed. This field is not updated by fast-switched traffic |
| Output | Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. Useful for knowing when a dead interface failed. |

| Field | Description |
|---|---|
| Output hang | Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is displayed. If that field overflows, asterisks are printed |
| Last clearing | Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero.<br>Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared.<br>A series of asterisks (***) indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232 ms) ago. |
| Input queue<br>(size/max/drops/flushes) | Packet statistics on the input queue reported as:<br>• Size--Number of packets in the input queue.<br>• Max--Maximum size of the queue.<br>• Drops--Number of packets dropped because of a full input queue.<br>• Flushes--Number of packets dropped as part of SPD. SPD implements a selective packet drop |
| Total Output Drops | Total number of packets dropped because of a full output queue. |
| Queueing Strategy | Type of Layer 3 queueing active on this interface. The default is FIFO. |
| Output queue (size/max) | Number of packets in the output queue (size), and the maximum size of the queue (max). |
| 30 second input rate, 30 second output rate | Average number of bits and packets transmitted per second in the last 30 seconds. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The 30 second input and output rates should be used only as an approximation of traffic per second during a given 30 second period. These rates are exponentially weighted averages with a time constant of 30 seconds. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period. The calculated input rate includes packets counted as input errors. |
| Packets Input | Total number of packets received by the system. |
| Bytes | Total number of bytes, including data and MAC encapsulation, in all packets received by the system. |
| Received…Broadcasts | Total number of broadcast or multicast packets received by the interface. |
| Runts | Number of packets that are discarded because they are smaller than the minimum packet size of the medium. |
| giants | |

| Field | Description |
|---|---|
| Throttles | Number of times the receiver on the port was disabled, possibly because of buffer or processor overload. |
| Input errors | Includes runts, giants, no buffer, CRC, frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts. |
| CRC | Cyclic redundancy check 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 collisions or a station transmitting bad data. |
| Frame | Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device. |
| Overrun | Number of times the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the 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. Broadcast storms and bursts of noise can cause the ignored count to be increased. |
| Watchdog | Number of times the watchdog receive timer expired. |
| Multicast | Number of multicast packets. |
| Pause input | Number of pause packets received. |
| Packets output | Total number of messages transmitted by the system. |
| Bytes | Total number of bytes, including data and MAC encapsulation, transmitted by the system. |
| Underruns | Number of times that the transmitter has been running faster than the router can handle. |
| Output errors | Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error and others may have errors that do not fall into any of the specifically tabulated categories. |
| Collisions | Number of messages retransmitted because of an Ethernet collision. This is usually the result of an overextended LAN (Ethernet or transceiver cable too long, more than two repeaters between stations, or too many cascaded multiport transceivers). A packet that collides is counted only once in output packets. |

| Field | Description |
|---|---|
| Interface resets | Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. Interface resets can occur when an interface is looped back or shut down. |
| Babbles | Transmit jabber timer expired. |
| Late collision | Number of late collisions. Late collision happens when a collision occurs after transmitting the preamble. |
| Deferred | Number of times that the interface had to defer while ready to transmit a frame because the carrier was asserted. |
| Lost carrier | Number of times the carrier was lost during transmission. |
| No carrier | Number of times the carrier was not present during the transmission. |
| Pause output | Number of pause packets transmitted. |
| Output buffer failures,<br>Output buffers swapped out | Number of output butters failures and output buffers swapped out. |

**Related Commands**

| Command | Description |
|---|---|
| **show ip interface** | Display the usability status of interfaces configured for IP,. |

# show interfaces vlan mapping

To display the status of a virtual local area network (VLAN) mapping on a port, use the **showinterfacesvlanmapping** command in user EXEC or privileged EXEC mode.

**show interfaces** *interface interface-number* **vlan mapping**

## Syntax Description

| | |
|---|---|
| *interface* | Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan**. |
| *interface-number* | Module and port number; see the "Usage Guidelines" section for valid values. |

## Command Default

This command has no default settings.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(17b)SXA | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

## Usage Guidelines

The **pos**, **atm**, and **ge-wan** keywords are supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

The *interface-number* designates the module and port number. Valid values depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the slot number are from 1 to 13 and valid values for the port number are from 1 to 48.

## Examples

This example shows how to list all of the VLAN mappings that are configured on a port and indicate whether such mappings are enabled or disabled on the port:

```
Router# show interfaces gigabitethernet 5/2 vlan mapping
State: enabled
Original VLAN Translated VLAN
------------- ---------------
  1649           755
Router#
```

## Related Commands

| Command | Description |
|---|---|
| **show vlan mapping** | Registers a mapping of an 802.1Q VLAN to an ISL VLAN. |
| **switchport vlan mapping enable** | Enables VLAN mapping per switch port. |

# show interfaces wlan-controller

To show the Cisco Wireless Local Area Network (WLAN) controller network module interfaces on the router, use the **showinterfaceswlan-controller** command in privileged EXEC mode.

**show interfaces wlan-controller slot/unit**

**Syntax Description**

| | |
|---|---|
| slot/unit | Specifies the router slot and unit numbers for the WLAN controller network module. |

**Command Default**

None

**Command Modes**

Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| 12.4(2)XA1 | This command was introduced on the router software. |
| 12.4(6)T | This command was integrated into Cisco IOS Release 12.4(6)T. |

**Examples**

The following example shows how to read the hardware information about the interface WLAN controller in the router:

```
Router# show interfaces wlan-controller 1/0
wlan-controller1/0 is up, line protocol is up
  Hardware is I82559FE, address is 0005.9a3d.7450 (bia 0005.9a3d.7450)
  Internet address is 30.0.0.1/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation 802.1Q Virtual LAN, Vlan ID  1., loopback not set
  Keepalive set (10 sec)
  Full-duplex, 100Mb/s, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:05, output 00:00:03, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     2400779 packets input, 143127299 bytes
     Received 2349587 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog
     0 input packets with dribble condition detected
     468232 packets output, 106333102 bytes, 0 underruns
     0 output errors, 0 collisions, 3 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 1 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

# show ip interface

To display the usability status of interfaces configured for IP, use the **show ip interface** command in privileged EXEC mode.

**show ip interface** [*type number*] [**brief**]

## Syntax Description

| | |
|---|---|
| *type* | (Optional) Interface type. |
| *number* | (Optional) Interface number. |
| **brief** | (Optional) Displays a summary of the usability status information for each interface. |

## Command Default

The full usability status is displayed for all interfaces configured for IP.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 10.0 | This command was introduced. |
| 12.0(3)T | The command output was modified to show the status of the **ip wccp redirect out** and **ip wccp redirect exclude add in** commands. |
| 12.2(14)S | The command output was modified to display the status of NetFlow on a subinterface. |
| 12.2(15)T | The command output was modified to display the status of NetFlow on a subinterface. |
| 12.3(6) | The command output was modified to identify the downstream VPN routing and forwarding (VRF) instance in the output. |
| 12.3(14)YM2 | The command output was modified to show the usability status of interfaces configured for Multiprocessor Forwarding (MPF) and implemented on the Cisco 7301 and Cisco 7206VXR routers. |
| 12.2(14)SX | This command was implemented on the Supervisor Engine 720. |
| 12.2(17d)SXB | This command was integrated into Cisco IOS 12.2(17d)SXB on the Supervisor Engine 2, and the command output was changed to include NDE for hardware flow status. |
| 12.4(4)T | This command was integrated into Cisco IOS Release 12.4(4)T. |
| 12.2(28)SB | This command was integrated into Cisco IOS Release 12.2(28)SB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2(31)SB2 | The command output was modified to display information about the Unicast Reverse Path Forwarding (RPF) notification feature. |

| Release | Modification |
|---|---|
| 12.4(20)T | The command output was modified to display information about the Unicast RPF notification feature. |
| 12.2(33)SXI2 | This command was modified. The command output was modified to display information about the Unicast RPF notification feature. |
| Cisco IOS XE Release 2.5 | This command was modified. This command was implemented on the Cisco ASR 1000 Series Aggregation Services Routers. |
| Cisco IOS XE Release 3.9S | This command was implemented on Cisco 4400 Series ISRs. |

## Usage Guidelines

The Cisco IOS software automatically enters a directly connected route in the routing table if the interface is usable (which means that it can send and receive packets). If an interface is not usable, the directly connected routing entry is removed from the routing table. Removing the entry lets the software use dynamic routing protocols to determine backup routes to the network, if any.

If the interface can provide two-way communication, the line protocol is marked "up." If the interface hardware is usable, the interface is marked "up."

If you specify an optional interface type, information for that specific interface is displayed. If you specify no optional arguments, information on all the interfaces is displayed.

When an asynchronous interface is encapsulated with PPP or Serial Line Internet Protocol (SLIP), IP fast switching is enabled. A **show ip interface** command on an asynchronous interface encapsulated with PPP or SLIP displays a message indicating that IP fast switching is enabled.

You can use the **show ip interface brief** command to display a summary of the router interfaces. This command displays the IP address, the interface status, and other information.

The **show ip interface brief** command does not display any information related to Unicast RPF.

## Examples

The following example shows configuration information for interface Gigabit Ethernet 0/3. In this example, the IP flow egress feature is configured on the output side (where packets go out of the interface), and the policy route map named PBRNAME is configured on the input side (where packets come into the interface).

```
Router# show running-config interface gigabitethernet 0/3
interface GigabitEthernet0/3
 ip address 10.1.1.1 255.255.0.0
 ip flow egress
 ip policy route-map PBRNAME
 duplex auto
 speed auto
 media-type gbic
 negotiation auto
end
```

The following example shows interface information on Gigabit Ethernet interface 0/3. In this example, MPF is enabled, and both Policy Based Routing (PBR) and NetFlow features are not supported by MPF and are ignored.

```
Router# show ip interface gigabitethernet 0/3
```

```
GigabitEthernet0/3 is up, line protocol is up
  Internet address is 10.1.1.1/16
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Local Proxy ARP is disabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachables are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP fast switching on the same interface is disabled
  IP Flow switching is disabled
  IP CEF switching is enabled
  IP Feature Fast switching turbo vector
  IP VPN Flow CEF switching turbo vector
  IP multicast fast switching is enabled
  IP multicast distributed fast switching is disabled
  IP route-cache flags are Fast, CEF
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Policy routing is enabled, using route map PBR
  Network address translation is disabled
  BGP Policy Mapping is disabled
  IP Multi-Processor Forwarding is enabled
     IP Input features, "PBR",
         are not supported by MPF and are IGNORED
     IP Output features, "NetFlow",
         are not supported by MPF and are IGNORED
```

The following example identifies a downstream VRF instance. In the example, "Downstream VPN Routing/Forwarding "D"" identifies the downstream VRF instance.

```
Router# show ip interface virtual-access 3
Virtual-Access3 is up, line protocol is up
  Interface is unnumbered. Using address of Loopback2 (10.0.0.8)
  Broadcast address is 255.255.255.255
  Peer address is 10.8.1.1
  MTU is 1492 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound  access list is not set
  Proxy ARP is enabled
  Local Proxy ARP is disabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachables are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP fast switching on the same interface is enabled
  IP Flow switching is disabled
  IP CEF switching is enabled
```

```
  IP Feature Fast switching turbo vector
  IP VPN CEF switching turbo vector
  VPN Routing/Forwarding "U"
  Downstream VPN Routing/Forwarding "D"
  IP multicast fast switching is disabled
  IP multicast distributed fast switching is disabled
  IP route-cache flags are Fast, CEF
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Policy routing is disabled
  Network address translation is disabled
  WCCP Redirect outbound is disabled
  WCCP Redirect inbound is disabled
  WCCP Redirect exclude is disabled
  BGP Policy Mapping is disabled
```

The following example shows the information displayed when Unicast RPF drop-rate notification is configured:

```
Router# show ip interface ethernet 2/3
Ethernet2/3 is up, line protocol is up
  Internet address is 10.0.0.4/16
  Broadcast address is 255.255.255.255
  Address determined by non-volatile memory
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound  access list is not set
  Proxy ARP is enabled
  Local Proxy ARP is disabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachables are always sent
  ICMP mask replies are never sent
  IP fast switching is disabled
  IP Flow switching is disabled
  IP CEF switching is disabled
  IP Null turbo vector
  IP Null turbo vector
  IP multicast fast switching is disabled
  IP multicast distributed fast switching is disabled
  IP route-cache flags are No CEF
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Probe proxy name replies are disabled
  Policy routing is disabled
  Network address translation is disabled
  WCCP Redirect outbound is disabled
  WCCP Redirect inbound is disabled
  WCCP Redirect exclude is disabled
  BGP Policy Mapping is disabled
```

### Unicast RPF Information

```
  Input features: uRPF
  IP verify source reachable-via RX, allow default
   0 verification drops
   0 suppressed verification drops
   0 verification drop-rate
Router#
```

The following example shows how to display the usability status for a specific VLAN:

```
Router# show ip interface vlan 1
Vlan1 is up, line protocol is up
  Internet address is 10.0.0.4/24
  Broadcast address is 255.255.255.255
Address determined by non-volatile memory
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound  access list is not set
  Proxy ARP is enabled
  Local Proxy ARP is disabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachables are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP fast switching on the same interface is disabled
  IP Flow switching is disabled
  IP CEF switching is enabled
  IP Fast switching turbo vector
  IP Normal CEF switching turbo vector
  IP multicast fast switching is enabled
  IP multicast distributed fast switching is disabled
  IP route-cache flags are Fast, CEF
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Probe proxy name replies are disabled
  Policy routing is disabled
  Network address translation is disabled
  WCCP Redirect outbound is disabled
  WCCP Redirect inbound is disabled
  WCCP Redirect exclude is disabled
  BGP Policy Mapping is disabled
  Sampled Netflow is disabled
  IP multicast multilayer switching is disabled
  Netflow Data Export (hardware) is enabled
```

The table below describes the significant fields shown in the display.

*Table 2: show ip interface Field Descriptions*

| Field | Description |
|---|---|
| Virtual-Access3 is up | Shows whether the interface hardware is usable (up). For an interface to be usable, both the interface hardware and line protocol must be up. |
| Broadcast address is | Broadcast address. |
| Peer address is | Peer address. |
| MTU is | MTU value set on the interface, in bytes. |
| Helper address | Helper address, if one is set. |
| Directed broadcast forwarding | Shows whether directed broadcast forwarding is enabled. |
| Outgoing access list | Shows whether the interface has an outgoing access list set. |
| Inbound access list | Shows whether the interface has an incoming access list set. |
| Proxy ARP | Shows whether Proxy Address Resolution Protocol (ARP) is enabled for the interface. |
| Security level | IP Security Option (IPSO) security level set for this interface. |
| Split horizon | Shows whether split horizon is enabled. |
| ICMP redirects | Shows whether redirect messages will be sent on this interface. |
| ICMP unreachables | Shows whether unreachable messages will be sent on this interface. |
| ICMP mask replies | Shows whether mask replies will be sent on this interface. |
| IP fast switching | Shows whether fast switching is enabled for this interface. It is generally enabled on serial interfaces, such as this one. |
| IP Flow switching | Shows whether Flow switching is enabled for this interface. |
| IP CEF switching | Shows whether Cisco Express Forwarding switching is enabled for the interface. |
| Downstream VPN Routing/Forwarding "D" | Shows the VRF instance where the PPP peer routes and AAA per-user routes are being installed. |
| IP multicast fast switching | Shows whether multicast fast switching is enabled for the interface. |
| IP route-cache flags are Fast | Shows whether NetFlow is enabled on an interface. Displays "Flow init" to specify that NetFlow is enabled on the interface. Displays "Ingress Flow" to specify that NetFlow is enabled on a subinterface using the **ip flow ingress**command. Shows "Flow" to specify that NetFlow is enabled on a main interface using the **ip route-cache flow** command. |

| Field | Description |
|---|---|
| Router Discovery | Shows whether the discovery process is enabled for this interface. It is generally disabled on serial interfaces. |
| IP output packet accounting | Shows whether IP accounting is enabled for this interface and what the threshold (maximum number of entries) is. |
| TCP/IP header compression | Shows whether compression is enabled. |
| WCCP Redirect outbound is disabled | Shows the status of whether packets received on an interface are redirected to a cache engine. Displays "enabled" or "disabled." |
| WCCP Redirect exclude is disabled | Shows the status of whether packets targeted for an interface will be excluded from being redirected to a cache engine. Displays "enabled" or "disabled." |
| Netflow Data Export (hardware) is enabled | NetFlow Data Expert (NDE) hardware flow status on the interface. |

The table below describes the significant fields shown in the display.

### Display a Summary of Interfaces on Cisco 4400 Series ISR: Example

The following is a sample out of the **show ip interface brief** command displaying a summary of the interfaces and their status on the device.

```
Router#show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0/0   unassigned      YES NVRAM  down                  down
GigabitEthernet0/0/1   unassigned      YES NVRAM  down                  down
GigabitEthernet0/0/2   unassigned      YES NVRAM  down                  down
GigabitEthernet0/0/3   unassigned      YES NVRAM  down                  down
Serial1/0/0            unassigned      YES unset  down                  down
GigabitEthernet0       unassigned      YES NVRAM  up                    up
```

### Display a Summary of the Usability Status: Example

The following example shows how to display a summary of the usability status information for each interface:

```
Router# show ip interface brief
Interface     IP-Address     OK?  Method  Status                  Protocol
Ethernet0     10.108.00.5    YES  NVRAM   up                      up
Ethernet1     unassigned     YES  unset   administratively down   down
Loopback0     10.108.200.5   YES  NVRAM   up                      up
Serial0       10.108.100.5   YES  NVRAM   up                      up
Serial1       10.108.40.5    YES  NVRAM   up                      up
Serial2       10.108.100.5   YES  manual  up                      up
Serial3       unassigned     YES  unset   administratively down   down
```

*Table 3: show ip interface brief Field Descriptions*

| Field | Description |
|---|---|
| Interface | Type of interface. |
| IP-Address | IP address assigned to the interface. |
| OK? | "Yes" means that the IP Address is valid. "No" means that the IP Address is not valid. |
| Method | The Method field has the following possible values:<br>• RARP or SLARP--Reverse Address Resolution Protocol (RARP) or Serial Line Address Resolution Protocol (SLARP) request.<br>• BOOTP--Bootstrap protocol.<br>• TFTP--Configuration file obtained from the TFTP server.<br>• manual--Manually changed by the command-line interface.<br>• NVRAM--Configuration file in NVRAM.<br>• IPCP--**ip address negotiated** command.<br>• DHCP--**ip address dhcp** command.<br>• unset--Unset.<br>• other--Unknown. |
| Status | Shows the status of the interface. Valid values and their meanings are:<br>• up--Interface is up.<br>• down--Interface is down.<br>• administratively down--Interface is administratively down. |
| Protocol | Shows the operational status of the routing protocol on this interface. |

## Related Commands

| Command | Description |
|---|---|
| **ip address** | Sets a primary or secondary IP address for an interface. |
| **ip vrf autoclassify** | Enables VRF autoclassify on a source interface. |
| **match ip source** | Specifies a source IP address to match to required route maps that have been set up based on VRF connected routes. |
| **route-map** | Defines the conditions for redistributing routes from one routing protocol into another or to enable policy routing. |
| **set vrf** | Enables VPN VRF selection within a route map for policy-based routing VRF selection. |

| Command | Description |
|---|---|
| **show ip arp** | Displays the ARP cache, in which SLIP addresses appear as permanent ARP table entries. |
| **show route-map** | Displays static and dynamic route maps. |

# show ipc

To display interprocess communication (IPC) statistics, use the **showipc** command in privileged EXEC mode.

**show ipc** {**nodes** | **ports** [**open**] | **queue** | **status** [**cumulative**] | **zones**}

## Syntax Description

| | |
|---|---|
| **nodes** | Displays participating nodes. |
| **ports** | Displays local and registered IPC ports. |
| **open** | (Optional) Displays local IPC ports that have been opened by the current seat (node). |
| **queue** | Displays information about the IPC retransmission queue and the IPC message queue. |
| **status** | Displays the status of the local IPC server. |
| **cumulative** | (Optional) Displays cumulative totals for the status counters of the local IPC server since the router was rebooted. |
| **zones** | Displays information about the IPC zones and seats. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(12c)EW | This command was introduced. |
| 12.2(15)T | The **cumulative** keyword was added. |
| 12.3(7)T | The **zones** keyword was added. |
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to 12.2(17d)SXB. |
| 12.2(28)SB | This command was integrated into Cisco IOS Release 12.2(28)SB. |

## Usage Guidelines

**The Cisco IOS version of IPC provides a reliable ordered delivery of messages using an underlying platform driver transport or User Datagram Protocol (UDP) transport protocol.**

**Nodes**

A node (referred to as a seat) is an intelligent element like a processor that can communicate using IPC services. A seat is where entities and ports reside. A seat manager performs all the interprocessor communications by receiving messages from the network and forwarding the messages to the appropriate port.

**Ports**

IPC communication endpoints (ports) receive and queue received IPC messages.

**Queue**

Use the **queue** keyword to display information about the IPC retransmission queue and the IPC message queue.

**Status**

Use the**status** keyword to display the IPC statistics that have been generated since a **clearipcstatistics** command was entered. The **showipcstatus** command with the **cumulative** keyword displays the IPC statistics that have been gathered since the router was rebooted, regardless of how many times the statistics have been cleared.

**Zones**

The IPC zone manager allows more than one group of IPC seats to exist to enable direct communication between line cards and the route processor. Use the**zones** keyword to display the IPC zone and seat information.

## Examples

The following is sample output from the **showipc**command with the **nodes**keyword displaying the participating seats (nodes):

```
Router# show ipc nodes
There are 6 nodes in this IPC realm.
   ID      Type       Name                     Last  Last
                                               Sent Heard
0.10000    Local      IPC Master                  0     0
0.1060000  RSP-CY     RSP IPC card slot 6         9    79
0.1050000  RSP-CY     RSP IPC card slot 5        21    22
0.1080000  RSP-CY     RSP IPC card slot 8        21    22
1.10000    Local      IPC Master: -Zone#1         0     0
2.10000    Local      IPC Master: -Zone#2
```

The table below describes the significant fields shown in the display.

***Table 4: show ipc nodes Field Descriptions***

| Field | Description |
|---|---|
| ID | Port ID, which consists of a zone ID followed by the seat ID. |
| Type | Type of seat (node). |
| Name | Seat name. |
| Last Sent | Sequence number of the message that was last sent. |
| Last Heard | Sequence number of the in-sequence message that was last heard. |

The following is sample output from the **showipc**command with the **ports**keyword displaying the local and registered IPC ports:

```
Router# show ipc ports
There are 11 ports defined.

Port ID     Type    Name            (current/peak/total)
1.10000.1   unicast IPC Master:Zone
1.10000.2   unicast IPC Master:Echo
1.10000.3   unicast IPC Master:Control
1.10000.4   unicast Remote TTY Server Port
1.10000.5   unicast GALIOS RF :Active
index = 0 seat_id = 0x2020000 last sent = 0 heard = 1635 0/1/1635
1.10000.6   unicast GALIOS RED:Active
```

```
index = 0 seat_id = 0x2020000 last sent = 0 heard = 2 0/1/2

2.2020000.3 unicast GALIOS IPC:Card 2:Control
2.2020000.4 unicast GALIOS RFS :Standby
2.2020000.5 unicast Slave: Remote TTY Client Port
2.2020000.6 unicast GALIOS RF :Standby
2.2020000.7 unicast GALIOS RED:Standby
RPC packets: current/peak/total 0/1/17
```

The table below describes the significant fields shown in the display.

***Table 5: show ipc ports Field Descriptions***

| Field | Description |
|---|---|
| Port ID | Port ID, which consists of a zone ID followed by the seat ID. |
| Type | Type of port. |
| Name | Port name. |
| current/peak/total | Displays information about the number of messages held by this IPC session. |

The following is sample output from the **showipc**command with the **queue**keyword displaying information about the IPC retransmission queue and the IPC message queue:

```
Router# show ipc queue
There are 0 IPC messages waiting for acknowledgement in the transmit queue.
There are 0 IPC messages waiting for a response.
There are 0 IPC messages waiting for additional fragments.
There are 0 IPC messages currently on the IPC inboundQ.
There are 0 messages currently in use by the system.
```

The following is sample output from the **showipc**command with the **status**keyword displaying information about the local IPC server:

```
Router# show ipc status
IPC System Status
Time last IPC stat cleared : never
This processor is the IPC master server.
Do not drop output of IPC frames for test purposes.
1000 IPC Message Headers Cached.
                                                    Rx Side     Tx Side
Total Frames                                            189         140
Total from Local Ports                                  189          70
Total Protocol Control Frames                            70          44
Total Frames Dropped                                      0           0
                          Service Usage
Total via Unreliable Connection-Less Service            145           0
Total via Unreliable Sequenced Connection-Less Svc        0           0
Total via Reliable Connection-Oriented Service           44          70
                           IPC Protocol Version 0
Total Acknowledgements                                   70          44
Total Negative Acknowledgements                           0           0
                           Device Drivers
Total via Local Driver                                    0           0
Total via Platform Driver                                 0          70
Total Frames Dropped by Platform Drivers                  0           0
                     Reliable Tx Statistics
Re-Transmission                                                       0
```

```
Re-Tx Timeout                                                    0
Rx Errors                          Tx Errors
Unsupp IPC Proto Version          0  Tx Session Error              0
Corrupt Frame                     0  Tx Seat Error                 0
Duplicate Frame                   0  Destination Unreachable       0
Out-of-Sequence Frame             0  Tx Test Drop                  0
Dest Port does Not Exist          0  Tx Driver Failed              0
Rx IPC Msg Alloc Failed           0  Ctrl Frm Alloc Failed         0
Unable to Deliver Msg             0
         Buffer Errors                        Misc Errors
IPC Msg Alloc                     0  IPC Open Port                 0
Emer IPC Msg Alloc                0  No HWQ                        0
IPC Frame PakType Alloc           0  Hardware Error                0
IPC Frame MemD Alloc              0
         Tx Driver Errors
No Transport                      0
MTU Failure                       0
Dest does not Exist               0
```

The table below describes the significant fields shown in the display.

***Table 6: show ipc status Field Descriptions***

| Field | Description |
|---|---|
| Time last IPC stat cleared | Displays the time, in dd:hh:mm (or never), since the IPC statistics were last cleared. |
| This processor is | Shows whether the processor is the IPC master or an IPC slave. |
| IPC Message Headers Cached | Number of message headers available in the IPC message cache. |
| Rx Side | Information about IPC messages received. |
| Tx Side | Information about IPC messages sent. |
| Service Usage | Number of IPC messages received or sent via connectionless or connection-oriented protocols. |
| IPC Protocol Version 0 | Number of acknowledgements and negative acknowledgements received or sent by the system. |
| Device Drivers | Number of IPC messages received or sent using the underlying device drivers. |
| Reliable Tx Statistics | Number of IPC messages that were retransmitted or that timed out on retransmission using a reliable connection-oriented protocol. |
| Rx Errors | Number of IPC messages received that displayed various internal frame or delivery errors. |
| Tx Errors | Number of IPC messages sent that displayed various transmission errors. |
| Buffer Errors | Number of message allocation failures from the IPC message cache, IPC emergency message cache, IPC frame allocation cache, and IPC frame memory allocation cache. |
| Misc Errors | Various miscellaneous errors that relate to the IPC open queue, to the hardware queue, or to other hardware failures. |

| Field | Description |
|---|---|
| Tx Driver Errors | Number of messages that relate to IPC transmission driver failures including messages to or from a destination without a valid transport entity from the seat; number of messages dropped because the packet size is larger than the maximum transmission unit (MTU); and number of messages without a valid destination address. |

The following example shows how to display cumulative IPC counters for the local IPC server. Note that the recent IPC clearing has not cleared the IPC counters because the **cumulative** keyword displays the IPC statistics that have been generated since the router was rebooted.

```
Router# show ipc status cumulative
IPC System Status
Time last IPC stat cleared : 00:00:05
This processor is the IPC master server.
Do not drop output of IPC frames for test purposes.
1000 IPC Message Headers Cached.
                                                    Rx Side     Tx Side
Total Frames                                           3473         184
Total from Local Ports                                 3473          92
Total Protocol Control Frames                            92          54
Total Frames Dropped                                      0           0
                           Service Usage
Total via Unreliable Connection-Less Service           2449           0
Total via Unreliable Sequenced Connection-Less Svc      970           0
Total via Reliable Connection-Oriented Service           54          92
                     IPC Protocol Version 0
Total Acknowledgements                                    0           0
Total Negative Acknowledgements                           0           0
                         Device Drivers
Total via Local Driver                                    0           0
Total via Platform Driver                                 0          92
Total Frames Dropped by Platform Drivers                  0           0
                    Reliable Tx Statistics
Re-Transmission                                                       0
Re-Tx Timeout                                                         0
Rx Errors                              Tx Errors
Unsupp IPC Proto Version          0  Tx Session Error                 0
Corrupt Frame                     0  Tx Seat Error                    0
Duplicate Frame                   0  Destination Unreachable          0
Out-of-Sequence Frame             0  Tx Test Drop                     0
Dest Port does Not Exist          0  Tx Driver Failed                 0
Rx IPC Msg Alloc Failed           0  Ctrl Frm Alloc Failed            0
Unable to Deliver Msg             0
         Buffer Errors                          Misc Errors
IPC Msg Alloc                     0  IPC Open Port                    0
Emer IPC Msg Alloc                0  No HWQ                           0
IPC Frame PakType Alloc           0  Hardware Error                   0
IPC Frame MemD Alloc              0
         Tx Driver Errors
No Transport                      0
MTU Failure                       0
Dest does not Exist               0
```

The following is sample output from the **showipc**command with the **zones**keyword displaying information about the IPC zones and seats:

```
Router# show ipc zones
There are 3 Zones in this IPC realm.
```

```
Zone ID   Seat ID   Name
      0    10000    IPC Default Zone
      1    10000    IPC TEST ZONE#1
      2    10000    IPC TEST ZONE#2
```

The table below describes the significant fields shown in the display.

***Table 7: show ipc zones Field Descriptions***

| Field | Description |
|---|---|
| Zone ID | Zone number. |
| Seat ID | Seat number. |
| Name | Zone name. |

## Related Commands

| Command | Description |
|---|---|
| **clear ipc statistics** | Clears and resets the IPC statistics. |

# show ipc hog-info

To provide information about interprocess communication (IPC) messages that consume excessive CPU, use the **showipchog-info**command in privileged EXEC mode.

**show ipc hog-info**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(15)T | This command was introduced. |
| 12.2(28)SB | This command was integrated into Cisco IOS Release 12.2(28)SB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

## Usage Guidelines

The Cisco IOS version of IPC provides a reliable ordered delivery of messages using an underlying platform driver transport or User Datagram Protocol (UDP) transport protocol.

The show ipc hog-info command displays information about IPC messages that are being processed when a CPUHOG error occurs, indicating that the client processing an IPC message is using too much CPU, or when an IPC message callback exceeds 200 milliseconds.

## Examples

The following example shows that the IPC process has had a CPUHOG error or the message callback exceeded the 200-millisecond threshold:

```
Router# show ipc hog-info
Time last IPC process hogged CPU: 00:05:09
IPC Messages Processed:
Source       Destination  Name                        Message-Type  Time-taken
                                                          (0x)       (msec)
 1030000     10000.14     ISSU Process: Active Por        0        864
 1030000     10000.D      RF : Active                     0          0
```

In the following example, the show ipc status command shows a counter incrementing whenever a callback exceeds 200 milliseconds:

```
Router# show ipc status
                            IPC System Status
 Time last IPC stat cleared : never
 This processor is the IPC master server.
 Do not drop output of IPC frames for test purposes.
 1000 IPC Message Headers Cached.
                                                    Rx Side     Tx Side
 Total Frames                                         9501        3973
 Total from Local Ports                              14328        3258
 Total Protocol Control Frames                        1628         713
 Total Frames Dropped                                    0           0
                             Service Usage
 Total via Unreliable Connection-Less Service         7865           0
```

```
Total via Unreliable Sequenced Connection-Less Svc          0           0
Total via Reliable Connection-Oriented Service            831        1629
                    IPC Protocol Version 0


Total Acknowledgments                                    1628         713
Total Negative Acknowledgments                              0           0
                           Device Drivers
Total via Local Driver                                     12          12
Total via Platform Driver                                9478        1619
Total Frames Dropped by Platform Drivers                    0           0
Total Frames Sent when media is quiesced                                0
                   Reliable Tx Statistics
Re-Transmission                                                         0
Re-Tx Timeout                                                           0
         Rx Errors                                 Tx Errors
Unsupp IPC Proto Version          0  Tx Session Error                   0
Corrupt Frame                     0  Tx Seat Error                      0
Duplicate Frame                   0  Destination Unreachable            0
Rel Out-of-Seq Frame              0  Unrel Out-of-Seq Frame             0
Dest Port does Not Exist          0  Tx Driver Failed                   0
Rx IPC Msg Alloc Failed           0  Rx IPC Frag Dropped                0
Rx IPC Transform Errors           0  Tx IPC Transform Errors            0
Unable to Deliver Msg             0  Tx Test Drop                       0
Ctrl Frm Alloc Failed             0  Rx Msg Callback Hog               11
         Buffer Errors                          Misc Errors
IPC Msg Alloc                     0  IPC Open Port                      0
Emer IPC Msg Alloc                0  No HWQ                             0
IPC Frame PakType Alloc           0  Hardware Error                     0
IPC Frame MemD Alloc              0  Invalid Messages                   0
         Tx Driver Errors
No Transport                      0
MTU Failure                       0
Dest does not Exist               0
```

## Related Commands

| Command | Description |
|---|---|
| **show ipc** | Displays IPC statistics. |

# show ipv6 ospf interface

To display Open Shortest Path First (OSPF)-related interface information, use the **showipv6ospfinterface** command in user EXEC or privileged mode.

**show ipv6 ospf** [*process-id*] [*area-id*] **interface** [*type number*] [**brief**]

## Syntax Description

| | |
|---|---|
| *process-id* | (Optional) Internal identification. It is locally assigned and can be any positive integer. The number used here is the number assigned administratively when the OSPF routing process is enabled. |
| *area-id* | (Optional) Displays information about a specified area only. |
| *type number* | (Optional) Interface type and number. |
| **brief** | (Optional) Displays brief overview information for OSPF interfaces, states, addresses and masks, and areas on the router. |

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.0(24)S | This command was introduced. |
| 12.2(15)T | This command was integrated into Cisco IOS Release 12.2(15)T. |
| 12.2(18)S | This command was integrated into Cisco IOS Release 12.2(18)S. |
| 12.3(4)T | Command output is changed when authentication is enabled. |
| 12.2(28)SB | This command was integrated into Cisco IOS Release 12.2(28)SB. |
| 12.2(25)SG | This command was integrated into Cisco IOS Release 12.2(25)SG. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.4(9)T | Command output is changed when encryption is enabled. |
| 12.2(33)SRB | The **brief** keyword was added. |
| 12.4(15)XF | Output displays were modified so that VMI PPPoE interface-based local state values are displayed in the command output when a VMI interface is specified. |
| 12.4(15)T | This command was integrated into Cisco IOS Release 12.4(15)T |
| 12.2(33)SXH | This command was integrated into Cisco IOS Release 12.2(33)SXH. |
| Cisco IOS XE Release 2.1 | Command output was updated to display graceful restart information. |
| 12.2(33)SRE | This command was modified. It was integrated into Cisco IOS Release 12.2(33)SRE. |

| Release | Modification |
|---|---|
| 15.1(1)SY | This command was was modified. It was integrated into Cisco IOS Release 15.1(1)SY. |

## Examples

### show ipv6 ospf interface Standard Output Example

The following is sample output from the **showipv6ospfinterface** command:

```
Router# show ipv6 ospf interface
ATM3/0 is up, line protocol is up
  Link Local Address 2001:0DB1:205:5FFF:FED3:5808, Interface ID 13
  Area 1, Process ID 1, Instance ID 0, Router ID 172.16.3.3
  Network Type POINT_TO_POINT, Cost: 1
  Transmit Delay is 1 sec, State POINT_TO_POINT,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:06
  Index 1/2/2, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 12, maximum is 12
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 172.16.4.4
  Suppress hello for 0 neighbor(s)
FastEthernet0/0 is up, line protocol is up
  Link Local Address 2001:0DB1:205:5FFF:FED3:5808, Interface ID 3
  Area 1, Process ID 1, Instance ID 0, Router ID 172.16.3.3
  Network Type BROADCAST, Cost: 1
  Transmit Delay is 1 sec, State BDR, Priority 1
  Designated Router (ID) 172.16.6.6, local address 2001:0DB1:205:5FFF:FED3:6408
  Backup Designated router (ID) 172.16.3.3, local address 2001:0DB1:205:5FFF:FED3:5808
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:05
  Index 1/1/1, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 12, maximum is 12
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 172.16.6.6  (Designated Router)
  Suppress hello for 0 neighbor(s)
```

The table below describes the significant fields shown in the display.

***Table 8: show ipv6 ospf interface Field Descriptions***

| Field | Description |
|---|---|
| ATM3/0 | Status of the physical link and operational status of protocol. |
| Link Local Address | Interface IPv6 address. |
| Area 1, Process ID 1, Instance ID 0, Router ID 172.16.3.3 | The area ID, process ID, instance ID, and router ID of the area from which this route is learned. |
| Network Type POINT_TO_POINT, Cost: 1 | Network type and link-state cost. |

| Field | Description |
|---|---|
| Transmit Delay | Transmit delay, interface state, and router priority. |
| Designated Router | Designated router ID and respective interface IP address. |
| Backup Designated router | Backup designated router ID and respective interface IP address. |
| Timer intervals configured | Configuration of timer intervals. |
| Hello | Number of seconds until the next hello packet is sent out this interface. |
| Neighbor Count | Count of network neighbors and list of adjacent neighbors. |

### Cisco IOS Release 12.2(33)SRB Example

The following is sample output of the **showipv6ospfinterface** command when the **brief** keyword is entered.

```
Router# show ipv6 ospf interface brief

Interface    PID   Area            Intf ID    Cost  State Nbrs F/C
VL0          6     0               21         65535 DOWN  0/0
Se3/0        6     0               14         64    P2P   0/0
Lo1          6     0               20         1     LOOP  0/0
Se2/0        6     6               10         62    P2P   0/0
Tu0          1000  0               19         11111 DOWN  0/0
```

### OSPF with Authentication on the Interface Example

The following is sample output from the **showipv6ospfinterface** command with authentication enabled on the interface:

```
Router# show ipv6 ospf interface
Ethernet0/0 is up, line protocol is up
  Link Local Address 2001:0DB1:A8BB:CCFF:FE00:6E00, Interface ID 2
  Area 0, Process ID 1, Instance ID 0, Router ID 10.10.10.1
  Network Type BROADCAST, Cost:10
  MD5 Authentication SPI 500, secure socket state UP (errors:0)
  Transmit Delay is 1 sec, State BDR, Priority 1
  Designated Router (ID) 10.11.11.1, local address 2001:0DB1:A8BB:CCFF:FE00:6F00
  Backup Designated router (ID) 10.10.10.1, local address
2001:0DB1:A8BB:CCFF:FE00:6E00
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:01
  Index 1/1/1, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.11.11.1  (Designated Router)
  Suppress hello for 0 neighbor(s)
```

### OSPF with Null Authentication Example

The following is sample output from the **showipv6ospfinterface** command with null authentication configured on the interface:

```
Router# show ipv6 ospf interface
Ethernet0/0 is up, line protocol is up
  Link Local Address 2001:0DB1:A8BB:CCFF:FE00:6E00, Interface ID 2
  Area 0, Process ID 1, Instance ID 0, Router ID 10.10.10.1
  Network Type BROADCAST, Cost:10
  Authentication NULL
  Transmit Delay is 1 sec, State BDR, Priority 1
  Designated Router (ID) 10.11.11.1, local address 2001:0DB1:A8BB:CCFF:FE00:6F00
  Backup Designated router (ID) 10.10.10.1, local address
2001:0DB1:A8BB:CCFF:FE00:6E00
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:03
  Index 1/1/1, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.11.11.1  (Designated Router)
  Suppress hello for 0 neighbor(s)
```

### OSPF with Authentication for the Area Example

The following is sample output from the **showipv6ospfinterface** command with authentication configured for the area:

```
Router# show ipv6 ospf interface
Ethernet0/0 is up, line protocol is up
  Link Local Address 2001:0DB1:A8BB:CCFF:FE00:6E00, Interface ID 2
  Area 0, Process ID 1, Instance ID 0, Router ID 10.10.10.1
  Network Type BROADCAST, Cost:10
  MD5 Authentication (Area) SPI 1000, secure socket state UP (errors:0)
  Transmit Delay is 1 sec, State BDR, Priority 1
  Designated Router (ID) 10.11.11.1, local address 2001:0DB1:A8BB:CCFF:FE00:6F00
  Backup Designated router (ID) 10.10.10.1, local address
FE80::A8BB:CCFF:FE00:6E00
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:03
  Index 1/1/1, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.11.11.1  (Designated Router)
  Suppress hello for 0 neighbor(s)
```

### OSPF with Dynamic Cost Example

The following display shows sample output from the **showipv6ospfinterface** command when the OSPF cost dynamic is configured.

```
Router1# show ipv6 ospf interface serial 2/0
```

```
Serial2/0 is up, line protocol is up
   Link Local Address 2001:0DB1:A8BB:CCFF:FE00:100, Interface ID 10
   Area 1, Process ID 1, Instance ID 0, Router ID 172.1.1.1
   Network Type POINT_TO_MULTIPOINT, Cost: 64 (dynamic), Cost Hysteresis: 200
   Cost Weights: Throughput 100, Resources 20, Latency 80, L2-factor 100
   Transmit Delay is 1 sec, State POINT_TO_MULTIPOINT,
   Timer intervals configured, Hello 30, Dead 120, Wait 120, Retransmit 5
     Hello due in 00:00:19
   Index 1/2/3, flood queue length 0
   Next 0x0(0)/0x0(0)/0x0(0)
   Last flood scan length is 0, maximum is 0
   Last flood scan time is 0 msec, maximum is 0 msec
   Neighbor Count is 0, Adjacent neighbor count is 0
   Suppress hello for 0 neighbor(s)
```

### OSPF Graceful Restart Example

The following display shows sample output from the **showipv6ospfinterface** command when the OSPF graceful restart feature is configured:

```
Router# show ipv6 ospf interface
Ethernet0/0 is up, line protocol is up
  Link Local Address FE80::A8BB:CCFF:FE00:300, Interface ID 2
  Area 0, Process ID 1, Instance ID 0, Router ID 10.3.3.3
  Network Type POINT_TO_POINT, Cost: 10
  Transmit Delay is 1 sec, State POINT_TO_POINT,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
   Graceful Restart p2p timeout in 00:00:19
    Hello due in 00:00:02
  Graceful Restart helper support enabled
  Index 1/1/1, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.1.1.1
  Suppress hello for 0 neighbor(s)
```

### Example of an Enabled Protocol

The following display shows that the OSPF interface is enabled for Bidirectional Forwarding Detection (BFD):

```
Router# show ipv6 ospf interface
Serial10/0 is up, line protocol is up
  Link Local Address FE80::A8BB:CCFF:FE00:6500, Interface ID 42
  Area 1, Process ID 1, Instance ID 0, Router ID 10.0.0.1
  Network Type POINT_TO_POINT, Cost: 64
  Transmit Delay is 1 sec, State POINT_TO_POINT, BFD enabled
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
    Hello due in 00:00:07
  Index 1/1/1, flood queue length 0
  Next 0x0(0)/0x0(0)/0x0(0)
  Last flood scan length is 1, maximum is 1
  Last flood scan time is 0 msec, maximum is 0 msec
  Neighbor Count is 1, Adjacent neighbor count is 1
    Adjacent with neighbor 10.1.0.1
  Suppress hello for 0 neighbor(s)
```

**Related Commands**

| Command | Description |
|---|---|
| **show ipv6 ospf graceful-restart** | Displays OSPFv3 graceful restart information. |

# show l2protocol-tunnel

To display the protocols that are tunneled on an interface or on all interfaces, use the **showl2protocol-tunnel** command.

**show l2protocol-tunnel** [**interface** *interface mod/port* | **summary** | **vlan** *vlan*]

## Syntax Description

| | |
|---|---|
| **interface** *interface-id* | (Optional) Specifies the interface type; possible valid values are **ethernet**, **FastEthernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan** |
| *mod/port* | Module and port number. |
| **summary** | (Optional) Displays a summary of a tunneled port. |
| **vlan***vlan* | (Optional) Limits the display to interfaces on the specified VLAN. Valid values are from 1 to 4094. |

## Command Modes

EXEC (>)

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17a)SX | The **showl2protocol-tunnelsummary** command output was changed to display the following information:<br>• Global drop-threshold setting<br>• Up status of a Layer 2-protocol interface tunnel |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to the 12.2 SX release. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2(33)SXI | This command was changed to add the optional **vlan***vlan* keyword and argument. |
| 15.2(2)T | This command was integrated into Cisco IOS Release 15.2(2)T. |

## Usage Guidelines

After enabling Layer 2 protocol tunneling on an access or IEEE 802.1Q tunnel port by using the l2protocol-tunnel interface configuration command, you can configure some or all of these parameters:

- Protocol type to be tunneled
- Shutdown threshold
- Drop threshold

The **showl2protocol-tunnel** command displays only the ports that have protocol tunneling enabled.

The **showl2protocol-tunnelsummary** command displays the ports that have protocol tunneling enabled, regardless of whether the port is down or currently configured as a trunk.

## Examples

The following example is an output from the show l2protocol-tunnel command:

```
Router# show l2protocol-tunnel
COS for Encapsulated Packets: 5
Drop Threshold for Encapsulated Packets: 0
```

| Port | Protocol | Shutdown Threshold | Drop Threshold | Encapsulation Counter | Decapsulation Counter | Drop Counter |
|---|---|---|---|---|---|---|
| Fa0/3 | --- | ---- | ---- | ---- | ---- | ---- |
| | --- | ---- | ---- | ---- | ---- | ---- |
| | --- | ---- | ---- | ---- | ---- | ---- |
| | pagp | ---- | ---- | 0 | 242500 | |
| | lacp | ---- | ---- | 24268 | 242640 | |
| | udld | ---- | ---- | 0 | 897960 | |
| Fa0/4 | --- | ---- | ---- | ---- | ---- | ---- |
| | --- | ---- | ---- | ---- | ---- | ---- |
| | --- | ---- | ---- | ---- | ---- | ---- |
| | pagp | 1000 | ---- | 24249 | 242700 | |
| | lacp | ---- | ---- | 24256 | 242660 | |
| | udld | ---- | ---- | 0 | 1344820 | |
| Gi0/3 | cdp | ---- | ---- | 134482 | 1344820 | |
| | --- | ---- | ---- | ---- | ---- | ---- |
| | --- | ---- | ---- | ---- | ---- | ---- |
| | pagp | 1000 | ---- | 0 | 242500 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | lacp | 500 | ---- | 0 | 485320 | |
| | udld | 300 | ---- | 44899 | 448980 | |
| Gi0/3 | cdp | ---- | ---- | 134482 | 1344820 | |
| | --- | ---- | ---- | ---- | ---- | ---- |
| | --- | ---- | ---- | ---- | ---- | ---- |
| | pagp | ---- | 1000 | 0 | 242700 | |
| | lacp | ---- | ---- | 0 | 485220 | |
| | udld | 300 | ---- | 44899 | 448980 | |

This example shows how to display a summary of Layer 2-protocol tunnel ports:

```
Router# show l2protocol-tunnel summary
COS for Encapsulated Packets:5
Drop Threshold for Encapsulated Packets:0
Port    Protocol    Shutdown         Drop             Status
                    Threshold        Threshold
                    (cdp/stp/vtp)    (cdp/stp/vtp)
------- ----------- ---------------- ---------------- ----------
Fa9/1   --- stp --- ----/----/----   ----/----/----   down
Fa9/9   cdp stp vtp ----/----/----   ----/----/----   up
Fa9/47  --- --- --- ----/----/----   1500/1500/1500   down(trunk)
Fa9/48  cdp stp vtp ----/----/----   ----/----/----   down(trunk)
```

This example shows how to display Layer 2-protocol tunnel information on interfaces for a specific VLAN:

```
Router# show l2protocol-tunnel vlan 1
COS for Encapsulated Packets: 5
Drop Threshold for Encapsulated Packets: 0
Protocol Drop Counter
-------- -------------
 cdp                 0
 lldp                0
 stp                 0
 vtp                 0
Port                Protocol Thresholds          Counters
                             Shutdown  Drop      Encap     Decap     Drop
------------------- -------- --------- --------- --------- --------- ---------
```

## Related Commands

| Command | Description |
|---|---|
| debug l2protocol-tunnel | Displays the debugging options for L2PT. |
| l2protocol-tunnel | Enables the protocol tunneling on an interface and specifies the type of protocol to be tunneled. |

| Command | Description |
|---|---|
| l2protocol-tunnel drop-threshold | Specifies the maximum number of packets that can be processed for the specified protocol on that interface before being dropped. |
| l2protocol-tunnel global drop-threshold | Enables rate limiting at the software level. |
| l2protocol-tunnel shutdown-threshold | Specifies the maximum number of packets that can be processed for the specified protocol on that interface in 1 second. |

# show l3-mgr

To display the information about the Layer 3 manager , use the **showl3-mgr** command in user EXEC or privileged EXEC mode.

**show l3-mgr status**
**show l3-mgr** {**interface interface interface-number** | **null interface-number** | **port-channel number** | **vlan vlan-id** | **status**}

## Syntax Description

| | |
|---|---|
| **status** | Displays information about the global variable. |
| **interface** | Displays information about the Layer 3 manager . |
| *interface* | Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan**. |
| *interface-number* | Module and port number; see the "Usage Guidelines" section for valid values. |
| **null** *interface-number* | Specifies the null interface; the valid value is **0**. |
| **port-channel** *number* | Specifies the channel interface; valid values are a maximum of 64 values ranging from 1 to 282. |
| **vlan** *vlan-id* | Specifies the VLAN; valid values are from 1 to 4094. |
| **status** | Displays status information about the Layer 3 manager. |

## Command Default

This command has no default settings.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

## Usage Guidelines

The *interface-number* argument designates the module and port number. Valid values for *interface-number* depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48.

The **port-channel***number*values from 257 to 282 are supported on the CSM and the FWSM only.

## Examples

This example shows how to display the status of the Layer 3 manager:

```
Router#
```

```
show l3-mgr status
l3_mgr_state:          2
l3_mgr_req_q.count:    0
l3_mgr_req_q.head:     0
l3_mgr_req_q.tail:     0
l3_mgr_max_queue_count:  1060
l3_mgr_shrunk_count:  0
l3_mgr_req_q.ip_inv_count:    303
l3_mgr_req_q.ipx_inv_count:   0
l3_mgr_outpak_count:  18871
l3_mgr_inpak_count:   18871
l3_mgr_max_pending_pak: 4
l3_mgr_pending_pak_count: 0
nde enable statue:    0
current nde addr:     0.0.0.0
Router#
```

This example shows how to display the information about the Layer 3 manager for a specific interface:

```
Router#
show l3-mgr interface fastethernet 5/40
vlan:                 0
ip_enabled:         1
ipx_enabled:        1
bg_state:           0 0 0 0
hsrp_enabled:       0
hsrp_mac:           0000.0000.0000
state:              0
up:                 0
Router#
```

# show l3vpn encapsulation ip

To display the L3VPN encapsulation profile health and the underlying tunnel interface, use the **showl3vpnencapsulationip** command in privileged EXEC mode.

**show l3vpn encapsulation ip** [*profile name*]

## Syntax Description

| | |
|---|---|
| *profile name* | (Optional) Name of the Layer 3 encapsulation profile. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2(33)SRE | This command was introduced. |

## Examples

The following is a sample output from the **showl3vpnencapsulationip** command:

```
Router# show l3vpn encapsulation ip tunnelencap
Profile: tunnelencap
    transport ipv4 source Loopback0
    protocol gre key 500
  Tunnel Tunnel0 Created [OK]
  Tunnel Linestate
  Tunnel Transport Source Loopback0
```

# show lacp

To display Link Aggregation Control Protocol (LACP) and multi-chassis LACP (mLACP) information, use the **show lacp** command in either user EXEC or privileged EXEC mode.

**show lacp** {*channel-group-number* {**counters** | **internal** [**detail**] | **neighbor** [**detail**]} | **multi-chassis** [**load-balance**] {**group** *number* | **port-channel** *number*} | **sys-id**}

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**show lacp** {*channel-group-number* {**counters** | **internal** [**detail**] | **neighbor** [**detail**] | **sys-id**}}

## Syntax Description

| | |
|---|---|
| *channel-group- number* | (Optional) Number of the channel group. The following are valid values:<br>• Cisco IOS 12.2 SB and Cisco IOS XE 2.4 Releases--from 1 to 64<br>• Cisco IOS 12.2 SR Releases--from 1 to 308<br>• Cisco IOS 12.2 SX Releases--from 1 to 496<br>• Cisco IOS 15.1S Releases—from 1 to 564<br>• Cisco ASR 901 Series Aggregation Services Router—from 1 to 8 |
| **counters** | Displays information about the LACP traffic statistics. |
| **internal** | Displays LACP internal information. |
| **neighbor** | Displays information about the LACP neighbor. |
| **detail** | (Optional) Displays detailed internal information when used with the **internal** keyword and detailed LACP neighbor information when used with the **neighbor** keyword. |
| **multi-chassis** | Displays information about mLACP. |
| **load-balance** | Displays mLACP load balance information. |
| **group** | Displays mLACP redundancy group information, |
| *number* | Integer value used with the **group** and **port-channel** keywords.<br>• Values from 1 to 4294967295 identify the redundancy group.<br>• Values from 1 to 564 identify the port-channel interface. |
| **port-channel** | Displays mLACP port-channel information. |
| **sys-id** | Displays the LACP system identification. It is a combination of the port priority and the MAC address of the device |

## Command Modes

User EXEC (>) Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Cisco IOS Release 12.2(17d)SXB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2(31)SB2 | This command was integrated into Cisco IOS Release 12.2(31)SB2. |
| 12.2(33)SRB | Support for this command on the Cisco 7600 router was integrated into Cisco IOS Release 12.2(33)SRB. |
| Cisco IOS XE Release 2.4 | This command was integrated into Cisco IOS XE Release 2.4. |
| 12.2(33)SRE | This command was modified. The **multi-chassis**, **group**, and **port-channel**keywords and *number* argument were added. |
| 15.1(3)S | This command was modified. The **load-balance** keyword was added. |
| 15.1(2)SNG | This command was implemented on the Cisco ASR 901 Series Aggregation Services Router. |

## Usage Guidelines

Use the **show lacp** command to troubleshoot problems related to LACP in a network.

If you do not specify a value for the argument *channel-group-number*, all channel groups are displayed. Values in the range of 257 to 282 are supported on the CSM and the FWSM only.

## Examples

### show lacp sys-id Example

This example shows how to display the LACP system identification using the **show lacp sys-id**command:

```
Device> show lacp sys-id

8000,AC-12-34-56-78-90
```

The system identification is made up of the system priority and the system MAC address. The first two bytes are the system priority, and the last six bytes are the globally administered individual MAC address that is associated to the system.

### LACP Statistics for a Specific Channel Group Examples

This example shows how to display the LACP statistics for a specific channel group:

```
Device# show lacp 1 counters

              LACPDUs         Marker       LACPDUs
Port       Sent   Recv     Sent   Recv     Pkts Err
---------------------------------------------------
Channel group: 1
```

```
  Fa4/1    8      15       0      0         3    0
  Fa4/2    14     18       0      0         3    0
  Fa4/3    14     18       0      0         0
  Fa4/4    13     18       0      0         0
```

The output displays the following information:

- The LACPDUs Sent and Recv columns display the LACPDUs that are sent and received on each specific interface.
- The LACPDUs Pkts and Err columns display the marker-protocol packets.

The following example shows output from a **show lacp***channel-group-number***counters**command:

```
Device1# show lacp 5 counters

              LACPDUs          Marker      Marker Response    LACPDUs
Port       Sent   Recv      Sent   Recv      Sent   Recv      Pkts Err
--------------------------------------------------------------------
Channel group: 5
Gi5/0/0     21     18       0      0         0      0         0
```

The following table describes the significant fields shown in the display.

***Table 9: show lacp channel-group-number counters Field Descriptions***

| Field | Description |
|---|---|
| LACPDUs Sent Recv | Number of LACP PDUs sent and received. |
| Marker Sent Recv | Attempts to avoid data loss when a member link is removed from an LACP bundle. |
| Marker Response Sent Recv | Cisco IOS response to the Marker protocol. |
| LACPDUs Pkts Err | Number of LACP PDU packets transmitted and the number of packet errors. |

The following example shows output from a **show lacp internal**command:

```
Device1# show lacp 5 internal

Flags:  S - Device is requesting Slow LACPDUs
        F - Device is requesting Fast LACPDUs
        A - Device is in Active mode       P - Device is in Passive mode
Channel group 5
                            LACP port     Admin     Oper    Port        Port
Port      Flags   State     Priority      Key       Key     Number      State
Gi5/0/0   SA      bndl      32768         0x5       0x5     0x42        0x3D
```

The following table describes the significant fields shown in the display.

***Table 10: show lacp internal Field Descriptions***

| Field | Description |
|---|---|
| Flags | Meanings of each flag value, which indicates a device activity. |
| Port | Port on which link bundling is configured. |

| Field | Description |
|---|---|
| Flags | Indicators of device activity. |
| State | Activity state of the port. States can be any of the following:<br>• Bndl--Port is attached to an aggregator and bundled with other ports.<br>• Susp--Port is in suspended state, so it is not attached to any aggregator.<br>• Indep--Port is in independent state (not bundled but able to switch data traffic). This condition differs from the previous state because in this case LACP is not running on the partner port.<br>• Hot-sby--Port is in hot standby state.<br>• Down--Port is down. |
| LACP port Priority | Priority assigned to the port. |
| Admin Key | Defines the ability of a port to aggregate with other ports. |
| Oper Key | Determines the aggregation capability of the link. |
| Port Number | Number of the port. |
| Port State | State variables for the port that are encoded as individual bits within a single octet with the following meaning:<br>• bit0: LACP_Activity<br>• bit1: LACP_Timeout<br>• bit2: Aggregation<br>• bit3: Synchronization<br>• bit4: Collecting<br>• bit5: Distributing<br>• bit6: Defaulted<br>• bit7: Expired |

### Internal Information About a Specific Channel Group Example

This example shows how to display internal information for the interfaces that belong to a specific channel:

```
Device# show lacp 1 internal

Flags:  S - Device sends PDUs at slow rate. F - Device sends PDUs at fast rate.
        A - Device is in Active mode.       P - Device is in Passive mode.
Channel group 1
                            LACPDUs     LACP Port    Admin   Oper    Port     Port
```

```
Port      Flags    State    Interval    Priority     Key      Key      Number   State
Fa4/1     saC      bndl     30s         32768        100      100      0xc1     0x75
Fa4/2     saC      bndl     30s         32768        100      100      0xc2     0x75
Fa4/3     saC      bndl     30s         32768        100      100      0xc3     0x75
Fa4/4     saC      bndl     30s         32768        100      100      0xc4     0x75
Device#
```

The following table describes the significant fields shown in the display.

***Table 11: show lacp internal Field Descriptions***

| Field | Description |
|---|---|
| State | Current state of the port; allowed values are as follows:<br>• bndl--Port is attached to an aggregator and bundled with other ports.<br>• susp--Port is in a suspended state; it is not attached to any aggregator.<br>• indep--Port is in an independent state (not bundled but able to switch data traffic. In this case, LACP is not running on the partner port).<br>• hot-sby--Port is in a hot-standby state.<br>• down--Port is down. |
| LACPDUs Interval | Interval setting. |
| LACP Port Priority | Port-priority setting. |
| Admin Key | Defines the ability of a port to aggregate with other ports. |
| Oper Key | Determines the aggregation capability of the link. |
| Port Number | Port number. |
| Port State | Activity state of the port.<br>• See the Port State description in the show lacp internal Field Descriptions table for state variables. |

### Information About LACP Neighbors for a Specific Port Example

This example shows how to display the information about the LACP neighbors for a specific port channel:

```
Device# show lacp 1 neighbors

Flags:  S - Device sends PDUs at slow rate. F - Device sends PDUs at fast rate.
        A - Device is in Active mode.       P - Device is in Passive mode.
Channel group 1 neighbors
          Partner                 Partner
Port      System ID               Port Number     Age     Flags
Fa4/1     8000,00b0.c23e.d84e     0x81            29s     P
Fa4/2     8000,00b0.c23e.d84e     0x82            0s      P
Fa4/3     8000,00b0.c23e.d84e     0x83            0s      P
Fa4/4     8000,00b0.c23e.d84e     0x84            0s      P
```

```
          Port          Admin     Oper      Port
          Priority      Key       Key       State
Fa4/1     32768         200       200       0x81
Fa4/2     32768         200       200       0x81
Fa4/3     32768         200       200       0x81
Fa4/4     32768         200       200       0x81
Device#
```

The following table describes the significant fields shown in the display.

***Table 12: show lacp neighbors Field Descriptions***

| Field | Description |
|---|---|
| Port | Port on which link bundling is configured. |
| Partner System ID | Peer's LACP system identification (sys-id). It is a combination of the system priority and the MAC address of the peer device. |
| Partner Port Number | Port number on the peer device |
| Age | Number of seconds since the last LACP PDU was received on the port. |
| Flags | Indicators of device activity. |
| Port Priority | Port priority setting. |
| Admin Key | Defines the ability of a port to aggregate with other ports. |
| Oper Key | Determines the aggregation capability of the link. |
| Port State | Activity state of the port.<br>See the Port State description in the show lacp internal Field Descriptions table for state variables. |

If no PDUs have been received, the default administrative information is displayed in braces.

## Related Commands

| Command | Description |
|---|---|
| **clear lacp counters** | Clears the statistics for all interfaces belonging to a specific channel group. |
| **lacp port-priority** | Sets the priority for the physical interfaces. |
| **lacp system-priority** | Sets the priority of the system. |

# show link state group

To display the link-state group information., use the **showlinkstategroup** command in user EXEC or privileged EXEC mode .

**show link state group detail**

## Syntax Description

| | |
|---|---|
| **detail** | Displays the detailed information about the group. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.1(1)S | This command was introduced. |

## Usage Guidelines

Link State Ttracking (LST), also known as trunk failover, is a feature that binds the link state of multiple interfaces. When you configure LST for the first time, add upstream interfaces to the link state group before adding the downstream interface, otherwise the downstream interfaces would move into error-disable mode. The maximum number of link state groups configurable is 10.

## Examples

The following example displays the link-state group information:

```
Router# enable
Router# show link state group 1
Link State Group: 1 Status: Enabled, Down
Router> show link state group detail
(Up):Interface up (Dwn):Interface Down (Dis):Interface disabled
Link State Group: 1 Status: Enabled, Down
Upstream Interfaces : Gi3/5(Dwn) Gi3/6(Dwn)
Downstream Interfaces : Gi3/1(Dis) Gi3/2(Dis) Gi3/3(Dis) Gi3/4(Dis)
Link State Group: 2 Status: Enabled, Down
Upstream Interfaces : Gi3/15(Dwn) Gi3/16(Dwn) Gi3/17(Dwn)
Downstream Interfaces : Gi3/11(Dis) Gi3/12(Dis) Gi3/13(Dis) Gi3/14(Dis)
(Up):Interface up (Dwn):Interface Down (Dis):Interface disabled
```

## Related Commands

| Command | Description |
|---|---|
| **link state track** | Configures the link state tracking number. |
| **link state group** | Configures the link state group and interface, as either an upstream or downstream interface in the group. |

# show mac-address-table dynamic

To display dynamic MAC address table entries only, use the **showmac-address-tabledynamic** command in privileged EXEC mode.

**Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers**
**show mac-address-table dynamic** [**address** *mac-addr* | **interface** *interface type slot/number* | **vlan** *vlan*]

**Catalyst Switches**
**show mac-address-table dynamic** [**address** *mac-addr* | **detail** | **interface** *interface number***protocol** *protocol* | **module** *number* | **vlan** *vlan*][**begin** | **exclude** | **include***expression*]

**Catalyst 6500 Series Switches**
**show mac-address-table dynamic** [**address** *mac-addr* | **interface** *interface interface-number* [**all** | **module** *number*] | **module** *num* | **vlan** *vlan-id* [**all** | **module** *number*]]

## Syntax Description

| | |
|---|---|
| **address** *mac -address* | (Optional) Specifies a 48-bit MAC address; valid format is H.H.H. |
| **detail** | (Optional) Specifies a detailed display of MAC address table information. |
| **interface** *type number* | (Optional) Specifies an interface to match; valid type values are FastEthernet and GigabitEthernet, valid number values are from 1 to 9. |
| **interface** *type* | (Optional) Specifies an interface to match; valid type values are FastEthernet and GigabitEthernet. |
| *slot* | (Optional) Adds dynamic addresses to module in slot 1 or 2. |
| *port* | (Optional) Port interface number ranges based on type of Ethernet switch network module used:<br>• 0 to 15 for NM-16ESW<br>• 0 to 35 for NM-36ESW<br>• 0 to 1 for GigabitEthernet |
| **protocol** *protocol* | (Optional) Specifies a protocol. See the "Usage Guidelines" section for keyword definitions. |
| **module** *number* | (Optional) Displays information about the MAC address table for a specific Distributed Forwarding Card (DFC) module. |
| **vlan** *vlan* | (Optional) Displays entries for a specific VLAN; valid values are from 1 to 1005. |
| **begin** | (Optional) Specifies that the output display begin with the line that matches the expression. |
| **exclude** | (Optional) Specifies that the output display exclude lines that match the expression. |

| | |
|---|---|
| **include** | (Optional) Specifies that the output display include lines that match the specified expression. |
| *expression* | Expression in the output to use as a reference point. |
| **all** | (Optional) Specifies that the output display all dynamic MAC-address table entries. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.0(7)XE | This command was introduced on Catalyst 6000 series switches. |
| 12.2(2)XT | This command was implemented on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers. |
| 12.2(8)T | This command was integrated into Cisco IOS Release 12.2(8)T on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers. |
| 12.2(11)T | This command was integrated into Cisco IOS Release 12.2(11)T. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2(14)SX | Support for this command was introduced on the Catalyst 6500 series switch. |
| 12.2(33)SXH | This command was changed to support the **all** keyword on the Catalyst 6500 series switch. |

## Usage Guidelines

### Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

The **showmac-address-tabledynamic** command output for an EtherChannel interface changes the port-number designation (for example, 5/7) to a port-group number.

### Catalyst Switches

The keyword definitions for the protocol argument are:

- **ip** --Specifies IP protocol
- **ipx** --Specifies Internetwork Packet Exchange (IPX) protocols
- **assigned** --Specifies assigned protocol entries
- **other** --Specifies other protocol entries

The **showmac-address-tabledynamic** command output for an EtherChannel interface changes the port-number designation (for example, 5/7) to a port-group number.

### Catalyst 6500 Series Switches

The *mac-address*is a 48-bit MAC address and the valid format is H.H.H.

The optional **module***num* keyword and argument are supported only on DFC modules. The **module***num*keyword and argument designate the module number.

## Examples

The following examples show how to display all dynamic MAC address entries. The fields shown in the various displays are self-explanatory.

### Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

```
Router# show mac-address-table dynamic

Non-static Address Table:
Destination Address  Address Type  VLAN  Destination Port
-------------------  ------------  ----  --------------------
000a.000a.000a          Dynamic       1     FastEthernet4/0
002a.2021.4567          Dynamic       2     FastEthernet4/0
```

### Catalyst Switches

```
Router# show mac-address-table dynamic
vlan   mac address     type    protocol  qos             ports
-----+---------------+--------+---------+---+--------------------------------
 200  0010.0d40.37ff  dynamic        ip  --  5/8
   1  0060.704c.73ff  dynamic        ip  --  5/9
4095  0000.0000.0000  dynamic        ip  --  15/1
   1  0060.704c.73fb  dynamic     other  --  5/9
   1  0080.1c93.8040  dynamic        ip  --  5/9
4092  0050.f0ac.3058  dynamic        ip  --  15/1
   1  00e0.4fac.b3ff  dynamic     other  --  5/9
```

The following example shows how to display dynamic MAC address entries with a specific protocol type (in this case, assigned).

```
Router# show mac-address-table dynamic protocol assigned
vlan   mac address     type    protocol  qos             ports
-----+---------------+--------+---------+---+--------------------------------
4092  0000.0000.0000  dynamic  assigned  --  Router
4092  0050.f0ac.3059  dynamic  assigned  --  Router
   1  0010.7b3b.0978  dynamic  assigned  --  Fa5/9
Router#
```

The following example shows the detailed output for the previous example.

```
Router# show mac-address-table dynamic protocol assigned detail
MAC Table shown in details
=========================================
 Type   Always Learn Trap Modified Notify Capture Protocol Flood
-------+------------+----+--------+------+-------+--------+-----+
     QoS bit      L3 Spare   Mac Address  Age Byte Pvlan Xtag SWbits Index
----------------+--------+-------------+--------+-----+----+------+-----
DYNAMIC     NO        NO     YES     NO     NO    assigned   NO
   Bit Not On        0     0000.0000.0000  255      4092   0     0     0x3

DYNAMIC     NO        NO     YES     NO     NO    assigned   NO
   Bit Not On        0     0050.f0ac.3059  254      4092   0     0     0x3

DYNAMIC     NO        NO     YES     NO     NO    assigned   NO
   Bit Not On        0     0010.7b3b.0978  254      1      0     0     0x108

Router#
```

### Catalyst 6500 Series Switches

This example shows how to display all the dynamic MAC-address entries for a specific VLAN.

```
Router# show mac-address-table dynamic vlan 200 all
Legend: * - primary entry
        age - seconds since last seen
        n/a - not aevailable
vlan     mac address      type   learn    age               ports
------+----------------+--------+-----+----------+--------------------------
 200  0010.0d40.37ff   dynamic    NO      23        Gi5/8
Router#
```

This example shows how to display all the dynamic MAC-address entries.

```
Router# show mac-address-table dynamic
Legend: * - primary entry
age - seconds since last seen
n/a - not applicable
vlan     mac address      type   learn    age               ports
------+----------------+--------+-----+----------+--------------------------
* 10   0010.0000.0000   dynamic  Yes   n/a        Gi4/1
* 3    0010.0000.0000   dynamic  Yes   0          Gi4/2
* 1    0002.fcbc.ac64   dynamic  Yes   265        Gi8/1
* 1    0009.12e9.adc0   static   No    -          Router
Router#
```

## Related Commands

| Command | Description |
|---|---|
| **show mac -address-tableaddress** | Displays MAC address table information for a specific MAC address. |
| **show mac -address-tableaging-time** | Displays the MAC address aging time. |
| **show mac -address-tablecount** | Displays the number of entries currently in the MAC address table. |
| **show mac -address-tabledetail** | Displays detailed MAC address table information. |
| **show mac -address-tableinterface** | Displays the MAC address table information for a specific interface. |
| **show mac -address-tablemulticast** | Displays multicast MAC address table information. |
| **show mac -address-tableprotocol** | Displays MAC address table information based on protocol. |
| **show mac -address-tablestatic** | Displays static MAC address table entries only. |
| **show mac -address-tablevlan** | Displays the MAC address table information for a specific VLAN. |

# show mls asic

To display the application-specific integrated circuit (ASIC) version, use the **showmlsasic** command in user EXEC or privileged EXEC mode.

**show mls asic**

**Syntax Description** This command has no arguments or keywords.

**Command Default** This command has no default settings.

**Command Modes** User EXEC Privileged EXEC

**Command History**

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

**Examples**

This example shows how to display the ASIC versions on a Supervisor Engine 2:

```
Router#
show mls asic
  Cafe version: 2
  Centauri version: 1
  Perseus version: 0/0
  Titan version: 1
Router#
```

This example shows how to display the ASIC versions on a Supervisor Engine 720:

```
Router#
show mls asic
Earl in Module 2
 Tycho - ver:1 Cisco-id:1C8 Vendor-id:49
Router#
```

**Related Commands**

| Command | Description |
|---|---|
| **show mls df-table** | Displays information about the DF table. |
| **show mls ip** | Displays the Multilayer Switching (MLS) IP information. |
| **show mls ipx** | Displays the Multilayer Switching (MLS) IPX information. |
| **show mls qos** | Displays Multilayer Switching (MLS) quality of service (QoS) information |
| **show mls statistics** | Displays the Multilayer Switching (MLS) statistics for the Internet Protocol (IP) |

# show mls ip

To display the Multilayer Switching (MLS) IP information, use the **showmlsip** command in user EXEC or privileged EXEC mode.

**show mls ip** [**any** | **destination** {*hostnameip-address*} | **detail** | **flow** {**tcp** | **udp**} | {**vlan** *vlan-id* | **macd** *destination-mac-address* | **macs** *source-mac-address* | **module** *number* | **source** {*hostnameip-address*}} | **count** | **static**]
**show mls ip** {**ipv6** | **mpls**}

## Syntax Description

| | |
|---|---|
| **any** | (Optional) Displays any MLS IP information. |
| **destination** *hostname* | (Optional) Displays the entries for a specific destination hostname. |
| **destination** *ip-address* | (Optional) Displays the entries for a specific destination IP address. |
| **detail** | (Optional) Specifies a detailed output. |
| **flow** | (Optional) Specifies the flow type. |
| **tcp** \| **udp** | Selects the flow type. |
| **vlan** *vlan-id* | (Optional) Specifies the virtual local area network (VLAN) ID; valid values are from 1 to 4094. |
| **macd** *destination-mac-address* | (Optional) Specifies the destination MAC address. |
| **macs** *source- mac-address* | (Optional) Specifies the source Media Access Control (MAC) address. |
| **module** *number* | (Optional) Displays the entries that are downloaded on the specified module; see the "Usage Guidelines" section for valid values. |
| **source** *hostname* | (Optional) Displays the entries for a specific source address. |
| **source** *ip-address* | (Optional) Displays the entries for a specific source IP address. |
| **count** | (Optional) Displays the total number of MLS entries. |
| **static** | (Optional) Displays the total number of static entries. |
| **ipv6** | Displays the total number of IPv6 entries. |
| **mpls** | Displays the total number of MPLS entries. |

## Command Default

This command has no default settings.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |

| Release | Modification |
|---|---|
| 12.2(17a)SX | This command is supported on releases prior to Release 12.2(17a)SX only. |
| 12.2(17b)SXA | On Cisco 7600 series routers that are configured with a Supervisor Engine 720, this command is replaced by the show mls netflow ip command. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

## Usage Guidelines

The **static**, **ipv6** and **mpls** keywords are not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2.

The *interface-number* argument designates the module and port number. Valid values for *interface-number* depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48. This definition also applies to the **module***number* keyword and argument.

When you view the output, note that a colon (:) is used to separate the fields.

## Examples

This example shows how to display any MLS IP information:

```
Router#
show mls ip
 any
Displaying Netflow entries in Supervisor Earl
DstIP           SrcIP           Prot:SrcPort:DstPort  Src i/f:AdjPtr
---------------------------------------------------------------------
Pkts         Bytes         Age   LastSeen  Attributes
-------------------------------------------------
0.0.0.0         0.0.0.0         0   :0      :0        0   : 0x0
82           3772          1329  20:46:03   L3 - Dynamic
Router#
```

This example shows how to display MLS information on a specific IP address:

```
Router#
show mls ip
 destination 172.20.52.122
Displaying Netflow entries in Supervisor Earl
DstIP           SrcIP           Dst i/f:DstMAC       Pkts         Bytes
---------------------------------------------------------------------------
SrcDstPorts   SrcDstEncap Age   LastSeen
---------------------------------------
172.20.52.122   0.0.0.0         5   : 00e0.4fac.b3ff 684          103469
Fa5/9,Fa5/9 ARPA,ARPA   281   07:17:02
 Number of Entries Found = 1
Router#
```

This example shows how to display MLS information on a specific flow type:

```
Router# show mls ip
 flow udp
```

```
Displaying Netflow entries in Supervisor Earl
DstIP           SrcIP           Prot:SrcPort:DstPort  Src i/f:AdjPtr
---------------------------------------------------------------------
Pkts         Bytes         Age   LastSeen  Attributes
-----------------------------------------------------
0.0.0.0         0.0.0.0         0   :0      :0        0   : 0x0
78           3588          1259  20:44:53   L3 - Dynamic
Router#
```

This example shows how to display detailed MLS information:

```
Router#
 show mls ip
 detail
Displaying Netflow entries in Supervisor Earl
DstIP           SrcIP           Prot:SrcPort:DstPort  Src i/f:AdjPtr
---------------------------------------------------------------------
Pkts         Bytes         Age   LastSeen  Attributes
-----------------------------------------------------
Mask Pi R CR Xt Prio Dsc IP_EN OP_EN Pattern Rpf FIN_RDT FIN/RST
----+--+-+--+--+----+---+-----+-----+-------+---+-------+-------
Ig/acli Ig/aclo Ig/qosi Ig/qoso Fpkt Gemini MC-hit Dirty Diags
-------+-------+-------+-------+----+------+------+-----+------
    QoS     Police Count Threshold    Leak     Drop Bucket  Use-Tbl Use-Enable
-----------+------------+---------+-----------+----+-------+-------+----------+
127.0.0.19      127.0.0.16      udp :68     :67       1009: 0x0
72           3312          1170  20:43:24   L3 - Dynamic
0    1  0  0  1  0    0    1     1     0       0     0      0
0          0       0       0      0    0       0     0     0
  0x0          0               0        0       NO   64        NO       NO
Router#
```

## Related Commands

| Command | Description |
|---|---|
| **show mls asic** | display the application-specific integrated circuit (ASIC) version |
| **show mls df-table** | Displays information about the DF table. |
| **show mls ipx** | Displays the Multilayer Switching (MLS) IPX information. |
| **show mls qos** | Displays Multilayer Switching (MLS) quality of service (QoS) information |
| **show mls statistics** | Displays the Multilayer Switching (MLS) statistics for the Internet Protocol (IP) |

# show mls ipx

To display Multilayer Switching (MLS) Internetwork Packet Exchange (IPX) information, use the **showmlsipx** command in user EXEC or privileged EXEC mode.

**show mls ipx** [**destination** *ipx-network* | **interface** *interface interface-number* | **vlan** *vlan-id* | **macd** *destination-mac-address* | **macs** *source-mac-address* | **module** *number* | **source** *hostnameipx-network*] [**detail** | **count**]

## Syntax Description

| | |
|---|---|
| **destination** *ipx-network* | (Optional) Displays the entries for a specific destination network address. |
| **interface** | (Optional) Specifies the interface. |
| *interface* | (Optional) Interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **pos**, **atm**, and **ge-wan**. |
| *interface-number* | (Optional) Module and port number; see the "Usage Guidelines" section for valid values. |
| **vlan** *vlan-id* | (Optional) Specifies the virtual local area network (VLAN) ID; valid values are from 1 to 4094. |
| **macd** *destination-mac-address* | (Optional) Specifies the destination Media Access Control (MAC) address. |
| **macs** *source- mac-address* | (Optional) Specifies the source MAC address. |
| **module** *number* | (Optional) Displays the entries that are downloaded on the specified slot; see the "Usage Guidelines" section for valid values. |
| **source** *hostname* | (Optional) Displays the entries for a specific source address. |
| **source** *ipx-network* | (Optional) Displays the entries for a specific destination network address. |
| **detail** | (Optional) Displays the detailed list of entries. |
| **count** | (Optional) Displays the total number of MLS entries. |

## Command Default

This command has no default settings.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

## Usage Guidelines

This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 720 with a PFC2.

When you enter the *ipx-network* value, the format is N.H.H.H.

When you enter the *destination-mac-address* value, the format for the 48-bit MAC address is H.H.H.

The *interface-number* argument designates the module and port number. Valid values for *interface-number* depend on the specified interface type and the chassis and module used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48. These valid values also apply when entering the **module***number* keyword and argument.

## Examples

This example shows how to display MLS IPX information:

```
Router#
show mls ipx
DstNet-DstNode          SrcNet    Dst i/f:DstMAC      Pkts          Bytes
------------------------------------------------------------------------
SrcDstPorts   SrcDstEncap Age   LastSeen
---------------------------------------
 Number of Entries Found = 0
Router#
```

This example shows how to display the total number of MLS entries:

```
Router#
show mls ipx
 count
Number of shortcuts = 66
Router#
```

## Related Commands

| Command | Description |
|---|---|
| **mls ipx** | Enables MLS IPX on the interface. |
| **show mls asic** | display the application-specific integrated circuit (ASIC) version |
| **show mls df-table** | Displays information about the DF table. |
| **show mls ip** | Displays the Multilayer Switching (MLS) IP information. |
| **show mls qos** | Displays Multilayer Switching (MLS) quality of service (QoS) information |
| **show mls statistics** | Displays the Multilayer Switching (MLS) statistics for the Internet Protocol (IP) |

# show mobility

To display information about the Layer 3 mobility and the wireless network, use the **showmobility** command in privileged EXEC mode.

**show mobility** {**ap** [*ip-address*] | **mn** [**ip** *ip-address*] | **mac** *mac-address* | **network** *network-id* | **status**}

## Syntax Description

| | |
|---|---|
| **ap** | Displays information about the access point. |
| *ip-address* | (Optional) IP address. |
| **mn** | Displays information about the mobile node. |
| **ip** *ip-address* | (Optional) Displays information about the IP database thread. |
| **mac** *mac-address* | Displays information about the MAC database thread. |
| **network** *network-id* | Displays information for a specific wireless network ID. |
| **status** | Displays status information. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(18)SXD | This command was introduced on the Supervisor Engine 720. |
| 12.2(18)SXD3 | The output of this command was changed to include the TCP adjust-mss status. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

## Usage Guidelines

This command is supported on Cisco 7600 series routers that are configured with a WLSM only.

## Examples

This example shows how to display information about the access point:

```
Router# show mobility
 ap
AP IP Address   AP Mac Address Wireless Network-ID
--------------- -------------- -------------------
10.1.1.2 000d.29a2.a852 101 102 109 103
```

This example shows how to display information about the access points for a specific network ID:

```
Router# show mobility
 ap 172.16.1.2 detail
IP Address : 172.16.1.2
MAC Address : 000d.29a2.a852
Participating Wireless Tunnels: 101, 102, 109, 103
Registered Mobile Nodes on AP {172.16.1.2, 000d.29a2.a852} :
MN Mac Address MN IP Address AP IP Address Wireless Network-ID
-------------- --------------- --------------- -------------------
000a.8afa.85c9 10.1.3.11 172.16.1.2 103
```

```
000d.bdb7.83f7 10.1.2.11 172.16.1.2 102
000d.bdb7.83fb 10.1.1.11 172.16.1.2 101
Router# show mobility
 network-id 101
Wireless Network ID : 101
Wireless Tunnel Source IP Address : 10.1.1.1
Wireless Network Properties : Trusted
Wireless Network State : Up
Registered Access Point on Wireless Network 101:
AP IP Address AP Mac Address Wireless Network-ID
--------------- -------------- --------------------
176.16.1.2 000d.29a2.a852 101 102 109 103
Registered Mobile Nodes on Wireless Network 101:
MN Mac Address MN IP Address AP IP Address Wireless Network-ID
-------------- --------------- --------------- --------------------
000d.bdb7.83fb 10.1.1.11 176.16.1.2 101
Router# show mobility
 status
WLAN Module is located in Slot: 4 (HSRP State: Active) LCP
Communication status      : up
MAC address used for Proxy ARP: 0030.a349.d800
Number of Wireless Tunnels    : 1
Number of Access Points       : 2
Number of Mobile Nodes        : 0
Wireless Tunnel Bindings:
Src IP Address   Wireless Network-ID  Flags
---------------  -------------------  -------
10.1.1.1          101                  B
Flags: T=Trusted, B=IP Broadcast enabled, A=TCP Adjust-mss enabled
```

## Related Commands

| Command | Description |
|---|---|
| **mobility** | Configures the wireless mGRE tunnels. |

# show module

To display the module status and information, use the **show** module command in user EXEC or privileged EXEC mode.

**show module** [**mod-num** | **all** | **provision** | **version**]

## Syntax Description

| | |
|---|---|
| *mod -num* | (Optional) Number of the module. |
| **all** | (Optional) Displays the information for all modules. |
| **provision** | (Optional) Displays the status about the module provisioning. |
| version | (Optional) Displays the version information. |

## Command Default

This command has no default settings.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

## Usage Guidelines

In the Mod Sub-Module fields, the **show module** command displays the supervisor engine number but appends the uplink daughter card's module type and information.

Entering the **show module** command with no arguments is the same as entering the **show module all** command.

## Examples

This example shows how to display information for all modules on a Cisco 7600 series router that is configured with a Supervisor Engine 720:

```
Router#
show module

Mod Ports Card Type Model Serial No.
--- ----- ------------------------------------ ------------------ -----------
1 48 CEF720 48 port 10/100/1000mb Ethernet WS-X6748-GE-TX SAL0843557C
2 48 48-port 10/100/1000 RJ45 EtherModule WS-X6148A-GE-45AF SAL1109HZW9
3 48 48-port 10/100/1000 RJ45 EtherModule WS-X6148A-GE-45AF SAL1114KYZ7
4 48 48 port 10/100 mb RJ45 WS-X6348-RJ-45 SAL0543DGZ1
6 2 Supervisor Engine 720 (Active) WS-SUP720-3B SAL1016KASS
7 48 48-port 10/100 mb RJ45 WS-X6148-45AF SAL08321X1H
8 4 CEF720 4 port 10-Gigabit Ethernet WS-X6704-10GE SAL08528ADQ
9 48 48-port 100FX SFP Ethernet Module WS-X6148-FE-SFP SAD090208MB
Mod MAC addresses Hw Fw Sw Status
--- --------------------------------- ------ ------------ ------------ -------
1 0012.005c.86e0 to 0012.005c.870f 2.1 12.2(14r)S5 12.2(33)SXH Ok
2 001b.0ce4.9fb0 to 001b.0ce4.9fdf 2.2 8.4(1) 8.7(0.22)SXH Ok
```

```
3 001b.534f.0540 to 001b.534f.056f 2.2 8.4(1) 8.7(0.22)SXH Ok
4 0007.4f6c.69f8 to 0007.4f6c.6a27 5.0 5.4(2) 8.7(0.22)SXH Ok
6 0017.9441.44cc to 0017.9441.44cf 5.2 8.4(2) 12.2(33)SXH Ok
7 0011.bb0e.c260 to 0011.bb0e.c28f 1.1 5.4(2) 8.7(0.22)SXH Ok
8 0012.da89.a43c to 0012.da89.a43f 2.0 12.2(14r)S5 12.2(33)SXH Ok
9 0030.f273.baf0 to 0030.f273.bb1f 3.0 8.4(1) 8.7(0.22)SXH Ok
Mod Sub-Module Model Serial Hw Status
---- -------------------------- ------------------ ----------- ------- -------
1 Centralized Forwarding Card WS-F6700-CFC SAL08363HL6 2.0 Ok
2 IEEE Voice Daughter Card WS-F6K-48-AF SAL1108HRB1 2.3 Ok
3 IEEE Voice Daughter Card WS-F6K-48-AF SAL1114KV3P 2.3 Ok
4 Inline Power Module WS-F6K-VPWR 1.0 Ok
6 Policy Feature Card 3 WS-F6K-PFC3B SAL1015K00Q 2.3 Ok
6 MSFC3 Daughterboard WS-SUP720 SAL1016KBY3 2.5 Ok
7 IEEE Voice Daughter Card WS-F6K-FE48-AF SAL08311GGL 1.1 Ok
8 Centralized Forwarding Card WS-F6700-CFC SAL0902040K 2.0 Ok
Mod Online Diag Status
---- -------------------
1 Bypass
2 Bypass
3 Bypass
4 Bypass
6 Bypass
7 Bypass
8 Bypass
9 Bypass
Router#
```

This example shows how to display information for a specific module:

```
Router#
show module 2
Mod Ports Card Type                                Model              Serial No.
--- ----- ---------------------------------------- ------------------ -----------
  5     2 Supervisor Engine 720 (Active)         WS-SUP720-BASE     SAD0644030K
Mod MAC addresses                       Hw    Fw           Sw           Status
--- ----------------------------------- ------ ------------ ------------ -------
  5 00e0.aabb.cc00 to 00e0.aabb.cc3f   1.0    12.2(2003012 12.2(2003012 Ok
Mod Sub-Module                  Model           Serial           Hw     Status
--- --------------------------- --------------- ---------------- ------- -------
  5 Policy Feature Card 3       WS-F6K-PFC3     SAD0644031P     0.302   Ok
  5 MSFC3 Daughtercard          WS-SUP720       SAD06460172     0.701
Mod Online Diag Status
--- -------------------
  5 Not Available
Router#
```

This example shows how to display version information:

```
Router#
show module version

Mod Port Model              Serial #    Versions
--- ---- ------------------ ----------- -------------------------------------
  2 0    WS-X6182-2PA                   Hw : 1.0
                      Fw : 12.2(20030125:231135)
                      Sw : 12.2(20030125:231135)
  4 16   WS-X6816-GBIC      SAD04400CEE Hw : 0.205
         WS-F6K-DFC3A       SAD0641029Y Hw : 0.501
                      Fw : 12.2(20020828:202911)
                      Sw : 12.2(20030125:231135)
  6 2    WS-X6K-SUP3-BASE   SAD064300GU Hw : 0.705
                      Fw : 7.1(0.12-Eng-02)TAM
```

```
                    Sw : 12.2(20030125:231135)
                    Sw1: 8.1(0.45)KIS
         WS-X6K-SUP3-PFC3   SAD064200VR Hw : 0.701
                    Fw : 12.2(20021016:001154)
                    Sw : 12.2(20030125:231135)
         WS-F6K-PFC3        SAD064300M7 Hw : 0.301
  9 48   WS-X6548-RJ-45     SAD04490BAC Hw : 0.301
                    Fw : 6.3(1)
                    Sw : 7.5(0.30)CFW11
Router#
```

This example shows how to display module provisioning information:

```
Router# show module provision
Module Provision
  1    dynamic
  2    dynamic
  3    dynamic
  4    dynamic
  5    dynamic
  6    dynamic
  7    dynamic
  8    dynamic
  9    dynamic
 10    dynamic
 11    dynamic
 12    dynamic
 13    dynamic
Router#
```

## Related Commands

| Command | Description |
|---|---|
| **show interfaces** | Displays the status and statistics for the interfaces in the chassis. |
| **show environment alarm** | Displays the information about the environmental alarm. |
| **show fm summary** | Displays a summary of FM Information. |
| **show environment status** | Displays the information about the operational FRU status. |

# show msfc

To display Multilayer Switching Feature Card (MSFC) information, use the **show msfc** command in user EXEC or privileged EXEC mode.

**show msfc** {**buffers** | **eeprom** | **fault** | **netint** | **tlb**}

## Syntax Description

| | |
|---|---|
| **buffers** | Displays buffer-allocation information. |
| **eeprom** | Displays the internal information. |
| **fault** | Displays fault information. |
| **netint** | Displays network-interrupt information. |
| **tlb** | Displays information about the TLB registers. |

## Command Default

This command has no default settings.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

## Examples

These examples display the **show msfc** command output:

```
Router# show msfc buffers
Reg. set    Min    Max
  TX              640
 ABQ        640  16384
   0          0     40
   1       6715   8192
   2          0      0
   3          0      0
   4          0      0
   5          0      0
   6          0      0
   7          0      0
Threshold = 8192
Vlan  Sel  Min  Max  Cnt  Rsvd
1016    1 6715 8192    0     0
Router#
Router# show msfc eeprom
RSFC CPU IDPROM:
IDPROM image:
  (FRU is 'Cat6k MSFC 2 daughterboard')
IDPROM image block #0:
  hexadecimal contents of block:
```

```
  00: AB AB 01 90 13 22 01 00 00 02 60 03 00 EA 43 69    ....."....`...Ci
  10: 73 63 6F 20 53 79 73 74 65 6D 73 00 00 00 00 00    sco Systems.....
  20: 00 00 57 53 2D 46 36 4B 2D 4D 53 46 43 32 00 00    ..WS-F6K-MSFC2..
  30: 00 00 00 00 00 00 00 53 41 44 30 36 32 31 30 30    .......SAD062100
  40: 37 00 00 00 00 00 00 00 00 00 00 37 33 2D 37 32 33    7..........73-723
  50: 37 2D 30 33 00 00 00 00 00 00 41 30 00 00 00 00    7-03......A0....
  60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ................
  70: 00 00 00 02 00 03 00 00 00 00 00 09 00 05 00 01    ................
  80: 00 03 00 01 00 01 00 02 00 EA FF DF 00 00 00 00    ................
  block-signature = 0xABAB, block-version = 1,
  block-length = 144, block-checksum = 4898
  *** common-block ***
  IDPROM capacity (bytes) = 256  IDPROM block-count = 2
  FRU type = (0x6003,234)
  OEM String = 'Cisco Systems'
  Product Number = 'WS-F6K-MSFC2'
  Serial Number = 'SAD06210067'
  Manufacturing Assembly Number = '73-7237-03'
  Manufacturing Assembly Revision = 'A0'
  Hardware Revision = 2.3
  Manufacturing bits = 0x0  Engineering bits = 0x0
  SNMP OID = 9.5.1.3.1.1.2.234
  Power Consumption = -33 centiamperes    RMA failure code = 0-0-0-0
  *** end of common block ***
IDPROM image block #1:
  hexadecimal contents of block:
  00: 60 03 01 62 0A C2 00 00 00 00 00 00 00 00 00 00    `..b............
  10: 00 00 00 00 00 00 01 00 23 00 08 7C A4 CE 80 00 40    .......#..|....@
  20: 01 01 00 01 00 00 00 00 00 00 00 00 00 00 00 00    ................
  30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ................
  40: 14 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ................
  50: 10 00 4B 3C 41 32 80 80 80 80 80 80 80 80 80 80    ..K<A2..........
  60: 80 80                                              ..
  block-signature = 0x6003, block-version = 1,
  block-length = 98, block-checksum = 2754
  *** linecard specific block ***
  feature-bits =   00000000 00000000
  hardware-changes-bits =   00000000 00000001
  card index = 35
  mac base = 0008.7CA4.CE80
  mac_len = 64
  num_processors = 1
  epld_num = 1
  epld_versions = 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 00
00 0000 0000
  port numbers:
    pair #0: type=14, count=01
    pair #1: type=00, count=00
    pair #2: type=00, count=00
    pair #3: type=00, count=00
    pair #4: type=00, count=00
    pair #5: type=00, count=00
    pair #6: type=00, count=00
    pair #7: type=00, count=00
  sram_size = 4096
  sensor_thresholds =
    sensor #0: critical = 75 oC, warning = 60 oC
    sensor #1: critical = 65 oC, warning = 50 oC
    sensor #2: critical = -128 oC (sensor not present), warning = -128 oC (senso
r not present)
    sensor #3: critical = -128 oC (sensor not present), warning = -128 oC (senso
r not present)
    sensor #4: critical = -128 oC (sensor not present), warning = -128 oC (senso
r not present)
```

```
    sensor #5: critical = -128 oC (sensor not present), warning = -128 oC (senso
r not present)
    sensor #6: critical = -128 oC (sensor not present), warning = -128 oC (senso
r not present)
    sensor #7: critical = -128 oC (sensor not present), warning = -128 oC (senso
r not present)
  *** end of linecard specific block ***
End of IDPROM image
Router#
Router# show msfc fault
 Reg. set    Min    Max
  TX               640
 ABQ        640  16384
   0          0     40
   1       6715   8192
   2          0      0
   3          0      0
   4          0      0
   5          0      0
   6          0      0
   7          0      0
Threshold = 8192
Vlan  Sel  Min  Max  Cnt  Rsvd
1016    1 6715 8192    0     0
Router#
Router# show msfc netint
Network IO Interrupt Throttling:
 throttle count=0, timer count=0
 active=0, configured=1
 netint usec=3999, netint mask usec=400
Router#
Router# show msfc tlb
Mistral revision 3
TLB entries : 37
Virt Address range      Phy Address range      Attributes
0x10000000:0x1001FFFF   0x010000000:0x01001FFFF   CacheMode=2, RW, Valid
0x10020000:0x1003FFFF   0x010020000:0x01003FFFF   CacheMode=2, RW, Valid
0x10040000:0x1005FFFF   0x010040000:0x01005FFFF   CacheMode=2, RW, Valid
0x10060000:0x1007FFFF   0x010060000:0x01007FFFF   CacheMode=2, RW, Valid
0x10080000:0x10087FFF   0x010080000:0x010087FFF   CacheMode=2, RW, Valid
0x10088000:0x1008FFFF   0x010088000:0x01008FFFF   CacheMode=2, RW, Valid
0x18000000:0x1801FFFF   0x010000000:0x01001FFFF   CacheMode=0, RW, Valid
0x19000000:0x1901FFFF   0x010000000:0x01001FFFF   CacheMode=7, RW, Valid
0x1E000000:0x1E1FFFFF   0x01E000000:0x01E1FFFFF   CacheMode=2, RW, Valid
0x1E880000:0x1E881FFF   0x01E880000:0x01E881FFF   CacheMode=2, RW, Valid
0x1FC00000:0x1FC7FFFF   0x01FC00000:0x01FC7FFFF   CacheMode=2, RO, Valid
0x30000000:0x3001FFFF   0x070000000:0x07001FFFF   CacheMode=2, RW, Valid
0x40000000:0x407FFFFF   0x000000000:0x0007FFFFF   CacheMode=3, RO, Valid
0x40800000:0x40FFFFFF   0x000800000:0x000FFFFFF   CacheMode=3, RO, Valid
0x41000000:0x417FFFFF   0x001000000:0x0017FFFFF   CacheMode=3, RO, Valid
0x41800000:0x419FFFFF   0x001800000:0x0019FFFFF   CacheMode=3, RO, Valid
0x41A00000:0x41A7FFFF   0x001A00000:0x001A7FFFF   CacheMode=3, RO, Valid
0x41A80000:0x41A9FFFF   0x001A80000:0x001A9FFFF   CacheMode=3, RO, Valid
0x41AA0000:0x41ABFFFF   0x001AA0000:0x001ABFFFF   CacheMode=3, RO, Valid
0x41AC0000:0x41AC7FFF   0x001AC0000:0x001AC7FFF   CacheMode=3, RO, Valid
0x41AC8000:0x41ACFFFF   0x001AC8000:0x001ACFFFF   CacheMode=3, RO, Valid
0x41AD0000:0x41AD7FFF   0x001AD0000:0x001AD7FFF   CacheMode=3, RO, Valid
0x41AD8000:0x41AD9FFF   0x001AD8000:0x001AD9FFF   CacheMode=3, RO, Valid
0x41ADA000:0x41ADBFFF   0x001ADA000:0x001ADBFFF   CacheMode=3, RW, Valid
0x41ADC000:0x41ADDFFF   0x001ADC000:0x001ADDFFF   CacheMode=3, RW, Valid
0x41ADE000:0x41ADFFFF   0x001ADE000:0x001ADFFFF   CacheMode=3, RW, Valid
0x41AE0000:0x41AFFFFF   0x001AE0000:0x001AFFFFF   CacheMode=3, RW, Valid
0x41B00000:0x41B7FFFF   0x001B00000:0x001B7FFFF   CacheMode=3, RW, Valid
0x41B80000:0x41BFFFFF   0x001B80000:0x001BFFFFF   CacheMode=3, RW, Valid
```

```
0x41C00000:0x41DFFFFF   0x001C00000:0x001DFFFFF   CacheMode=3, RW, Valid
0x41E00000:0x41FFFFFF   0x001E00000:0x001FFFFFF   CacheMode=3, RW, Valid
0x42000000:0x43FFFFFF   0x002000000:0x003FFFFFF   CacheMode=3, RW, Valid
0x44000000:0x45FFFFFF   0x004000000:0x005FFFFFF   CacheMode=3, RW, Valid
0x46000000:0x47FFFFFF   0x006000000:0x007FFFFFF   CacheMode=3, RW, Valid
0x06E00000:0x06FFFFFF   0x006E00000:0x006FFFFFF   CacheMode=2, RW, Valid
0x07000000:0x077FFFFF   0x007000000:0x0077FFFFF   CacheMode=2, RW, Valid
0x07800000:0x07FFFFFF   0x007800000:0x007FFFFFF   CacheMode=2, RW, Valid
Router#
```

## Related Commands

| Command | Description |
|---|---|
| **show environment alarm** | Displays the information about the environmental alarm. |
| **show fm summary** | Displays a summary of FM Information. |
| **show environment status** | Displays the information about the operational FRU status. |

# show network-clocks

To display the current configured and active network clock sources, use the**shownetwork-clocks** command in privileged EXEC mode.

**show network-clocks**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 11.1 | This command was introduced. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |
| 12.2(33)SRD1 | This command was introduced to display BITS clock information for the 7600-ES+ITU-2TG and 7600-ES+ITU-4TG. |

## Usage Guidelines

On the Cisco MC3810, this command applies to Voice over Frame Relay, Voice over ATM, and Voice over HDLC. The Cisco MC3810 has a background task that verifies whether a valid clocking configuration exists every 120 seconds. If this task detects an error, you will be reminded every 120 seconds until the error is corrected. A clocking configuration error may be generated for various reasons. Using the **shownetwork-clocks** command, you can display the clocking configuration status.

On the Cisco 7600 series routers, this command applies to the following:

- The clock source from the POS SPAs on the SIP-200 and the SIP-400.
- The 24-Port Channelized T1/E1 ATM CEoP SPA and the 1-Port Channelized OC-3 STM1 ATM CEoP SPA on the SIP-400.
- The 7600-ES+ITU-2TG and 7600-ES+ITU-4TG line cards.

## Examples

The following is sample output from the **shownetwork-clocks** EXEC command:

```
Router# show network-clocks
Priority 1 clock source: ATM3/0/0
Priority 2 clock source: System clock
Priority 3 clock source: System clock
Priority 4 clock source: System clock
Current clock source:ATM3/0/0, priority:1
```

The following is sample output from the **shownetwork-clocks** command on the Cisco MC3810:

```
Router# show network-clocks
Priority 1 clock source(inactive config): T1 0
Priority 1 clock source(active config) : T1 0
```

```
Clock switch delay: 10
Clock restore delay: 10
T1 0 is clocking system bus for 9319 seconds.
Run Priority Queue: controller0
```

In this display, inactive configuration is the new configuration that has been established. Active configuration is the run-time configuration. Should an error be made in the new configuration, the inactive and active configurations will be different. In the previous example, the clock priority configuration is valid, and the system is being clocked as indicated.

The following is another sample output from the **shownetwork-clocks** command:

```
Router# show network-clocks
Priority 1 clock source(inactive config) : T1 0
Priority 2 clock source(inactive config) : T1 1
Priority 1 clock source(active config) : T1 0
Clock switch delay: 10
Clock restore delay: 10
T1 0 is clocking system bus for 9319 seconds.
Run Priority Queue: controller0
```

In this display, the new clocking configuration has an error for controller T1 1. This is indicated by checking differences between the last valid configuration (active) and the new proposed configuration (inactive). The error may result from hardware (the system controller board or MFT) unable to support this mode, or controller T1 1 is currently configured as “clock source internal.”

Since the active and inactive configurations are different, the system will periodically display the warning message about the wrong configuration.

The following is another sample output from the **shownetwork-clocks** command for the 7600-ES+ITU-2TG or 7600-ES+ITU-4TG:

```
Router# show network-clocks
 Active source = Slot 1 BITS 0
 Active source backplane reference line = Primary Backplane Clock
 Standby source = Slot 9
 Standby source backplane reference line = Secondary Backplane Clock
(Standby source not driving backplane clock currently)
 All Network Clock Configuration
--------------------------------
 Priority  Clock Source             State                        Reason
 1         POS3/0/1                Valid but not present
 2         Slot 1 BITS 0           Valid
 3         Slot 9                  Valid
 Current operating mode is Revertive
 Current OOR Switchover mode is Switchover
There are no slots disabled from participating in network clocking
 BITS Port Configuration
-------------------------
 Slot    Port    Signal Type/Mode        Line Build-Out Select
```

1 0 T1 ESF DSX-1 (533 to 655 feet)

## Related Commands

| Command | Description |
|---|---|
| **clock source** | Specifies the interface clock source type. |
| **network-clock** | Configures BITS port signaling types. |

| Command | Description |
|---|---|
| **network-clock select** | Selects a source of network clock. |
| **network-clock-select (ATM)** | Establishes the sources and priorities of the requisite clocking signals for an ATM-CES port adapter. |
| **show platform hardware network-clocks** | Displays network clocks for an ES+ line card. |

# show pagp

To display port-channel information, use the **show pagp** command in user EXEC or privileged EXEC mode.

**show pagp** [*group-number*] {**counters** | **internal** | **neighbor** | **pgroup**}

## Syntax Description

| | |
|---|---|
| *group-number* | (Optional) Channel-group number; valid values are a maximum of 64 values from 1 to 282. |
| **counters** | Displays the traffic information. |
| **internal** | Displays the internal information. |
| **neighbor** | Displays the neighbor information. |
| **pgroup** | Displays the active port channels. |

## Command Default

This command has no default settings.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

## Usage Guidelines

You can enter any **show pagp** command to display the active port-channel information. To display the nonactive information, enter the **show pagp** command with a group.

The **port-channel** *number*values from 257 to 282 are supported on the CSM and the FWSM only.

## Examples

This example shows how to display information about the PAgP counters:

```
Router#
show pagp
 counters
           Information        Flush
Port       Sent   Recv     Sent   Recv
---------------------------------------
Channel group: 1
  Fa5/4    2660   2452     0      0
  Fa5/5    2676   2453     0      0
Channel group: 2
  Fa5/6    289    261      0      0
  Fa5/7    290    261      0      0
Channel group: 1023
  Fa5/9    0      0        0      0
Channel group: 1024
  Fa5/8    0      0        0      0
Router#
```

This example shows how to display internal PAgP information:

```
Router# show pagp
 1 internal
Flags:  S - Device is sending Slow hello.  C - Device is in Consistent state.
        A - Device is in Auto mode.
Timers: H - Hello timer is running.        Q - Quit timer is running.
        S - Switching timer is running.    I - Interface timer is running.
Channel group 1
                              Hello    Partner  PAgP     Learning
Port      Flags State   Timers  Interval Count   Priority  Method
Fa5/4     SC    U6/S7           30s      1        128      Any
Fa5/5     SC    U6/S7           30s      1        128      Any
Router#
```

This example shows how to display PAgP-neighbor information for all neighbors:

```
Router# show pagp
 neighbor
Flags:  S - Device is sending Slow hello.  C - Device is in Consistent state.
        A - Device is in Auto mode.        P - Device learns on physical port.
Channel group 1 neighbors
          Partner               Partner          Partner         Partner Group
Port      Name                  Device ID        Port       Age  Flags   Cap.
Fa5/4     JAB031301             0050.0f10.230c   2/45         2s SAC     2D
Fa5/5     JAB031301             0050.0f10.230c   2/46        27s SAC     2D
Channel group 2 neighbors
          Partner               Partner          Partner         Partner Group
Port      Name                  Device ID        Port       Age  Flags   Cap.
Fa5/6     JAB031301             0050.0f10.230c   2/47        10s SAC     2F
Fa5/7     JAB031301             0050.0f10.230c   2/48        11s SAC     2F
Channel group 1023 neighbors
          Partner               Partner          Partner         Partner Group
Port      Name                  Device ID        Port       Age  Flags   Cap.
Channel group 1024 neighbors
          Partner               Partner          Partner         Partner Group
Port      Name                  Device ID        Port       Age  Flags   Cap.
Router#
```

## Related Commands

| Command | Description |
|---|---|
| **pagp learn-method** | Learns the input interface of the incoming packets. |
| **pagp port-priority** | Selects a port in hot standby mode. |

# show pas caim

To show debug information about the data compression Advanced Interface Module (CAIM) daughter card, use the **showpascaim**command in user EXEC or privileged EXEC mode.

**show pas caim** {**rings** | **dma** | **coprocessor** | **stats** | **cnxt_table** | **page_table**} *element-number*

## Syntax Description

| | |
|---|---|
| **rings** *element-number* | Displays current content of the Direct Memory Access (DMA) ring buffer. |
| **dma** *element-number* | Displays registers of the Jupiter DMA controller. |
| **coprocessor** *element-number* | Displays registers of the Hifn 9711 compression coprocessor. |
| **stats** *element-number* | Displays statistics that describes operation of the data compression Advanced Interface Module (AIM). |
| **cnxt_table** *element-number* | Displays the context of the specific data compression AIM element. |
| **page_table** *element-number* | Displays the page table for each CAIM element. |

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.0(2)T | This command was introduced. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |

## Usage Guidelines

This command displays performance statistics that describe the operation of the CAIM. This command is primarily intended for engineering debug, but it can also be useful to Cisco support personnel and to Cisco customers in troubleshooting network problems. The table below lists the output values for this command.

***Table 13: show pas caim Output Values and Descriptions***

| Value | Description |
|---|---|
| uncomp paks in | Number of packets containing uncompressed data input to the CAIM for compression. |
| comp paks out | Number of packets containing uncompressed data that were successfully compressed. |
| comp paks in | Number of packets containing compressed data input to the CAIM for compression. |
| uncomp paks out | Number of packets containing compressed data that were successfully decompressed. |

| Value | Description |
|---|---|
| uncomp bytes in / comp bytes out | Summarizes the compression performance of the CAIM. The “uncomp bytes in” statistic gives the total number of uncompressed bytes submitted to the CAIM for compression. The “Comp bytes out” statistic gives the resulting number of compressed bytes output by the CAIM. If one forms the ratio of “uncomp bytes in” to “comp bytes out”, one obtains the average compression ratio achieved by the CAIM. |
| comp bytes in / uncomp bytes out | Summarizes the decompression performance of the CAIM. The “comp bytes in” statistic gives the total number of compressed bytes submitted to the CAIM for decompression. The “uncomp bytes out” statistic gives the resulting number of uncompressed bytes output by the CAIM. The average decompression ratio achieved can be computed as the ratio of “uncomp bytes out” to “comp bytes in”.<br><br>Note that each packet submitted for compression or decompression has a small header at the front which is always clear data and hence never compressed nor decompressed. The “comp bytes in / uncomp bytes out” and “uncomp bytes in / comp bytes out” statistics do not include this header. |
| uncomp paks/sec in | A time average of the number of packets per second containing uncompressed data submitted as input to the CAIM for compression. It is computed as the ratio of the “uncomp paks in” statistic to the “seconds since last clear” statistic. |
| comp paks/sec out | A time average of the number of packets per second containing uncompressed data which were successfully compressed by the CAIM. It is computed as the ratio of the “comp paks out” statistic to the “seconds since last clear” compressed by the CAIM. It is computed as the ratio of the “comp paks out” statistic to the “seconds since last clear” statistic. |
| comp paks/sec in | A time average of the number of packets per second containing compressed data submitted as input to the CAIM for decompression. It is computed as the ratio of the “comp paks in” statistic to the “seconds since last clear” statistic. |
| uncomp paks/sec out | A time average of the number of packets per second containing compressed data which were successfully decompressed by the CAIM. It is computed as the ratio of the “uncomp paks out” statistic to the “seconds since last clear” statistic.<br><br>Note that the “uncomp paks/sec in”, “comp paks/sec out”, “comp paks/sec in”, and “uncomp paks/sec out” statistics are averages over the entire time since the last “clear count” command was issued. This means that as time progresses, these statistics become averages over an ever larger time interval. As time progresses, these statistics become ever less sensitive to current prevailing conditions. Note also that the “uncomp paks in”, “comp paks out”, “comp paks in”, and “uncomp paks out” statistics are 32-bit counters and can roll over from 0xffff ffff to 0. When they do so, the “uncomp paks/sec in”, “comp paks/sec out”, “comp paks/sec in”, and “uncomp paks/sec out” statistics can be rendered meaningless. It is therefore recommend that one issue a “clear count” command before sampling these statistics. |
| uncomp bits/sec in | A time average of the number of bits per second of uncompressed data which were submitted to the CAIM for compression. It is computed as the ratio of the “uncomp bytes in” statistic, times 8, to the “seconds since last clear” statistic. |

| Value | Description |
|---|---|
| comp bits/sec out | A time average of the number of bits per second of uncompressed data which were successfully compressed by the CAIM. It is computed as the ratio of the “comp bytes out” statistic, times 8, to the “seconds since last clear” statistic. |
| comp bits/sec in | A time average of the number of bits per second of compressed data which were submitted to the CAIM for decompression. It is computed as the ratio of the “comp bytes in” statistic, times 8, to the “seconds since last clear” statistic. |
| uncomp bits/sec out | A time average of the number of bits per second of compressed data which were successfully decompressed by the CAIM. It is computed as the ratio of the “uncomp bytes in” statistic, times 8, to the “seconds since last clear” statistic.<br>Note again that these “bits/sec” statistics are time averages over the “seconds since last clear” statistics, and therefore become less and less sensitive to current conditions as time progresses. Also, these “bits/sec” statistics are computed from 32-bit counters, and when the counters roll over from the maximum 32-bit value to 0, the “bits/sec” statistics become inaccurate. It is again recommended that one issue the “clear count” command before sampling the “bits/sec” statistics. |
| The remaining statistics summarize operational state and error conditions encountered by the CAIM, and have the following interpretations: | |
| holdq | Gives the number of packets occupying the “hold queue” of the CAIM. The hold queue is a holding area, or “overflow” area, for packets to be processed by the CAIM. Normally, the CAIM is fast enough that no overflow into the hold queue occurs, and so normally this statistic should show zero. |
| hw_enable | Flag indicating if the CAIM is disabled or not. Zero implies disabled; one implies enabled. The CAIM can become disabled if certain fatal hardware error conditions are detected. It can be reenabled by issuing the **clearaim***element-number* command. |
| src_limited | Flag indicating if the CAIM is in “source limited” mode. In source limited mode, the CAIM can only process a single command at a time. In non source limited mode, the CAIM can process several commands at a time using a pipeline built into the 9711 coprocessor. Note that the normal mode of operation is “non-source limited”, and there is no command to place the CAIM in “source limited” mode. Hence, this statistic should always read zero. |
| num cnxts | Gives the number of “contexts” which are currently open on the CAIM. Each interface configured for compression opens two contexts, one for each direction of data transfer. |
| no data | Counts the number of times in which the CAIM performed either a compress or decompression operation, and the output data length was reported with a length of zero. In normal operation, this statistic should always read zero. A nonzero value is an indication of a malfunctioning CAIM. |

| Value | Description |
|---|---|
| drops | Counts the total number of times in which the CAIM was forced to drop a packet it was asked to compress or decompress. This can happen for a number of reasons, and the remaining statistics summarize these reasons. This statistic indicates that the CAIM is being overloaded with requests for compression/decompression. |
| nobuffers | Counts the total number of times the CAIM needed to allocate memory for buffers but could not obtain memory. The CAIM allocates memory for buffers for holding the results of compression or decompression operations. In normal operation, there is plenty of memory available for holding CAIM results. This statistic, if nonzero, indicates that there is a significant backup in memory, or perhaps a memory leak. |
| enc adj errs | Each packet compressed or decompressed involves an adjustment of the encapsulation of the packet between the LZS-DCP, FRF9, or MPPC encapsulation used to transport compressed packets to the standard encapsulation used to transport clear data. This statistic counts the number of times this encapsulation adjustment failed. In normal operation, this statistic should be zero. A nonzero value indicates that we are short in a specific memory resource referred to as “paktypes”, and that packets are being dropped because of this shortage. |
| fallbacks | Number of times the data compression AIM card could not use its pre-allocated buffers to store compression results and had to “fallback” to using a common buffer pool. |
| no replace | Each time a compression or decompression operation is completed and the resultant data fill up a buffer, the CAIM software allocates a new buffer to replace the buffer filled. If no buffers are available, then the packet involved in this operation is dropped and the old buffer reused. This statistic thus represents the number of times such an allocation failure occurred. In normal operation there is plenty of memory available for these buffers. A nonzero value for this statistic is thus a serious indication of a memory leak or other backup in buffer usage somewhere in the system. |
| num seq errs | This statistic is incremented when the CAIM produces results in a different order than that in which the requests were submitted. Packets involved in such errors are dropped. A nonzero value in this statistic indicates a serious malfunction in the CAIM. |
| num desc errs | Incremented when the CAIM reports error in a compression or decompression operation. Such errors are most likely bus errors, and they indicate a serious malfunction in the CAIM. |
| cmds complete | Reports the number of compression/decompression commands completed. This statistic should steadily increase in normal operation (assuming that the CAIM is continuously being asked to perform compression or decompression). If this statistic is not steadily increasing or decreasing when a steady stream of compression/decompression is expected, this is an indication of a malfunctioning CAIM. |
| bad reqs | Reports the number of compression/decompression requests that the CAIM software determined it could not possibly handle. This occurs only if a severely scattered packet (with more than 64 “particles”, or separate buffers of data) is handed to the CAIM to compress or decompress. This statistic should not increment during normal operation. A nonzero value indicates a software bug. |

| Value | Description |
|---|---|
| dead cntxts | Number of times a packet was successfully compressed or decompressed, only to find that the software “context”, or stream sourcing the packet, was no longer around. In such a case the packet is dropped. This statistic can be incremented at times when a serial interface is administratively disabled. If the timing is right, the CAIM may be right in the middle of operating on a packet from that interface when the disable takes effect. When the CAIM operation completes, it finds that the interface has been disabled and all “compression contexts” pertaining to that interface have been deleted. Another situation in which this can occur is when a Frame Relay DLC goes down. This is a normal and tolerable. If this statistic is incrementing when no such situations exist, it is an indication of a software bug. |
| no paks | If a packet to be compressed or decompressed overflows into the hold queue, then it must undergo an operation called “reparenting”. This involves the allocation of a “paktype” structure for the packet. If no paktype structures are available, then the packet is dropped and this statistic is incremented. A nonzero value of this statistic indicates that the CAIM is being overtaxed, that is, it is being asked to compress/decompress at a rate exceeding its capabilities. |
| enq errors | Closely related to the “no paks” statistic. The hold queue for the CAIM is limited in length, and if the hold queue grows to this length, no further packets may be placed on it. A nonzero value of this statistic therefore also indicates that the CAIM is being overtaxed. |
| rx pkt drops | Contains the total number of packets dropped because of “no paks” or “enq errors”, which were destined to be decompressed. |
| tx pkt drops | Contains the total number of packets dropped because of “no paks” or “enq errors”, which were destined to be compressed |
| dequeues | Indicates the total number of packets which were removed from the CAIM hold queue when the CAIM became available for servicing its hold queue. |
| requeues | Indicates the total number of packets that were removed from the hold queue, only to find that the necessary CAIM resources were not available (it is not possible to determine whether CAIM resources are available until the packet is dequeued). Such packets are requeued onto the hold queue, with order in the queue preserved. |
| drops disabled | Indicates the total number of packets which were submitted for compression or decompression, but that were dropped because the CAIM was disabled. |
| clears | Indicates the number of times the CAIM was reset using the **clearaim***element-number*command. |
| # ints | Indicates the number of interrupts serviced by the CAIM software. This statistic should steadily increase (assuming that the CAIM workload is steady). If this statistic is not incremented when expected, it indicates a severe CAIM malfunction. |

| Value | Description |
|---|---|
| # purges | Indicates the total number of times the compression history for a session had to be purged. This statistic is incremented a couple of times at startup. Thereafter, any increase in this statistic is an indication that the other side of the serial link detected bad data or gaps in the compressed packets being passed to it, and hence signalled a request to purge compression history in order to get back in synchronization. This can indicate that the CAIM is being overtaxed or that the serial interface is overtaxed and being forced to drop output packets. |
| no cnxts | Indicates the total number of times a request was issued to open a context, but the CAIM could not support any more contexts. Recall that two contexts are required for each interface configured for compression. |
| bad algos | Indicates the total number of times a request was issued to open a context for a compression algorithm not supported by the CAIM. Recall that the CAIM supports the LZS and MPPC algorithms only. |
| no crams | Indicates the total number of times a request was issued to open a context but there was insufficient compression DRAM to open another context. The CAIM software is set up to run out of contexts before it runs out of compression DRAM, so this statistic should always be zero. |
| bad paks | Indicates the total number of times a packet was submitted for compression or decompression to the CAIM, but the packet had an invalid size. |
| # opens | Indicates the total number of times a context was opened. |
| # closes | Indicates the total number of times a context was closed. |
| # hangs | Indicates the total number of times a CAIM appeared hung up, necessitating a clear of the CAIM. |

## Examples

The **showpascaimrings***element-number* command displays the current state of the DMA ring buffers maintained by the CAIM software. These rings feed the CAIM with data and commands. It is intended for an engineering debug of the compression AIM. It produces the following output:

```
Router# show pas caim rings 0
CAIM Command Ring: 0x01A2BC00  Stack: 0x01A2BE40  Shadow: 0x80F88BAC
 Head: 0021  Tail: 0021  Count: 0000
CAIM Source Ring:  0x01A2C900  Shadow: 0x80F88BAC
 Head: 0021  Tail: 0021  Num: 0000
CAIM Results Ring: 0x01A2C280  Stack: 0x01A2C4C0
 Head=021  Tail=021
CAIM Dest Ring:    0x01A2CB40  Shadow: 0x80F892D8  Head=021  Tail=000
  Desc: 0x01A2CBE8  flags: 0x8000060C  dptr: 0x019E7EB8  part: 0x80F84BE0
  Desc: 0x01A2CBF0  flags: 0x8000060C  dptr: 0x019FC63C  part: 0x80F85240
.
.
.
```

The table below describes the significant fields shown in the display.

*Table 14: show pas caim rings Field Descriptions*

| Field | Description |
|---|---|
| CAIM Command Ring | Feeds commands to the CAIM. |
| command ring address | Address of the command ring. |
| Command Ring Stack | Ring that feeds additional commands to the CAIM. |
| command ring stack address | Address of the command ring stack. |
| Command Ring Shadow | Software ring that stores additional information about each command. |
| command ring shadow address | Address of the command ring shadow. |
| Command Ring Head | Index into the Source Ring, specifying where the next entry will be extracted from. |
| Command Ring Tail | Index into the Source Ring, specifying where the next entry will be inserted. |
| CAIM Source Ring | Feeds information about input data to the CAIM. |
| source ring address | Address of the source ring. |
| Source Ring Shadow | Ring that contains additional information about each source buffer. |
| source ring shadow address | Address of the source ring shadow. |
| Source Ring Head | Specifies where the next entry will be extracted from. |
| Source Ring Tail | Specifies where the next entry will be inserted. |
| CAIM Results Ring | Receives information about each CAIM command as it is completed. |
| results ring address | Address of the results ring. |
| Results Ring Stack | Ring that receives additional information about each completed command. |
| results ring stack address | Address of the results ring stack. |
| Results Ring Head | Specifies where the next entry will be extracted from. |
| Results Ring Tail | Specifies where the next entry will be inserted. |
| CAIM Dest Ring | Holds information about the buffers available to the CAIM for output data. |
| dest ring address | Address of the dest ring. |
| Dest Ring Shadow | Ring that holds additional information about each output buffer. |

| Field | Description |
|---|---|
| dest ring shadow address | Address of the dest ring shadow. |
| Dest Ring Head | Index into the Source Ring, specifying where the next entry will be extracted from. |
| Dest Ring Tail | Index into the Source Ring, specifying where the next entry will be inserted. |
| The remaining fields describe each output data buffer. | |
| dest | Address of a so-called descriptor, used by the Jupiter DMA engine. |
| flags | Contains flags describing attributes of the buffer. |
| dptr | Displays the actual address of the output buffer. |
| part | Displays the address of the corresponding particle type structure, a software-defined structure that describes a buffer when it is a component of a network data buffer. |

The **show pas caim dma** *element-number*command displays the registers of the Jupiter DMA Controller. These registers control the operation of the Jupiter DMA Controller. This command is intended for Engineering debug of the CAIM. You can find detailed descriptions of the various fields in the Jupiter DMA Controller specification. It produces the following output:

```
Router# show pas caim dma 0
Jupiter DMA Controller Registers: (0x40200000
        Cmd Ring: 0x01A2BCA8  Src Ring: 0x01A2C9A8
        Res Ring: 0x01A2C328  Dst Ring: 0x01A2CBE8
        Status/Cntl: present: 0x80808084  last int: 0x80808084
        Inten: 0x10100000  config: 0x00100003
        Num DMA ints: 143330469
```

The show pas caim compressor element-number command displays the registers of the Hifn 9711 compression coprocessor. These registers control the operation of the Hifn 9711 part. This command is intended for engineering to debug the CAIM. Detailed descriptions of the various fields may be found in the Hifn 9711 data book. It produces the following output:

```
Router# show pas caim compressor 0
Hifn9711 Data Compression Coprocessor Registers (0x40201000):
        Config: 0x000051D4  Inten: 0x00000E00
        Status: 0x00004000  FIFO status: 0x00004000
        FIFO config: 0x00000101
```

The table below describes the fields shown in the preceding display.

***Table 15: show pas caim compressor Field Descriptions***

| Field | Description |
|---|---|
| Hifn9711 Data Compression Coprocessor Registers | Controls the operation of the Hifn 9711 part. |

| Field | Description |
|---|---|
| registers address | Address of the registers in the address space of the processor. |
| Config | Displays the current contents of the 9711 configuration register. |
| Inten | Displays the contents of the 9711 interrupt enable register. |
| Status | Displays the contents of the 9711 status register. |
| FIFO status | Contents of the 9711 FIFO Status register. |
| FIFO config | Contents of the 9711 FIFO Config register. |

The show pas caim cnxt_table element-number command displays the context table for the specified CAIM element. The context table is a table of information concerning each compression context. It produces the following output:

```
Router# show pas caim cnxt_table 0
CAIM0 Context Table
Context: 0x8104F320  Type: Compr   Algo: Stac
    Hdrlen: 0006  History: 0x0000
    Callback: 0x8011D68C  Shutdown: x8011EBE4  Purge: N
    Comp_db: 0x81034BC0  idb: 0x81038084  ds: 0x8104E514
Context: 0x8104F340  Type: Decomp  Algo: Stac
    Hdrlen: 0002  History: 0x0000
    Callback: 0x8011E700  Shutdown: x8011EBE4  Purge: N
    Comp_db: 0x81034BC0  idb: 0x81038084  ds: 0x8104E514
```

The table below describes the fields shown in the preceding display.

***Table 16: show pas caim cnxt_table Fields Descriptions***

| Field | Description |
|---|---|
| Context | Numeric internal reference for the compression context. |
| Type | Gives the type of context:<br>• Compr--compression context<br>• Decomp--decompression context |
| Algo | Gives the compression algorithm used:<br>• Stac<br>• Mppc |
| Hdrlen | Gives the number of bytes in the compression header for each compressed packet. |
| History | Gives the 16-KB page number in compression RAM for the context. |
| Callback | Gives an internal numeric reference for a control structures or procedure to facilitate debugging. |
| Shutdown | Gives an internal numeric reference for a control structures or procedure to facilitate debugging. |

| Field | Description |
|---|---|
| Comp_db | Gives an internal numeric reference for a control structures or procedure to facilitate debugging. |
| idb | Gives an internal numeric reference for a control structures or procedure to facilitate debugging. |
| idb | Gives an internal numeric reference for a control structures or procedure to facilitate debugging. |
| Purge | Indicates whether the compression context has been flagged to have its history purged. |

The show pas caim page_table element-number command displays the page table for the selected CAIM element. The page table is a table of entries describing each page in compression RAM. It produces the following output:

```
Router# show pas caim page_table 0
CAIM0 Page Table
    Page  0x0000 Comp cnxt: 8104F320  Decmp cnxt: 8104F340  Algo: Stac
```

The table below describes the fields shown in the preceding display.

***Table 17: show pas caim page_table Field Descriptions***

| Field | Description |
|---|---|
| Page | 16 KB page number of the page. |
| Comp cnxt | Contains an internal numeric reference to the context structures using this page. |
| Decmp cnxt | Contains an internal numeric reference to the context structures using this page. |
| Algo | Gives the compression algorithm used:<br>• Stac<br>• Mppc |

The following example shows statistics of an active data compression AIM session:

```
Router# show pas caim stats 0
CompressionAim0
    ds:0x80F56A44 idb:0x80F50DB8
        422074 uncomp paks in -->       422076 comp paks out
        422071 comp paks in   -->       422075 uncomp paks out
     633912308 uncomp bytes in-->     22791798 comp bytes out
      27433911 comp bytes in  -->    633911762 uncomp bytes out
           974 uncomp paks/sec in-->       974 comp paks/sec out
           974 comp paks/sec in  -->       974 uncomp paks/sec out
      11739116 uncomp bits/sec in-->    422070 comp bits/sec out
        508035 comp bits/sec in  -->  11739106 uncomp bits/sec out
    433 seconds since last clear
    holdq: 0  hw_enable: 1  src_limited: 0  num cnxts: 4
    no data: 0  drops: 0  nobuffers: 0  enc adj errs: 0  fallbacks: 0
    no Replace: 0  num seq errs: 0  num desc errs: 0  cmds complete: 844151
    Bad reqs: 0  Dead cnxts: 0  No Paks: 0  enq errs: 0
    rx pkt drops: 0  tx pkt drops: 0  dequeues: 0  requeues: 0
    drops disabled: 0  clears: 0  ints: 844314  purges: 0
    no cnxts: 0  bad algos: 0  no crams: 0  bad paks: 0
    # opens: 0  # closes: 0 # hangs: 0
```

**Related Commands**

| Command | Description |
|---|---|
| **show compress** | Displays compression statistics. |

# show pas eswitch address

To display the Layer 2 learned addresses for an interface, use the **showpaseswitchaddress** command in user EXEC or privileged EXEC mode.

**show pas eswitch address commandshow pas eswitch address** [**ethernet** | **fastethernet**] [*slot*/*port*]

## Syntax Description

| | |
|---|---|
| **ethernet** \| **fastethernet** | (Optional) Type of interface. |
| *slot* | (Optional) Slot number of the interface. |
| *port* | (Optional) Interface number. |

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 11.2P | This command was introduced. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |

## Examples

The following sample output shows that the first PA-12E/2FE interface (listed below as port 0) in port adapter slot 3 has learned the Layer 2 address 00e0.f7a4.5100 for bridge group 30 (listed below as BG 30):

```
Router# show pas eswitch address fastethernet 3/0
U 00e0.f7a4.5100, AgeTs 56273 s, BG 30 (vLAN 0), Port 0
```

# show pas i82543 interface

To display interface information that is specific to Fast Ethernet or Gigabit Ethernet port adapters with an Intel 82543 processor on Cisco 7200 series routers, use the **showpasi82543interface**command in privileged EXEC mode.

**show pas i82543 interface** {**fastethernet** | **gigabitethernet**} *slot*/*port* [**multicast-table** | **receive-address** | **statistics**]

## Syntax Description

| | |
|---|---|
| **fastethernet** | Displays i82543-specific information for Fast Ethernet interfaces. |
| **gigabitethernet** | Displays i82543-specific information for Gigabit Ethernet interfaces. |
| *slot* | Slot number. |
| / *port* | Port number. The slash mark is required between the *slot* argument and the *port* argument. |
| **multicast-table** | (Optional) Displays i82543-specific multicast address table information.<br>**Note**<br>In Cisco IOS Release 12.2 S, this keyword is **MTA**. |
| **receive-address** | (Optional) Displays the contents of the receive address registers on the i82543 chip. |
| **statistics** | (Optional) Displays i82543-specific statistical information. |

## Command Modes

Privileged EXEC(#)

## Command History

| Release | Modification |
|---|---|
| 12.2(20)S | This command was introduced on Cisco 7200 series routers. |
| 12.1(20)E | This command was integrated into Cisco IOS Release 12.1(20)E on Cisco 7200 series routers. |
| 12.0(27)S | This command was integrated into Cisco IOS Release 12.0(27)S on Cisco 7200 series routers. |
| 12.3(7)T | This command was integrated into Cisco IOS Release 12.3(7)T on Cisco 7200 series routers. |

## Usage Guidelines

Use the **showpasi82543interface** command with the **statistics** keyword to determine what types of packets are being processed. Similar statistical information is displayed by the **showcontrollersfastethernet** and **showcontrollersgigabitethernet** commands.

**Note** We recommend that the **multicast-table** and **receive-address** keywords for this command be used only under the supervision of a Cisco engineer because of the cryptic output.

## Examples

The following sample output shows the contents of the multicast address table present on the i82543 processor.

```
Router# show pas i82543 interface fastethernet 6/0 multicast-table
Multicast Table Entry #0 = 0x10000
Multicast Table Entry #1 = 0x1
Multicast Table Entry #84 = 0x8000
```

The following sample output shows the contents of the Receive Address High (RAH) and Receive Address Low (RAL) registers on the i82543 processor.

```
Router# show pas i82543 interface fastethernet 6/0 receive-address
#1 RAH 0x8000A8FC RAL 0x67B60900
#3 RAH 0x0003FFFF RAL 0xFF45F75B
#5 RAH 0x0003FFFF RAL 0xCBEE539A
#7 RAH 0x0003FFFF RAL 0x5ABDADEB
#9 RAH 0x0003FFFF RAL 0x365B5ACF
#11 RAH 0x0003FFFF RAL 0xB2D9B0CE
#13 RAH 0x0003FFFF RAL 0x12A91CF6
#15 RAH 0x0003FFFF RAL 0xEF4A3125
#17 RAH 0x0003FFFF RAL 0x1A07EB7D
#19 RAH 0x0003FFFF RAL 0xFF9B6EF8
#21 RAH 0x0003FFFF RAL 0xB7C2AFC9
#23 RAH 0x0003FFFF RAL 0x14F4FB0A
#25 RAH 0x0003FFFF RAL 0xC60D6706
#27 RAH 0x0003FFFF RAL 0x5E9DE230
#29 RAH 0x0003FFFF RAL 0x5FEF9FBE
#31 RAH 0x0003FFFF RAL 0xBBCCC57E
```

The following sample output shows packet statistics of the i82543 processor.

```
Router# show pas i82543 interface fastethernet 6/0 statistics
i82543 (Livengood) Statistics
  CRC error         0             Symbol error     0
  Missed Packets    0             Single Collision 0
  Excessive Coll    0             Multiple Coll    0
  Late Coll         0             Collision        0
  Defer             0             Receive Length   0
  Sequence Error    0             XON RX           0
  XON TX            0             XOFF RX          0
  XOFF TX           0             FC RX Unsupport  0
  Packet RX (64)    0             Packet RX (127)  0
  Packet RX (255)   0             Packet RX (511)  0
  Packet RX (1023)  0             Packet RX (1522) 0
  Good Packet RX    348           Broadcast RX     0
  Multicast RX      319           Good Packet TX   0
  Good Octets RX.H  0             Good Octets RX.L 0
  Good Octets TX.H  0             Good Octets TX.L 0
  RX No Buff        0             RX Undersize     0
  RX Fragment       0             RX Oversize      0
  RX Octets High    0             RX Octets Low    0
  TX Octets High    0             TX Octets Low    0
  TX Packet         0             RX Packet        348
  TX Broadcast      0             TX Multicast     0
  Packet TX (64)    0             Packet TX (127)  0
  Packet TX (255)   0             Packet TX (511)  0
  Packet TX (1023)  0             Packet TX (1522) 0
  TX Underruns      0             TX No CRS        0
  RX Error Count    0             RX DMA Underruns 0
  RX Carrier Ext    0
  TCP Segmentation  0             TCP Seg Failed   0
```

The table below describes significant fields shown in the display.

*Table 18: **show pas i82543 interface statistics** Field Descriptions*

| Field | Description |
|---|---|
| CRC error | Cyclic redundancy checksum (CRC) 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 collisions or a station transmitting bad data. |
| Symbol error | Number of symbol errors between reads. |
| Missed Packets | Indicates whether the software processes that handle the line protocol believe that the interface is usable (that is, whether keepalives are successful) or if it has been taken down by an administrator. |
| Single Collision | Number of times that a transmit operation encountered a single collision. |
| Excessive Coll | This counter is incremented after a transmit operation has encountered more than 16 collisions. |
| Multiple Coll | Number of times that a transmit operation encountered more than 1 collision, but less than 16 collisions. |
| Late Coll | Number of late collisions. A late collision happens when a collision occurs after transmitting the preamble. The most common cause of late collisions is Ethernet cable segments that are too long for the speed at which you are transmitting. |
| Collision | Number of messages transmitted because of an Ethernet collision. A packet that collides is counted only once in output packets. |
| Defer | Defer indicates that the chip had to defer while ready to transmit a frame because the carrier was asserted. |
| Receive Length | Number of receive length error events. A receive length error occurs if an incoming packet passes the filter criteria but is either oversized or undersized. Packets less than 64 bytes are undersized. Packets over 1522 bytes are oversized if LongPacketEnable (LPE) is 0. If LPE is 1, a packet is considered oversized if it exceeds 16,384 bytes. |
| Sequence Error | Number of sequence error events. |
| XON RX | Number of XON packets received. |
| XON TX | Number of XON packets transmitted. |
| XOFF RX | Number of XOFF packets received. |
| XOFF TX | Number of XOFF packets transmitted. |
| FC RX Unsupport | Number of unsupported flow control frames received. |
| Packet RX | Number of received packets of the following lengths in bytes: 64, 127, 255, 511, 1023, 1522. |
| Good Packet RX | Number of received packets without errors. |

| Field | Description |
|---|---|
| Broadcast RX | Number of broadcast packets received. |
| Multicast RX | Number of multicast packets received. |
| Good Packet TX | Number of transmitted packets without errors. |
| Good Octets | Number of good (without errors) octets received (RX) or transmitted (TX). |
| RX No Buff | Number of times that frames were received when there were no available buffers in host memory to store those frames. The packet will be received if there is space in FIFO memory. |
| RX Undersize | Number of received frames that passed through address filtering and were less than the minimum size of 64 bytes (from destination address through CRC, inclusively), but that contained a valid CRC. |
| RX Fragment | Number of received frames that passed through address filtering and were less than the minimum size of 64 bytes (from destination address through CRC, inclusively), but that contained a bad CRC. |
| RX Oversize | Number of received frames that passed through address filtering and were greater than the maximum size. |
| RX Octets | Total number of octets received. |
| TX Octets | Total number of octets transmitted. |
| TX Packet | Number of transmitted packets. |
| RX Packet | Number of received packets. |
| TX Broadcast | Number of broadcast packets transmitted. |
| TX Multicast | Number of multicast packets transmitted. |
| Packet TX | Number of transmitted packets of the following lengths in bytes: 64, 127, 255, 511, 1023, 1522. |
| TX Underruns | Number of times that the transmitter has been running faster than the router can handle. This may never be reported on some interfaces. |
| TX No CRS | Number of successful packet transmissions in which Carrier Sense (CRS) input from the physical layer was not asserted within one slot time of start of transmission. |
| RX Error Count | Number of receive packets in which RX_ER was asserted by the physical layer. |
| RX DMA Underruns | Number of receive direct memory access (DMA) underruns observed by the DMA. |
| RX Carrier Ext | Number of packets received in which the carrier extension error was signalled across the gigabit medium independent interface (GMII) interface. |
| TCP Segmentation | Number of TCP segmentation offload transmissions to the hardware. |

| Field | Description |
|---|---|
| TCP Seg Failed | Number of TCP segmentation offload transmissions to the hardware that failed to transmit all data in the TCP segmentation context payloads. |

## Related Commands

| Commands | Description |
|---|---|
| **show compress** | Displays compression statistics. |
| **show controllers fastethernet** | Displays information about Fast Ethernet controllers. |
| **show controllers gigabitethernet** | Displays information about Gigabit Ethernet controllers. |
| **show interfaces** | Displays information about interfaces. |

# show pas isa controller

To show controller information that is specific to the Virtual Private Network (VPN) accelerator controller when an Integrated Services Adapter (ISA) is installed, use the **showpasisacontroller**EXEC command.

**show pas isa controller**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(5)T | This command was introduced. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |

## Examples

The following is sample output from the **showpasisacontroller** command:

```
Router# show pas isa controller
Interface ISA5/1 :
Encryption Mode = IPSec
Addresses of Rings and instance structure:
High Priority Rings
   TX: 0x4B0E97C0 TX Shadow:0x62060E00
   RX: 0x4B0EB840 RX Pool:0x4B0EBC80 RX Pool Shadow:0x62068E58
Low Priority Rings
   TX: 0x4B0EA800 TX Shadow:0x62066E2C
   RX: 0x4B0EC0C0, RX Shadow:0x62069284
Instance Structure address:0x620603D8
Firmware write head/tail offset:0x4B0EC900
Firmware read  head/tail offset:0x3EA00000
```

## Related Commands

| Command | Description |
|---|---|
| **show pas isa interface** | Displays interface status information that is specific to the VPN accelerator card. |

# show pas isa interface

To display interface information that is specific to the Virtual Private Network (VPN) accelerator card when an Integrated Services Adapter (ISA) is installed, use the **showpasisainterface**command in privileged EXEC mode.

**show pas isa interface**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(5)T | This command was introduced. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |

## Examples

The following is sample output from the **showpasisainterface** command:

```
Router# show pas isa interface
Interface ISA5/1 :
        Statistics of packets and bytes through this interface:
           2876894 packets in                  2910021 packets out
               420 paks/sec in                     415 paks/sec out
              2327 Kbits/sec in                   2408 Kbits/sec out
               632 commands out                    632 commands acknowledged
        low_pri_pkts_sent     1911    low_pri_pkts_rcvd:      1911
        invalid_sa:           260     invalid_flow:           33127
        invalid_dh:           0       ah_seq_failure:         0
        ah_spi_failure:       0       esp_auth_failure:       0
        esp_seq_failure:      0       esp_spi_failure:        0
        esp_protocol_absent:  0       ah_protocol_absent:     0
        bad_key_group:        0       no_shared_secret:       0
        no_skeyids:           0       pad_size_error:         0
        cmd_ring_full:        0       bulk_ring_full:         990
        bad_peer_pub_len:     0       authentication_failure: 0
        fallback:             1606642 no_particle:            0
        6922 seconds since last clear of counters
```

The table below describes the significant fields shown in the display.

***Table 19: show pas isa interface Field Descriptions***

| Field | Description |
|---|---|
| packets in/out | Number of data packets received from, or sent to, the Integrated Service Adapter (ISA). |

| Field | Description |
|---|---|
| paks/sec in/out | Number of packets received in, or sent out, with the total number of seconds that the ISA is active. |
| Kbits/sec in/out | Number of kilobits (Kbits) received in, or sent out, with the total number of seconds that the ISA is active. |
| commands out | Number of commands going to the ISA. Examples of commands include setting up encryption sessions and retrieving statistics or status from the ISA. |
| commands acknowledged | Number of commands returning from the ISA. Examples of commands include setting up encryption sessions and retrieving statistics or status from the ISA. |
| low_pri_pkts_sent | This is a summary counter for number of Internet Key Exchange (IKE) and IPSec commands submitted to ISA. |
| low_pri_pkts_rcvd | This is a summary counter for number of IKE & IPSEC command responses received from ISA. |
| invalid_sa | Reference to an unusable security association key pair. |
| invalid_flow | An invalid packet using an IPSec key is received for encryption or decryption.<br>Example: session has expired. |
| invalid_dh | Reference to an unusable Diffie-Hellman( DH) key pair. |
| ah_seq_failure | Unacceptably late Authentication Header (AH) header received. |
| ah_spi_failure | SPI specified in the AH header does not match the SPI associated with the IPSec AH key. |
| esp_auth_failure | Number of ESP packets received with authentication failures. |
| esp_seq_failure | Unacceptably late ESP packet received. |
| esp_spi_failure | SPI specified in the ESP header does not match the SPI associated with the IPSec ESP key. |
| esp_protocol_absent | Packet is missing expected ESP header. |
| ah_protocol_absent | Packet is missing expected AH header. |
| bad_key_group | Unsupported key group requested during a Diffie-Hellman generation. |
| no_shared_secret | Attempting to use a Diffie-Hellman shared secret that is not generated. |
| no_skeyids | Attempting to use a shared secret that is not generated. |
| pad_size_error | The length of the ESP padding is greater than the length of the entire packet. |
| cmd_ring_full | New IKE setup messages are not queued for processing until the previous queued requests are processed. |

| Field | Description |
|---|---|
| bulk_ring_full | New packets requiring IPSec functionality are not queued to the ISA until the ISA completes the processing of existing requests. |
| bad_peer_pub_len | Length of peer's DH public key does not match the length specified for the negotiated DH key group. |
| authentication_failure | Authentication failed. |
| fallback | The number of instances when the driver is successful in getting a replacement buffer from the global pool. |
| no_particle | The number of instances when the driver was unable to get a replacement buffer from the driver pool and the global (fallback) pool. |

## Related Commands

| Command | Description |
|---|---|
| **show pas isa controller** | Displays controller status information that is specific to the VPN accelerator card. |

# show pas vam controller

To display controller information that is specific to the VPN Acceleration Module (VAM), use the **showpasvamcontroller** command in privileged EXEC mode.

**show pas vam controller**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(9)E | This command was introduced. |
| 12.2(9)YE | This command was integrated into Cisco IOS Release 12.2(9)YE. |
| 12.2(13)T | This command was integrated into Cisco IOS Release 12.2(13)T. |

## Examples

The following is sample output from the**showpasvamcontroller**command:

```
Router# show pas vam controller
Encryption Mode = IPSec
Addresses of Rings and instance structure:
Low Priority Queue:
    OMQ=0xF2CB2E0, OMQ Shadow = 0x630E6638, {1, 1, 0, 256}
    PKQ=0xF2CF320, PKQ Shadow = 0x630EBE64, {232, 232, 0, 256}
    ERQ=0xF2D3360, ERQ Shadow = 0x630F1690, {0, 0, 0, 256}
High Priority Rings:
   TX: 0x0F2D73A0 TX Shadow:0x630F6EBC, {6, 6, queued=0}
   RX: 0x7F2D93E0 {13, 0, 256}
   RX Pool:0x7F2DA420 RX Pool Shadow:0x630FCAE8, {6, 0, 255}
Instance Structure address:0x630E5898
Misc registers:
mini-omq=0xF2DB460, shdw=0x63102714
Group0=0x3D800000, Group1=0x3D801000
IndexReg = 0xDFFE700
Heartbeat info:<Addr, Value> = <0xF2DB520, 0x2A55A>
Running default HSP (addr=0x629D36AC, size=294268)
```

## Related Commands

| Command | Description |
|---|---|
| **show pas vam interface** | Displays interface status information specific to the VPN accelerator module. |

# show pas vam interface

To display interface information that is specific to the VPN Acceleration Module (VAM), use the **showpasvaminterface** command in privileged EXEC mode.

**show pas vam interface**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.1(9)E | This command was introduced. |
| 12.2(9)YE | This command was integrated into Cisco IOS Release 12.2(9)YE. |
| 12.2(13)T | This command was integrated into Cisco IOS Release 12.2(13)T. |

## Usage Guidelines

Enter the**showpasvaminterface** command to see if the VAM is currently processing crypto packets.

## Examples

The following is sample output from the **showpasvaminterface** command:

```
Router# show pas vam interface
Interface VAM 2/1 :
        ds: 0x621CE0D8        idb:0x621C28DC
        Statistics of packets and bytes that through this interface:
              1110 packets in                  1110 packets out
            123387 bytes in                  100979 bytes out
                 0 paks/sec in                    0 paks/sec out
                 0 Kbits/sec in                   0 Kbits/sec out
              3507 commands out                3507 commands acknowledged
        ppq_full_err   : 0            ppq_rx_err       : 0
        cmdq_full_err  : 0            cmdq_rx_err      : 0
        no_buffer      : 0            fallback         : 0
        dst_overflow   : 0            nr_overflow      : 0
        sess_expired   : 0            pkt_fragmented   : 0
        out_of_mem     : 0            access_denied    : 0
        invalid_fc     : 0            invalid_param    : 0
        invalid_handle : 0            output_overrun   : 0
        input_underrun : 0            input_overrun    : 0
        key_invalid    : 0            packet_invalid   : 0
        decrypt_failed : 0            verify_failed    : 0
        attr_invalid   : 0            attr_val_invalid : 0
        attr_missing   : 0            obj_not_wrap     : 0
        bad_imp_hash   : 0            cant_fragment    : 0
        out_of_handles : 0            compr_cancelled  : 0
        rng_st_fail    : 0            other_errors     : 0
        3420 seconds since last clear of counters
```

The table below describes the significant fields shown in the display.

*Table 20: show pas vam interface Field Descriptions*

| Field | Description |
|---|---|
| packets in/out | Number of data packets received from, or sent to, the VAM. |
| bytes in/out | Number of data bytes received from, or sent to, the VAM. |
| paks/sec in/out | Number of packets received in, or sent out, with the total number of seconds that the VAM is active. |
| Kbits/sec in/out | Number of kilobits (Kbits) received in, or sent out, with the total number of seconds that the VAM is active. |
| commands out | Number of commands going to the VAM. Examples of commands include setting up encryption sessions and retrieving statistics or status from the VAM. |
| commands acknowledged | Number of commands returning from the VAM. Examples of commands include setting up encryption sessions and retrieving statistics or status from the VAM. |
| ppq_full_err | Number of packets dropped because of a lack of space in the packet processing queues for the VAM. This usually means that input traffic has reached VAM maximum throughput possible. |
| ppq_rx_err | Summary counter for all errors related to packet processing. |
| cmdq_full_err | Number of commands dropped because of a lack of space in the command processing queues for the VAM. This error indicates that the input tunnel setup rate has reached the VAM maximum setup rate. The Internet Key Exchange (IKE) process retries the tunnel creation and deletion when commands are dropped by VAM. |
| cmdq_rx_err | Summary counter for all errors related to command processing (for example, IKE, or IPSec session creation or deletion). |
| no_buffer | Errors related to the VAM running out of buffers. May occur with large packets. Although VAM buffers cannot be tuned, try tuning buffers for other interfaces. |
| fallback | Internal VAM buffer pool is completely used up and VAM has to fallback to global buffer pool. This may cause minor performance impact, however, packets are still processed so this error can be ignored. |
| dst_overflow | Counter that is incremented when the VAM has completed an operation, but there is no available space into which to place the result. |
| nr_overflow | Counter that is incremented when the VAM has completed an operation, but there is no available space into which to place the result. |
| sess_expired | Counter that is incremented if the session used to encrypt or decrypt the packet has expired because of time or space limit. |
| pkt_fragmented | Counter that is incremented when the input packet has to be fragmented after encryption. This counter should always be 0 as fragmentation by VAM is disabled. |
| out_of_mem | Counter that is incremented when the VAM runs out of memory. |

| Field | Description |
|---|---|
| access_denied | Counter that is incremented when the VAM is requested to perform an operation on an object that can not be modified. |
| invalid_fc | Counter that is incremented when the VAM has received a request that is illegal for the specified object type. |
| invalid_param | Counter that is incremented when the VAM has received invalid parameters within a command. |
| invalid_handle | Counter that is incremented when the VAM receives a request for an operation to be performed on an object that does not exist. |
| output_overrun | Counter that is incremented when the space allocated for a response is not large enough to hold the result posted by the VAM. |
| input_underrun | Counter that is incremented when the VAM receives a packet for which it finds a premature end to the data, for example, a truncated packet. |
| input_overrun | Counter that is incremented when the VAM receives a buffer that is too large for the requested operation. |
| key_invalid | Counter that is incremented when the VAM receives a request for an operation on a key where the key is invalid or of the wrong type. |
| packet_invalid | Counter that is incremented when the VAM receives a packet whose body is badly formed. |
| decrypt_failed | Counter that is incremented when the VAM receives a packet that cannot be decrypted because the decrypted data was not properly formatted (for example, padding is wrong). |
| verify_failed | Counter that is incremented when the VAM receives a packet which could not be verified because the verification of a signature or authentication value failed. |
| attr_invalid | Counter that is incremented when the VAM receives a packet which specifies an attribute that is not correct for the specified object or operation. |
| attr_val_invalid | Counter that is incremented when the VAM encounters errors during packet or command processing. The packets or commands are dropped in such cases. |
| attr_missing | Counter that is incremented when the VAM receives an operation request for which the value of a required attribute is missing. |
| obj_not_wrap | Counter that is incremented when the VAM receives an operation request to retrieve an object that is hidden or unavailable for export beyond the FIPS boundary of the VPN Module. |
| bad_imp_hash | Counter that is incremented when the VAM sees a hash miscompare on unwrap. |
| cant_fragment | Counter that is incremented when the VAM determines a need to fragment a packet, but cannot fragment because the “don’t fragment” bit is set. This counter should always be zero because the fragmentation on the VAM is disabled. |

| Field | Description |
|---|---|
| out_of_handles | Counter that is incremented when the VAM has run out of available space for objects of the requested type. |
| comp_cancelled | Due to the operation of the compression algorithm, some data patterns cannot be compressed. Usually data that has already been compressed or data that does not have a sufficient number of repetitive patterns cannot be compressed and a compress operation would actually result in expansion of the data.<br>There are certain known data patterns which do not compress. In these cases, the compression engine cancels the compression of the data and returns the original, uncompressed data without an IPPCP header.<br>These counters are useful to determine if the content of the traffic on the network is actually benefiting from compression. If a large percentage of the network traffic is already compressed files, these counters may indicate that compression on these streams are not improving the performance of the network. |
| rng_st_fail | Counter that is incremented when the VAM detects a Random Number Generator self test failure. |
| pkt_replay_err | Counter that is incremented when a replay error is detected by the VAM. |
| other_errors | Counter that is incremented when the VAM encounters a packet or command error that is not listed in other error categories. An example could be if the packet IP header checksum is incorrect. |

## Related Commands

| Command | Description |
|---|---|
| **show pas vam controller** | Displays controller status information that is specific to the VPN accelerator module. |

# show pas y88e8k interface

To display the y88e8k Port Adaptor Information (pas) message details of a Gigabit Ethernet interface, use the **showpasy88e8kinterface** command in User EXEC or privileged EXEC mode.

**show pas y88e8k interface** *type number* {**registers** | **rx_ring** | **statistics** | **tx_ring**}

## Syntax Description

| | |
|---|---|
| *type* | (Optional) Displays the interface type. |
| *number* | (Optional) Displays the interface number. |
| **registers** | Displays register values. |
| **rx -ring** | Displays the receive ring entries of the interface. |
| **statistics** | Displays the y88e8k chip statistics values. |
| **tx -ring** | Displays the transmit ring entries of the interface. |

## Command Modes

User EXEC (>) Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.4(22)T | This command was introduced in a release earlier than Cisco IOS Release 12.4(22)T. |

## Examples

The following is sample output from the **showpasy88e8kinterface** command:

```
Router# show pas y88e8k interface gigabit ethernet 1/0 rx-ring
Rx Ring:
 --------
  ring size = 128, particle size = 2048
  ring head = 0, tail = 127
  Ring entries:
     rxr       next_desc_addr   buf_ctrl   buf_addr_lo frame_sw  rxr_shadow   data_start
data_bytes
  0  0x642AE918  0x2DD9F020    0xC8550800 0x0DDA3180  0x00000000 0x64525440  0x2DDA3180  0
  1  0x642AE938  0x2DD9F040    0xC8550800 0x0DDA3A00  0x00000000 0x64525480  0x2DDA3A00  0
  2  0x642AE958  0x2DD9F060    0xC8550800 0x0DDA4280  0x00000000 0x645254C0  0x2DDA4280  0
  3  0x642AE978  0x2DD9F080    0xC8550800 0x0DDA4B00  0x00000000 0x64525500  0x2DDA4B00  0
  4  0x642AE998  0x2DD9F0A0    0xC8550800 0x0DDA5380  0x00000000 0x64525540  0x2DDA5380  0
  5  0x642AE9B8  0x2DD9F0C0    0xC8550800 0x0DDA5C00  0x00000000 0x64525580  0x2DDA5C00  0
  6  0x642AE9D8  0x2DD9F0E0    0xC8550800 0x0DDA6480  0x00000000 0x645255C0  0x2DDA6480  0
  7  0x642AE9F8  0x2DD9F100    0xC8550800 0x0DDA6D00  0x00000000 0x64525600  0x2DDA6D00  0
  8  0x642AEA18  0x2DD9F120    0xC8550800 0x0DDA7580  0x00000000 0x64525640  0x2DDA7580  0
  9  0x642AEA38  0x2DD9F140    0xC8550800 0x0DDA7E00  0x00000000 0x64525680  0x2DDA7E00  0
  10 0x642AEA58  0x2DD9F160    0xC8550800 0x0DDA8680  0x00000000 0x645256C0  0x2DDA8680  0
  11 0x642AEA78  0x2DD9F180    0xC8550800 0x0DDA8F00  0x00000000 0x64525700  0x2DDA8F00  0
  12 0x642AEA98  0x2DD9F1A0    0xC8550800 0x0DDA9780  0x00000000 0x64525740  0x2DDA9780  0
  13 0x642AEAB8  0x2DD9F1C0    0xC8550800 0x0DDAA000  0x00000000 0x64525780  0x2DDAA000  0
 .
 .
 .
  127 0x642AF8F8  0x2DD9F000    0xC8550800 0x0DDE6900  0x00000000 0x64527400  0x2DDE6900
0
```

Table 1 describes the significant fields shown in the display.

***Table 21: show pas y88e8k interface Field Descriptions***

| Field | Description |
|---|---|
| ring size | Displays the size of the ring. This is based on the bandwidth of the interface or virtual circuit (VC) and is a power of two. |
| particle size | Displays the particle size on the receive and transmit paths, in bytes. |
| ring head | Displays the head of the ring. |
| tail | Displays the tail of the ring. |
| rxr | Displays the Rx ring pointer. |
| next_desc_addr | Displays next Rx buffer descriptor address. |
| buf_ctrl | Displays the buffer control. |
| buf_addr_lo | Displays the buffer address. |
| frame_sw | Displays the Frame status word. |
| rxr_shadow | Displays the Rx ring shadow. |
| data_start | Displays the start of data in the particle. |
| data_bytes | Displays the number of bytes consumed for data storage. |

## Related Commands

| Command | Description |
|---|---|
| **tx-ring-limit** | Limits the number of packets that can be used on a transmission ring on the DSL WIC or interface. |

# show pci aim

To show the IDPROM contents for each compression Advanced Interface Module (AIM) daughter card in the Cisco 2600 router, use the **showpciaim**command in user EXEC or privileged EXEC mode.

**show pci aim**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.0(1)T | This command was introduced. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |

## Usage Guidelines

This command shows the IDPROM contents for each compression AIM daughtercard present in the system, by AIM slot number (currently 0, since that is the only daughtercard installed for Cisco IOS Release 12.0(1)T). The IDPROM is a small PROM built into the AIM board used to identify it to the system. It is sometimes referred to as an EEPROM because it is implemented using electronically erasable PROM.

## Examples

The following example shows the IDPROM output for the installed compression AIM daughter card:

```
Router# show pci aim
AIM Slot 0: ID 0x012D
        Hardware Revision        : 1.0
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 01 2D 41 01 00 FF FF FF FF FF FF FF FF
          0x10: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x20: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x30: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

## Related Commands

| Command | Description |
|---|---|
| **clear aim** | Clears data compression AIM registers and resets the hardware. |
| **test aim eeprom** | Tests the data compression AIM after it is installed in a Cisco 2600 series router. |

# show platform

To display platform information, use the **show platform** command in privileged EXEC mode.

**show platform** {**buffers** | **copp rate-limit** {**arp** | **dhcp** | **atm-oam** | **ethernet-oam** | **icmp** | **igmp** | **pppoe-discovery** | **atom ether-vc** | **all**} | **np copp** [*ifnum*] [**detail**] | **dma** | **eeprom** | **fault** | **hardware capacity** | **hardware pfc mode** | **internal-vlan** | **interrupts** | **netint** | **software ipv6-multicast connected** | **stats** | **tech-support** {**ipmulticast** [**vrf** *vrf-name*] *group-ip-addr src-ip-addr* | **unicast** [**vrf** *vrf-name*] *destination-ip-addr destination-mask* [**global**]} | **tlb** | **vfi dot1q-transparency** | **vlans**}

**Cisco 4400 Series Integrated Services Routers**
**show platform**

**Cisco ASR 1000 Series Aggregation Services Routers**
**show platform**

## Syntax Description

| | |
|---|---|
| **buffers** | Displays buffer-allocation information. |
| copp rate-limit | Displays Cisco Control Plane Policing (CoPP) rate-limit information on the Cisco 7600 SIP-400. |
| arp | Specifies Address Resolution Protocol (ARP) packet traffic. |
| dhcp | Specifies Dynamic Host Configuration Protocol (DHCP) packet traffic. |
| atm-oam | Specifies ATM Operation, Administration, and Maintenance (OAM) packet traffic. |
| ethernet-oam | Specifies Ethernet OAM packet traffic. |
| **icmp** | Specifies Internet Connection Management Protoocol Rate limiter. |
| **igmp** | Specifies Internet Group Management Potocol Rate limiter. |
| pppoe-discovery | Specifies Point-to-Point Protocol over Ethernet (PPPoE) discovery packet information. |
| **atom ether-vc** | Shows whether IP or routed mode interworking is configured. |
| all | Displays rate-limit information for all protocols. |
| np copp | Displays debug information for a given CoPP session ID or for all CoPP sessions. |
| *ifnum* | (Optional) A session ID. |
| detail | (Optional) Shows full rate-limited values. |
| **dma** | Displays Direct Memory Access (DMA) channel information. |
| **eeprom** | Displays CPU EEPROM information. |

| | |
|---|---|
| **fault** | Displays the fault date. |
| hardware capacity | Displays the capacities and utilizations for hardware resources; see the **show platform hardware capacity** command. |
| **hardware pfc mode** | Displays the type of installed Policy Feature Card (PFC). |
| **internal-vlan** | Displays the internal VLAN. |
| **interrupts** | Displays m8500 interrupt counters. |
| **netint** | Displays the platform network-interrupt information. |
| software ipv6-multicast connected | Displays all the IPv6 subnet Access Control List (ACL) entries on the Route Processor (RP); see the show platform software ipv6-multicast command. |
| **stats** | Displays Constellation WAN (CWAN) statistics. |
| **tech-support ipmulticast** | Displays IP multicast-related information for Technical Assistance Center (TAC). |
| **vrf** *vrf-name* | (Optional) Displays the Virtual Private Network (VPN) routing and forwarding (VRF) instance. |
| *group-ip-addr* | Group IP address. |
| *src-ip-addr* | Source IP address. |
| **unicast** | Displays IP unicast-related information for TAC. |
| *destination-ip-addr* | Destination IP address. |
| *destination-mask* | Destination mask. |
| **global** | (Optional) Displays global output. |
| **tlb** | Displays information about the translation look-aside buffer (TLB) register. |
| **vfi** | Displays CWAN virtual forwarding instance (VFI) commands. |
| **dot1q-transparency** | Displays the dot1q transparency setting. |
| **vlans** | Displays hidden VLAN-to-WAN interface mapping. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |

| Release | Modification |
|---|---|
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Cisco IOS Release 12.2(17d)SXB. This command was changed to include the **hardware pfc mode**keywords. |
| 12.2(18)SXD | This command was modified to include the software ipv6-multicast connectedkeywords. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2(33)SRC | This command was modified to include additional keywords to support CoPP enhancements on the Cisco 7600 SIP-400 on the Cisco 7600 series router. |
| Cisco IOS XE Release 2.1 | This command was integrated into Cisco IOS XE Release 2.1. |
| 12.2(33)SRD | This command was modified. The **atom ether-vc** keyword was added. |
| Cisco IOS XE Release 3.9S | This command was integrated into Cisco IOS XE Release 3.9S. |
| Cisco IOS XE Gibraltar 16.11.1 | Output now indicates when a PSU slot is empty. In earlier releases, the state of an empty PSU slot appeared in the command output as "ps, fail". See the examples for differences in indication options for Cisco ASR 1000 Series and ISR 4000 Series routers. |

## Usage Guidelines

This command is similar to the **show msfc** command.

This command can be used to verify the existence of a second Cisco IOS process on a single Cisco ASR 1000 RP on a Cisco ASR 1002 router or Cisco ASR 1004 router.

When this command is used with the **atom ether-vc** keyword, it is used on the line-card console.

## Examples

The following sample output from the **show platform buffers** command displays buffer-allocation information:

```
Router# show platform buffers
Reg. set    Min    Max
  TX              640
 ABQ        640  16384
   0          0     40
   1       6715   8192
   2          0      0
   3          0      0
   4          0      0
   5          0      0
   6          0      0
   7          0      0
Threshold = 8192

Vlan  Sel  Min  Max  Cnt  Rsvd
1019    1 6715 8192    0     0
Router#
```

### Cisco ISR 4400 Series Routers

The following example displays online status information for a Cisco ISR 4451-X/K9.

```
Router# show platform
Chassis type: ISR4451-X/K9

Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
0         ISR4451-X/K9        ok                    00:06:51
 0/0      ISR4451-X-4x1GE     ok                    00:05:31
 0/1      NIM-ES2-8-P         ok                    00:05:31
1         ISR4451-X/K9        ok                    00:06:51
 1/0      UCS-EN120S-M2/K9    ok                    00:05:31
2         ISR4451-X/K9        ok                    00:06:51
R0        ISR4451-X/K9        ok, active            00:06:51
F0        ISR4451-X/K9        ok, active            00:06:51
P0        PWR-4450-1000W-AC   ok                    00:06:29
P1        PWR-4450-1000W-AC   ok                    00:06:29
P2        ACS-4450-FANASSY    ok                    00:06:29
POE0      PWR-POE-4450        ok                    00:06:29
GE-POE    PWR-GE-POE-4400     ok                    00:06:29

Slot      CPLD Version        Firmware Version
--------- ------------------- ---------------------------------------
0         15010638            16.7(4r)
1         15010638            16.7(4r)
2         15010638            16.7(4r)
R0        15010638            16.7(4r)
F0        15010638            16.7(4r)
```

The table below describes the fields that appear in the above example

***Table 22: show platform Field Descriptions***

| Field | Description |
|---|---|
| Slot | Chassis slot number |
| Type | Type of module |
| State | Status of the module |
| Insert time | Period of time ((hh:mm:ss format) since the module has been up and running |

### Cisco ASR 1000 Series Routers

The following example displays online status information for the shared port adapters (SPAs), Cisco ASR 1000 SPA Interface Processor (SIP), Cisco ASR 1000 Embedded Services Processor (ESP), Cisco ASR 1000 RP, power supplies, and fans. The ESPs are shown as F0 and F1. The RPs are shown as R0 and R1.

The State column should display “ok” for SIPs, SPAs, power supplies, and fans. For RPs and ESPs, the State column should display “ok, active” or “ok, standby.”

```
Router# show platform
```

```
Chassis type: ASR1006
Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
0         ASR1000-SIP10       ok                    18:23:58
 0/0      SPA-5X1GE-V2        ok                    18:22:38
 0/1      SPA-8X1FE-TX-V2     ok                    18:22:33
 0/2      SPA-2XCT3/DS0       ok                    18:22:38
1         ASR1000-SIP10       ok                    18:23:58
 1/0      SPA-2XOC3-POS       ok                    18:22:38
 1/1      SPA-8XCHT1/E1       ok                    18:22:38
 1/2      SPA-2XT3/E3         ok                    18:22:38
R0        ASR1000-RP1         ok, active            18:23:58
R1        ASR1000-RP1         ok, standby           18:23:58
F0        ASR1000-ESP10       ok, active            18:23:58
F1        ASR1000-ESP10       ok, standby           18:23:58
P0        ASR1006-PWR-AC      ok                    18:23:09
P1        ASR1006-FAN         ok                    18:23:09
Slot      CPLD Version        Firmware Version
--------- ------------------- ---------------------------------------
0         06120701            12.2(33r)XN2
1         06120701            12.2(33r)XN2
R0        07082312            12.2(33r)XN2
R1        07082312            12.2(33r)XN2
F0        07051680            12.2(33r)XN2
F1        07051680            12.2(33r)XN2
```

### Empty PSU slot

This example shows an "empty" state for slot P1. It applies to Cisco ISR 4000 Series and ASR 1000 Series routers.

```
Device#show platform

Chassis type: ASR1002-X

Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
0         ASR1002-X           ok                    1d18h
 0/0      6XGE-BUILT-IN       ok                    1d18h
 0/1      SPA-8X1GE-V2        ok                    1d18h
R0        ASR1002-X           ok, active            1d18h
F0        ASR1002-X           ok, active            1d18h
P0        ASR1002-PWR-AC      ok                    1d18h
P1        Unknown             empty                 never
```

### Cisco ISR 4000 with two PSUs, no power cord attached to P1 or bad input detected

This example shows "fail, badinput" for P1.

On ISR 4000 Series routers, the possible states are:

- "fail, badinput": No power cord attached or bad input detected
- “fail, badoutput”: Bad output detected
- “fail, badcookie”: Failed to read the status of the PSU

```
Device#show platform
```

```
 Chassis type: ISR4431/K9

Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
0         ISR4431/K9          ok                    19:32:35
 0/0      ISR4431-X-4x1GE     ok                    19:30:27
 0/1      NIM-SSD             ok                    19:30:27
R0        ISR4431/K9          ok, active            19:32:35
F0        ISR4431/K9          ok, active            19:32:35
P0        PWR-4430-AC         ok                    19:32:03
P1        Unknown             fail, badinput        19:32:03
P2        ACS-4430-FANASSY    ok                    19:32:03
```

### Cisco ASR 1000 with two PSUs, no power cord attached to P1, PSU turned off, or PSU failed

This example shows the "ps, fail" state for slot P1.

```
Device#show platform
Chassis type: ASR1002-X

Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
0         ASR1002-X           ok                    1d18h
 0/0      6XGE-BUILT-IN       ok                    1d18h
 0/1      SPA-8X1GE-V2        ok                    1d18h
R0        ASR1002-X           ok, active            1d18h
F0        ASR1002-X           ok, active            1d18h
P0        ASR1002-PWR-AC      ok                    1d18h
P1        ASR1002-PWR-AC      ps, fail              1d18h
```

### Cisco ASR 1000 Series Routers--Verifying Dual Cisco IOS Processes on Single RP

In the following example, a second Cisco IOS process is enabled on a Cisco ASR 1004 router using stateful switchover (SSO). The output of the **show platform** command is provided before and after the SSO configuration to verify that the second Cisco IOS process is enabled and active.

```
Router# show platform
Chassis type: ASR1004
Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
0         ASR1000-SIP10       ok                    00:04:39
 0/0      SPA-5X1GE-V2        ok                    00:03:23
 0/1      SPA-2XT3/E3         ok                    00:03:18
R0        ASR1000-RP1         ok, active            00:04:39
F0        ASR1000-ESP10       ok, active            00:04:39
P0        ASR1004-PWR-AC      ok                    00:03:52
P1        ASR1004-PWR-AC      ok                    00:03:52
Slot      CPLD Version        Firmware Version
--------- ------------------- ---------------------------------------
0         07091401            12.2(33r)XN2
R0        07062111            12.2(33r)XN2
F0        07051680            12.2(33r)XN2
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.

Router(config)# redundancy
Router(config-red)# mode sso
*May 27 19:43:43.539: %CMRP-6-DUAL_IOS_REBOOT_REQUIRED: R0/0: cmand:  Configuration must
```

```
be saved and the chassis must be rebooted for IOS redundancy changes to take effect

Router(config-red)# exit
Router(config)# exit
Router#
*May 27 19:44:04.173: %SYS-5-CONFIG_I: Configured from console by user on console

Router# copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]

Router# reload
Proceed with reload? [confirm]
*May 27 19:45:16.917: %SYS-5-RELOAD: Reload requested by user on console. Reload Reason:
Reload command.
<reload output omitted for brevity>

Router# show platform
Chassis type: ASR1004
Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
0         ASR1000-SIP10       ok                    00:29:34
 0/0      SPA-5X1GE-V2        ok                    00:28:13
 0/1      SPA-2XT3/E3         ok                    00:28:18
R0        ASR1000-RP1         ok                    00:29:34
F0        ASR1000-ESP10       ok, active            00:29:34
P0        ASR1004-PWR-AC      ok                    00:28:47
P1        ASR1004-PWR-AC      ok                    00:28:47
Slot      CPLD Version        Firmware Version
--------- ------------------- ---------------------------------------
0         07091401            12.2(33r)XN2
R0        07062111            12.2(33r)XN2
F0        07051680            12.2(33r)XN2
```

The table below describes the significant fields shown in the display.

***Table 23: show platform Field Descriptions***

| Field | Description |
|---|---|
| Slot | Chassis slot. |
| Type | Hardware type. |

| Field | Description |
|---|---|
| State | Online state of the hardware. One of the following values:<br>All Hardware<br>• booting--Hardware is initializing and software is booting.<br>• disabled--Hardware is not operational.<br>• init--Hardware or Cisco IOS process is initializing.<br>• ok--Hardware is operational.<br>• shutdown--Hardware was administratively shut down using the no shutdown command.<br>• unknown--Hardware is not operational; state is unknown.<br>RP or ESP<br>• init, standby--Standby RP or ESP is operational but is not yet in a high availability (HA) state. An RP or ESP switchover is not yet possible.<br>• ok, active--Active RP or ESP is operational.<br>• ok, standby--Standby RP or ESP is operational. The standby RP or ESP is ready to become active in the event of a switchover.<br>SPA<br>• admin down--SPA was disabled using the shutdown command.<br>• inserted--SPA is being inserted.<br>• missing--SPA was removed.<br>• out of service--SPA is not operational.<br>• retrieval error--An error occurred while retrieving the SPA state; state is unknown.<br>• stopped--SPA was gracefully deactivated using the hw-module subslot stop command.<br>Fan or Power Supply<br>• fan, fail--Fan is failing.<br>• Empty--Power supply is missing.<br>• ps, fail--Power supply is failing. |
| Insert time (ago) | Amount of time (hh:mm:ss format) the hardware has been online. |
| CPLD Version | Complex programmable logic device version number. |
| Firmware Version | Firmware (ROMmon) version number. |

### Cisco 7600 Series Routers with Cisco 7600 SIP-400

The following sample output from the **show platform copp rate-limit arp** command displays the list of interfaces on which a rate limiter is active for ARP, along with the count of confirmed and exceeded packets for the rate limiter:

```
Router# show platform copp rate-limit arp
Rate limiter Information for Protocol arp:
  Rate Limiter Status: Enabled
  Rate : 20 pps
  Max Observation Period : 60 seconds
Per Interface Rate Limiter Information
  Interface              Conformed Pkts  Exceeded Pkts  Enabled  Obs Period (Mts)
  GigabitEthernet5/1         0               0          No        -
  GigabitEhternet5/1.1       14              0          No        -
  GigabitEthernet5/1.2       28              2          No        -
  GigabitEthernet5/2         0               0          No        -
  GigabitEthernet5/2.1       180             4          Yes       35
  GigabitEthernet5/2.2       200             16         Yes       Max
```

The table below describes the significant fields shown in the display.

***Table 24: show platform copp rate-limit Field Descriptions***

| Field | Description |
|---|---|
| Rate Limiter Status | Indicates if a rate limiter has been enabled on the interface. |
| Rate | Indicates the configured rate in packets per second (pps) or bits per second (bps). |
| Max Observation Period | Indicates the configured observation period, in seconds, before the per-interface rate limiter is automatically turned off. |
| Per Interface Rate Limiter Information | Displays the list of interfaces on which the rate limiter is active. In this example:<br>• GigabitEthernet5/1.1 is free from attack.<br>• GigabitEthernet5/2.1 has an exceed count of 4, and has a rate limiter enabled. The observation period is 35 minutes, which indicates that currently the interface is free from attack and is being kept under observation. The interface will remain under observation for an additional 35 minutes. If it remains free from attack after that time, the rate limiter is automatically removed.<br>• GigabitEthernet5/2.2 has an exceed count of 16 and has a rate limiter enabled. The observation period has been designated as Max. This indicates that the interface is still under attack and has not yet entered the observation time window. |

The following sample from the **show platform eeprom** command displays CPU EEPROM information:

```
Router# show platform eeprom
MSFC CPU IDPROM:
IDPROM image:
IDPROM image block #0:
  hexadecimal contents of block:
```

```
  00: AB AB 02 9C 13 5B 02 00 00 02 60 03 03 E9 43 69    .....[....`...Ci
  10: 73 63 6F 20 53 79 73 74 65 6D 73 00 00 00 00 00    sco Systems.....
  20: 00 00 57 53 2D 58 36 4B 2D 53 55 50 33 2D 50 46    ..WS-X6K-SUP3-PF
  30: 43 33 00 00 00 00 53 41 44 30 36 34 34 30 31 57    C3....SAD064401W
  40: 4C 00 00 00 00 00 00 00 00 00 37 33 2D 37 34 30    L.........73-740
  50: 34 2D 30 37 00 00 00 00 00 00 30 35 00 00 00 00    4-07......05....
  60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ................
  70: 00 00 00 00 02 BD 00 00 00 00 00 09 00 05 00 01    ................
  80: 00 03 00 01 00 01 00 02 03 E9 00 00 00 00 00 00    ................
  90: 00 00 00 00 00 00 00 00 00 00 00 00                ............
  block-signature = 0xABAB, block-version = 2,
  block-length = 156, block-checksum = 4955
  *** common-block ***
  IDPROM capacity (bytes) = 512  IDPROM block-count = 2
  FRU type = (0x6003,1001)
  OEM String = 'Cisco Systems'
  Product Number = 'WS-X6K-SUP3-PFC3'
  Serial Number = 'SAD064401WL'
  Manufacturing Assembly Number = '73-7404-07'
  Manufacturing Assembly Revision = '05'
  Hardware Revision = 0.701
  Manufacturing bits = 0x0  Engineering bits = 0x0
  SNMP OID = 9.5.1.3.1.1.2.1001
  Power Consumption = 0 centiamperes    RMA failure code = 0-0-0-0
  CLEI =
  *** end of common block ***
IDPROM image block #1:
  hexadecimal contents of block:
  00: 60 03 02 67 0C 24 00 00 00 00 00 00 00 00 00 00    `..g.$..........
  10: 00 00 00 00 00 00 00 51 00 05 9A 3A 7E 9C 00 00    .......Q...:~...
  20: 02 02 00 01 00 01 00 00 00 00 00 00 00 00 00 00    ................
  30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ................
  40: 14 01 00 00 00 00 00 00 00 00 00 00 00 00 00 00    ................
  50: 00 00 81 81 81 81 80 80 80 80 80 80 80 80 80 80    ................
  60: 80 80 06 72 00 46 37                               ...r.F7
  block-signature = 0x6003, block-version = 2,
  block-length = 103, block-checksum = 3108
  *** linecard specific block ***
  feature-bits =   00000000 00000000
  hardware-changes-bits =   00000000 00000000
  card index = 81
  mac base = 0005.9A3A.7E9C
  mac_len = 0
  num_processors = 2
  epld_num = 2
  epld_versions = 0001 0001 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000 0000
0000
  port numbers:
    pair #0: type=14, count=01
    pair #1: type=00, count=00
    pair #2: type=00, count=00
    pair #3: type=00, count=00
    pair #4: type=00, count=00
    pair #5: type=00, count=00
    pair #6: type=00, count=00
    pair #7: type=00, count=00
  sram_size = 0
  sensor_thresholds =
    sensor #0: critical = -127 oC (sensor present but ignored), warning = -127 oC (sensor
present but ignored)
    sensor #1: critical = -127 oC (sensor present but ignored), warning = -127 oC (sensor
present but ignored)
    sensor #2: critical = -128 oC (sensor not present), warning = -128 oC (sensor not
present)
```

```
    sensor #3: critical = -128 oC (sensor not present), warning = -128 oC (sensor not
present)
    sensor #4: critical = -128 oC (sensor not present), warning = -128 oC (sensor not
present)
    sensor #5: critical = -128 oC (sensor not present), warning = -128 oC (sensor not
present)
    sensor #6: critical = -128 oC (sensor not present), warning = -128 oC (sensor not
present)
    sensor #7: critical = -128 oC (sensor not present), warning = -128 oC (sensor not
present)
  max_connector_power = 1650
  cooling_requirement = 70
  ambient_temp = 55
  *** end of linecard specific block ***
```

The following sample output from the **show platform fault** command displays fault-date information:

```
Router# show platform fault
Fault History Buffer:
rsp72043_rp Software (rsp72043_rp-ADVENTERPRISEK9_DBG-M), Version 12.2(32.8.1)RE
C186 ENGINEERING WEEKLY BUILD, synced to V122_32_8_11_SR186
Compiled Wed 08-Apr-09 09:22 by abcd
Uptime 2w3d
Exception Vector: 0x1500 PC 0x0B13DD4C MSR 0x00029200 LR 0x0B13DD10
r0  0x0B13DD10 r1  0x1C58A1C8 r2  0xFFFCFFFC r3  0x189EDEF4
r4  0x00000000 r5  0x00000000 r6  0x1C58A1B0 r7  0x00029200
r8  0x00029200 r9  0x00000000 r10 0x00000001 r11 0x189EDEF0
r12 0x0000001B r13 0x04044000 r14 0x08736008 r15 0x115C0000
r16 0x00000000 r17 0x00000000 r18 0x00000000 r19 0x1B751358
r20 0x00000000 r21 0x00000000 r22 0x00000000 r23 0x00000000
r24 0x00000000 r25 0x00000000 r26 0x00000000 r27 0x00000001
r28 0x13255EC0 r29 0x1C59BD00 r30 0x13255EC0 r31 0x00000000
dec  0x00007333 tbu   0x00004660 tbl   0x594BBFC4 pvr   0x80210020
dear 0x00000000 dbcr0 0x41000000 dbcr1 0x00000000 dbcr2 0x00000000
iac1 0x00000000 iac2  0x00000000 dac1  0x00000000 dac2  0x00000000
```

The following sample output from the **show platform hardware pfc** mode command displays the PFC-operating mode:

```
Router# show platform hardware pfc mode
PFC operating mode : PFC3A
```

This example shows how to display platform network-interrupt information:

```
Router# show platform netint
Network IO Interrupt Throttling:
 throttle count=0, timer count=0
 active=0, configured=1
 netint usec=3999, netint mask usec=800
inband_throttle_mask_hi = 0x0
inband_throttle_mask_lo = 0x800000
```

This following sample output from the **show platform tlb** command displays the TLB-register information:

```
Router# show platform tlb
Mistral revision 5
TLB entries : 42
Virt Address range      Phy Address range      Attributes
0x10000000:0x1001FFFF   0x010000000:0x01001FFFF   CacheMode=2, RW, Valid
0x10020000:0x1003FFFF   0x010020000:0x01003FFFF   CacheMode=2, RW, Valid
0x10040000:0x1005FFFF   0x010040000:0x01005FFFF   CacheMode=2, RW, Valid
```

```
0x10060000:0x1007FFFF   0x010060000:0x01007FFFF   CacheMode=2, RW, Valid
0x10080000:0x10087FFF   0x010080000:0x010087FFF   CacheMode=2, RW, Valid
0x10088000:0x1008FFFF   0x010088000:0x01008FFFF   CacheMode=2, RW, Valid
0x18000000:0x1801FFFF   0x010000000:0x01001FFFF   CacheMode=0, RW, Valid
0x19000000:0x1901FFFF   0x010000000:0x01001FFFF   CacheMode=7, RW, Valid
0x1E000000:0x1E1FFFFF   0x01E000000:0x01E1FFFFF   CacheMode=2, RW, Valid
0x1E880000:0x1E899FFF   0x01E880000:0x01E899FFF   CacheMode=2, RW, Valid
0x1FC00000:0x1FC7FFFF   0x01FC00000:0x01FC7FFFF   CacheMode=2, RO, Valid
0x30000000:0x3001FFFF   0x070000000:0x07001FFFF   CacheMode=2, RW, Valid
0x40000000:0x407FFFFF   0x000000000:0x0007FFFFF   CacheMode=3, RO, Valid
.
.
.
0x58000000:0x59FFFFFF   0x088000000:0x089FFFFFF   CacheMode=3, RW, Valid
0x5A000000:0x5BFFFFFF   0x08A000000:0x08BFFFFFF   CacheMode=3, RW, Valid
0x5C000000:0x5DFFFFFF   0x08C000000:0x08DFFFFFF   CacheMode=3, RW, Valid
0x5E000000:0x5FFFFFFF   0x08E000000:0x08FFFFFFF   CacheMode=3, RW, Valid
```

This example shows how use the **atom ether-vc** keyword to display line-card information for an ES20 line card in slot 3.

```
Router# show platform copp rate-limit atom ether-vc
 AToM Ether VC Index(12902): segtype(3) seghandle(0x5ECF7F34)
  Disposition : flags(97) vlanid(502) local_vc_label(22691)
   ForwardingTable: oper(12) flags(0x2100) vlan(502) dest_index(0x9ED)
  Imposition: flags(0x21) egress_idx(0x0) ifnum(28)
   tx_tvc(0x7D83) rvclbl[0](3356) rigplbl[1](1011) label[2](0)
   label[3](0) ltl(0x9ED) mac(0014.1c80.f600) qos_info(0x0)
  Platform Data:
   loc_lbl acif_num fw_idx cword    eg_ifnum ckt_idx  vlan ac_hdl     vc_hash
   22691   615      0x0    0x3      28       0x8003   502  0x5ECF7F34 0x3266
  Platform Index(0x81F68003) is_sw(1) is_vfi(0) vlan(502) pseudo_port_offset(3) tx_tvc(0x7D83)

  Statistics :  Packets    Bytes      Drop Pkts  Drop Bytes ID
   Disposition: 0          0          0          0          0
   Imposition : 0          0          0          0          0
     Vlan func[1]: 502 (0x1F6) func(0:invalid) feat  (0x0 )
    Tx TVC Table
            idx   ltl h pt cw vt efp  adj  v imp
            x---- x-- d d- d- d- x--- x--- d x---
  SIP10G EoMPLS disp detailed info:
    t vclbl    VLAN       Type    disp-idx
    - d------- x---(d---) ------- x-------
    0 00022691 01F6(0502) ether   00001692
  SIP10G EoMPLS ipiw disp detailed info:
    ipiw mac valid CE-MAC Address
    b--- b-------- --------------
    0001 000000001 0016.9c6e.7480
  VC Summary: vlan(502) VC count(1)
```

## Related Commands

| Command | Description |
|---|---|
| **platform copp** | Turns on or off rate-limiting for an interface on the Cisco 7600 SIP-400. |
| **platform copp observation period** | Sets the observation period before automatically turning off the per-interface rate limiter on the Cisco 7600 SIP-400. |
| **pseudowire class** | Specifies the name of a Layer 2 pseudowire class. |

| Command | Description |
|---|---|
| **show msfc** | Displays MSFC information. |

# show platform acl software-switched

To display whether ACLs are enabled for software-switched WAN packets, use the **showplatformaclsoftware-switched**command in privileged EXEC mode.

**show platform acl software-switched**

## Syntax Description

This command has no arguments or keywords.

## Command Default

This command has no default settings.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2(50)SY | This command was introduced. |
| 12.2(33)SXI2 | This command was integrated into Cisco IOS Release 12.2(33)SXI2. |

## Usage Guidelines

By default, ACLs are not applied to packets that are software-switched between WAN cards and the route processor. To determine whether ACLs are enabled for software-switched ingress or egress WAN packets, use the **showplatformaclsoftware-switched**command.

## Examples

This example shows how to display whether ACLs are enabled for software-switched WAN packets:

```
Router# show platform acl software-switched
 CWAN: ACL treatment for software switched in INGRESS is enabled
 CWAN: ACL treatment for software switched in EGRESS is disabled
```

## Related Commands

| Command | Description |
|---|---|
| **platform cwan acl software-switched** | Allows ACLs to be applied to WAN packets that are software-switched. |

# show platform atom disp-tbl backup

To display the disposition table on the line card for backup VCs, use the **showplatformatomdisp-tblbackup** command in privileged EXEC mode .

**show platform atom disp-tbl backup** *pseudo-ckt-index*

## Syntax Description

| | |
|---|---|
| *pseudo-ckt-index* | Defines the *pseudo-circuit-index*. The acceptable range is between 1 and 65537. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.1(1)S | This command was introduced. |

## Usage Guidelines

The show platform atom disp-tbl backup command should be used while using the Hot-Standby Psuedo Wire (HSPW) feature.

## Examples

The following example displays the disposition table on the Line Card for backup VCs.

```
Router# show platform atom disp-tbl backup

Pseudo   Dlci or   Local         Outgoing          IW   Backup
Ckt Idx    Vcd     Label         Interface        Type   VC
-------  -------  -------  --------------------  ----  ------
  32786        2       24                   AC0   L2L    Yes
```

## Related Commands

| Command | Description |
|---|---|
| **show platform atom disp-tbl local-vc-label** | Displays the disposition table on the line card for a VC based on the local label. |
| **show platform atom tbl-summary** | Displays the total number of PWs programmed on the Line Card. |
| **show platform atom imp-tbl backup** | Displays the imposition table on the line card for backup VCs. |
| **show platform atom imp-tbl remote-vc-label** | Displays the imposition table on the line card for a VC based on the remote label. |

# show platform atom disp-tbl local-vc-label

To display the disposition table on the line card for a VC based local label, use the **showplatformatomdisp-tbllocal-vc-label** command in privileged EXEC mode .

**show platform atom disp-tbl local-vc-label** *local-vc-label*

## Syntax Description

| | |
|---|---|
| *local-vc-label* | Defines the VC based local label. The acceptable range is between 15 and 1048575. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.1(1)S | This command was introduced. |

## Usage Guidelines

The show platform atom disp-tbl local-vc-label command should be used only if you know the Local VC Label for a VC.

## Examples

The following example displays the disposition table on the Line Card for a VC based on the local label.

```
Router# show platform atom imp-tbl remote-vc-label 97
Pseudo Ckt Idx    Dlci or Vcd   Dest Vlanid   LTL Index   # Lbls Imposed   Remote Label
--------------   -------------  ------------  ----------  ---------------  --------------
 49170                2            1028          0xFF             2              97
Local Label  Outgoing Interface   IW Type  Backup VC    AC segment ssm id   Segment Status
-----------  --------------------  -------  ---------   -------------------  --------------

   57              Gi4/3/3         L2L       No            20561               UP
```

## Related Commands

| Command | Description |
|---|---|
| **show platform atom imp-tbl remote-vc-label** | Displays the imposition table on the line card for a VC based on the remote label. |
| **show platform atom tbl-summary** | Displays the total number of PWs programmed on the line card. |
| **show platform atom imp-tbl backup** | Displays the imposition table on the line card for backup VCs. |
| **show platform atom disp-tbl backup** | Displays the disposition table on the line card for backup VCs. |

# show platform atom imp-tbl backup

To display the imposition table on the line card for backup VCs, use the **showplatformatomimp-tblbackup** command in privileged EXEC mode .

**show platform atom imp-tbl backup** *pseudo-ckt-index*

## Syntax Description

| | |
|---|---|
| *pseudo-ckt-index* | Defines the *pseudocircuitindex*. The acceptable range is between 1 and 65537. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.1(1)S | This command was introduced. |

## Usage Guidelines

The show platform atom imp-tbl backup command should be used while using the Hot-Standby Psuedo Wire (HSPW) feature.

## Examples

The following example displays the imposition table on the Line Card for backup VCs.

```
Router# show platform atom imp-tbl backup

Pseudo Ckt Idx    Dlci or Vcd   Dest Vlanid   LTL Index   # Lbls Imposed   Remote Label
--------------   -------------  ------------  ----------  ---------------  --------------
 432786      2            1029        0xFF             1        25
Local Label  Outgoing Interface   IW Type  Backup VC    AC segment ssm id   Segment Status
-----------  --------------------  -------  ---------   -------------------  --------------

61      Gi4/0/1    L2L       Yes      16464      STANDBY
```

## Related Commands

| Command | Description |
|---|---|
| **show platform atom disp-tbl local-vc-label** | Displays the disposition table on the line card for a VC based on the local label. |
| **show platform atom tbl-summary** | Displays the total number of PWs programmed on the Line Card. |
| **show platform atom disp-tbl backup** | Displays the disposition table on the line card for backup VCs. |
| **show platform atom imp-tbl remote-vc-label** | Displays the imposition table on the line card for a VC based on the remote label. |

# show platform atom imp-tbl remote-vc-label

To display the imposition table on the line card for a VC based remote label, use the **showplatformatomimp-tblremote-vc-label** command in privileged EXEC mode .

**show platform atom imp-tbl** *remote-vc-label remote-vc-label*

## Syntax Description

| | |
|---|---|
| *remote-vc-label* | Defines the remote VC based label. The acceptable range is between 15 and 1048575. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.1(1)S | This command was introduced. |

## Usage Guidelines

The **showplatformatomimp-tblremote-vc-label** command should be used only if the Remote VC Label for a VC is known.

## Examples

The following example displays the imposition table on the Line Card for a VC based on the remote label.

```
Router# show platform atom imp-tbl remote-vc-label 97
Pseudo Ckt Idx    Dlci or Vcd   Dest Vlanid   LTL Index   # Lbls Imposed   Remote Label
--------------   -------------  ------------  ----------  ---------------  --------------
 49170                2            1028          0xFF             2              97
Local Label  Outgoing Interface   IW Type  Backup VC    AC segment ssm id   Segment Status
-----------  --------------------  -------  ---------   -------------------  --------------

   57              Gi4/3/3         L2L       No            20561               UP
```

## Related Commands

| Command | Description |
|---|---|
| **show platform atom disp-tbl local-vc-label** | Displays the disposition table on the line card for a VC based on the local label. |
| **show platform atom tbl-summary** | Displays the total number of PWs programmed on the Line Card. |
| **show platform atom imp-tbl backup** | Displays the imposition table on the line card for backup VCs. |
| **show platform atom disp-tbl backup** | Displays the disposition table on the line card for backup VCs. |

# show platform atom tbl-summary

To display the total number of pseudowires (PWs) programmed on the line card., use the**showplatformatomtbl-summary** command in privileged EXEC mode .

**show platform atom tbl-summary**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.1(1)S | This command was introduced. |

## Usage Guidelines

The **showplatformatomtbl-summary** command is used to determine the primaryPWs and backup PWs that are programmed.

## Examples

This example displays the total number of PWs programmed on the Line Card.

```
Router# show platform atom tbl-summary

 Total Number of entries(CWAN): 2, AToM Entries(LC): 2 Local Switching Entries(LC): 0
 AToM Entries Primary: 1, Backup: 1
```

## Related Commands

| Command | Description |
|---|---|
| **show platform atom imp-tbl local-vc-label** | Displays the imposition table on the line card for a VC based on the remote label. |
| **show platform atom disp-tbl local-vc-label** | Displays the disposition table on the line card for a VC based on the local label. |
| **show platform atom imp-tbl backup** | Displays the imposition table on the line card for backup VCs. |
| **show platform atom disp-tbl backup** | Displays the disposition table on the line card for backup VCs. |

# show platform condition

To display the currently active debug configuration, use the **show platform condition** command in privileged EXEC mode.

**show platform condition**

**Command Modes**

Privileged EXEC (#)

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.10.0S | This command was introduced on the Cisco ASR 1000 Series Aggregation Services Routers. |

### Example

The following is sample output of the **show platform condition** command:

```
Router# show platform condition

Conditional Debug Global State: Start

Conditions                                                                  Direction
------------------------------------------------------------------------------|---------
VoIP-Null0                                & IPV4 [2.2.2.2/24]          both
LI-Null0                                  & IPV4 [2.2.2.2/24]          both
GigabitEthernet0                          & IPV4 [2.2.2.2/24]          both
LIIN0                                     & IPV4 [2.2.2.2/24]          both
GigabitEthernet0/0/0                      & IPV4 [2.2.2.2/24]          both
GigabitEthernet0/0/1                      & IPV4 [2.2.2.2/24]          both
GigabitEthernet0/1/0                      & IPV4 [2.2.2.2/24]          both
GigabitEthernet0/1/1                      & IPV4 [2.2.2.2/24]          both
GigabitEthernet0/3/0                      & IPV4 [2.2.2.2/24]          both
GigabitEthernet0/3/1                      & IPV4 [2.2.2.2/24]          both
GigabitEthernet0/3/6                      & IPV4 [2.2.2.2/24]          both
GigabitEthernet0/3/7                      & IPV4 [2.2.2.2/24]          both
Loopback1                                 & IPV4 [2.2.2.2/24]          both
Overlay10                                 & IPV4 [2.2.2.2/24]          both
Overlay30                                 & IPV4 [2.2.2.2/24]          both
GigabitEthernet0/0/4.20                   & IPV4 [2.2.2.2/24]          both
Internal-RP                               & IPV4 [2.2.2.2/24]          both
Internal-Recycle                          & IPV4 [2.2.2.2/24]          both
GigabitEthernet0/0/2.EFP100               & IPV4 [2.2.2.2/24]          both
```

The following table describes the significant fields shown in the display.

***Table 25: show platform condition Field Descriptions***

| Field | Description |
|---|---|
| Conditions | Condition of platform debug. |
| Direction | Direction of platform debug. |

# show platform diag

To display diagnostic and debug information about individual platform components, use the **show platform diag** command in privileged EXEC mode.

**show platform diag**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.2 | This command was introduced on the Cisco ASR 1000 Series Aggregation Services Routers. |
| Cisco IOS XE Release 3.9S | This command was integrated into Cisco IOS XE Release 3.9S. |

## Usage Guidelines

This command can be used to display the debug and diagnostic information about the Cisco ASR 1000 shared port adapter (SPA) Interface Processor (SIP), SPA, Cisco ASR 1000 Embedded Services Processor (ESP), Cisco ASR 1000 Route Processor (RP), and power supplies. This command also indicates the status of the field replaceable unit (FRU) components in any Cisco ASR 1000 Series Router.

Use the **show platform diag** command to display the debug and diagnostic information related to your Cisco 4400 Series Integrated Services Router (ISR), any connected Service Modules (SM-X) or Network Interface Modules (NIMs), power supply for front panel Gigabit Ethernet (FPGE) ports, Fan Trays and other components of your router.

## Examples

The following is sample output from the **show platform diag** command. The Embedded Services Processor (ESP) is shown as F0 or F1. The RPs are shown as R0 or R1. The power supplies are shown as P0 and P1.

```
Device# show platform diag

Chassis type: ASR1004
Slot: 0, ASR1000-SIP10
Running state               : ok
Internal state              : online
Internal operational state  : ok
Physical insert detect time : 00:00:48 (4d22h ago)
Software declared up time   : 00:01:40 (4d22h ago)
CPLD version                : 07091401
Firmware version            : 12.2(33r)XNB
Sub-slot: 0/0, SPA-5X1GE-V2
Operational status          : ok
Internal state              : inserted
Physical insert detect time : 00:00:36 (4d22h ago)
Logical insert detect time  : 00:02:23 (4d22h ago)
Sub-slot: 0/1, SPA-2XT3/E3
Operational status          : ok
Internal state              : inserted
  Physical insert detect time : 00:00:36 (4d22h ago)
  Logical insert detect time  : 00:02:23 (4d22h ago)
```

```
Slot: R0, ASR1000-RP1
  Running state               : ok
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:00:48 (4d22h ago)
  Software declared up time   : 00:00:48 (4d22h ago)
  CPLD version                : 07062111
  Firmware version            : 12.2(33r)XNB
Sub-slot: R0/0,
  Running state               : ok, active
  Logical insert detect time  : 00:00:48 (4d22h ago)
  Became HA Active time       : 00:04:56 (4d22h ago)
Sub-slot: R0/1,
  Running state               : ok, standby
  Logical insert detect time  : 00:02:50 (4d22h ago)
Slot: F0, ASR1000-ESP10
  Running state               : ok, active
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:00:48 (4d22h ago)
  Software declared up time   : 00:01:40 (4d22h ago)
  Hardware ready signal time  : 00:00:49 (4d22h ago)
  Packet ready signal time    : 00:01:49 (4d22h ago)
  CPLD version                : 07051680
  Firmware version            : 12.2(33r)XNB
Slot: P0, ASR1004-PWR-AC
  State                       : ok
  Physical insert detect time : 00:01:40 (4d22h ago)
Slot: P1, ASR1004-PWR-AC
  State                       : ok
  Physical insert detect time : 00:01:40 (4d22h ago)
```

```
Device# show platform diag

Chassis type: CSR1000V

Slot: R0, CSR1000V
  Running state               : ok, active
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:00:37 (00:02:26 ago)
  Software declared up time   : 00:00:37 (00:02:26 ago)

Slot: F0, CSR1000V
  Running state               : ok, active
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:00:37 (00:02:26 ago)
  Software declared up time   : 00:00:57 (00:02:06 ago)
  Hardware ready signal time  : 00:00:56 (00:02:06 ago)
  Packet ready signal time    : 00:01:01 (00:02:02 ago)
```

### Cisco 4400 Series Integrated Services Router: Example

The following is a sample output from the **show platform diag** command.

```
Router# show platform diag

Chassis type: ISR4451/K9

Slot: 0, ISR4451/K9
```

```
  Running state               : ok
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:01:05 (6d23h ago)
  Software declared up time   : 00:01:46 (6d23h ago)
  CPLD version                : 12090323
  Firmware version           : 12.2(20120829:165313) [ciscouser-ESGROM_20120829_DELTA 101]


Sub-slot: 0/0, ISR4451-X-4x1GE
  Operational status          : ok
  Internal state              : inserted
  Physical insert detect time : 00:02:57 (6d23h ago)
  Logical insert detect time  : 00:02:57 (6d23h ago)

Slot: 1, ISR4451/K9
  Running state               : ok
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:01:05 (6d23h ago)
  Software declared up time   : 00:01:47 (6d23h ago)
  CPLD version                : 12090323
  Firmware version           : 12.2(20120829:165313) [ciscouser-ESGROM_20120829_DELTA 101]


Sub-slot: 1/0, SM-X-1T3/E3
  Operational status          : ok
  Internal state              : inserted
  Physical insert detect time : 00:02:57 (6d23h ago)
  Logical insert detect time  : 00:02:57 (6d23h ago)

Slot: 2, ISR4451/K9
  Running state               : ok
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:01:05 (6d23h ago)
  Software declared up time   : 00:01:48 (6d23h ago)
  CPLD version                : 12090323
  Firmware version           : 12.2(20120829:165313) [ciscouser-ESGROM_20120829_DELTA 101]


Slot: R0, ISR4451/K9
  Running state               : ok, active
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:01:05 (6d23h ago)
  Software declared up time   : 00:01:05 (6d23h ago)
  CPLD version                : 12090323
  Firmware version           : 12.2(20120829:165313) [ciscouser-ESGROM_20120829_DELTA 101]


Slot: F0, ISR4451/K9
  Running state               : ok, active
  Internal state              : online
  Internal operational state  : ok
  Physical insert detect time : 00:01:05 (6d23h ago)
  Software declared up time   : 00:02:20 (6d23h ago)
  Hardware ready signal time  : 00:00:00 (never ago)
  Packet ready signal time    : 00:02:29 (6d23h ago)
  CPLD version                : 12090323
  Firmware version           : 12.2(20120829:165313) [ciscouser-ESGROM_20120829_DELTA 101]


Slot: P0, Unknown
```

```
  State                       : ps, fail
  Physical insert detect time : 00:00:00 (never ago)

Slot: P1, XXX-XXXX-XX
  State                       : ok
  Physical insert detect time : 00:01:30 (6d23h ago)

Slot: P2, ACS-4450-FANASSY
  State                       : ok
  Physical insert detect time : 00:01:30 (6d23h ago)

Slot: GE-POE, Unknown
  State                       : NA
  Physical insert detect time : 00:00:00 (never ago)
```

The table below describes the significant fields shown in the display.

***Table 26: show platform diag Field Descriptions***

| Field | Description |
|---|---|
| Running state | The current online running state of the FRU component. |
| Internal state | The internal debug state of the FRU component for diagnostic purposes. |
| Internal operational state | The internal operational state of the FRU component for diagnostic purposes. |
| Physical insert detect time | The time of the most recent physical insertion of the FRU component detected by the platform code. |
| Software declared up time | The time that the software on the FRU component was declared running by the platform code. |
| Hardware ready signal time | The time that the hardware ready signal was detected by the platform code. |
| Packet ready signal time | The time that the ESP packet ready signal was detected by the platform code. |
| CPLD version | The Complex Programmable Logic Device (CPLD) version number. |
| Firmware version | The firmware ROM monitor (ROMMON) version number. |
| Logical insert detect time | The time that the SPA was logically detected by the platform code. |
| Became HA Active time | The time that this FRU became High Availability (HA) active. |

## Related Commands

| Command | Description |
|---|---|
| **show platform** | Displays platform information. |
| **show platform hardware** | Displays platform hardware information. |
| **show platform software** | Displays platform software information. |

# show platform discover-devices

To display PCI device information, use the **showplatformdiscover-devices**command in privileged EXEC mode.

**show platform discover-devices**

## Syntax Description

| | |
|---|---|
| **show platform discover-devices** | Displays PCI device information. |

## Command Modes

Privileged EXEC mode

## Command History

| Release | Modification |
|---|---|
| 15.1(1)T | This command was introduced for Cisco 3925E and Cisco 3945E Integrated Services Routers. |

## Usage Guidelines

Use the **showplatformdiscover-devices** command to display information about PCI devices on the router. The output shows the device name, interface slot and port, and detailed hardware information.

## Examples

The following sample output shows PCI device information for Cisco 3925E ISR.

```
Router#show platform discover-devices
Discovered PCI device GE 0/0, GE 0/1
  root_port=2, bus_no=1, device_no=0, func_no=0, root_device_id=2
  DeviceID=0x10C9, VendorID=0x8086, Command=0x0146, Status=0x0010
  Class=0x02/0x00/0x00, Revision=0x01, LatencyTimer=0x00, CacheLineSize=0x10
  BaseAddr0=0xFD220000, BaseAddr1=0x00000000
Discovered PCI device GE 0/2, GE 0/3
  root_port=3, bus_no=2, device_no=0, func_no=0, root_device_id=3
  DeviceID=0x10C9, VendorID=0x8086, Command=0x0146, Status=0x0010
  Class=0x02/0x00/0x00, Revision=0x01, LatencyTimer=0x00, CacheLineSize=0x10
  BaseAddr0=0xFD120000, BaseAddr1=0x00000000
Discovered PCI device PLX:
  root_port=6, bus_no=37, device_no=0, func_no=0, root_device_id=6
  DeviceID=0x8509, VendorID=0x10B5, Command=0x0007, Status=0x0010
  Class=0x06/0x04/0x00, Revision=0xAA, LatencyTimer=0x00, CacheLineSize=0x10
  BaseAddr0=0xF8F00000, BaseAddr1=0x00000000
  SecLat=0x00, SubBus=53, SecBus=38, PrimBus=37
  MemLimit=0xF8F0, MemBase=0xF100, PrefMemLimit=0x0001, PrefMemBase=0xFFF1
Discovered PCI device PLX:
  root_port=6, bus_no=38, device_no=1, func_no=0, root_device_id=6
  DeviceID=0x8509, VendorID=0x10B5, Command=0x0007, Status=0x0010
  Class=0x06/0x04/0x00, Revision=0xAA, LatencyTimer=0x00, CacheLineSize=0x10
  BaseAddr0=0x00000000, BaseAddr1=0x00000000
  SecLat=0x00, SubBus=40, SecBus=39, PrimBus=38
  MemLimit=0xF2F0, MemBase=0xF100, PrefMemLimit=0x0001, PrefMemBase=0xFFF1
```

*Table 27: Show Platform Discover-Devices Field Description*

| Field | Description |
|---|---|
| PCI Device | Identifies the PCI device on the router. |
| Root_port | Defines the root port address on the device. |

| Field | Description |
|---|---|
| Bus_no | Defines the bus number on the device. |
| Device_no | Defines the device number. |
| Func_no | Defines the function number. |
| Root_device_id | Defines the root device number. |
| DeviceID | Defines the device identifcation number. |
| VendorID | Defines the vendor identifcation number. |
| Operation Command | Defines the operation command. |
| Status of Device | Defines the status of device. |
| Class | Defines the class address. |
| Revision (type of device) | Defines type of device. |
| LatencyTimer | Defines the latency timer. |
| CacheLineSize | Defines cache line size. |
| Base Address | Address of Base. |
| Base Address 1 | Address of Base 1. |
| Secondary Latency Timer | Defines secondary latency timer. |
| SubBus | Defines subordinate Bus number. |
| SecBus | Defines secondary Bus number. |
| PrimBus | Defines primary Bus number. |
| DeviceID | Defines the device identifcation number. |
| MemLimit | Defines the memory limit. |
| MemBase | Defines the memory base. |
| PrefMemLimit | Defines the pre-fetchable memory limit. |
| PrefMemBase | Defines the pre-fetchable memory base. |

## Related Commands

| Command | Description |
|---|---|
| show platform cf | Shows CF support-related information. |
| show platform dma | Show DMA-related information. |
| show platform hw-module-power | Displays power settings of service modules. |

| Command | Description |
|---|---|
| show platform interrupt | Shows Interrupt-related information. |
| show platform io-controller | Displays IO-controller information. |
| show platform led | Shows LED-related information. |
| show platform nvram | Displays NVRAM-related information. |
| show platform versions | Displays versions/revisions of various modules. |
| show platform smbdev | Shows smbus slave devices. |
| show platform mgf | Shows multi-gigabit fabric information. |

# show platform dwdm alarm history

To display platform DWDM alarm history, use the **showplatformdwdmalarmhistory**command in privileged EXEC mode.

**show platform dwdm alarm history** [**port index**]

## Syntax Description

| | |
|---|---|
| *port index* | Specifies the port index.<br>• For a 7600-ES+ITU-2TG, the valid values for the port index are 1, 2.<br>• For a 7600-ES+ITU-4TG, the valid values for the port index are 1, 2, 3, 4. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2(33)SRD1 | This command was introduced on the Cisco 7600 series routers for the 7600-ES+ITU-2TG and the 7600-ES+ITU-4TG line cards only. |

## Usage Guidelines

If the port index is not specified, the alarm history (last 32 alarms) for all ports on that line card whose interface transport mode is Optical Transport Network (OTN) is displayed. If a port index is specified, the alarm history (last 32 alarms) for that particular port is displayed, if the interface transport mode of that port is OTN. An alarm is logged in the alarm history only if the reporting for that alarm is enabled. If reporting for an alarm is disabled with the no g709 otu report command or the no g709 odu report command, then neither the alarm declaration nor clearing will be logged in the alarm history.

## Examples

The following examples illustrate the command when interface TenGigabitEthernet 2/1 and interface TenGigabitEthernet 2/3 are configured with a transport-mode of OTN. Because the transport modes of interface TenGigabitEthernet 2/2 and interface TenGigabitEthernet 2/4 are not OTN, nothing is displayed for dwdm 2/2 and dwdm 2/4.

```
Router# show platform dwdm alarm history
dwdm 2/1 :
Current alarms in HW are
 LOS
 ---- LAST 32 ALARMS ----------
00. LOS declared                    , *Jan  7 2009 21:16:40.165 UTC
dwdm 2/3 :
Current alarms in HW are

 ---- LAST 32 ALARMS ----------
00. LOS cleared                     , *Jan  7 2009 21:14:32.709 UTC
01. LOS declared                    , *Jan  7 2009 21:14:02.625 UTC
Router# show platform dwdm alarm history 1
dwdm 2/1 :
Current alarms in HW are
 LOS
 ---- LAST 32 ALARMS ----------
00. LOS declared                    , *Jan  7 2009 21:16:40.165 UTC
Router# how platform dwdm alarm history 2
```

```
Router# show platform dwdm alarm history 3
dwdm 2/3 :
Current alarms in HW are

 ---- LAST 32 ALARMS ----------
00. LOS cleared                    , *Jan  7 2009 21:14:32.709 UTC
01. LOS declared                   , *Jan  7 2009 21:14:02.625 UTC
```

## Related Commands

| Command | Description |
|---|---|
| **show controllers dwdm** | Displays ITU-T G.709 alarms, alerts, and counters for a DWDM controller. |

# show platform hardware capacity

To display the capacities and utilizations for the hardware resources, use the **show platform hardware capacity** command in privileged EXEC mode.

**show platform hardware capacity** [*resource-type*]

**Syntax Description**

| | |
|---|---|
| *resource-type* | (Optional) Hardware resource type; see the "Usage Guidelines" section for the valid values. |

**Command Default**

This command has no default settings.

**Command Modes**

Privileged EXEC (#)

**Command History**

| Release | Modification |
|---|---|
| 12.2(18)SXF | This command was introduced. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2(33)SXI | This command was integrated into Cisco IOS Release 12.2(33)SXI. Support was added for the **ibc** and **rewrite-engine** keywords. |

**Usage Guidelines**

The valid values for *resource-type* are as follows:

- **acl** --Displays the capacities and utilizations for ACL/QoS TCAM resources.
- **cpu** --Displays the capacities and utilizations for CPU resources.
- **eobc** --Displays the capacities and utilizations for Ethernet out-of-band channel resources.
- **fabric** --Displays the capacities and utilizations for Switch Fabric resources.
- **flash** --Displays the capacities and utilizations for Flash/NVRAM resources.
- **forwarding** --Displays the capacities and utilizations for Layer 2 and Layer 3 forwarding resources.
- **ibc** --Displays the capacities and utilizations for interboard communication resources.
- **interface** --Displays the capacities and utilizations for interface resources.
- **monitor** --Displays the capacities and utilizations for SPAN resources.
- **multicast** --Displays the capacities and utilizations for Layer 3 multicast resources.
- **netflow** --Displays the capacities and utilizations for NetFlow resources.
- **pfc** --Displays the capacities and utilizations for all the PFC resources including Layer 2 and Layer 3 forwarding, NetFlow, CPU rate limiters, and ACL/QoS TCAM resources.
- **power** --Displays the capacities and utilizations for power resources.
- **qos** --Displays the capacities and utilizations for QoS policer resources.
- **rate-limit** --Displays the capacities and utilizations for CPU rate limiter resources.

- **rewrite-engine** --Displays the packet drop and performance counters of the central rewrite engine on supervisors and line cards. For detailed information, see the **show platform hardware capacity rewrite-engine** command documentation.
- **system** --Displays the capacities and utilizations for system resources.
- **vlan** --Displays the capacities and utilizations for VLAN resources.

The **show platform hardware capacity cpu**command displays the following information:

- CPU utilization for the last 5 seconds (busy time and interrupt time), the percentage of the last 1-minute average busy time, and the percentage of the last 5-minute average busy time.
- Processor memory total available bytes, used bytes, and percentage used.
- I/O memory total available bytes, used bytes, and percentage used.

The **show platform hardware capacity eobc**command displays the following information:

- Transmit and receive rate
- Packets received and packets sent
- Dropped received packets and dropped transmitted packets

The **show platform hardware capacity forwarding** command displays the following information:

- The total available entries, used entries, and used percentage for the MAC tables.
- The total available entries, used entries, and used percentage for the FIB TCAM tables. The display is done per protocol base.
- The total available entries, used entries, and used percentage for the adjacency tables. The display is done for each region in which the adjacency table is divided.
- The created entries, failures, and resource usage percentage for the NetFlow TCAM and ICAM tables.
- The total available entries and mask, used entries and mask, reserved entries and mask, and entries and mask used percentage for the ACL/QoS TCAM tables. The output displays the available, used, reserved, and used percentage of the labels. The output displays the resource of other hardware resources that are related to the ACL/QoS TCAMs (such as available, used, reserved, and used percentage of the LOU, ANDOR, and ORAND).
- The available, used, reserved, and used percentage for the CPU rate limiters.

The **show platform hardware capacity interface** command displays the following information:

- Tx/Rx drops--Displays the sum of transmit and receive drop counters on each online module (aggregate for all ports) and provides the port number that has the highest drop count on the module.
- Tx/Rx per port buffer size--Summarizes the port-buffer size on a per-module basis for modules where there is a consistent buffer size across the module.

The **show platform hardware capacity monitor** command displays the following SPAN information:

- The maximum local SPAN sessions, maximum RSPAN sessions, maximum ERSPAN sessions, and maximum service module sessions.

- The local SPAN sessions used/available, RSPAN sessions used/available, ERSPAN sessions used/available, and service module sessions used/available.

The **show platform hardware capacity multicast** command displays the following information:

- Multicast Replication Mode: ingress and egress IPv4 and IPv6 modes.
- The MET table usage that indicates the total used and the percentage used for each module in the system.
- The bidirectional PIM DF table usage that indicates the total used and the percentage used.

The **show platform hardware capacity system**command displays the following information:

- PFC operating mode (PFC Version: PFC3A, PFC3B, unknown, and so forth)
- Supervisor redundancy mode (RPR, RPR+, SSO, none, and so forth)
- Module-specific switching information, including the following information:
  - Part number (WS-SUP720-BASE, WS-X6548-RJ-45, and so forth)
  - Series (supervisor engine, fabric, CEF720, CEF256, dCEF256, or classic)
  - CEF Mode (central CEF, dCEF)

The **show platform hardware capacity vlan** command displays the following VLAN information:

- Total VLANs
- VTP VLANs that are used
- External VLANs that are used
- Internal VLANs that are used
- Free VLANs

## Examples

This example shows how to display CPU capacity and utilization information for the route processor, the switch processor, and the LAN module in the Cisco 7600 series router:

```
Router# show platform hardware capacity cpu
CPU Resources
  CPU utilization: Module             5 seconds       1 minute       5 minutes
                   1  RP               0% /  0%            1%              1%
                   1  SP               5% /  0%            5%              4%
                   7                  69% /  0%           69%             69%
                   8                  78% /  0%           74%             74%
  Processor memory: Module   Bytes:       Total          Used           %Used
                    1  RP             176730048       51774704             29%
                    1  SP             192825092       51978936             27%
                    7                 195111584       35769704             18%
                    8                 195111584       35798632             18%
  I/O memory: Module         Bytes:       Total          Used           %Used
              1  RP                     35651584       12226672             34%
              1  SP                     35651584        9747952             27%
              7                         35651584        9616816             27%
              8                         35651584        9616816             27%
Router#
```

This example shows how to display EOBC-related statistics for the route processor, the switch processor, and the DFCs in the Cisco 7600 series router:

```
Router# show platform hardware capacity eobc
EOBC Resources
  Module                      Packets/sec     Total packets     Dropped packets
  1  RP      Rx:                       61            108982                   0
             Tx:                       37             77298                   0
  1  SP      Rx:                       34            101627                   0
             Tx:                       39            115417                   0
  7          Rx:                        5             10358                   0
             Tx:                        8             18543                   0
  8          Rx:                        5             12130                   0
             Tx:                       10             20317                   0
Router#
```

This example shows how to display the current and peak switching utilization:

```
Router# show platform hardware capacity fabric
Switch Fabric Resources
  Bus utilization: current is 100%, peak was 100% at 12:34 12mar45
  Fabric utilization:      ingress                    egress
      Module channel speed current peak               current peak
        1      0        20G   100%  100% 12:34 12mar45  100%    100% 12:34 12mar45
        1      1        20G   12%    80% 12:34 12mar45   12%     80% 12:34 12mar45
        4      0        20G   12%    80% 12:34 12mar45   12%     80% 12:34 12mar45
       13      0         8G   12%    80% 12:34 12mar45   12%     80% 12:34 12mar45
Router#
```

This example shows how to display information about the total capacity, the bytes used, and the percentage that is used for the Flash/NVRAM resources present in the system:

```
Router# show platform hardware capacity flash
Flash/NVRAM Resources
  Usage: Module Device               Bytes:      Total          Used     %Used
         1  RP  bootflash:                     31981568      15688048       49%
         1  SP  disk0:                        128577536     105621504       82%
         1  SP  sup-bootflash:                 31981568      29700644       93%
         1  SP  const_nvram:                     129004           856        1%
         1  SP  nvram:                            391160         22065        6%
         7      dfc#7-bootflash:               15204352        616540        4%
         8      dfc#8-bootflash:               15204352             0        0%
Router#
```

This example shows how to display the capacity and utilization of the EARLs present in the system:

```
Router# show platform hardware capacity forwarding
L2 Forwarding Resources
           MAC Table usage:   Module  Collisions  Total       Used       %Used
                              6               0  65536         11          1%
             VPN CAM usage:                       Total       Used       %Used
                                                    512          0          0%
L3 Forwarding Resources
             FIB TCAM usage:                      Total       Used       %Used
                  72 bits (IPv4, MPLS, EoM)     196608         36          1%
                 144 bits (IP mcast, IPv6)       32768          7          1%
                     detail:      Protocol                   Used       %Used
                                  IPv4                         36          1%
                                  MPLS                          0          0%
                                  EoM                           0          0%
                                  IPv6                          4          1%
                                  IPv4 mcast                    3          1%
                                  IPv6 mcast                    0          0%
            Adjacency usage:                      Total       Used       %Used
```

```
                                          1048576         175          1%
     Forwarding engine load:
                    Module       pps   peak-pps                    peak-time
                    6              8       1972  02:02:17 UTC Thu Apr 21 2005
Netflow Resources
          TCAM utilization:       Module       Created      Failed       %Used
                                  6                 1           0          0%
          ICAM utilization:       Module       Created      Failed       %Used
                                  6                 0           0          0%
                 Flowmasks:   Mask#   Type        Features
                        IPv4:     0   reserved    none
                        IPv4:     1   Intf FulNAT_INGRESS NAT_EGRESS FM_GUARDIAN
                        IPv4:     2   unused      none
                        IPv4:     3   reserved    none
                        IPv6:     0   reserved    none
                        IPv6:     1   unused      none
                        IPv6:     2   unused      none
                        IPv6:     3   reserved    none
CPU Rate Limiters Resources
              Rate limiters:       Total         Used      Reserved       %Used
                    Layer 3            9            4             1         44%
                    Layer 2            4            2             2         50%
ACL/QoS TCAM Resources
  Key: ACLent - ACL TCAM entries, ACLmsk - ACL TCAM masks, AND - ANDOR,
       QoSent - QoS TCAM entries, QOSmsk - QoS TCAM masks, OR - ORAND,
       Lbl-in - ingress label, Lbl-eg - egress label, LOUsrc - LOU source,
       LOUdst - LOU destination, ADJ - ACL adjacency
  Module ACLent ACLmsk QoSent QoSmsk Lbl-in Lbl-eg LOUsrc LOUdst  AND  OR  ADJ
  6          1%     1%     1%     1%     1%     1%     0%     0%   0%  0%   1%
Router#
```

This example shows how to display the interboard communication resources:

```
Router# show platform hardware capacity ibc
IBC Resources
  Module                     Packets/sec     Total packets     Dropped packets
  1  RP      Rx:                        3           5001419                   0
             Tx:                        1           1943884                   0
Router#
```

This example shows how to display the interface resources:

```
Router# show platform hardware capacity interface
Interface Resources
  Interface drops:
    Module    Total drops:    Tx            Rx      Highest drop port:  Tx  Rx
    9                          0             2                           0  48
  Interface buffer sizes:
    Module                              Bytes:     Tx buffer           Rx buffer
         1                                             12345               12345
         5                                             12345               12345
Router#
```

This example shows how to display SPAN information:

```
Router# show platform hardware capacity monitor
SPAN Resources
  Source sessions: 2 maximum, 0 used
    Type                                    Used
    Local                                      0
    RSPAN source                               0
    ERSPAN source                              0
    Service module                             0
```

```
  Destination sessions: 64 maximum, 0 used
    Type                                  Used
    RSPAN destination                        0
    ERSPAN destination (max  24)             0
Router#
```

This example shows how to display the capacity and utilization of resources for Layer 3 multicast functionality:

```
Router# show platform hardware capacity
 multicast
L3 Multicast Resources
  IPv4 replication mode: ingress
  IPv6 replication mode: ingress
  Bi-directional PIM Designated Forwarder Table usage: 4 total, 0 (0%) used
  Replication capability: Module                                IPv4        IPv6
                          5                                   egress      egress
                          9                                  ingress     ingress
  MET table Entries: Module                                 Total    Used    %Used
                     5                                      65526       6       0%
Router#
```

This example shows how to display information about the system power capacities and utilizations:

```
Router# show platform hardware capacity power
Power Resources
  Power supply redundancy mode: administratively combined
                                                        operationally combined
  System power: 1922W, 0W (0%) inline, 1289W (67%) total allocated
  Powered devices: 0 total
Router#
```

This example shows how to display the capacity and utilization of QoS policer resources per EARL in the Cisco 7600 series router:

```
Router# show platform hardware capacity qos
 QoS Policer Resources
  Aggregate policers: Module                      Total         Used     %Used
                      1                            1024          102       10%
                      5                            1024            1        1%
  Microflow policer configurations: Module        Total         Used     %Used
                                    1                64           32       50%
                                    5                64            1        1%
Router#
```

This example shows how to display information about the key system resources:

```
Router# show platform hardware capacity system
System Resources
  PFC operating mode: PFC3BXL
  Supervisor redundancy mode: administratively rpr-plus, operationally rpr-plus
  Switching Resources: Module   Part number              Series      CEF mode
                       5        WS-SUP720-BASE        supervisor           CEF
                       9        WS-X6548-RJ-45            CEF256           CEF
Router#
```

This example shows how to display VLAN information:

```
Router# show platform hardware capacity vlan
VLAN Resources
```

```
  VLANs: 4094 total, 10 VTP, 0 extended, 0 internal, 4084 free
Router#
```

## Related Commands

| Command | Description |
|---|---|
| **show msfc** | Displays MSFC information. |
| **show platform** | Displays platform information. |
| **show platform hardware capacity rewrite-engine** | Displays the packet drop and performance counters of the central rewrite engine on supervisors and line cards. |

# show platform hardware capacity rewrite-engine

To display the packet drop and performance counters of the central rewrite engine on supervisors and line cards, use the **show platform hardware capacity rewrite-engine** command in privileged EXEC mode.

**show platform hardware capacity rewrite-engine** {**drop** | **performance**} [**slot** *number*] [**rate** [*sample interval*]][ **details**]

## Syntax Description

| | |
|---|---|
| drop | Displays the central rewrite engine drop counter values. |
| performance | Displays the central rewrite engine current performance counter values or the performance rate. |
| **slot** *number* | (Optional) Displays the counter values for the module in the specified slot. If no slot is specified, the counters are displayed for each slot. |
| **rate** [*sample_interval*] | (Optional) Displays the drop rate or rewrite rate for a sample interval in msec between 1 and 1000. The default interval is 50 msec. |
| details | (Optional) Displays each individual drop counter with its name and register ID number. This keyword is not available with the **performance** keyword. |

## Command Default

If the sample interval is not specified, the default interval is 50 msec.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(33)SXI | This command was introduced. |
| 15.1(1)S | Support was added for Cisco 7600 routers. This command replaces the **show platform hardware central-rewrite**command. |

## Usage Guidelines

In the output of the **show platform hardware capacity rewrite-engine performance** command output, a value of ﷺN/Aﷺ means the slot/channel has a rewrite engine, but does not support performance counters.

## Examples

The following sample output of the **show platform hardware capacity rewrite-engine drop**command displays the packet drop counters of the central rewrite engine in all installed supervisors and line cards:

```
Router# show platform hardware capacity rewrite-engine drop
slot channel   packet drops      total overruns
----+---------+-----------------+-----------------+
1    0         0                 0
5    0         15440040          22
7    0         44                0
7    1         0                 0
```

## Examples

The following sample output of the **show platform hardware capacity rewrite-engine drop**command displays the packet drop counters of the central rewrite engine in all installed supervisors and line cards:

```
Router# show platform hardware capacity rewrite-engine drop
slot channel   packet drops      total overruns
----+---------+-----------------+------------------+
1    0         0                 0
5    0         15440040          22
7    0         44                0
7    1         0                 0
```

The following sample output of the **show platform hardware capacity rewrite-engine drop**command displays a detailed report of the packet drop counters of the module in slot 1:

```
Router# show platform hardware capacity rewrite-engine drop slot 1 details
slot channel drop_id description          packet drops     total overruns
----+-------+-------+--------------------+----------------+--------------+
1    0       0x5ED   DROP NON BPDU        0                0
1    0       0x5EB   DROP BPDU            0                0
1    1       0x5ED   DROP NON BPDU        0                0
1    1       0x5EB   DROP BPDU            0                0
```

The following sample output of the **show platform hardware capacity rewrite-engine drop**command displays the packet drop counters of the module in slot 5 over the default sample interval of 50 msec:

```
Router# show platform hardware capacity rewrite-engine drop slot 5 rate
slot channel   drop rate [pps]        overrun [Y/N]
----+---------+---------------------+-------------+
5    0         120079                Y
```

The following sample output of the **show platform hardware capacity rewrite-engine drop**command displays the packet drop counters of the module in slot 5 over a sample interval of 20 msec:

```
Router# show platform hardware capacity rewrite-engine drop slot 5 rate 20
slot channel   drop rate [pps]        overrun [Y/N]
----+---------+---------------------+-------------+
5    0         180000                N
```

The following sample output of the **show platform hardware capacity rewrite-engine drop**command displays the performance counters of the central rewrite engine in all installed supervisors and line cards:

```
Router# show platform hardware capacity rewrite-engine performance
slot channel perf_id description          packets          total overruns
----+-------+-------+--------------------+----------------+--------------+
1    0       0x235   FAB RX 0             12870            0
1    0       0x237   FAB RX 1             0                0
1    0       0x27B   FAB TX 0             164              0
1    0       0x27F   FAB TX 1             0                0
1    0       0x350   REPLICATION ML3      0                0
1    0       0x351   REPLICATION ML2      0                0
1    0       0x352   RECIRC L2            0                0
1    0       0x353   RECIRC L3            0                0
1    0       0x34C   SPAN TX 0            0                0
1    0       0x34D   SPAN TX 1            0                0
1    0       0x34E   SPAN RX 0            0                0
1    0       0x34F   SPAN RX 1            0                0
1    0       0x354   SPAN TERMINATION     0                0
```

```
1    1       0x235   FAB RX 0            106065          0
1    1       0x237   FAB RX 1            0               0
1    1       0x27B   FAB TX 0            180806          0
1    1       0x27F   FAB TX 1            0               0
1    1       0x350   REPLICATION ML3     0               0
1    1       0x351   REPLICATION ML2     0               0
1    1       0x352   RECIRC L2           0               0
1    1       0x353   RECIRC L3           0               0
1    1       0x34C   SPAN TX 0           0               0
1    1       0x34D   SPAN TX 1           0               0
1    1       0x34E   SPAN RX 0           201             0
1    1       0x34F   SPAN RX 1           90201           0
1    1       0x354   SPAN TERMINATION    0               0
4    0       N/A
5    0       0xBE    FAB RX 0            181496          0
5    0       0xC0    FAB RX 1            0               0
5    0       0x112   FAB TX 0            992089          0
5    0       0x116   FAB TX 1            0               0
5    0       0x299   REPLICATION ML3     0               0
5    0       0x29A   REPLICATION ML2     0               0
5    0       0x29B   RECIRC L2           0               0
5    0       0x29C   RECIRC L3           0               0
5    0       0x295   SPAN TX 0           91166           0
5    0       0x296   SPAN TX 1           91313           0
5    0       0x297   SPAN RX 0           1               0
5    0       0x298   SPAN RX 1           1               0
5    0       0x29D   SPAN TERMINATION    0               0
```

The following sample output of the **show platform hardware capacity rewrite-engine drop**command displays the performance counters of the module in slot 5:

```
Router# show platform hardware capacity rewrite-engine performance slot 5
slot channel perf_id description          packets          total overruns
----+-------+-------+--------------------+----------------+--------------+
5    0       0xBE    FAB RX 0            1330            0
5    0       0xC0    FAB RX 1            0               0
5    0       0x112   FAB TX 0            715253          0
5    0       0x116   FAB TX 1            0               0
5    0       0x299   REPLICATION ML3     0               0
5    0       0x29A   REPLICATION ML2     0               0
5    0       0x29B   RECIRC L2           0               0
5    0       0x29C   RECIRC L3           0               0
5    0       0x295   SPAN TX 0           1022            0
5    0       0x296   SPAN TX 1           1152            0
5    0       0x297   SPAN RX 0           1               0
5    0       0x298   SPAN RX 1           1               0
5    0       0x29D   SPAN TERMINATION    0               0
```

The following sample output of the **show platform hardware capacity rewrite-engine drop**command displays the performance counters of the module in slot 5 over the default sample interval of 50 msec:

```
Router# show platform hardware capacity rewrite-engine performance slot 5 rate
slot channel perf_id description          packet rate[pps] overrun [Y/N]
----+-------+-------+--------------------+----------------+--------------+
5    0       0xBE    FAB RX 0            11680           N
5    0       0xC0    FAB RX 1            0               N
5    0       0x112   FAB TX 0            11680           N
5    0       0x116   FAB TX 1            0               N
5    0       0x299   REPLICATION ML3     0               N
5    0       0x29A   REPLICATION ML2     0               N
5    0       0x29B   RECIRC L2           0               N
5    0       0x29C   RECIRC L3           0               N
5    0       0x295   SPAN TX 0           5840            N
```

```
5    0       0x296   SPAN TX 1           5840            N
5    0       0x297   SPAN RX 0           0               N
5    0       0x298   SPAN RX 1           0               N
5    0       0x29D   SPAN TERMINATION    0               N
```

## Related Commands

| Command | Description |
|---|---|
| **clear platform hardware capacity rewrite-engine counter** | Clears the packet drop and performance counters of the central rewrite engine on supervisors and line cards. |

# show platform hardware interface

To display information about an interface, use the **showplatformhardwareinterface**command in privileged EXEC or diagnostic mode.

**show platform hardware interface type number plim qos input map**

**Channelized T3 Shared Port Adapters**
**show platform hardware interface serial slot/subslot/port/t1-number:channel-group plim qos input map**

**Channelized T1/E1 Shared Port Adapters**
**show platform hardware interface serial slot/subslot/port:channel-group plim qos input map**

**Shared Port Adapters**
**show platform hardware interface type slot/subslot/port [.subint] plim qos input map**

## Syntax Description

| | |
|---|---|
| *type* | Interface type. The table in the "Usage Guidelines" contains a list of interface types. |
| number | Port number on the selected interface. |
| **plim qos input map** | Physical Line Interface Module (PLIM) QoS input mapping information. |
| serial | Serial interface. |
| slot/subslot/port/t1-number:channel-group | The following applies to Channelized T3 shared port adapters:<br>• slot/--Chassis slot where the Cisco ASR 1000 Series SPA interface processor (SIP) is installed.<br>• subslot/--Secondary slot number of the SIP where the Cisco ASR 1000 Series shared port adapter (SPA) is installed.<br>• port/--Interface number on the SPA.<br>• t1-number--T1 time slot in the T3 line. The value can be from 1 to 28.<br>• channel-group--Number 0 to 23 of the DS0 link on the T1 channel.<br>**Note**<br>When a port on a Channelized T3 SPA is configured to be in unchannelized mode, only the slot/subslot/port/ arguments are used to specify the unchannelized T3 interface. The t1-number and channel-group arguments are not used. |

| | |
|---|---|
| slot/subslot/port: channel-group | The following applies to Channelized T1/E1 shared port adapters:<br>• slot/--Chassis slot where the Cisco ASR 1000 Series SPA interface processor (SIP) is installed.<br>• subslot/--Secondary slot number of the SIP where the Cisco ASR 1000 Series shared port adapter (SPA) is installed.<br>• port--Interface number on the SPA.<br>• channel-group--Number 0 to 30 of the DS0 link on the T1 channel. |
| slot/subslot/port [.subint] | The following applies to shared port adapters other than the Channelized T3 or Channelized T1/E1 shared port adapters:<br>• slot/--Chassis slot where the Cisco ASR 1000 Series SPA interface processor (SIP) is installed.<br>• subslot/--Secondary slot number of the SIP where the Cisco ASR 1000 Series shared port adapter (SPA) is installed.<br>• port--Interface number on the SPA.<br>• (Optional) .subint--Subinterface number (for those SPAs that support subinterface configuration). |

## Command Default

No default behavior or values

## Command Modes

Privileged EXEC (#)

Diagnostic (diag)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.1 | This command was introduced on the Cisco ASR 1000 Series Routers. |

## Usage Guidelines

This command displays platform-specific information and configuration information related to a specific interface.

The table below lists the interface types.

***Table 28: Interface Types***

| Interface Type | Description |
|---|---|
| async | Asynchronous interface |
| auto-template | Auto-template interface |
| bvi | Bridge group virtual interface |
| ctunnel | Connectionless Network Service (CLNS) tunnel (CTunnel) interface |
| container | Container interface |

| Interface Type | Description |
|---|---|
| dialer | Dialer interface |
| esconphy | ESCON interface |
| fastethernet | Fast Ethernet IEEE 802.3 interface |
| filter | Filter interface |
| filtergroup | Filter group interface |
| gigabitethernet | Gigabit Ethernet IEEE 802.3 interface. |
| group-async | Group asynchronous interface |
| lex | LAN extender (LEX) interface |
| longreachethernet | Long Reach Ethernet interface |
| loopback | Loopback interface |
| multilink | Multilink group interface |
| null | Null interface |
| pos | Packet over SONET (POS) interface |
| port-channel | Ethernet channel of interfaces |
| portgroup | Port group interface |
| pos-channel | POS channel of interfaces |
| sbc | Session border controller interface |
| sysclock | Telecom bus clock controller interface |
| serial | Serial interface |
| tunnel | Tunnel interface |
| vif | Pragmatic General Multicast (PGM) host interface |
| virtual-ppp | Virtual point-to-point (PPP) interface |
| virtual-template | Virtual template interface |
| virtual-tokenring | Virtual Token Ring interface |
| vlan | Catalyst VLAN interface |
| fcpa | Fiber Channel interface |
| multiservice | Multiservice interface |
| voabyapssin | Variable optical attenuator (VOA) bypass-in interface |

| Interface Type | Description |
|---|---|
| voabyapssout | VOA bypass-out interface |
| voafilterin | VOA filter-in interface |
| voafilterout | VOA filter-out interface |
| voain | VOA-in interface |
| voaout | VOA-out interface |

## Examples

Packets can be classified based on the IP precedence, IPv6 traffic class, MPLS experimental bits, or VLAN TOS bits. In the following example, incoming packets with IP precedence 6 or 7, IPv6 packets with traffic class 46, and MPLS packets with experimental bits 6 or 7 are classified as high priority packets:

```
Router# show platform hardware interface gigabitethernet 0/0/0 plim qos input map
Interface GigabitEthernet0/0/0
Low Latency Queue(High Priority):
IP PREC, 6, 7
IPv6 TC, 46
MPLS EXP, 6, 7
```

## Related Commands

| Command | Description |
|---|---|
| show platform hardware port | Displays information about an interface port on a shared port adapter (SPA). |
| show platform hardware slot | Displays information about the processor in a chassis slot. |
| show platform hardware subslot | Displays information about a shared port adapter (SPA). |

# show platform hardware network-clocks

To display network clocks for an ES+ line card, use the **showplatformhardwarenetwork-clocks**command in privileged EXEC mode.

**show platform hardware network-clocks** [**bits** | **zl30138**]

## Syntax Description

| | |
|---|---|
| *bits* | Specifies uilding Integrated Timing Supply (BITS) element. |
| *zl30138* | Specifies ZL30138 SONET/SDH/10GbE System Synchronizer. |
| **sec GNSS** | Displays the standby GNSS module device information. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2(33)SRD1 | This command was introduced on the Cisco 7600 series routers for ES+ line cards only. |

## Examples

The following example shows how the **showplatformhardwarenetwork-clocks**command is used to display network clocks:

```
Router# show platform hardware network-clocks

Local Loop Timing:

    Port 1: N    Port 2: N    Port 3: N    Port 4: N

Backplane Bus Status and Source:

    Primary   : Disabled, Port 0 RX_DEMAP Clock
    Secondary : Disabled, Port 0 RX_DEMAP Clock
    BITS      : Disabled, Port 0 RX_DEMAP Clock

ZL30138 Configuration and Status:

    DPLL1: Failure (4)
        Mode of Operation  : Manual Freerun
        Selected Reference : 0
        Ref0 Priority : 15        Ref1 Priority : 15
        Ref2 Priority : 15        Ref3 Priority : 15
        Ref4 Priority : 15        Ref5 Priority : 15
        Ref6 Priority : 15        Ref7 Priority : 15

    Reference Monitoring: Custom A frequency 25000 kHz
        Ref#    SCM    CFM    GST    PFM    Mode      Detected
        ------------------------------------------------------------
        0       1      1      1      1      CustA     38.88 MHz
        1       1      1      1      1      CustA     19.44 MHz
        2       0      0      0      0      Auto      77.76 MHz
        3       1      1      1      1      CustA     not detected
        4       1      1      1      1      Auto      not detected
```

```
        5       1       1       1       1       Auto      not detected
        6       1       1       1       1       Auto      not detected
        7       1       1       1       1       Auto      not detected

BITS Configuration and Status:

    Signal Type   : T1 ESF Framing
    Clock Divider : 1.544 MHz


Router# show platform hardware network-clocks | sec GNSS
GNSS status
  GNSS device: not detected
  Lock status: Disabled
  Survey progress: 0
  Satelite count: 0
  Firmware version: 0.0
  Firmware update progress: NA
  GNSS TAM Authentication: Not applicable
  Serial number:
```

## Related Commands

| Command | Description |
|---|---|
| clock source | Specifies the interface clock source type. |
| network-clock select | Selects a source of network clock. |
| **show network-clocks** | Displays the current configured and active network clock sources. |

# show platform hardware pp active interface all

Use this command to verify the bandwidth and port speed.

**show platform hardware pp active interface all**

There are no keywords for this command.

## Command Default

None

## Command Modes

Privileged EXEC

## Examples

The following example shows how to verify the bandwidth and port speed:

```
Router#show platform hardware pp active interface all
Interface manager platform keys
-----------------------------------------------
Name: TenGigabitEthernet0/4/7, Asic: 0, hwidx: 9
lpn: 0, ppn: 9, gid: 9, mac: c8f9.f98d.202b
InLportId: 0, ELportId: 0, dpidx: 31, l3ID: 25
port_flags: 0, port_speed: 10000 Mbps, efp_count: 0, destIndex: 9, intType: 1
etherchnl: 0, efp: 0, bdi: 0, l2PhyIf: 0, l3PhyIf: 1, l3TDM: 0, loopBack: 0
tunnel: 0, tunneltp: 0, icmp_flags: 0, icmp6_flags: 0
bandwidth: 10000000, fcid: 0, cid: 0, mpls_tbid: 0, protocols: 4
v4_netsmask: 8, v4_tableid: 8, v6_tableid: 65535, vrf_tbid_dstrm: , snmp_index: 0
bd_id: 0, encap: 1, ip_mtu: 1500, l2_max_tu: 1500, l2_min_tu: 0
vrfid: 8, enctype: 0, admin_state: 1, admin_state_oir: 0
Name: TenGigabitEthernet0/4/6, Asic: 0, hwidx: 10
lpn: 0, ppn: 10, gid: 10, mac: c8f9.f98d.202a
InLportId: 0, ELportId: 0, dpidx: 30, l3ID: 24
port_flags: 0, port_speed: 10000 Mbps, efp_count: 0, destIndex: 10, intType: 1
etherchnl: 0, efp: 0, bdi: 0, l2PhyIf: 0, l3PhyIf: 1, l3TDM: 0, loopBack: 0
tunnel: 0, tunneltp: 0, icmp_flags: 0, icmp6_flags: 0
bandwidth: 10000000, fcid: 0, cid: 0, mpls_tbid: 0, protocols: 4
v4_netsmask: 8, v4_tableid: 6, v6_tableid: 65535, vrf_tbid_dstrm: , snmp_index: 0
bd_id: 0, encap: 1, ip_mtu: 1500, l2_max_tu: 1500, l2_min_tu: 0
vrfid: 6, enctype: 0, admin_state: 1, admin_state_oir: 0
```

## Related Commands

| Command | Description |
|---|---|
| **hw-module subslot** *slot* / *subslot* **ether-mode 10G** | Configures the 10G mode from 1G mode. |
| **hw-module subslot** *slot* / *subslot* **ether-mode 1G** | Configures the 1G mode from 10G mode. |

# show platform hardware pp active resource-usage monitor

To display the current utilizations and the maximum capacities available in the hardware for various resources, use the **show platform hardware pp active resource-usage monitor** command in privileged EXEC mode.

**show platform hardware pp active resource-usage monitor**

## Syntax Description

This command has no arguments or keywords.

## Command Default

This command has no default settings.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE 17.15.2 | This command was introduced. |

## Examples

The following is sample output of the **show platform hardware pp active resource-usage monitor** command:

```
Router# show platform hardware pp active resource-usage monitor
HW Resource and Scale Monitoring

Table Configuration

Tbl-ID    Tbl-Name                 Size      Width     AD Width    Num ent.   ~Capacity
-------------------------------------------------------------------------------------
13        LSR IP SHARED            163840    80        128         19         163840
14        LSR IP SHARED FOR IP     163840    80        128         0          163840
15        LSR IP SHARED FOR LSR    163840    80        128         0          163840


Printing all entries in SEM A


-------------------------------------------------------------------------------------
Entry  1:   Prefix= 1,   Key (include prefix)=0x00000021   ffffffff   Payload=0x00004064

Entry  2:   Prefix=10,   Key (include prefix)=0x00000140   00008902   Payload=0x000046b0

Entry  3:   Prefix= 9,   Key (include prefix)=0x00000120   00000007   Payload=0x000046b0

Entry  4:   Prefix= 8,   Key (include prefix)=0x00000100   00000001   Payload=0x00000000

Entry  5:   Prefix=12,   Key (include prefix)=0x00000180   00000000   Payload=0x00005000

Printing all entries in SEM B


-------------------------------------------------------------------------------------
Entry  1:   Prefix=10,   Key (include prefix)=0x00000140   00008902   Payload=0x000046b0

Entry  2:   Prefix= 6,   Key (include prefix)=0x000000c0   00000004   Payload=0x00000000
```

```
Entry  3:   Prefix= 7,   Key (include prefix)=0x000000e0   00000047   Payload=0x00000000

Entry  4:   Prefix=13,   Key (include prefix)=0x000001a0   00000000   Payload=0x00001000

Entry  5:   Prefix=13,   Key (include prefix)=0x000001a0   00000002   Payload=0x00001001

Entry  6:   Prefix=13,   Key (include prefix)=0x000001a0   00000011   Payload=0x00008001

Printing all entries pool

Pool                                    Total number of entr  Used entries   Lowest entry
 ID is
-------------------------------------------------------------------------------------------------
FECs for global use                      31744                 12             1024

Ingress LIF bank allocation (A+ and belo  63                   2              1

QOS INGRESS LIF/COS IDs                  65536                 33             0


ID/s Summary Information for FEC and Lif:
ID-Name               Index     Asic      Used      Free       NextFree    Frag?     nBlocks

-------------------------------------------------------------------------------------------------
FEC ID                2         0         12        31732      1024        0         0

Ingress Static LIF I  3         0         28        61412      4096        0         0

Egress Static LIF ID  4         0         26        61414      4096        0         0

Ingress Dynamic LIF   5         0         2         61438      4096        0         4

Egress Dynamic LIF I  6         0         18        61422      4096        0         15

Ingress LIF ID        7         0         0         61440      4096        0         4

Egress LIF ID         8         0         0         61440      4096        0         15

FEC ID                2         1         12        31732      1024        0         0

Ingress Static LIF I  3         1         24        61416      4096        0         0

Egress Static LIF ID  4         1         22        61418      4096        0         0

Ingress Dynamic LIF   5         1         2         61438      4096        0         4

Egress Dynamic LIF I  6         1         18        61422      4096        0         15

Ingress LIF ID        7         1         0         61440      4096        0         4

Egress LIF ID         8         1         0         61440      4096        0         15
```

The following table describes the significant fields shown in the display.

***Table 29: show platform hardware pp active resource-usage monitor Field Descriptions***

| Field | Description |
|---|---|
| **Table Configuration** | This section gives an overview of various tables used in the hardware platform, with their respective characteristics |

| Field | Description |
|---|---|
| Tbl-ID | Table Identifier |
| Tbl-Name | Name of the table |
| Size | Maximum number of entries the table can hold |
| Width | Width of each entry in the table |
| AD Width | Administrative Distance Width |
| Num ent. | Current number of entries in the table |
| ~Capacity | Approximate capacity of the table |
| **SEM A and SEM B Entries** | This section lists entries in SEM A and SEM B with specific details |
| Entry | Entry number |
| Prefix | Identifier prefix for the entry |
| Key | The key associated with the entry, including the prefix |
| Payload | The data associated with this entry |
| **Printing all entries pool** | This section lists the resource usage for different resource pools |
| Pool | Name of the resource pool |
| Total number of entr | Total number of entries in the pool |
| Used entries | Number of entries currently in use |
| Lowest entry ID is | The lowest ID value among the entries |
| **ID/s Summary Information for FEC and Lif** | This section summarizes the usage of Forwarding Equivalence Class (FEC) and Logical Interface (LIF) IDs |
| ID-Name | Name of the ID type |
| Index | Index number of the ID |
| Asic | Associated ASIC (Application-Specific Integrated Circuit) |
| Used | Number of used entries |
| Free | Number of free entries |
| NextFree | The next free ID |
| Frag? | Indicates if the entries are fragmented |
| nBlocks | Number of block |

# show platform hardware qfp active feature cef-mpls urpf

To confirm and display the hardware information pertaining to Cisco Express Forwarding (CEF) Multiprotocol Label Switching (MPLS) Unicast Reverse Path Forwarding (uRPF) feature on a Cisco QuantumFlow Processor (QFP) of the Cisco ASR 1000 Series Aggregation Services Routers, use the **show platform hardware qfp active feature cef-mpls urpf** command in privileged EXEC mode.

**show platform hardware qfp active feature cef-mpls urpf** *interface-name ip-version ip version*

## Syntax Description

| | |
|---|---|
| *ip-version* | Name of the interface. |
| *interface-name* | Version of the IP. Valid values are IPv4 and IPv6. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.0S | This command was introduced on the Cisco ASR 1000 Series Aggregation Services Routers. |

## Examples

The following is a sample output of the **show platform hardware qfp active feature cef-mpls urpf** command:

```
Device# show platform hardware qfp active feature cef-mpls urpf GigabitEthernet 0/0/0.777
ipv4


=== uRPF Information ===
  uRPF mode: Strict
  allow_default_route: FALSE
  allow_self_ping: FALSE
```

## Related Commands

The table below describes the significant fields shown in the display.

***Table 30: show platform hardware qfp active feature cef-mpls urpf Field Descriptions***

| Field | Description |
|---|---|
| uRPF mode | Mode of uRPF. Valid values are Strict or Loose.. |
| allow_default_route | State showing whether the QFP allows the use of the default route in the source verification process or not. Valid values are TRUE or FALSE. |
| allow_self_ping | State showing whether the QFP allows the source of the packet to ping itself during the source verification process or not. Valid values are TRUE or FALSE. |

# show platform hardware qfp active feature cef-mpls prefix ip

To display the interface name along with the interface descriptor block (IDB) information, use the **showplatformhardwareqfpactivefeaturecef-mplsprefixip** command in privileged EXEC.

**show platform hardware qfp active feature cef-mpls prefix ip** {*ipv4 prefix* | [**vrf** [*id*]] [**exact**] [**brief**]}

## Syntax Description

| | |
|---|---|
| *ipv4 prefix* | IPv4 address and mask. |
| **vrf** | (Optional) Displays information about VPN Routing and Forwarding (VRF). |
| *id* | (Optional) Information about the particular VRF instance. The range is from 0 to 4294967295. If no VRF ID is specified, information about the global VRF, which is the prefix in global routing table, is displayed. |
| **exact** | (Optional) Find and displays the exact match of the IPV4 prefix. |
| **brief** | (Optional) Displays a summary of prefix information. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2(33)XNB | This command was introduced on the Cisco ASR 1000 Series Routers. |
| Cisco IOS XE Release 3.4S | This command was integrated into Cisco IOS Release XE 3.4S. Support for IP Fast Reroute (IP FRR) was added. |

## Examples

The following is sample output from the**showplatformhardwareqfpactivefeaturecef-mplsprefixip** command:

```
Router# show platform hardware qfp active feature cef-mpls prefix ip 0.0.0.0/1 vrf
Gtrie Node Type: Leaf Node
HW Content: : 00002000 00000000 897daf40 895db490
  QPPB QoS Precedence valid: 0
  QoS Precedence: 0
  QPPB QoS Group valid: 0
  QoS Group: 0
  BGPPA Traffic Index valid: 0
  BGPPA Traffic Index: 0
  TBLF refcount: 2
  TBLF application lf handle: 0
  Prefix Length: 32
  Prefix: 64 00 00 01
=== uRPF path list ===
  Loose Flag: : 1
  Path list pointer: : 0x8b8414a0
  Number of interfaces: : 1
  Interfaces: : 1017
  Interface Name(s): GigabitEthernet0/3/1
=== OCE ===
OCE Type: Adjacency, Number of children: 0
```

```
Adj Type: : IPV4 Adjacency
Encap Len: : 14
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 0
Output UIDB: : 65522
Interface Name: GigabitEthernet0/3/1
Encap: : 00 14 f1 74 9c 1a 00 1a 30 44 3a 31 08 00
Next Hop Address: : 64000001 00000000 00000000 00000000
Oce Chain: : 0
```

The following example shows the output with the names of each interface when there are multiple interfaces in the unicast reverse path forwarding (uRPF) path list:

Router# **show platform hardware qfp active feature cef-mpls prefix ip 0.0.0.0/2 vrf**

```
Gtrie Node Type: Leaf Node
HW Content: : 00001800 00000000 897dae00 895d8df0
  QPPB QoS Precedence valid: 0
  QoS Precedence: 0
  QPPB QoS Group valid: 0
  QoS Group: 0
  BGPPA Traffic Index valid: 0
  BGPPA Traffic Index: 0
  TBLF refcount: 2
  TBLF application lf handle: 0
  Prefix Length: 24
  Prefix: 4d 4d 4d
=== uRPF path list ===
  Loose Flag: : 1
  Path list pointer: : 0x8b8414a0
  Number of interfaces: : 2
  Interfaces: : 1019, 1017
  Interface Name(s): : GigabitEthernet0/0/4, GigabitEthernet0/3/1
```

# show platform hardware qfp active feature cef-mpls prefix mpls

To display the complete Output Chain Element (OCE) chains used for handling the incoming Multiprotocol Label Switching (MPLS) packets with a particular label, use the show platform hardware qfp active feature cef-mpls prefix mpls command in the privileged EXEC mode.

**show platform hardware qfp active feature cef-mpls prefix mpls mpls-label exact**

## Syntax Description

| | |
|---|---|
| *mpls-label* | MPLS label containing a 20-bit label value, a 3-bit experimental field, a 1-bit bottom-of-stack indicator, and an 8-bit Time-to-Live (TTL) field. |
| **exact** | Displays all the OCE chains that are used for handling the incoming MPLS packets with a particular label. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 3.8S | This command was introduced on the Cisco ASR 1000 Series Aggregation Services Routers. |

## Examples

The following is sample output from the show platform hardware qfp active feature cef-mpls prefix mpls mpls-label exact command displaying all the OCE chains used for handling incoming MPLS packets with a particular label:

```
Router# show platform hardware qfp active feature cef-mpls prefix mpls 17 exact
Gtrie Node Type: Leaf Node
HW Content: : 0a000000 00000f00 00000000 8bb08a30
QPPB QoS Precedence valid: 0
QoS Precedence: 0
QPPB QoS Group valid: 0
QoS Group: 0
BGPPA Traffic Index valid: 0
BGPPA Traffic Index: 0
TBLF refcount: 2
TBLF application lf handle: 0
CTS src_sgt: 0
CTS dst_sgt: 0
Prefix Length: 20
Prefix: 00 0d 00
Lisp local eid: 0
Lisp remote eid: 0
Lisp locator status bits: 0
Lisp dynamic configured eid: 0
Lisp dynamic discovered eid: 0
OCE Type: EOS OCE, Number of children: 2
Next HW OCE Ptr: : 0x8bb07e10, 0x8bb07e00
OCE Type: REPLICATE OCE, Number of children: 2
Replica_node: : 0x8ca90a20
Next HW OCE Ptr: : 0x8bb07eb0, 0x8bb08840
OCE Type: Label OCE, Number of children: 1
Label flags: : 64
Num Labels: : 1
```

```
Num Bk Labels: : 0
Out Labels: : 1048577
Next HW OCE Ptr: : 0x8bb07e60
OCE Type: Interface OCE, Number of children: 1
Next HW OCE Ptr: : 0x8bb07e40
Interface Name: Lspvif20
OCE Type: Lookup OCE, Number of children: 0
Lookup flags: : 1
Table Type: : 0
Lookup table ID: : 0
OCE Type: Label OCE, Number of children: 1
Label flags: : 0
Num Labels: : 1
Num Bk Labels: : 1
Out Labels: : 88
Out Backup Labels: : 0
Next HW OCE Ptr: : 0x8bb06ca0
OCE Type: Adjacency, Number of children: 0
Adj Type: : MPLS Adjacency
Encap Len: : 14
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 0
Interface Name: GigabitEthernet0/1/0
Encap: : 00 0e 39 88 70 19 00 21 d8 60 c0 10 88 47
Next Hop Address: : 0f000001 00000000 00000000 00000000
Next HW OCE Ptr: : 00000000
OCE Type: REPLICATE OCE, Number of children: 2
Replica_node: : 0x8ca90a00
Next HW OCE Ptr: : 0x8bb07e70, 0x8bb08840
OCE Type: Label OCE, Number of children: 1
Label flags: : 64
Num Labels: : 1
Num Bk Labels: : 0
Out Labels: : 1048577
Next HW OCE Ptr: : 0x8bb07e50
OCE Type: Interface OCE, Number of children: 1
Next HW OCE Ptr: : 0x8bb001f0
Interface Name: Lspvif20
OCE Type: Lookup OCE, Number of children: 0
Lookup flags: : 0
Table Type: : 1
Lookup table ID: : 2
OCE Type: Label OCE, Number of children: 1
Label flags: : 0
Num Labels: : 1
Num Bk Labels: : 1
Out Labels: : 88
Out Backup Labels: : 0
Next HW OCE Ptr: : 0x8bb06ca0
OCE Type: Adjacency, Number of children: 0
Adj Type: : MPLS Adjacency
Encap Len: : 14
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 0
Interface Name: GigabitEthernet0/1/0
Encap: : 00 0e 39 88 70 19 00 21 d8 60 c0 10 88 47
Next Hop Address: : 0f000001 00000000 00000000 00000000
Next HW OCE Ptr: : 00000000
The fields shown in the display are self-explanatory.
```

# show platform hardware qfp active feature multicast

To display the complete Output Chain Element (OCE) chains that are connected by each leaf node in the multicast replication tree for a particular output path in the Cisco QuantumFlow Processor (QFP) active feature on the Cisco ASR 1000 Series Aggregation Services Routers, use the show platform hardware qfp active feature multicast command in the privileged EXEC mode.

**show platform hardware qfp active feature multicast ip-version ip-address-mgroup** [**ip-address-source**] **vrf vrf-id extension**

## Syntax Description

| | |
|---|---|
| ip-version | Version of the IP address. It can be one of the following values:<br>• v4mcast—IPv4.<br>• v6mcast—IPv6. |
| ip-address-mgroup | Multicast group's IP address. |
| ip-address-source | (Optional) Source prefix for the IP address. |
| vrf | Displays information present in a particular VRF. |
| vrf-id | ID of the VRF. |
| extension | Displays the entire OCE that is connected by each leaf node in the multicast replication tree for a particular output path. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 3.8S | This command was introduced on the Cisco ASR 1000 Series Aggregation Services Routers. |

## Examples

The following is sample output from the show platform hardware qfp active feature multicast v4mcast command displaying all the OCE chains used for forwarding traffic to a particular IPv4 multicast address:

```
Router# show platform hardware qfp active feature multicast v4mcast 239.1.1.1/32 vrf 2
extension
Root: 0x1187fc58
Flags: 0x000002
First leaf: 0x11887fa8
Number of nodes: 1
Number of leaves: 3
RPF i/f: 0x01fff7
Punt limit counter: 200
NS DCS Punt limit: 0x000001
RPF Fast Convergence Flags: 00000000
Secondary RPF interface: 00000000
RPF Fast Convergence Timer: 0
Extended leaf address: 0x89f80060
Node: 0x1187fc58
```

```
Cumulative Free Space: : 4
Cumulative Weight: : 3
Number of Children: : 3
Hw Addr: : 0x8b969440
Node Flags: : 0x000004
Software Child Ptr: : 0x1187fce0, 0x1187fd60, 0x11887fa8, 00000000
00000000, 00000000, 00000000
Hardware Child Ptr: : 0x89f8e440, 0x89f8e450, 0x89f8e460, 00000000
00000000, 00000000, 00000000
OCE Flags: : 0x000009
SW OCE chain ptr: 0x11884b48
HW OCE chain ptr: 0x895d59a0
OCE Type: Adjacency, Number of children: 1
Adj Type: : IPV4 Adjacency
Encap Len: : 0
L3 MTU: : 9216
Adj Flags: : 64
Fixup Flags: : 0
Interface Name: Lspvif0
Next Hop Address: : 00000000 00000000 00000000 00000000
Lisp locator status: : 00000000
Next HW OCE Ptr: : 0x895d5940
OCE Type: REPLICATE OCE, Number of children: 1
Replica_node: : 0x89fab440
Next HW OCE Ptr: : 0x895d5ab0
OCE Type: Label OCE, Number of children: 1
Label flags: : 0
Num Labels: : 1
Num Bk Labels: : 1
Out Labels: : 17
Out Backup Labels: : 0
Next HW OCE Ptr: : 0x895d5a70
OCE Type: Label OCE, Number of children: 1
Label flags: : 65
Num Labels: : 1
Num Bk Labels: : 0
Out Labels: : 3
Next HW OCE Ptr: : 0x895d59f0
OCE Type: Adjacency, Number of children: 0
Adj Type: : MPLS Adjacency
Encap Len: : 14
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 0
Interface Name: GigabitEthernet0/1/0
Encap: : 00 24 14 f4 9d 00 00 21 d8 d4 a5 10 88 47
Next Hop Address: : 0b000002 00000000 00000000 00000000
Next HW OCE Ptr: : 00000000
OCE Flags: : 0x000002
SW OCE chain ptr: 0x118830d0
HW OCE chain ptr: 0x895d58f0
OCE Type: Adjacency, Number of children: 0
Adj Type: : IPV4 Adjacency
Encap Len: : 20
L3 MTU: : 1480
Adj Flags: : 0
Fixup Flags: : 2
Interface Name: Tunnel1
Encap: : 45 00 00 00 00 00 00 00 ff 67 39 94 c0 00 01 01
c0 00 01 01
Next Hop Address: : 00000000 00000000 00000000 00000000
Lisp locator status: : 00000000
Next HW OCE Ptr: : 00000000
OCE Flags: : 0x000009
```

```
SW OCE chain ptr: 0x1186c250
HW OCE chain ptr: 0x895d5650
OCE Type: Adjacency, Number of children: 0
Adj Type: : IPV4 Adjacency
Encap Len: : 14
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 64
Interface Name: GigabitEthernet0/1/2
Encap: : 01 00 5e 00 00 00 00 21 d8 d4 a5 12 08 00
Next Hop Address: : e1000000 00000000 00000000 00000000
Lisp locator status: : 00000000
Next HW OCE Ptr: : 00000000
OCE Flags: : 0x000009
SW OCE chain ptr: 0x1186d478
HW OCE chain ptr: 0x895d5660
OCE Type: Adjacency, Number of children: 0
Adj Type: : IPV4 Adjacency
Encap Len: : 14
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 64
Interface Name: GigabitEthernet0/1/4
Encap: : 01 00 5e 00 00 00 00 21 d8 d4 a5 14 08 00
Next Hop Address: : e1000000 00000000 00000000 00000000
Lisp locator status: : 00000000
Next HW OCE Ptr: : 00000000
```

The fields shown in the display are self-explanatory.

The following is sample output from the show platform hardware qfp active feature multicast v6mcast command displaying all the OCE chains used for forwarding traffic to a particular IPv6 multicast address:

```
Router# show platform hardware qfp active feature multicast v6mcast FF04::10/128 vrf 503316482
 extension
Root: 0x11b6c700
Flags: 0x000002
First leaf: 0x11e55bc8
Number of nodes: 1
Number of leaves: 3
RPF i/f: 0x01fff3
Punt limit counter: 200
NS DCS Punt limit: 0x000001
RPF Fast Convergence Flags: 00000000
Secondary RPF interface: 00000000
RPF Fast Convergence Timer: 0
Extended leaf address: 0x8ba18c90
Node: 0x11b6c700
Cumulative Free Space: : 4
Cumulative Weight: : 3
Number of Children: : 3
Hw Addr: : 0x8ba06c60
Node Flags: : 0x000004
Software Child Ptr: : 0x11b6dcb0, 0x11b6e0b0, 0x11e55bc8, 00000000
00000000, 00000000, 00000000
Hardware Child Ptr: : 0x8ba24060, 0x8ba24070, 0x8ba245f0, 00000000
00000000, 00000000, 00000000
OCE Flags: : 0x000009
SW OCE chain ptr: 0x11b71af0
HW OCE chain ptr: 0x895ffa40
OCE Type: Adjacency, Number of children: 1
Adj Type: : IPV6 Adjacency
```

```
Encap Len: : 0
L3 MTU: : 9216
Adj Flags: : 64
Fixup Flags: : 0
Interface Name: Lspvif0
Next Hop Address: : 00000000 00000000 00000000 00000000
Lisp locator status: : 00000000
Next HW OCE Ptr: : 0x895ffa20
OCE Type: Label OCE, Number of children: 1
Label flags: : 0
Num Labels: : 1
Num Bk Labels: : 1
Out Labels: : 2
Out Backup Labels: : 2
Next HW OCE Ptr: : 0x895ff9f0
OCE Type: Adjacency, Number of children: 1
Adj Type: : MPLS Adjacency
Encap Len: : 0
L3 MTU: : 9216
Adj Flags: : 64
Fixup Flags: : 0
Interface Name: Lspvif0
Next Hop Address: : 00000000 00000000 00000000 00000000
Next HW OCE Ptr: : 0x895ff980
OCE Type: REPLICATE OCE, Number of children: 1
Replica_node: : 0x8ba51060
Next HW OCE Ptr: : 0x895ffa60
OCE Type: Label OCE, Number of children: 1
Label flags: : 0
Num Labels: : 1
Num Bk Labels: : 1
Out Labels: : 17
Out Backup Labels: : 0
Next HW OCE Ptr: : 0x895ff7b0
OCE Type: Adjacency, Number of children: 0
Adj Type: : MPLS Adjacency
Encap Len: : 14
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 0
Interface Name: GigabitEthernet0/1/0
Encap: : 00 24 14 f4 9d 00 00 21 d8 d4 a5 10 88 47
Next Hop Address: : 0b000002 00000000 00000000 00000000
Next HW OCE Ptr: : 00000000
OCE Flags: : 0x000009
SW OCE chain ptr: 0x11b6b800
HW OCE chain ptr: 0x895ff6a0
OCE Type: Adjacency, Number of children: 0
Adj Type: : IPV6 Adjacency
Encap Len: : 14
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 64
Interface Name: GigabitEthernet0/1/2
Encap: : 33 33 00 00 00 00 00 21 d8 d4 a5 12 86 dd
Next Hop Address: : ff0e0000 00000000 00000000 00000000
Lisp locator status: : 00000000
Next HW OCE Ptr: : 00000000
OCE Flags: : 0x000009
SW OCE chain ptr: 0x11b6ba08
HW OCE chain ptr: 0x895ff6e0
OCE Type: Adjacency, Number of children: 0
Adj Type: : IPV6 Adjacency
Encap Len: : 14
```

```
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 64
Interface Name: GigabitEthernet0/1/4
Encap: : 33 33 00 00 00 00 21 d8 d4 a5 14 86 dd
Next Hop Address: : ff0e0000 00000000 00000000 00000000
Lisp locator status: : 00000000
Next HW OCE Ptr: : 00000000
OCE Flags: : 0x00000a
SW OCE chain ptr: 0x11b6de20
HW OCE chain ptr: 0x895ff770
OCE Type: Adjacency, Number of children: 0
Adj Type: : IPV6 Adjacency
Encap Len: : 4
L3 MTU: : 1460
Adj Flags: : 2
Fixup Flags: : 2
Interface Name: Tunnel5
Encap: : f8 00 01 47
Next Hop Address: : 00000000 00000000 00000000 00000000
Lisp locator status: : 00000000
Next HW OCE Ptr: : 00000000
Root: 0x11e4f428
Flags: 00000000
First leaf: 0x11e51b90
Number of nodes: 1
Number of leaves: 3
RPF i/f: 0x0003fd
Punt limit counter: 200
NS DCS Punt limit: 0x000001
RPF Fast Convergence Flags: 00000000
Secondary RPF interface: 00000000
RPF Fast Convergence Timer: 0
Extended leaf address: 0x8ba21210
Node: 0x11e4f428
Cumulative Free Space: : 4
Cumulative Weight: : 3
Number of Children: : 3
Hw Addr: : 0x8ba0c560
Node Flags: : 0x000004
Software Child Ptr: : 0x11e424b8, 0x11e332b8, 0x11e51b90, 00000000
Root: 0x11e50f20
Flags: 00000000
First leaf: 0x11e51b90
Number of nodes: 1
Number of leaves: 3
RPF i/f: 0x0003fd
Punt limit counter: 200
NS DCS Punt limit: 0x000001
RPF Fast Convergence Flags: 00000000
Secondary RPF interface: 00000000
RPF Fast Convergence Timer: 0
Extended leaf address: 0x8ba212a0
Node: 0x11e50f20
Cumulative Free Space: : 4
Cumulative Weight: : 3
Number of Children: : 3
Hw Addr: : 0x8ba0c560
Node Flags: : 0x000004
Software Child Ptr: : 0x11e424b8, 0x11e56f98, 0x11e51b90, 00000000
00000000, 00000000, 00000000
Hardware Child Ptr: : 0x8ba247a0, 0x8ba24750, 0x8ba24740, 00000000
00000000, 00000000, 00000000
OCE Flags: : 0x000009
```

```
SW OCE chain ptr: 0x11b6ba08
HW OCE chain ptr: 0x895ff6e0
OCE Type: Adjacency, Number of children: 0
Adj Type: : IPV6 Adjacency
Encap Len: : 14
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 64
Interface Name: GigabitEthernet0/1/4
Encap: : 33 33 00 00 00 00 00 21 d8 d4 a5 14 86 dd
Next Hop Address: : ff0e0000 00000000 00000000 00000000
Lisp locator status: : 00000000
Next HW OCE Ptr: : 00000000
OCE Flags: : 0x000009
SW OCE chain ptr: 0x11b71af0
HW OCE chain ptr: 0x895ffa40
OCE Type: Adjacency, Number of children: 1
Adj Type: : IPV6 Adjacency
Encap Len: : 0
L3 MTU: : 9216
Adj Flags: : 64
Fixup Flags: : 0
Interface Name: Lspvif0
Next Hop Address: : 00000000 00000000 00000000 00000000
Lisp locator status: : 00000000
Next HW OCE Ptr: : 0x895ffa20
OCE Type: Label OCE, Number of children: 1
Label flags: : 0
Num Labels: : 1
Num Bk Labels: : 1
Out Labels: : 2
Out Backup Labels: : 2
Next HW OCE Ptr: : 0x895ff9f0
OCE Type: Adjacency, Number of children: 1
Adj Type: : MPLS Adjacency
Encap Len: : 0
L3 MTU: : 9216
Adj Flags: : 64
Fixup Flags: : 0
Interface Name: Lspvif0
Next Hop Address: : 00000000 00000000 00000000 00000000
Next HW OCE Ptr: : 0x895ff980
OCE Type: REPLICATE OCE, Number of children: 1
Replica_node: : 0x8ba51060
Next HW OCE Ptr: : 0x895ffa60
OCE Type: Label OCE, Number of children: 1
Label flags: : 0
Num Labels: : 1
Num Bk Labels: : 1
Out Labels: : 17
Out Backup Labels: : 0
Next HW OCE Ptr: : 0x895ff7b0
OCE Type: Adjacency, Number of children: 0
Adj Type: : MPLS Adjacency
Encap Len: : 14
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 0
Interface Name: GigabitEthernet0/1/0
Encap: : 00 24 14 f4 9d 00 00 21 d8 d4 a5 10 88 47
Next Hop Address: : 0b000002 00000000 00000000 00000000
Next HW OCE Ptr: : 00000000
OCE Flags: : 0x000003
SW OCE chain ptr: 0x11b6b800
```

```
HW OCE chain ptr: 0x895ff6a0
OCE Type: Adjacency, Number of children: 0
Adj Type: : IPV6 Adjacency
Encap Len: : 14
L3 MTU: : 1500
Adj Flags: : 0
Fixup Flags: : 64
Interface Name: GigabitEthernet0/1/2
Encap: : 33 33 00 00 00 00 00 21 d8 d4 a5 12 86 dd
Next Hop Address: : ff0e0000 00000000 00000000 00000000
Lisp locator status: : 00000000
Next HW OCE Ptr: : 00000000
The fields shown in the display are self-explanatory.
```

# show platform hardware qfp active infrastructure punt

To display the hardware and infrastructure information for punt statistics and configuration in an active instance of the Cisco Quantum Flow Processor (QFP), use the **show platform hardware qfp active infrastructure punt** command in privileged EXEC mode.

**show platform hardware qfp active infrastructure punt** [**config | internal-interface | policer | statistics { interface |qfp |type** [**global-drop | inject-drop | per-cause | punt-drop**] } ]

## Syntax Description

| | |
|---|---|
| **config** | Specifies the entries in the punt table. |
| **internal-interface** | Specifies the configuration for an internal interface. |
| **policer** | Specifies the punt policer configuration. |
| **statistics** | Specifies the punt statistics. |
| **interface** | Specifies the punt statistics for an interface. |
| **qfp** | Specifies the punt statistics for a specific qfp. |
| **type** | Specifies the aggregate statistics. |
| **global-drop** | Specifies the aggregate drop statistics. |
| **inject-drop** | Specifies the aggregate inject drop statistics. |
| **per-cause** | Specifies the aggregate per cause punt statistics. |
| **punt-drop** | Specifies the aggregate punt drop statistics. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2.0S | This command was introduced. |
| Cisco IOS XE 3.13.0S | This command was integrated into Cisco IOS XE Release 3.13.0S. |

### Example

The following is sample output of the **show platform hardware qfp active infrastructure punt config** command:

```
Router# show platform hardware qfp active infrastructure punt config
Punt table base addr : 0x89C91010
  punt cause index     96
  punt cause name      VLAN Auto Sense FSOL
  maximum instances    1
  punt table address : 0x89C91190
  instance[0] ptr    : 0x89C919A0
    QFP interface handle : 2
```

```
 Interface name       : internal0/0/rp:0
instance address        : 0x89C919A0
 fast failover address   : 0x89C8EC94
 Low priority policer    : 128
 High priority policer   : 129
```

The following table describes the significant fields shown in the display.

***Table 31: show platform hardware qfp active infrastructure punt config Field Descriptions***

| Field | Description |
|---|---|
| Punt table base addr | Base address of the punt table. |
| punt cause index | Index number of the punt cause |
| punt cause name | Name of the punt cause. |
| maximum instances | The number of instances. |
| punt table address | Address of the punt table. |
| instance[0] ptr | Address where the packets are stored for each of the punt cause. |
| QFP interface handle | The handle number of the qfp interface. |
| Interface name | Name of the interface. |
| instance address | Points to the address for each instance. |
| fast failover address | Points to the address for a fast failover. |
| Low priority policer | Low priority policer number. |
| High priority policer | High priority policer number. |

## Example

The following is sample output of the **show platform hardware qfp a infrastructure punt policer** command:

```
Router# show platform hardware qfp active infrastructure punt policer
QFP Punt Policer Config Summary


Policer  Rate     PeakRate   ConformBurst  ExceedBurst   Scaling
Handle   (pps)    (pps)      (pps)         (pps)         Factor
-------------------------------------------------------------------
001      146484   0          2288          2288          0
002      4000     0          4000          0             0
003      3000     0          3000          0             0
004      40000    0          40000         0             0
```

The following table describes the significant fields shown in the display.

*Table 32: show platform hardware qfp a infrastructure punt config Field Descriptions*

| Field | Description |
|---|---|
| Policer Handle | Indicates the number of the policer handle. |
| Rate | Indicates the configured rate in packets per second (pps). |
| Peak Rate | Indicates the peak rate in pps. |
| Conform Burst | Displays the number of packets marked as conforming to a specified rate. |
| Exceed Burst | Displays the number of packets marked as exceeding a specified rate. |
| Scaling Factor | Indicates the scaling factor. |

### Example

The following is sample output of the **show platform hardware qfp active infrastructure statistics type per-cause** command. The fields in the display are self-explanatory.

```
Router# show platform hardware qfp active infrastructure punt statistics type per-cause

Global Per Cause Statistics

  Number of punt causes =   97

  Per Punt Cause Statistics
                                                          Packets          Packets
  Counter ID  Punt Cause Name                             Received         Transmitted
  ------------------------------------------------------------------------------------
  000         Reserved                                    0                0
  001         MPLS ICMP Can't Fragment                    0                0
  002         IPv4 Options                                0                0
  003         Layer2 control and legacy                   0                0
…
```

### Example

The following is sample output of the **show platform hardware qfp active infrastructure statistics type punt-drop** command. The fields in the display are self-explanatory.

```
Router# show platform hardware qfp active infrastructure punt statistics type punt-drop

Punt Drop Statistics

  Number of punt causes = 97

  Drop Counter ID   0     Drop Counter Name PUNT_NOT_ENABLED_BY_DATA_PLANE

  Counter ID  Punt Cause Name                             Packets
  ------------------------------------------------------------------
  000         Reserved                                    0
  001         MPLS ICMP Can't Fragment                    0
  002         IPv4 Options                                0
  003         Layer2 control and legacy                   0
```

```
   004          PPP Control                              0
...
```

# show platform hardware qfp active interface if-name statistics

To display the statistics of packet drops for each interface in the Packet Processor Engine (PPE), use the **show platform hardware qfp active interface if-name statistics** command in privileged EXEC mode.

**show platform hardware qfp active interface if-name** *type number* **statistics**

## Syntax Description

This command has no arguments or keywords.

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.0 | This command was introduced. |

## Usage Guidelines

You can use this command for troubleshooting the problems on an interface in a PPE by analyzing the statistics of packet drops.

## Examples

The following sample output from the **show platform hardware qfp active interface if-name statistics** command displays the statistics of packet drops on the Gigabit Ethernet interface 0/0/0.781 interface:

```
Router # show platform hardware qfp active GigabitEthernet0/0/0.781 if-name statistics

------------------------------------------------------------------
Receive Stats                              Packets        Octets
------------------------------------------------------------------
  Ipv4                                           2           322
  Ipv6                                           0             0
  Tag                                            0             0
  McastIpv4                                      0             0
  McastIpv6                                      0             0
  Other                                          3           204

------------------------------------------------------------------
Transmit Stats                             Packets        Octets
------------------------------------------------------------------
  Ipv4                                           2           178
  Ipv6                                           0             0
  Tag                                            0             0
  McastIpv4                                      0             0
  McastIpv6                                      0             0
  Other                                          0             0

------------------------------------------------------------------
Input Drop Stats                           Packets        Octets
------------------------------------------------------------------
Ipv4uRpfStrictFailed                             5           590
Ipv6uRpfStrictFailed                             5           590

------------------------------------------------------------------
Output Drop Stats                          Packets        Octets
```

```
------------------------------------------------------------------
  The Egress drop stats were all zero

------------------------------------------------------------------
Drop Stats Summary:
note: 1) these drop stats are only updated when PAL
         reads the interface stats.
      2) the interface stats include the subinterface

Interface                                       Rx Pkts             Tx Pkts
------------------------------------------------------------------------------
GigabitEthernet0/0/0.781                             25                   0
```

The following table describes the fields shown in the display.

***Table 33: show platform hardware qfp active interface if-name statistics Field Descriptions***

| Field | Description |
|---|---|
| Receive Stats | Number of packets received. |
| Packets | Number of packets that are received. |
| Octets | Total number of bytes of the packets that are received. |
| Transmit Stats | Number of packets that are transmitted on an interface. |
| Input Drop Stats | The drop cause and the number of incoming packets that are dropped.<br>• pv4uRpfStrictFailed - Specifies the number and bytes of packets that are dropped with this drop cause.<br>• Ipv6uRpfStrictFailed - Specifies the number and bytes of packets that are dropped with this drop cause |
| Packets | Number of packets that are transmitted.<br>• IPv4uRpfStrictFailed received 5 packets.<br>• IPv6uRpfStrictFailed received 5 packets. |
| Octets | Total number of bytes of the packets that are received.<br>• IPv4uRpfStrictFailed received 590 bytes of packets.<br>• IPv6uRpfStrictFailed received 590 bytes of packets. |
| Output Drop Stats | Specifies the drop cause and the number of outgoing packets that are dropped. |
| Interface | Name of the interface. |
| Rx Pkts | Number of packets received on an interface. |
| Tx Pkts | Number of packets transmitted on an interface. |

**Related Commands**

| Command | Description |
|---|---|
| **show platform hardware qfp active statistics drop** | Displays the statistics of packet drops on all the interfaces in a PPE. |

# show platform hardware qfp statistics drop

To display the statistics of all the dropped packets on the Embedded Services Processor (ESP), use the **show platform hardwareqfp active statistics drop** command in privileged EXEC mode.

**show platform hardware qfp** {**active | standby**} **statistics drop**

## Syntax Description

| | |
|---|---|
| **active** | Active forwarding processor. |
| **standby** | Standby forwarding processor . |

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.0 | This command was introduced. |
| Cisco IOS XE Release 3.5 | This command was modified for Cisco ASR 1000 Series Routers. A new drop type, PPPoECAC, was added to the**show platform hardware qfp active statistics drop** command. |

## Usage Guidelines

You can use this command for troubleshooting the problems on all the interfaces in a PPE by analyzing the statistics of packet drops.

You can use this command for troubleshooting the problems on all the interfaces in a packet processing engine (PPE) by analyzing the statistics of packet drops.

To improve the CPU utilization and memory of the Route Processor (RP) on Cisco ASR 1000 Series Router, the SRSM hardware feature has been implemented. When Call Admission Control (CAC) is enabled and the CAC threshold level is reached, the PPPoE packets are punted on the Embedded Service Processor (ESP) instead of being sent to the RP. Managing the PPPoE packets at the ESP level helps in controlling and minimizing RP CPU and memory utilization. A new drop type, PPPoECAC, is added to the**show platform hardware qfp active statistics drop** command which indicates the number of PPPoE Active Discovery Initiation (PADI) and PPPoE Active Discovery Request (PADR) packets rejected by the hardware due to call admission control.

**Note** The **show call admission statistics** command shows how many packets were dropped by the RP and the **show platform hardware qfp active statistics drop** command indicates how many packets were dropped by the ESP. A small number of packets are still dropped by the RP because it takes time for the drop message to reach the ESP. The actual number of packets dropped by SRSM is the total number of packets dropped by **show call admission statistics** and **show platform hardware qfp active statistics drop** commands.

## Examples

The following sample output from the **show platform hardware qfp active statistics drop** command displays the statistics of packet drops on all the interfaces in a PPPoE:

```
Router# show platform hardware qfp active statistics drop

Global Drop Stats                          Packets                 Octets
-----------------------------------------------------------------------------
BadUidbSubIdx                                59187                4918277
Disabled                                      4725                 373436
Ipv4NoAdj                                      219                   9468
Ipv4uRpfStrictFailed                            10                   1180
Ipv6uRpfStrictFailed                            10                   1180
UnconfiguredIpv4Fia                           1589                 132013
```

The following sample output of the **show platform hardware qfp active statistics drop** command shows the PPPoECAC packets dropped on the ESP when the CAC threshold level is reached:

```
Router# show platform hardware qfp active statistics drop

Global Drop Stats                          Packets                 Octets
-----------------------------------------------------------------------------
BadUidbIdx                                      80                   7901
BadUidbSubIdx                                40374                2860531
Disabled                                      4765                 375064
InjectErr                                       64                   8350
Ipv4NoAdj                                        8                    776
Ipv4NoRoute                                  52608                5482626
Ipv6NoAdj                                        1                     79
MplsIpv6FragReq                                  1                   1515
UnconfiguredIpv4Fia                           2412                 215692
PPPoECAC                                      4648                 171976
```

The following table describes the fields shown in the display.

***Table 34: show platform hardware qfp active statistics drop Field Descriptions***

| Field | Description |
|---|---|
| Global Drop Stats | The reason for dropping packets.<br>• pv4uRpfStrictFailed - Specifies the number and bytes of packets that are dropped with this drop cause.<br>• Ipv6uRpfStrictFailed - Specifies the number and bytes of packets that are dropped with this drop cause |
| Packets | Number of packets that are dropped.<br>• IPv4uRpfStrictFailed dropped 10 packets.<br>• IPv6uRpfStrictFailed dropped 10 packets. |
| Octets | Total number of bytes of the packets that are dropped.<br>• IPv4uRpfStrictFailed dropped 1180 bytes of packets.<br>• IPv6uRpfStrictFailed dropped 1180 bytes of packets. |

**Related Commands**

| Command | Description |
|---|---|
| **show platform hardware qfp interface** | Displays information about an interface in the target flow processor. |
| **show platform hardware qfp active interface if-name statistics** | Displays the statistics of packet drops for each interface in the Packet Processor Engine (PPE). |

# show platform hardware qfp interface

To display information about an interface in the target flow processor, use the **show platform hardware qfp interface** command in privileged EXEC mode.

**show platform hardware qfp** {**active** | **standby**} **interface** {**all** [**summary** | **statistics** [**drop_summary** [**subinterface**]] [**clear_drop**] [**detail**]] | **dsp** {**client resource** *dsp-resource-id* | **global clear** | **stream** *stream-id*} | {**if-name** *name* | **if-handle** *handle*} [**info** | **path** | **statistics** [**drop_summary** [**subinterface**]] | [**clear_drop**] | [**detail**]] | **atm if-name** *name* **statistics** [**clear_drop**]}

## Syntax Description

| | |
|---|---|
| **active** | Specifies the active instance of the processor. |
| **standby** | Specifies the standby instance of the processor. |
| **interface** | Specifies interfaces. |
| **all** | Specifies all interfaces available on the processor. |
| **summary** | (Optional) Specifies the interface summary report. |
| **statistics** | (Optional) Specifies the statistics of transmitted and received packets. |
| **drop_summary** | (Optional) Specifies the drop status summary report. |
| **subinterface** | (Optional) Specifies the subinterface and the drop statistics. |
| **clear_drop** | (Optional) Clears the drop statistics after reading. |
| **detail** | (Optional) Shows drop cause IDs. |
| **dsp** | Specifies digital signal processor (DSP) statistics. |
| **client** | Specifies DSP client statistics. |
| **resource** | Specifies DSP client resource statistics. |
| *dsp-resource-id* | Combinet Packet Protocol (CPP) DSP resource ID. |
| **global** | Specifies DSP global statistics. |
| **clear** | Clears statistics after reading. |
| **stream** | Specifies DSP stream statistics. |
| *stream-id* | Stream ID. |
| **if-name** *name* | Specifies the name of an interface, interface type, and port number of the selected interface. |
| **if-handle** *handle* | Specifies the quantum flow processor (QFP) interface handle number. |
| **info** | (Optional) Specifies interface information. |
| **path** | (Optional) Specifies path information. |

| | |
|---|---|
| **atm** | Specifies information and statistics for the ATM interface. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.1 | This command was introduced. |
| Cisco IOS XE Release 2.5 | This command was modified. The **cpp** keyword was changed to **qfp**. |
| 12.2(33)XNE | This command was integrated into Cisco IOS Release 12.2(33)XNE. |
| Cisco IOS XE Release 3.8S | This command was modified. The **path** keyword was added. |

## Usage Guidelines

The **show platform hardware qfp interface** command displays information about the relationship between one interface and another in the target flow processor. In the command output, the main interface is identified if the interface is a subinterface; the group interface is identified if the interface is a member of a group; and the interfaces that are members of the group are identified if the interface is a group, bundle, or multipoint interface.

## Examples

The following sample output shows information about the relationship between one interface and the other on the target flow processor:

```
Device# show platform hardware qfp active interface if-name Port-channel1 info

General interface information
  Interface Name: Port-channel1
  Platform interface handle: 36
  QFP interface handle: 36
  Rx uidb: 131064
  Tx uidb: 131036
  Channel: 0
Interface Relationships
  if_h   Member Interface Name
  10      GigabitEthernet0/0/2
  11      GigabitEthernet0/0/3
```

The table below describes the significant fields shown in the display.

***Table 35: show platform hardware qfp interface Field Descriptions***

| Field | Description |
|---|---|
| Interface Name | Name of the interface requested by the **show platform hardware qfp interface** command. |
| Platform interface handle | Number of platform interface handles displayed for the interface. |
| QFP interface handle | Internal identifier assigned by the QFP software for this interface. |
| Rx uidb | Internal identifier for the receive side of the interface. |
| Tx uidb | Internal identifier for the transmit side of the interface. |

| Field | Description |
|---|---|
| Channel | Internal identifier for the transmit path to which the interface is connected. |

The following sample output shows the summary of the drop status of the packets:

```
Device# show platform hardware qfp active statistics drop

Global Drop Stats                          Packets                Octets
-----------------------------------------------------------------------------
BadUidbIdx                                    80                  7901
BadUidbSubIdx                              40374               2860531
Disabled                                    4765                375064
InjectErr                                     64                  8350
Ipv4NoAdj                                      8                   776
Ipv4NoRoute                                52608               5482626
Ipv6NoAdj                                      1                    79
MplsIpv6FragReq                                1                  1515
UnconfiguredIpv4Fia                         2412                215692
```

The table below describes the significant fields shown in the display.

***Table 36: show platform hardware qfp active statistics drop Field Descriptions***

| Field | Description |
|---|---|
| Global Drop Stats | Reason for dropping of packets. |
| Packets | Number of packets that are dropped. |
| Octets | Total number of bytes of the packets that are dropped. |

The following sample output shows the statistics of the packets on an interface:

```
Device# show platform hardware qfp active interface if-name GigabitEthernet0/0/0.775
statistics

------------------------------------------------------------------
Receive Stats                          Packets        Octets
------------------------------------------------------------------
  Ipv4                                     9             810
  Ipv6                                     0               0
  Tag                                      0               0
  McastIpv4                                0               0
  McastIpv6                                0               0
  Other                                    2             136
------------------------------------------------------------------
Transmit Stats                         Packets        Octets
------------------------------------------------------------------
  Ipv4                                     0               0
  Ipv6                                     1             154
  Tag                                      0               0
  McastIpv4                                0               0
  McastIpv6                                0               0
  Other                                    0               0
------------------------------------------------------------------
Input Drop Stats                       Packets        Octets
------------------------------------------------------------------
Ipv4NoRoute                              182          22996
MplsIpv6FragReq                            1           1515
```

```
UnconfiguredIpv4Fia                              550         49120
----------------------------------------------------------------------
Output Drop Stats                              Packets        Octets
----------------------------------------------------------------------
Ipv4NoRoute                                       13          3721
----------------------------------------------------------------------
Drop Stats Summary:
note: 1) these drop stats are only updated when PAL
         reads the interface stats.
      2) the interface stats include the subinterface
Interface                                        Rx Pkts             Tx Pkts
------------------------------------------------------------------------------
GigabitEthernet0/0/0.775                            3209                  20
```

The table below describes the significant fields shown in the display.

***Table 37: show platform hardware qfp active interface if-name statistics Field Descriptions***

| Field | Description |
|---|---|
| Receive Stats | Number of packets received through a protocol. |
| Packets | Number of packets transmitted through a protocol. |
| Octets | Total number of bytes of the packets that are dropped. |
| Transmit Stats | Number of packets that are transmitted on an interface. |
| Input Drop Stats | Drop cause and the number of incoming packets that are dropped. |
| Output Drop Stats | Drop cause and the number of outgoing packets that are dropped. |
| Interface | Name of the interface. |
| Rx Pkts | Number of packets received on an interface. |
| Tx Pkts | Number of packets transmitted on an interface. |

```
Device# show platform hardware qfp active interface if-handle 10 path

Hardware Path Information: Port type 2 - NGIO
Ingress Path Information:
Interface ID 1
IID table entry address 0x30b61018
Input uIDB 2043
Flow Control ID 0x30b61500
Egress Path Information:
Interface ID 1
FFP output port -2
Module backplane connection index 0
Switch port ID 8
Module number 0
MAC destination address c4: a:cb:56: 0:d5
MAC source address 30:f7: d:53:f4:db
```

The table below describes the significant fields shown in the display.

*Table 38: show platform hardware qfp active interface if-handle path Field Descriptions*

| Field | Description |
|---|---|
| Hardware Path Information | Type of module on which the interface exists. Possible values are NGIO and BEST_EFFORT. |
| Ingress Path Information | Ingress path information. |
| Interface ID | Identifier assigned to the interface by the module. This identifier is local to the module. |
| IID table entry address | Address of the table of interfaces on the module in the forwarding plane memory. |
| Input uIDB | Input micro-interface descriptor block (uIDB) assigned to this interface. |
| Flow Control ID | Identifier for the flow control structure if the interface traffic is flow controlled. |
| Egress Path Information | Egress path information. |
| FFP output port | Port of the forwarding process that handles traffic on the interface. |
| Module backplane connection index | Identifier for the backplane connection of the module that handles the traffic on the interface. |
| Switch port ID | Identifier for the backplane switchport that handles the traffic for the interface. |
| Module number | Module identifier. |
| MAC destination address | MAC address in the headers of the packets that traverse the backplane switch. |

```
Device# show platform hardware qfp active interface if-handle 14 path

Hardware Path Information:
Ingress Path Information:
Look-up class 1
Remap table entry:
  SPA Format 2
  Valid flag 1
  Marmot channel 0
  Indirect flag 1
  Input uIDB 1019
Egress Path Information:
Marmot header 0x2000000
SPA type 2
SPA header length 4
SPA header 0x0 0x0 0x0 0x0
  LP small header 0xd2 0xa9 0xe0 0x10
  HP header 0x0 0x0 0x1 0x0
  Cntl header 0xfa 0x28 0xd4 0x10
```

The table below describes the significant fields shown in the display.

*Table 39: show platform hardware qfp active interface if-handle path Field Descriptions*

| Field | Description |
|---|---|
| Hardware Path Information | Type of module on which the interface exists. |
| Ingress Path Information | Ingress path information follows. |
| Look-up class | Look-up method used to identify the ingress interface. |
| Remap table entry | Entry of the remap table of the interface follows. |
| SPA format | Format of the Shared Port Adapter (SPA) header. |
| Valid Flag | Flag indicating whether entry in the remap table is valid. 1 is valid. |
| Marmot Channel | Channel in the Marmot chip through which traffic passes. |
| Indirect flag | Flag indicating whether the ingress interface is determined indirectly through the SPA header. |
| Input uIDB | Input micro-interface descriptor block (uIDB) assigned to the interface. |
| Egress Path Information | Egress path information follows. |
| Marmot header | Marmot header in the egress packets. |
| SPA type | Format of the SPA header. |
| SPA header length | Length of the egress SPA header, in bytes. |
| SPA header | Default SPA header of the egress packets. |
| LP small header | SPA header used for low priority (LP) packets. |
| HP header | SPA header used for high priority (HP) packets. |
| Cntl header | SPA header used for control packets. |

## Related Commands

| Command | Description |
|---|---|
| **show interfaces** | Displays statistics for all interfaces configured on a device or on an access server. |

# show platform hardware slot

To display information about the processor in a chassis slot, use the **show platform hardware slot** command in privileged EXEC or diagnostic mode.

**Cisco ASR 1000 Series SPA Interface Processors**
**show platform hardware slot** *sip* {**dram statistics** | **eobc** {**interface** {**primary** | **standby**} {**rmon** | **status**} | **switch statistics** {**brief** | **detail**}} | **fan status** | **io-port** | **led status** | **mcu status** [**raw**] | **plim** {**buffer settings** [**detail**] | **cpu** | **qos input bandwidth** | **registers** *reg* | **statistics** [**internal**] | **status** [**internal**]} | **sensor** {**consumer** | **producer**} {*id* | **all**} | **serdes** {**registers** *reg* | **statistics** [**internal**] | **status** [**brief**]} | **spa** {**attributes** | **oir-statistics** | **status**}}

**Cisco ASR 1000 Series Embedded Services Processors**
**show platform hardware slot** *esp* {**dram statistics** | **eobc** {**interface** {**primary** | **standby**} {**rmon** | **status**} | **switch statistics** {**brief** | **detail**}} | **io-port** | **led status** | **sensor** {**consumer** | **producer**} {*id* | **all** } | **serdes** {**registers** *reg* | **statistics** [**internal**] | **status** [**brief**]}}

**Cisco ASR 1000 Series Route Processors**
**show platform hardware slot** *rp* {**alarms** {**audible** | **visual**} | **dram statistics** | **eobc** {**interface** {**primary** | **standby**} {**rmon** | **status**} | **switch statistics** {**brief** | **detail**}} | **io-port** | **led status** | **plim** {**buffer settings** [**detail**] | **cpu** | **qos input bandwidth** | **registers** *reg* | **statistics** [**internal**] | **status** [**internal**]} | **sensor** {**consumer** | **producer**} {*id* | **all**} | **serdes** {**registers** *reg* | **statistics** [**internal**] | **status** [**brief**]}}

**Cisco ISR 4400 Series Routers**
**show platform hardware slot** *sm* {**dram statistics** | **eobc** {**interface** {**primary** | **standby**} {**rmon** | **status**}} | **fan status** | **i95 stats** | **io-port** | **led status** | **mcu status** [**raw**] | **network-clocks** | **pcie** {**driver** {**layers** | **statistics** {**3pa** | **lsmpi** | **mux** | **octeon**}} | **status**} | **plim** {**buffer settings** [**detail**] | **cpu** | **qos input bandwidth** | **registers** *reg* | **statistics** [**internal**] | **status** [**internal**]} | **rommon status** | **sensor** {**consumer** | **producer**} {*id* | **all**} | **serdes** {**registers** *reg* | **statistics** [**internal** | **clear**] | **status** [**brief** | **clear**]} | **spa** {**attributes** | **oir-statistics** | **status**}}

## Syntax Description

| | |
|---|---|
| *sip* | Type of Cisco ASR 1000 Series SPA interface processor (SIP) with one of the following values:<br>• **0**—SIP in chassis slot 0.<br>• **1**—SIP in chassis slot 1.<br>• **2**—SIP in chassis slot 2.<br>• **P0**—Power supply slot 0.<br>• **P1**—Power supply slot 1.<br>• **P2**—Power supply slot 2.<br>• **P3**—Power supply slot 3. |
| **dram statistics** | Displays error-correcting code (ECC) error statistics for DRAM (for Cisco Technical Support only). |
| **eobc** | Displays Ethernet out-of-band channel (EOBC) information. |
| **interface primary** | Displays primary EOBC interface information. |

| | |
|---|---|
| **interface standby** | Displays standby EOBC interface information. |
| **rmon** | Displays EOBC interface remote monitoring (RMON) information (for Cisco Technical Support only). |
| **status** | Displays EOBC interface status information (Physical Line Interface Module [PLIM] status and serializer/deserializer [SerDes] status are for Cisco Technical Support only). |
| **switch statistics** | Displays EOBC switch statistics. |
| **brief** | Displays summary information. |
| **detail** | Displays detailed information (for Cisco Technical Support only). This keyword is optional for PLIM buffer settings. |
| **fan status** | Displays fan software status. |
| **io-port** | Displays I/O port information. |
| **led status** | Displays LED states. |
| **mcu status** | Displays microcontroller unit (MCU) hardware status (for Cisco Technical Support only). |
| **raw** | (Optional) Displays MCU unparsed raw data (for Cisco Technical Support only). |
| **plim** | Displays PLIM information. |
| **buffer settings** | Displays PLIM buffer settings (for Cisco Technical Support only). |
| **cpu** | Displays CPU hyper threading (HT) bus information (for Cisco Technical Support only). |
| **qos input bandwidth** | Displays PLIM quality of service (QoS) input bandwidth information. |
| **registers** *reg* | It is the register name (for Cisco Technical Support only). |
| **statistics** | Displays statistics information. |
| **internal** | (Optional) Displays Cisco internal information (for Cisco Technical Support only). |
| **sensor** | Displays sensor information (for Cisco Technical Support only). |
| **consumer** | Displays sensor information from the consumer process (for Cisco Technical Support only). |
| **producer** | Displays sensor information from the producer process (for Cisco Technical Support only). |
| *id* | Displays the consumer or producer sensor ID number (for Cisco Technical Support only). |
| **all** | Displays a brief view of all sensors (for Cisco Technical Support only). |
| **serdes** | Displays serializer/deserializer (SerDes) information. |

| | |
|---|---|
| **spa** | Displays Cisco ASR 1000 Series SPA information. |
| **attributes** | Displays SPA attribute information (for Cisco Technical Support only). |
| **oir-statistics** | Displays SPA online insertion and removal (OIR) counters. |
| *esp* | Type of Cisco ASR 1000 Series Embedded Services Processor (ESP) with one of the following values:<br>• **f0**—ESP in ESP slot 0.<br>• **f1**—ESP in ESP slot 1. |
| *rp* | Type of Cisco ASR 1000 Series Route Processor (RP) with one of the following values:<br>• **r0**—RP in RP slot 0.<br>• **r1**—RP in RP slot 1. |
| **alarms** | Displays alarm states information (for Cisco Technical Support only). To display alarm status, use the **show facility-alarm status** command. |
| **audible** | Displays audible alarm states (for Cisco Technical Support only) information. |
| **visual** | Displays LED alarm states (for Cisco Technical Support only) information. |
| *sm* | Type of Cisco ISR 4400 Series Routers interface with one of the following values:<br>• **0**—SM-Inter-Processor slot 0.<br>• **F0**—Embedded Service Processor slot 0.<br>• **P0**—Power supply slot 0.<br>• **P1**—Power supply slot 1.<br>• **P2**—Power supply slot 2.<br>• **R0**—Route Processor slot 0. |
| **i95 stats** | Displays i95 driver statistics. |
| **network-clocks** | Displays network clock devices. |
| **pcie status** | Displays Peripheral Component Interconnect Express (PCIE) information. |
| **pcie driver layers** | Displays PCIE driver stacking information. |
| **pcie driver statistics** | Displays PCIE driver statistics. |
| **rommon status** | Displays ROM Monitor (ROMMON) status. |

## Command Modes

Privileged EXEC (#)

Diagnostic (diag)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.1 | This command was introduced. |

| Release | Modification |
|---|---|
| 15.0(1)S | This command was modified. The minimum bandwidth and the priority mode that cannot be configured in Strict Priority mode are not displayed in the output. The HP policer BW field was added to the output. |
| Cisco IOS XE Release 3.8S | This command was modified. References to SIP (Cisco ASR 1000 Series Shared Port Adaptor Interface Processors) in command options were replaced with SM (Cisco Services-Ready Engine [SRE] service module) for Cisco ISR 4400 Series Routers only. |

## Examples

The following sample output from the **show platform hardware slot 0 eobc interface primary status** command displays EOBC interface status for a SIP in chassis slot 0. This command provides the status of the EOBC in the indicated slot.

```
Device# show platform hardware slot 0 eobc interface primary status

EOBC interface status
  EOBC : eth0, status : Active
    Line State : Up, Speed : 1Gbps, Link mode : Full
    Line Type : AUI, Autoneg : Disabled
    Addr : 10.0.3.0, Netmask : 255.255.0.0, HW Addr : 0000.0300.0000
    Rx pkts : 1292995, bytes : 316283357, dropped : 0 errors : 0
    Tx pkts : 1124534, bytes : 270172949, dropped : 0 errors : 0
```

The table below describes the significant fields shown in the display.

***Table 40: show platform hardware slot 0 eobc interface primary status Field Descriptions***

| Field | Description |
|---|---|
| EOBC: eth0 | Ethernet port. |
| status | Port status. “Active” or “Standby.” |
| Line State | Line status. “Up” or “Down.” |
| Speed | Bandwidth in gigabits per second (Gbps). |
| Link mode | Transmission mode. “Full” (full duplex) or “Half” (half duplex). |
| Line Type | Type of transceiver. “AUI” (attachment unit interface), “TP” (twisted pair), “MII” (media independent interface), “FIBER” (fiber optic), or “BNC” (Bayonette Neil-Concelman). |
| Autoneg | Autonegotiation. “Enabled” or “Disabled.” |
| Addr | IP address of the port. |
| Netmask | IP addressing netmask of the port. |
| HW Addr | MAC address of the port. |
| Rx pkts/bytes | Number of packets and bytes received. |
| Tx pkts/bytes | Number of packets and bytes transmitted. |

| Field | Description |
|---|---|
| Rx dropped | Number of received packets that were dropped. |
| Tx dropped | Number of transmitted packets that were dropped. |
| Rx errors | Number of packets received with errors. |
| Tx errors | Number of packets transmitted with errors. |

The following sample output from the **show platform hardware slot 0 eobc switch statistics brief** command displays brief EOBC switch statistics for a SIP in chassis slot 0:

```
Device# show platform hardware slot 0 eobc switch statistics brief

Port: 4, Link state: Up, Mode: Full Duplex, Speed: 1000 Mbps
Ingress bytes  :            276915312    Egress bytes  :            349585709
Ingress packets:              1151944    Egress packets:              1320618
```

The table below describes the significant fields shown in the display.

***Table 41: show platform hardware slot 0 eobc switch statistics brief Field Descriptions***

| Field | Description |
|---|---|
| Port | Port on the EOBC switch. |
| Link state | Link status. “Up” or “Down.” |
| Mode | Transmission mode. “Full Duplex” or “Half Duplex.” |
| Speed | Bandwidth in megabits per second (Mbps). |
| Ingress bytes | Number of bytes received on this port. |
| Egress bytes | Number of bytes transmitted through this port. |
| Ingress packets | Number of packets received on this port. |
| Egress packets | Number of packets transmitted through this port. |

The following sample output from the **show platform hardware slot 0 fan status** command displays fan operation status for a SIP in chassis slot 0:

```
Device# show platform hardware slot 0 fan status

Fan speed: 65%
Fan 0: Normal
Fan 1: Normal
Fan 2: Normal
```

The table below describes the significant fields shown in the display.

*Table 42: show platform hardware slot 0 fan status Field Descriptions*

| Field | Description |
|---|---|
| Fan speed | Speed at which the fans are spinning as a percentage of their maximum speed. |
| Fan 0, 1, 2 | Specifies whether a fan is encountering a fault condition. “Normal” or “Fail.” |

The following sample output from the **show platform hardware slot 0 plim qos input bandwidth** command displays the ingress arbiter settings for all PLIM buffers that are in use for a SIP in chassis slot 0:

```
Device# show platform hardware slot 0 plim qos input bandwidth

Ingress QOS Scheduling Mode: Strict Priority

0/0, SPA-3XOC3-ATM-V2
  Interface 0/0/0
    BW:   155520 Kbps, Min BW: N/A , Excessive Weight:   100000 Kbps, HP Policer BW:
155520 Kbps
  Interface 0/0/1
    BW:   155520 Kbps, Min BW: N/A , Excessive Weight:   155000 Kbps, HP Policer BW:
155520 Kbps
  Interface 0/0/2
    BW:   155520 Kbps, Min BW: N/A , Excessive Weight:   155000 Kbps, HP Policer BW:
155520 Kbps
```

The table below describes the significant fields shown in the display.

*Table 43: show platform hardware slot 0 plim qos input bandwidth Field Descriptions*

| Field | Description |
|---|---|
| Ingress QOS Scheduling Mode | Current scheduler operation mode. |
| BW | Interface bandwidth in kilobits per second (kb/s). |
| Min BW | Guaranteed bandwidth assigned on this interface in Kbps. |
| Excessive Weight | Excessive bandwidth assigned on this interface in Kbps. |
| HP Policer BW | Bandwidth assigned for processing high-priority traffic on this interface in Kbps. |

The following sample output from the **show platform hardware slot 0 plim statistics** command displays PLIM statistics for a SIP in chassis slot 0. Interprocess communication (IPC) packets are internal control packets. The first set of RX and TX packet counts include both user packets and IPC packets. In this example, the RX/TX and RX IPC/TX IPC packet counts are the same because only IPC packets are being passed (no user packets).

```
Device# show platform hardware slot 0 plim statistics

1/0, 2XOC3-POS, Online
  RX Pkts 739     Bytes 54564
  TX Pkts 739     Bytes 30752
  RX IPC Pkts 739     Bytes 54564
  TX IPC Pkts 739     Bytes 30752
```

The table below describes the significant fields shown in the display.

*Table 44: show platform hardware slot 0 plim statistics Field Descriptions*

| Field | Description |
|---|---|
| RX Pkts | Packets (user data and IPC data) received by the PLIM from the indicated SPA. |
| TX Pkts | Packets (user data and IPC data) transmitted from the PLIM to the indicated SPA. |
| RX IPC Pkts | IPC packets received by the PLIM from the indicated SPA. |
| TX IPC Pkts | IPC packets transmitted from the PLIM to the indicated SPA. |

The following is sample output from the **show platform hardware slot f0 serdes statistics** command for Cisco ASR1000-ESP20 and later versions of the ESP. This output displays the byte counters and packet counters associated with the Enhanced SerDes Interconnect (ESI) links for the ESP. The output includes information about drop counters and the number of link-level flow control messages. Information is displayed from the standpoint of the card (in this example, ESP0), where the command is run. An ESP displays information from all the cards with active ESI links connected to it. A SIP or an RP displays statistics from each ESP.

```
Device# show platform hardware slot f0 serdes statistics

From Slot R0
  Pkts High: 0 Low: 0 Bad: 0 Dropped: 0
  Bytes High: 0 Low: 0 Bad: 0 Dropped: 0
  Pkts Looped: 0 Error: 0
  Bytes Looped 0
  Qstat count: 0 Flow ctrl count: 25671
To Slot R0
  Pkts High: 0 Low: 0
From Slot 0
  Pkts High: 0 Low: 0 Bad: 0 Dropped: 0
  Bytes High: 0 Low: 0 Bad: 0 Dropped: 0
  Pkts Looped: 0 Error: 0
  Bytes Looped 0
  Qstat count: 0 Flow ctrl count: 25674
To Slot 0
  Pkts High: 0 Low: 0
```

The table below describes the significant fields shown in the display.

*Table 45: show platform hardware slot f0 serdes statistics Field Descriptions*

| Field | Description |
|---|---|
| From Slot | Information on data passed from the indicated processor to the card where the command is run and over the SerDes. |
| To Slot | Information on data passed to the indicated processor from the card where the command is run and over the SerDes. |
| Pkts/Bytes High | Number of packets and bytes of high priority data payload. |
| Pkts/Bytes Low | Number of packets and bytes of low priority data payload. |

| Field | Description |
|---|---|
| Pkts/Bytes Bad | Number of packets received with packet length errors or cyclic redundancy check (CRC) errors. |
| Pkts/Bytes Dropped | Number of bit bucket packets or bytes dropped. |
| Pkts/Bytes Looped | Number of packets looped back in loopback mode. |
| Pkts Error | Number of packets with errors. |
| Qstat count | Number of queue status messages received. |
| Flow ctrl count | Number of link-level flow control messages. |

The following is sample output from the **show platform hardware slot f0 serdes statistics** command for the Cisco ASR1000-ESP10.

```
Device# show platform hardware slot f0 serdes statistics

From Slot R0
  Pkts High: 0 Low: 0 Bad: 0 Dropped: 0
  Bytes High: 0 Low: 0 Bad: 0 Dropped: 0
  Pkts Looped: 0 Error: 0
  Bytes Looped 0
  Qstat count: 0 Flow ctrl count: 25671
From Slot 0
  Pkts High: 0 Low: 0 Bad: 0 Dropped: 0
  Bytes High: 0 Low: 0 Bad: 0 Dropped: 0
  Pkts Looped: 0 Error: 0
  Bytes Looped 0
  Qstat count: 0 Flow ctrl count: 25674
```

The following is sample output from the **show platform hardware slot f0 serdes statistics internal** command for the Cisco ASR 1000-ESP10.

```
Device# show platform hardware slot f0 serdes statistics internal

Load for five secs: 35%/8%; one minute: 33%; five minutes: 30%
Time source is NTP, 12:20:00.746 IST Fri Nov 9 2011
Network-Processor Link:
  Local TX in sync, Local RX in sync
  From Network-Processor    Packets:     1150522  Bytes:   166031138
  To Network-Processor      Packets:     4364008  Bytes:   697982854

RP/ESP Link:
Local TX in sync, Local RX in syncxist
Remote TX in sync, Remote RX in sync
To RP/ESP                  Packets:     1150522  Bytes:   166031138
 Drops                    Packets:           0  Bytes:           0
From RP/ESP                Packets:     4364008  Bytes:   697982854
 Drops                    Packets:           0  Bytes:           0
Errors:
 RX/TX process: 0/0, RX/TX schedule: 0/0
 RX/TX statistics: 0/0, RX parity: 0

Encryption Processor Link:
  Local TX in sync, Local RX in sync
  Remote TX in sync, Remote RX in sync
```

The following is sample output from the **show platform hardware slot f0 serdes statistics internal** command for the Cisco ASR 1000-ESP20 and later versions of the ESP.

```
Device# show platform hardware slot f0 serdes statistics internal

Load for five secs: 35%/8%; one minute: 33%; five minutes: 30%
Time source is NTP, 12:20:00.746 IST Fri Nov 9 2011
Network-Processor Link:
  Local TX in sync, Local RX in sync
  From Network-Processor    Packets:     1150522  Bytes:   166031138
  To Network-Processor      Packets:     4364008  Bytes:   697982854

Encryption Processor Link:
  Local TX in sync, Local RX in sync
  Remote TX in sync, Remote RX in sync
```

The following sample output from the **show platform hardware slot 0 spa oir-statistics** command displays the OIR statistics of SPAs installed in a SIP in chassis slot 0:

```
Device# show platform hardware slot 0 spa oir-statistics

 SPA OIR requests: : 3
SPA OIR responses: : 3
   SPA insertions: : 0
     SPA removals: : 0
SPA driver starts: : 0
 SPA driver stops: : 0
SPA driver deaths: : 0
```

The table below describes the significant fields shown in the display.

***Table 46: show platform hardware slot 0 spa oir-statistics Field Descriptions***

| Field | Description |
|---|---|
| SPA OIR requests | Number of times the chassis software on the SIP made a request to the chassis software on the RP to allow a SPA to come online. |
| SPA OIR responses | Number of times the chassis software on the RP sent a response to an OIR request to the chassis software on the SIP. |
| SPA insertions | Number of SPA insertions since the last boot. The number is zero for SPAs that were in the chassis when the chassis booted. |
| SPA removals | Number of SPA removals since the last boot. |
| SPA driver starts | Number of times the SPA driver started. |
| SPA driver stops | Number of times the SPA driver stopped. |
| SPA driver deaths | Number of time the SPA driver reloaded. |

The following sample output from the **show platform hardware slot P0 mcu status** displays the MCU hardware status and power supply in the slot:

If you use the **show platform hardware slot** *sip* **mcu status** command or the **show platform hardware slot** *sip* **fan status** command on the Cisco ASR 1000 Series Router, we recommend that you use the value “Px” rather than “0” or other numeric values to specify the power supply slot. This command displays the MCU hardware status or fan status and references the power supply in the slot.

```
Device# show platform hardware slot P0 mcu status

Model ID: 5
12V I: 31
12V V: 11
Temp: 29
Input V: 218
Fan speed: 65%
```

The table below describes the significant fields shown in the display.

***Table 47: show platform hardware slot mcu status Field Descriptions***

| Field | Description |
|---|---|
| Model ID | Model ID of the card slot. |
| 12V | Power supply in the slot in voltage. |
| Temp | Chassis temperature. |
| Input V | Voltage input for power supply. |
| Fan speed | Speed at which the fans are spinning as a percentage of their maximum speed. |

## Related Commands

| Command | Description |
|---|---|
| **show platform hardware interface** | Displays information about an interface. |
| **show platform hardware port** | Displays information about an interface port on an SPA. |
| **show platform hardware subslot** | Displays information about an SPA. |

# show platform hardware throughput crypto

To display throughput information on a physical router, use the **show platform hardware throughput crypto** command in privileged EXEC mode. The output displays the configured throughput level, indicates if hardware throttling is effective and what the system-imposed limit is, the default throughput level for the device, and the configured boot level license.

**show platform hardware throughput crypto**

## Command Default

Privileged EXEC (#)

## Command Modes

No default behavior or values.

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Amsterdam 17.3.2 | This command was introduced on Cisco Catalyst 8300, and 8500 Series Edge Platforms. |
| Cisco IOS XE Bengaluru 17.4.1 | This command was introduced on the Cisco Catalyst 8200 Series Edge Platforms |
| Cisco IOS XE Cupertino 17.9.3a | The text in the output was modified to make it easier to understand. |

## Usage Guidelines

The output of the command provides the following information related to the throughput level on a physical router:

- It displays the throughput level that is currently effective. This value is configured with the **platform hardware throughput crypto** command in global configuration mode. If a level is not configured, the default is effective.

  The value here can be a numeric value or a tier-based throughput value. Support for tier-based throughput values was introduced in Cisco IOS XE Cupertino 17.7.1a. For more information, see Tier and Numeric Throughput Mapping for Physical Platforms, Cisco IOS XE Cupertino 17.8.1a and Later Releases.

- It indicates if the value is saved in the startup configuration file. If a configured value is not saved, it does not persist across reloads.

- It displays the hardware throttling limit that the configured value falls under. This is system-determined. See device-specific details in the following table: **Entitled throughput and throttling specifications in the autonomous mode** (formerly known as Throughput and System Hardware Throttling Specifications in the Autonomous Mode) in Configure Licenses and Throughput for Catalyst 8000 Series Physical Platforms.

- It specifies the throttling limit that is finally effective. This value will account for aggregate throughput throttling if it is effective. Support for aggregate throughput throttling was introduced in Cisco IOS XE Cupertino 17.8.1a.

- It displays the default throughput level of the device.

- It displays the boot-level DNA license that is configured on the device.

The following is sample output of the **show platform hardware throughput crypto** command on a Cisco Catalyst 8300 Series Edge Platform (C8300-2N2S-4T2X). The software version running on the device is earlier than Cisco IOS XE Cupertino 17.9.3a:

```
Device# show platform hardware throughput crypto
Current configured crypto throughput level: 250M
     Level is saved, reboot is not required
Current enforced crypto throughput level: 250M
Crypto Throughput is throttled at 250M
Default Crypto throughput level: 10M
Current boot level is network-advantage
```

The following is sample output of the **show platform hardware throughput crypto** command on a Cisco Catalyst 8300 Series Edge Platform (C8300-2N2S-4T2X). The software version running on the device is Cisco IOS XE Cupertino 17.9.3a. From the output you can derive these key conclusions:

- The throughput level that is effective is 10 Mbps.
- Configuration is saved in the startup configuration file; the configured value will therefore persist across reloads.
- From table **Entitled throughput and throttling specifications in the autonomous mode** (formerly known as Throughput and System Hardware Throttling Specifications in the Autonomous Mode) in Configure Licenses and Throughput for Catalyst 8000 Series Physical Platforms, we know that on a C8300-2N2S-4T2X, for any throughput level up to 250 Mbps, the hardware-imposed throttling limit is 250 Mbps.
- Throughput is throttled at 250 Mpbs. Note that aggregate throughput throttling is not applicable when the configured throughput is lesser than or equal to 250 Mbps.

```
Device# show platform hardware throughput crypto
Current configured crypto throughput level: 10M
     Level is saved, reboot is not required
Configured crypto throughput level on rate limiter: 250M
Crypto Throughput will be rate limited at 250M
Default Crypto throughput level: 10M
Current boot level is network-essentials
```

The following is sample output of the **show platform hardware throughput crypto** command on a Cisco Catalyst 8300 Series Edge Platform (**C8300-1N1S-4T2X**). The software version running on the device is Cisco IOS XE Cupertino 17.9.3a. From the output you can derive these key conclusions:

- The throughput level that is effective is T3.
- On C8300-1N1S-4T2X, T3 is the equivalent of 2.5 Gbps.
- Configuration is saved in the startup configuration file; the configured value will therefore persist across reloads.
- On a C8300-1N1S-4T2X, when a throughput level of T3 (2.5 Gbps) is configured, the system lifts all throttling restrictions.

```
Device# show platform hardware throughput crypto
Current configured crypto throughput level: T3
     Level is saved, reboot is not required
Configured crypto throughput level on rate limiter: 2.5G
Crypto Throughput will not be rate limited
Default Crypto throughput level: 10M
```

```
Current boot level is network-premier
```

**Related Commands**

| Command | Description |
|---|---|
| **platform hardware throughput crypto** | Configures a throughput value on a physical router. |

# show platform hardware throughput level

To display the current maximum throughput level for a virtual router, use the **show platform hardware throughput level** command in Privileged EXEC mode.

**show platform hardware throughput level**

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE 3.9S | This command was introduced on the Cisco CSR 1000V Cloud Services Router. |

## Usage Guidelines

The maximum throughput level is determined by the installed license. Depending on the configuration and installed license, you can change the maximum throughput level. See the **platform hardware throughput level** command for more information.

### Example

The following example displays the maximum throughput level on the router:

```
Router# show platform hardware throughput level
The current throughput level is 50000 kb/s
```

## Related Commands

| Command | Description |
|---|---|
| platform hardware throughput level | Changes the maximum throughput level on the virtual router. |

# show platform hardware subslot

To display information about a Cisco ASR 1000 Series shared port adapter (SPA), use the **showplatformhardwaresubslot**command in privileged EXEC or diagnostic mode.

**show platform hardware subslot** *slot/card* **plim** {**buffer** [**settings detail**] | **qos input bandwidth** | **spa settings** | **statistics** [**internal**]}

## Syntax Description

| | |
|---|---|
| *slot* / | Chassis slot where the Cisco ASR 1000 Series SPA interface processor (SIP) is installed. |
| *card* | Secondary slot number of the SIP where the SPA is installed. |
| **plim** | Provides Physical Line Interface Module (PLIM) information. |
| **buffer** | Provides PLIM buffer information (for Cisco Technical Support only). |
| **settings detail** | (Optional) Provides detailed PLIM buffer settings (for Cisco Technical Support only). |
| **qos input bandwidth** | Provides PLIM QoS input bandwidth information. |
| **spa settings** | Provides PLIM SPA settings (for Cisco Technical Support only). |
| **statistics** | Provides PLIM statistics. |
| **internal** | (Optional) Provides PLIM detailed statistics information (for Cisco Technical Support only). |

## Command Modes

Privileged EXEC (#) Diagnostic (diag)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.1 | This command was introduced on the Cisco ASR 1000 Series Routers. |
| 15.0(1)S | This command was modified. The minimum bandwidth and the proirity mode that cannot be configured in Strict Priority mode are not displayed in the output. The HP policer BW field was added to the output. |

## Examples

The following example displays ingress arbiter settings for all PLIM buffers that are in use for a SPA in chassis slot 1:

```
Router# show platform hardware subslot 1/0 plim qos input bandwidth
Ingress QOS Scheduling Mode: Strict Priority

0/0, SPA-3XOC3-ATM-V2
  Interface 0/0/0
    BW:   155520 Kbps, Min BW: N/A , Excessive Weight:   100000 Kbps, HP Policer BW:
155520 Kbps
  Interface 0/0/1
    BW:   155520 Kbps, Min BW: N/A , Excessive Weight:   155000 Kbps, HP Policer BW:
```

```
155520 Kbps
  Interface 0/0/2
    BW:   155520 Kbps, Min BW: N/A , Excessive Weight:   155000 Kbps, HP Policer BW:
155520 Kbps
```

The table below describes the significant fields shown in the display.

***Table 48: show platform hardware subslot 1/0 plim qos input bandwidth Field Descriptions***

| Field | Description |
|---|---|
| Ingress QOS Scheduling Mode | Current scheduler operation mode. |
| BW | Interface bandwidth in kilobits per second (kb/s). |
| Min Bw | Guaranteed bandwidth assigned on this interface in kb/s. |
| Excessive Weight | Excessive bandwidth assigned on this interface in kb/s. |
| HP Policer BW | Bandwidth assigned for processing high priority traffic on this interface in kb/s. |

The following example displays PLIM statistics for a SPA in chassis slot 1. Interprocess communication (IPC) packets are internal control packets. The first set of RX and TX packet counts includes both user packets and IPC packets. In this example, the RX/TX and RX IPC/TX IPC packet counts are the same because no user packets are being passed, only IPC packets.

```
Router# show platform hardware subslot 1/0 plim statistics
1/0, 2XOC3-POS, Online
  RX Pkts 739     Bytes 54564
  TX Pkts 739     Bytes 30752
  RX IPC Pkts 739     Bytes 54564
  TX IPC Pkts 739     Bytes 30752
```

The table below describes the significant fields shown in the display.

***Table 49: show platform hardware subslot 1/0 plim statistics Field Descriptions***

| Field | Description |
|---|---|
| RX Pkts | Packets (user data and IPC data) received by the PLIM from the indicated SPA. |
| TX Pkts | Packets (user data and IPC data) transmitted from the PLIM to the indicated SPA. |
| RX IPC Pkts | IPC packets received by the PLIM from the indicated SPA. |
| TX IPC Pkts | IPC packets transmitted from the PLIM to the indicated SPA. |

## Related Commands

| Command | Description |
|---|---|
| **show platform hardware interface** | Displays information about an interface. |
| **show platform hardware port** | Displays information about an interface port on a shared port adapter (SPA). |
| **show platform hardware slot** | Displays information about the processor in a chassis slot. |

# show platform hardware subslot (4400)

To display information on the network interface module, use the **show platform hardware subslot** command in privileged EXEC mode.

**show platform hardware subslot** *slot/bay* **module** [ **firmware** | **status** | **device** *device-name* | **host-if** | [**statistics** | **status** | **register**]]

## Syntax Description

| | |
|---|---|
| *slot/ bay* | Specifies the chassis slot and secondary slot number where the module is installed. |
| **module** | Specifies the module information. |
| **firmware** | Displays the firmware and bootloader version. |
| **status** | Displays information on the firmware operational status, CPU, and memory utilization. |
| **device** | Displays information for specific module devices. |
| *device-name* | Specifies the device. |
| **host-if** | Specifies the host interface. |
| **statistics** | (Optional) Displays the link statistics for the host interface. |
| **status** | (Optional) Displays the configuration, status, and interface ID for the host interface. |
| **register** | (Optional) Displays the register information for the host interface. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 3.9S | This command was introduced. |

### Example

The following are sample outputs from the **show platform hardware subslot module** command.

```
Router# show platform hardware subslot 0/1 module host-if status

NPU global_info:
CP_MAC:     0x30.f7.0d.53.bc.9e
FFP_MAC:    0x30.f7.0d.53.bc.9b
Module_MAC: 0x0c.d9.96.a8.01.cc
DSP_MAC:    0x00.00.00.00.00.00
CP VLAN ID:    0x09 0x2f
FFP VLAN ID:    0x29 0x2e
FFP HP1 VLAN ID: 0x89 0x2e
FFP HP2 VLAN ID: 0xa9 0x2e
Max MTU 10442
```

```
Router# show platform hardware subslot 0/1 module host-if statistics

GE (connecting to BP switch) statistics

                Rx frames       Rx Bytes        Tx frames       Tx Bytes
-------------------------------------------------------------------------------
pkt forwarded   744             51328           691             101687
oversize        0                               2
undersize       0                               0
multicast       0                               0
broadcast       0                               2
pause           0                               0
dropped         0                               0
FCS err         0                               0
aligmt err      0
length err      0
MRU err         0
SDU err         0
overrun err     0
undrrun err                                     0


Total frames
-------------------------------------------------------------------------------
64              696
65 ~ 127        195
128 ~ 255       529
256 ~ 511       11
512 ~ 1023      2
1024 ~ 1518     0
1519 ~ 1522     0

Flow Aggregation to BP switch
-------------------------------------------------------------------------------
FlowControl FA
        pkt fowarded:18 bytes forwarded:576
        fpb drop:0 mtu drop:0 tx_q drop:0
DSP signaling FA
        pkt fowarded:0 bytes forwarded:0
        fpb drop:0 mtu drop:0 tx_q drop:0
DSP media FA
        pkt fowarded:0 bytes forwarded:0
        fpb drop:0 mtu drop:0 tx_q drop:0
Low priorty FA (IP/ARP/BC)
        pkt fowarded:2 bytes forwarded:1180
        fpb drop:0 mtu drop:0 tx_q drop:0
Control message FA
        pkt fowarded:670 bytes forwarded:96285
        fpb drop:0 mtu drop:0 tx_q drop:0


Router# show platform hardware subslot 0/1 module firmware


Chip Revision: unknown

WDDI Build: 1771
WinFarm-0:DPS Build: 2220
WinFarm-1:DPS Build: 2220

WF-0 features set:
70d43f57 7987fffe 30f80386 46809a62 016d100e
c780344e 38357dd1 01940200 00000000 00000000
00000000 00000000 00000000 00000000 50c55135
```

```
WF-1 features set:
70d43f57 7987fffe 30f80386 46809a62 016d100e
c780344e 38357dd1 01940200 00000000 00000000
00000000 00000000 00000000 00000000 50c55135



Linux version 2.6.28.10.mips-malta (sheaunt@mcp-bld-lnx-101) (gcc version 4.3.3 (MontaVista
 Linux Sourcery G++ 4.3-302) ) #2 PREEMPT Wed Feb 27 19:14:01 PST 2013


Bootloader version: 0.1
FPGA (Active) version: 12120415
FPGA (Upgraded) version: 12120415

Router# show platform hardware subslot 0/1 module status


Process and Memory
---------------------------------
Mem: 39640K used, 12464K free, 0K shrd, 0K buff, 27492K cached
CPU:   0% usr   0% sys   0% nic 100% idle   0% io   0% irq   0% sirq
Load average: 0.00 0.00 0.00 1/17 198
  PID  PPID USER     STAT   VSZ %MEM %CPU COMMAND
  156   155 0        S     122m 240%   0% [cisco_fortitude]
    1     0 0        S     3452   7%   0% sh
  197   196 0        S     3080   6%   0% /bin/sh ./fortitude_moduleinfo.sh Proc
  196   156 0        S     3016   6%   0% sh -c ./fortitude_moduleinfo.sh "Proce
  198   197 0        R     3016   6%   0% /usr/bin/top -b -n 1 -d 30
  155   154 0        S     1852   4%   0% ./Supervisory
  154     1 0        S     1788   3%   0% ./Supervisory
    2     0 0        SW<      0   0%   0% [kthreadd]
    3     2 0        SW<      0   0%   0% [ksoftirqd/0]
    4     2 0        SW<      0   0%   0% [events/0]
    5     2 0        SW<      0   0%   0% [khelper]
    6     2 0        SW<      0   0%   0% [kblockd/0]
    7     2 0        SW       0   0%   0% [pdflush]
    8     2 0        SW       0   0%   0% [pdflush]
    9     2 0        SW<      0   0%   0% [kswapd0]
   10     2 0        SW<      0   0%   0% [aio/0]
   19     2 0        SW<      0   0%   0% [mtdblockd]



Interrupts
---------------------------------
           CPU0
  2:          0            MIPS  WinPath interrupt controller
  7:   26845968            MIPS  timer
  8:          0     WinPath-PIC  sys_err_handler
  9:          0     WinPath
```

# show platform hardware transceiver

To see transceiver information on a port, use the show platform hardware transceiver command in EXEC mode.

**show platform hardware transceiver** {**brief** | **status** | **config** | **error** | **register**} [**port**]

## Syntax Description

| | |
|---|---|
| brief | Brief device information. |
| status | Device status. |
| config | Device configuration. |
| error | Device error information. |
| register | Device register contents. |
| port | Specifies the port. If you do not select a port, this command will iterate through all ports. |

## Command Default

No default behavior or values

## Command Modes

EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2(33)SRD | This command was introduced on the Cisco 7600 series routers.<br>**Note**<br>This command applies only to the Cisco 7600 Series Ethernet Services Plus (ES+) line card on the Cisco 7600 series router. |

## Usage Guidelines

Use this command with the remote command command in EXEC mode.

## Examples

The following example shows brief information for port 1.

```
Router# remote command module 13 show platform hardware transceiver brief 1
Show brief info for port 1:
GigabitEthernet13/1:
        ID: SFP
        Extended ID: 4
        Xcvr Type: GE SX (13)
        Connector: LC
        Vendor name: CISCO-FINISAR
        Vendor part number: FTLF8519P2BCL-CS
        State: Enabled
```

The following example shows status information for port 1.

```
Router# remote command module 13 show platform hardware transceiver status 1
Show status info for port 1:
TenGigabitEthernet1/1:
```

```
State: Enabled
Environmental Information - raw values
        Temperature: 7616
        Tx voltage: 0 in units of 100uVolt
        Tx bias: 28722 uA
        Tx power: -2 dBm (5441 in units of 0.1 uW)
        Rx power: 0 dBm (7712 in units of 0.1 uW)
        (AUX1) Laser Temperature: 8704
        (AUX2) +3.3V Supply Voltage: 32928
XFP TX is enabled.
XFP TX is soft enabled.
XFP is ready.
XFP is not power down.
XFP is not soft power down.
XFP doesn't have interrupt(s).
XFP is not LOS.
XFP data is ready.
XFP TX path is ready.
XFP TX laser is not in fault condition.
XFP TX path CDR is locked.
XFP RX path is ready.
XFP RX path CDR is locked.
No active alarms
No active warning
```

## Related Commands

| Command | Description |
|---|---|
| remote command {module num \| standby-rp \| switch} command | Executes a Cisco 7600 series router command directly on the switch console or a specified module without having to log into the Cisco 7600 series router first. |

# show platform isg memory

To display dynamically allocated memory usage information on the route processor (RP), use the **showplatformisgmemory**command in privileged EXEC mode.

**show platform isg memory** [**detail**]

## Syntax Description

| | |
|---|---|
| **detail** | (Optional) Displays detailed memory usage information. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.1(1)S | This command was introduced. |

## Examples

This is a sample output of the **showplatformisgmemory**command.

```
Router# show platform isg memory
Allocator-Name                 In-use/Allocated           Count
  ------------------------------------------------------------------------------
  CWAN VRF NODE             :          0/65588      (  0%) [      0] Chunk
  CWAN PLATFORM             :          0/20052      (  0%) [      0] Chunk
  CWAN PPPoE SB             :          0/20052      (  0%) [      0] Chunk
  CWAN PPPOE NOD            :          0/65588      (  0%) [      0] Chunk
  CWAN VRF Sess Cnt         :      16384/16436      ( 99%) [      1]
  CWAN MSI Array            :      16384/16436      ( 99%) [      1]
  CWAN MSI Elem             :      98304/311296     ( 31%) [   4096]
  VRF Pend list Array       :      16384/16436      ( 99%) [      1]
  VRF Pend list MSI         :      98304/311296     ( 31%) [   4096]
  CWAN slot pid hdl         :         60/112        ( 53%) [      1]
  CWAN sess per slot        :    2880000/2880780    ( 99%) [     15]
  CWAN test lru hdl         :         24/76         ( 31%) [      1]
  CWAN Container HWSB       :         56/108        ( 51%) [      1]
  CW Cont swidb SB          :        104/208        ( 50%) [      2]
  L4R Rules per             :          0/32820      (  0%) [      0] Chunk
  L4R Srv Grps p            :          0/32820      (  0%) [      0] Chunk
  L4R non-access            :          0/65588      (  0%) [      0] Chunk
  L4R Srv Info              :          0/32820      (  0%) [      0] Chunk
```

The table below describes the fields shown in the **showplatformisgmemory**command display.

***Table 50: show platform isg memory Field Descriptions***

| Field | Description |
|---|---|
| Allocator-Name | Name of the memory allocating process. |
| In-use | Indicates the current memory usage. |
| Allocated | Total memory allocated by the process. |
| Count | Number of allocated memory blocks. |

# show platform mgf

To show the details of the multi-gigabit fabric, use the **show platform mgf** command in privileged EXEC mode.

**show platform mgf** [**module** | **statistics cpu**]

## Syntax Description

| | |
|---|---|
| **module** | Shows details of the modules registered to the backplane switch manager (BPSM). |
| **statistics** | Displays the multi-gigabit fabric's packet statistics. |
| **cpu** | Displays the multi-gigabit fabric's cpu port statistics. |

## Command Default

None

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.0(1)M | This command was introduced for the Cisco 3900 Series, 2900 Series, and 1900 Series Integrated Services Routers (ISRs). |

## Usage Guidelines

To show the details of the multi-gigabit fabric, use the **show platform mgf** command in privileged EXEC mode. Or, enter the **show platform mgf** command and press Enter to display VLAN and slot assignments on the router. An asterisk next to the slot indicates that the vlan is the slot's default VLAN. The following example displays output from a Cisco 3945 ISR.

**Note** Before Cisco IOS 15.1(3)T release, the Cisco Services Ready Engine (SRE) Service Module was managed by the platform backplane code. Therefore, when you entered the **show platform mgf** command, the Cisco SRE Service Module was displayed in the command output. But with Cisco IOS 15.1(3)T release, because the Cisco SRE Service Module is in the switchport managed module, it is no longer displayed in the **show platform mgf** command output.

**Note** VLAN1 is the default when no other VLAN are listed.

```
Router# show platform mgf
VLAN    Slots
---------------------------------------------------------------
1       ISM*, EHWIC-0*, EHWIC-1*, EHWIC-2*, EHWIC-3*
        PVDM-0*, PVDM-1*, PVDM-2*, PVDM-3*, SM-1*
        SM-2*, SM-3*, SM-4*
```

## Examples

The following example displays the output for the **show platform mgf module** command when entered on a Cisco 3945 ISR. The table below displays the information code that appears in the output.

```
Router# show platform mgf module
Registered Module Information
Code:   NR - Not Registered, TM - Trust Mode, SP - Scheduling Profile
        BL - Buffer Level, TR - Traffic Rate, PT - Pause Threshold
slot    vlan    type/ID         TM      SP      BL      TR      PT
----    ----    ----------      ------- ---     ------  -----   ----
ISM     NR
EHWIC-0 NR
EHWIC-1 NR
EHWIC-2 NR
EHWIC-3 NR
PVDM-0  NR
PVDM-1  NR
PVDM-2  NR
PVDM-3  NR
SM-1     1       SM/6            UP      1       high    1000    high
SM-2     1       SM/6            UP      1       high    1000    high
SM-3    NR
SM-4    NR
```

***Table 51: Show Platform Backplane Module Information Code***

| Code | Description |
|---|---|
| NR | Not registered |
| TM | Trust mode |
| SP | Scheduling profile |
| BL | Buffer level |
| TR | Traffic rate |
| PT | Pause threshold |

The following example displays output for the **show platform mgf statistics** command when entered on a Cisco 1941 ISR.

```
Router# show platform mgf statistics

Interface statistics for slot: ISM (port 1)
-----------------------------------------------------
30 second input rate 0 packets/sec
30 second output rate 0 packets/sec
0 packets input, 0 bytes, 0 overruns
Received 0 broadcasts, 0 multicast, 0 unicast 0 runts, 0 giants, 0 jabbers 0 input errors,
 0 CRC, 0 fragments, 0 pause input 0 packets output, 0 bytes, 0 underruns 0 broadcast, 0
multicast, 0 unicast 0 late collisions, 0 collisions, 0 deferred 0 bad bytes received, 0
multiple, 0 pause output
Interface statistics for slot: EHWIC-0 (port 2)
-----------------------------------------------------
30 second input rate 13844 packets/sec
30 second output rate 13844 packets/sec
3955600345 packets input, 1596845471340 bytes, 26682 overruns Received 0 broadcasts, 0
```

```
multicast, 3955600345 unicast 0 runts, 0 giants, 0 jabbers 0 input errors, 0 CRC, 0 fragments,
 0 pause input
3955738564 packets output, 1596886171288 bytes, 0 underruns 0 broadcast, 0 multicast,
3955738564 unicast 0 late collisions, 0 collisions, 0 deferred 0 bad bytes received, 0
multiple, 94883 pause output
Interface statistics for slot: EHWIC-1 (port 3)
-----------------------------------------------------
30 second input rate 13844 packets/sec
30 second output rate 13844 packets/sec
3955973016 packets input, 1598763291608 bytes, 26684 overruns Received 0 broadcasts, 0
multicast, 3955973016 unicast 0 runts, 0 giants, 0 jabbers 0 input errors, 0 CRC, 0 fragments,
 0 pause input 3955781430 packets output, 1598708166660 bytes, 0 underruns 0 broadcast, 0
multicast, 3955781430 unicast 0 late collisions, 0 collisions, 0 deferred 0 bad bytes
received, 0 multiple, 94987 pause output
```

The following example displays output for the **show platform mgf statistics cpu** command when entered on a Cisco 3945 ISR.

```
Router# show platform mgf statistics cpu
Backplane-GigabitEthernet0/3 is up, line protocol is up
  Hardware is PQ3_TSEC, address is 001b.5428.d403 (bia 001b.5428.d403)
  MTU 9600 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Full-duplex, 1000Mb/s, media type is internal
  output flow-control is unsupported, input flow-control is unsupported
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 watchdog, 0 multicast, 0 pause input
     0 input packets with dribble condition detected
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier, 0 pause output
     0 output buffer failures, 0 output buffers swapped out Interface statistics for CPU:
(port 0)
-----------------------------------------------------
30 second input rate 0 packets/sec
30 second output rate 0 packets/sec
0 packets input, 0 bytes, 0 overruns
Received 0 broadcasts, 0 multicast, 0 unicast 0 runts, 0 giants, 0 jabbers 0 input errors,
 0 CRC, 0 fragments, 0 pause input 0 packets output, 0 bytes, 0 underruns 0 broadcast, 0
multicast, 0 unicast 0 late collisions, 0 collisions, 0 deferred 0 bad bytes received, 0
multiple, 0 pause output
```

## Related Commands

| Command | Description |
|---|---|
| **show platform** | To display platform information, use the show platform command in privileged EXEC mode. |

# show platform resources

To display information about the utilization of platform resources, such as the Control Processor (CP), Service Processor (SP), DRAM, bootflash, and harddisk, use the **show platform resources** command in privileged EXEC mode.

The command now reports Control Processor (CP) and Service Processor (SP) CPU utilization under the 'Control/Service Processor' entry.

**show platform resources {R0 | R0 cpu | R0 memory | exmem | datapath | datpath oversubscription}**

## Syntax Description

*Table 52: Syntax Description*

| | |
|---|---|
| **R0** | Shows the CPU summary from a BINOS perspective. |
| **R0 cpu** | Shows the CPU utilization. |
| **R0 memory** | Shows the memory utilization. |
| **exmem** | Shows the user allocation statistics. |
| **datapath** | Shows the quantum flow processor utilization. |
| **datapath oversubscription** | Shows the oversubscription of the quantum flow processor. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE release 3.14 | This command was introduced. |
| Cisco IOS XE Gibraltar 16.11.1 | The command output is enhanced to include bootflash and harddisk information for Route Processors. |
| Cisco IOS XE Amsterdam 17.3.1 | This command was modified. The following keywords were added: **R0**, **R0 cpu**, **R0 memory**, **exmem**, **datapath**, and **datapath oversubscription**. |

## Examples

The following sample output from the **show platform resources** command displays resource utilization related to the Embedded Service Processor and the Route Processor.

```
Router# show platform resources
**State Acronym: H - Healthy, W - Warning, C - Critical

Resource                 Usage                Max            Warning         Critical
     State
-------------------------------------------------------------------------------------------------
RP0 (ok, active)
     H
 Control Processor       0.60%                100%           80%             90%
     H
  DRAM                   3077MB(40%)          7567MB         88%             93%
     H
  bootflash              3900MB(53%)          7305MB         88%             93%
```

```
     H
  harddisk               8223MB(8%)            93836MB          88%              93%
     H
RP1 (ok, standby)
     H
 Control Processor       0.00%                 100%             80%              90%
     H
  DRAM                   2982MB(39%)           7567MB           88%              93%
     H
  bootflash              2564MB(35%)           7305MB           88%              93%
     H
  harddisk               14377MB(15%)          93836MB          88%              93%
     H
ESP0(ok, active)
     H
 Control Processor       0.60%                 100%             80%              90%
     H
  DRAM                   1027MB(13%)           7872MB           88%              93%
     H
 QFP
     H
  TCAM                   240834cells(45%)      524288cells      65%              85%
     H
  DRAM                   181248KB(17%)         1048576KB        85%              95%
     H
  IRAM                   13013KB(9%)           131072KB         85%              95%
     H
  Pkt Buf Mem            55296KB(15%)          65535KB          85%              95%
     H
  CPU Utilization        0.00%                 100%             90%              95%
     H
ESP1(ok, standby)
     H
 Control Processor       0.70%                 100%             80%              90%
     H
  DRAM                   1016MB(12%)           7872MB           88%              93%
     H
 QFP
     H
  TCAM                   240834cells(45%)      524288cells      65%              85%
     H
  DRAM                   181248KB(17%)         1048576KB        85%              95%
     H
  IRAM                   13013KB(9%)           131072KB         85%              95%
     H
  CPU Utilization        0.00%                 100%             90%              95%
     H
```

The output fields are self-explanatory.

**Note** On platforms where the harddisk is not present, only the bootflash information is displayed.

# show platform slot r0 pcie status

To display information about all Peripheral Component Interconnect (PCI) buses on the Route Processor (RP) slot on the Cisco ASR 1000 Series Aggregation Services Router and devices connected to the PCI buses, use the **show platform slot r0 pcie status** command in user EXEC or privileged EXEC mode.

**show platform slot r0 pcie status**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC (#)
User EXEC (>)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 3.6 | This command was introduced. |

## Examples

The following sample output from the **show platform slot r0 pcie status** command displays information about all PCI buses on the RP slot on the Cisco ASR 1000 Series Aggregation Services Router and the devices connected to them:

```
Router# show platform slot r0 pcie status

00:00.0 Class 0600: Device 8086:65c0 (rev 90)
00:02.0 Class 0604: Device 8086:65f7 (rev 90)
00:03.0 Class 0604: Device 8086:65e3 (rev 90)
00:04.0 Class 0604: Device 8086:65e4 (rev 90)
00:05.0 Class 0604: Device 8086:65e5 (rev 90)
00:06.0 Class 0604: Device 8086:65e6 (rev 90)
00:07.0 Class 0604: Device 8086:65e7 (rev 90)
00:08.0 Class 0880: Device 8086:65ff (rev 90)
00:10.0 Class 0600: Device 8086:65f0 (rev 90)
00:10.1 Class 0600: Device 8086:65f0 (rev 90)
00:10.2 Class 0600: Device 8086:65f0 (rev 90)
00:11.0 Class 0600: Device 8086:65f1 (rev 90)
00:13.0 Class 0600: Device 8086:65f3 (rev 90)
00:15.0 Class 0600: Device 8086:65f5 (rev 90)
00:16.0 Class 0600: Device 8086:65f6 (rev 90)
00:19.0 Class 0200: Device 8086:10e5 (rev 02)
00:1a.0 Class 0c03: Device 8086:2937 (rev 02)
00:1a.1 Class 0c03: Device 8086:2938 (rev 02)
00:1a.2 Class 0c03: Device 8086:2939 (rev 02)
00:1a.7 Class 0c03: Device 8086:293c (rev 02)
00:1b.0 Class 0403: Device 8086:293e (rev 02)
00:1d.0 Class 0c03: Device 8086:2934 (rev 02)
00:1d.1 Class 0c03: Device 8086:2935 (rev 02)
```

The output fields are self-explanatory.

# show platform software agent iomd

To display the packets of High Priority and Low Priority queue in Over Subscription mode, use the **show platform software agent iomd** command in privileged EXEC mode.

**show platform software agent iomd** *im module* **dump fpga** *port number*

**Syntax Description**

| | |
|---|---|
| *im module* | The name of the interface module. |
| **port number** | The port number used |

**Command Default**

No default behavior or values.

**Command Modes**

Privileged EXEC (#)

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE Everest 16.6.1 | This command was introduced on Cisco ASR 900 Series Routers and Cisco NCS 4200 Routers. |

**Examples**

```
#show platform software agent iomd 0/8 dump fpga 4
OS LP Drop Q Pkt Cnt :0x0
OS HP Drop Q Pkt Cnt :0x0
OS LP Q Pkt Cnt :0x22906bd0
OS HP Q Pkt Cnt :0x55fdd731
```

To clear the High Priority and Low Priority counters in Over Subscription mode, use the **show platform software agent iomd** command in privileged EXEC mode.

**show platform software agent iomd** *im module* **clear fpga** *port number*

**Syntax Description**

| | |
|---|---|
| *im module* | The name of the interface module. |
| **port number** | The port number used |

**Command Default**

No default behavior or values.

**Command Modes**

Privileged EXEC (#)

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE Everest 16.6.1 | This command was introduced on Cisco ASR 900 Series Routers and Cisco NCS 4200 Routers. |

**Examples**

```
#show platform software agent iomd 0/8 clear fpga 4
OS LP Drop Q Pkt Cnt :0x0
OS HP Drop Q Pkt Cnt :0x0
```

```
OS LP Q Pkt Cnt :0x0
OS HP Q Pkt Cnt :0x0
```

# show platform software audit

To display the SE Linux Audit logs, use the **show platform software audit** command in privileged EXEC mode.

**show platform software audit** { **all** | **summary** | **0** | **1** | **2** | **F0** | **R0** | **FP active** | **RP active**}

## Syntax Description

| | |
|---|---|
| **all** | Shows the audit log from all the slots. |
| **summary** | Shows the audit log summary count from all the slots. |
| **0** | Shows the audit log for the SM-Inter-Processor slot 0. |
| **1** | Shows the audit log for the SM-Inter-Processor slot 1. |
| **2** | Shows the audit log for the SM-Inter-Processor slot 2. |
| **F0** | Shows the audit log for the Embedded-Service-Processor slot 0. |
| **R0** | Shows the audit log for the Route-Processor slot 0. |
| **FP active** | Shows the audit log for the active Embedded-Service-Processor slot. |
| **RP active** | Shows the audit log for the active Route-Processor slot. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Gibraltar 16.11.1 | This command was introduced on Cisco ISR 4000 series routers, Cisco CSR 1000V series routers, and Cisco 1000 ISR series routers running time-sensitive networking (TSN). |

## Usage Guidelines

This command was introduced in the Cisco IOS XE Gibraltar 16.11.1 as a part of the SELinux Permissive Mode feature. The **show platform software audit** command displays the system logs containing the access violation events.

In Cisco IOS XE Gibraltar 16.11.1, operation in a permissive mode is available - with the intent of confining specific components (process or application) of the IOS-XE platform. In the permissive mode, access violation events are detected and system logs are generated, but the event or operation itself is not blocked. The solution operates mainly in an access violation detection mode.

The following is a sample output of the **show software platform software audit summary** command:

```
Device# show platform software audit summary
==================================
AUDIT LOG ON ACTIVE
----------------------------------
AVC Denial count: 7
```

The following is a sample output of the **show software platform software audit all** command. This command displays the information in the `audit.log` file.

```
Device#sh pla software audit all
==================================
AUDIT LOG ON ACTIVE
----------------------------------
========== START ============
type=DAEMON_START msg=audit(1553837190.262:3031): op=start ver=2.6.6 format=raw kernel=4.4.172
 auid=4294967295 pid=446 subj=system_u:system_r:auditd_t:s0 res=success
type=NETFILTER_CFG msg=audit(1553837185.956:2): table=nat family=2 entries=0
type=MAC_STATUS msg=audit(1553837186.523:3): enforcing=1 old_enforcing=0 auid=4294967295
ses=4294967295
type=SYSCALL msg=audit(1553837186.523:3): arch=c000003e syscall=1 success=yes exit=1 a0=3
a1=7ffcf1c22070 a2=1 a3=0 items=0 ppid=203 pid=205 auid=4294967295 uid=0 gid=0 euid=0 suid=0
 fsuid=0 egid=0 sgid=0 fsgid=0 tty=(none) ses=4294967295 comm="load_policy"
exe="/usr/sbin/load_policy" subj=kernel key=(null)
type=PROCTITLE msg=audit(1553837186.523:3):
proctitle=2F7573722F7362696E2F6C6F61645F706F6C696379002D69
type=MAC_POLICY_LOAD msg=audit(1553837186.528:4): policy loaded auid=4294967295 ses=4294967295
type=SYSCALL msg=audit(1553837186.528:4): arch=c000003e syscall=1 success=yes exit=1693637
 a0=4 a1=7f792d1d6000 a2=19d7c5 a3=f items=0 ppid=203 pid=205 auid=4294967295 uid=0 gid=0
euid=0 suid=0 fsuid=0 egid=0 sgid=0 fsgid=0 tty=(none) ses=4294967295 comm="load_policy"
exe="/usr/sbin/load_policy" subj=system_u:system_r:kernel_t:s0 key=(null)
…
```

You can use the output of this command to copy the contents of `audit.log` to a file to then transfer to a remote host.

```
Device#show platform software audit all | redirect bootflash:audi_123.log

Device#dir bootflash:audi_123.log
Directory of bootflash:/audi_123.log
   27  -rw-            35305  Mar 29 2019 22:16:36 +00:00  audi_123.log

3249049600 bytes total (538112000 bytes free)
```

# show platform software memory

To display memory information for the specified process, use the **show platform software memory**command in privileged EXEC or diagnostic mode.

**show platform software memory** [**database** | **messaging**] {**chassis-manager** *slot* | **cpp-control-process** *process* | **cpp-driver** *process* | **cpp-ha-server** *process* | **cpp-service-process** *process* | **forwarding-manager** *slot* | **host-manager** *slot* | **interface-manager** *slot* | **ios** *slot* | **logger** *slot* | **pluggable-services** *slot* | **shell-manager** *slot*} [**brief**]

## Syntax Description

| | |
|---|---|
| **database** database | (Optional) Displays database memory information for the specified process. |
| **messaging** | (Optional) Displays messaging memory information for specified process.<br>The information displayed is for internal debugging purposes only. |
| **chassis-manager** *slot* | Displays memory information for the Chassis Manager process in the specified *slot*. Possible *slot* values are:<br>• **0** --Cisco ASR 1000 Series SPA Interface Processor (SIP) slot 0<br>• **1** --Cisco ASR 1000 Series SIP slot 1<br>• **2** --Cisco ASR 1000 Series SIP slot 2<br>• **f0** --Cisco ASR 1000 Series Embedded Services Processor (ESP) slot 0<br>• **f1** --Cisco ASR 1000 Series ESP slot 1<br>• **fp active** --Active Cisco ASR 1000 Series ESP<br>• **fp standby** --Standby Cisco ASR 1000 Series ESP<br>• **r0** --Cisco ASR 1000 Series Route Processor (RP) slot 0<br>• **r1** --Cisco ASR 1000 Series RP slot 1<br>• **rp active** --Active Cisco ASR 1000 Series RP<br>• **rp standby** --Standby Cisco ASR 1000 Series RP |
| **cpp-control-process** | Displays memory information for the specified Cisco Packet Processor (CPP) Client Control process. Possible *process* values are:<br>• **cpp active** --Active CPP Client Control process<br>• **cpp standby** --Standby CPP Client Control process<br>The information displayed is for internal debugging purposes only. |

| | |
|---|---|
| **cpp-driver** | Displays memory information for the specified CPP Driver process. Possible *process* values are:<br>• **cpp active** --Active CPPDriver process<br>• **cpp standby** --Standby CPP Driver process<br>The information displayed is for internal debugging purposes only. |
| **cpp-ha-server** | Displays memory information for the specified CPP High Availability (HA) Server process. Possible *process* values are:<br>• **cpp active** --Active CPP HA Server process<br>• **cpp standby** --Standby CPP HA Server process<br>The information displayed is for internal debugging purposes only. |
| **cpp-service-process** | Displays memory information for the specified CPP Client Service process. Possible *process* values are:<br>• **cpp active** --Active CPP Client Service process<br>• **cpp standby** --Standby CPP Client Service process<br>The information displayed is for internal debugging purposes only. |
| **forwarding-manager** *slot* | Displays memory information for the Forwarding Manager process in the specified *slot*. Possible *slot* values are:<br>• **f0** --Cisco ASR 1000 Series ESP slot 0<br>• **f1** --Cisco ASR 1000 Series ESP slot 1<br>• **fp active** --Active Cisco ASR 1000 Series ESP<br>• **fp standby** --Standby Cisco ASR 1000 Series ESP<br>• **r0** --Cisco ASR 1000 Series RP slot 0<br>• **r1** --Cisco ASR 1000 Series RP slot 1<br>• **rp active** --Active Cisco ASR 1000 Series RP<br>• **rp standby** --Standby Cisco ASR 1000 Series RP |

| | |
|---|---|
| **host-manager** *slot* | Displays memory information for the Host Manager process in the specified *slot*. Possible *slot* values are:<br>• **0** --Cisco ASR 1000 Series SIP slot 0<br>• **1** --Cisco ASR 1000 Series SIP slot 1<br>• **2** --Cisco ASR 1000 Series SIP slot 2<br>• **f0** --Cisco ASR 1000 Series ESP slot 0<br>• **f1** --Cisco ASR 1000 Series ESP slot 1<br>• **fp active** --Active Cisco ASR 1000 Series ESP<br>• **fp standby** --Standby Cisco ASR 1000 Series ESP<br>• **r0** --Cisco ASR 1000 Series RP slot 0<br>• **r1** --Cisco ASR 1000 Series RP slot 1<br>• **rp active** --Active Cisco ASR 1000 Series RP<br>• **rp standby** --Standby Cisco ASR 1000 Series RP |
| **interface-manager** *slot* | Displays memory information for the Interface Manager process in the specified *slot*. Possible *slot* values are:<br>• **0** --Cisco ASR 1000 Series SIP slot 0<br>• **1** --Cisco ASR 1000 Series SIP slot 1<br>• **2** -- Cisco ASR 1000 Series SIP slot 2<br>• **r0** --Cisco ASR 1000 Series RP slot 0<br>• **r1** --Cisco ASR 1000 Series RP slot 1<br>• **rp active** --Active Cisco ASR 1000 Series RP<br>• **rp standby** --Standby Cisco ASR 1000 Series RP |

| | |
|---|---|
| **ios** *slot* | Displays memory information for the IOS process in the specified *slot*. Possible *slot* values are:<br>• **0/0** --Cisco ASR 1000 Series SIP slot 0, bay 0<br>• **0/1** --Cisco ASR 1000 Series SIP slot 0, bay 1<br>• **0/2** --Cisco ASR 1000 Series SIP slot 0, bay 2<br>• **0/3** --Cisco ASR 1000 Series SIP slot 0, bay 3<br>• **1/0** --Cisco ASR 1000 Series SIP slot 1, bay 0<br>• **1/1** --Cisco ASR 1000 Series SIP slot 1, bay 1<br>• **1/2** --Cisco ASR 1000 Series SIP slot 1, bay 2<br>• **1/3** --Cisco ASR 1000 Series SIP slot 1, bay 3<br>• **2/0** --Cisco ASR 1000 Series SIP slot 2, bay 0<br>• **2/1** --Cisco ASR 1000 Series SIP slot 2, bay 1<br>• **2/2** --Cisco ASR 1000 Series SIP slot 2, bay 2<br>• **2/3** --Cisco ASR 1000 Series SIP slot 2, bay 3<br>• **r0** --Cisco ASR 1000 Series RP slot 0<br>• **r1** --Cisco ASR 1000 Series RP slot 1<br>• **rp active** --Active Cisco ASR 1000 Series RP<br>• **rp standby** --Standby Cisco ASR 1000 Series RP |
| **logger** *slot* | Displays memory information for the logger process in the specified *slot*. Possible *slot* values are:<br>• **0** --Cisco ASR 1000 Series SIP slot 0<br>• **1** --Cisco ASR 1000 Series SIP slot 1<br>• **2** --Cisco ASR 1000 Series SIP slot 2<br>• **f0** --Cisco ASR 1000 Series ESP slot 0<br>• **f1** --Cisco ASR 1000 Series ESP slot 1<br>• **fp active** --Active Cisco ASR 1000 Series ESP<br>• **fp standby** --Standby Cisco ASR 1000 Series ESP<br>• **r0** --Cisco ASR 1000 Series RP slot 0<br>• **r1** --Cisco ASR 1000 Series RP slot 1<br>• **rp active** --Active Cisco ASR 1000 Series RP<br>• **rp standby** --Standby Cisco ASR 1000 Series RP |

| | |
|---|---|
| **pluggable-services** *slot* | Displays memory information for the pluggable-services process in the specified *slot*. Possible *slot* values are:<br>• **r0** --Cisco ASR 1000 Series RP slot 0<br>• **r1** --Cisco ASR 1000 Series RP slot 1<br>• **rp active** --Active Cisco ASR 1000 Series RP<br>• **rp standby** --Standby Cisco ASR 1000 Series RP |
| **shell-manager** *slot* | Displays memory information for the Shell Manager process in the specified slot. Possible *slot* values are:<br>• **r0** --Cisco ASR 1000 Series RP slot 0<br>• **r1** --Cisco ASR 1000 Series RP slot 1<br>• **rp active** --Active Cisco ASR 1000 Series RP<br>• **rp standby** --Standby Cisco ASR 1000 Series RP |
| **brief** | (Optional) Displays abbreviated memory information for the specified process. |

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC (#)

Diagnostic (diag)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.1 | This command was introduced on the Cisco ASR 1000 Series Routers. |

## Usage Guidelines

The specification of the database and brief keywords are optional.

The specification of a process and slot are required.

## Examples

The following example displays memory information for the Forwarding Manager process for Cisco ASR 1000 Series RP slot 0:

```
Router# show platform software memory forwarding-manager r0
Module: cdllib
  allocated: 900, requested: 892, overhead: 8
  Allocations: 2, failed: 0, frees: 1
Module: eventutil
  allocated: 117379, requested: 117059, overhead: 320
  Allocations: 46, failed: 0, frees: 6
Module: uipeer
  allocated: 9264, requested: 9248, overhead: 16
  Allocations: 3, failed: 0, frees: 1
Module: Summary
  allocated: 127543, requested: 127199, overhead: 344
  Allocations: 51, failed: 0, frees: 8
```

The table below describes the significant fields shown in the display.

*Table 53: show platform software memory Field Descriptions*

| Field | Description |
|---|---|
| Module: | Name of submodule. |
| allocated: | Memory, allocated in bytes. |
| requested: | Number of bytes requested by application. |
| overhead: | Allocation overhead. |
| Allocations: | Number of discrete allocation event attempts. |
| failed: | Number of allocation attempts that were attempted, but failed. |
| frees: | Number of free events. |

The following example displays abbreviated (brief keyword) memory information for the Chassis Manager process for Cisco ASR 1000 Series ESP slot 0:

```
Router# show platform software memory chassis-manager f0 brief

  module            allocated     requested     allocs        frees
  ------------------------------------------------------------------------
  CPP Features      692           668           3             0
  Summary           497816        495344        323           14
  chunk             419322        419290        4             0
  eventutil         68546         66146         312           12
  uipeer            9256          9240          4             2
```

The table below describes the significant fields shown in the **brief** keyword display.

*Table 54: show platform software memory brief Field Descriptions*

| Field | Description |
|---|---|
| module | Name of submodule. |
| allocated | Memory, allocated in bytes. |
| requested | Number of bytes requested by application. |
| allocs | Number of discrete allocation event attempts. |
| frees | Number of free events. |

# show platform software mount

To display the mounted file systems, both physical and virtual, for a Cisco ASR 1000 Series SPA Interface Processor (SIP), Cisco ASR 1000 Series Embedded Services Processor (ESP), or Cisco ASR 1000 Series Route Processor (RP), use the **show platform software mount**command in privileged EXEC or diagnostic mode.

**show platform software mount** [*slot* [**brief**]]

## Syntax Description

| | |
|---|---|
| *slot* | (Optional) Displays mounted file systems for the specified *slot*. Possible *slot* values are:<br>• **0** --Cisco ASR 1000 Series SIP slot 0<br>• **1** --Cisco ASR 1000 Series SIP slot 1<br>• **2** --Cisco ASR 1000 Series SIP slot 2<br>• **f0** --Cisco ASR 1000 Series ESP slot 0<br>• **f1** --Cisco ASR 1000 Series ESP slot 1<br>• **fp active** --Active Cisco ASR 1000 Series ESP<br>• **fp standby** --Standby Cisco ASR 1000 Series ESP<br>• **r0** --Cisco ASR 1000 Series RP slot 0<br>• **r1** --Cisco ASR 1000 Series RP slot 1<br>• **rp active** --Active Cisco ASR 1000 Series RP<br>• **rp standby** --Standby Cisco ASR 1000 Series RP |
| **brief** | (Optional) Displays abbreviated mounted file system information. |

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC (#)

Diagnostic (diag)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.1 | This command was introduced on the Cisco ASR 1000 Series Routers. |

## Usage Guidelines

If no slot is specified, the command returns mounted file systems for the active RP.

This command allows you to ascertain the presence or absence of specific system mounts. For example, this command might be used to determine /tmp-related mounts, which are used to create many run-time directories and files.

Users may be requested to execute this command to collect information about the underlying configuration of the platform software.

The RP output can differ depending on how the router was booted, and whether there are USB devices inserted.

The SIP and ESP output can differ depending on whether the chassis is a dual or single RP.

## Examples

The following example displays mounted file systems for the active RP:

```
Router# show platform software mount
Filesystem                          Used   Available  Use% Mounted on
rootfs                                 0           0     -  /
proc                                   0           0     -  /proc
sysfs                                  0           0     -  /sys
none                                 524     1037640    1%  /dev
/dev/bootflash1                   298263       42410   88%  /bootflash
/dev/harddisk1                    609208     4025132   14%  /misc/scratch
/dev/loop1                         28010           0  100%  /tmp/sw/mount/2007-10-14_...
/dev/loop2                         26920           0  100%  /tmp/sw/mount/2007-10-14_...
/dev/loop3                         48236           0  100%  /tmp/sw/mount/2007-10-14_...
/dev/loop4                          6134           0  100%  /tmp/sw/mount/2007-10-14_...
/dev/loop5                         43386           0  100%  /tmp/sw/mount/2007-10-14_...
/dev/loop6                         30498           0  100%  /tmp/sw/mount/2007-10-14_...
/dev/loop7                         14082           0  100%  /tmp/sw/mount/2007-10-14_...
none                                 524     1037640    1%  /dev
/proc/bus/usb                          0           0     -  /proc/bus/usb
/dev/mtdblock1                       460        1588   23%  /obfl
automount(pid4165)                     0           0     -  /vol
```

The following example displays mounted file systems for the Cisco ASR 1000 Series ESP in ESP slot 0:

```
Router# show platform software mount f0
Filesystem                          Used   Available Use% Mounted on
rootfs                                 0           0     -  /
proc                                   0           0     -  /proc
sysfs                                  0           0     -  /sys
none                               10864      507124    3%  /dev
/dev/loop1                         41418           0  100%  /tmp/sw/fp/0/0/fp/mount
none                               10864      507124    3%  /dev
/dev/proc/bus/usb                      0           0     -  /proc/bus/usb
/dev/mtdblock1                       504        1544   25%  /obfl
automount(pid3210)                     0           0     -  /misc1
```

The following example displays mounted file systems for the active Cisco ASR 1000 Series RP:

```
Router# show platform software mount rp active
Filesystem                          Used   Available  Use% Mounted on
rootfs                                 0           0     -  /
proc                                   0           0     -  /proc
sysfs                                  0           0     -  /sys
none                                 436     1037728    1%  /dev
/dev/bootflash1                   256809       83864   76%  /bootflash
/dev/harddisk1                    252112     4382228    6%  /misc/scratch
/dev/loop1                         30348           0  100%  /tmp/sw/mount/2007-09-27_...
/dev/loop2                         28394           0  100%  /tmp/sw/mount/2007-09-27_...
/dev/loop3                         42062           0  100%  /tmp/sw/mount/2007-09-27_...
/dev/loop4                          8384           0  100%  /tmp/sw/mount/2007-09-27_...
/dev/loop5                         41418           0  100%  /tmp/sw/mount/2007-09-27_...
/dev/loop6                         21612           0  100%  /tmp/sw/mount/2007-09-27_...
/dev/loop7                         16200           0  100%  /tmp/sw/mount/2007-09-27_...
none                                 436     1037728    1%  /dev
/proc/bus/usb                          0           0     -  /proc/bus/usb
```

```
/dev/mtdblock1                          484         1564   24%  /obfl
automount(pid4004)                        0            0     -  /vol
```

The table below describes the significant fields shown in the SIP slot (0, 1, or 2) displays.

***Table 55: show platform software mount SIP slot Field Descriptions***

| Field | Description |
|---|---|
| Filesystem | Logical name of the file system device. |
| Used | Number of 1Kb blocks used. |
| Available | Number of free 1Kb blocks available. |
| Use% | Percentage of 1Kb blocks used of the total available. |
| Mounted on | Canonical path to the mounted file system. |

The following example displays abbreviated (brief keyword) mounted file system information for Cisco ASR 1000 Series SIP slot 0:

```
Router# show platform software mount 0 brief
Mount point: rootfs
  Type     : rootfs
  Location : /
  Options  : rw
Mount point: proc
  Type     : proc
  Location : /proc
  Options  : rw
Mount point: sysfs
  Type     : sysfs
  Location : /sys
  Options  : rw
Mount point: none
  Type     : tmpfs
  Location : /dev
  Options  : rw
Mount point: /dev/loop1
  Type     : iso9660
  Location : /tmp/sw/cc/0/0/cc/mount
  Options  : ro

Mount point: none
  Type     : tmpfs
  Location : /dev
  Options  : rw

Mount point: /proc/bus/usb
  Type     : usbfs
  Location : /proc/bus/usb
  Options  : rw

Mount point: /dev/mtdblock1
  Type     : jffs2
  Location : /obfl
  Options  : rw,noatime,nodiratime

Mount point: automount(pid3199)
  Type     : autofs
```

```
Location : /misc1
Options  : rw,fd=5,pgrp=3199,timeout=60,minproto=2,maxproto=4,indirect
```

The tab le below describes the significant fields shown in the brief keyword display.

***Table 56: show platform software mount brief Field Descriptions***

| Field | Description |
|---|---|
| Mount point: | Logical name of the file system device. |
| Type: | File system type. |
| Location: | Canonical path to the mounted file system. |
| Options: | Mount point type-specific flags and settings. |

# show platform software infrastructure punt-keepalive

To display information about the settings for the **platform punt-keepalive** command, use the **show platform software infrastructure punt-keepalive** command in the privileged EXEC mode.

**show platform software infrastructure punt-keepalive**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 3.5S | This command was introduced. |

## Examples

The following is a sample output of the **show platform software infrastructure punt-keepalive** command when the punt-keepalive feature is enabled:

```
Router# show platform software infrastructure punt-keepalive

----- punt inject keepalive settings -----
punt keepalive interval (sec) = 2
punt keepalive warn count(miss) = 10
punt keepalive fatal (warn count) = 15

----- punt inject keepalive status -----
Last punt keepalive proc sched = 1.140 sec ago
Last punt keepalive sent = 1.140 sec ago
punt keepalive rx count = 1473
punt keepalive tx count = 1473
punt keepalive last keepalive received = yes

----- punt inject keepalive errors -----
punt keepalive failed to send no buffers = 0
punt keepalive tx fail count = 0

----- punt inject keepalive tweaks -----
ignore rx keepalive msg = no
ignore keepalive failover fault = yes
```

The following is a sample output of the **show platform software infrastructure punt-keepalive** command when the punt-keepalive feature is disabled:

```
Router# show platform software infrastructure punt-keepalive

----- punt inject keepalive settings -----
punt keepalive fatal (warn count) = 15
punt keepalive interval (sec) = 0(Stopped)
punt keepalive warning count (miss) = 10
Disable XE kernel core = No

----- punt inject keepalive status -----
```

```
Last punt keepalive proc sched = 8.005 sec ago
Last punt keepalive sent = 8.195 sec ago
punt keepalive rx count = 6695
punt keepalive tx count = 6695
punt keepalive last keepalive received = yes

----- punt inject keepalive errors -----
punt keepalive failed to send no buffers = 0
punt keepalive tx fail count = 0
```

## Related Commands

| Command | Description |
|---|---|
| **platform punt-keepalive** | Enables the Punt-Keepalive feature and monitors the status of the punt path between the forwarding processor (FP) and the route processor (RP). |

# show platform software interface summary

To display a summary of statistics for interfaces that are configured on a networking device, use the **show platform software interface summary** command in privileged EXEC mode.

**show platform software interface summary** [[*name*][*queues*][*rates*]]

## Syntax Description

| | |
|---|---|
| **name** | (Optional) Displays, for the named interface, a summary of the packets held and dropped in input/output queues and the transmission/reception rates. |
| **queues** | (Optional) Displays a summary of the packets held and dropped in input/output queues, for interfaces on the router.. |
| **rates** | (Optional) Displays a summary of the transmission/reception rates, for interfaces on the router. |

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 3.9 | This command was introduced on Cisco 4400 Series Routers. |

## Usage Guidelines

**Cisco ISR 4400 Series**

On a Cisco ISR 4400 Series router you can use this command to show a summary of the packets held and dropped in input/output queues and the transmit/receive rates, for interfaces on the router.

## Examples

The following example displays summary information for the interfaces of a Cisco 4400 Series router.

```
Router# show platform software interface summary
 Interface                IHQ  IQD  OHQ  OQD  RXBS  RXPS  TXBS  TXPS  TRTL
-------------------------------------------------------------------------------
  GigabitEthernet0/0/0      0    0    0    0     0     0     0     0     0
  GigabitEthernet0/0/1      0    0    0    0     0     0     0     0     0
  GigabitEthernet0/0/2      0    0    0    0     0     0     0     0     0
  GigabitEthernet0/0/3      0    0    0    0     0     0     0     0     0
  Serial1/0/0               0    0    0    0     0     0     0     0     0
* GigabitEthernet0          0    0    0    0 34000    60     0     0     0
```

*Table 57: show platform software interface summary Field Descriptions*

| Field | Description |
|---|---|
| IHQ | Packets in input hold queue. |
| IQD | Packets dropped from input queue. |
| OHQ | Packets in output hold queue. |

| Field | Description |
|---|---|
| OQD | Packets dropped from output queue. |
| RXBS | Reception rate in bits per second. |
| RXPS | Reception rate in packets per second. |
| TXBS | Transmission rate in bits per second. |
| TXPS | Transmission rate in packets per second. |
| TRTL | Throttle count. |

The following example displays summary (queues) information for interfaces of a Cisco 4400 Series router.

```
Router# show platform software interface summary queues

Interface                       IHQ           IQD           OHQ           OQD
-----------------------------------------------------------------------------
GigabitEthernet0/0/0              0             0             0             0
GigabitEthernet0/0/1              0             0             0             0
GigabitEthernet0/0/2              0             0             0             0
GigabitEthernet0/0/3              0             0             0             0
Serial1/0/0                       0             0             0             0
GigabitEthernet0                  0             0             0             0
```

The table below describes the significant fields shown in the queues keyword display.

***Table 58: show platform software interface summary queues Field Descriptions***

| Field | Description |
|---|---|
| IHQ | Packets in input hold queue. |
| IQD | Packets dropped from input queue. |
| OHQ | Packets in output hold queue. |
| OQD | Packets dropped from output queue. |

## Related Commands

| Command | Description |
|---|---|
| **show interfaces summary** | Displays a summary of statistics for interfaces on a networking device. |

# show platform software l2pt statistics

Network devices maintain statistics counters for performance monitoring. Statistics counters in the Cisco routers collect Layer 2 Protocol Tunneling (L2PT) statistics, such as the number of packets that are enqueued and dequeued to an L2PT process, packets dropped, total number of outgoing tunneled packets, total number of outgoing L2 control packets, and unprocessed packets. Use the **show platform software l2pt statistics** command in previleged EXEC mode to collect L2PT statistics.

**show platform software l2pt statistics**

**Command Default**

No default behavior or values.

**Command Modes**

Privileged EXEC (#)

| Release | Modification |
|---|---|
| Cisco IOS XE Dublin 17.10.1 | This command was introduced on Cisco NCS 520 Series Routers. |

**Examples**

```
Router#show platform software l2pt statistics
Platform L2PT statistics:
 Number of packets enqueued to L2PT process  : 36
 Number of packets dequeued from L2PT process: 36
 Number of packets dropped                   : 0
 Total number of tunneled packets out        : 72
 Total number of L2 control packets out      : 0
 Number of packets failed to process         : 0
```

# clear platform software l2pt counters

The **clear platform software l2pt counters** command clears the Layer 2 Protocol Tunneling (L2PT) statistics collected by the statistics counters.

**clear platform software l2pt counters**

**Command Default**

No default behavior or values.

**Command Modes**

Privileged EXEC (#)

| Release | Modification |
|---|---|
| Cisco IOS XE Dublin 17.10.1 | This command was introduced on Cisco NCS 520 Series Routers. |

**Examples**

```
Router#clear pla software l2pt counters
RTR1-Dom2#sh pla software l2pt statistics
Platform L2PT statistics:
 Number of packets enqueued to L2PT process  : 0
 Number of packets dequeued from L2PT process: 0
 Number of packets dropped                   : 0
 Total number of tunneled packets out        : 0
```

```
Total number of L2 control packets out      : 0
Number of packets failed to process         : 0
```

# show platform software process list

To display a list of the processes running in a given slot, use the **show platform software process list**command in privileged EXEC or diagnostic mode.

**show platform software process list** *slot* [**name** *process-name* | **process-id** *process-id* | **sort** *memory* | **summary**]

## Syntax Description

| | |
|---|---|
| *slot* | Displays running process information for the specified *slot*. Possible *slot* values are:<br>• **0**--Cisco ASR 1000 Series SPA Interface Processor (SIP) slot 0<br>• **1**--Cisco ASR 1000 Series SIP slot 1<br>• **2**--Cisco ASR 1000 Series SIP slot 2<br>• **f0**--Cisco ASR 1000 Series Embedded Services Processor (ESP) slot 0<br>• **f1**--Cisco ASR 1000 Series ESP slot 1<br>• **fp active**--Active Cisco ASR 1000 Series ESP<br>• **fp standby**--Standby Cisco ASR 1000 Series ESP<br>• **r0**--Cisco ASR 1000 Series Route Processor (RP) slot 0<br>• **r1**--Cisco ASR 1000 Series RP slot 1<br>• **rp active**--Active Cisco ASR 1000 Series RP<br>• **rp standby**--Standby Cisco ASR 1000 Series RP |
| **name** *process-name* | (Optional) Displays information for the specified process name. |
| **process-id** process-id | (Optional) Displays information for the specified process ID. |
| **sort** *memory* | (Optional) Sorts the processes by memory. |
| **summary** | (Optional) Displays summary process information for the running host. |

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC (#)

Diagnostic (diag)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.1 | This command was introduced on the Cisco ASR 1000 Series Routers. |

## Usage Guidelines

The name and process-id keywords can be used to narrow the process list display down to specific processes.

The **sort** keyword can be used to sort the process list by memory size.

The summary keyword can be used to display summary information about running processes.

## Examples

The following example displays information about running processes for Cisco ASR 1000 Series SIP slot 0:

```
Router# show platform software process list 0

Name                       Pid    PPid  Group Id  Status    Priority  Size
------------------------------------------------------------------------------
init                         1       0         1  S               20  1974272
ksoftirqd/0                  2       1         1  S               39  0
events/0                     3       1         1  S               15  0
khelper                      4       1         1  S               15  0
kthread                      5       1         1  S               15  0
kblockd/0                   19       5         1  S               15  0
khubd                       23       5         1  S               15  0
pdflush                     59       5         1  S               20  0
pdflush                     60       5         1  S               20  0
kswapd0                     61       5         1  S               15  0
aio/0                       62       5         1  S               15  0
xfslogd/0                   63       5         1  S               15  0
xfsdatad/0                  64       5         1  S               15  0
mtdblockd                  626       1         1  S               20  0
loop0                     1370       1         1  S                0  0
portmap                   1404       1      1404  S               20  2076672
portmap                   1406       1      1406  S               20  2076672
loop1                     1440       1         1  S                0  0
udevd                     2104       1      2104  S               16  1974272
jffs2_gcd_mtd1            2796       1         1  S               30  0
klogd                     3093       1      3093  S               20  1728512
automount                 3199       1      3199  S               20  2396160
xinetd                    3214       1      3214  S               20  3026944
xinetd                    3216       1      3216  S               20  3026944
pvp.sh                    3540       1      3540  S               20  3678208
inotifywait               3575    3540      3575  S               20  1900544
pman.sh                   3614    3540      3614  S               20  3571712
pman.sh                   3714    3540      3714  S               20  3571712
btrace_rotate.s           3721    3614      3721  S               20  3133440
agetty                    3822       1      3822  S               20  1720320
mcp_chvrf.sh              3823       1      3823  S               20  2990080
sntp                      3824       1      3824  S               20  2625536
issu_switchover           3825       1      3825  S               20  3899392
xinetd                    3827    3823      3823  S               20  3026944
cmcc                      3862    3714      3862  S               20  26710016
pman.sh                   3883    3540      3883  S               20  3571712
pman.sh                   4014    3540      4014  S               20  3575808
hman                      4020    3883      4020  R               20  19615744
imccd                     4114    4014      4114  S               20  31539200
inotifywait               4196    3825      3825  S               20  1896448
pman.sh                   4351    3540      4351  S               20  3575808
plogd                     4492    4351      4492  S               20  22663168
inotifywait               4604    3721      4604  S               20  1900544
```

The table below describes the significant fields shown in the display.

***Table 59: show platform software process list Field Descriptions***

| Field | Description |
|---|---|
| Name | Name of the process. |

| Field | Description |
|---|---|
| Pid | Process ID. |
| PPid | Parent Process ID. |
| Group Id | Process group ID. |
| Status | Process status. |
| Priority | Process priority. |
| Size | Virtual memory size (in bytes). |

The following example displays information about a specific named process for Cisco ASR 1000 Series SIP slot 0:

```
Router# show platform software process list 0 name sleep
Name: sleep
  Process id       : 25938
  Parent process id: 3891
  Group id         : 3891
  Status           : S
  Session id       : 3816
  User time        : 0
  Kernel time      : 0
  Priority         : 20
  Virtual bytes    : 2482176
  Resident pages   : 119
  Resident limit   : 4294967295
  Minor page faults: 182
  Major page faults: 0
```

The following example displays information about a specific process identifier for Cisco ASR 1000 Series SIP slot 0:

```
Router# show platform software process list 0 process-id 1

Name: init
  Process id       : 1
  Parent process id: 0
  Group id         : 1
  Status           : S
  Session id       : 1
  User time        : 1
  Kernel time      : 741
  Priority         : 20
  Virtual bytes    : 1974272
  Resident pages   : 161
  Resident limit   : 4294967295
  Minor page faults: 756
  Major page faults: 0
```

The table below describes the significant fields shown in the **name** and **process-id keyword**displays.

*Table 60: show platform software process list name and process-id Field Descriptions*

| Field | Description |
|---|---|
| Name | Name of the process. |
| Process id | Process ID. |
| Parent process id | Parent process ID. |
| Group id | Process group ID. |
| Status | Process status. |
| Session id | Process session ID. |
| User time | Time (in seconds) spent in user mode. |
| Kernel time | Time (in seconds) spent in kernel mode. |
| Priority | Process priority. |
| Virtual bytes | Virtual memory size (in bytes). |
| Resident pages | Resident page size. |
| Resident limit | Current limit on Resident pages. |
| Minor page faults | Number of minor page faults. |
| Major page faults | Number of major page faults. |

The following example displays process summary information for Cisco ASR 1000 Series SIP slot 0:

```
Router# show platform software process list 0 summary
Total number of processes: 54
  Running          : 4
  Sleeping         : 50
  Disk sleeping    : 0
  Zombies          : 0
  Stopped          : 0
  Paging           : 0
  Up time          : 1562
  Idle time        : 1511
  User time        : 1606
  Kernel time      : 1319
  Virtual memory   : 587894784
  Pages resident   : 45436
  Major page faults: 25
  Minor page faults: 149098
Architecture     : ppc
  Memory (kB)
    Physical       : 524288
    Total          : 479868
    Used           : 434948
    Free           : 44920
    Active         : 183020
    Inactive       : 163268
```

```
  Inact-dirty    : 0
  Inact-clean    : 0
  Dirty          : 0
  AnonPages      : 76380
  Bounce         : 0
  Cached         : 263764
  Commit Limit   : 239932
  Committed As   : 201452
  High Total     : 0
  High Free      : 0
  Low Total      : 479868
  Low Free       : 44920
  Mapped         : 59996
  NFS Unstable   : 0
  Page Tables    : 1524
  Slab           : 73760
  VMmalloc Chunk : 426840
  VMmalloc Total : 474856
  VMmalloc Used  : 47372
  Writeback      : 0
Swap (kB)
  Total          : 0
  Used           : 0
  Free           : 0
  Cached         : 0
Buffers (kB)     : 6144
Load Average
  1-Min          : 0.00
  5-Min          : 0.00
  15-Min         : 0.00
```

The table below describes the significant fields shown in the **summary** keyword display.

***Table 61: show platform software process list summary Field Descriptions***

| Field | Description |
|---|---|
| Total number of processes | Total number of processes in all possible states. |
| Running | Number of processes in the running state. |
| Sleeping | Number of processes in the sleeping state. |
| Disk sleeping | Number of processes in the disk-sleeping state. |
| Zombies | Number of processes in the zombie state. |
| Stopped | Number of processes in the stopped state. |
| Paging | Number of processes in the paging state. |
| Up time | System Up time (in seconds). |
| Idle time | System Idle time (in seconds). |
| User time | System time (in seconds) spent in user mode. |
| Kernel time | System time (in seconds) spent in kernel mode. |
| Virtual memory | Virtual memory size (in bytes). |

| Field | Description |
|---|---|
| Pages resident | Resident page size. |
| Major page faults | Number of major page faults. |
| Minor page faults | Number of minor page faults. |
| Architecture | System CPU architecture: PowerPC (ppc). |
| Memory (kB) | System memory heading. |
| Physical | Total physical memory (in kilobytes). |
| Total | Total available memory (in kilobytes). This value represents the physical memory available for kernel use. |
| Used | Used memory (in kilobytes). |
| Free | Free memory (in kilobytes). |
| Active | Most recently used memory (in kilobytes). |
| Inactive | Memory (in kilobytes) that has been less recently used. It is more eligible to be reclaimed for other purposes. |
| Inact-dirty | Memory (in kilobytes) that may need to be written to persistent store (cache or disk). |
| Inact-clean | Memory (in kilobytes) that is readily available for re-use. |
| Dirty | Memory (in kilobytes) that is waiting to get written back to the disk. |
| AnonPages | Memory (in kilobytes) that is allocated when a process requests memory from the kernel via the malloc() system call. This memory has no file backing on disk. |
| Bounce | Memory (in kilobytes) that is allocated to bounce buffers. |
| Cached | Amount of physical RAM (in kilobytes) used as cache memory. |
| Commit Limit | Total amount of memory (in kilobytes) currently available to be allocated on the system. This limit is only adhered to if strict overcommit accounting is enabled. |
| Committed As | Total amount of memory (in kilobytes) presently allocated on the system. The committed memory is a sum of all of the memory that has been allocated by processes, even if it has not been used by them as of yet. |
| High Total | Total amount of memory (in kilobytes) that is not directly mapped into kernel space. The High Total value can vary based on the type of kernel used. |
| High Free | Amount of free memory (in kilobytes) that is not directly mapped into kernel space. The High Free value can vary based on the type of kernel used. |

| Field | Description |
|---|---|
| Low Total | Total amount of memory (in kilobytes) that is directly mapped into kernel space. The Low Total value can vary based on the type of kernel used. |
| Low Free | Amount of free memory (in kilobytes) that is directly mapped into kernel space. The Low Free value can vary based on the type of kernel used. |
| Mapped | Total amount of memory (in kilobytes) that has been used to map devices, files, or libraries using the mmap command. |
| NFS Unstable | Total amount of memory (in kilobytes) used for unstable NFS pages. Unstable NFS pages are pages that have been written into the page cache on the server, but have not yet been synchronized to disk. |
| Page Tables | Total amount of memory (in kilobytes) dedicated to the lowest page table level. |
| Slab | Total amount of memory (in kilobytes) used by the kernel to cache data structures for its own use. |
| VMalloc Chunk | Largest contiguous block of available virtual address space (in kilobytes) that is free. |
| VMalloc Total | Total amount of memory (in kilobytes) of total allocated virtual address space. |
| VMalloc Used | Total amount of memory (in kilobytes) of used virtual address space. |
| Writeback | Memory (in kilobytes) that is actively being written back to the disk. |
| Swap (kB) | Swap memory heading. |
| Total | Total swap memory (in kilobytes). |
| Used | Used swap memory (in kilobytes). |
| Free | Free swap memory (in kilobytes). |
| Cached | Cached swap memory (in kilobytes). |
| Buffers (kB) | Buffers heading. |
| Load Average | Indicators of system load. |
| 1-Min | Average number of processes running for the last minute. |
| 5-Min | Average number of processes running for the last 5 minutes. |
| 15-Min | Average number of processes running for the last 15 minutes. |

The following example displays process summary information for Cisco ASR 1000 Series sorted by memory size:

```
Router#show platform software process list R0 sort memory
Name                   Pid    PPid  Group Id  Status    Priority  Size
------------------------------------------------------------------------------
linux_iosd-imag        27982   26696     27982  S              20  4294967295
```

```
fman_rp                25857   25309     25857  S              20  684867584
vman                   30685   29587     30685  S              20  194850816
smand                  30494   28948     30494  S              20  103538688
libvirtd                5260    5254      5254  S              20  83197952
python                 10234   10233     10210  S              20  29765632
python                 10975   10234     10975  S              20  29765632
python                 10977   10234     10977  S              20  29765632
python                 10978   10234     10978  S              20  29765632
python                 10979   10234     10979  S              20  29765632
python                 10981   10234     10981  S              20  29765632
automount              15682       1     15682  S              20  25092096
cmand                  25530   24760     25530  S              20  23789568
imand                  27198   26090     27198  S              20  22040576
psd                    31284   28535     31284  S              20  16019456
emd                    25712   24917     25712  S              20  15302656
hman                   26622   25617     26622  R              20  14544896
plogd                  28878   27718     28878  S              20  12349440
btrace_rotate.s        25251   24643     25251  S              20  6008832
sort_files_by_i        30092   29066     30092  S              20  5234688
periodic.sh            28469   27490     28469  S              20  4812800
rotee                   5403       1      5396  S              20  4788224
rotee                   5412       1      5411  S              20  4788224
rotee                   5438       1      5437  S              20  4788224
rotee                   5482       1      5481  S              20  4788224
rotee                   9844       1      9843  S              20  4788224
rotee                   9958       1      9957  S              20  4788224
rotee                  16942       1     16941  S              20  4788224
rotee                  16946       1     16945  S              20  4788224
rotee                  24383       1     24382  S              20  4788224
rotee                  24742       1     24741  S              20  4788224
rotee                  24960       1     24959  S              20  4788224
rotee                  25107       1     25106  S              20  4788224
rotee                  25534       1     25533  S              20  4788224
rotee                  25542       1     25541  S              20  4788224
rotee                  25880       1     25879  S              20  4788224
rotee                  26390       1     26389  S              20  4788224
rotee                  26881       1     26880  S              20  4788224
rotee                  27728       1     27727  S              20  4788224
rotee                  27882       1     27881  S              20  4788224
rotee                  28867       1     28866  S              20  4788224
rotee                  29220       1     29219  S              20  4788224
rotee                  29257       1     29256  S              20  4788224
rotee                  29405       1     29404  S              20  4788224
rotee                  29784       1     29783  S              20  4788224
oom.sh                  5560    5246      5560  S              20  4427776
reflector.sh           15598       1     15598  S              20  3997696
droputil.sh            15600       1     15600  S              20  3997696
pvp.sh                 24336       1     24335  S              20  3870720
pman.sh                29066   24336     24335  S              14  3805184
pman.sh                24643   24336     24335  S              14  3801088
pman.sh                27490   24336     24335  S              14  3801088
pman.sh                26696   24336     24335  S              14  3788800
pman.sh                 9679   24336     24335  S              14  3784704
pman.sh                 9812   24336     24335  S              14  3784704
pman.sh                24760   24336     24335  S              14  3784704
pman.sh                24917   24336     24335  S              14  3784704
pman.sh                25309   24336     24335  S              14  3784704
pman.sh                25617   24336     24335  S              14  3784704
pman.sh                26090   24336     24335  S              14  3784704
pman.sh                27718   24336     24335  S              14  3784704
pman.sh                28535   24336     24335  S              14  3784704
pman.sh                28948   24336     24335  S              14  3784704
pman.sh                29587   24336     24335  S              14  3784704
chasync.sh              5248       1      5248  S              20  3620864
```

```
lighttpd              11522   11521     10223  S              20  3543040
iptbl.sh               5252       1      5252  S              20  3477504
rollback_timer.        5226       1      5226  S              20  3014656
oom.sh                 5246       1      5246  S              20  2977792
wui-lighttpd-la       10223    9812     10223  S              20  2605056
wui-app-launch.       10210    9679     10210  S              20  2600960
mcp_chvrf.sh          10233   10210     10210  S              20  2596864
mcp_chvrf.sh          11521   10223     10223  S              20  2596864
auxinit.sh            15593       1     15593  S              20  2584576
mcp_chvrf.sh           5223       1      5223  S              20  2580480
mcp_chvrf.sh           5224       1      5224  S              20  2580480
libvirtd.sh            5254       1      5254  S              20  2576384
xinetd                 5231    5223      5223  S              20  2183168
xinetd                 5232    5224      5224  S              20  2183168
xinetd                15714       1     15714  S              20  2183168
xinetd                15716       1     15716  S              20  2183168
sleep                 30979   28469     28469  S              20  1925120
sleep                 31820    5560      5560  S              20  1925120
sleep                 32645   30092     30092  S              20  1925120
sntp                   5225       1      5225  S              20  1863680
init                      1       0         1  S              20  1859584
portmap                2654       1      2654  S              20  1806336
rpc.mountd            15751       1     15751  S              20  1789952
inotifywait            5459    5248      5459  S              20  1761280
inotifywait           16968   15598     16968  S              20  1761280
inotifywait           17050   15600     17050  S              20  1761280
inotifywait           24572   24336     24335  S              20  1761280
inotifywait            5462    5226      5462  S              20  1757184
inotifywait            5522    5252      5522  S              20  1757184
udevd                 13853       1     13853  S              16  1757184
inotifywait           32725   25251     32725  S              20  1757184
klogd                 24325       1     24325  S              20  1650688
kthreadd                  2       0         0  S              15  0
migration/0               3       2         0  S      4294967196  0
ksoftirqd/0               4       2         0  S              15  0
watchdog/0                5       2         0  S      4294967196  0
migration/1               6       2         0  S      4294967196  0
ksoftirqd/1               7       2         0  S              15  0
watchdog/1                8       2         0  S      4294967196  0
events/0                  9       2         0  S              15  0
events/1                 10       2         0  S              15  0
khelper                  11       2         0  S              15  0
netns                    14       2         0  S              15  0
kblockd/0                59       2         0  S              15  0
kblockd/1                60       2         0  S              15  0
kacpid                   61       2         0  S              15  0
kacpi_notify             62       2         0  S              15  0
cqueue                  144       2         0  S              15  0
ata/0                   148       2         0  S              15  0
ata/1                   149       2         0  S              15  0
ata_aux                 150       2         0  S              15  0
ksuspend_usbd           151       2         0  S              15  0
khubd                   156       2         0  S              15  0
kseriod                 159       2         0  S              15  0
pdflush                 210       2         0  S              20  0
pdflush                 211       2         0  S              20  0
kswapd0                 212       2         0  S              15  0
aio/0                   256       2         0  S              15  0
aio/1                   257       2         0  S              15  0
scsi_eh_0              1077       2         0  S              15  0
scsi_eh_1              1079       2         0  S              15  0
scsi_eh_2              1081       2         0  S              15  0
scsi_eh_3              1083       2         0  S              15  0
scsi_eh_4              1115       2         0  S              15  0
```

```
usb-storage             1116       2          0  S              15  0
scsi_eh_5               1129       2          0  S              15  0
usb-storage             1130       2          0  S              15  0
scsi_eh_6               1133       2          0  S              15  0
usb-storage             1134       2          0  S              15  0
rpciod/0                2333       2          0  S              15  0
rpciod/1                2336       2          0  S              15  0
nfsiod                  2345       2          0  S              15  0
loop0                   2424       2          0  S               0  0
loop1                   2708       2          0  S               0  0
loop2                   2745       2          0  S               0  0
loop3                   2782       2          0  S               0  0
loop4                   2819       2          0  S               0  0
loop5                   2928       2          0  S               0  0
loop6                   2965       2          0  S               0  0
loop7                   3002       2          0  S               0  0
loop8                   3075       2          0  S               0  0
lockd                  15741       2          0  S              15  0
nfsd                   15742       2          0  S              15  0
nfsd                   15743       2          0  S              15  0
nfsd                   15744       2          0  S              15  0
nfsd                   15745       2          0  S              15  0
nfsd                   15746       2          0  S              15  0
nfsd                   15747       2          0  S              15  0
nfsd                   15748       2          0  S              15  0
nfsd                   15749       2          0  S              15  0
lsmpi-refill           15852       2          0  S              15  0
lsmpi-xmit             15853       2          0  S              15  0
lsmpi-rx               15854       2          0  S              15  0
ddr_err_monitor        16267       2          0  S              15  0
mtdblockd              16292       2          0  S              15  0
scansta                16315       2          0  S              15  0
```

# show platform software process memory

To display the memory statistics of a platform software process, use the **show platform software process memory** command in privileged EXEC mode or diagnostic mode.

**show platform software process memory** *host* {**name** *process-name* {**maps** | **smaps**} | **process-id** *process-id* {**maps** | **smaps**} | **all** [**sorted** | **virtual** [**sorted**] | **rss** [**sorted**]]}

## Syntax Description

| | |
|---|---|
| *host* | Process information. Possible *host* values are:<br>• **0**—Cisco ASR 1000 Series SPA Interface Processor (SIP) slot 0<br>• **1**—Cisco ASR 1000 Series SIP slot 1<br>• **f0**—Cisco ASR 1000 Series Embedded Services Processor (ESP) slot 0<br>• **fp**—Cisco ASR 1000 Series ESP<br>• **r0**—Cisco ASR 1000 Series Route Processor (RP) slot 0<br>• **rp**—Cisco ASR 1000 Series RP |
| **name** *process-name* | Displays the name of the specified process. |
| **maps** | Displays the memory maps of the specified process. |
| **smaps** | Displays the smaps of the specified process. |
| **process-id** *process-id* | Displays the ID of the specified process. |
| **all** | Lists all the processes. |
| **sorted** | Sorts the output from the highest size to the lowest size. |
| **virtual** | Displays the virtual memory footprint of all the processes. |
| **rss** | Displays the physical memory footprint of all the processes. |

## Command Modes

Privileged EXEC (#)

Diagnostic (diag)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 3.8S | This command was introduced. |
| Cisco IOS XE Release 3.9S | This command was modified. The **all**, **virtual**, and **rss** keywords were added. |

## Examples

The following is sample output of the **show platform software process memory** command on the host *r0* with the keywords **name** and **maps**:

```
Device# show platform software process memory r0 name smand maps

maps for process 29284:
address           perms offset   dev   inode      pathname
00100000-00103000 r-xp 00100000 00:00 0          [vdso]
0ebdb000-0ebe6000 r-xp 00000000 00:01 340        /lib/libnss_files.so.2
0ebe6000-0ebf5000 ---p 0000b000 00:01 340        /lib/libnss_files.so.2
0ebf5000-0ebf6000 r--p 0000a000 00:01 340        /lib/libnss_files.so.2
0ebf6000-0ebf7000 rwxp 0000b000 00:01 340        /lib/libnss_files.so.2
0ec07000-0ec0e000 r-xp 00000000 07:02 2310
/tmp/sw/mount/asr1000rp1-rpcontrol.2012-01-19_09.31_shpalani.pkg/usr/binos/lib/cdlapi.so
0ec0e000-0ec1d000 ---p 00007000 07:02 2310
/tmp/sw/mount/asr1000rp1-rpcontrol.2012-01-19_09.31_shpalani.pkg/usr/binos/lib/cdlapi.so
0ec1d000-0ec1e000 rwxp 00006000 07:02 2310
/tmp/sw/mount/asr1000rp1-rpcontrol.2012-01-19_09.31_shpalani.pkg/usr/binos/lib/cdlapi.so
0ec2e000-0ec30000 r-xp 00000000 07:02 4100
/tmp/sw/mount/asr1000rp1-rpcontrol.2012-01-19_09.31_shpalani.pkg/usr/binos/lib/trace.so
.
.
.
```

The following is sample output of the **show platform software process memory** command on the host *r0* with the keywords **process-id** and **maps**:

```
Device# show platform software process memory r0 process-id 1 maps

maps for process-id 1:
address           perms offset   dev   inode      pathname
00100000-00103000 r-xp 00100000 00:00 0          [vdso]
0fe2b000-0ff87000 r-xp 00000000 00:01 333        /lib/libc.so.6
0ff87000-0ff97000 ---p 0015c000 00:01 333        /lib/libc.so.6
0ff97000-0ff98000 r--p 0015c000 00:01 333        /lib/libc.so.6
0ff98000-0ff9c000 rwxp 0015d000 00:01 333        /lib/libc.so.6
0ff9c000-0ff9f000 rwxp 0ff9c000 00:00 0
0ffaf000-0ffb8000 r-xp 00000000 00:01 342        /lib/libcrypt.so.1
0ffb8000-0ffc7000 ---p 00009000 00:01 342        /lib/libcrypt.so.1
0ffc7000-0ffc8000 r--p 00008000 00:01 342        /lib/libcrypt.so.1
0ffc8000-0ffc9000 rwxp 00009000 00:01 342        /lib/libcrypt.so.1
0ffc9000-0fff0000 rwxp 0ffc9000 00:00 0
10000000-10008000 r-xp 00000000 00:01 149        /sbin/init
10017000-10018000 rwxp 00007000 00:01 149        /sbin/init
10018000-10039000 rwxp 10018000 00:00 0          [heap]
30000000-3001e000 r-xp 00000000 00:01 338        /lib/ld.so.1
3001e000-30021000 rw-p 3001e000 00:00 0
3002e000-3002f000 r--p 0001e000 00:01 338        /lib/ld.so.1
3002f000-30030000 rwxp 0001f000 00:01 338        /lib/ld.so.1
bfa9e000-bfab3000 rw-p bffe9000 00:00 0          [stack]
bffe000-bffff000 r--p bfffe000 00:00 0
.
.
.
```

The following is sample output of the **show platform software process memory** command on the host *r0* with the keyword **all**:

```
Device# show platform software process memory r0 all

   Pid      VIRT       RSS       PSS      Heap    Shared   Private            Name
-------------------------------------------------------------------------------
     1      1820       516       119       132       404       112            init
  2195      1616       404        89       136       320        84           klogd
  2211      3892      2656      1623      1444      1056      1596          pvp.sh
```

```
  2258      4704      1592       410       132      1220       372          rotee
  2450      1724       500       106       136       404        96    inotifywait
  2519      3828      2560      1543      1380      1040      1516        pman.sh
  2596      3808      2544      1524      1360      1040      1500        pman.sh
  2634      4704      1592       417       132      1216       376          rotee
  2778      4704      1596       411       132      1220       376          rotee
  2868      3808      2544      1524      1360      1040      1500        pman.sh
.
.
.
```

The following is sample output of the **show platform software process memory** command on the host *r0* with the keywords **all** and **sorted**:

```
Device# show platform software process memory r0 all sorted
```

```
   Pid      VIRT       RSS       PSS      Heap    Shared   Private           Name
-------------------------------------------------------------------------------
  6559   5535152    644496    642116     29444      3768    640568  linux_iosd...
  8977    115232    108408    105527     99156      3312    105088          smand
  4708    758268     69688     67024      1744      3920     65768       fman_rp
 10074    197640     40700     38213       868      3564     37136          vman
  5081     24164     15116     11917      1192      4080     11036          imand
  8302    167472     13628     11125      1204      3592     10028    ptpd_mcp_rp
  3267     26928     12880      8721      2016      5920      6952          cmand
  4692     19136      7424      4100      2072      4424      3000            emd
  4252     15036      6456      3609      1072      3280      3176           hman
  7208     14940      5732      4455       684      1664      4068            psd
.
.
.
```

The following is sample output of the **show platform software process memory** command on the host *r0* with the keywords **all**, **virtual**, and **sorted**:

```
Device# show platform software process memory r0 all virtual sorted
```

```
Name               Pid   Virtual      Text   Shared Data   Private Data
-------------------------------------------------------------------------
linux_iosd...     6559   5536756    287488         16888        5232380
fman_rp           4708    758264     64444         37796         656024
vman             10074    199244     15436         37924         145884
ptpd_mcp_rp       8302    169216     14308         10708         144200
smand             8977    116836      9908          3228         103700
cmand             3267     28684     20264          4256           4164
imand             5081     24160     10556         11164           2440
libvirtd         19860     23916      5020             0          18896
automount        23046     23472      2992             0          20480
emd               4692     19132     14052          1620           3460
pcscd             5576     18320      1520             0          16800
psd               7208     16544      9272          5284           1988
hman              4252     15032      9028          1620           4384
```

The following is sample output of the **show platform software process memory** command on the host *r0* with the keywords **all**, **rss**, and **sorted**:

```
Device# show platform software process memory r0 all rss sorted
```

```
Name               Pid       RSS      Text   Shared Data   Private Data
-------------------------------------------------------------------------
linux_iosd...     6559    702284    172816          3128         526112
smand             8977    108780      5052           836         102884
```

```
fman_rp           4708      69140      27604          424          41112
vman             10074      40836       4752          332          35752
imand             5081      15084       3380         1256          10448
ptpd_mcp_rp       8302      13788       4584          312           8884
cmand             3267      13392       8040         1812           3532
emd               4692       7408       4284          148           2976
hman              4252       6476       3692          300           2484
psd               7208       5864       3848          408           1608
plogd             7170       5372       2632          384           2348
btrace_rot...     3090       3960       1044            0           2912
droputil.sh      22982       2844       1100            0           1740
```

The following table describes the significant fields shown in the display.

***Table 62: show platform software process memory Field Descriptions***

| Field | Description |
|---|---|
| Address | Address space that the memory occupies in the process. |
| Perms | Set of permissions, such as:<br>• **r**—Read<br>• **w**—Write<br>• **x**—Execute<br>• **s**—Shared<br>• **p**—Private |
| Offset | Offset into the file. |
| Dev | Number of the device. |
| Inode Number | Number of the inode on the device. |
| PathName | Location of the file. |
| Name | Name of the process. |
| PID | Process ID. |
| VIRT | Virtual memory size (in KB). |
| RSS | Resident Set Size (in KB). |
| PSS | Proportional Set Size (in KB). |
| Heap | Heap memory (in KB). |
| Shared | Memory and libraries shared with other processes (in KB). |
| Private | Memory that is exclusive to the specified process (in KB). |

**Related Commands**

| Command | Description |
|---|---|
| **show platform software process list** | Displays the list of processes running in a given slot. |

# show platform software ptp foreign-master

To display the PTP foreign-master information, use the show platform software ptp foreign-master command in privileged EXEC mode.

**show platform software ptp** [**foreign-master**] **domain** *domain-number*

## Syntax Description

| | |
|---|---|
| **domain** | Filters output by domain. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| IOS-XE 3.18 | This command was introduced. |

## Usage Guidelines

Use this command to verify a PTP foreign-master information.

## Examples

The following examples show the output generated by this command:

```
Router# show platform software ptp foreign-master domain 24

PTPd Foreign Master Information:

Current Master: SLA

Port: SLA
  Clock Identity: 0x74:A2:E6:FF:FE:5D:CE:3F
  Clock Stream Id: 0
  Priority1: 128
  Priority2: 128
  Local Priority: 128
  Clock Quality:
    Class: 6
    Accuracy: Within 100ns
    Offset (Log Variance): 0x4E5D
  Steps Removed: 1
  Not-Slave: FALSE
```

The table below describes significant fields shown in the display.

***Table 63: show ptp clock dataset Field Descriptions***

| Field | Description |
|---|---|
| Current Master | Indicates the type of foreign master. |
| Port | Indicates the type of port. |
| Clock Identity | Unique identifier for the clock. |
| Priority1 | Priority1 preference value of the PTP clock; the priority1 clock is considered first during clock selection. |

| Field | Description |
|---|---|
| Priority2 | Priority2 preference value of the PTP clock; the priority2 clock is considered after all other clock sources during clock selection. |
| Local Priority | Indicates the PTP clock local priority. |
| Clock quality | Summarizes the quality of the grandmaster clock. |
| Class | Displays the time and frequency traceability of the grandmaster clock |
| Accuracy | Field applies only when the Best Master Clock algorithm is in use; indicates the expected accuracy of the master clock were the grandmaster clock. |
| Offset (log variance) | Offset between the local clock and an ideal reference clock. |
| Steps removed | Number of hops from the local clock to the grandmaster clock. |
| Not-Slave | Indicates whether the foreign master is a slave. |

# show platform software status control-processor

To display status information about the control processors, use the **showplatformsoftwarestatuscontrol-processor**command in privileged EXEC or diagnostic mode.

**show platform software status control-processor** [**brief**]

## Syntax Description

| | |
|---|---|
| **brief** | (Optional) Displays summary status information for the control processors. |

## Command Modes

Privileged EXEC (#) Diagnostic (diag)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.1 | This command was introduced on the Cisco ASR 1000 Series Aggregation Services Routers. |
| Cisco IOS XE Release 2.2 | This command was modified. The **brief** keyword was added. |

## Usage Guidelines

Control processors consist of Embedded Services Processors (ESPs), Route Processors (RPs), and SPA Interface Processors (SIPs).

Use the **showplatformsoftwarestatuscontrol-processor** command to provide a quick view of the health of the system concerning memory and CPU usage on each processor.

The CPU usage output reflects the relative percentage of CPU usage during the latest two seconds instead of the cumulative percent usage over the entire uptime.

All control processors should show a status of Healthy. Other possible status values are Warning and Critical. Warning indicates that the router is operational but that the operating level should be reviewed. Critical implies that the router is near failure.

If you see a status of Warning or Critical, take the following actions:

- Reduce static and dynamic loads on the system by reducing the number of elements in the configuration or by limiting the capacity for dynamic services.
- Reduce the number of routes and adjacencies, limit the number of ACLs and other rules, reduce the number of VLANs, and so on.

## Examples

The following example displays status information about the control processors:

```
Router# show platform software status control-processor
RP0: online, statistics updated 7 seconds ago
Load Average: healthy
  1-Min: 0.16, status: healthy, under 5.00
  5-Min: 0.16, status: healthy, under 5.00
  15-Min: 0.12, status: healthy, under 5.00
Memory (kb): healthy
  Total: 3733016
  Used: 1320804 (31%)
  Free: 2412212 (58%)
  Committed: 1889524 (45%), status: healthy, under 90%
```

```
ESP0: online, statistics updated 7 seconds ago
Load Average: healthy
  1-Min: 0.00, status: healthy, under 5.00
  5-Min: 0.00, status: healthy, under 5.00
  15-Min: 0.00, status: healthy, under 5.00
Memory (kb): healthy
  Total: 984996
  Used: 532492 (50%)
  Free: 452504 (43%)
  Committed: 1724096 (164%), status: healthy, under 300%
SIP0: online, statistics updated 10 seconds ago
Load Average: healthy
  1-Min: 0.00, status: healthy, under 5.00
  5-Min: 0.00, status: healthy, under 5.00
  15-Min: 0.00, status: healthy, under 5.00
Memory (kb): warning
  Total: 479884
  Used: 434476 (82%)
  Free: 45408 (8%)
  Committed: 202508 (38%), status: healthy, under 90%
SIP1: online, statistics updated 10 seconds ago
Load Average: healthy
  1-Min: 0.00, status: healthy, under 5.00
  5-Min: 0.00, status: healthy, under 5.00
  15-Min: 0.00, status: healthy, under 5.00
Memory (kb): warning
  Total: 479884
  Used: 430384 (82%)
  Free: 49500 (9%)
  Committed: 202512 (38%), status: healthy, under 90%
```

The following example displays summary status information about the control processors with **brief** keyword:

```
Router# show platform software status control-processor brief
Load Average
 Slot  Status  1-Min  5-Min 15-Min
  RP0 Healthy   0.25   0.30   0.44
  RP1 Healthy   0.31   0.19   0.12
 ESP0 Healthy   0.01   0.05   0.02
 ESP1 Healthy   0.03   0.05   0.01
 SIP1 Healthy   0.15   0.07   0.01
 SIP2 Healthy   0.03   0.03   0.00
Memory (kB)
 Slot  Status    Total     Used (Pct)     Free (Pct) Committed (Pct)
  RP0 Healthy  3722408  2514836 (60%)  1207572 (29%)   1891176 (45%)
  RP1 Healthy  3722408  2547488 (61%)  1174920 (28%)   1889976 (45%)
 ESP0 Healthy  2025468  1432088 (68%)   593380 (28%)   3136912 (149%)
 ESP1 Healthy  2025468  1377980 (65%)   647488 (30%)   3084412 (147%)
 SIP1 Healthy   480388   293084 (55%)   187304 (35%)    148532 (28%)
 SIP2 Healthy   480388   273992 (52%)   206396 (39%)     93188 (17%)
CPU Utilization
 Slot  CPU   User System   Nice   Idle    IRQ   SIRQ IOwait
  RP0    0  30.12   1.69   0.00  67.63   0.13   0.41   0.00
  RP1    0  21.98   1.13   0.00  76.54   0.04   0.12   0.16
 ESP0    0  13.37   4.77   0.00  81.58   0.07   0.19   0.00
 ESP1    0   5.76   3.56   0.00  90.58   0.03   0.05   0.00
 SIP1    0   3.79   0.13   0.00  96.04   0.00   0.02   0.00
 SIP2    0   3.50   0.12   0.00  96.34   0.00   0.02   0.00
```

The table below describes the significant fields shown in the display.

*Table 64: show platform software status control-processor Field Descriptions*

| Field | Description |
|---|---|
| *processor-name* : online | Name of the online control processor to which the statistics that follow apply. |
| statistics updated x seconds ago | Time (in seconds) when the statistics were last updated. |
| Load Average: | Summary status indicator of the overall control processor load average. This value is derived from the “5-Min” load average. |
| 1-Min: / status: | One-minute load average on the control processor and status indicator. |
| 5-Min: / status: | Five-minute load average on the control processor and status indicator. |
| 15-Min: / status: | Fifteen-minute load average on the control processor and status indicator. |
| Memory (kb): | Summary status indicator of the overall control processor memory usage. This value signals if any of the individual memory values below are in critical or warning status. |
| Total: | Total memory (in kilobytes) on the control processor. |
| Used: xxxxxxx (pp%) | Total used memory (in kilobytes) on the control processor and the percentage of used memory on the control processor. |
| Free: xxxxxxx (pp%) | Total free memory (in kilobytes) on the control processor and the percentage of free memory on the control processor. |
| Committed: xxxxxxx (pp%) / status: | Total committed memory (in kilobytes) on the control processor, percentage of committed memory on the control processor, and status indicator. |
| CPU Utilization: | Percentage of time that the CPU is busy. |
| CPU: | Allocated processor. |
| User: | Non-Linux kernel processes. |
| System: | Linux kernel process. |
| Nice: | Low priority processes. |
| Idle: | Percentage of time that the CPU was inactive. |
| IRQ: | Interrupts. |
| SIRQ: | System interrupts. |
| IOwait: | Percentage of time that the CPU was waiting for I/O. |

**Related Commands**

| Command | Description |
|---|---|
| **show platform software process list** | Displays a list of the processes running in a given slot. |

# show platform software punt-policer

To display the VLAN packets that are sent to the IOS on a Cisco ASR 1000 Router, use the **show platform software punt-policer** command in privileged EXEC mode.

**show platform software punt-policer**

**Command Modes**

Privileged EXEC (#)

**Command History**

| Release | Modification |
|---|---|
| Cisco IOS XE 3.2.0S | This command was introduced. |
| Cisco IOS XE 3.13.0S | This command was integrated into Cisco IOS XE Release 3.13.0S. |

### Example

The following is sample output of the **show platform software punt-policer** command:

```
Router# show platform software punt-policer

Punt                                Configured (pps)    Conform Packets     Dropped Packets
Cause      Description             Normal      High     Normal     High      Normal    High

------------------------------------------------------------------------------------------
96       VLAN Auto Sense FSOL       2000       1000       0        0           0         0
```

The following table describes the significant fields shown in the display.

***Table 65: show platform software punt-policer***

| Field | Description |
|---|---|
| Punt Cause | Indicates the punt cause number. |
| Description | Indicates the feature associated with a particular punt cause. |
| Configured (pps) | Indicates the number of packets the system handles for a particular VLAN. You can change the default maximum punt rate value 1000 by using the **platform punt-policer** *punt cause* command. |
| Conform Packets | Indicates the number of packets that conform to the rate limit. |
| Dropped Packets | Indicates the number of packets that are dropped. |

# show platform process slot

To monitor the software-running process in a given slot, use the **show platform software process slot**command in privileged EXEC or diagnostic mode.

**show platform software process slot** *slot* **monitor** [**cycles** *cycles*][**interval** *delay*][**lines** *lines-of-output*]

## Syntax Description

| | |
|---|---|
| **slot** | Specifies the Field Replace Unit (FRU) where the command is run. |
| *slot* | Slot information. |
| **monitor** | Monitors the running processes. |
| **cycles** | Checks the processes multiple times. |
| *cycles* | Number of times the command is run during a single invocation of the command. The range is from 1 to 4294967295. The default is 5. |
| **interval** | Sets delay interval after each command run. |
| *delay* | Delay between two successive runs of the command. The range is from 0 to 300. The default is 3. |
| **lines** | Sets the number of output lines that are displayed. |
| *lines-of-output* | Number of output lines displayed. The range is from 0 to 512. 0 displays all the lines.<br>**Note**<br>The number of lines is determined by the current terminal length. |

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 3.1.0S | This command was introduced in a release earlier than Release 3.1.0S on Cisco ASR 1000 Series Routers. |

## Examples

The following is a sample output of the show platform software process slot command. Only 23 lines are displayed because the lines-of-output argument is set to 23:

```
Router# show platform software process slot 0 monitor cycles 3 interval 2 lines 23
top - 19:29:32 up 1 day,  4:46,  0 users,  load average: 0.10, 0.11, 0.09
Tasks:  78 total,   4 running,  74 sleeping,   0 stopped,   0 zombie
Cpu(s):  3.0%us,  2.9%sy,  0.0%ni, 93.9%id,  0.0%wa,  0.1%hi,  0.1%si,  0.0
Mem:    449752k total,   328940k used,   120812k free,     6436k buffers
Swap:        0k total,        0k used,        0k free,   155396k cached
  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
 7223 root      20   0  124m  46m  23m R  2.0 10.5  11:13.01 mcpcc-lc-ms
```

```
 8135 root      20   0  123m  46m  25m R  2.0 10.6  35:59.75 mcpcc-lc-ms
    1 root      20   0  2156  644  556 S  0.0  0.1   0:02.05 init
    2 root      15  -5     0    0    0 S  0.0  0.0   0:00.04 kthreadd
    3 root      15  -5     0    0    0 S  0.0  0.0   0:00.00 ksoftirqd/0
    4 root      RT  -5     0    0    0 S  0.0  0.0   0:00.00 watchdog/0
    5 root      15  -5     0    0    0 S  0.0  0.0   0:00.04 events/0
    6 root      15  -5     0    0    0 S  0.0  0.0   0:00.10 khelper
    9 root      15  -5     0    0    0 S  0.0  0.0   0:00.00 netns
   55 root      15  -5     0    0    0 S  0.0  0.0   0:00.00 kblockd/0
   63 root      15  -5     0    0    0 S  0.0  0.0   0:00.00 ata/0
   64 root      15  -5     0    0    0 S  0.0  0.0   0:00.00 ata_aux
   70 root      15  -5     0    0    0 S  0.0  0.0   0:00.00 khubd
   73 root      15  -5     0    0    0 S  0.0  0.0   0:00.00 kseriod
  118 root      20   0     0    0    0 S  0.0  0.0   0:00.00 pdflush
  119 root      20   0     0    0    0 S  0.0  0.0   0:00.00 pdflush
top - 19:29:35 up 1 day,  4:46,  0 users,  load average: 0.41, 0.17, 0.11
 --More--
```

The table below describes the significant fields shown in the display.

***Table 66: show platform software process slot Field Descriptions***

| Field | Description |
|---|---|
| %CPU | CPU Usage |
| %MEM | Memory Usage |
| COMMAND | Command name or command line |
| NI | Nice value |
| PID | Process ID |
| PR | Priority |
| RES | Resident memory size (in kb) |
| S | Process status |
| SHR | Shared memory size (in kb) |
| TIME+ | Elapsed execution time |
| USER | User name |
| VIRT | Virtual memory size (in kb) |

# show platform software tech-support

To display system information or create a technical support information tar file for Cisco Technical Support, use the **show platform software tech-support**command in privileged EXEC or diagnostic mode.

**show platform software tech-support** [**file** {**bootflash:***filename***.tgz** | **fpd:***filename***.tgz** | **harddisk:***filename***.tgz** | **obfl:***filename***.tgz** | **stby-bootflash:***filename***.tgz** | **stby-harddisk:***filename***.tgz** | **stby-obfl:***filename***.tgz** | **stby-usb0:***filename***.tgz** | **stby-usb1:***filename***.tgz**}]

## Syntax Description

| | |
|---|---|
| **file** | (Optional) Creates a technical support information tar file for the specified destination file path. |
| **bootflash:** *filename* **.tgz** | Creates a technical support information tar file for the boot flash memory file system on the active RP. |
| **fpd:***filename***.tgz** | Creates a technical support information tar file for the field-programmable device (FPD) image package on the active RP. The information displayed is for internal debugging puposes only. |
| **harddisk:***filename* **.tgz** | Creates a technical support information tar file for the hard disk file system on the active RP. |
| **obfl:***filename***.tgz** | Creates a technical support information tar file for the file system for Onboard Failure Logging (obfl) files. The information displayed is for internal debugging puposes only. |
| **stby-bootflash:** *filename* **.tgz** | Creates a technical support information tar file for the boot flash memory file system on the standby RP. The information displayed is for internal debugging puposes only. |
| **stby-harddisk:** *filename* **.tgz** | Creates a technical support information tar file for the hard disk file system on the standby RP. The information displayed is for internal debugging puposes only. |
| **stby-obfl:***filename***.tgz** | Creates a technical support information tar file for the Onboard Failure Logging (obfl) files on the standby RP. The information displayed is for internal debugging puposes only. |
| **stby-usb0:***filename***.tgz** | Creates a technical support information tar file for Universal Serial Bus (USB) memory. The information displayed is for internal debugging puposes only. |
| **stby-usb1:***filename***.tgz** | Creates a technical support information tar file for Universal Serial Bus (USB) memory. The information displayed is for internal debugging puposes only. |

## Command Default

No default behavior or values.

## Command Modes

Privileged EXEC (#)

Diagnostic (diag)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 2.1 | This command was introduced on the Cisco ASR 1000 Series Routers. |

## Usage Guidelines

If the file keyword is specified, the specification of the bootflash: or harddisk: keyword and filename is required.

The show platform software tech-support command without a destination file path specification returns a large volume of information in a short period of time. You should save the output of the show platform software tech-support command in a log file to send to Cisco Technical Support for analysis.

## Examples

The following example displays system information for Cisco Technical Support:

```
Router# show platform software tech-support
---- show version installed -----
Type: provisioning file, Version: unknown
  Provisioned on: RP0, Status: active
  File: packages.conf.super
  Modified: 2007-11-07 15:06:12.212303000 +0000
  SHA1 (header): d929d995d5ba2d3dedf67137c3e0e321b1727d7b
  SHA1 (calculated): d929d995d5ba2d3dedf67137c3e0e321b1727d7b
  SHA1 (external): a16881b6a7e3a5593b63bf211f72b8af9c534063
instance address        : 0X890DE9B4
    fast failover address   : 00000000
    cpp interface handle  0
    instance address        : 0X890DE9B8
    fast failover address   : 00000000
    cpp interface handle  0
    instance address        : 0X890DE9BC
    fast failover address   : 00000000
...
```

**Note** The show platform software tech-support command returns a large volume of information in a short period of time. The example above has been abbreviated for the purposes of this description.

The following example creates a technical support information tar file for the boot flash memory file system on the active RP:

```
Router# show platform software tech-support file bootflash:tech_support_output.tgz
Running tech support command set; please wait...
Creating file 'bootflash:target_support_output.tgz.tgz' ...
File 'bootflash:target_support_output.tgz.tgz' created successfully
```

The following example creates a technical support information tar file for the hard disk file system on the active RP:

```
Router# show platform software tech-support file harddisk:tech_support_output.tgz
Running tech support command set; please wait...
Creating file 'harddisk:tech_support_ouput.tgz.tgz' ...
File 'harddisk:tech_support_ouput.tgz.tgz' created successfully
```

# show platform software vnic-if interface-mapping

To display the mapping between the virtual Network Interface Cards (vNICs) on the virtual machine (VM) and the network interfaces on the virtual router, use the **show platform software vnic-if interface-mapping** command in Privileged EXEC mode.

**show platform software vnic-if interface-mapping**

## Command Modes

Privilged EXEC

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Release 3.8S (Controlled Availability) | This command was introduced on the Cisco CSR 1000V Cloud Services Router. |
| Cisco IOS XE Release 3.10S | The command display fields were changed. The Short Name field was removed, and the vNIC Name field was changed to Driver Name. |

## Usage Guidelines

The GigabitEthernet0 interface configured on the Cisco CSR 1000V automatically maps to the vNIC designated as “eth0” on the VM.

All subsequent interfaces configured on the router are sequentially mapped to the corresponding vNIC interface on the VM. For example, the GigabitEthernet1 interface is mapped to the eth1 vNIC on the VM, and the GigabitEthernet2 interface is mapped to the eth2 vNIC.

The display for this command was changed in Cisco IOS XE 3.10S.

### Examples

The following example displays the vNIC-to-interface mapping for Cisco IOS XE Release 3.9S and earlier:

```
Router# show platform software vnic-if interface-mapping
------------------------------------------------------------------------
Interface Name        Short Name     vNIC Name            Mac Addr
------------------------------------------------------------------------
GigabitEthernet0       Gi0        eth0 (vmxnet3)       000c.2946.3f4d
GigabitEthernet2       Gi2        eth2 (vmxnet3)       0050.5689.0034
GigabitEthernet1       Gi1        eth1 (vmxnet3)       0050.5689.000b
------------------------------------------------------------------------
```

The following example displays the vNIC-to-interface mapping for Cisco IOS XE Release 3.10S and later:

```
csr1000v# show platform software vnic-if interface-mapping
------------------------------------------------------------------------
Interface Name             Driver Name           Mac Addr
------------------------------------------------------------------------
GigabitEthernet0            vmxnet3            000c.2946.3f4d
GigabitEthernet2            vmxnet3            0050.5689.0034
GigabitEthernet1            vmxnet3            0050.5689.000b
------------------------------------------------------------------------
```

The following table describes the significant fields shown in the display.

*Table 67: show platform software vnic-if interface-mapping Field Descriptions*

| Field | Description |
|---|---|
| Interface Name | The virtual router interface name. |
| Short Name | (Cisco IOS XE 3.9S and earlier) The virtual router short interface name. |
| vNIC Name | (Cisco IOS XE 3.9S and earlier) The virtual network interface on the VM that the virtual router interface is mapped to. |
| Driver Name | (Cisco IOS XE 3.10S and later) The vNIC driver type for the interface on the VM that the virtual router interface is mapped to. |
| Mac Addr | The MAC address on the VM's physical host that the virtual network interface (vNIC) is mapped to. |

## Related Commands

| Command | Description |
|---|---|
| clear platform software vnic-if-nvtable | Clears the virtual router's persistent interface database on the original VM and updates the interface mapping to the hypervisor. |

# show platform time-source

To display the platform time-source details configured, use the **showplatformtime-source** command in the Privileged Exec mode .

**show platform time-source**

**Command Default**

No default behavior or values.

**Command Modes**

Privileged EXEC (#)

**Command History**

| Release | Modification |
|---|---|
| 15.1(2)S | This command was introduced on the Cisco 7600 series routers. |

**Usage Guidelines**

The**showplatformtime-source** command displays the platform time source configuration.

**Examples**

This example displays the show platform time source output:

```
Router#show platform time-source
 Time Source mode     : PTP
 PTP State            : Synchronized
 Master IP Address    : 200.1.1.2
 Slave IP Address     : 60.60.60.60
 UDP Source Port      : 51966
 UDP Destination Port : 320
 Control packets sent : 21
 Internal Vlan        : 1035
```

**Related Commands**

| Command | Description |
|---|---|
| **platform time-source** | Initiates the Time of Day (ToD) synchroniztion on a line card. |

# show plim fpga

To display details gathered from the registers of the internal FPGA (Field Programmable Gate Array) located in the PLIM (Physical Layer Interface Module) section of the line card, use the **show plim fpga** command in privileged EXEC mode.

**show plim fpga**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.0(33)S4 | This command was introduced. |

## Usage Guidelines

This command helps you to troubleshoot datapath failures and get the datapath counters on Shiver FPGA.

The following information is available:

- Rx packet counter
- Tx packet counter
- Rx Error Counter
- Status and control register
- Door bell register status
- FPGA Binary image revision number
- Whether loop back is enabled
- Whether Ingress and Egress paths are enabled

## Examples

The following example shows how to display the Shiver FPGA details:

```
Router# show plim fpga
***Shiver FPGA Stats***
FPGA Doorbell Register   : 0x00
FGPA binary image Revsion : 0xDD
FPGA Datapath Ctrl Reg   : 0x000B
 FPGA is Enabled in Eggress Direction
 FGPA is Enabled in Ingress Direction
 FPGA Eggress is Empty
======== Output from Tofab755 =======
FPGA Control and Status Register  : 0x028104dd
FPGA Rx Packet Count    : 0x000000cc
FPGA Tx Packet Count    : 0x000000cb
FPGA Rx Packet Error Count   : 0x0008ffff
```

The table below describes significant fields shown in the display.

*Table 68: show plim fpga Field Descriptions*

| Field | Description |
|---|---|
| FPGA Doorbell Register | Line card's version of mailbox doorbell register. |
| FGPA binary image Revision | FPGA image version. |
| FPGA Datapath Ctrl Reg | Indicates whether the ingress and eggress paths are enabled or disabled. |
| Control and Status Register | A 32-bit read-write register that provides the MPC8260 processor with interrupt mask control, interrupt status, Rx Error status, and the FPGA revision ID. |
| Rx Packet Count | The number of packets received from the FREEDM-336 in the receive direction.<br>This 32-bit count value saturates at 0xFFFF_FFFF. The counter is cleared when a write cycle is detected. |
| Tx Packet Count | The number of packets transmitted to the FREEDM-336.<br>This 32-bit count value saturates at 0xFFFF_FFFF. The counter is cleared when a write cycle is detected. |
| Rx Packet Error Count | The number of packets with errors received from the FREEDM-336 in the receive direction.<br>In this 32-bit counter, the 16 bit MSB (Most Significant Bit) indicates the errors that saturate after the value reaches FFFF. The value of LSB (Least Significant Bit) 16 bits will always be FFFF. |

# show policy-map interface

To display the statistics and the configurations of the input and output policies that are attached to an interface, use the **show policy-map interface** command in user EXEC or privileged EXEC mode.

**ATM Shared Port Adapters**
**show policy-map interface** *slot/subslot/port* **.**[*subinterface*]

**Cisco CMTS Routers**
**show policy-map interface** *interface-type slot/subslot/port*

**Cisco 3660, 3845, 7200, 7400, 7500, Cisco ASR 903 Series Routers, and Cisco ASR 1000 Series Routers**
**show policy-map interface** *type type-parameter* [**vc** [*vpi*][*/*]*vci*] [**dlci** *dlci*] [**input** | **output**] [**class** *class-name*]

**Cisco 6500 Series Switches**
**show policy-map interface** [*interface-type interface-number* | **vlan** *vlan-id*] [**detailed**] [ {**input** | **output**} [**class** *class-name*]]
**show policy-map interface** [**port-channel** *channel-number* [**class** *class-name*]]

**Cisco 7600 Series Routers**
**show policy-map interface** [*interface-type interface-number* | **null 0** | **vlan** *vlan-id*] [**input** | **output**]

## Syntax Description

| | |
|---|---|
| *slot* | (CMTS and ATM shared port adapter only) Chassis slot number. See the appropriate hardware manual for slot information. For SIPs, see the platform-specific SPA hardware installation guide or the corresponding "Identifying Slots and Subslots for SIPs and SPAs" topic in the platform-specific SPA software configuration guide. |
| */subslot* | (CMTS and ATM shared port adapter only) Secondary slot number on an SPA interface processor (SIP) where a SPA is installed. See the platform-specific SPA hardware installation guide and the corresponding "Specifying the Interface Address on an SPA" topic in the platform-specific SPA software configuration guide for subslot information. |
| *port* | (CMTS and ATM shared port adapter only) Port or interface number. See the appropriate hardware manual for port information. For SPAs, see the corresponding "Specifying the Interface Address" topics in the platform-specific SPA software configuration guide. |
| ***.subinterface*** | (ATM shared port adapter only—Optional) Subinterface number. The number that precedes the period must match the number to which this subinterface belongs. The range is 1 to 4,294,967,293. |
| *type* | Type of interface or subinterface whose policy configuration is to be displayed. |
| *type-parameter* | Port, connector, interface card number, class-map name or other parameter associated with the interface or subinterface type. |
| **vc** | (Optional) For ATM interfaces only, shows the policy configuration for a specified PVC. |

| | |
|---|---|
| *vpi* / | (Optional) ATM network virtual path identifier (VPI) for this permanent virtual circuit (PVC). On the Cisco 7200 and 7500 series routers, this value ranges from 0 to 255.<br>The *vpi* and *vci* arguments cannot both be set to 0; if one is 0, the other cannot be 0.<br>The absence of both the forward slash (/) and a *vpi* value defaults the *vpi* value to 0. If this value is omitted, information for all virtual circuits (VCs) on the specified ATM interface or subinterface is displayed. |
| *vci* | (Optional) ATM network virtual channel identifier (VCI) for this PVC. This value ranges from 0 to 1 less than the maximum value set for this interface by the **atmvc-per-vp** command. Typically, the lower values 0 to 31 are reserved for specific traffic (F4 Operation, Administration, and Maintenance [OAM], switched virtual circuit [SVC] signaling, Integrated Local Management Interface [ILMI], and so on) and should not be used.<br>The VCI is a 16-bit field in the header of the ATM cell. The VCI value is unique only on a single link, not throughout the ATM network, because it has local significance only.<br>The *vpi* and *vci* arguments cannot both be set to 0; if one is 0, the other cannot be 0. |
| **dlci** | (Optional) Indicates a specific PVC for which policy configuration will be displayed. |
| *dlci* | (Optional) A specific data-link connection identifier (DLCI) number used on the interface. Policy configuration for the corresponding PVC will be displayed when a DLCI is specified. |
| **input** | (Optional) Indicates that the statistics for the attached input policy will be displayed. |
| **output** | (Optional) Indicates that the statistics for the attached output policy will be displayed. |
| **class** *class-name* | (Optional) Displays the QoS policy actions for the specified class. |
| *interface-type* | (Optional) Interface type; possible valid values are **atm**, **ethernet**, **fastethernet**, **ge-wan gigabitethernet**, **pos**, **pseudowire** and **tengigabitethernet**. |
| *interface-number* | (Optional) Module and port number; see the "Usage Guidelines" section for valid values. |
| **vlan** *vlan-id* | (Optional) Specifies the VLAN ID; valid values are from 1 to 4094. |
| **detailed** | (Optional) Displays additional statistics. |
| **port-channel** *channel-number* | (Optional) Displays the EtherChannel port-channel interface. |
| **null 0** | (Optional) Specifies the null interface; the only valid value is 0. |

## Command Default

This command displays the packet statistics of all classes that are configured for all service policies on the specified interface or subinterface or on a specific permanent virtual circuit (PVC) on the interface.

When used with the ATM shared port adapter, this command has no default behavior or values.

## Command Modes

Privileged EXEC (#)

**ATM Shared Port Adapter**

User EXEC (>)

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.0(5)T | This command was introduced. |
| 12.0(5)XE | This command was integrated into Cisco IOS Release 12.0(5)XE. |
| 12.0(7)S | This command was integrated into Cisco IOS Release 12.0(7)S. |
| 12.0(28)S | This command was modified for the QoS: Percentage-Based Policing feature to include milliseconds when calculating the committed (conform) burst (bc) and excess (peak) burst (be) sizes. |
| 12.1(1)E | This command was integrated into Cisco IOS Release 12.1(1)E. |
| 12.1(2)T | This command was modified to display information about the policy for all Frame Relay PVCs on the interface or, if a DLCI is specified, the policy for that specific PVC. This command was also modified to display the total number of packets marked by the quality of service (QoS) set action. |
| 12.1(3)T | This command was modified to display per-class accounting statistics. |
| 12.2(4)T | This command was modified for two-rate traffic policing and can display burst parameters and associated actions. |
| 12.2(8)T | This command was modified for the Policer Enhancement—Multiple Actions feature and the WRED—Explicit Congestion Notification (ECN) feature.<br>For the Policer Enhancement—Multiple Actions feature, the command was modified to display the multiple actions configured for packets conforming to, exceeding, or violating a specific rate.<br>For the WRED—Explicit Congestion Notification (ECN) feature, the command displays ECN marking information. |

| Release | Modification |
|---|---|
| 12.2(13)T | The following modifications were made:<br>• This command was modified for the Percentage-Based Policing and Shaping feature.<br>• This command was modified for the Class-Based RTP and TCP Header Compression feature.<br>• This command was modified as part of the Modular QoS CLI (MQC) Unconditional Packet Discard feature. Traffic classes in policy maps can now be configured to discard packets belonging to a specified class.<br>• This command was modified to display the Frame Relay DLCI number as a criterion for matching traffic inside a class map.<br>• This command was modified to display Layer 3 packet length as a criterion for matching traffic inside a class map.<br>• This command was modified for the Enhanced Packet Marking feature. A mapping table (table map) can now be used to convert and propagate packet-marking values. |
| 12.2(14)SX | This command was modified. Support for this command was introduced on Cisco 7600 series routers. |
| 12.2(15)T | This command was modified to display Frame Relay voice-adaptive traffic-shaping information. |
| 12.2(17d)SXB | This command was implemented on the Supervisor Engine 2 and integrated into Cisco IOS Release 12.2(17d)SXB. |
| 12.3(14)T | This command was modified to display bandwidth estimation parameters. |
| 12.2(18)SXE | This command was integrated into Cisco IOS Release 12.2(18)SXE. This command was modified to display aggregate WRED statistics for the ATM shared port adapter. Note that changes were made to the syntax, defaults, and command modes. These changes are labelled “ATM Shared Port Adapter.” |
| 12.4(4)T | This command was modified. The **typeaccess-control** keywords were added to support flexible packet matching. |
| 12.2(28)SB | This command was integrated into Cisco IOS Release 12.2(28)SB, and the following modifications were made:<br>• This command was modified to display either legacy (undistributed processing) QoS or hierarchical queueing framework (HQF) parameters on Frame Relay interfaces or PVCs.<br>• This command was modified to display information about Layer 2 Tunnel Protocol Version 3 (L2TPv3) tunnel marking. |

| Release | Modification |
|---|---|
| 12.2(31)SB2 | The following modifications were made:<br>• This command was enhanced to display statistical information for each level of priority service configured and information about bandwidth-remaining ratios, and this command was implemented on the Cisco 10000 series router for the PRE3.<br>• This command was modified to display statistics for matching packets on the basis of VLAN identification numbers. As of Cisco IOS Release 12.2(31)SB2, matching packets on the basis of VLAN identification numbers is supported on Cisco 10000 series routers only. |
| 12.2(33)SRC | This command was integrated into Cisco IOS Release 12.2(33)SRC. |
| 12.4(15)T2 | This command was modified to display information about Generic Routing Encapsulation (GRE) tunnel marking.<br>**Note**<br>As of this release, GRE-tunnel marking is supported on the Cisco MGX Route Processor Module (RPM-XF) platform *only* . |
| 12.2(33)SB | This command was modified to display information about GRE-tunnel marking, and support for the Cisco 7300 series router was added. |
| Cisco IOS XE 2.1 | This command was integrated into Cisco IOS XE Release 2.1 and was implemented on the Cisco ASR 1000 series router. |
| 12.4(20)T | This command was modified. Support was added for hierarchical queueing framework (HQF) using the Modular Quality of Service (QoS) Command-Line Interface (CLI) (MQC). |
| 12.2(33)SXI | This command was implemented on the Catalyst 6500 series switch and modified to display the strict level in the priority feature and the counts per level. |
| 12.2(33)SRE | This command was modified to automatically round off the bc and be values, in the MQC police policy map, to the interface's MTU size. |
| Cisco IOS XE Release 2.6 | The command output was modified to display information about subscriber QoS statistics. |
| 12.2(54)SG | This command was modified to display only the applicable count of policer statistics. |
| 12.2(33)SCF | This command was integrated into Cisco IOS Release 12.2(33)SCF. |
| Cisco IOS XE Release 3.7S | This command was implemented on Cisco ASR 903 Series Routers. |
| Cisco IOS XE Release 3.8S | This command was modified. The *pseudowire* interface type was added. |

| Release | Modification |
|---|---|
| Cisco IOS XE Release 3.8S | This command was modified. The *pseudowire* interface type was added on Cisco 1000 Series Routers. |
| Cisco IOS Release 15.3(1)S | This command was modified. The *pseudowire* interface type was added. |

## Usage Guidelines

**Cisco 3660, 3845, 7200, 7400, 7500, Cisco ASR 903 Series Routers, and Cisco ASR 1000 Series Routers**

The **show policy-map interface** command displays the packet statistics for classes on the specified interface or the specified PVC only if a service policy has been attached to the interface or the PVC.

The counters displayed after the **show policy-map interface** command is entered are updated only if congestion is present on the interface.

The **show policy-map interface** command displays policy information about Frame Relay PVCs only if Frame Relay Traffic Shaping (FRTS) is enabled on the interface.

The **show policy-map interface** command displays ECN marking information only if ECN is enabled on the interface.

To determine if shaping is active with HQF, check the queue depth field of the "(queue depth/total drops/no-buffer drops)" line in the **show policy-map interface** command output.

In HQF images for Cisco IOS Releases 12.4(20)T and later, the packets delayed and the bytes delayed counters were removed for traffic shaping classes.

**Cisco 7600 Series Routers and Catalyst 6500 Series Switches**

The pos, atm, and ge-wan interfaces are not supported on Cisco 7600 series routers or Catalyst 6500 series switches that are configured with a Supervisor Engine 720

Cisco 7600 series routers and Catalyst 6500 series switches that are configured with a Supervisor Engine 2 display packet counters.

Cisco 7600 series routers and Catalyst 6500 series switches that are configured with a Supervisor Engine 720 display byte counters.

The output does not display policed-counter information; 0 is displayed in its place (for example, 0 packets, 0 bytes). To display dropped and forwarded policed-counter information, enter the **show mls qos** command.

On the Cisco 7600 series router, for OSM WAN interfaces only, if you configure policing within a policy map, the hardware counters are displayed and the class-default counters are not displayed. If you do not configure policing within a policy map, the class-default counters are displayed.

On the Catalyst 6500 series switch, the **show policy-map interface** command displays the strict level in the priority feature and the counts per level.

The *interface-number* argument designates the module and port number. Valid values for *interface-number* depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48.

**HQF**

When you configure HQF, the **show policy-map interface** command displays additional fields that include the differentiated services code point (DSCP) value, WRED statistics in bytes, transmitted packets by WRED, and a counter that displays packets output/bytes output in each class.

## Examples

This section provides sample output from typical **show policy-map interface** commands. Depending upon the interface or platform in use and the options enabled, the output you see may vary slightly from the ones shown below.

### Weighted Fair Queueing (WFQ) on Serial Interface: Example

The following sample output of the **show policy-map interface** command displays the statistics for the serial 3/1 interface, to which a service policy called mypolicy (configured as shown below) is attached. Weighted fair queueing (WFQ) has been enabled on this interface. See the table below for an explanation of the significant fields that commonly appear in the command output.

```
policy-map mypolicy
 class voice
  priority 128
 class gold
  bandwidth 100
 class silver
  bandwidth 80
  random-detect
Router# show policy-map interface serial3/1 output

 Serial3/1
  Service-policy output: mypolicy
    Class-map: voice (match-all)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: ip precedence 5
      Weighted Fair Queueing
        Strict Priority
        Output Queue: Conversation 264
        Bandwidth 128 (kbps) Burst 3200 (Bytes)
        (pkts matched/bytes matched) 0/0
        (total drops/bytes drops) 0/0
    Class-map: gold (match-all)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: ip precedence 2
      Weighted Fair Queueing
        Output Queue: Conversation 265
        Bandwidth 100 (kbps) Max Threshold 64 (packets)
        (pkts matched/bytes matched) 0/0
        (depth/total drops/no-buffer drops) 0/0/0
    Class-map: silver (match-all)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: ip precedence 1
      Weighted Fair Queueing
        Output Queue: Conversation 266
        Bandwidth 80 (kbps)
        (pkts matched/bytes matched) 0/0
        (depth/total drops/no-buffer drops) 0/0/0
         exponential weight: 9
         mean queue depth: 0
class     Transmitted       Random drop      Tail drop    Minimum Maximum  Mark
```

```
          pkts/bytes        pkts/bytes       pkts/bytes    thresh  thresh  prob
0             0/0               0/0              0/0          20      40  1/10
1             0/0               0/0              0/0          22      40  1/10
2             0/0               0/0              0/0          24      40  1/10
3             0/0               0/0              0/0          26      40  1/10
4             0/0               0/0              0/0          28      40  1/10
5             0/0               0/0              0/0          30      40  1/10
6             0/0               0/0              0/0          32      40  1/10
7             0/0               0/0              0/0          34      40  1/10
rsvp          0/0               0/0              0/0          36      40  1/10
Class-map: class-default (match-any)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: any
```

### Traffic Shaping on Serial Interface: Example

The following sample output from the **show policy-map interface** command displays the statistics for the serial 3/2 interface, to which a service policy called p1 (configured as shown below) is attached. Traffic shaping has been enabled on this interface. See the table below for an explanation of the significant fields that commonly appear in the command output.

**Note** In HQF images for Cisco IOS Releases 12.4(20)T and later, the packets delayed and bytes delayed counters were removed for traffic shaping classes.

```
policy-map p1
 class c1
  shape average 320000
Router# show policy-map interface serial3/2 output

 Serial3/2
  Service-policy output: p1
    Class-map: c1 (match-all)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: ip precedence 0
      Traffic Shaping
        Target    Byte   Sustain   Excess    Interval  Increment Adapt
        Rate      Limit  bits/int  bits/int  (ms)      (bytes)   Active
        320000    2000   8000      8000      25        1000      -
        Queue     Packets   Bytes     Packets   Bytes     Shaping
        Depth                         Delayed   Delayed   Active
        0         0         0         0         0         no
    Class-map: class-default (match-any)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: any
```

The table below describes significant fields commonly shown in the displays. The fields in the table are grouped according to the relevant QoS feature. A number in parentheses may appear next to the service-policy output name, class-map name, and match criteria information. The number is for Cisco internal use only and can be disregarded.

*Table 69: show policy-map interface Field Descriptions*

| Field | Description |
|---|---|
| Fields Associated with Classes or Service Policies | |
| Service-policy output | Name of the output service policy applied to the specified interface or VC. |
| Class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets and bytes | Number of packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of packets coming in to the class.<br>**Note**<br>If the packets are compressed over an outgoing interface, the improved packet rate achieved by packet compression is not reflected in the offered rate. Also, if the packets are classified *before* they enter a combination of tunnels (for example, a generic routing encapsulation (GRE) tunnel and an IP Security (IPSec) tunnel), the offered rate does not include all the extra overhead associated with tunnel encapsulation in general. Depending on the configuration, the offered rate may include no overhead, may include the overhead for only *one* tunnel encapsulation, or may include the overhead for *all* tunnel encapsulations. In most of the GRE and IPSec tunnel configurations, the offered rate includes the overhead for GRE tunnel encapsulation only. |
| drop rate | Rate, in kbps, at which packets are dropped from the class. The drop rate is calculated by subtracting the number of successfully transmitted packets from the offered rate. |
| **Note**<br>In distributed architecture platforms (such as the Cisco 7500 series platform), the value of the transfer rate, calculated as the difference between the offered rate and the drop rate counters, can sporadically deviate from the average by up to 20 percent or more. This can occur while no corresponding burst is registered by independent traffic analyser equipment. | |

| Field | Description |
|---|---|
| Match | Match criteria specified for the class of traffic. Choices include criteria such as IP precedence, IP differentiated services code point (DSCP) value, Multiprotocol Label Switching (MPLS) experimental (EXP) value, access groups, and QoS groups. For more information about the variety of match criteria that are available, see the "Classifying Network Traffic" module in the *Cisco IOS Quality of Service Solutions Configuration Guide* . |
| Fields Associated with Queueing (if Enabled) | |
| Output Queue | The weighted fair queueing (WFQ) conversation to which this class of traffic is allocated. |
| Bandwidth | Bandwidth, in either kbps or percentage, configured for this class and the burst size. |
| pkts matched/bytes matched | Number of packets (also shown in bytes) matching this class that were placed in the queue. This number reflects the total number of matching packets queued at any time. Packets matching this class are queued only when congestion exists. If packets match the class but are never queued because the network was not congested, those packets are not included in this total. However, if process switching is in use, the number of packets is always incremented even if the network is not congested. |
| depth/total drops/no-buffer drops | Number of packets discarded for this class. No-buffer indicates that no memory buffer exists to service the packet. |
| Fields Associated with Weighted Random Early Detection (WRED) (if Enabled) | |
| exponential weight | Exponent used in the average queue size calculation for a WRED parameter group. |
| mean queue depth | Average queue depth based on the actual queue depth on the interface and the exponential weighting constant. It is a fluctuating average. The minimum and maximum thresholds are compared against this value to determine drop decisions. |
| class | IP precedence level. |
| Transmitted pkts/bytes | Number of packets (also shown in bytes) passed through WRED and not dropped by WRED.<br>**Note**<br>If there is insufficient memory in the buffer to accommodate the packet, the packet can be dropped *after* the packet passes through WRED. Packets dropped because of insufficient memory in the buffer (sometimes referred to as "no-buffer drops") are not taken into account by the WRED packet counter. |

| Field | Description |
|---|---|
| Random drop pkts/bytes | Number of packets (also shown in bytes) randomly dropped when the mean queue depth is between the minimum threshold value and the maximum threshold value for the specified IP precedence level. |
| Tail drop pkts/bytes | Number of packets dropped when the mean queue depth is greater than the maximum threshold value for the specified IP precedence level. |
| Minimum thresh | Minimum threshold. Minimum WRED threshold in number of packets. |
| Maximum thresh | Maximum threshold. Maximum WRED threshold in number of packets. |
| Mark prob | Mark probability. Fraction of packets dropped when the average queue depth is at the maximum threshold. |
| Fields Associated with Traffic Shaping (if Enabled) | |
| Target Rate | Rate used for shaping traffic. |
| Byte Limit | Maximum number of bytes that can be transmitted per interval. Calculated as follows:<br>((Bc+Be) /8) x 1 |
| Sustain bits/int | Committed burst (Bc) rate. |
| Excess bits/int | Excess burst (Be) rate. |
| Interval (ms) | Time interval value in milliseconds (ms). |
| Increment (bytes) | Number of credits (in bytes) received in the token bucket of the traffic shaper during each time interval. |
| Queue Depth | Current queue depth of the traffic shaper. |
| Packets | Total number of packets that have entered the traffic shaper system. |
| Bytes | Total number of bytes that have entered the traffic shaper system. |
| Packets Delayed | Total number of packets delayed in the queue of the traffic shaper before being transmitted. |
| Bytes Delayed | Total number of bytes delayed in the queue of the traffic shaper before being transmitted. |
| Shaping Active | Indicates whether the traffic shaper is active. For example, if a traffic shaper is active, and the traffic being sent exceeds the traffic shaping rate, a “yes” appears in this field. |

### Precedence-Based Aggregate WRED on ATM Shared Port Adapter: Example

The following sample output of the **show policy-map interface** command displays the statistics for the ATM shared port adapter interface 4/1/0.10, to which a service policy called prec-aggr-wred (configured as shown below) is attached. Because aggregate WRED has been enabled on this interface, the classthrough Mark Prob statistics are aggregated by subclasses. See the table below for an explanation of the significant fields that commonly appear in the command output.

```
Router(config)# policy-map prec-aggr-wred
Router(config-pmap)# class class-default
Router(config-pmap-c)# random-detect aggregate
Router(config-pmap-c)# random-detect precedence values 0 1 2 3 minimum thresh 10
maximum-thresh 100 mark-prob 10
Router(config-pmap-c)# random-detect precedence values 4 5 minimum-thresh 40 maximum-thresh
 400 mark-prob 10
Router(config-pmap-c)# random-detect precedence values 6 minimum-thresh 60 maximum-thresh
600 mark-prob 10
Router(config-pmap-c)# random-detect precedence values 7 minimum-thresh 70 maximum-thresh
700 mark-prob 10
Router(config-pmap-c)# exit
Router(config-pmap)# exit
Router(config)# interface ATM4/1/0.10 point-to-point
Router(config-if)# ip address 10.0.0.2 255.255.255.0
Router(config-if)# pvc 10/110
Router(config-if)# service-policy output prec-aggr-wred


Router# show policy-map interface atm4/1/0.10

 ATM4/1/0.10: VC 10/110 -
  Service-policy output: prec-aggr-wred
    Class-map: class-default (match-any)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: any
        Exp-weight-constant: 9 (1/512)
        Mean queue depth: 0
        class       Transmitted     Random drop      Tail drop     Minimum   Maximum  Mark
 pkts/bytes pkts/bytes pkts/bytes thresh thresh prob

        0  1  2  3       0/0              0/0              0/0           10     100  1/10
        4  5             0/0              0/0              0/0           40     400  1/10
        6                0/0              0/0              0/0           60     600  1/10
        7                0/0              0/0              0/0           70     700  1/10
```

### DSCP-Based Aggregate WRED on ATM Shared Port Adapter: Example

The following sample output of the **show policy-map interface** command displays the statistics for the ATM shared port adapter interface 4/1/0.11, to which a service policy called dscp-aggr-wred (configured as shown below) is attached. Because aggregate WRED has been enabled on this interface, the class through Mark Prob statistics are aggregated by subclasses. See the table below for an explanation of the significant fields that commonly appear in the command output.

```
Router(config)# policy-map dscp-aggr-wred
Router(config-pmap)# class class-default
Router(config-pmap-c)# random-detect dscp-based aggregate minimum-thresh 1 maximum-thresh
10 mark-prob 10
```

```
Router(config-pmap-c)# random-detect dscp values 0 1 2 3 4 5 6 7 minimum-thresh 10
maximum-thresh 20 mark-prob 10
Router(config-pmap-c)# random-detect dscp values 8 9 10 11 minimum-thresh 10 maximum-thresh
 40 mark-prob 10
Router(config-pmap-c)# exit
Router(config-pmap)# exit
Router(config)# interface ATM4/1/0.11 point-to-point
Router(config-subif)# ip address 10.0.0.2 255.255.255.0
Router(config-subif)# pvc 11/101
Router(config-subif)# service-policy output dscp-aggr-wred
Router# show policy-map interface atm4/1/0.11

 ATM4/1/0.11: VC 11/101 -
  Service-policy output: dscp-aggr-wred
    Class-map: class-default (match-any)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: any
        Exp-weight-constant: 0 (1/1)
        Mean queue depth: 0
        class       Transmitted     Random drop      Tail drop     Minimum   Maximum  Mark
                   pkts/bytes pkts/bytes pkts/bytes thresh thresh prob
        default          0/0               0/0              0/0            1      10  1/10
        0  1  2  3
        4  5  6  7       0/0               0/0              0/0           10      20  1/10
        8  9  10 11      0/0               0/0              0/0           10      40  1/10
```

The table below describes the significant fields shown in the display when aggregate WRED is configured for an ATM shared port adapter.

***Table 70: show policy-map interface Field Descriptions—Configured for Aggregate WRED on ATM Shared Port Adapter***

| Field | Description |
|---|---|
| exponential weight | Exponent used in the average queue size calculation for a Weighted Random Early Detection (WRED) parameter group. |
| mean queue depth | Average queue depth based on the actual queue depth on the interface and the exponential weighting constant. It is a fluctuating average. The minimum and maximum thresholds are compared against this value to determine drop decisions. |
| **Note** When Aggregate Weighted Random Early Detection (WRED) is enabled, the following WRED statistics will be aggregated based on their subclass (either their IP precedence or differentiated services code point (DSCP) value). | |
| class | IP precedence level or differentiated services code point (DSCP) value. |

| Field | Description |
|---|---|
| Transmitted pkts/bytes | Number of packets (also shown in bytes) passed through WRED and not dropped by WRED.<br>**Note**<br>If there is insufficient memory in the buffer to accommodate the packet, the packet can be dropped *after* the packet passes through WRED. Packets dropped because of insufficient memory in the buffer (sometimes referred to as "no-buffer drops") are not taken into account by the WRED packet counter. |
| Random drop pkts/bytes | Number of packets (also shown in bytes) randomly dropped when the mean queue depth is between the minimum threshold value and the maximum threshold value for the specified IP precedence level or DSCP value. |
| Tail drop pkts/bytes | Number of packets dropped when the mean queue depth is greater than the maximum threshold value for the specified IP precedence level or DSCP value. |
| Minimum thresh | Minimum threshold. Minimum WRED threshold in number of packets. |
| Maximum thresh | Maximum threshold. Maximum WRED threshold in number of packets. |
| Mark prob | Mark probability. Fraction of packets dropped when the average queue depth is at the maximum threshold. |

### Frame Relay Voice-Adaptive Traffic-Shaping: Example

The following sample output shows that Frame Relay voice-adaptive traffic shaping is currently active and has 29 seconds left on the deactivation timer. With traffic shaping active and the deactivation time set, this means that the current sending rate on DLCI 201 is minCIR, but if no voice packets are detected for 29 seconds, the sending rate will increase to CIR.

**Note** In HQF images for Cisco IOS Releases 12.4(20)T and later, the packets delayed and bytes delayed counters were removed for traffic shaping classes.

```
Router# show policy interface Serial3/1.1

 Serial3/1.1:DLCI 201 -
  Service-policy output:MQC-SHAPE-LLQ1

    Class-map:class-default (match-any)
      1434 packets, 148751 bytes
      30 second offered rate 14000 bps, drop rate 0 bps
      Match:any
      Traffic Shaping
           Target/Average   Byte   Sustain   Excess    Interval  Increment
             Rate           Limit  bits/int  bits/int  (ms)      (bytes)
            63000/63000     1890   7560      7560      120       945
```

```
Adapt  Queue     Packets   Bytes     Packets   Bytes     Shaping
Active Depth                         Delayed   Delayed   Active
BECN   0         1434      162991    26        2704      yes
Voice Adaptive Shaping active, time left 29 secs
```

The table below describes the significant fields shown in the display. Significant fields that are not described in the table below are described in the table above (for "show policy-map interface Field Descriptions").

***Table 71: show policy-map interface Field Descriptions—Configured for Frame Relay Voice-Adaptive Traffic Shaping***

| Field | Description |
|---|---|
| Voice Adaptive Shaping active/inactive | Indicates whether Frame Relay voice-adaptive traffic shaping is active or inactive. |
| time left | Number of seconds left on the Frame Relay voice-adaptive traffic shaping deactivation timer. |

### Two-Rate Traffic Policing: Example

The following is sample output from the **show policy-map interface** command when two-rate traffic policing has been configured. In the example below, 1.25 Mbps of traffic is sent ("offered") to a policer class.

```
Router# show policy-map interface serial3/0


 Serial3/0
  Service-policy output: policy1
   Class-map: police (match all)
    148803 packets, 36605538 bytes
    30 second offered rate 1249000 bps, drop rate 249000 bps
    Match: access-group 101
    police:
     cir 500000 bps, conform-burst 10000, pir 1000000, peak-burst 100000
     conformed 59538 packets, 14646348 bytes; action: transmit
     exceeded 59538 packets, 14646348 bytes; action: set-prec-transmit 2
     violated 29731 packets, 7313826 bytes; action: drop
     conformed 499000 bps, exceed 500000 bps violate 249000 bps
   Class-map: class-default (match-any)
    19 packets, 1990 bytes
    30 seconds offered rate 0 bps, drop rate 0 bps
    Match: any
```

The two-rate traffic policer marks 500 kbps of traffic as conforming, 500 kbps of traffic as exceeding, and 250 kbps of traffic as violating the specified rate. Packets marked as conforming will be sent as is, and packets marked as exceeding will be marked with IP Precedence 2 and then sent. Packets marked as violating the specified rate are dropped.

The table below describes the significant fields shown in the display.

*Table 72: show policy-map interface Field Descriptions—Configured for Two-Rate Traffic Policing*

| Field | Description |
|---|---|
| police | Indicates that the **police** command has been configured to enable traffic policing. Also, displays the specified CIR, conform burst size, peak information rate (PIR), and peak burst size used for marking packets. |
| conformed | Displays the action to be taken on packets conforming to a specified rate. Displays the number of packets and bytes on which the action was taken. |
| exceeded | Displays the action to be taken on packets exceeding a specified rate. Displays the number of packets and bytes on which the action was taken. |
| violated | Displays the action to be taken on packets violating a specified rate. Displays the number of packets and bytes on which the action was taken. |

### Multiple Traffic Policing Actions: Example

The following is sample output from the **show policy-map** command when the Policer Enhancement—Multiple Actions feature has been configured. The sample output from the **show policy-map interface** command displays the statistics for the serial 3/2 interface, to which a service policy called "police" (configured as shown below) is attached.

```
policy-map police
 class class-default
  police cir 1000000 pir 2000000
   conform-action transmit
   exceed-action set-prec-transmit 4
   exceed-action set-frde-transmit
   violate-action set-prec-transmit 2
   violate-action set-frde-transmit

Router# show policy-map interface serial3/2

Serial3/2: DLCI 100 -
Service-policy output: police
    Class-map: class-default (match-any)
      172984 packets, 42553700 bytes
      5 minute offered rate 960000 bps, drop rate 277000 bps
      Match: any
     police:
         cir 1000000 bps, bc 31250 bytes, pir 2000000 bps, be 31250 bytes
       conformed 59679 packets, 14680670 bytes; actions:
         transmit
exceeded 59549 packets, 14649054 bytes; actions:
         set-prec-transmit 4
         set-frde-transmit
       violated 53758 packets, 13224468 bytes; actions:
         set-prec-transmit 2
         set-frde-transmit
       conformed 340000 bps, exceed 341000 bps, violate 314000 bps
```

The sample output from **show policy-map interface** command shows the following:

- 59679 packets were marked as conforming packets (that is, packets conforming to the CIR) and were transmitted unaltered.

- 59549 packets were marked as exceeding packets (that is, packets exceeding the CIR but not exceeding the PIR). Therefore, the IP Precedence value of these packets was changed to an IP Precedence level of 4, the discard eligibility (DE) bit was set to 1, and the packets were transmitted with these changes.
- 53758 packets were marked as violating packets (that is, exceeding the PIR). Therefore, the IP Precedence value of these packets was changed to an IP Precedence level of 2, the DE bit was set to 1, and the packets were transmitted with these changes.



**Note** Actions are specified by using the *action* argument of the **police** command. For more information about the available actions, see the **police** command reference page.

The table below describes the significant fields shown in the display.

***Table 73: show policy-map interface Field Descriptions—Configured for Multiple Traffic Policing Actions***

| Field | Description |
|---|---|
| police | Indicates that the **police** command has been configured to enable traffic policing. Also, displays the specified CIR, conform burst size (BC), PIR, and peak burst size (BE) used for marking packets. |
| conformed, packets, bytes, actions | Displays the number of packets (also shown in bytes) marked as conforming to a specified rate and the actions taken on the packet. If there are multiple actions, each action is listed separately. |
| exceeded, packets, bytes, actions | Displays the number of packets (also shown in bytes) marked as exceeding a specified rate and the actions taken on the packet. If there are multiple actions, each action is listed separately. |
| violated, packets, bytes, actions | Displays the number of packets (also shown in bytes) marked as violating a specified rate and the actions taken on the packet. If there are multiple actions, each action is listed separately. |

### Explicit Congestion Notification: Example

The following is sample output from the **show policy-map interface** command when the WRED — Explicit Congestion Notification (ECN) feature has been configured. The words "explicit congestion notification" included in the output indicate that ECN has been enabled.

```
Router# show policy-map interface Serial4/1

 Serial4/1
  Service-policy output:policy_ecn
        Class-map:prec1 (match-all)
          1000 packets, 125000 bytes
          30 second offered rate 14000 bps, drop rate 5000 bps
          Match:ip precedence 1
          Weighted Fair Queueing
            Output Queue:Conversation 42
            Bandwidth 20 (%)
```

```
        Bandwidth 100 (kbps)
        (pkts matched/bytes matched) 989/123625
    (depth/total drops/no-buffer drops) 0/455/0
         exponential weight:9
         explicit congestion notification
         mean queue depth:0
class    Transmitted  Random drop  Tail drop   Minimum     Maximum     Mark
         pkts/bytes   pkts/bytes    pkts/bytes threshold   threshold   probability
  0        0/0          0/0          0/0          20          40         1/10
  1      545/68125      0/0          0/0          22          40         1/10
  2        0/0          0/0          0/0          24          40         1/10
  3        0/0          0/0          0/0          26          40         1/10
  4        0/0          0/0          0/0          28          40         1/10
  5        0/0          0/0          0/0          30          40         1/10
  6        0/0          0/0          0/0          32          40         1/10
  7        0/0          0/0          0/0          34          40         1/10
rsvp       0/0          0/0          0/0          36          40         1/10
class    ECN Mark
        pkts/bytes
  0      0/0
  1     43/5375
  2      0/0
  3      0/0
  4      0/0
  5      0/0
  6      0/0
  7      0/0
rsvp     0/0
```

The table below describes the significant fields shown in the display.

***Table 74: show policy-map interface Field Descriptions—Configured for ECN***

| Field | Description |
|---|---|
| explicit congestion notification | Indication that Explicit Congestion Notification is enabled. |
| mean queue depth | Average queue depth based on the actual queue depth on the interface and the exponential weighting constant. It is a moving average. The minimum and maximum thresholds are compared against this value to determine drop decisions. |
| class | IP precedence value. |
| Transmitted pkts/bytes | Number of packets (also shown in bytes) passed through WRED and not dropped by WRED.<br>**Note**<br>If there is insufficient memory in the buffer to accommodate the packet, the packet can be dropped *after* the packet passes through WRED. Packets dropped because of insufficient memory in the buffer (sometimes referred to as “no-buffer drops”) are not taken into account by the WRED packet counter. |
| Random drop pkts/bytes | Number of packets (also shown in bytes) randomly dropped when the mean queue depth is between the minimum threshold value and the maximum threshold value for the specified IP precedence value. |

| Field | Description |
|---|---|
| Tail drop pkts/bytes | Number of packets dropped when the mean queue depth is greater than the maximum threshold value for the specified IP precedence value. |
| Minimum threshold | Minimum WRED threshold in number of packets. |
| Maximum threshold | Maximum WRED threshold in number of packets. |
| Mark probability | Fraction of packets dropped when the average queue depth is at the maximum threshold. |
| ECN Mark pkts/bytes | Number of packets (also shown in bytes) marked by ECN. |

### Class-Based RTP and TCP Header Compression: Example

The following sample output from the **show policy-map interface** command shows the RTP header compression has been configured for a class called "prec2" in the policy map called "p1".

The **show policy-map interface** command output displays the type of header compression configured (RTP), the interface to which the policy map called "p1" is attached (Serial 4/1), the total number of packets, the number of packets compressed, the number of packets saved, the number of packets sent, and the rate at which the packets were compressed (in bits per second (bps)).

In this example, User Datagram Protocol (UDP)/RTP header compressions have been configured, and the compression statistics are included at the end of the display.

```
Router# show policy-map interface Serial4/1

Serial4/1
Service-policy output:p1
    Class-map:class-default (match-any)
      1005 packets, 64320 bytes
      30 second offered rate 16000 bps, drop rate 0 bps
      Match:any
compress:
          header ip rtp
          UDP/RTP Compression:
          Sent:1000 total, 999 compressed,
                41957 bytes saved, 17983 bytes sent
                3.33 efficiency improvement factor
                99% hit ratio, five minute miss rate 0 misses/sec, 0 max
                 rate 5000 bps
```

The table below describes the significant fields shown in the display.

***Table 75: show policy-map interface Field Descriptions—Configured for Class-Based RTP and TCP Header Compression***

| Field | Description |
|---|---|
| Service-policy output | Name of the output service policy applied to the specified interface or VC. |
| Class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |

| Field | Description |
|---|---|
| packets, bytes | Number of packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of packets coming in to the class.<br>**Note**<br>If the packets are compressed over an outgoing interface, the improved packet rate achieved by packet compression is not reflected in the offered rate. Also, if the packets are classified *before* they enter a combination of tunnels (for example, a generic routing encapsulation (GRE) tunnel and an IP Security (IPSec) tunnel), the offered rate does not include all the extra overhead associated with tunnel encapsulation in general. Depending on the configuration, the offered rate may include no overhead, may include the overhead for only *one* tunnel encapsulation, or may include the overhead for *all* tunnel encapsulations. In most of the GRE and IPSec tunnel configurations, the offered rate includes the overhead for GRE tunnel encapsulation only. |
| UDP/RTP Compression | Indicates that RTP header compression has been configured for the class. |
| Sent total | Count of every packet sent, both compressed packets and full-header packets. |
| Sent compressed | Count of number of compressed packets sent. |
| bytes saved | Total number of bytes saved (that is, bytes not needing to be sent). |
| bytes sent | Total number of bytes sent for both compressed and full-header packets. |
| efficiency improvement factor | The percentage of increased bandwidth efficiency as a result of header compression. For example, with RTP streams, the efficiency improvement factor can be as much as 2.9 (or 290 percent). |
| hit ratio | Used mainly for troubleshooting purposes, this is the percentage of packets found in the context database. In most instances, this percentage should be high. |
| five minute miss rate | The number of new traffic flows found in the last five minutes. |
| misses/sec max | The average number of new traffic flows found per second, and the highest rate of new traffic flows to date. |
| rate | The actual traffic rate (in bits per second) after the packets are compressed. |

**Note** A number in parentheses may appear next to the service-policy output name and the class-map name. The number is for Cisco internal use only and can be disregarded.

### Modular QoS CLI (MQC) Unconditional Packet Discard: Example

The following sample output from the **show policy-map interface** command displays the statistics for the Serial2/0 interface, to which a policy map called "policy1" is attached. The discarding action

has been specified for all the packets belonging to a class called “c1.” In this example, 32000 bps of traffic is sent (“offered”) to the class and all of them are dropped. Therefore, the drop rate shows 32000 bps.

```
Router# show policy-map interface

 Serial2/0
 Serial2/0
  Service-policy output: policy1
    Class-map: c1 (match-all)
       10184 packets, 1056436 bytes
       5 minute offered rate 32000 bps, drop rate 32000 bps
       Match: ip precedence 0
       drop
```

The table below describes the significant fields shown in the display.

***Table 76: show policy-map interface Field Descriptions—Configured for MQC Unconditional Packet Discard***

| Field | Description |
|---|---|
| Service-policy output | Name of the output service policy applied to the specified interface or VC. |
| Class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets, bytes | Number of packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of packets coming in to the class.<br>**Note**<br>If the packets are compressed over an outgoing interface, the improved packet rate achieved by packet compression is not reflected in the offered rate. Also, if the packets are classified *before* they enter a combination of tunnels (for example, a generic routing encapsulation (GRE) tunnel and an IP Security (IPSec) tunnel), the offered rate does not include all the extra overhead associated with tunnel encapsulation in general. Depending on the configuration, the offered rate may include no overhead, may include the overhead for only *one* tunnel encapsulation, or may include the overhead for *all* tunnel encapsulations. In most of the GRE and IPSec tunnel configurations, the offered rate includes the overhead for GRE tunnel encapsulation only. |
| drop rate | Rate, in kbps, at which packets are dropped from the class. The drop rate is calculated by subtracting the number of successfully transmitted packets from the offered rate. |

| Field | Description |
|---|---|
| **Note** In distributed architecture platforms (such as the Cisco 7500), the value of the transfer rate, calculated as the difference between the offered rate and the drop rate counters, can sporadically deviate from the average by up to 20 percent or more. This can occur while no corresponding burst is registered by independent traffic analyser equipment. | |
| Match | Match criteria specified for the class of traffic. Choices include criteria such as the Layer 3 packet length, IP precedence, IP DSCP value, MPLS experimental value, access groups, and QoS groups. For more information about the variety of match criteria that are available, see the "Classifying Network Traffic" module in the *Cisco IOS Quality of Service Solutions Configuration Guide* . |
| drop | Indicates that the packet discarding action for all the packets belonging to the specified class has been configured. |

**Note** A number in parentheses may appear next to the service-policy output name and the class-map name. The number is for Cisco internal use only and can be disregarded.

### Percentage-Based Policing and Shaping: Example

The following sample output from the **show policy-map interface** command shows traffic policing configured using a CIR based on a bandwidth of 20 percent. The CIR and committed burst (Bc) in milliseconds (ms) are included in the display.

```
Router# show policy-map interface Serial3/1

  Service-policy output: mypolicy
    Class-map: gold (match-any)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: any
      police:
          cir 20 % bc 10 ms
          cir 2000000 bps, bc 2500 bytes
          pir 40 % be 20 ms
          pir 4000000 bps, be 10000 bytes
     conformed 0 packets, 0 bytes; actions:
      transmit
     exceeded 0 packets, 0 bytes; actions:
```

```
 drop
violated 0 packets, 0 bytes; actions:
 drop
conformed 0 bps, exceed 0 bps, violate 0 bps
```

The table below describes the significant fields shown in the display. A number in parentheses may appear next to the service-policy output name and the class-map name. The number is for Cisco internal use only and can be disregarded.

***Table 77: show policy-map interface Field Descriptions—Configured for Percentage-Based Policing and Shaping.***

| Field | Description |
|---|---|
| Service-policy output | Name of the output service policy applied to the specified interface or VC. |
| Class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets, bytes | Number of packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of packets coming in to the class.<br>**Note**<br>If the packets are compressed over an outgoing interface, the improved packet rate achieved by packet compression is not reflected in the offered rate. Also, if the packets are classified *before* they enter a combination of tunnels (for example, a generic routing encapsulation (GRE) tunnel and an IP Security (IPSec) tunnel), the offered rate does not include all the extra overhead associated with tunnel encapsulation in general. Depending on the configuration, the offered rate may include no overhead, may include the overhead for only *one* tunnel encapsulation, or may include the overhead for *all* tunnel encapsulations. In most of the GRE and IPSec tunnel configurations, the offered rate includes the overhead for GRE tunnel encapsulation only. |
| police | Indicates that traffic policing based on a percentage of bandwidth has been enabled. Also, displays the bandwidth percentage, the CIR, and the committed burst (Bc) size in ms. |
| conformed, actions | Displays the number of packets and bytes marked as conforming to the specified rates, and the action to be taken on those packets. |
| exceeded, actions | Displays the number of packets and bytes marked as exceeding the specified rates, and the action to be taken on those packets. |

### Traffic Shaping: Example

The following sample output from the **show policy-map interface** command (shown below) displays the statistics for the serial 3/2 interface. Traffic shaping has been enabled on this interface, and an average rate of 20 percent of the bandwidth has been specified.

**Note** In HQF images for Cisco IOS Releases 12.4(20)T and later, the packets delayed and bytes delayed counters were removed for traffic shaping classes.

```
Router# show policy-map interface Serial3/2

Serial3/2
  Service-policy output: p1
    Class-map: c1 (match-all)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: any
      Traffic Shaping
        Target/Average      Byte   Sustain    Excess      Interval  Increment  Adapt
        Rate              Limit  bits/int  bits/int    (ms)     (bytes)   Active
         20 %                       10 (ms)    20 (ms)
        201500/201500       1952   7808       7808        38         976       -
        Queue     Packets   Bytes     Packets   Bytes     Shaping
        Depth                         Delayed   Delayed   Active
        0         0         0         0         0         no
```

The table below describes the significant fields shown in the display. A number in parentheses may appear next to the service-policy output name, class-map name, and match criteria information. The number is for Cisco internal use only and can be disregarded.

***Table 78: show policy-map interface Field Descriptions—Configured for Percentage-Based Policing and Shaping (with Traffic Shaping Enabled).***

| Field | Description |
|---|---|
| Service-policy output | Name of the output service policy applied to the specified interface or VC. |
| Class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets, bytes | Number of packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of packets coming in to the class.<br>**Note**<br>If the packets are compressed over an outgoing interface, the improved packet rate achieved by packet compression is not reflected in the offered rate. Also, if the packets are classified *before* they enter a combination of tunnels (for example, a generic routing encapsulation (GRE) tunnel and an IP Security (IPSec) tunnel), the offered rate does not include all the extra overhead associated with tunnel encapsulation in general. Depending on the configuration, the offered rate may include no overhead, may include the overhead for only *one* tunnel encapsulation, or may include the overhead for *all* tunnel encapsulations. In most of the GRE and IPSec tunnel configurations, the offered rate includes the overhead for GRE tunnel encapsulation only. |

| Field | Description |
|---|---|
| drop rate | Rate, in kbps, at which packets are dropped from the class. The drop rate is calculated by subtracting the number of successfully transmitted packets from the offered rate. |
| Match | Match criteria specified for the class of traffic. Choices include criteria such as the Layer 3 packet length, IP precedence, IP DSCP value, MPLS experimental value, access groups, and quality of service (QoS) groups. For more information about the variety of match criteria that are available, see the "Classifying Network Traffic" module in the *Quality of Service Solutions Configuration Guide*. |
| Traffic Shaping | Indicates that traffic shaping based on a percentage of bandwidth has been enabled. |
| Target/Average Rate | Rate (percentage) used for shaping traffic and the number of packets meeting that rate. |
| Byte Limit | Maximum number of bytes that can be transmitted per interval. Calculated as follows:<br>((Bc+Be) /8 ) x 1 |
| Sustain bits/int | Committed burst (Bc) rate. |
| Excess bits/int | Excess burst (Be) rate. |
| Interval (ms) | Time interval value in milliseconds (ms). |
| Increment (bytes) | Number of credits (in bytes) received in the token bucket of the traffic shaper during each time interval. |
| Adapt Active | Indicates whether adaptive shaping is enabled. |
| Queue Depth | Current queue depth of the traffic shaper. |
| Packets | Total number of packets that have entered the traffic shaper system. |
| Bytes | Total number of bytes that have entered the traffic shaper system. |
| Packets Delayed | Total number of packets delayed in the queue of the traffic shaper before being transmitted.<br>**Note**<br>In Cisco IOS Release 12.4(20)T, this counter was removed. |
| Bytes Delayed | Total number of bytes delayed in the queue of the traffic shaper before being transmitted.<br>**Note**<br>In Cisco IOS Release 12.4(20)T, this counter was removed. |
| Shaping Active | Indicates whether the traffic shaper is active. For example, if a traffic shaper is active, and the traffic being sent exceeds the traffic shaping rate, a "yes" appears in this field. |

### Packet Classification Based on Layer 3 Packet Length: Example

The following sample output from the **show policy-map interface** command displays the packet statistics for the Ethernet4/1 interface, to which a service policy called "mypolicy" is attached. The Layer 3 packet length has been specified as a match criterion for the traffic in the class called "class1".

```
Router# show policy-map interface Ethernet4/1

  Ethernet4/1
  Service-policy input: mypolicy
    Class-map: class1 (match-all)
       500 packets, 125000 bytes
       5 minute offered rate 4000 bps, drop rate 0 bps
       Match: packet length min 100 max 300
       QoS Set
         qos-group 20
           Packets marked 500
```

The table below describes the significant fields shown in the display. A number in parentheses may appear next to the service-policy input name, class-map name, and match criteria information. The number is for Cisco internal use only and can be disregarded.

***Table 79: show policy-map interface Field Descriptions—Configured for Packet Classification Based on Layer 3 Packet Length.***

| Field | Description |
|---|---|
| Service-policy input | Name of the input service policy applied to the specified interface or VC. |
| Class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets, bytes | Number of packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of packets coming in to the class.<br>**Note**<br>If the packets are compressed over an outgoing interface, the improved packet rate achieved by packet compression is not reflected in the offered rate. Also, if the packets are classified *before* they enter a combination of tunnels (for example, a generic routing encapsulation (GRE) tunnel and an IP Security (IPSec) tunnel), the offered rate does not include all the extra overhead associated with tunnel encapsulation in general. Depending on the configuration, the offered rate may include no overhead, may include the overhead for only *one* tunnel encapsulation, or may include the overhead for *all* tunnel encapsulations. In most of the GRE and IPSec tunnel configurations, the offered rate includes the overhead for GRE tunnel encapsulation only. |
| drop rate | Rate, in kbps, at which packets are dropped from the class. The drop rate is calculated by subtracting the number of successfully transmitted packets from the offered rate. |

| Field | Description |
|---|---|
| Match | Match criteria specified for the class of traffic. Choices include criteria such as the Layer 3 packet length, IP precedence, IP DSCP value, MPLS experimental value, access groups, and QoS groups. |
| QoS Set, qos-group, Packets marked | Indicates that class-based packet marking based on the QoS group has been configured. Includes the qos-group number and the number of packets marked. |

### Enhanced Packet Marking: Example

The following sample output of the **show policy-map interface** command shows the service policies attached to a FastEthernet subinterface. In this example, a service policy called "policy1" has been attached. In "policy1", a table map called "table-map1" has been configured. The values in "table-map1" will be used to map the precedence values to the corresponding class of service (CoS) values.

```
Router# show policy-map interface

 FastEthernet1/0.1
  Service-policy input: policy1
    Class-map: class-default (match-any)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: any
      QoS Set
        precedence cos table table-map1
          Packets marked 0
```

The table below describes the fields shown in the display. A number in parentheses may appear next to the service-policy input name and the class-map name. The number is for Cisco internal use only and can be disregarded.

***Table 80: show policy-map interface Field Descriptions—Configured for Enhanced Packet Marking.***

| Field | Description |
|---|---|
| Service-policy input | Name of the input service policy applied to the specified interface or VC. |
| Class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets, bytes | Number of the packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of the packets coming into the class. |
| Match | Match criteria specified for the class of traffic. Choices include criteria such as Precedence, IP differentiated services code point (DSCP) value, Multiprotocol Label Switching (MPLS) experimental value, access groups, and quality of service (QoS) group (set). For more information about the variety of match criteria that are available, see the "Classifying Network Traffic" module in the *Quality of Service Solutions Configuration Guide*. |

| Field | Description |
|---|---|
| QoS Set | Indicates that QoS group (set) has been configured for the particular class. |
| precedence cos table table-map1 | Indicates that a table map (called “table-map1”) has been used to determine the precedence value. The precedence value will be set according to the CoS value defined in the table map. |
| Packets marked | Total number of packets marked for the particular class. |

### Traffic Policing: Example

The following is sample output from the **show policy-map interface** command. This sample displays the statistics for the serial 2/0 interface on which traffic policing has been enabled. The committed (conform) burst (bc) and excess (peak) burst (be) are specified in milliseconds (ms).

```
Router# show policy-map interface serial2/0

 Serial2/0
  Service-policy output: policy1 (1050)
    Class-map: class1 (match-all) (1051/1)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: ip precedence 0  (1052)
      police:
          cir 20 % bc 300 ms
          cir 409500 bps, bc 15360 bytes
          pir 40 % be 400 ms
          pir 819000 bps, be 40960 bytes
        conformed 0 packets, 0 bytes; actions:
          transmit
        exceeded 0 packets, 0 bytes; actions:
          drop
        violated 0 packets, 0 bytes; actions:
          drop
        conformed 0 bps, exceed 0 bps, violate 0 bps
    Class-map: class-default (match-any) (1054/0)
      0 packets, 0 bytes
      5 minute offered rate 0 bps, drop rate 0 bps
      Match: any  (1055)
        0 packets, 0 bytes
        5 minute rate 0 bps
```

In this example, the CIR and PIR are displayed in bps, and both the committed burst (bc) and excess burst (be) are displayed in bits.

The CIR, PIR bc, and be are calculated on the basis of the formulas described below.

### Formula for Calculating the CIR: Example

When calculating the CIR, the following formula is used:

- CIR percentage specified (as shown in the output from the **show policy-map** command) * bandwidth (BW) of the interface (as shown in the output from the**show interfaces** command) = total bits per second

According to the output from the **show interfaces** command for the serial 2/0 interface, the interface has a bandwidth (BW) of 2048 kbps.

```
Router# show interfaces serial2/0

Serial2/0 is administratively down, line protocol is down
  Hardware is M4T
  MTU 1500 bytes, BW 2048 Kbit, DLY 20000 usec, rely 255/255, load 1/255
```

The following values are used for calculating the CIR:

20 % * 2048 kbps = 409600 bps

### Formula for Calculating the PIR: Example

When calculating the PIR, the following formula is used:

- PIR percentage specified (as shown in the output from the **show policy-map** command) * bandwidth (BW) of the interface (as shown in the output from the**show interfaces** command) = total bits per second

According to the output from the **show interfaces** command for the serial 2/0 interface, the interface has a bandwidth (BW) of 2048 kbps.

```
Router# show interfaces serial2/0

Serial2/0 is administratively down, line protocol is down
  Hardware is M4T
  MTU 1500 bytes, BW 2048 Kbit, DLY 20000 usec, rely 255/255, load 1/255
```

The following values are used for calculating the PIR:

40 % * 2048 kbps = 819200 bps



**Note** Discrepancies between this total and the total shown in the output from the **show policy-map interface** command can be attributed to a rounding calculation or to differences associated with the specific interface configuration.

### Formula for Calculating the Committed Burst (bc): Example

When calculating the bc, the following formula is used:

- The bc in milliseconds (as shown in the **show policy-map** command) * the CIR in bits per seconds = total number bytes

The following values are used for calculating the bc:

300 ms * 409600 bps = 15360 bytes

### Formula for Calculating the Excess Burst (be): Example

When calculating the bc and the be, the following formula is used:

- The be in milliseconds (as shown in the **show policy-map** command) * the PIR in bits per seconds = total number bytes

The following values are used for calculating the be:

400 ms * 819200 bps = 40960 bytes

The table below describes the significant fields shown in the display.

***Table 81: show policy-map interface Field Descriptions***

| Field | Description |
|---|---|
| Service-policy output | Name of the output service policy applied to the specified interface or VC. |
| Class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets and bytes | Number of packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of packets coming in to the class. |
| drop rate | Rate, in kbps, at which packets are dropped from the class. The drop rate is calculated by subtracting the number of successfully transmitted packets from the offered rate. |
| Match | Match criteria specified for the class of traffic. Choices include criteria such as the Layer 3 packet length, IP precedence, IP differentiated services code point (DSCP) value, Multiprotocol Label Switching (MPLS) experimental value, access groups, and quality of service (QoS) groups. For more information about the variety of match criteria that are available, see the "Classifying Network Traffic" module in the *Quality of Service Solutions Configuration Guide* . |
| police | Indicates that traffic policing has been enabled. Display includes the CIR, PIR (in both a percentage of bandwidth and in bps) and the bc and be in bytes and milliseconds. Also displays the optional conform, exceed, and violate actions, if any, and the statistics associated with these optional actions. |

### Bandwidth Estimation: Example

The following sample output from the **show policy-map interface** command displays statistics for the Fast Ethernet 0/1 interface on which bandwidth estimates for quality of service (QoS) targets have been generated.

The Bandwidth Estimation section indicates that bandwidth estimates for QoS targets have been defined. These targets include the packet loss rate, the packet delay rate, and the timeframe in milliseconds. Confidence refers to the drop-one-in value (as a percentage) of the targets. Corvil Bandwidth means the bandwidth estimate in kilobits per second.

When no drop or delay targets are specified, “none specified, falling back to drop no more than one packet in 500” appears in the output.

```
Router# show policy-map interface FastEthernet0/1

 FastEthernet0/1
  Service-policy output: my-policy
    Class-map: icmp (match-all)
      199 packets, 22686 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match: access-group 101
      Bandwidth Estimation:
        Quality-of-Service targets:
          drop no more than one packet in 1000 (Packet loss < 0.10%)
          delay no more than one packet in 100 by 40 (or more) milliseconds
            (Confidence: 99.0000%)
        Corvil Bandwidth: 1 kbits/sec
    Class-map: class-default (match-any)
      112 packets, 14227 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match: any
      Bandwidth Estimation:
        Quality-of-Service targets:
          <none specified, falling back to drop no more than one packet in 500
        Corvil Bandwidth: 1 kbits/sec
```

### Shaping with HQF Enabled: Example

The following sample output from the **show policy-mapinterface** command shows that shaping is active (as seen in the queue depth field) with HQF enabled on the serial 4/3 interface. All traffic is classified to the class-default queue.



**Note** In HQF images for Cisco IOS Releases 12.4(20)T and later, the packets delayed and bytes delayed counters were removed for traffic shaping classes.

```
Router# show policy-map interface serial4/3

 Serial4/3
  Service-policy output: shape
    Class-map: class-default (match-any)
      2203 packets, 404709 bytes
      30 second offered rate 74000 bps, drop rate 14000 bps
      Match: any
      Queueing
      queue limit 64 packets
      (queue depth/total drops/no-buffer drops) 64/354/0
      (pkts output/bytes output) 1836/337280
      shape (average) cir 128000, bc 1000, be 1000
      target shape rate 128000
        lower bound cir 0,  adapt to fecn 0
      Service-policy : LLQ
        queue stats for all priority classes:

          queue limit 64 packets
          (queue depth/total drops/no-buffer drops) 0/0/0
          (pkts output/bytes output) 0/0
```

```
Class-map: c1 (match-all)
  0 packets, 0 bytes
  30 second offered rate 0 bps, drop rate 0 bps
  Match: ip precedence 1
  Priority: 32 kbps, burst bytes 1500, b/w exceed drops: 0
Class-map: class-default (match-any)
  2190 packets, 404540 bytes
  30 second offered rate 74000 bps, drop rate 14000 bps
  Match: any
  queue limit 64 packets
  (queue depth/total drops/no-buffer drops) 63/417/0
  (pkts output/bytes output) 2094/386300
```

### Packets Matched on the Basis of VLAN ID Number: Example

**Note** As of Cisco IOS Release 12.2(31)SB2, matching packets on the basis of VLAN ID numbers is supported on the Catalyst 1000 platform only.

The following is a sample configuration in which packets are matched and classified on the basis of the VLAN ID number. In this sample configuration, packets that match VLAN ID number 150 are placed in a class called “class1.”

```
Router# show class-map

Class Map match-all class1 (id 3)
Match vlan 150
```

Class1 is then configured as part of the policy map called “policy1.” The policy map is attached to Fast Ethernet subinterface 0/0.1.

The following sample output of the **show policy-map interface** command displays the packet statistics for the policy maps attached to Fast Ethernet subinterface 0/0.1. It displays the statistics for policy1, in which class1 has been configured.

```
Router# show policy-map interface

FastEthernet0/0.1
! Policy-map name.
Service-policy input: policy1
! Class configured in the policy map.
Class-map: class1 (match-all)
0 packets, 0 bytes
5 minute offered rate 0 bps, drop rate 0 bps
! VLAN ID 150 is the match criterion for the class.
Match: vlan 150
police:
cir 8000000 bps, bc 512000000 bytes
conformed 0 packets, 0 bytes; actions:
transmit
exceeded 0 packets, 0 bytes; actions:
drop
conformed 0 bps, exceed 0 bps
Class-map: class-default (match-any)
10 packets, 1140 bytes
5 minute offered rate 0 bps, drop rate 0 bps
Match: any
```

```
10 packets, 1140 bytes
5 minute rate 0 bps
```

The table below describes the significant fields shown in the display. A number in parentheses may appear next to the service-policy input name and the class-map name. The number is for Cisco internal use only and can be disregarded.

***Table 82: show policy-map interface Field Descriptions—Packets Matched on the Basis of VLAN ID Number.***

| Field | Description |
|---|---|
| Service-policy input | Name of the input service policy applied to the specified interface or VC. |
| Class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets, bytes | Number of the packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of the packets coming into the class. |
| Match | Match criteria specified for the class of traffic. Choices include criteria such as VLAN ID number, precedence, IP differentiated services code point (DSCP) value, Multiprotocol Label Switching (MPLS) experimental value, access groups, and quality of service (QoS) group (set). For more information about the variety of match criteria that are available, see the "Classifying Network Traffic" module in the *Cisco IOS Quality of Service Solutions Configuration Guide* . |

### Cisco 7600 Series Routers: Example

The following example shows how to display the statistics and the configurations of all the input and output policies that are attached to an interface on a Cisco 7600 series router:

```
Router# show policy-map interface

 FastEthernet5/36
  service-policy input: max-pol-ipp5
    class-map: ipp5 (match-all)
      0 packets, 0 bytes
      5 minute rate 0 bps
      match: ip precedence 5
  class ipp5
    police 2000000000 2000000 conform-action set-prec-transmit 6 exceed-action p
policed-dscp-transmit
```

The following example shows how to display the input-policy statistics and the configurations for a specific interface on a Cisco 7600 series router:

```
Router# show policy-map interface fastethernet 5/36 input

 FastEthernet5/36
  service-policy input: max-pol-ipp5
    class-map: ipp5 (match-all)
      0 packets, 0 bytes
      5 minute rate 0 bps
```

```
      match: ip precedence 5
  class ipp5
    police 2000000000 2000000 conform-action set-prec-transmit 6 exceed-action p
policed-dscp-transmit
```

The table below describes the significant fields shown in the display.

***Table 83: show policy-map interface Field Descriptions—Cisco 7600 Series Routers***

| Field | Description |
|---|---|
| service-policy input | Name of the input service policy applied to the specified interface. |
| class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets, bytes | Number of the packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| minute rate | Rate, in kbps, of the packets coming into the class. |
| match | Match criteria specified for the class of traffic. Choices include criteria such as VLAN ID number, precedence, IP differentiated services code point (DSCP) value, Multiprotocol Label Switching (MPLS) experimental value, access groups, and quality of service (QoS) group (set). For more information about the variety of match criteria that are available, see the "Classifying Network Traffic" module in the *Cisco IOS Quality of Service Solutions Configuration Guide* . |
| class | Precedence value. |
| police | Indicates that the **police** command has been configured to enable traffic policing. |

### Cisco 7200 Series Routers: Example

The following example shows the automatic rounding-off of the **bc** and **be** values, in the MQC police policy-map, to the interface's MTU size in a Cisco 7200 series router. The rounding-off is done only when the bc and be values are lesser than the interface's MTU size.

```
Router# show policy-map interface

Service-policy output: p2
Service-policy output: p2
    Class-map: class-default (match-any)
      2 packets, 106 bytes
      30 second offered rate 0000 bps, drop rate 0000 bps
      Match: any
        2 packets, 106 bytes
        30 second rate 0 bps
      police:
          cir 10000 bps, bc 4470 bytes
          pir 20000 bps, be 4470 bytes
        conformed 0 packets, 0 bytes; actions:
          transmit
        exceeded 0 packets, 0 bytes; actions:
          drop
```

```
        violated 0 packets, 0 bytes; actions:
          drop
        conformed 0000 bps, exceed 0000 bps, violate 0000 bps
```

### Multiple Priority Queues on Serial Interface: Example

The following sample output from the show policy-map interface command shows the types of statistical information that displays when multiple priority queues are configured. Depending upon the interface in use and the options enabled, the output that you see may vary slightly from the output shown below.

```
Router# show policy-map interface

Serial2/1/0
Service-policy output: P1
Queue statistics for all priority classes:
.
.
.
Class-map: Gold (match-all)
0 packets, 0 bytes   /*Updated for each priority level configured.*/
5 minute offered rate 0 bps, drop rate 0 bps
Match: ip precedence 2
Priority: 0 kbps, burst bytes 1500, b/w exceed drops: 0
Priority Level 4:
0 packets, 0 bytes
```

### Bandwidth-Remaining Ratios: Example

The following sample output from the show policy-map interface command indicates that bandwidth-remaining ratios are configured for class queues. As shown in the example, the classes precedence_0, precedence_1, and precedence_2 have bandwidth-remaining ratios of 20, 40, and 60, respectively.

```
Router# show policy-map interface GigabitEthernet1/0/0.10

  Service-policy output: vlan10_policy
    Class-map: class-default (match-any)
      0 packets, 0 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match: any
        0 packets, 0 bytes
        30 second rate 0 bps
      Queueing
      queue limit 250 packets
      (queue depth/total drops/no-buffer drops) 0/0/0
      (pkts output/bytes output) 0/0
      shape (average) cir 1000000, bc 4000, be 4000
      target shape rate 1000000
      bandwidth remaining ratio 10
      Service-policy : child_policy
        Class-map: precedence_0 (match-all)
          0 packets, 0 bytes
          30 second offered rate 0 bps, drop rate 0 bps
          Match: ip precedence 0
          Queueing
          queue limit 62 packets
```

```
  (queue depth/total drops/no-buffer drops) 0/0/0
  (pkts output/bytes output) 0/0
  shape (average) cir 500000, bc 2000, be 2000
  target shape rate 500000
  bandwidth remaining ratio 20
Class-map: precedence_1 (match-all)
  0 packets, 0 bytes
  30 second offered rate 0 bps, drop rate 0 bps
  Match: ip precedence 1
  Queueing
  queue limit 62 packets
  (queue depth/total drops/no-buffer drops) 0/0/0
  (pkts output/bytes output) 0/0
  shape (average) cir 500000, bc 2000, be 2000
  target shape rate 500000
  bandwidth remaining ratio 40
Class-map: precedence_2 (match-all)
  0 packets, 0 bytes
  30 second offered rate 0 bps, drop rate 0 bps
  Match: ip precedence 2
  Queueing
  queue limit 62 packets
  (queue depth/total drops/no-buffer drops) 0/0/0
  (pkts output/bytes output) 0/0
  shape (average) cir 500000, bc 2000, be 2000
  target shape rate 500000
  bandwidth remaining ratio 60
Class-map: class-default (match-any)
  0 packets, 0 bytes
  30 second offered rate 0 bps, drop rate 0 bps
  Match: any
    0 packets, 0 bytes
    30 second rate 0 bps

  queue limit 62 packets
  (queue depth/total drops/no-buffer drops) 0/0/0
  (pkts output/bytes output) 0/0
```

The table below describes the significant fields shown in the display.

***Table 84: show policy-map interface Field Descriptions—Configured for Bandwidth-Remaining Ratios***

| Field | Description |
|---|---|
| Service-policy output | Name of the output service policy applied to the specified interface. |
| Class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets, bytes | Number of the packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| bandwidth remaining ratio | Indicates the ratio used to allocate excess bandwidth. |

### Tunnel Marking: Example

In this sample output of the **show policy-map interface** command, the character string "ip dscp tunnel 3" indicates that L2TPv3 tunnel marking has been configured to set the DSCP value to 3 in the header of a tunneled packet.

```
Router# show policy-map interface

 Serial0
  Service-policy input: tunnel
    Class-map: frde (match-all)
      0 packets, 0 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match: fr-de
      QoS Set
        ip dscp tunnel 3
          Packets marked 0
    Class-map: class-default (match-any)
      13736 packets, 1714682 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match: any
        13736 packets, 1714682 bytes
        30 second rate 0 bps
```

The table below describes the significant fields shown in the display.

***Table 85: show policy-map interface Field Descriptions—Configured for Tunnel Marking***

| Field | Description |
|---|---|
| service-policy input | Name of the input service policy applied to the specified interface. |
| class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets, bytes | Number of the packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of packets coming in to the class. |
| drop rate | Rate, in kbps, at which packets are dropped from the class. The drop rate is calculated by subtracting the number of successfully transmitted packets from the offered rate. |
| match | Match criteria specified for the class of traffic. In this example, the Frame Relay Discard Eligible (DE) bit has been specified as the match criterion.<br>For more information about the variety of match criteria that are available, see the "Classifying Network Traffic" module in the *Cisco IOS Quality of Service Solutions Configuration Guide*. |
| ip dscp tunnel | Indicates that tunnel marking has been configured to set the DSCP in the header of a tunneled packet to a value of 3. |

### Traffic Shaping Overhead Accounting for ATM: Example

The following output from the show policy-map interface command indicates that ATM overhead accounting is enabled for shaping and disabled for bandwidth:

```
Router# show policy-map interface

Service-policy output:unit-test
Class-map: class-default (match-any)
100 packets, 1000 bytes
30 second offered rate 800 bps, drop rate 0 bps
Match: any
shape (average) cir 154400, bc 7720, be 7720
target shape rate 154400
overhead accounting: enabled
bandwidth 30% (463 kbps)
overhead accounting: disabled
queue limit 64 packets
(queue depth/total drops/no-buffer drops) 0/0/0
(packets output/bytes output) 100/1000
```

The table below describes the significant fields shown in the display.

***Table 86: show policy-map interface Field Descriptions—Configured for Traffic Shaping Overhead Accounting for ATM***

| Field | Description |
|---|---|
| service-policy output | Name of the output service policy applied to the specified interface. |
| class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets, bytes | Number of the packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of packets coming in to the class. |
| drop rate | Rate, in kbps, at which packets are dropped from the class. The drop rate is calculated by subtracting the number of successfully transmitted packets from the offered rate. |
| match | Match criteria specified for the class of traffic. In this example, the Frame Relay Discard Eligible (DE) bit has been specified as the match criterion.<br>For more information about the variety of match criteria that are available, see the "Classifying Network Traffic" module in the *Cisco IOS Quality of Service Solutions Configuration Guide*. |
| target shape rate | Indicates that traffic shaping is enabled at the specified rate. |
| overhead accounting | Indicates whether overhead accounting is enabled or disabled for traffic shaping. |
| bandwidth | Indicates the percentage of bandwidth allocated for traffic queueing. |
| overhead accounting: | Indicates whether overhead accounting is enabled or disabled for traffic queueing. |

### HQF: Example

The following output from the show policy-map interface command displays the configuration for Fast Ethernet interface 0/0:



**Note** In HQF images for Cisco IOS Releases 12.4(20)T and later releases, the packets delayed and bytes delayed counters were removed for traffic shaping classes.

```
Router# show policy-map interface FastEthernet0/0
 FastEthernet0/0

  Service-policy output: test1

    Class-map: class-default (match-any)
      129 packets, 12562 bytes
      30 second offered rate 0 bps, drop rate 0 bps
      Match: any
      Queueing
      queue limit 64 packets
      (queue depth/total drops/no-buffer drops) 0/0/0
      (pkts output/bytes output) 129/12562
      shape (average) cir 1536000, bc 6144, be 6144
      target shape rate 1536000

      Service-policy : test2

        queue stats for all priority classes:

          queue limit 64 packets
          (queue depth/total drops/no-buffer drops) 0/0/0
          (pkts output/bytes output) 0/0

        Class-map: RT (match-all)
          0 packets, 0 bytes
          30 second offered rate 0 bps, drop rate 0 bps
          Match: ip dscp ef (46)
          Priority: 20% (307 kbps), burst bytes 7650, b/w exceed drops: 0


        Class-map: BH (match-all)
          0 packets, 0 bytes
          30 second offered rate 0 bps, drop rate 0 bps
          Match: ip dscp af41 (34)
          Queueing
          queue limit 128 packets
          (queue depth/total drops/no-buffer drops) 0/0/0
          (pkts output/bytes output) 0/0
          bandwidth 40% (614 kbps)

        Class-map: BL (match-all)
          0 packets, 0 bytes
          30 second offered rate 0 bps, drop rate 0 bps
          Match: ip dscp af21 (18)
          Queueing
          queue limit 64 packets
          (queue depth/total drops/no-buffer drops) 0/0/0
          (pkts output/bytes output) 0/0
          bandwidth 35% (537 kbps)
```

```
    Exp-weight-constant: 9 (1/512)
    Mean queue depth: 0 packets
    dscp     Transmitted   Random drop   Tail drop   Minimum   Maximum   Mark
             pkts/bytes    pkts/bytes    pkts/bytes  thresh    thresh    prob

    af21     0/0           0/0           0/0         100       400       1/10

Class-map: class-default (match-any)
  129 packets, 12562 bytes
  30 second offered rate 0 bps, drop rate 0 bps
  Match: any

  queue limit 64 packets
  (queue depth/total drops/no-buffer drops) 0/0/0
  (pkts output/bytes output) 129/12562
```

The table below describes the significant fields shown in the display.

***Table 87: show policy-map interface Field Descriptions—Configured for HQF***

| Field | Description |
|---|---|
| FastEthernet | Name of the interface. |
| service-policy output | Name of the output service policy applied to the specified interface. |
| class-map | Class of traffic being displayed. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| packets, bytes | Number of the packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| offered rate | Rate, in kbps, of packets coming in to the class. |
| drop rate | Rate, in kbps, at which packets are dropped from the class. The drop rate is calculated by subtracting the number of successfully transmitted packets from the offered rate. |
| Match | Match criteria specified for the class of traffic.<br>**Note**<br>For more information about the variety of match criteria that are available, see the "Classifying Network Traffic" module in the *Cisco IOS Quality of Service Solutions Configuration Guide*. |
| Queueing | Indicates that queueing is enabled. |
| queue limit | Maximum number of packets that a queue can hold for a class policy configured in a policy map. |
| bandwidth | Indicates the percentage of bandwidth allocated for traffic queueing. |

| Field | Description |
|---|---|
| dscp | Differentiated services code point (DSCP). Values can be the following:<br>• 0 to 63—Numerical DSCP values. The default value is 0.<br>• af1 to af43—Assured forwarding (AF) DSCP values.<br>• cs1 to cs7—Type of service (ToS) precedence values.<br>• default—Default DSCP value.<br>• ef—Expedited forwarding (EF) DSCP values. |

### Account QoS Statistics for the Cisco ASR 1000 Series Aggregation Services Routers: Example

The following example shows the new output fields associated with the QoS: Policies Aggregation Enhancements feature beginning in Cisco IOS XE Release 2.6 for subscriber statistics. The new output fields begin with the label "Account QoS Statistics."

```
Router# show policy-map interface port-channel 1.1

Port-channel1.1
   Service-policy input: input_policy
     Class-map: class-default (match-any)
       0 packets, 0 bytes
       5 minute offered rate 0000 bps, drop rate 0000 bps
       Match: any
       QoS Set
       dscp default
       No packet marking statistics available
   Service-policy output: Port-channel_1_subscriber
     Class-map: EF (match-any)
       105233 packets, 6734912 bytes
       5 minute offered rate 134000 bps, drop rate 0000 bps
       Match: dscp ef (46)
       Match: access-group name VLAN_REMARK_EF
       Match: qos-group 3
       Account QoS statistics
         Queueing
           Packets dropped 0 packets/0 bytes
       QoS Set
       cos 5
       No packet marking statistics available
       dscp ef
       No packet marking statistics available
     Class-map: AF4 (match-all)
       105234 packets, 6734976 bytes
       5 minute offered rate 134000 bps, drop rate 0000 bps
       Match: dscp cs4 (32)
       Account QoS statistics
         Queueing
           Packets dropped 0 packets/0 bytes
       QoS Set
       cos 4
       No packet marking statistics available
     Class-map: AF1 (match-any)
       315690 packets, 20204160 bytes
       5 minute offered rate 402000 bps, drop rate 0000 bps
```

```
    Match: dscp cs1 (8)
    Match: dscp af11 (10)
    Match: dscp af12 (12)
    Account QoS statistics
      Queueing
        Packets dropped 0 packets/0 bytes
    QoS Set
    cos 1
    No packet marking statistics available
  Class-map: class-default (match-any) fragment Port-channel_BE
    315677 packets, 20203328 bytes
    5 minute offered rate 402000 bps, drop rate 0000 bps
    Match: any
    Queueing
      queue limit 31250 bytes
      (queue depth/total drops/no-buffer drops) 0/0/0
      (pkts output/bytes output) 315679/20203482
      bandwidth remaining ratio 1
```

### Cisco Catalyst 4000 Series Routers: Example

The following example shows how to display the policer statistics (the packet and byte count). The output displays only the applicable count (either packets or bytes) with the actual number.

```
Router# show policy-map interface GigabitEthernet 3/1 input

GigabitEthernet3/1
  Service-policy input: in1
    Class-map: p1 (match-all)
      0 packets
      Match:  precedence 1
           QoS Set
             ip precedence 7
      police:
          cir 20 %
          cir 200000000 bps, bc 6250000 bytes
        conformed 0 bytes; actions:
          transmit
        exceeded 0 bytes; actions:
          drop
        conformed 0000 bps, exceed 0000 bps
    Class-map: class-default (match-any)
      10000000 packets
      Match: any
      police:
          cir 20 %
          cir 200000000 bps, bc 6250000 bytes
        conformed 174304448 bytes; actions:
          transmit
        exceeded 465695552 bytes; actions:
          drop
        conformed 4287000 bps, exceed 11492000 bps
```

### Cisco CMTS Routers: Example

The following example shows how to display the statistics and the configurations of the input and output service policies that are attached to an interface:

```
Router# show policy-map interface GigabitEthernet 1/2/0

Load for five secs: 1%/0%; one minute: 1%; five minutes: 1%
Time source is hardware calendar, *23:02:40.857 pst Thu Mar 3 2011

 GigabitEthernet1/2/0

  Service-policy input: policy-in

    Class-map: class-exp-0 (match-all)
      6647740 packets, 9304674796 bytes
      30 second offered rate 3234000 bps, drop rate 0 bps
      Match: mpls experimental topmost 0
      QoS Set
        precedence 3
          Packets marked 6647740

    Class-map: class-default (match-any)
      1386487 packets, 1903797872 bytes
      30 second offered rate 658000 bps, drop rate 0 bps
      Match: any

  Service-policy output: policy-out

    Class-map: class-pre-1 (match-all)
      2041355 packets, 2857897000 bytes
      30 second offered rate 986000 bps, drop rate 0 bps

      Match: ip precedence 1
      QoS Set
        mpls experimental topmost 1
          Packets marked 2041355

    Class-map: class-default (match-any)
      6129975 packets, 8575183331 bytes
      30 second offered rate 2960000 bps, drop rate 0 bps
      Match: any
```

The table below describes the significant fields shown in the display.

***Table 88: show policy-map interface Field Descriptions—Cisco Catalyst 4000 Series Routers***

| Field | Description |
|---|---|
| class-map | Displays the class of traffic. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| conformed | Displays the action to be taken on packets conforming to a specified rate. Also displays the number of packets and bytes on which the action was taken. |
| drop | Indicates that the packet discarding action for all the packets belonging to the specified class has been configured. |
| exceeded | Displays the action to be taken on packets exceeding a specified rate. Displays the number of packets and bytes on which the action was taken. |
| match | Match criteria specified for the class of traffic. |

| Field | Description |
|---|---|
| packets, bytes | Number of the packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| police | Indicates that the **police** command has been configured to enable traffic policing. Also displays the specified CIR, conform burst size, peak information rate (PIR), and peak burst size used for marking packets. |
| QoS Set | Indicates that QoS group (set) has been configured for the particular class. |
| service-policy input | Name of the input service policy applied to the specified interface. |

### Displaying Pseudowire Policy Map Information: Example

The following example shows how to display the class maps configured for a pseudowire interface:

```
Router# show policy-map interface pseudowire2
 pseudowire2
  Service-policy output: pw_brr

    Class-map: prec1 (match-all)
      0 packets, 0 bytes
      30 second offered rate 0000 bps, drop rate 0000 bps
      Match: ip precedence 1
      Queueing
      queue limit 4166 packets
      (queue depth/total drops/no-buffer drops) 0/0/0
      (pkts output/bytes output) 0/0
      bandwidth remaining ratio 1

    Class-map: prec2 (match-all)
      0 packets, 0 bytes
      30 second offered rate 0000 bps, drop rate 0000 bps
      Match: ip precedence 2
      Queueing
      queue limit 4166 packets
      (queue depth/total drops/no-buffer drops) 0/0/0
      (pkts output/bytes output) 0/0
      bandwidth remaining ratio 2

    Class-map: prec3 (match-all)
      0 packets, 0 bytes
      30 second offered rate 0000 bps, drop rate 0000 bps
      Match: ip precedence 3
      Queueing
      queue limit 4166 packets
      (queue depth/total drops/no-buffer drops) 0/0/0
      (pkts output/bytes output) 0/0
      bandwidth remaining ratio 3

    Class-map: class-default (match-any)
      0 packets, 0 bytes
      30 second offered rate 0000 bps, drop rate 0000 bps
      Match: any
      Queueing
      queue limit 4166 packets
      (queue depth/total drops/no-buffer drops) 0/0/0
      (pkts output/bytes output) 0/0
```

```
      bandwidth remaining ratio 4
Device#
```

The table below describes the significant fields shown in the display.

***Table 89: show policy-map interface Field Descriptions—Pseudowire Policy Map Information***

| Field | Description |
|---|---|
| bandwidth | Indicates the percentage of bandwidth allocated for traffic queueing. |
| Class-map | Displays the class of traffic. Output is displayed for each configured class in the policy. The choice for implementing class matches (for example, match-all or match-any) can also appear next to the traffic class. |
| Match | Match criteria specified for the class of traffic. |
| packets, bytes | Number of the packets (also shown in bytes) identified as belonging to the class of traffic being displayed. |
| Queueing | Indicates that queueing is enabled. |
| queue limit | Maximum number of packets that a queue can hold for a class policy configured in a policy map. |
| service-policy output | Name of the output service policy applied to the specified interface. |

## Related Commands

| Command | Description |
|---|---|
| **bandwidth remaining ratio** | Specifies a bandwidth-remaining ratio for class queues and subinterface-level queues to determine the amount of unused (excess) bandwidth to allocate to the queue during congestion. |
| **class-map** | Creates a class map to be used for matching packets to a specified class. |
| **compression header ip** | Configures RTP or TCP IP header compression for a specific class. |
| **drop** | Configures a traffic class to discard packets belonging to a specific class. |
| **match fr-dlci** | Specifies the Frame Relay DLCI number as a match criterion in a class map. |
| **match packet length (class-map)** | Specifies the length of the Layer 3 packet in the IP header as a match criterion in a class map. |
| **police** | Configures traffic policing. |
| **police (percent)** | Configures traffic policing on the basis of a percentage of bandwidth available on an interface. |
| **police (two rates)** | Configures traffic policing using two rates, the CIR and the PIR. |
| **policy-map** | Creates or modifies a policy map that can be attached to one or more interfaces to specify a service policy. |

| Command | Description |
|---|---|
| **priority** | Specifies that low-latency behavior must be given to a traffic class and configures multiple priority queues. |
| **random-detect ecn** | Enables ECN. |
| **shape (percent)** | Specifies average or peak rate traffic shaping on the basis of a percentage of bandwidth available on an interface. |
| **show class-map** | Display all class maps and their matching criteria. |
| **show frame-relay pvc** | Displays statistics about PVCs for Frame Relay interfaces. |
| **show interfaces** | Displays statistics for all interfaces configured on a router or access server. |
| **show mls qos** | Displays MLS QoS information. |
| **show policy-map** | Displays the configuration of all classes for a specified service policy map or all classes for all existing policy maps. |
| **show policy-map class** | Displays the configuration for the specified class of the specified policy map. |
| **show table-map** | Displays the configuration of a specified table map or of all table maps. |
| **table-map (value mapping)** | Creates and configures a mapping table for mapping and converting one packet-marking value to another. |

# show power

To display information about the power status, use the **show power**command in user EXEC or privileged EXEC mode**.**

**show power** [ **available** | **inline** [ *interface number* | **module number** ] | **redundancy-mode** | **status** { **all** | **fan-tray** *fan-tray-number* | **module** *slot* | **power-supply** *pwr-supply-number* } | **total** | **used** | **details** | **history** ]

## Syntax Description

| | |
|---|---|
| **available** | (Optional) Displays the available system power (margin). |
| **inline** | (Optional) Displays the inline power status. |
| *interface number* | (Optional) Specifies the interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, **tengigabitethernet**, **null**, **port-channel**, and **vlan**. See the "Usage Guidelines" section for additional information. |
| **module number** | Displays the power status for a specific module. |
| **redundancy-mode** | (Optional) Displays the power-supply redundancy mode. |
| **status** | (Optional) Displays the power status. |
| **all** | Displays all the FRU types. |
| **fan-tray** *fan-tray-number* | Displays the power status for the fan tray . |
| **module** *slo* t | Displays the power status for a specific module. |
| **power-supply** *pwr-supply-number* | Displays the power status for a specific power supply; valid values are **1** and **2** |
| **total** | (Optional) Displays the total power that is available from the power supplies. |
| **used** | (Optional) Displays the total power that is budgeted for powered-on items. |
| **details** | (Optional) Displays the power consumption details for each component. |
| **history** | (Optional) Displays the power consumption history for the device. |

## Command Default

This command has no default settings.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17a)SX1 | The output was changed to include the total system-power information. |

| Release | Modification |
|---|---|
| 12.2(17b)SXA | This command was changed to include information about the inline power status for a specific module. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(18)SXF | The output was changed to include information about the high-capacity power supplies. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| Cisco IOS XE 17.16.1a | The keywords **usage** and **detail** were introduced for the following platforms:<br>• Cisco Catalyst 8200 Series Edge Platforms<br>• Cisco Catalyst 8300 Series Edge Platforms<br>• Cisco Catalyst 8500 and 8500L Series Edge Platforms |

## Usage Guidelines

The *interface-number* argument designates the module and port number. Valid values for *interface-number* depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48.

Valid values for *vlan-id* are from 1 to 4094.

The Inline power field in the **show power**output displays the inline power that is consumed by the modules. For example, this example shows that module 9 has consumed 0.300 A of inline power:

```
Inline power   #    current
module         9    0.300A
```

## Examples

This example shows how to display the available system power:

```
Router>
show power
available
system power available = 20.470A
Router>
```

This example shows how to display power-supply redundancy mode:

```
Router#
show power
redundancy-mode
system power redundancy mode = redundant
Router#
```

This command shows how to display the system-power status:

```
Router> show power
system power redundancy mode = combined
system power total =     3984.12 Watts (94.86 Amps @ 42V)
system power used =      1104.18 Watts (26.29 Amps @ 42V)
system power available = 2879.94 Watts (68.57 Amps @ 42V)
                         Power-Capacity PS-Fan Output Oper
PS   Type                Watts   A @42V Status Status State
---- ------------------ ------- ------ ------ ------ -----
1    WS-CAC-3000W       2830.80 67.40  OK     OK     on
2    WS-CAC-1300W       1153.32 27.46  OK     OK     on
Note: PS2 capacity is limited to 2940.00 Watts (70.00 Amps @ 42V)
      when PS1 is not present
                         Pwr-Allocated  Oper
Fan  Type                Watts   A @42V State
---- ------------------ ------- ------ -----
1    FAN-MOD-9           241.50  5.75  OK
2                        241.50  5.75  failed
                         Pwr-Requested  Pwr-Allocated  Admin Oper
Slot Card-Type           Watts   A @42V Watts   A @42V State State
---- ------------------ ------- ------ ------- ------ ----- -----
1    WS-X6K-SUP2-2GE     145.32  3.46   145.32  3.46  on    on
2                          -     -      145.32  3.46  -     -
3    WS-X6516-GBIC       118.02  2.81   118.02  2.81  on    on
5    WS-C6500-SFM        117.18  2.79   117.18  2.79  on    on
7    WS-X6516A-GBIC      214.20  5.10     -     -     on    off (insuff cooling capacity)
8    WS-X6516-GE-TX      178.50  4.25   178.50  4.25  on    on
9    WS-X6816-GBIC       733.98 17.48     -     -     on    off (connector rating exceeded)
Router>
```

This example shows how to display the power status for all FRU types:

```
Router#
show power
status all
FRU-type       #    current   admin state oper
power-supply   1    27.460A   on          on
module         1    4.300A    on          on
module         2    4.300A    -           -   (reserved)
module         5    2.690A    on          on
Router#
```

This example shows how to display the power status for a specific module:

```
Router#
show power
status module 1
FRU-type       #    current   admin state oper
module         1    -4.300A   on          on
Router#
```

This example shows how to display the power status for a specific power supply:

```
Router#
show power
status power-supply 1
FRU-type       #    current   admin state oper
power-supply   1    27.460A   on          on
Router#
```

This example displays information about the high-capacity power supplies:

```
Router#
show power
status power-supply 2
                        Power-Capacity PS-Fan Output Oper
PS   Type               Watts   A @42V Status Status State
---- ------------------ ------- ------ ------ ------ -----
1    WS-CAC-6000W       2672.04  63.62 OK     OK     on
2    WS-CAC-9000W-E     2773.68  66.04 OK     OK     on
Router#
```

This example shows how to display the total power that is available from the power supplies:

```
Router#
show power
total
system power total = 27.460A
Router#
```

This example shows how to display the total power that is budgeted for powered-on items:

```
Router#
show power
used
system power used = -6.990A
Router#
```

This command shows how to display the inline power status on the interfaces:

```
Router#
show power
inline
Interface            Admin    Oper    Power ( mWatt )  Device
-------------------- ----- ---------- --------------- -----------
FastEthernet9/1      auto  on         6300            Cisco 6500 IP Phone
FastEthernet9/2      auto  on         6300            Cisco 6500 IP Phone
.
.
. <Output truncated>
```

This command shows how to display the inline power status for a specific module:

```
Router
# show power
inline mod 7

Interface  Admin    Oper    Power       Device        Class
                            (Watts)
---------- ----- ---------- ------- --------------  -----------
Gi7/1      auto   on            6.3  Cisco IP Phone 7960  n/a
Gi7/2      static power-deny      0  Ieee PD              3
.
.
. <Output truncated>
```

This example shows how to display power usage details:

```
Router# show power detail

Component Power:
 Slot        Type                Instant   Peak      Budget    Unit      Direction
 --------    ------------------  --------  --------  --------  --------  --------
```

```
 P0          PWR-CC1-650WAC        143       152       142       Watts     Input
 P0          PWR-CC1-650WAC        129       136       126       Watts     Output
 P1          PWR-CC1-1000WAC       22        26        19        Watts     Input
 P1          PWR-CC1-1000WAC       3         4         3         Watts     Output
 P2          C8300-FAN-2R          7         12        7         Watts
 POE0        PWR-CC1-MOD-POE       75        80        75        Watts     Input
 POE1        PWR-POE-4450          96        96        96        Watts     Input
 0/1         NIM-ES2-8-P           4         4         4         Watts
 0/2         NIMX-M-1TE-SFP        5         5         5         Watts
 R0          C8300-2N2S-4T2X       43        49        39        Watts

System Power:

Instant   Peak      Budget    Unit
 --------  --------  --------  --------
 165       176       162       Watts


System Energy:
 Meter Reset Time          Meter Update Time         System Energy in WattSec
 ------------------------  ------------------------  ------------------------------
 2024-08-22 23:13:12 UTC   2024-08-23 21:58:12 UTC   13665000

Metered System Energy:

 Meter Update              Hourly Metered    Metered Energy in WattSec (5min Buckets)

 Time                      Value (WattSec)
 ------------------------  ----------------
-------------------------------------------------------------------------
 2024-08-23 21:58:12 UTC   602100
49800-50100-50100-50100-50100-50400-50400-50700-50100-50100-50100-50100
```

This example shows how to display power usage history:

```
Router# show power history


      1111111111111111111111111111111111111111111111111111111111111111
      7666666666666666666666677676666667666766666666666676666666676
      2686687798778797667978712707787882878188678868786617657986 27
  200
  190
  180
  170 ************************************************************
  160 ************************************************************
  150 ************************************************************
  140 ************************************************************
  130 ************************************************************
  120 ************************************************************
  110 ************************************************************
  100 ************************************************************
   90 ************************************************************
   80 ************************************************************
   70 ************************************************************
   60 ************************************************************
   50 ************************************************************
   40 ************************************************************
   30 ************************************************************
   20 ************************************************************
   10 ************************************************************
     0....5....1....1....2....2....3....3....4....4....5....5....6
               0    5    0    5    0    5    0    5    0    5    0
         Power(Watts) per minute (last 60 minutes)
         * = maximum Power(Watts) # = average Power(Watts)
```

```
11111111111111
      77777777777777
      21121232110214
  200
  190
  180
  170 ###############
  160 ###############
  150 ###############
  140 ###############
  130 ###############
  120 ###############
  110 ###############
  100 ###############
   90 ###############
   80 ###############
   70 ###############
   60 ###############
   50 ###############
   40 ###############
   30 ###############
   20 ###############
   10 ###############
     0....5....1....1....2....2....3....3....4....4....5....5....6....6....7..
               0    5    0    5    0    5    0    5    0    5    0    5    0
          Power(Watts) per hour (last 72 hours)
          * = maximum Power(Watts) # = average Power(Watts)
```

## Related Commands

| Command | Description |
|---|---|
| **power enable** | Turns on power for the modules. |
| **power redundancy-mode** | Sets the power-supply redundancy mode. |

# show power inline

To display the power status for a specified port or for all ports, use the **show power inline** command in privileged EXEC mode.

**show power inline** [*interface-type slot/port*] [**actual** | **configured**]

## Syntax Description

| | |
|---|---|
| *interface* -type | (Optional) Type of interface. |
| *slot* | (Optional) Slot number. |
| / *port* | (Optional) Port number. |
| **actual** | (Optional) Displays the present power status, which might not be the same as the configured power. |
| **configured** | (Optional) Displays the configured power status. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.0(5)XU | This command was introduced. |
| 12.2(2)XT | This command was introduced on the Cisco 2600 series, the Cisco 3600 series, and the Cisco 3700 series routers to support switchport creation. |
| 12.2(8)T | This command was integrated into Cisco IOS Release 12.2(8)T to support switchport creation on Cisco 2600 series, the Cisco 3600 series, and Cisco 3700 series routers. |
| 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |
| Cisco IOS XE 3.9S | This command was integrated into Cisco IOS Release XE 3.9S. |

## Usage Guidelines

The **show power inline** command displays the amount of power used to operate a Cisco IP phone. To view the amount of power requested, use the **show cdp neighbors** command.

Use the **show power inline** *gigabitEthernet* **detail** command on a Cisco 4400 Series Integrated Services Router (ISR) to monitor the total available power budget on your router.

## Examples

The following is sample output from the **show power inlinefa0/4actual** command asking for the actual status of each interface rather than what is configured for each:

```
Router#
show power inline fastethernet 0/4 actual
Interface              Power
---------------------- -----
FastEthernet0/4        no
```

Notice that the status shown for the FastEthernet interface 0/4, there is no power.

### Cisco 4400 Series Integrated Services Router (ISR): Example

The following are sample outputs from the **show power inline** command and the **show power inline** *gigabitEthernet* **detail** commands

```
 Router# show power inline

Available:31.0(w)  Used:30.8(w)  Remaining:0.2(w)

Interface Admin  Oper       Power   Device              Class Max
                            (Watts)
--------- ------ ---------- ------- ------------------- ----- ----
Gi0/0/0   auto   on         15.4    Ieee PD             4     30.0
Gi0/0/1   auto   on         15.4    Ieee PD             4     30.0


Router# show power inline gigabitEthernet 0/0/0 detail
Interface: Gi0/0/0
 Inline Power Mode: auto
 Operational status: on
 Device Detected: yes
 Device Type: Ieee PD
 IEEE Class: 4
 Discovery mechanism used/configured: Ieee
 Police: off

 Power Allocated
 Admin Value: 30.0
 Power drawn from the source: 15.4
 Power available to the device: 15.4

 Absent Counter: 0
 Over Current Counter: 0
 Short Current Counter: 0
 Invalid Signature Counter: 0
 Power Denied Counter: 0
```

## Related Commands

| Command | Description |
|---|---|
| **power inline** | Determines how inline power is applied to devices on the specified Fast Ethernet port. |
| **show cdp neighbors** | Displays detailed information about neighboring devices discovered using CDP. |

# show proc cpu platform

To display detailed CPU usage statistics for platform processes in relation to the Control Processor (CP), Service Processor (SP), or Data Processor (DP), use the **show proc cpu platform** command. This command now includes filtering options based on CP, SP, or DP, and can be sorted by time duration (1min, 5min, 5sec) to provide more specific output.

**show process cpu platform** [ **control-plane** | **data-plane** | **service-plane** ]

## Syntax Description

| | |
|---|---|
| **proc** | Specifies process. |
| **cpu** | Specifies CPU. |
| **platform** | Specifies platform. |
| **control-plane** | (Optional) Specifies the control plane of the router. The control plane is responsible for routing operations and other control functions. |
| **data-plane** | (Optional) Specifies the data plane of the router. The data plane is responsible for processing and forwarding data packets. |
| **service-plane** | (Optional) Specifies the service plane of the router. The service plane handles services such as management and configuration interfaces. |

## Command Default

There is no default.

## Command Modes

User EXEC (>) Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE 17.13.1a | The command was updated to include CP, SP, DP filters in the CLI. When these filters are specified by the user, the output is specific to the respective plane. |

## Usage Guidelines

The **show process cpu platform** command can provide detailed information on a core-by-core basis. This can be useful for getting a detailed view of your system's operation, but it might not always provide a clear picture of the overall system health.

For information about the overall system health, the recommended command is **show platform resources.**

The following example shows the detailed CPU usage statistics for platform processes related to the Control Processor

```
Router#show proc cpu plat sort
CPU utilization for five seconds:  8%, one minute:  7%, five minutes: 10%
Core 0: CPU utilization for five seconds: 12%, one minute:  4%, five minutes: 10%
Core 1: CPU utilization for five seconds: 12%, one minute:  3%, five minutes:  9%
Core 2: CPU utilization for five seconds:  0%, one minute:  0%, five minutes:  3%
Core 3: CPU utilization for five seconds:  0%, one minute:  0%, five minutes:  7%
Core 4: CPU utilization for five seconds:  0%, one minute:  0%, five minutes:  7%
Core 5: CPU utilization for five seconds:  0%, one minute:  0%, five minutes:  5%
Core 6: CPU utilization for five seconds: 10%, one minute:  6%, five minutes:  5%
```

```
Core 7: CPU utilization for five seconds:  6%, one minute:  3%, five minutes:  6%
Core 8: CPU utilization for five seconds: 28%, one minute: 15%, five minutes:  9%
Pid    PPid    5Sec    1Min    5Min  Status        Size  Name
------------------------------------------------------------------------------
 17295   17288    166%    162%    116%  S           862100  ucode_pkt_PPE0
  8731    8722      3%      2%      8%  S           871892  linux_iosd-imag
 22924   22918      1%      0%      3%  S            14280  ngiolite
 17198   17187      1%      1%      1%  S           156380  fman_fp_image
 29497   29491      0%      0%      0%  S             2684  iox_restart.sh
 29491    8045      0%      0%      0%  S             2692  pman
```

**Note** The numbers reported are sourced from Linux and represent the specialized ways in which the CPU cores are being used from the kernel's perspective. The numbers can be high as the overall kernel CPU usage is typically high. The ucode_pkt_PPE0 process, which represents the sum of all threats, usually shows high utilization. It's important to note that this is not scaled to 100% and can exceed that number.

# show process | include persis

To verify the validity of the process during alarm history configuration, use the **show process | include persis** command.

## Syntax Description

**Syntax Description**

## Command Default

There is no default.

## Command Modes

User EXEC (>) Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| XE 3.18 SP | Support for this command was introduced on NCS 4200 Series. |

## Examples

The following example shows the detailed information about a particular circuit.:

```
Router#show process | include persis
292 Msi 13F0D4AC 0 49 010328/12000 0 mcprp_spa_persis
```

# show protection-group

Use this command to verify the protection group configuration. It defines the status of the protection group.

**show protection-group**

## Command Default

None

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| Cisco IOS XE Everest 16.5.1 | Support for this command was introduced for the Cisco NCS 4200 Series and Cisco ASR 900 Series Routers. |

## Usage Guidelines

This command is used for configuring protection group parameters.

## Examples

The following example shows how to configure protection group:

```
show protection-group
PGN Type Working I/f Protect I/f Active Status
------------------------------------------------------------------------------
401 STS48C SONET0/3/6.1-48 SONET0/12/6.1-48 W A
------------------------------------------------------------------------------
Status legend:D=Deleted FO=Force SF=SignalFailure SD=SignalDegrade
FL=Fail M=Manual L=Lockout C=Clear A=Auto
(W)=working, (P)=protect
```

## Related Commands

| Command | Description |
|---|---|
| **controller protection-group** | Configures protection group controller. |
| **protection-group** | Configures virtual protection group interface. |
| **protection-group** *group id* [**working** \| **protect**] | Configures protection group roles. |

# show ptp clock dataset

To display a summary of the Precision Time Protocol clock status, use the show ptp clock dataset command in privileged EXEC mode.

**show ptp clock dataset** [**default** | **current**]

**Cisco ASR 901 Series Aggregation Services Router**

**show ptp clock dataset** {**default** | **current**}

## Syntax Description

| | |
|---|---|
| **default** | (Optional) Displays the default PTP clock dataset.<br>**Note**<br>**default**<br>On the ASR 901 Series Aggregation Services Router, you must choose either the**default** keyword or the **current** keyword. |
| **current** | (Optional) Displays the current PTP clock dataset.<br>**Note**<br>On the ASR 901 Series Aggregation Services Router, you must choose either the**current** keyword or the **default** keyword. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.0(1)S | This command was introduced. |
| 15.1(2)SNG | This command was implemented on the Cisco ASR 901 Series Aggregation Services Router. |

## Usage Guidelines

Use this command to verify a PTP clocking configuration.

On the Cisco ASR 901 Series Aggregation Services Router, one of the keywords (**default** or **current**) must be used with the command.

## Examples

The following examples show the output generated by this command:

```
Device# show ptp clock dataset default

CLOCK [Boundary Clock, domain 10]
  Two Step Flag: No
  Clock Identity: 0x2A:0:0:0:58:67:F3:4
  Number Of Ports: 1
  Priority1: 89
  Priority2: 90
  Domain Number: 10
  Slave Only: No
  Clock Quality:
    Class: 224
```

```
    Accuracy: Unknown
    Offset (log variance): 4252

Device# show ptp clock dataset current

CLOCK [Boundary Clock, domain 10]
  Steps Removed: 18522
  Offset From Master: 4661806827187470336
  Mean Path Delay: 314023819427708928
```

The table below describes significant fields shown in the display.

***Table 90: show ptp clock dataset Field Descriptions***

| Field | Description |
|---|---|
| Two Step Flag | Indicates whether the clock is sending timestamp information using a FOLLOW_UP message (a 2-step handshake) or not (a 1-step handshake). |
| Clock Identity | Unique identifier for the clock. |
| Number of Ports | Number of ports assigned to the PTP clock. |
| Priority1 | Priority1 preference value of the PTP clock; the priority1 clock is considered first during clock selection. |
| Priority2 | Priority2 preference value of the PTP clock; the priority2 clock is considered after all other clock sources during clock selection. |
| Domain number | PTP clocking domain number. |
| Slave only | Specifies whether the PTP clock is a slave-only clock. |
| Clock quality | Summarizes the quality of the grandmaster clock. |
| Class | Displays the time and frequency traceability of the grandmaster clock |
| Accuracy | Field applies only when the Best Master Clock algorithm is in use; indicates the expected accuracy of the primary clock were the grandmaster clock. |
| Offset (log variance) | Offset between the local clock and an ideal reference clock. |
| Steps removed | Number of hops from the local clock to the grandmaster clock. |
| Offset From Master | Time offset between the subordinate and primary clocks. |
| Mean Path Delay | Mean propagation time between the primary and subordinate clocks. |

# show ptp clock dataset parent

To display a description of the Precision Time Protocol parent clock, use the show ptp dataset parent command in privileged EXEC mode.

**show ptp clock dataset parent**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.0(1)S | This command was introduced. |
| 15.1(2)SNG | This command was implemented on the Cisco ASR 901 Series Aggregation Services Router. |

## Usage Guidelines

Use this command to verify a PTP clocking configuration.

## Examples

The following example shows the output generated by this command:

```
Device# show ptp clock dataset parent

CLOCK [Boundary Clock, domain 10]
  Parent Stats: No
  Observed Parent Offset (log variance): 0
  Observed Parent Clock Phase Change Rate: 58087144
  Grandmaster Clock:
    Identity: 0x3E:D3:D0:0:0:0:0:0
    Priority1: 42
    Priority2: 0
    Clock Quality:
      Class: 176
      Accuracy: Unknown
      Offset (log variance): 4252
```

The table below describes significant fields shown in the display.

***Table 91: show ptp clock dataset parent Field Descriptions***

| Field | Description |
|---|---|
| Parent Stats | Indicates the availability of parent statistics. |
| Observed Parent Offset (log variance) | The offset between the parent clock and the local clock. |
| Observed Parent Clock Phase Change Rate | This value indicates the parent clock speed relative to the subordinate clock. A positive value indicates that the parent clock is faster than the subordinate clock ; a negative value indicates that the parent clock is slower than the subordinate clock. |
| Grandmaster clock | Summarizes the Grandmaster clock configuration. |

| Field | Description |
|---|---|
| Identity | The hardware address of the Grandmaster clock. |
| Priority1 | The priority1 preference value of the PTP clock; the priority1 clock is considered first during clock selection. |
| Priority2 | The priority2 preference value of the PTP clock; the priority2 clock is considered after all other clock sources during clock selection. |
| Clock Quality | Summarizes the quality of the Grandmaster clock. |
| Class | Displays the time and frequency traceability of the grandmaster clock |
| Accuracy | This field applies only when the Best Master Clock algorithm is in use; indicates the expected accuracy of the primary clock were the grandmaster clock. |
| Offset (log variance) | The offset between the Grandmaster clock and the parent clock. |

# show ptp clock dataset time-properties

To display a summary of time properties for a Precision Time Protocol clock, use the show ptp dataset time-properties command in privileged EXEC mode.

**show ptp clock dataset time-properties**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.0(1)S | This command was introduced. |
| 15.1(2)SNG | This command was implemented on the Cisco ASR 901 Series Aggregation Services Router. |

## Usage Guidelines

Use this command to verify a PTP clocking configuration.

## Examples

The following example shows the output generated by this command:

```
Device# show ptp clock dataset time-properties

CLOCK [Boundary Clock, domain 10]
  Current UTC Offset Valid: TRUE
  Current UTC Offset: 10752
  Leap 59: FALSE
  Leap 61: TRUE
  Time Traceable: TRUE
  Frequency Traceable: TRUE
  PTP Timescale: TRUE
  Time Source: Unknown
```

The table below describes significant fields shown in the display.

***Table 92: show ptp clock dataset time-properties Field Descriptions***

| Field | Description |
|---|---|
| Current UTC Offset Valid | Indicates whether the current UTC offset is valid. |
| Current UTC Offset | Offset between the TAI and UTC in seconds. |
| Leap 59 | Indicates whether the last minute of the current UTC day contains 59 seconds. |
| Leap 61 | Indicates whether the last minute of the current UTC day contains 61 seconds. |
| Time Traceable | Indicates whether the value of the current UTC offset is traceable to a primary reference. |
| Frequency Traceable | Indicates whether the frequency used to determine the time scale is traceable to a primary reference. |

| Field | Description |
|---|---|
| PTP Timescale | Indicates whether the PTP grandmaster clock uses a PTP clock time scale. |
| Time Source | Time source used by the grandmaster clock. |

# show ptp clock running

To display a summary of the Precision Time Protocol clock status, use the show ptp clock running command in privileged EXEC mode.

**show ptp clock running** [**domain**]

## Syntax Description

| | |
|---|---|
| **domain** | Filters output by domain. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.0(1)S | This command was introduced. |
| 15.1(2)SNG | This command was implemented on the Cisco ASR 901 Series Aggregation Services Router. |

## Usage Guidelines

Use this command to verify a PTP clocking configuration.

## Examples

The following example shows the output generated by this command:

```
Device# show ptp clock running

PTP Boundary Clock [Domain 1]
         State           Ports           Pkts sent      Pkts rcvd
         FREERUN         3               1090           1023
                                 PORT SUMMARY
Name                 Tx Mode      Role         Transport    State        Sessions
MASTER-1             unicast      master       Et0/0        -            5
MASTER-2             mcast        master       Et0/0        -            5
SLAVE                unicast      slave        Et0/0        -            5
                        PTP Ordinary Clock [Domain 2]
         State           Ports           Pkts sent      Pkts rcvd
         HOLDOVER        1               2090           2023
                                 PORT SUMMARY
Name                 Tx Mode      Role         Transport    State        Sessions
MASTER               unicast      master       Et0/0        -            5
```

The table below describes significant fields shown in the display.

***Table 93: show ptp clock running Field Descriptions***

| Field | Description |
|---|---|
| State | State of the PTP clock. |
| Ports | Number of ports assigned to the PTP clock. |
| Pkts sent | Number of packets sent by the PTP clock. |
| Pkts rcvd | Number of packets received by the PTP clock. |

| Field | Description |
|---|---|
| Name | Name of the PTP clock port. |
| Tx Mode | Transmission mode of the PTP clock port (unicast or multicast). |
| Role | PTP role of the clock port (primary or subordinate). |
| Transport | Physical port assigned to the clock port. |
| State | State of the clock port. |
| Sessions | Number of PTP sessions active on the clock port. |

# show ptp port dataset foreign-master

To display a summary of Precision Time Protocol foreign master records, use the **show ptp port dataset foreign-master-record** command in privileged EXEC mode.

**show ptp port dataset foreign-master** [**domain**]

## Syntax Description

This command has no arguments or keywords.

| | |
|---|---|
| **domain** | Filters output by domain. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.0(1)S | This command was introduced. |

## Usage Guidelines

Use this command to verify a PTP clocking configuration.

## Examples

The following example shows the output generated by this command.

```
Device# show ptp dataset foreign-master

PTP FOREIGN MASTER RECORDS
Interface Vlan2
Number of foreign records 1, max foreign records 5
Best foreign record 0
RECORD #0
Foreign master port identity: clock id: 0x0:1E:4A:FF:FF:96:A2:A9
Foreign master port identity: port num: 1
Number of Announce messages: 8
Number of Current Announce messages: 6
Time stamps: 1233935406, 664274927
```

The table below describes significant fields shown in the display.

***Table 94: show ptp port dataset foreign-master Field Descriptions***

| Field | Description |
|---|---|
| Interface | Currently foreign-master data is not displayed in the show command. |
| Number of foreign records | Number of foreign master records in device memory. |
| max foreign records | Maximum number of foreign records. |
| Best foreign record | Foreign record with the highest clock quality. |
| Foreign master port identity: clock id | Hardware address of the foreign master port. |
| Foreign master port identity: port number | Port number of the foreign master port. |

| Field | Description |
|---|---|
| Number of Announce messages | Number of Announce messages received from the foreign master clock. |
| Number of Current Announce messages | Number of current announcement messages. |
| Time stamps | Time stamps of current announcement messages. |

# show ptp port dataset port

To display a summary of Precision Time Protocol ports, use the **show ptp port dataset port** command in privileged EXEC mode.

**show ptp dataset port**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 15.0(1)S | This command was introduced. |

## Usage Guidelines

Use this command to verify a PTP clocking configuration.

## Examples

The following example shows the output generated by this command.

```
Device# show ptp port dataset port

PORT [MASTER]
  Clock Identity: 0x49:BD:D1:0:0:0:0:0
  Port Number: 0
  Port State: Unknown
  Min Delay Req Interval (log base 2): 42
  Peer Mean Path Delay: 648518346341351424
  Announce interval (log base 2): 0
  Announce Receipt Timeout: 2
  Sync Interval (log base 2): 0
  Delay Mechanism: End to End
  Peer Delay Request Interval (log base 2): 0
  PTP version: 2
```

The table below describes significant fields shown in the display.

***Table 95: show ptp port dataset port Field Descriptions***

| Field | Description |
|---|---|
| Clock Identity | Unique identifier for the clock. |
| Port Number | Port number on the PTP node. |
| Port State | State of the PTP port. |
| Min Delay Req Interval (log base 2) | Time interval permitted between Delay_Req messages. |
| Peer Mean Path Delay | One way propagation delay on the local port. |
| Announce interval (log base 2) | Mean interval between PTP announcement messages. |
| Announce Receipt Timeout | Number of intervals before a PTP announcement times out. |

| Field | Description |
|---|---|
| Sync Interval (log base 2) | Mean interval between PTP sync messages. |
| Delay Mechanism | Mechanism used for measuring propagation delay. |
| Peer Delay Request Interval (log base 2) | Interval permitted between Peer Delay Request messages. |
| PTP version | PTP version in use. |

# show pxf cpu access-lists

To display Parallel eXpress Forwarding (PXF) memory information for access control lists (ACLs), use the **show pxf cpu access-lists** command in privileged EXEC mode.

**show pxf cpu access-lists** [**security** | **qos** | **pbr** | **compiled**]

**Cisco 10000 Series Router**
**show pxf cpu access-lists** [**security** [[**tcam** *acl-name* [**detail**]] | **flex-sum** | **children**] | **qos** | **pbr** | **compiled**]

## Syntax Description

| | |
|---|---|
| **security** | (Optional) Displays information about the security ACLs defined in Cisco IOS and compiled to the PXF. Also displays information about split ACLs, such as how much memory has been used. |
| **tcam** *acl-name* | (Optional) Displays information about the specified security ACL stored in ternary content addressable memory (TCAM).<br>This option is only available on the PRE3 for the Cisco 10000 series router. |
| **detail** | (Optional) Displays decoded information about the packet fields used for matching in the TCAM. |
| **flex-sum** | (Optional) Displays summary information describing the amount of memory allocated in the parallel express forwarding (PXF) engine for use by the flexible key construction microcode. This information is useful for design teams.<br>This option is only available on the PRE3 for the Cisco 10000 series router. |
| **children** | (Optional) Displays information for child policies. If an ACL is a template child, the output typically does not display the child information. Specifying the **children** keyword displays data for child policies, too, and shows the children and the parent policy of each child.<br>Use caution when using the **children** keyword as there might be thousands of child policies configured, which could have negative effects on the command output. |
| **qos** | (Optional) Displays information about the QoS ACLs defined in Cisco IOS and compiled to the PXF. |
| **pbr** | (Optional) Displays information about ACLs for policy-based routing (PBR). |
| **compiled** | (Optional) Displays information for all compiled Turbo-ACLs.<br>The PRE2 supports Turbo-ACLs and the **compiled** option. The PRE3 accepts the PRE2 **compiled** option, but does not implement Turbo-ACLs. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2S | This command was introduced. |
| 12.3(7)XI1 | This command was introduced on the PRE2 for the Cisco 10000 series router. |
| 12.2(31)SB2 | This command was introduced on the PRE3 for the Cisco 10000 series router. |

## Usage Guidelines

### Cisco 10000 Series Router (PRE2)

Because memory is shared between TurboACLs and MiniACLs, they can interfere with each other's capacities. The Mini-ACL is automatically set up with space for 8191 Mini-ACLs at router start. If more than 8191 Mini-ACLs are created, another block of MiniACLs (4096) is allocated. This process is repeated as necessary until the router is out of External Column Memory (XCM) in any one bank that the Mini-ACLs need.

### Cisco 10000 Series router (PRE3)

The PRE3 implements only TCAM ACLs. Turbo-ACLs and Mini-ACLs are not supported.

## Examples

The sample output from the **show pxf cpu access-lists security** command (see Sample Output) is based on the configuration of the access control list (ACL) called test_list (see ACL Configuration). The sample output is divided into several sections with a description of the type of information displayed in each.

### ACL Configuration

```
Router# show pxf cpu access-lists test_list
Extended IP access list test_list (Compiled)
    10 permit ip any host 10.1.1.1
    20 permit ip any host 10.1.1.2
    30 permit ip any host 10.1.1.3
    40 permit ip any host 10.1.1.4
    50 permit ip any host 10.1.1.5
    60 permit ip any host 10.1.1.6
    70 permit ip any host 10.1.1.7
    80 permit ip any host 10.1.1.8
    90 permit ip any host 10.1.1.9
    100 permit ip any host 10.1.1.11
    110 permit ip any host 10.1.1.12
```

### Sample Output

The following sample output describes the information displayed in the first section of the command output from the **show pxf cpu access-lists security** command:

```
Router# show pxf cpu access-lists security
PXF Security ACL statistics:
ACL            State      Tables  Entries  Config  Fragment  Redundant  Memory ACL_index
 1            Operational   1        -       -        -         -         0Kb     1
sl_def_acl    Operational   2        -       -        -         -         0Kb     2
test          Operational   3        -       -        -         -         0Kb     3
test_list     Operational   1        12      11       0         0         7Kb     1
```

The table below describes the significant fields shown in the display.

*Table 96: show pxf cpu access-lists security Field Descriptions*

| Field | Description |
|---|---|
| ACL | Identifies the ACL by name or number. |
| State | Displays the current state of the ACL:<br>• Copying--ACL is in the process of being created or compiled.<br>• Operational--ACL is active and filtering packets.<br>• Out of acl private mem--ACL has run out of the private memory that was allocated exclusively to it.<br>• Out of shared mem--ACL has run out of the memory that it shares with other ACLs.<br>• Unknown Failure--ACL has failed because of an uncategorized reason.<br>• Unneeded--ACL was allocated but is not currently in use. |
| Tables | An indicator of whether the ACL has been split into more than one PXF pass. The first three ACLs in the output are MiniACLs, and have the ACL_index duplicated in the Tables column. |
| Entries | The count of ACL rules as seen by the Turbo compiler. This is the sum of the Config, Fragment, and Redundant columns plus 1. |
| Config | The count of rules for this ACL. |
| Fragment | The count of extra rules added to handle fragment handling, where Layer 4 information is needed but not available in a packet fragment. |
| Redundant | The count of rules that are not needed because they are covered by earlier rules. |
| Memory | The amount of PXF XCM in use for the ACL. |
| ACL_index | The index of the ACL in XCM. |

The following sample output describes the information displayed in the next section of the command output from the **show pxf cpu access-lists security** command:

```
First level lookup tables:
Block      Use              Rows       Columns   Memory used
  0   TOS/Protocol           1/128     1/32      16384
  1   IP Source (MS)         1/128     1/32      16384
  2   IP Source (LS)         1/128     1/32      16384
  3   IP Dest (MS)           2/128     1/32      16384
  4   IP Dest (LS)          12/128     1/32      16384
  5   TCP/UDP Src Port       1/128     1/32      16384
  6   TCP/UDP Dest Port      1/128     1/32      16384
  7   TCP Flags/Fragment     1/128     1/32      16384
```

The table below describes the significant fields shown in the display.

*Table 97: show pxf cpu access-lists security Field Descriptions*

| Field | Description |
|---|---|
| Block | Indicates the block number. |
| Use | Describes the IP packet field that is being matched. |
| Rows | An indication of where the largest variety of values are in use in the ACLs that are being applied. In the output, 12/128 means that there are 12 different values of significance in the field. If there are other rules added and the value exceeds 128, more memory will be needed to accommodate the new rules. |
| Columns | An indication of the number of TurboACLs in PXF memory. In the output, 1/32 means there is only one TurboACL in PXF memory. If there are more than 31 added, another chunk of memory is needed to accommodate the new ACLs. |
| Memory used | Displays the total amount of memory used for this particular lookup table. |

The following sample output describes the information displayed in the next section of the command output from the **show pxf cpu access-lists security** command. There are 16 banks of XCM in each PXF column. This output section shows the usage level of each bank.

```
Banknum   Heapsize   Freesize  %Free
   0       4718592    4702208    99
   1       8126464    6012928    73
   2       8388608    6290432    74
   3       8388608    6290432    74
   4       5898240    5881856    99
   5       8126464    6012928    73
   6       8388608    6290432    74
   7       8126464    6012928    73
   8       4456448    4440064    99
   9       8126464    6012928    73
```

The table below describes the significant fields shown in the display.

*Table 98: show pxf cpu access-lists security Field Descriptions*

| Field | Description |
|---|---|
| Banknum | The block of memory used for this particular lookup table. |
| Heapsize | The total amount of memory, in bytes, allocated for this block. |
| Freesize | The amount of memory, in bytes, that is currently available for use by this block of memory. |
| %Free | The percentage of memory that is free and available for use for this block of memory. When the %Free drops to 0, the router cannot hold any more ACLs in PXF memory, and any new ACL will not pass traffic. |

This section of the sample command output indicates the memory usage of the MiniACLs in the router. All of the rows state about the same thing. To determine the actual number of MiniACLs in play, divide the memory used in any of blocks 1 to 10 by 256, or blocks 11 to 14 by 16.

```
MiniACL XCM Tables:
```

```
Block   Use               Memory Used   %Free
  0   IP Src 1                768         99
  1   IP Src 2                768         99
  2   IP Src 3                768         99
  3   IP Src 4                768         99
  4   IP Dest 1               768         99
  5   IP Dest 2               768         99
  6   IP Dest 3               768         99
  7   IP Dest 4               768         99
  8   ToS                     768         99
  9   Protocol                768         99
  10  TCP Flags/Fragment      768         99
  11  Source Port 1            48         99
  12  Source Port 2            48         99
  13  Destination Port 2       48         99
  14  Destination Port 2       48         99
```

The following describes the information displayed in the last section of the sample output from the **show pxf cpu access-lists security** command:

```
Available MiniACL count = 8191
Usable ranges(inclusive):
1->8191
```

The table below describes the significant fields shown in the display.

***Table 99: show pxf cpu access-lists security Field Descriptions***

| Field | Description |
|---|---|
| Available MiniACL | The number of ACLs currently available for allocation in XCM. |
| Usable ranges | The ACL indexes that will be assigned to MiniACLs. |

**PRE2 and PRE3 Security ACLs Examples (Cisco 10000 Series Router)**

This section compares the output from the **show pxf cpu access-lists security** command when issued on the PRE2 and PRE3.

For the PRE2, the following sample output displays VMR (value, plus a mask and result) data for the ACL named ICMP_IGMP_MATCH:

```
Router# show pxf cpu access-lists security tcam ICMP_IGMP_MATCH detail

------------------------------------------------------------
VMR Format - handle: 524607B4
Format has 5 fields, refcount = 1
Field: Format, FIXED, start_bit = 69, end_bit = 71
Field: ACL index, FIXED, start_bit = 54, end_bit = 68
Field: Flags, FIXED, start_bit = 43, end_bit = 53
Field: L4 proto, FIXED CNV, start_bit = 16, end_bit = 23
Field: L4 source port, FIXED CNV, start_bit = 0, end_bit = 15 Total bits = 53, format = 72
 GMR used: 5 Col 2 LKBP Vector: 544
------------------------------------------------------------
VMRs
------ VMR 0 ------
V: 001B0000 0000010B 00
M: FFFFC000 0000FFFF FF
R: 00010001
Format: 00000000/00000007
ACL index: 0000006C/00007FFF
```

```
L4 source port: 00000B00/0000FFFF
L4 proto: 00000001/000000FF
Flags: 00000000/00000000
------ VMR 1 ------
V: 001B0000 00000103 01
M: FFFFC000 0000FFFF FF
R: 00010002
Format: 00000000/00000007
ACL index: 0000006C/00007FFF
L4 source port: 00000301/0000FFFF
L4 proto: 00000001/000000FF
Flags: 00000000/00000000
------ VMR 2 ------
V: 001B0000 00000213 00
M: FFFFC000 0000FFFF 00
R: 00010003
Format: 00000000/00000007
ACL index: 0000006C/00007FFF
L4 source port: 00001300/0000FF00
L4 proto: 00000002/000000FF
Flags: 00000000/00000000
------ VMR 3 ------
V: 001B0000 00000214 00
M: FFFFC000 0000FFFF 00
R: 00010004
Format: 00000000/00000007
ACL index: 0000006C/00007FFF
L4 source port: 00001400/0000FF00
L4 proto: 00000002/000000FF
Flags: 00000000/00000000
```

For the PRE3, the following sample output displays for the **show pxf cpu access-lists security** command. Notice that the output does not include the columns shown above that are relevant to only the PRE2 and the output no longer displays first-level lookup tables.

```
Router# show pxf cpu access-lists security

PXF Security ACL statistics:
 ACL                                    State           ACL_index
STANDARD_MATCH_PERMIT                   Operational           116
SRC_IP_MATCH144                         Operational           102
DST_IP_MATCH                            Operational           113
DST_IP_MATCH144                         Operational           112
PROTOCOL_MATCH                          Operational           104
PROTOCOL_MATCH144                       Operational           103
FRAG_MATCH                              Operational           109
PRECEDENCE_TOS_MATCH                    Operational           106
PRECEDENCE_TOS_MATCH144                 Operational           105
```

## Related Commands

| Command | Description |
|---|---|
| **show pxf cpu statistics** | Displays PXF CPU statistics. |
| **show pxf statistics** | Displays a chassis-wide summary of PXF statistics. |

# show pxf cpu iedge

To display Parallel eXpress Forwarding (PXF) policy and template information, use the **show pxf cpu iedge**command in privileged EXEC mode.

**show pxf cpu iedge**[ **detail** | **policy** *policy-name* | **template**]

## Syntax Description

| | |
|---|---|
| **detail** | (Optional) Displays detailed information about policies and templates. |
| **policy** *policy-name* | (Optional) Displays summary policy information. |
| **template** | (Optional) Displays summary template information. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2S | This command was introduced. |

## Examples

The following example shows PXF template information. The fields shown in the display are self-explanatory.

```
Router# show pxf cpu iedge template
Super ACL name                   OrigCRC   Class Count    CalcCRC
1sacl_2                         4EA94046   2             00000000
if_info 71BA3F20
```

## Related Commands

| Command | Description |
|---|---|
| **show pxf statistics** | Displays a summary of PXF statistics. |

# show pxf cpu qos

To display Parallel eXpress Forwarding (PXF) External Column Memory (XCM) contents related to a particular policy, use the **show pxf cpu qos** command in privileged EXEC mode.

**show pxf cpu qos** [**policy-map** *policy-name* | **vcci-maps**]

**Cisco 10000 Series Router**
**show pxf cpu qos** [*vcci* | **classifiers** | **flex-sum** | **policy-map** *policy-name* | **vcci-maps**]

## Syntax Description

| | |
|---|---|
| *vcci* | (Optional) Virtual Channel Circuit Identifier (VCCI). Information about this specified VCCI will be displayed. |
| **classifiers** | (Optional) Displays information about the criteria used to classify traffic. |
| **flex-sum** | (Optional) Displays summary information describing the amount of memory allocated in the PXF engine for use by the flexible key construction microcode.<br>**Note**<br>This option is only available on the Cisco 10000 series router for the PRE3. |
| **policy-map** *policy-name* | (Optional) Displays per-policy map information. |
| **vcci-maps** | (Optional) Displays VCCI map values. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2S | This command was introduced. |
| 12.3(7)XI1 | This command was introduced on the Cisco 10000 series router for the PRE2. |
| 12.2(28)SB | This command was integrated into Cisco IOS Release 12.2(28)SB. |
| 12.2(31)SB2 | This command was introduced on the PRE3 for the Cisco 10000 series router. |

## Usage Guidelines

This command is useful in verifying the presence of a policy on interfaces and indexes programmed in the PXF.

## Examples

The following example shows XCM contents related to a policy called police_test, which is defined as follows:

```
policy-map police_test
 class high-priority
 priority
 class low-priority
  set atm-clp
 class class-default
```

```
    queue-limit 512
Router# show pxf cpu qos police_test
Output Policymap: police_test
 Vcci: A05  Flags: 4  Policymap_index: 6  Policymap_data_index: 12
 OUT AT1/0/0.111 (0x71764660) ref_count 1
Output Action Table Contents for vcci 0xA05 - Policymap index: 6
 class-name: high-priority  class_index: 0  action_flags: 0x00
  srp_class_id: 0x01  prec/dscp: 0x00  cos: 0
  discard_class: 0x00  exp_value: 0
class-name: low-priority  class_index: 1  action_flags: 0x10
  srp_class_id: 0x00  prec/dscp: 0x00  cos: 0
  discard_class: 0x00  exp_value: 0
class-name: class-default  class_index: 2  action_flags: 0x00
  srp_class_id: 0x00  prec/dscp: 0x00  cos: 0
  discard_class: 0x00  exp_value: 0
```

## Related Commands

| Command | Description |
|---|---|
| **show pxf cpu statistics qos** | Displays match statistics for a service policy on an interface. |

# show pxf dma

To display the current state of direct memory access (DMA) buffers, error counters, and registers on the Parallel eXpress Forwarding (PXF), use the **show pxf dma**command in privileged EXEC mode.

**show pxf dma** [**buffers** | **counters** | **reassembly** | **registers**]

**Cisco 10000 Series Router (PRE3 only)**

**show pxf dma** [**buffers** | **counters** | **reassembly** | **registers**][**brief** | **config** | **errors** | **status**]

## Syntax Description

| | |
|---|---|
| **buffers** | (Optional) Displays PXF DMA buffers information. |
| **counters** | (Optional) Displays packet and error counters for the PXF DMA engine. |
| **reassembly** | (Optional) Displays PXF reassembly table usage information. |
| **registers** | (Optional) Displays PXF DMA registers information. |
| **brief** | (Optional) Displays PXF DMA information, including the initialization state of each block in the PXF API and any errors that occurred.<br>**Note**<br>This option is available on the PRE3 only. |
| **config** | (Optional) Displays a configuration summary of the registers in each of the PXF DMA blocks.<br>**Note**<br>This option is available on the PRE3 only. |
| **errors** | (Optional) Displays the errors that occurred in each of the PXF DMA blocks.<br>**Note**<br>This option is available on the PRE3 only. |
| **status** | (Optional) Displays the initialization state of each PXF DMA block. In normal operation, all blocks display the enabled state.<br>**Note**<br>This option is available on the PRE3 only. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.2S | This command was introduced. |
| 12.3(7)XI | This command was integrated into Cisco IOS Release 12.3(7)XI and implemented on the Cisco 10000 series router for the PRE2. |

| Release | Modification |
|---|---|
| 12.2(31)SB2 | This command was integrated into Cisco IOS Release 12.2(31)SB2 and implemented on the Cisco 10000 series router for the PRE3. |

## Examples

The following example shows PXF DMA buffers information:

```
Router# show pxf dma buffers
PXF To-RP DMA Ring Descriptors & Buffers:
     Descriptor       Buffer        Buffer      Descriptor
     Address          Address       Length(b)   Flags
0    0x0CA06340       0x0AC097C0      512       0x0002
1    0x0CA06350       0x0AC088C0      512       0x0002
2    0x0CA06360       0x0AC07C40      512       0x0002
3    0x0CA06370       0x0AC0B5C0      512       0x0002
4    0x0CA06380       0x0AC0CC40      512       0x0002
5    0x0CA06390       0x0AC08640      512       0x0002
6    0x0CA063A0       0x0AC0C240      512       0x0002
7    0x0CA063B0       0x0AC08B40      512       0x0002
8    0x0CA063C0       0x0AC0AE40      512       0x0002
9    0x0CA063D0       0x0AC0BAC0      512       0x0002
10   0x0CA063E0       0x0AC0C9C0      512       0x0002
11   0x0CA063F0       0x0AC09CC0      512       0x0002
12   0x0CA06400       0x0AC0C740      512       0x0002
13   0x0CA06410       0x0AC0A6C0      512       0x0002
14   0x0CA06420       0x0AC0B0C0      512       0x0002
15   0x0CA06430       0x0AC09040      512       0x0002
16   0x0CA06440       0x0AC0A440      512       0x0002
17   0x0CA06450       0x0AC065C0      512       0x0002
18   0x0CA06460       0x0AC06FC0      512       0x0002
19   0x0CA06470       0x0AC06340      512       0x0002
20   0x0CA06480       0x0AC07240      512       0x0002
21   0x0CA06490       0x0AC092C0      512       0x0002
22   0x0CA064A0       0x0AC0D140      512       0x0002
23   0x0CA064B0       0x0AC0C4C0      512       0x0002
24   0x0CA064C0       0x0AC07740      512       0x0002
25   0x0CA064D0       0x0AC09540      512       0x0002
26   0x0CA064E0       0x0AC0A940      512       0x0002
27   0x0CA064F0       0x0AC06840      512       0x0002
28   0x0CA06500       0x0AC08140      512       0x0002
29   0x0CA06510       0x0AC06D40      512       0x0002
30   0x0CA06520       0x0AC07EC0      512       0x0002
31   0x0CA06530       0x0AC0ABC0      512       0x0003
PXF From-RP DMA Ring Descriptors & Buffers:
     Descriptor       Buffer        Buffer      Descriptor    Context
     Address          Address       Length(b)   Flags         Bit
0    0x0CA06580       0x00000000      0         0x0000        Not set
1    0x0CA06590       0x00000000      0         0x0000        Not set
2    0x0CA065A0       0x00000000      0         0x0000        Not set
3    0x0CA065B0       0x00000000      0         0x0000        Not set
4    0x0CA065C0       0x00000000      0         0x0000        Not set
5    0x0CA065D0       0x00000000      0         0x0000        Not set
6    0x0CA065E0       0x00000000      0         0x0000        Not set
7    0x0CA065F0       0x00000000      0         0x0000        Not set
8    0x0CA06600       0x00000000      0         0x0000        Not set
9    0x0CA06610       0x00000000      0         0x0000        Not set
10   0x0CA06620       0x00000000      0         0x0000        Not set
11   0x0CA06630       0x00000000      0         0x0000        Not set
12   0x0CA06640       0x00000000      0         0x0000        Not set
13   0x0CA06650       0x00000000      0         0x0000        Not set
```

```
14    0x0CA06660        0x00000000        0        0x0000        Not set
15    0x0CA06670        0x00000000        0        0x0001        Not set
```

The table below describes the fields shown in the display.

***Table 100: show pxf dma Field Descriptions***

| Field | Description |
|---|---|
| Descriptor Address | Memory address pointing to the descriptor for this buffer. |
| Buffer Address | Address of this buffer in memory. |
| Buffer Length | Length, in bytes, of this particular buffer. |
| Descriptor Flags | Internal flags identifying this buffer's use and status. |
| Context Bit | State of the context bit which is set when the buffer is currently in use by a context (the basic unit of packet processing). |

## Related Commands

| Command | Description |
|---|---|
| **clear pxf** | Clears PXF counters and statistics. |
| **show pxf cpu** | Displays PXF CPU statistics. |
| **show pxf microcode** | Displays the microcode version running on the PXF. |

# show pxf max-logical-interfaces

To display the configuration for the maximum number of classes permitted per QoS policy in PXF and the maximum number of PXF logical interfaces allowed on the router, use the **showpxfmax-logical-interfaces** command in privileged EXEC mode.

**show pxf max-logical-interfaces**

## Syntax Description

This command has no arguments or keywords.

## Command Default

No default behavior or values

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(20)S5 | This command was introduced. |

## Usage Guidelines

The **showpxfmax-logical-interfaces** command is used to verify if the **pxfmax-logical-interfaces** configuration change was accepted by the router. The output from this command provides the settings for the maximum number of classes permitted per QoS policy in PXF and the number of PXF logical interfaces as set in both the running configuration file and the startup configuration file. The settings listed in the startup configuration file are the current settings on the router; the settings listed in the running configuration will be the settings on the router when the router is reloaded.

## Examples

In the following example, the **pxfmax-logical-interfaces16k** command has been entered to change the setting from the previous setting of 4k. The router, however, has not been rebooted with the changes saved to the running configuration.

```
Router# show pxf max-logical-interfaces
Running configuration:
    PXF Max classes per interface: 23
    Max PXF interfaces:            16K
Startup configuration:
    PXF Max classes per interface: 64
    Max PXF interfaces:            4K
```

## Related Commands

| Command | Description |
|---|---|
| **pxf max-logical-interfaces** | Configures the maximum number of PXF logical interfaces permitted on the router. |

# show qm-sp port-data

To display information about the QoS-manager switch processor, use the **showqm-spport-data** command in privileged EXEC mode.

**show qm-sp port-data** *mod port*

## Syntax Description

| | |
|---|---|
| *mod port* | Module and port number; see the "Usage Guidelines" section for valid values. |

## Command Default

This command has no default settings.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

## Usage Guidelines

This command is supported by the supervisor engine only and can be entered only from theCisco 7600 series routers console (see the **remotelogin** command).

The *modport* arguments designate the module and port number. Valid values depend on the chassis and module that are used. For example, if you have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48.

Enter the **showqm-spport-data**command to verify the values that are programmed in the hardware.

## Examples

This example shows how to display information about the QoS manager:

```
Router# show qm-sp port-data 1 2
------------------------------------------------------------------------------
* Type: Tx[1p2q2t] Rx[1p1q4t]  [0] Pinnacle
* Per-Port: [Untrusted] Default COS[0] force[0] [VLAN based]
------------------------------------------------------------------------------
* COSMAP(C[Q/T]) TX: 0[1/1] 1[1/1] 2[1/2] 3[1/2] 4[2/1] 5[3/1] 6[2/1] 7[2/2]
                 RX: 0[1/1] 1[1/1] 2[1/2] 3[1/2] 4[1/3] 5[2/1] 6[1/3] 7[1/4]
------------------------------------------------------------------------------
* WRR bandwidth:        [7168 18432]
* TX queue limit(size): [311296 65536 65536]
* WRED queue[1]:        failed (0x82)
       queue[2]:        failed (0x82)
------------------------------------------------------------------------------
* TX drop thr queue[1]: type[2 QOS_SCP_2_THR] dropThr[311104 311104]
              queue[2]: type[2 QOS_SCP_2_THR] dropThr[61504 61504]
* RX drop threshold:    type[4 QOS_SCP_4_THR] dropThr[62259 62259 62259 62259]
* RXOvr drop threshold: type[0 UNSUPPORTED] dropThr[16843009 131589 61504 61504]
* TXOvr drop threshold: type[0 UNSUPPORTED] dropThr[67174656 260 16843009 131589]
Switch-sp#
```

**Related Commands**

| Command | Description |
|---|---|
| **rcv-queue queue-limit** | Sets the size ratio between the strict-priority and standard receive queues. |
| **remote login** | Accesses the Cisco 7600 series routers console or a specific module. |
| **wrr-queue bandwidth** | Allocates the bandwidth between the standard transmit queues. |
| wrr-queue queue-limit | Sets the transmit-queue size ratio on an interface. |
| wrr-queue threshold | Configures the drop-threshold percentages for the standard receive and transmit queues on 1q4t and 2q2t interfaces. |

# show rbscp

To display state and statistical information about Rate Based Satellite Control Protocol (RBSCP) tunnels, use the **showrbscp** command in user EXEC or privileged EXEC mode.

**show rbscp** {**all** | **inbound** | **state** | **statistics**} [**tunnel** *tunnel-number*]

## Syntax Description

| | |
|---|---|
| **all** | Displays both RBSCP state and RBSCP statistical information. |
| **inbound** | Displays all the RBSCP inbound queue dump information. |
| **state** | Displays the RBSCP state information. |
| **statistics** | Displays RBSCP statistical information. |
| **tunnel** *tunnel-number* | (Optional) Displays the RBSCP information for a specific tunnel interface in the range from 0 to 2147483647. If a tunnel interface is not specified, information for all RBSCP tunnels is displayed. |

## Command Modes

User EXEC (>) Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 12.3(7)T | This command was introduced. |
| 12.4(22)T | This command was modified. The **inbound** keyword was added. |
| Cisco IOS 2.1 XE | This command was integrated into Cisco IOS XE Release 2.1. |

## Usage Guidelines

The output of this command is useful when you need to configure and monitor RBSCP tunnels. The output shows various state and statistical information about RBSCP tunnels.

## Examples

The following is sample output from the **showrbscpall**command:

```
Router# show rbscp all
Tunnel0 is up, line protocol is up
RBSCP operational state:  IS OPENING
RBSCP operating mode: (264h) ack_split window_stuffing inorder SCTP_report
  window step: 1
  drop scale : 0
  ACK split size: 4
  input drop scale: 2
  initial TSN: 1h
  fuzz factor: 0
  next TSN: 1h
  next sequence: 1h
  current outstanding: 0
  max out per RTT: 68750
  packets since SACK: 0
  cumulative ack: 0h
  TSN at SACK: 1h
  last cumulative ack: 0h
```

```
  last delivered TSN: 0h
  next FWDTSN corr: 6h
  RTO: 704 ms
  RTT: 550 ms     srtt_sa: 0      srtt_sv: 4
  sentQ: num packets: 0, num bytes: 0
  tmitQ: num packets: 0, num bytes: 0
RBSCP protocol statistics:
  Init FWD-TSNs sent 0, received 0
  TUNNEL-UPs sent 0, received 0
  CLOSEDs sent 0, received 0
  TSNs sent 0, resent 0, lost by sender 0
  TSNs received 0 (duplicates 0)
  FWD-TSNs sent 63 (heartbeats 0)
  FWD-TSNs received 0 (ignored 0)
  FWD-TSNs caused 0 packet drops, 0 whole window drops
  SACKs sent 0, received 0 (ignored 0)
  Recovered with RTX 0
  Received with delay 0
  Most released at once 0
  Failed sends into the: tunnel 1, network 0
  Dropped due to: excess delay 0, tmit queue full 0
  Max on any queue: num packets: 0, num bytes: 0
  Max outstanding: 0
```

The table below describes the significant fields shown in the display.

***Table 101: show rbscp all Field Descriptions***

| Field | Description |
|---|---|
| Tunnel*n* is {up \| down} | Interface is currently active (up) or inactive (down). |
| line protocol is {up \| down \| administratively down} | Shows line protocol up if a valid route is available to the tunnel destination. Shows line protocol down if no route is available or if the route would be recursive. |
| RBSCP operational state | Indicates the current RBSCP state. |
| RBSCP operating mode | Indicates the RBSCP operating mode. |
| window step | Step size for the window scale. |
| drop scale | Scale factor for the number of bytes that can be queued before packets are dropped on the output side. |
| Ack split size | Number of TCP acknowledgements to send for every ack received. |
| input drop scale | Scale factor for the number of bytes that can be queued before packets are dropped on the input side. |
| initial TSN | Transport Sequence Number (TSN) of the first outgoing RBSCP/IP packet sent to a peer. RBSCP uses sequence numbers to ensure a reliable service. Peers will send the TSN back in the acknowledgment packet. |
| fuzz factor | Value added to the RBSCP delay clock to pad the delay when large round-trip time (RTT) fluctuations occur. |
| next TSN | TSN of the next outgoing RBSCP/IP packet. |

| Field | Description |
|---|---|
| next sequence | Next sequence number to use, in hexadecimal format. |
| current outstanding | Current number of bytes that are in transit or are unacknowledged. |
| max out per RTT | Maximum number of bytes allowed to be sent out per RTT. |
| packets sent since SACK | Number of packets sent since an RBSCP Selective Acknowledgement (SACK). |
| cumulative ack | Cumulative acknowledgement point that is the highest in sequence TSN that was received from a peer. |
| TSN at SACK | Value of highest TSN for the last SACK that was received from a peer. |
| last cumulative ack | Last cumulative acknowledgement point that was received from the peer. |
| last delivered TSN | Last TSN received that was subsequently delivered to an upper level protocol. |
| next FWDTSN corr | Next FWD_TSN correlation entry to use. |
| RTO | Retransmission timeout, in milliseconds. |
| RTT | Round-trip time estimate, in milliseconds. |
| srtt_sa | Smoothed round-trip time average. |
| srtt_sv | Smoothed round-trip time variance. |
| sentQ | Number of packets and bytes sent but not yet acknowledged. |
| tmitQ | Number of packets and bytes ready to be sent. |
| Init FWD-TSNs | Number of TSNs sent and received for initializing the RBSCP tunnel. |
| TUNNEL-UPs | Number of TUNNEL_UP messages sent and received. |
| CLOSEDs | Number of CLOSED messages sent and received. |
| heartbeats | Heartbeats are equivalent to keepalive messages. |
| Recovered with RTX | Number of packets recovered using a retransmitted message. |
| Received with delay | Number of packets that included a delay value. |
| Most released at once | Maximum burst of packets sent in one interval. |
| Failed sends | Number of packets that were sent but failed because of an internal error, such as no route or the underlying interface is down. |

The following is sample output from the **showrbscpstate**command:

```
Router# show rbscp state
```

```
Tunnel0 is up, line protocol is up
RBSCP operational state:  IS OPENING
RBSCP operating mode: (264h) ack_split window_stuffing inorder SCTP_report
  window step: 1
  drop scale : 0
  ACK split size: 4
  input drop scale: 2
  initial TSN: 1h
  fuzz factor: 0
  next TSN: 1h
  next sequence: 1h
  current outstanding: 0
  max out per RTT: 68750
  packets since SACK: 0
  cumulative ack: 0h
  TSN at SACK: 1h
  last cumulative ack: 0h
  last delivered TSN: 0h
  next FWDTSN corr: 0h
  RTO: 704 ms
  RTT: 550 ms     srtt_sa: 0      srtt_sv: 4
  sentQ: num packets: 0, num bytes: 0
  tmitQ: num packets: 0, num bytes: 0
```

The following is sample output from the **showrbscpstatistics**command:

```
Router# show rbscp statistics tunnel 0
Tunnel0 is up, line protocol is up
RBSCP protocol statistics:
  Init FWD-TSNs sent 0, received 0
  TUNNEL-UPs sent 0, received 0
  CLOSEDs sent 0, received 0
  TSNs sent 0, resent 0, lost by sender 0
  TSNs received 0 (duplicates 0)
  FWD-TSNs sent 136 (heartbeats 0)
  FWD-TSNs received 0 (ignored 0)
  FWD-TSNs caused 0 packet drops, 0 whole window drops
  SACKs sent 0, received 0 (ignored 0)
  Recovered with RTX 0
  Received with delay 0
  Most released at once 0
  Failed sends into the: tunnel 1, network 0
  Dropped due to: excess delay 0, tmit queue full 0
  Max on any queue: num packets: 0, num bytes: 0
  Max outstanding: 0
```

## Related Commands

| Command | Description |
|---|---|
| **clear rbscp** | Resets and restarts RBSCP tunnels. |

# show redundancy

To display current or historical status and related information on planned or logged handovers, use the **show redundancy** command in user EXEC or privileged EXEC mode.

**Privileged EXEC Mode**
**show redundancy** [**clients** | **counters** | **debug-log** | **handover** | **history** | **inter-device** | **states** | **switchover** | **switchover history**]

**User EXEC Mode**
**show redundancy** {**clients** | **counters** | **history** | **states** | **switchover**}

## Syntax Description

| | |
|---|---|
| **clients** | (Optional) Displays the redundancy-aware client-application list. |
| **counters** | (Optional) Displays redundancy-related operational measurements. |
| **debug-log** | (Optional) Displays up to 256 redundancy-related debug entries. |
| **handover** | (Optional) Displays details of any pending scheduled handover. |
| **history** | (Optional) Displays past status and related information about logged handovers. This is the only keyword supported on the Cisco AS5800. |
| **inter-device** | (Optional) Displays redundancy interdevice operational state and statistics. |
| **states** | (Optional) Displays redundancy-related states: disabled, initialization, standby, active (various substates for the latter two), client ID and name, length of time since the client was sent the progression, and event history for the progression that was sent to the client. |
| **switchover** | (Optional) Displays the switchover counts, the uptime since active, and the total system uptime. |
| **switchover history** | (Optional) Displays redundancy switchover history. |

## Command Modes

User EXEC (>) Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| 11.3(6)AA | This command was introduced in privileged EXEC mode. |
| 12.2(8)T | This command was integrated into Cisco IOS Release 12.2(8)T. Support for the Cisco AS5800 and Cisco AS5850 is not included in this release. |
| 12.2(8)MC2 | This command was modified. This command was made available in user EXEC mode. |
| 12.2(11)T | The privileged EXEC mode form of this command was implemented on the Cisco AS5800 and Cisco AS5850. |

| Release | Modification |
|---|---|
| 12.2(14)SX | The user EXEC mode form of this command was implemented on the Supervisor Engine 720. |
| 12.2(18)S | This command was implemented on Cisco 7304 routers running Cisco IOS Release 12.2S. |
| 12.2(20)S | The **states**, **counters**, **clients**, **history**, and **switchover history** keywords were added. |
| 12.2(17d)SXB | Support for the user EXEC mode form of this command was extended to the Supervisor Engine 2. |
| 12.3(8)T | The **inter-device** keyword was added to the privileged EXEC form of the command. |
| 12.3(11)T | The user EXEC form of this command was integrated into Cisco IOS Release 12.3(11)T. |
| 12.2(28)SB | This command was integrated into Cisco IOS Release 12.2(28)SB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2(31)SGA | This command was integrated into Cisco IOS Release 12.2(31)SGA. |
| 12.2(33)SRB | The **clients** keyword was enhanced to provide information about the status of each client. |
| 12.2(33)SRB1 | ISSU is supported on the Cisco 7600 series routers in Cisco IOS Release 12.2(33)SRB1. |
| 12.2(31)SXH | This command was integrated into Cisco IOS Release 12.2(31)SXH. |
| 12.2(33)SRE | This command was integrated into Cisco IOS Release 12.2(33)SRE. |
| Cisco IOS XE Release 3.1S | More information regarding the **states** keyword was added. |

## Usage Guidelines

### Cisco AS5800

Use this command from the router-shelf console to determine when failover is enabled. Use this command with the **history** keyword to log failover events.

### Cisco AS5850

To use this command, the router must have two route-switch-controller (RSC) cards installed and must be connected to one of them.

## Examples

The following example shows how to display information about the RF client:

```
Router# show redundancy clients
 clientID = 0       clientSeq = 0        RF_INTERNAL_MSG
 clientID = 25      clientSeq = 130      CHKPT RF
 clientID = 5026    clientSeq = 130      CHKPT RF
 clientID = 5029    clientSeq = 135      Redundancy Mode RF
```

```
clientID = 5006    clientSeq = 170      RFS client
clientID = 6       clientSeq = 180      Const OIR Client
clientID = 7       clientSeq = 190      PF Client
clientID = 5008    clientSeq = 190      PF Client
clientID = 28      clientSeq = 330      Const Startup Config
clientID = 29      clientSeq = 340      Const IDPROM Client
clientID = 65000   clientSeq = 65000    RF_LAST_CLIENT
```

The output displays the following information:

- clientID displays the client's ID number.
- clientSeq displays the client's notification sequence number.
- Current RF state.

The following example shows how to display information about the RF counters:

```
Router# show redundancy counters
Redundancy Facility OMs
               comm link up = 0
        comm link down down = 0
          invalid client tx = 0
          null tx by client = 0
                tx failures = 0
      tx msg length invalid = 0
      client not rxing msgs = 0
 rx peer msg routing errors = 0
           null peer msg rx = 0
         errored peer msg rx = 0
                  buffers tx = 0
     tx buffers unavailable = 0
                buffers rx = 0
      buffer release errors = 0
 duplicate client registers = 0
  failed to register client = 0
       Invalid client syncs = 0
```

The following example shows information about the RF history:

```
Router# show redundancy history
00:00:00 client added: RF_INTERNAL_MSG(0) seq=0
00:00:00 client added: RF_LAST_CLIENT(65000) seq=65000
00:00:02 client added: Const Startup Config Sync Clien(28) seq=330
00:00:02 client added: CHKPT RF(25) seq=130
00:00:02 client added: PF Client(7) seq=190
00:00:02 client added: Const OIR Client(6) seq=180
00:00:02 client added: Const IDPROM Client(29) seq=340
00:00:02 *my state = INITIALIZATION(2) *peer state = DISABLED(1)
00:00:02 RF_PROG_INITIALIZATION(100) RF_INTERNAL_MSG(0) op=0 rc=11
00:00:02 RF_PROG_INITIALIZATION(100) CHKPT RF(25) op=0 rc=11
00:00:02 RF_PROG_INITIALIZATION(100) Const OIR Client(6) op=0 rc=11
00:00:02 RF_PROG_INITIALIZATION(100) PF Client(7) op=0 rc=11
```

The following example shows information about the RF state:

```
Router# show redundancy states
       my state = 13 -ACTIVE
     peer state = 1  -DISABLED
           Mode = Simplex
           Unit = Primary
        Unit ID = 1
```

```
Redundancy Mode (Operational) = Route Processor Redundancy
Redundancy Mode (Configured)  = Route Processor Redundancy
     Split Mode = Disabled
   Manual Swact = Disabled  Reason: Simplex mode
 Communications = Down      Reason: Simplex mode
   client count = 11
 client_notification_TMR = 30000 milliseconds
          keep_alive TMR = 4000 milliseconds
        keep_alive count = 0
    keep_alive threshold = 7
           RF debug mask = 0x0
```

If you enter the **show redundancy states** command with stateful switchover (SSO) configured, the Redundancy Mode (Operational) and the Redundancy Mode (Configured) fields display stateful switchover.

The following example shows how to display the switchover counts, the uptime since active, and the total system uptime:

```
Router> show redundancy switchover
Switchovers this system has experienced          : 1
Uptime since this supervisor switched to active  : 1 minute
Total system uptime from reload                  : 2 hours, 47 minutes
```

### Example: Setting the terminal length for the Cisco ASR 1006

The following example shows how to set the terminal length value to pause the multiple-screen output:

```
Router# terminal length 5
Router# show redundancy states
my state = 13 -ACTIVE
     peer state = 8  -STANDBY HOT
           Mode = Duplex
           Unit = Primary
        Unit ID = 48
```

### Example: Cisco AS5850

The following is sample output from the **show redundancy handover** and **show redundancy states** commands on the Cisco AS5850:

```
Router# show redundancy handover

No busyout period specified
Handover pending at 23:00:00 PDT Wed May 9 2001
Router# show redundancy states

my state = 14 -ACTIVE_EXTRALOAD
peer state = 4 -STANDBY COLD
Mode = Duplex
Unit = Preferred Primary
Unit ID = 6
Redundancy Mode = Handover-split: If one RSC fails, the peer RSC will take over the
feature boards
Maintenance Mode = Disabled
Manual Swact = Disabled Reason: Progression in progress
```

```
Communications = Up
client count = 3
client_notification_TMR = 30000 milliseconds
keep_alive TMR = 4000 milliseconds
keep_alive count = 1
keep_alive threshold = 7
RF debug mask = 0x0
```

### Example: Cisco AS5800

The following is sample output from the **show redundancy** command on the Cisco AS5800:

```
Router# show redundancy
DSC in slot 12:
Hub is in 'active' state.
Clock is in 'active' state.
DSC in slot 13:
Hub is in 'backup' state.
Clock is in 'backup' state.
```

### Example: Cisco AS5800 with History

The following is sample output from the **show redundancy history** command on the Cisco AS5800:

```
Router# show redundancy history
DSC Redundancy Status Change History:
981130 18:56 Slot 12 DSC: Hub, becoming active - RS instruction
981130 19:03 Slot 12 DSC: Hub, becoming active - D13 order
```

### Example: Cisco AS5800 Router Shelves as Failover Pair

The following is sample output from two Cisco AS5800 router shelves configured as a failover pair. The active router shelf is initially RouterA. The **show redundancy history** and **show redundancy** commands have been issued. The **show redundancy** command shows that failover is enabled, shows the configured group number, and shows that this router shelf is the active one of the pair. Compare this output with that from the backup router shelf (RouterB) that follows.

**Note** When RouterA is reloaded, thereby forcing a failover, new entries are shown on RouterB when the**show redundancy history** command is issued after failover has occurred.

### Log from the First Router (RouterA)

```
RouterA# show redundancy history
DSC Redundancy Status Change History:
010215 18:17 Slot -1 DSC:Failover configured -> ACTIVE role by default.
010215 18:18 Slot -1 DSC:Failover -> BACKUP role.
010215 18:18 Slot 12 DSC:Failover -> ACTIVE role.
010215 18:18 Slot 12 DSC:Hub, becoming active - arb timeout
RouterA# show redundancy
```

```
failover mode enabled, failover group = 32
Currently ACTIVE role.
DSC in slot 12:
Hub is in 'active' state.
Clock is in 'active' state.
No connection to slot 13
RouterA# reload
Proceed with reload? [confirm] y
*Feb 15 20:19:11.059:%SYS-5-RELOAD:Reload requested
System Bootstrap, Version xxx
Copyright xxx by cisco Systems, Inc.
C7200 processor with 131072 Kbytes of main memory
```

### Log from the Second Router (RouterB)

```
RouterB# show redundancy
failover mode enabled, failover group = 32
Currently BACKUP role.
No connection to slot 12
DSC in slot 13:
Hub is in 'backup' state.
Clock is in 'backup' state.
*Feb 16 03:24:53.931:%DSC_REDUNDANCY-3-BICLINK:Switching to DSC 13
*Feb 16 03:24:53.931:%DSC_REDUNDANCY-3-BICLINK:Failover:changing to active mode
*Feb 16 03:24:54.931:%DIAL13-3-MSG:
02:32:06:%DSC_REDUNDANCY-3-EVENT:Redundancy event:LINK_FAIL from other DSC
*Feb 16 03:24:55.491:%OIR-6-INSCARD:Card inserted in slot 12, interfaces administratively
shut down
*Feb 16 03:24:58.455:%DIAL13-3-MSG:
02:32:09:%DSC_REDUNDANCY-3-EVENT:Redundancy event:LINK_FAIL from other DSC
*Feb 16 03:25:04.939:%DIAL13-0-MSG:
RouterB# show redundancy
failover mode enabled, failover group = 32
Currently ACTIVE role.
No connection to slot 12
DSC in slot 13:
Hub is in 'active' state.
Clock is in 'backup' state.
RouterB# show redundancy history
DSC Redundancy Status Change History:
010216 03:09 Slot -1 DSC:Failover configured -> BACKUP role.
010216 03:24 Slot 13 DSC:Failover -> ACTIVE role.
010216 03:24 Slot 13 DSC:Hub, becoming active - D12 linkfail
010216 03:24 Slot 13 DSC:Hub, becoming active - D12 linkfail
*Feb 16 03:26:14.079:%DSIPPF-5-DS_HELLO:DSIP Hello from shelf 47 slot 1 Succeeded
*Feb 16 03:26:14.255:%DSIPPF-5-DS_HELLO:DSIP Hello from shelf 47 slot 3 Succeeded
*Feb 16 03:26:14.979:%DSIPPF-5-DS_HELLO:DSIP Hello from shelf 47 slot 10 Succeeded
```

### Example: Privileged EXEC Mode

The following is sample output generated by this command in privileged EXEC mode on router platforms that support no keywords for the privileged EXEC mode form of the command:

```
RouterB# show redundancy
MWR1900 is the Active Router
Previous States with most recent at bottom
 INITL_INITL     Dec 31 19:00:00.000
 LISTN_INITL     Feb 28 19:00:15.568
```

```
LISTN_LISTN     Feb 28 19:00:15.568
SPEAK_LISTN     Feb 28 19:00:18.568
SPEAK_SPEAK     Feb 28 19:00:18.568
STDBY_SPEAK     Mar 19 08:54:26.191
ACTIV_SPEAK     Mar 19 08:54:26.191
ACTIV_STDBY     Mar 19 08:54:26.191
ACTIV_ACTIV     Mar 19 08:54:26.191
INITL_ACTIV     Mar 19 08:56:22.700
INITL_INITL     Mar 19 08:56:22.700
INITL_LISTN     Mar 19 08:56:28.544
LISTN_LISTN     Mar 19 08:56:28.652
LISTN_SPEAK     Mar 19 08:56:31.544
SPEAK_SPEAK     Mar 19 08:56:31.652
SPEAK_STDBY     Mar 19 08:56:34.544
SPEAK_ACTIV     Mar 19 08:56:34.544
STDBY_ACTIV     Mar 19 08:56:34.652
ACTIV_ACTIV     Mar 19 08:56:34.652
INITL_ACTIV     Mar 19 10:20:41.455
INITL_INITL     Mar 19 10:20:41.455
INITL_LISTN     Mar 19 10:20:49.243
LISTN_LISTN     Mar 19 10:20:49.299
LISTN_SPEAK     Mar 19 10:20:52.244
SPEAK_SPEAK     Mar 19 10:20:52.300
SPEAK_STDBY     Mar 19 10:20:55.244
STDBY_STDBY     Mar 19 10:20:55.300
ACTIV_STDBY     Mar 19 10:21:01.692
ACTIV_ACTIV     Mar 19 10:21:01.692
```

## Related Commands

| Command | Description |
|---|---|
| **debug redundancy** | Displays information used for troubleshooting dual (redundant) router shelves (Cisco AS5800) or RSCs (Cisco AS5850). |
| **hw-module** | Enables the router shelf to stop a DSC or to restart a stopped DSC. |
| **mode** | Sets the redundancy mode. |
| **mode y-cable** | Invokes y-cable mode. |
| **redundancy** | Enters redundancy configuration mode. |
| **redundancy force-switchover** | Forces a switchover from the active to the standby supervisor engine. |
| **show chassis** | Displays, for a router with two RSCs, information about the mode (handover-split or classic-split), RSC configuration, and slot ownership. |
| **show standby** | Displays the standby configuration. |
| **standalone** | Specifies whether the MWR 1941-DC router is used in a redundant or standalone configuration. |
| **standby** | Sets HSRP attributes. |

# show redundancy (HSA redundancy)

To display the current redundancy mode, use the **showredundancy**command in user EXEC or privileged EXEC mode.

**show redundancy**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 11.2 GS | This command was introduced. |
| 12.0(16)ST | This command was modified to display information about Route Processor Redundancy (RPR). |
| 12.0(19)ST1 | This command was modified to display information about RPR Plus (RPR+). |
| 12.3(7)T | The command modifications to support RPR and RPR+ were integrated into Cisco IOS Release 12.3(7)T. |

## Usage Guidelines

Use this command to display the redundancy mode of a Cisco 7500 series router. The default redundancy mode is High System Availability (HSA). Use the **redundancy**configuration command to enter redundancy configuration mode. Use the **moderpr**command in redundancy configuration mode to configure RPR as the high availability mode. HSA is the default high availability mode.

## Examples

The following is sample output from the **showredundancy** command for a router with RPR configured:

```
Router# show redundancy
redundancy mode rpr
hw-module slot 2 image slot0:rsp-pv-mz
hw-module slot 3 image slot0:rsp-pv-mz
```

## Related Commands

| Command | Description |
|---|---|
| **hw-module sec-cpu reset** | Resets and reloads the standby RSP with the specified Cisco IOS image and executes the image. |
| **hw-module slot image** | Specifies a high availability Cisco IOS image to run on a standby RSP. |
| **mode (HSA redundancy)** | Configures the redundancy mode. |
| **redundancy** | Enters redundancy configuration mode. |

# show redundancy interchassis

To display information about interchassis redundancy group configuration, use the **show redundancy interchassis** command in privileged EXEC mode.

**show redundancy interchassis** *group-number*

## Syntax Description

| | |
|---|---|
| *group-number* | Interchassis redundancy group number. |

## Command Modes

Privileged EXEC (#)

## Command History

| Release | Modification |
|---|---|
| Cisco IOS 15.2(1)S | This command was introduced. |
| Cisco IOS XE 3.11S | This command was integrated into Cisco IOS XE Release 3.11S. |

The following is sample output from the **show redundancy interchassis** command when *group-number* is used to display information about an interchassis redundancy group:

```
Router# show redundancy interchassis 100

Redundancy Group 100 (0x64)
Applications connected: MR-APS with HSPW
Monitor mode: RW
member ip: 60.60.60.2 "R-222-2028", CONNECTED
Route-watch for 60.60.60.2 is UP
MR-APS with HSPW state: CONNECTED
backbone int GigabitEthernet0/4/0: UP (IP)
backbone int GigabitEthernet0/4/2: UP (IP)
ICRM fast-failure detection neighbor table
IP Address Status Type Next-hop IP Interface
========== ====== ==== ============ =========
60.60.60.2 UP RW
```

## Related Commands

| Command | Description |
|---|---|
| **show hspw-aps-icrm** | Displays information about HSPW. |

# show redundancy interlink

To display interlink utilization, use the **showredundancyinterlink**command in user EXEC or privileged EXEC mode.

**show redundancy interlink** [**rx** | **tx** [**pps** | **bps**]] [**histogram**]

## Syntax Description

| | |
|---|---|
| **rx** | (Optional) Receive interlink utilization histograms. |
| **tx** | (Optional) Transmit interlink utilization histograms. |
| **pps** | (Optional) Packets per second (pps) histograms. |
| **bps** | (Optional) Bytes per second (bps) histograms. |
| **histogram** | (Optional) Usage information. |

## Command Default

Interlink utilization information is not displayed.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(11)T | This command was introduced on the Cisco AS5850. |
| 12.2(31)SB | This command was introduced on the Cisco 10000 series Internet routers. Support for the Cisco AS5850 is not included in this release. |

## Usage Guidelines

Use the **showredundancyinterlink** command to display the current or historical status on interlink utilization.

## Examples

The following histogram displays receive BPS interlink information for the past minute, the past hour, and the past three days:

```
Router# show redundancy interlink rx bps histogram
      1111111111111111111111111111111111111111111111112222222222111
5000
4500
4000
3500
3000
2500
2000
1500
1000
  500
    0....5....1....1....2....2....3....3....4....4....5....5....
              0    5    0    5    0    5    0    5    0    5
                   Interlink Rx BPS (last 60 seconds)
                      # = Bits Per Second (x1000)
      2111112111112121111121111111211111111111111111111111111111
5000
4500
```

```
4000
3500
3000
2500
2000
1500
1000
  500
     0....5....1....1....2....2....3....3....4....4....5....5....
               0    5    0    5    0    5    0    5    0    5
                    Interlink Rx BPS (last 60 minutes)
            * = maximum BPS (x1000)    # = average BPS (x1000)

111122222111111111211111111111111112112111111111111111211121111111111111
5000
4500
4000
3500
3000
2500
2000
1500
1000
  500

0....5....1....1....2....2....3....3....4....4....5....5....6....6....7.
               0    5    0    5    0    5    0    5    0    5    0
5    0
                    Interlink Rx BPS (last 72 hours)
            * = maximum BPS (x1000)    # = average BPS (x1000)
```

# show rpc

To display remote procedure call (RPC) information, use the **showrpc** command in user EXEC or privileged EXEC mode.

**show rpc** {**applications** | **counters** | **status**}

## Syntax Description

| | |
|---|---|
| **applications** | Displays information about the RPC application. |
| **counters** | Displays the RPC counters. |
| **status** | Displays the RPC status. |

## Command Default

This command has no default settings.

## Command Modes

User EXEC Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

## Examples

This example shows how to display RPC applications:

```
Router#
show rpc applications
  ID Dest Callback Application
   1 0011 <remote> rpc-master
   2 0011 <remote> cygnus-oir
   3 0021 60201708 rpc-slave-33
   4 0021 6022A514 idprom-MP
   5 0021 60204420 msfc-oir
   6 0011 <remote> Nipcon-SP
   7 0011 <remote> sw_vlan_sp
   8 0011 <remote> stp_switch_api
   9 0011 <remote> pagp_rpc
  10 0011 <remote> span_switch_rpc
  11 0011 <remote> pf_rp_rpc
  13 0011 <remote> mapping_sp
  14 0011 <remote> logger-sp
  17 0011 <remote> c6k_power_sp
  18 0011 <remote> c6k_sp_environmental
  19 0011 <remote> pagp_switch_rpc
  20 0011 <remote> pm-cp
  21 0021 602675B0 Nipcon-RP
  22 0021 602283B0 pm-mp
  23 0021 601F2538 sw_vlan_rp
  24 0021 601F77D0 span_switch_sp_rpc
  25 0021 601F7950 idbman_fec
  26 0021 601F7F30 logger-rp
  27 0021 601F80D8 pagp_switch_l3_split
```

```
  28 0021 601F81C0 pagp_switch_sp2mp
  29 0021 6026F190 c6k_rp_environmental
Router#
```

This example shows how to display information about the RPC counters:

```
Router#
show rpc counters
  ID Dest Rcv-req  Xmt-req  Q size   Application
   1 0011 0        26       0        rpc-master
   2 0011 0        6221     0        cygnus-oir
   4 0021 15       0        0        idprom-MP
   5 0021 6222     0        0        msfc-oir
   7 0011 0        2024     0        sw_vlan_sp
   8 0011 0        3        0        stp_switch_api
   9 0011 0        188      0        pagp_rpc
  11 0011 0        4        0        pf_rp_rpc
  13 0011 0        2        0        mapping_sp
  14 0011 0        3        0        logger-sp
  17 0011 0        2        0        c6k_power_sp
  18 0011 0        66       0        c6k_sp_environmental
  19 0011 0        109      0        pagp_switch_rpc
  20 0011 0        33       0        pm-cp
  22 0021 126      0        0        pm-mp
  23 0021 5        0        0        sw_vlan_rp
  24 0021 14       0        0        span_switch_sp_rpc
  25 0021 22       0        0        idbman_fec
  26 0021 8        0        0        logger-rp
  27 0021 3        0        0        pagp_switch_l3_split
  28 0021 3        0        0        pagp_switch_sp2mp
Router#
```

# show running configuration | include mode

Use this command to configure hardware module of the chassis.

**show running configuration | include mode**

There are no keywords for this command.

**Command Default** None

**Command Modes** User EXEC Privileged EXEC

**Examples** The following example shows how to configure configure 5G mode from 10G mode:

```
enable
configure terminal
platform hw-module configuration
hw-module slot / bay PID mode 5G_CEM
end
```

**Related Commands**

| Command | Description |
|---|---|
| **platform hw-module configuration** | Configures the hardware module of the chassis |
| **hw-module mode** | Configures the IM from 10G to 5G mode. |

# show scp

To display Switch-Module Configuration Protocol (SCP) information, use the **show scp** in privileged EXEC mode on the Switch Processor.

**show scp** {**accounting** | **counters** | **linecards** [**details**] | **mcast** {**group** *group-id* | **inst**} | **process** *id* | **status**}

## Syntax Description

| | |
|---|---|
| **accounting** | Displays information about the SCP accounting. |
| **counters** | Displays information about the SCP counter. |
| **linecards** | Displays information about the Optical Services Module (OSM) wide area network (WAN) modules in the chassis. |
| **details** | (Optional) Displays detailed information about the OSM WAN module. |
| **mcast** | Displays information about the SCP multicast. |
| **group** *group-id* | (Optional) Displays information for a specific group and group ID; valid values are from 1 to 127. |
| **inst** | (Optional) Displays information for an instance. |
| **process** *id* | Displays all the processes that have registered an SAP with SCP. |
| **status** | Displays information about the local SCP server status. |

## Command Default

This command has no default settings.

## Command Modes

Privileged EXEC on the Switch Processor

## Command History

| Release | Modification |
|---|---|
| 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| 12.2(18)SXE | The output of the **show scp process** command was changed to display all the processes that have registered an SAP with SCP on the Supervisor Engine 720 only. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 15.0(1)S | The output of the **show scp status** command was changed to additionally display the Flow Control State (FC-State) and the Flow Control Count (FC-Count) |

## Examples

This example displays the SCP flow control status:

```
Router# show scp status
Rx 185,  Tx 181,  scp_my_addr 0x14
```

```
Id Sap   Channel name      current/peak/retry/dropped/totaltime(queue/process/ack) FC-state
  FC-count
-------------------------------------------------------------  ---------- ---- --------
 0  18   SCP Unsolicited:18    801/    0/    0/      0/    0      0/   0/   0 off         0
 1  80   SCP Unsolicited:80      0/    0/    0/      0/    0      0/   0/   0 off         0
 2  23   SCP async: LCP#5        0/    0/    0/      0/    0      0/   0/   0 off         0
 3  0    SCP Unsolicited:0       0/    1/    0/      0/    5      0/   0/   0 off         0

-----------------------------------------------------------------------------------------------------------------------
```

FC-state indicates the flow control state and FC-count indicates the number of times flow control has been turned on.

This example shows how to display all the processes that have registered an SAP with SCP:

```
Router# show module
Mod Ports Card Type                                Model              Serial No.
--- ----- ---------------------------------------- ------------------ -----------
  1   48  48-port 10/100 mb RJ45                   WS-X6148-RJ-45     SAL091800RY
  2    0  2 port adapter Enhanced FlexWAN          WS-X6582-2PA       JAE0940MH7Z
  3    8  8 port 1000mb GBIC Enhanced QoS          WS-X6408A-GBIC     SAL09391KZH
  5    2  Supervisor Engine 720 (Active)           WS-SUP720-3BXL     SAL09337UE6
  6    2  Supervisor Engine 720 (Hot)              WS-SUP720-3BXL     SAL09148P59
Mod MAC addresses                       Hw     Fw           Sw           Status
--- ----------------------------------- ------ ------------ ------------ -------
  1  0013.c3f8.d2c4 to 0013.c3f8.d2f3   5.0    8.3(1)       8.6(0.366)TA Ok
  2  0015.2bc3.5b40 to 0015.2bc3.5b7f   2.1    12.2(nightly 12.2(nightly Ok
  3  0015.6324.ed48 to 0015.6324.ed4f   3.1    5.4(2)       8.6(0.366)TA Ok
  5  0014.a97d.b0ac to 0014.a97d.b0af   4.3    8.4(2)       12.2(nightly Ok
  6  0013.7f0d.0660 to 0013.7f0d.0663   4.3    8.4(2)       12.2(nightly Ok
Mod  Sub-Module                  Model              Serial       Hw     Status
---- --------------------------- ------------------ ------------ ------- -------
  5  Policy Feature Card 3       WS-F6K-PFC3BXL     SAL09337NVE  1.6    Ok
  5  MSFC3 Daughterboard         WS-SUP720          SAL09327AU6  2.3    Ok
  6  Policy Feature Card 3       WS-F6K-PFC3BXL     SAL1033Y0YK  1.8    Ok
  6  MSFC3 Daughterboard         WS-SUP720          SAL09158XB3  2.3    Ok
Mod  Online Diag Status
---- --------------------
  1  Pass
  2  Pass
  3  Pass
  5  Pass
  6  Pass
Router# attach 5
Trying Switch ...
Entering CONSOLE for Switch
Type "^C^C^C" to end this session
Switch-sp#
show scp process
Sap Pid Name
=== === ====
0 180 CWAN-RP SCP Input Process
18 42 itasca
20 3 Exec
21 3 Exec
22 180 CWAN-RP SCP Input Process
Total number of SAP registered = 5
Router#
```