service single-slot-reload-enable

To enable single line card reloading for all line cards in the Cisco 7500 series router, use the **service single-slot-reload-enable** command in global configuration mode. To disable single line card reloading for the line cards in the Cisco 7500 series router, use the **no** form of this command.

service single-slot-reload-enable

no service single-slot-reload-enable

Syntax Description

This command has no arguments or keywords.

Defaults

Single line card reloading is disabled by default.

Command Modes

Global configuration mode

Command History

Release	Modification
12.0(13)S	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Examples

In the following example, single line card reloading is enabled for all lines cards on the Cisco 7500 series router:

```
Router(config)# service single-slot-reload-enable
```

Related Commands

Command	Description
show running-config	Displays configuration information.
show diag	Displays hardware information for a networking device.

set ip df

To change the Don't Fragment (DF) bit value in the IP header, use the **set ip df** command in route-map configuration mode. To disable changing the DF bit value, use the **no** form of this command.

set ip df {**0** | **1**}

no set ip df {**0** | **1**}

Syntax Description

0	Sets the DF bit to 0 (clears the DF bit) and allows packet fragmentation.
1	Sets the DF bit to 1 which prohibits packet fragmentation.

Defaults

The DF bit value is not changed in the IP header.

Command Modes

Route-map configuration

Command History

Release	Modification
12.1(6)	This command was introduced.

Usage Guidelines

Using Path MTU Discovery (PMTUD) you can determine an MTU value for IP packets that avoids fragmentation. If ICMP messages are blocked by a router, the path MTU is broken and packets with the DF bit set are discarded. Use the **set ip df** command to clear the DF bit and allow the packet to be fragmented and sent. Fragmentation can slow the speed of packet forwarding on the network but access lists can be used to limit the number of packets on which the DF bit will be cleared.

Note Some IP transmitters (notably some versions of Linux) may set the identification field in the IP header (IPid) to zero when the DF bit is set. If the router should clear the DF bit on such a packet and if that packet should subsequently be fragmented, then the IP receiver will probably be unable to correctly reassemble the original IP packet.

Examples

The following example shows how to clear the DF bit to allow fragmentation. In this example a router is blocking ICMP messages and breaking the path MTU. Using policy routing both the inbound and outbound packets on interface serial 0 will have their DF bit set to 0 which allows fragmentation.

```
interface serial 0

ip policy route-map clear-df-bit
route-map clear-df-bit permit 10
match ip address 111
set ip df 0

access-list 111 permit tcp any any
```

Related Commands

Command	Description
ip tcp path-mtu-discovery	Enables Path MTU Discovery.
route-map	Defines a route map to control where packets are output.

show alarm-interface

To display the alarm interface controller (AIC) configuration setting and the information sent to the Cisco IOS software by the AIC, use the **show alarm-interface** command in privileged EXEC mode.

show alarm-interface [*slot-number*] [**summary**]

Syntax Description

slot-number	(Optional) Selects AIC when you enter the slot number in which the AIC was placed.
summary	(Optional) Selects the summary format for the output message.

Defaults

Displays verbose message output and displays all AICs in all slot numbers on the router.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(2)XG	This command was introduced on the Cisco 2600 series and Cisco 3600 series.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T.

Examples

The following is sample output from the **show alarm-interface summary** command:

```
Router# show alarm-interface 5 summary

         Alarm Interface Card in Slot 5:
Configured IP address:10.2.130.102
Status: KEEPALIVE TIMER EXPIRED
Alarm Interface Card in Slot 5:
Configured IP address:10.2.130.102
Status:KEEPALIVE TIMER EXPIRED
```

The following is an example of a verbose **show alarm-interface** display:

```
Router# show alarm-interface 4

         Alarm Interface Card in Slot 4:
Configured IP address: 10.10.10.2
Status: RUNNING
Timer expires in < 11 min.
Reported version: 00 00 00 01
Expected version: 00 00 00 01
Last Self Test result: READY
Last Start-Up message:
----------
<AIC>: Hardware Version 1, Revision A Software Version 2, Revision A 1.0.1 Installed and
running, POST passed.
----------
```

```
Last Status severity: 0
Last Status message:
----------
Status
----------
```

Table 10 describes significant fields shown in this output.

Table 10 show alarm-interface Field Descriptions

Field	Description
Alarm Interface Card in Slot 4	Card type and slot number.
Configured IP address	Configured IP address.
Status	Alarm interface controller (AIC) card status. Can be one of the following: • HARDWARE DETECTED • RUNNING • HARDWARE NOT PRESENT • KEEPALIVE TIMER EXPIRED
Timer expires in	Current value of the KEEPALIVE TIMER, or states if the timer has been disabled. This line is only active when the status line reads HARDWARE DETECTED or RUNNING. Used in troubleshooting to detect operational failures of the AIC.
Reported version	Active software version number. Comparing the reported version to the expected version may reveal possible incompatibilities between the AIC's software and the IOS image.
Expected version	Expected software version number. Comparing the reported version to the expected version may reveal possible incompatibilities between the AIC's software and the IOS image.
Last Self Test result	Result of the AIC's power on self-test (POST).
Last Start-Up message	Startup messages.
<AIC>	AIC. Includes version and activity information.
Last Status severity	Rates the severity of the status message. Any number other than 0 indicates a need for intervention. The number 1 indicates the most severe condition.
Last Status message	Last status message.

Related Commands

Command	Description
alarm-interface	Enters the alarm interface mode and configures the AIC.

show aps

To display information about the current automatic protection switching (APS) feature, use the **show aps** command in privileged EXEC mode.

show aps

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1 CC	This command was introduced.

Examples

The following is an example of the **show aps** command on a router configured with a working interface. In this example, POS interface 0/0/0 is configured as a working interface in group 1, and the interface is selected (that is, active).

```
router1# show aps

POS0/0/0 working group 1 channel 1 Enabled Selected
```

The following is an example of the **show aps** command on a router configured with a protect interface. In this example, POS interface 2/0/0 is configured as a protect interface in group 1, and the interface is not selected (the ~ indicates that the interface is not active). The output also shows that the working channel is located on the router with the IP address 15.1.6.1 and that the interface is currently selected (that is, active).

```
router2# show aps

POS2/0/0 protect group 1 channel 0 bidirectional ~Selected
        Rx_K1= 0, Rx_K2= 0 Tx_K1= 0 Tx_K2= 5
        Working channel 1 at 10.1.6.1 Enabled
```

For the K1 field (8 bits), the first 4 bits indicate the channel number that has made the request, and the last 4 bits map to the requests (local or external) listed in Table 11. For the K2 field (8 bits), the first 4 bits indicate the channel number bridged onto the protect line, the next bit is the architecture used, and the last 3 bits indicate the mode of operation or non-APS use listed in Table 11.

Table 11 K1 Bit Descriptions

Bits (Hexadecimal)	Description
K1 bits 8765	K1 bits 8 through 5: Channel number that made the request.
K1 bits 4321	K1 bits 4 through 1: Type of request.
1111 (0xF)	Lockout of protection request.
1110 (0xE)	Forced switch request.
1101 (0xD)	Signal failure (SF)—high priority request.

Table 11 K1 Bit Descriptions (continued)

Bits (Hexadecimal)	Description
1100 (0xC)	Signal failure (SF)—low priority request.
1011 (0xB)	Signal degradation (SD)—high priority request.
1010 (0xA)	Signal degradation (SD)—low priority request.
1001 (0x9)	Not used.
1000 (0x8)	Manual switch request.
0111 (0x7)	Not used.
0110 (0x6)	Wait to restore request.
0101 (0x5)	Not used.
0100 (0x4)	Exercised request.
0011 (0x3)	Not used.
0010 (0x2)	Reverse request.
0001 (0x1)	Do not revert request.
0000 (0x0)	No request.

show compress

To display compression statistics, use the **show compress** command in user EXEC and privileged EXEC mode.

show compress

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
11.3	An example for hardware compression was added as implemented in the Canadian Standards Association (CSA) hardware.

Examples

The following is a sample output display from the **show compress** command when software compression is used on the router:

```
Router# show compress

Serial0
uncompressed bytes xmt/rcv 10710562/11376835
1  min avg ratio xmt/rcv 2.773/2.474
5  min avg ratio xmt/rcv 4.084/3.793
10 min avg ratio xmt/rcv 4.125/3.873
no bufs xmt 0 no bufs rcv 0
resets 0
```

Table 12 describes the fields shown in the display.

Table 12 show compress Field Descriptions—Software Compression

Field	Description
Serial0	Name and number of the interface.
uncompressed bytes xmt/rcv	Total number of uncompressed bytes sent and received.
1 min avg ratio xmt/rcv 5 min avg ratio xmt/rcv 10 min avg ratio xmt/rcv	Static compression ratio for bytes sent and received, averaged over 1, 5, and 10 minutes.
no bufs xmt	Number of times buffers were not available to compress data being sent.
no bufs rcv	Number of times buffers were not available to uncompress data being received.
resets	Number of resets (for example, line errors could cause resets).

The following is a sample output display from the **show compress** command when hardware compression is enabled (that is, compression is implemented in the CSA hardware):

```
Router# show compress

 Serial6/1
     Hardware compression enabled
     CSA in slot3 in use
     Compressed bytes sent:     402 bytes     0 Kbits/sec    ratio: 4.092
     Compressed bytes recv:     390 bytes     0 Kbits/sec    ratio: 3.476
     restarts:1
     last clearing of counters: 1278 seconds
```

Table 13 describes the fields shown in the display. The information displayed by the **show compress** command is the same for hardware and distributed compression. For Cisco 7200 series routers with multiple CSAs, an additional line is displayed indicating the CSA in use.

Table 13 show compress Field Descriptions—Hardware or Distributed Compression

Field	Description
Serial6/1	Name and number of the interface.
Hardware compression enabled	Type of compression.
CSA in slot3 in use	Identifies the CSA that is performing compression service.
Compressed bytes sent	Total number of compressed bytes sent including the kilobits per second.
Compressed bytes recv	Total number of compressed bytes received including the kilobits per second.
ratio	Compression ratio for bytes sent and received since the link last came up or since the counters were last cleared.
restarts	Number of times the compression process restarted or reset.
last clearing of counters	Duration since the last time the counters were cleared with the **clear counters** command.

Related Commands

Command	Description
compress	Configures compression for LAPB, PPP, and HDLC encapsulations.

show etherchannel

To display EtherChannel information for a channel, use the **show etherchannel** command in privileged EXEC mode.

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

show etherchannel [*channel-group*] {**port-channel | brief | detail | summary | port | load-balance**}

Catalyst Switches

show etherchannel [*channel-group*] {**port-channel | brief | detail | summary | port | load-balance**} [{**begin | exclude | include**} *expression*]

Syntax Description

channel-group	(Optional) Number of the channel group; see the "Usage Guidelines" section for valid values.
port-channel	Displays port channel information.
brief	Displays a summary of EtherChannel information.
detail	Displays detailed EtherChannel information.
summary	Displays a one-line summary per channel group.
port	Displays EtherChannel port information.
load-balance	Displays load-balance information.
begin	(Optional) Specifies that the output display begin with the line that matches the *expression* value.
exclude	(Optional) Specifies that the output display exclude lines that match the *expression* value.
include	(Optional) Specifies that the output display include lines that match the *expression* value.
expression	Expression in the output to use as a reference point.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(7)XE	This command was introduced on Catalyst 6000 family switches.
12.1(3a)E3	The number of valid values for *channel-group* changed; see the "Usage Guidelines" section for valid values.
12.2(2)XT	This command was integrated to support switchport creation 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 to support switchport creation.

Usage Guidelines

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

The *channel-group* argument supports six EtherChannels and eight ports in each channel.

If you do not specify a value for *channel-group*, all channel groups are displayed.

Catalyst Switches

The number of valid values for the *channel-group* argument depends on the software release. For software releases prior to Cisco IOS Release 12.1(3a)E3, valid values are from 1 to 256; for Cisco IOS Release 12.1(3a)E3, 12.1(3a)E4, and 12.1(4)E1, valid values are from 1 to 64. Cisco IOS Release 12.1(5c)EX and later support a maximum of 64 values ranging from 1 to 256.

If you do not specify a value for *channel-group*, all channel groups are displayed.

In the output, the Passive port list field is displayed for Layer 3 port channels only. This field means that the physical interface, which is still not up, is configured to be in the channel group (and indirectly in the only port channel in the channel group).

Expressions, are case sensitive. For example, if you enter **exclude output**, the lines that contain "output" are not displayed, but the lines that contain "Output" are displayed.

Examples

Port Channel Information for a Specific Group

The following example shows how to display port channel information for a specific group:

```
Router# show etherchannel 1 port-channel

                Port-channels in the group:
                ----------------------
Port-channel: Po1
------------
Age of the Port-channel   = 02h:35m:26s
Logical slot/port   = 10/1          Number of ports in agport = 0
GC                  = 0x00000000      HotStandBy port = null
Passive port list   = Fa5/4 Fa5/5
Port state          = Port-channel L3-Ag Ag-Not-Inuse
Ports in the Port-channel:
Index   Load   Port
-------------------
```

Load Balancing

The following example shows how to display load-balancing information:

```
Router# show etherchannel load-balance

Source XOR Destination mac address
Router#
```

Summary Information for a Specific Group

The following example shows how to display a summary of information for a specific group:

```
Router# show etherchannel 1 brief
Group state = L3
Ports: 2   Maxports = 8
port-channels: 1 Max port-channels = 1
```

Detailed Information for a Specific Group

The following example shows how to display detailed information for a specific group:

```
Router# show etherchannel 1 detail

Group state = L3
Ports: 2   Maxports = 8
Port-channels: 1 Max Port-channels = 1
               Ports in the group:
               -------------------
Port: Fa5/4
------------
Port state    = EC-Enbld Down Not-in-Bndl Usr-Config
Channel group = 1           Mode = Desirable     Gcchange = 0
Port-channel  = null        GC   = 0x00000000    Psudo-agport = Po1
Port indx     = 0           Load = 0x00
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.
Timers: H - Hello timer is running.        Q - Quit timer is running.
        S - Switching timer is running.    I - Interface timer is running.

Local information:
                                Hello    Partner  PAgP     Learning  Group
Port      Flags State   Timers  Interval Count   Priority   Method  Ifindex
Fa5/4     d     U1/S1           1s       0        128        Any      0

Age of the port in the current state: 02h:33m:14s
Port: Fa5/5
------------

Port state    = EC-Enbld Down Not-in-Bndl Usr-Config
Channel group = 1           Mode = Desirable     Gcchange = 0
Port-channel  = null        GC   = 0x00000000    Psudo-agport = Po1
Port indx     = 0           Load = 0x00

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.
Timers: H - Hello timer is running.        Q - Quit timer is running.
        S - Switching timer is running.    I - Interface timer is running.


Local information:
                                Hello    Partner  PAgP     Learning  Group
Port      Flags State   Timers  Interval Count   Priority   Method  Ifindex
Fa5/5     d     U1/S1           1s       0        128        Any      0

Age of the port in the current state: 02h:33m:17s
               Port-channels in the group:
               ----------------------


Port-channel: Po1
------------
Age of the Port-channel   = 02h:33m:52s
Logical slot/port   = 10/1          Number of ports in agport = 0
GC                  = 0x00000000      HotStandBy port = null
Passive port list   = Fa5/4 Fa5/5
Port state          = Port-channel L3-Ag Ag-Not-Inuse

Ports in the Port-channel:

Index   Load   Port
-------------------
```

One-Line Summary Per Channel Group

The following example shows how to display a one-line summary per channel group:

```
Router# show etherchannel summary

U-in use  I-in port-channel   S-suspended   D-down  i-stand-alone  d-default
Group Port-channel  Ports
----- ------------  ----------------------------------------------------------
1     Po1(U)        Fa5/4(I)  Fa5/5(I)
2     Po2(U)        Fa5/6(I)  Fa5/7(I)
255                 Fa5/9(i)
256                 Fa5/8(i)
```

The following example shows how to display EtherChannel port information for all ports and all groups:

```
Router# show etherchannel port

               Channel-group listing:
               ----------------------
Group: 1
----------
               Ports in the group:
               -------------------
Port: Fa5/4
------------
Port state    = EC-Enbld Down Not-in-Bndl Usr-Config
Channel group = 1           Mode = Desirable     Gcchange = 0
Port-channel  = null        GC   = 0x00000000    Psudo-agport = Po1
Port indx     = 0           Load = 0x00

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.
Timers: H - Hello timer is running.        Q - Quit timer is running.
        S - Switching timer is running.    I - Interface timer is running.

Local information:
                              Hello    Partner  PAgP     Learning  Group
Port      Flags State   Timers  Interval Count   Priority   Method  Ifindex
Fa5/4     d     U1/S1           1s       0        128        Any      0

Age of the port in the current state: 02h:40m:35s
Port: Fa5/5
------------
Port state    = EC-Enbld Down Not-in-Bndl Usr-Config
Channel group = 1           Mode = Desirable     Gcchange = 0
Port-channel  = null        GC   = 0x00000000    Psudo-agport = Po1
Port indx     = 0           Load = 0x00

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.
Timers: H - Hello timer is running.        Q - Quit timer is running.
        S - Switching timer is running.    I - Interface timer is running.
.
.
.
```

Related Commands

Command	Description
channel-group	Assigns and configures an EtherChannel interface to an EtherChannel group.
interface port-channel	Accesses or creates the IDB port channel.

show hub

To display information about the hub (repeater) on an Ethernet interface of a Cisco 2505 or Cisco 2507 router, use the **show hub** command in user EXEC and privileged EXEC mode.

show hub [**ethernet** *number* [*port* [*end-port*]]]

Syntax Description

ethernet	(Optional) Indicates that this is an Ethernet hub.
number	(Optional) Hub number, starting with 0. Because there is currently only one hub, this number is 0.
port	(Optional) Port number on the hub. On the Cisco 2505 router, port numbers range from 1 through 8. On the Cisco 2507 router, port numbers range from 1 through 16. If a second port number follows, this port number indicates the beginning of a port range.
end-port	(Optional) Ending port number of a range.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
10.3	This command was introduced.

Usage Guidelines

If you do not specify a port or port range for the **show hub** command, the command displays all ports (for example, ports 1 through 16 on a Cisco 2507 router) by default. Therefore, the **show hub**, **show hub ethernet 0**, and **show hub ethernet 0 1 16** commands produce the same result.

If no ports are specified, the command displays some additional data about the internal port. The internal port is the hub's connection to Ethernet interface 0 inside the box. Ethernet interface 0 still exists; physical access to the interface is via the hub.

Examples

Information for a Specific Port

The following is sample output from the **show hub** command for hub 0, port 2 only:

```
Router# show hub ethernet 0 2

Port 2 of 16 is administratively down, link state is down
  0 packets input, 0 bytes
  0 errors with 0 collisions
     (0 FCS, 0 alignment, 0 too long,
      0 short, 0 runts, 0 late,
      0 very long, 0 rate mismatches)
  0 auto partitions, last source address (none)
  Last clearing of "show hub" counters never
```

```
Repeater information (Connected to Ethernet0)
  2792429 bytes seen with 18 collisions, 1 hub resets
  Version/device ID 0/1 (0/1)
  Last clearing of "show hub" counters never
```

Information for All Ports

The following is sample output from the **show hub** command for hub 0, all ports:

```
Router# show hub ethernet 0

Port 1 of 16 is administratively down, link state is up
  2458 packets input, 181443 bytes
  3 errors with 18 collisions
     (0 FCS, 0 alignment, 0 too long,
      0 short, 3 runts, 0 late,
      0 very long, 0 rate mismatches)
  0 auto partitions, last source address was 0000.0cff.e257
  Last clearing of "show hub" counters never
...
Port 16 of 16 is down, link state is down
  0 packets input, 0 bytes
  0 errors with 0 collisions
     (0 FCS, 0 alignment, 0 too long,
      0 short, 0 runts, 0 late,
      0 very long, 0 rate mismatches)
  0 auto partitions, last source address (none)
  Last clearing of "show hub" counters never

Repeater information (Connected to Ethernet0)
  2792429 bytes seen with 18 collisions, 1 hub resets
  Version/device ID 0/1 (0/1)
  Last clearing of "show hub" counters never

Internal Port (Connected to Ethernet0)
  36792 packets input, 4349525 bytes
  0 errors with 14 collisions
     (0 FCS, 0 alignment, 0 too long,
      0 short, 0 runts, 0 late,
      0 very long, 0 rate mismatches)
  0 auto partitions, last source address (none)
  Last clearing of "show hub" counters never
```

Table 14 describes significant fields shown in the display.

Table 14 show hub Field Descriptions

Field	Description
Port ... of ... is administratively down	Port number out of total ports; indicates whether the interface hardware is currently active or down because of the following: • The link-state test failed. • The MAC address mismatched when source address configured. • It has been taken down by an administrator.
link state is up	Indicates whether port has been disabled by the link-test function. If the link-test function is disabled by the user, nothing will be shown here.
packets input	Total number of error-free packets received by the system.

Table 14 show hub Field Descriptions (continued)

Field	Description
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
errors	Sum of FCS, alignment, too long, short, runts, very long, and rate mismatches.
collisions	Number of messages retransmitted due to Ethernet collisions.
FCS	Counter for the number of frames detected on the port with an invalid frame check sequence.
alignment	Counter for the number of frames of valid length (64 to 1518 bytes) that have been detected on the port with an FCS error and a framing error.
too long	Counter for the number of frames that exceed the maximum valid packet length of 1518 bytes.
short	Counter for the number of instances when activity is detected with duration less than 74 to 82 bit times.
runts	Number of packets that are discarded because they are smaller than the medium's minimum packet size. For example, any Ethernet packet that is less than 64 bytes is considered a runt.
late	Counter for the number of instances when a collision is detected after 480 to 565 bit times in the frame.
very longs	Counter for the number of times the transmitter is active in excess of 4 to 7.5 milliseconds.
rate mismatches	Counter for the number of occurrences when the frequency, or data rate of incoming signal is noticeably different from the local transmit frequency.
auto partitions	Counter for the number of instances where the repeater has partitioned the port from the network.
last source address	Source address of last packet received by this port. Indicates "none" if no packets have been received since power on or a hub reset.
Last clearing of "show hub" counters	Elapsed time since the **clear hub counters** command was entered. Indicates "never" if counters have never been cleared.
Repeater information (Connected to Ethernet0)	Indicates that the following information is about the hub connected to the Ethernet interface shown.
... bytes seen with ... collisions, ... hub resets	Hub resets is the number of times the hub has been reset by network management software or by the **clear hub** command.
Version/device ID 0/1 (0/1)	Hub hardware version. IMR+ version device of daughter board.
Internal Port (Connected to Ethernet0)	Set of counters for the internal AUI port connected to the Ethernet interface.

Related Commands

Command	Description
hub	Enables and configures a port on an Ethernet hub of a Cisco 2505 or Cisco 2507 router.

show interfaces

To display statistics for all interfaces configured on the router or access server, use the **show interfaces** command in privileged EXEC mode. The resulting output varies, depending on the network for which an interface has been configured.

Cisco 2500 Series, Cisco 2600 Series, Cisco 3000 Series, Cisco 4000 Series, Cisco 4500 Series, and Cisco 7000 Series

show interfaces [*type number*] [*first*] [*last*] [**accounting**]

Cisco 7200 Series and Cisco 7500 Series with a Packet over SONET Interface Processor

show interfaces [*type slot*/*port*] [**accounting**]

Cisco 7500 Series with Ports on VIPs

show interfaces [*type slot*/*port-adapter*/*port*] [**ethernet** | **serial**]

Syntax Description

type	(Optional) Interface type. Allowed values for *type* include **async**, **bri0**, **dialer**, **ethernet**, **fastethernet**, **fddi**, **hssi**, **loopback**, **null**, **serial**, **tokenring**, and **tunnel**. For the Cisco 4000 series routers, *type* can be **e1**, **ethernet**, **fastethernet**, **fddi**, **serial**, **t1**, and **token**. For the Cisco 4500 series routers, *type* can also include **atm**. For the Cisco 7000 family, *type* can be **atm**, **e1, ethernet**, **fastethernet**, **fddi**, **serial**, **t1,** and **tokenring**. For the Cisco 7500 series *type* can also include **pos**.
number	(Optional) Port number on the selected interface.
first last	(Optional) For the Cisco 2500 and 3000 series routers, ISDN BRI only. The argument *first* can be either 1 or 2. The argument *last* can only be 2, indicating B channels 1 and 2. D-channel information is obtained by using the command without the optional arguments.
accounting	(Optional) Displays the number of packets of each protocol type that has been sent through the interface.
slot	(Optional) Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information.
port	(Optional) Number of the port being configured. Refer to the appropriate hardware manual for slot and port information.
port-adapter	(Optional) Number of the port adapter being configured. Refer to the appropriate hardware manual for information about port adapter compatibility.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.0(3)T	This command was modified to include support for flow-based WRED.
12.0(4)T	This command was modified to include enhanced display information for dialer bound interfaces.
12.0(7)T	This command was modified to include **dialer** as an interface type, and to reflect the default behavior.

Usage Guidelines

Display Interpretation

The **show interfaces** command displays statistics for the network interfaces. The resulting display on the Cisco 7200 series routers shows the interface processors in slot order. If you add interface processors after booting the system, they will appear at the end of the list, in the order in which they were inserted.

Information about Specific Interfaces

If you use the **show interfaces** command on the Cisco 7200 series routers without the *slot*/*port* arguments, information for all interface types will be shown. For example, if you type **show interfaces ethernet** you will receive information for all ethernet, serial, Token Ring, and FDDI interfaces. Only by adding the *type slot*/*port* argument can you specify a particular interface.

Removed Interfaces

If you enter a **show interfaces** command for an interface type that has been removed from the router or access server, interface statistics will be displayed accompanied by the following text: "Hardware has been removed."

Weighted Fair Queueing Information

If you use the **show interfaces** command on a router or access server for which interfaces are configured to use weighted fair queueing through the **fair-queue** interface command, additional information is displayed. This information consists of the current and high-water mark number of flows.

Dialer Interfaces Configured for Binding

If you use the **show interfaces** command on dialer interfaces configured for binding, the display will report statistics on each physical interface bound to the dialer interface; see the following examples for more information.

Command Variations

You will use the **show interfaces** command frequently while configuring and monitoring devices. The various forms of the **show interfaces** commands are described in detail in the sections that follow.

Examples

The following is sample output from the **show interfaces** command. Because your display will depend on the type and number of interface cards in your router or access server, only a portion of the display is shown.

Note If an asterisk (*) appears after the throttles counter value, it means that the interface was throttled at the time the command was run.

```
Router# show interfaces

Ethernet 0 is up, line protocol is up
  Hardware is MCI Ethernet, address is 0000.0c00.750c (bia 0000.0c00.750c)
  Internet address is 131.108.28.8, subnet mask is 255.255.255.0
  MTU 1500 bytes, BW 10000 Kbit, DLY 100000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input 0:00:00, output 0:00:00, output hang never
  Last clearing of "show interface" counters 0:00:00
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 2000 bits/sec, 4 packets/sec
     1127576 packets input, 447251251 bytes, 0 no buffer
     Received 354125 broadcasts, 0 runts, 0 giants, 57186* throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     5332142 packets output, 496316039 bytes, 0 underruns
     0 output errors, 432 collisions, 0 interface resets, 0 restarts
.
.
.
```

Example with Custom Output Queueing

The following shows partial sample output when custom output queueing is enabled:

```
Router# show interfaces

Last clearing of "show interface" counters 0:00:06
Input queue: 0/75/0 (size/max/drops); Total output drops: 21
Output queues: (queue #: size/max/drops)
     0: 14/20/14  1: 0/20/6  2: 0/20/0 3: 0/20/0 4: 0/20/0 5: 0/20/0
     6: 0/20/0 7: 0/20/0  8: 0/20/0  9: 0/20/0  10: 0/20/0
.
.
.
```

When custom queueing is enabled, the drops accounted for in the output queues result from bandwidth limitation for the associated traffic and leads to queue length overflow. Total output drops include drops on all custom queues as well as the system queue. Fields are described with the Weighted Fair Queueing output in Table 15.

Example including Weighted-Fair-Queueing Output

For each interface on the router or access server configured to use weighted fair queueing, the **show interfaces** command displays the information beginning with *Input queue:* in the following display:

```
Router# show interfaces

Ethernet 0 is up, line protocol is up
  Hardware is MCI Ethernet, address is 0000.0c00.750c (bia 0000.0c00.750c)
  Internet address is 131.108.28.8, subnet mask is 255.255.255.0
  MTU 1500 bytes, BW 10000 Kbit, DLY 100000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input 0:00:00, output 0:00:00, output hang never
  Last clearing of "show interface" counters 0:00:00
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 2000 bits/sec, 4 packets/sec
     1127576 packets input, 447251251 bytes, 0 no buffer
     Received 354125 broadcasts, 0 runts, 0 giants, 57186* throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     5332142 packets output, 496316039 bytes, 0 underruns
```

```
     0 output errors, 432 collisions, 0 interface resets, 0 restarts
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Output queue: 7/64/0 (size/threshold/drops)
     Conversations 2/9 (active/max active)
```

Table 15 describes the input queue and output queue fields shown in the preceding display.

Table 15 Weighted-Fair-Queueing Output Field Descriptions

Field	Description
Input queue:	
• size	Current size of the input queue.
• max	Maximum size of the queue.
• drops	Number of messages discarded in this interval.
• Total output drops	Total number of messages discarded in this session.
Output queue:	
• size	Current size of the output queue.
• threshold	Congestive-discard threshold. Number of messages in the queue after which new messages for high-bandwidth conversations are dropped.
• drops	Number of dropped messages.
• Conversations: active	Number of currently active conversations.
• Conversations: max active	Maximum number of concurrent conversations allowed.

Example with Accounting Option

To display the number of packets of each protocol type that have been sent through all configured interfaces, use the **show interfaces accounting** EXEC command. When you use the **accounting** option, only the accounting statistics are displayed.

Note Except for protocols that are encapsulated inside other protocols, such as IP over X.25, the accounting option also shows the total of all bytes sent and received, including the MAC header. For example, it totals the size of the Ethernet packet or the size of a packet that includes High-Level Data Link Control (HDLC) encapsulation.

Per-packet accounting information is kept for the following protocols:

- AppleTalk
- ARP (for IP, Frame Relay, SMDS)
- CLNS
- DEC MOP

  The routers use MOP packets to advertise their existence to Digital Equipment Corporation machines that use the MOP protocol. A router periodically broadcasts MOP packets to identify itself as a MOP host. This results in MOP packets being counted, even when DECnet is not being actively used.
- DECnet
- HP Probe

- IP
- LAN Manager (LAN Network Manager and IBM Network Manager)
- Novell
- Serial Tunnel (SDLC)
- Spanning Tree
- SR Bridge
- Transparent Bridge

Example with DWRED

The following is sample output from the **show interfaces** command when distributed weighted RED (DWRED) is enabled on an interface. Notice that the packet drop strategy is listed as "VIP-based weighted RED."

```
Router# show interfaces hssi 0/0/0

Hssi0/0/0 is up, line protocol is up
  Hardware is cyBus HSSI
  Description: 45Mbps to R1
Internet address is 200.200.14.250/30
MTU 4470 bytes, BW 45045 Kbit, DLY 200 usec, rely 255/255, load 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)
Last input 00:00:02, output 00:00:03, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Packet Drop strategy: VIP-based weighted RED
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
1976 packets input, 131263 bytes, 0 no buffer
Received 1577 broadcasts, 0 runts, 0 giants
0 parity
4 input errors, 4 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
1939 packets output, 130910 bytes, 0 underruns
0 output errors, 0 applique, 3 interface resets
0 output buffers copied, 0 interrupts, 0 failures
```

Example with ALC

The following is sample output from the **show interfaces** command for serial interface 2 when ALC is enabled:

```
Router# show interfaces serial 2

Serial2 is up, line protocol is up
Hardware is CD2430
MTU 1500 bytes, BW 115 Kbit, DLY 20000 usec, rely 255/255, load 1/255
Encapsulation ALC, loopback not set
Full-duplex enabled.
     ascus in UP state: 42, 46
     ascus in DOWN state:
     ascus DISABLED:
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
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 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
0 packets output, 0 bytes, 0 underruns
0 output errors, 0 collisions, 3 interface resets
0 output buffer failures, 0 output buffers swapped out
DCD=down  DSR=down  DTR=down  RTS=down  CTS=down
```

Example with SDLC

The following is sample output from the **show interfaces** command for an Synchronous Data Link Control (SDLC) primary interface supporting the SDLC function:

```
Router# show interfaces

Serial 0 is up, line protocol is up
 Hardware is MCI Serial
 MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec, rely 255/255, load 1/255
 Encapsulation SDLC-PRIMARY, loopback not set
      Timers (msec): poll pause 100 fair poll 500. Poll limit 1
      [T1 3000, N1 12016, N2 20, K 7] timer: 56608 Last polled device: none
      SDLLC [ma: 0000.0C01.14--, ring: 7 bridge: 1, target ring: 10
             largest token ring frame 2052]
SDLC addr C1 state is CONNECT
       VS 6, VR 3, RCNT 0, Remote VR 6, Current retransmit count 0
       Hold queue: 0/12 IFRAMEs 77/22 RNRs 0/0 SNRMs 1/0 DISCs 0/0
       Poll: clear, Poll count: 0, chain: p: C1 n: C1
       SDLLC [largest SDLC frame: 265, XID: disabled]
  Last input 00:00:02, output 00:00:01, output hang never
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 517 bits/sec, 30 packets/sec
  Five minute output rate 672 bits/sec, 20 packets/sec
       357 packets input, 28382 bytes, 0 no buffer
       Received 0 broadcasts, 0 runts, 0 giants
       0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
       926 packets output, 77274 bytes, 0 underruns
       0 output errors, 0 collisions, 0 interface resets, 0 restarts
       2 carrier transitions
```

Table 16 shows the fields relevant to all SDLC connections.

Table 16 show interfaces Field Descriptions When SDLC is Enabled

Field	Description
Timers (msec)	List of timers in milliseconds.
poll pause, fair poll, Poll limit	Current values of these timers, as described in the individual commands in this chapter.
T1, N1, N2, K	Current values for these variables, as described in the individual commands in this chapter.

Table 17 shows other data given for each SDLC secondary interface configured to be attached to this interface.

Table 17 SDLC Field Descriptions

Field	Description
addr	Address of this secondary interface.
State	Current state of this connection. The possible values are: • DISCONNECT—No communication is being attempted to this secondary. • CONNECT—A normal connect state exists between this router and this secondary. • DISCSENT—This router has sent a disconnect request to this secondary and is awaiting its response. • SNRMSENT—This router has sent a connect request (SNRM) to this secondary and is awaiting its response. • THEMBUSY—This secondary has told this router that it is temporarily unable to receive any more information frames. • USBUSY—This router has told this secondary that it is temporarily unable to receive any more information frames. • BOTHBUSY—Both sides have told each other that they are temporarily unable to receive any more information frames. • ERROR—This router has detected an error, and is waiting for a response from the secondary acknowledging this.
VS	Sequence number of the next information frame this station sends.
VR	Sequence number of the next information frame from this secondary that this station expects to receive.
RCNT	Number of correctly sequenced I-frames received when the Cisco IOS software was in a state in which it is acceptable to receive I-frames.
Remote VR	Last frame transmitted by this station that has been acknowledged by the other station.
Current retransmit count	Number of times the current I-frame or sequence of I-frames has been retransmitted.
Hold queue	Number of frames in hold queue/Maximum size of hold queue.
IFRAMEs, RNRs, SNRMs, DISCs	Sent/received count for these frames.
Poll	"Set" if this router has a poll outstanding to the secondary; "clear" if it does not.
Poll count	Number of polls, in a row, given to this secondary at this time.
chain	Shows the previous (p) and next (n) secondary address on this interface in the round robin loop of polled devices.

Sample show interfaces accounting Display

The following is sample output from the **show interfaces accounting** command:

```
Router# show interfaces accounting

Interface TokenRing0 is disabled

Ethernet0
                Protocol    Pkts In   Chars In   Pkts Out  Chars Out
                      IP     873171  735923409      34624    9644258
                  Novell     163849   12361626      57143    4272468
                 DEC MOP          0          0          1         77
                     ARP      69618    4177080       1529      91740
Interface Serial0 is disabled

Ethernet1
                Protocol    Pkts In   Chars In   Pkts Out  Chars Out
                      IP          0          0         37      11845
                  Novell          0          0       4591     275460
                 DEC MOP          0          0          1         77
                     ARP          0          0          7        420

Interface Serial1 is disabled
Interface Ethernet2 is disabled
Interface Serial2 is disabled
Interface Ethernet3 is disabled
Interface Serial3 is disabled
Interface Ethernet4 is disabled
Interface Ethernet5 is disabled
Interface Ethernet6 is disabled
Interface Ethernet7 is disabled
Interface Ethernet8 is disabled
Interface Ethernet9 is disabled

Fddi0
                Protocol    Pkts In   Chars In   Pkts Out  Chars Out
                  Novell          0          0        183      11163
                     ARP          1         49          0          0
```

When the output indicates an interface is "disabled," the router has received excessive errors (over 5000 in a keepalive period).

Example with Flow-based WRED

The following is sample output from the **show interfaces** command issued for the Serial1 interface for which flow-based weighted RED (WRED) is enabled. The output shows that there are 8 active flow-based WRED flows, that the maximum number of flows active at any time is 9, and that the maximum number of possible flows configured for the interface is 16:

```
Router# show interfaces serial1
Serial1 is up, line protocol is up

  Hardware is HD64570
  Internet address is 190.1.2.1/24
  MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
Reliability 255/255, txload 237/255, rxload 1/255
  Encapsulation HDLC, loopback not set
  Keepalive not set
  Last input 00:00:22, output 00:00:00, output hang never
  Last clearing of "show interface" counters 00:17:58
  Input queue: 0/75/0 (size/max/drops); Total output drops: 2479
```

```
  Queueing strategy: random early detection(RED)
    flows (active/max active/max): 8/9/16
    mean queue depth: 27
    drops: class  random   tail     min-th   max-th   mark-prob
           0      946      0        20       40       1/10
           1      488      0        22       40       1/10
           2      429      0        24       40       1/10
           3      341      0        26       40       1/10
           4      235      0        28       40       1/10
           5      40       0        31       40       1/10
           6      0        0        33       40       1/10
           7      0        0        35       40       1/10
           rsvp   0        0        37       40       1/10
  30 second input rate 1000 bits/sec, 2 packets/sec
  30 second output rate 119000 bits/sec, 126 packets/sec
     1346 packets input, 83808 bytes, 0 no buffer
     Received 12 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     84543 packets output, 9977642 bytes, 0 underruns
     0 output errors, 0 collisions, 6 interface resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions
     DCD=up  DSR=up  DTR=up  RTS=up  CTS=up
```

Example with DWFQ

The following is sample output from the **show interfaces** command when distributed weighted fair queueing (DWFQ) is enabled on an interface. Notice that the queueing strategy is listed as "VIP-based fair queueing."

```
Router# show interfaces fastethernet 1/1/0

Fast Ethernet 1/1/0 is up, line protocol is up
  Hardware is cyBus Fast Ethernet Interface, address is 0007.f618.4448 (bia 00e0)
  Description: pkt input i/f for WRL tests (to pagent)
  Internet address is 80.0.2.70/24
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive not set, fdx, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output 01:11:01, output hang never
  Last clearing of "show interface" counters 01:12:31
  Queueing strategy: VIP-based fair queueing
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  30 second input rate 0 bits/sec, 0 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 watchdog, 0 multicast
     0 input packets with dribble condition detected
     1 packets output, 60 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffers copied, 0 interrupts, 0 failures
```

Example with DNIS Binding

When the **show interfaces** command is issued on an unbound dialer interface, the output looks as follows:

```
Router# show interfaces dialer0

Dialer0 is up (spoofing), line protocol is up (spoofing)
  Hardware is Unknown
```

```
  Internet address is 21.1.1.2/8
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 3/255
  Encapsulation PPP, loopback not set
  DTR is pulsed for 1 seconds on reset
  Last input 00:00:34, output never, output hang never
  Last clearing of "show interface" counters 00:05:09
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 1000 bits/sec, 0 packets/sec
     18 packets input, 2579 bytes
     14 packets output, 5328 bytes
```

But when the **show interfaces** command is issued on a bound dialer interface, you will get an additional report that indicates the binding relationship. The output is shown here:

```
Router# show interfaces dialer0

Dialer0 is up, line protocol is up
  Hardware is Unknown
  Internet address is 21.1.1.2/8
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation PPP, loopback not set
  DTR is pulsed for 1 seconds on reset
  Interface is bound to BRI0:1
  Last input 00:00:38, output never, output hang never
  Last clearing of "show interface" counters 00:05:36


  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     38 packets input, 4659 bytes
     34 packets output, 9952 bytes
Bound to:
BRI0:1 is up, line protocol is up
  Hardware is BRI
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation PPP, loopback not set, keepalive not set
  Interface is bound to Dialer0 (Encapsulation PPP)
  LCP Open, multilink Open
  Last input 00:00:39, output 00:00:11, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     78 packets input, 9317 bytes, 0 no buffer
     Received 65 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     93 packets output, 9864 bytes, 0 underruns
     0 output errors, 0 collisions, 7 interface resets
     0 output buffer failures, 0 output buffers swapped out
     4 carrier transitions
```

At the end of the Dialer0 output, the **show interfaces** command is executed on each physical interface bound to it.

Example of show interface With BRI

In this example, the physical interface is the B1 channel of the BRI0 link. This example also illustrates that the output under the B channel keeps all hardware counts that are not displayed under any logical or virtual access interface. The line in the report that states "Interface is bound to Dialer0 (Encapsulation LAPB)" indicates that this B interface is bound to Dialer0 and the encapsulation running over this connection is LAPB, not PPP, which is the encapsulation configured on the D interface and inherited by the B channel.

```
Router# show interface bri0:1

BRI0:1 is up, line protocol is up
  Hardware is BRI
  MTU 1500 bytes, BW 64 Kbit, DLY 20000 usec, rely 255/255, load 1/255
  Encapsulation PPP, loopback not set, keepalive not set
  Interface is bound to Dialer0 (Encapsulation LAPB)
  LCP Open, multilink Open
  Last input 00:00:31, output 00:00:03, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 1 packets/sec
  5 minute output rate 0 bits/sec, 1 packets/sec
     110 packets input, 13994 bytes, 0 no buffer
     Received 91 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     135 packets output, 14175 bytes, 0 underruns
     0 output errors, 0 collisions, 12 interface resets
     0 output buffer failures, 0 output buffers swapped out
     8 carrier transitions
```

Any protocol configuration and states should be displayed from the Dialer0 interface.

show interfaces ctunnel

To display information about an IP over CLNS tunnel (CTunnel), use the **show interfaces ctunnel** command in privileged EXEC mode.

show interfaces ctunnel *interface-number* [**accounting**]

Syntax Description

interface-number	Virtual interface number.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(5)T	This command was introduced.

Examples

The following is sample output from the **show interfaces ctunnel** command:

```
Router# show interfaces ctunnel 1

CTunnel1 is up, line protocol is up
  Hardware is CTunnel
  Internet address is 10.0.0.1/24
  MTU 1514 bytes, BW 9 Kbit, DLY 500000 usec,
      reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation TUNNEL, loopback not set
  Keepalive set (10 sec)
  Tunnel destination 49.0001.2222.2222.2222.cc
  Last input never, output 00:00:05, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/0, 0 drops; input queue 0/75, 0 drops
  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 abort
     1 packets output, 104 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
```

Table 18 describes the significant fields shown in the display.

Note For the **show interfaces ctunnel** command, all output that relates to a physical medium is irrelevant and should be ignored because the CTunnel is a virtual interface.

Table 18 show interfaces ctunnel Field Descriptions

Field	Description
CTunnel is {up | down | administratively down}	Interface is currently active (up) or inactive (down). Shows interface is administratively down if disabled.
line protocol is {up | down}	Shows line protocol up if a valid route is available to the CLNS tunnel (CTunnel) destination. Shows line protocol down if no route is available, or if the route would be recursive.
Hardware	Type of interface, in this instance CTunnel.
Internet address	IP address of the interface.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth, as specified by the user, that is available on the link.
DLY	Delay of the interface, in microseconds.
Encapsulation	Encapsulation method is always TUNNEL for tunnels.
Loopback	Shows whether loopback is set or not.
Keepalive	Shows whether keepalives are set or not.
Tunnel destination	The NSAP address of the tunnel destination. The N-Selector part of the displayed NSAP address is set by the router and cannot be changed.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface. This counter is updated only when packets are process switched, not when packets are fast switched.
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. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates that the elapsed time is too large to be displayed. 0:00:00 indicates that the counters were cleared more than 2^{31} ms (and less than 2^{32} ms) ago.
Queueing strategy	Type of queueing active on this interface.
Output queue, drops Input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
Five minute input rate, Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of 4 time constants must pass before the average will be within 2 percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no memory buffer available.

Table 18 show interfaces ctunnel Field Descriptions (continued)

Field	Description
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	This field does not apply to the CTunnel virtual interface.
giants	This field does not apply to the CTunnel virtual interface.
throttles	This field does not apply to the CTunnel virtual interface.
input errors	This field does not apply to the CTunnel virtual interface.
CRC	This field does not apply to the CTunnel virtual interface.
frame	This field does not apply to the CTunnel virtual interface.
overrun	This field does not apply to the CTunnel virtual interface.
ignored	This field does not apply to the CTunnel virtual interface.
abort	This field does not apply to the CTunnel virtual interface.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes transmitted by the system.
underruns	This field does not apply to the CTunnel virtual interface.
output errors	This field does not apply to the CTunnel virtual interface.
collisions	This field does not apply to the CTunnel virtual interface.
interface resets	Number of times an interface has been reset. The interface may be reset manually by the administrator or automatically by the system when an internal error occurs.
output buffer failures	Number of buffer failures.
output buffers swapped out	Number of output buffer allocation failures.

Related Commands

Command	Description
show interfaces	Displays the statistical information specific to interfaces.
show ip route	Displays all static IP routes, or those installed using the AAA route download function.

show interfaces ethernet

To display information about an Ethernet interface on the router, use the **show interfaces ethernet** command in privileged EXEC mode.

show interfaces ethernet *unit* [**accounting**]

Cisco 7200 and 7500 Series

show interfaces ethernet [*slot*/*port*] [**accounting**]

Cisco 7500 Series with Ports on VIPs

show interfaces ethernet [*type slot*/*port-adapter*/*port*]

Syntax Description

unit	Must match a port number on the selected interface.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
slot	(Optional) Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information.
port	(Optional) Number of the port being configured. Refer to the appropriate hardware manual for slot and port information.
type	(Optional) Type of interface.
port-adapter	(Optional) Number of the port adapter being configured. Refer to the appropriate hardware manual for information about port adapter compatibility.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

If you do not provide values for the argument *unit* (or *slot* and *port* on the Cisco 7200 series routers or slot and port adapter on the Cisco 7500 series routers), the command displays statistics for all network interfaces. The optional keyword **accounting** displays the number of packets of each protocol type that have been sent through the interface.

Examples

The following is sample output from the **show interfaces ethernet** command for Ethernet interface 0:

```
Router# show interfaces ethernet 0

Ethernet0 is up, line protocol is up
  Hardware is Lance, address is 0060.3ef1.702b (bia 0060.3ef1.702b)
  Internet address is 172.21.102.33/24
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
```

```
ARP type: ARPA, ARP Timeout 04:00:00
Last input 00:00:20, output 00:00:06, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
   115331 packets input, 27282407 bytes, 0 no buffer
   Received 93567 broadcasts, 0 runts, 0 giants, 0 throttles
   0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
   0 input packets with dribble condition detected
   143782 packets output, 14482169 bytes, 0 underruns
   0 output errors, 1 collisions, 5 interface resets
   0 babbles, 0 late collision, 7 deferred
   0 lost carrier, 0 no carrier
   0 output buffer failures, 0 output buffers swapped out
```

Table 19 describes significant fields shown in the display.

Table 19 show interfaces ethernet Field Descriptions

Field	Description
Ethernet ... is up ... is administratively down	Indicates whether the interface hardware is currently active and if it has been taken down by an administrator. “Disabled” indicates the router has received over 5000 errors in a keepalive interval, which is 10 seconds by default.
line protocol is {up | down | administratively down}	Indicates whether the software processes that handle the line protocol believe the interface is usable (that is, whether keepalives are successful) or if it has been taken down by an administrator.
Hardware	Hardware type (for example, MCI Ethernet, SCI, cBus Ethernet) and address.
Internet address	Internet address followed by subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
ARP type:	Type of Address Resolution Protocol assigned.
loopback	Indicates whether loopback is set or not.
keepalive	Indicates whether keepalives are set or not.
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 counter is updated only when packets are process switched, not when packets are fast switched.

Table 19 show interfaces ethernet Field Descriptions (continued)

Field	Description
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. Useful for knowing when a dead interface failed. This counter is updated only when packets are process switched, not when packets are fast switched.
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 printed. 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. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2^{31} ms (and less than 2^{32} ms) ago.
Output queue, input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
Five minute input rate, Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffers	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
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. For instance, any Ethernet packet that is less than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.

Table 19 show interfaces ethernet Field Descriptions (continued)

Field	Description
input error	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 checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of 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 mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame.
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. This may never be reported on some interfaces.
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, as 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 transmitted because of an Ethernet collision. A packet that collides is counted only once in output packets.
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. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.

Table 19 show interfaces ethernet Field Descriptions (continued)

Field	Description
restarts	Number of times a Type 2 Ethernet controller was restarted because of errors.
babbles	The transmit jabber timer expired.
late collision	Number of late collisions. Late collision happens when a collision occurs after transmitting the preamble. The most common cause of late collisions is that your Ethernet cable segments are too long for the speed at which you are transmitting.
deferred	Deferred indicates that the chip 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.
output buffer failures	Number of failed buffers and number of buffers swapped out.

Example on Cisco 7500 Series Routers

The following sample output illustrates the **show interfaces ethernet** command on a Cisco 7500 series router:

```
Router> show interfaces ethernet 4/2

Ethernet4/2 is up, line protocol is up
  Hardware is cxBus Ethernet, address is 0000.0c02.d0ce (bia 0000.0c02.d0ce)
  Internet address is 131.108.7.1, subnet mask is 255.255.255.0
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input 0:00:00, output 0:00:09, output hang never
  Last clearing of "show interface" counters 0:56:40
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 3000 bits/sec, 4 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     4961 packets input, 715381 bytes, 0 no buffer
     Received 2014 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     567 packets output, 224914 bytes, 0 underruns
     0 output errors, 168 collisions, 0 interface resets, 0 restarts
     0 babbles, 2 late collision, 7 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

Example with Accounting Option

The following is sample output from the **show interfaces ethernet** command with the **accounting** option on a Cisco 7500 series router:

```
Router# show interfaces ethernet 4/2 accounting

Ethernet4/2
       Protocol    Pkts In   Chars In   Pkts Out  Chars Out
             IP       7344    4787842       1803    1535774
      Appletalk      33345    4797459      12781    1089695
        DEC MOP          0          0        127       9779
            ARP          7        420         39       2340
```

show interfaces fastethernet

To display information about the Fast Ethernet interfaces, use the **show interfaces fastethernet** command in user EXEC and privileged EXEC mode.

Cisco 4500 and 4700 Series

show interfaces fastethernet [*number*]

Cisco 7200 and 7500 Series

show interfaces fastethernet [*slot*/*port*]

Cisco 7500 Series with a VIP

show interfaces fastethernet [*slot*/*port-adapter*/*port*]

Syntax Description

number	(Optional) Port, connector, or interface card number. On a Cisco 4500 or Cisco 4700 series routers, specifies the network interface module (NIM) or NPM number. The numbers are assigned at the factory at the time of installation or when added to a system.
slot	(Optional) Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information.
port	(Optional) Number of the port being configured. Refer to the appropriate hardware manual for slot and port information.
port-adapter	(Optional) Number of the port adapter being configured. Refer to the appropriate hardware manual for information about port adapter compatibility.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.

Examples

The following is sample output from the **show interfaces fastethernet** command on a Cisco 4500 series routers:

```
Router# show interfaces fastethernet 0

Fast Ethernet0 is up, line protocol is up
  Hardware is DEC21140, address is 0000.0c0c.1111 (bia 0002.eaa3.5a60)
  Internet address is 10.0.0.1 255.0.0.0
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive not set, hdx, 100BaseTX
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input never, output 0:00:16, output hang 0:28:01
  Last clearing of "show interface" counters 0:20:05
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
```

```
  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 input errors, 0 CRC, 0 frame, 0 overrun, 1786161921 ignored, 0 abort
     0 watchdog, 0 multicast
     0 input packets with dribble condition detected
     67 packets output, 8151 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets, 0 restarts
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The following is sample output from the **show interfaces fastethernet** command on a Cisco AS5300 access server:

```
Router# show interface fastethernet 0

Fast Ethernet0 is up, line protocol is up
  Hardware is DEC21140AD, address is 00e0.1e3e.c179 (bia 00e0.1e3e.c179)
  Internet address is 10.17.30.4/16
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  Half-duplex, 10Mb/s, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:00, output 00:00:03, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/120, 8 drops
  5 minute input rate 2000 bits/sec, 3 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     158773 packets input, 17362631 bytes, 4 no buffer
     Received 158781 broadcasts, 0 runts, 0 giants, 7 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 watchdog, 0 multicast
     0 input packets with dribble condition detected
     6299 packets output, 622530 bytes, 0 underruns
     1 output errors, 0 collisions, 3 interface resets
     0 babbles, 0 late collision, 0 deferred
     1 lost carrier, 1 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The following shows information specific to the first Fast Ethernet Interface Processor (FEIP) port in slot 0 on a Cisco 7500 series routers:

```
Router# show interface fastethernet 0/1

Fast Ethernet0/1 is administratively down, line protocol is down
  Hardware is cxBus Fast Ethernet, address is 0000.0c35.dc16 (bia 0000.0c35.dc16)
  Internet address is 10.1.0.64 255.255.0.0
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive not set, half-duplex, RJ45 (or MII)
  ARP type: ARPA, ARP Timeout 4:00:00
  Last input never, output 2:03:52, output hang never
  Last clearing of "show interface" counters never
  Output queue 0/40, 0 drops; input queue 0/75, 1 drops
  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 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 watchdog, 0 multicast
     0 input packets with dribble condition detected
     5 packets output, 805 bytes, 0 underruns
```

```
0 output errors, 0 collisions, 4 interface resets, 0 restarts
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier
0 output buffer failures, 0 output buffers swapped out
```

Table 20 describes the fields in these displays.

Table 20 show interfaces fastethernet Field Descriptions—FEIP

Field	Description
Fast Ethernet0 is ... is up ...is administratively 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 (for example, MCI Ethernet, SCI, cBus Ethernet) and address.
Internet address	Internet address followed by subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
ARP type:	Type of Address Resolution Protocol assigned.
loopback	Indicates whether loopback is set or not.
keepalive	Indicates whether keepalives are set or not.
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 counter is updated only when packets are process switched, not when packets are fast switched.
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. This counter is updated only when packets are process switched, not when packets are fast switched.
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 printed. If that field overflows, asterisks are printed.

Table 20 show interfaces fastethernet Field Descriptions—FEIP (continued)

Field	Description
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. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2^{31} ms (and less than 2^{32} ms) ago.
Output queue, input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
5 minute input rate, 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
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. For instance, any Ethernet packet that is less than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.
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 checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data.

Table 20 show interfaces fastethernet Field Descriptions—FEIP (continued)

Field	Description
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 mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
abort	Number of packets whose receipt was aborted.
watchdog	Number of times watchdog receive timer expired. It happens when receiving a packet with length greater than 2048.
multicast	Number of multicast packets received.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame.
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. This may never be reported on some interfaces.
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, as 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. A packet that collides is counted only once in output packets.
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. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
restarts	Number of times a Type 2 Ethernet controller was restarted because of errors.
babbles	The transmit jabber timer expired.

Table 20 show interfaces fastethernet Field Descriptions—FEIP (continued)

Field	Description
late collision	Number of late collisions. Late collision happens when a collision occurs after transmitting the preamble. The most common cause of late collisions is that your Ethernet cable segments are too long for the speed at which you are transmitting.
deferred	Deferred indicates that the chip 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.
output buffer failures	Number of failed buffers and number of buffers swapped out.

The following example of the **show interfaces fastethernet** command shows all the information specific to the first PA-12E/2FE interface port (interface port 0) in port adapter slot 3:

```
Router# show interfaces fastethernet 3/0

Fast Ethernet3/0 is up, line protocol is up
  Hardware is TSWITCH, address is 00e0.f7a4.5130 (bia 00e0.f7a4.5130)
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  Half-duplex, 100BaseTX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:05:30, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     312 packets input, 18370 bytes, 0 no buffer
     Received 216 broadcasts, 0 runts, 0 giants, 0 throttles
     3 input errors, 0 CRC, 0 frame, 0 overrun, 3 ignored, 0 abort
     0 input packets with dribble condition detected
     15490 packets output, 1555780 bytes, 0 underruns
     2 output errors, 0 collisions, 2 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     2 output buffer failures, 0 output buffers swapped out
```

Table 21 describes the fields in this displays.

Table 21 show interfaces fastethernet Field Descriptions—PA-12E/2FE

Field	Description
Fast Ethernet0 is... is up ...is administratively 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 (for example, MCI Ethernet, SCI, cBus Ethernet) and address.
Internet address	Internet address followed by subnet mask.

Table 21 show interfaces fastethernet Field Descriptions—PA-12E/2FE (continued)

Field	Description
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
ARP type:	Type of Address Resolution Protocol assigned.
loopback	Indicates whether loopback is set or not.
keepalive	Indicates whether keepalives are set or not.
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 counter is updated only when packets are process switched, not when packets are fast switched.
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.
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 printed. 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. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2^{31} ms (and less than 2^{32} ms) ago.
Output queue, input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.

Table 21 show interfaces fastethernet Field Descriptions—PA-12E/2FE (continued)

Field	Description
Five minute input rate, Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic). The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.
bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
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. For instance, any Ethernet packet that is less than 64 bytes is considered a runt.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.
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 checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of 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.

Table 21 show interfaces fastethernet Field Descriptions—PA-12E/2FE (continued)

Field	Description
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
abort	Number of packets whose receipt was aborted.
input packets with dribble condition detected	Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented for informational purposes; the router accepts the frame.
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. This may never be reported on some interfaces.
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, as 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. A packet that collides is counted only once in output packets.
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. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also 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. The most common cause of late collisions is that your Ethernet cable segments are too long for the speed at which you are transmitting.
deferred	Deferred indicates that the chip 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.

show interfaces fddi

To display information about the FDDI interface, use the **show interfaces fddi** command in user EXEC and privileged EXEC mode.

show interfaces fddi *number* [**accounting**]

Cisco 7000 and 7200 Series

show interfaces fddi [*slot*/*port*] [**accounting**]

Cisco 7500 Series

show interfaces fddi [*slot*/*port-adapter*/*port*] [**accounting**]

Syntax Description

number	Port number on the selected interface.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
slot	(Optional) Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information.
port	(Optional) Number of the port being configured. Refer to the appropriate hardware manual for slot and port information.
port-adapter	(Optional) Number of the port adapter being configured. Refer to the appropriate hardware manual for information about port adapter compatibility.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
11.3	This command was modified to include support for FDDI full-duplex, single- and multimode port adapters (PA-F/FD-SM and PA-F/FD-MM).

Examples

The following is a sample partial display of FDDI-specific data from the **show interfaces fddi** command on a Cisco 7500 series router:

```
Router# show interfaces fddi 3/0/0

Fddi3/0/0 is up, line protocol is up
  Hardware is cxBus Fddi, address is 0000.0c02.adf1 (bia 0000.0c02.adf1)
  Internet address is 131.108.33.14, subnet mask is 255.255.255.0
  MTU 4470 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation SNAP, loopback not set, keepalive not set
  ARP type: SNAP, ARP Timeout 4:00:00
  Phy-A state is active, neighbor is   B, cmt signal bits 008/20C, status ILS
  Phy-B state is active, neighbor is   A, cmt signal bits 20C/008, status ILS
  ECM is in, CFM is thru, RMT is ring_op
```

```
  Token rotation 5000 usec, ring operational 21:32:34
  Upstream neighbor 0000.0c02.ba83, downstream neighbor 0000.0c02.ba83
  Last input 0:00:05, output 0:00:00, output hang never
  Last clearing of "show interface" counters 0:59:10
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 69000 bits/sec, 44 packets/sec
  Five minute output rate 0 bits/sec, 1 packets/sec
     113157 packets input, 21622582 bytes, 0 no buffer
     Received 276 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     4740 packets output, 487346 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets, 0 restarts
     0 transitions, 2 traces, 3 claims, 2 beacons
```

The following is sample output from the **show interfaces fddi** command for the full-duplex FDDI port adapter on a Cisco 7500 series router:

```
Router# show interfaces fddi 0/1/0

Fddi0/1/0 is up, line protocol is up
  Hardware is cxBus FDDI, address is 0060.3e33.3608 (bia 0060.3e33.3608)
  Internet address is 10.1.1.1/24
  MTU 4470 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation SNAP, loopback not set, keepalive not set
  ARP type: SNAP, ARP Timeout 04:00:00
  FDX supported, FDX enabled, FDX state is operation
  Phy-A state is maintenance, neighbor is Unknown, status HLS
  Phy-B state is active, neighbor is A, status SILS
  ECM is in, CFM is c_wrap_b, RMT is ring_op,
  Requested token rotation 5000 usec, negotiated 4997 usec
  Configured tvx is 2500 usec
  LER for PortA = 0A, LER for PortB = 0A ring operational 00:02:45
  Upstream neighbor 0060.3e73.4600, downstream neighbor 0060.3e73.4600
  Last input 00:00:12, output 00:00:13, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     62 packets input, 6024 bytes, 0 no buffer
     Received 18 broadcasts, 0 runts, 0 giants
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     71 packets output, 4961 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 output buffer failures, 0 output buffers swapped out
     3 transitions, 0 traces, 100 claims, 0 beacon
```

Table 22 describes the fields shown in the display.

Table 22 show interfaces fddi Field Descriptions

Field	Description
Fddi is {up | down | administratively down	Gives the interface processor unit number and tells whether the interface hardware is currently active and can transmit and receive or if it has been taken down by an administrator.
line protocol is {up | down}	Indicates whether the software processes that handle the line protocol consider the interface usable.
Hardware	Provides the hardware type, followed by the hardware address.
Internet address	IP address, followed by subnet mask.

Table 22 show interfaces fddi Field Descriptions (continued)

MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether or not loopback is set.
keepalive	Indicates whether or not keepalives are set.
ARP type	Type of Address Resolution Protocol assigned.
FDX	Displays full-duplex information. Values are: not supported or supported. When the value is supported, the display indicates whether full-duplex is enabled or disabled. When enabled, the state of the FDX negotiation process is displayed. The negotiation states only relate to the full-duplex negotiation process. You must also ensure that the interface is up and working by looking at other fields in the **show interfaces fddi** command such as line protocol and RMT. Negotiation states are: • idle—Interface is working but not in full-duplex mode yet. If persistent, it could mean that the interface did not meet all negotiation conditions (for example, there are more than two stations in the ring). • request—Interface is working but not in full-duplex mode yet. If persistent, it could mean that the remote interface does not support full-duplex or full-duplex is not enabled on the interface. • confirm—Transient state. • operation—Negotiations completed successfully, and both stations are operating in full-duplex mode.
Phy-{A | B}	Lists the state the Physical A or Physical B connection is in; one of the following: off, active, trace, connect, next, signal, join, verify, or break.

Table 22 show interfaces fddi Field Descriptions (continued)

Field	Description
neighbor	State of the neighbor: • A—Indicates that the connection management (CMT) process has established a connection with its neighbor. The bits received during the CMT signaling process indicate that the neighbor is a Physical A type dual attachment station (DAS) or concentrator that attaches to the primary ring IN and the secondary ring OUT when attaching to the dual ring. • S—Indicates that the CMT process has established a connection with its neighbor and that the bits received during the CMT signaling process indicate that the neighbor is one Physical type in a single attachment station (SAS). • B—Indicates that the CMT process has established a connection with its neighbor and that the bits received during the CMT signaling process indicate that the neighbor is a Physical B dual attachment station or concentrator that attaches to the secondary ring IN and the primary ring OUT when attaching to the dual ring. • M—Indicates that the CMT process has established a connection with its neighbor and that the bits received during the CMT signaling process indicate that the router's neighbor is a Physical M-type concentrator serving as a Master to a connected station or concentrator. • unk—Indicates that the network server has not completed the CMT process and, as a result, does not know about its neighbor. See the section "Setting Bit Control" for an explanation of the bit patterns.
cmt signal bits	Shows the transmitted/received CMT bits. The transmitted bits are 0x008 for a Physical A type and 0x20C for Physical B type. The number after the slash (/) is the received signal bits. If the connection is not active, the received bits are zero (0); see the line beginning Phy-B in the display. This applies to FIP interfaces only.

Table 22 show interfaces fddi Field Descriptions (continued)

Field	Description
status	Status value displayed is the actual status on the fiber. The FDDI standard defines the following values: • LSU—Line State Unknown, the criteria for entering or remaining in any other line state have not been met. • NLS—Noise Line State is entered upon the occurrence of 16 potential noise events without satisfying the criteria for entry into another line state. • MLS—Master Line State is entered upon the receipt of eight or nine consecutive HQ or QH symbol pairs. • ILS—Idle Line State is entered upon receipt of four or five idle symbols. • HLS—Halt Line State is entered upon the receipt of 16 or 17 consecutive H symbols. • QLS—Quiet Line State is entered upon the receipt of 16 or 17 consecutive Q symbols or when carrier detect goes low. • ALS—Active Line State is entered upon receipt of a JK symbol pair when carrier detect is high. • OVUF—Elasticity buffer Overflow/Underflow. The normal states for a connected Physical type are ILS or ALS. If the report displays the QLS status, this indicates that the fiber is disconnected from Physical B, or that it is not connected to another Physical type, or that the other station is not running.
ECM is...	ECM is the SMT entity coordination management, which overlooks the operation of CFM and PCM. The ECM state can be one of the following: • out—Router is isolated from the network. • in—Router is actively connected to the network. This is the normal state for a connected router. • trace—Router is trying to localize a stuck beacon condition. • leave—Router is allowing time for all the connections to break before leaving the network. • path_test—Router is testing its internal paths. • insert—Router is allowing time for the optical bypass to insert. • check—Router is making sure optical bypasses switched correctly. • deinsert—Router is allowing time for the optical bypass to deinsert.

Table 22 show interfaces fddi Field Descriptions (continued)

Field	Description
CFM is...	Contains information about the current state of the MAC connection. The Configuration Management state can be one of the following: • isolated—MAC is not attached to any Physical type. • wrap_a—MAC is attached to Physical A. Data is received on Physical A and transmitted on Physical A. • wrap_b—MAC is attached to Physical B. Data is received on Physical B and transmitted on Physical B. • wrap_s—MAC is attached to Physical S. Data is received on Physical S and transmitted on Physical S. This is the normal mode for a single attachment station (SAS). • thru—MAC is attached to Physical A and B. Data is received on Physical A and transmitted on Physical B. This is the normal mode for a dual attachment station (DAS) with one MAC. The ring has been operational for 1 minute and 42 seconds.
RMT is...	RMT (Ring Management) is the SMT MAC-related state machine. The RMT state can be one of the following: • isolated—MAC is not trying to participate in the ring. This is the initial state. • non_op—MAC is participating in ring recovery, and ring is not operational. • ring_op—MAC is participating in an operational ring. This is the normal state while the MAC is connected to the ring. • detect—Ring has been nonoperational for longer than normal. Duplicate address conditions are being checked. • non_op_dup—Indications have been received that the address of the MAC is a duplicate of another MAC on the ring. Ring is not operational. • ring_op_dup—Indications have been received that the address of the MAC is a duplicate of another MAC on the ring. Ring is operational in this state. • directed—MAC is sending beacon frames notifying the ring of the stuck condition. • trace—Trace has been initiated by this MAC, and the RMT state machine is waiting for its completion before starting an internal path test.
token rotation	Token rotation value is the default or configured rotation value as determined by the **fddi token-rotation-time** command. This value is used by all stations on the ring. The default is 5000 microseconds. For FDDI full-duplex, this indicates the value in use prior to entering full-duplex operation.
negotiated	Actual (negotiated) target token rotation time.

Table 22 show interfaces fddi Field Descriptions (continued)

Field	Description
ring operational	When the ring is operational, the displayed value will be the negotiated token rotation time of all stations on the ring. Operational times are displayed by the number of hours:minutes:seconds the ring has been up. If the ring is not operational, the message "ring not operational" is displayed.
Configured tvx	Transmission timer.
LER	Link error rate.
Upstream | downstream neighbor	Displays the canonical MAC address of outgoing upstream and downstream neighbors. If the address is unknown, the value will be the FDDI unknown address (0x00 00 f8 00 00 00).
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 counter is updated only when packets are process switched, not when packets are fast switched.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process switched, not when packets are fast switched.
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 printed. 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. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2^{31} ms (and less than 2^{32} ms) ago.
Queueing strategy	First-in, first-out queueing strategy (other queueing strategies you might see are priority-list, custom-list, and weighted fair).
Output queue, input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
5 minute input rate 5 minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes. The five-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.
packets input	Total number of error-free packets received by the system.

Table 22 show interfaces fddi Field Descriptions (continued)

bytes	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
Field	**Description**
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
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 mediu.
giants	Number of packets that are discarded because they exceed the maximum packet size of the medium.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data.
frame	Number of packets received incorrectly that have a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device. On an FDDI LAN, this also can be the result of a failing fiber (cracks) or a hardware malfunction.
overrun	Number of times the serial 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 from the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
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 transmit aborts (when the router cannot feed the transmitter fast enough).
output errors	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this might not balance with the sum of the enumerated output errors, because some datagrams can have more than one error, and others can have errors that do not fall into any of the specifically tabulated categories.
collisions	Because an FDDI ring cannot have collisions, this statistic is always zero.
interface resets	Number of times an interface has been reset. The interface may be reset by the administrator or automatically when an internal error occurs.
restarts	Should always be zero for FDDI interfaces.
output buffer failures	Number of no resource errors received on the output.

Table 22 show interfaces fddi Field Descriptions (continued)

output buffers swapped out	Number of packets swapped to DRAM.
Field	**Description**
transitions	The number of times the ring made a transition from ring operational to ring nonoperational, or vice versa. A large number of transitions indicates a problem with the ring or the interface.
traces	Trace count applies to both the FCI, FCIT, and FIP. Indicates the number of times this interface started a trace.
claims	Pertains to FCIT and FIP only. Indicates the number of times this interface has been in claim state.
beacons	Pertains to FCIT and FIP only. Indicates the number of times the interface has been in beacon state.

The following is sample output that includes the **accounting** option. When you use the **accounting** option, only the accounting statistics are displayed.

```
Router# show interfaces fddi 3/0 accounting

Fddi3/0
       Protocol    Pkts In   Chars In   Pkts Out  Chars Out
             IP       7344    4787842       1803    1535774
      Appletalk      33345    4797459      12781    1089695
        DEC MOP          0          0        127       9779
            ARP          7        420         39       2340
```

Table 23 describes the fields shown in the display.

Table 23 show interfaces fddi Field Descriptions—Accounting

Field	Description
Protocol	Protocol that is operating on the interface.
Pkts In	Number of packets received for that protocol.
Chars In	Number of characters received for that protocol.
Pkts Out	Number of packets transmitted for that protocol.
Chars Out	Number of characters transmitted for that protocol.

show interfaces gigabitethernet

To check the status and configuration settings of the Gigabit Ethernet interface of the Cisco 7200-I/O-GE+E, use the **show interfaces gigabitethernet** command in privileged EXEC mode.

show interfaces gigabitethernet *slot*/*port*

Syntax Description

slot	Slot number on the interface.
port	Port number on the interface.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1 CC	This command was introduced.
12.1(3a)E	Support for the Cisco 7200-I/O-GE+E controller was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

This command is used on the Cisco 7200-I/O-GE+E to display the configuration status of the Gigabit Ethernet interface. Slot 0 is always reserved for the Gigabit Ethernet port on the I/O controller.

Examples

The following is sample output from the **show interfaces gigabitethernet** command:

```
Router# show interfaces gigabitethernet 0/0

GigabitEthernet0/0 is up, line protocol is up
   Hardware is 82543 (Livengood), address is 00d0.ffb6.4c00 (bia 00d0.ffb6.4c00)
   Internet address is 10.1.1.3/8
   MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
      reliability 255/255, txload 1/255, rxload 1/255
   Encapsulation ARPA, loopback not set
   Keepalive set (10 sec)
   Full-duplex mode, link type is autonegotiation, media type is SX
   output flow-control is on, input flow-control is on
   ARP type:ARPA, ARP Timeout 04:00:00
   Last input 00:00:04, output 00:00:03, output hang never
   Last clearing of "show interface" counters never
   Queueing strategy:fifo
   Output queue 0/40, 0 drops; input queue 0/75, 0 drops
   5 minute input rate 0 bits/sec, 0 packets/sec
   5 minute output rate 0 bits/sec, 0 packets/sec
      2252 packets input, 135120 bytes, 0 no buffer
      Received 2252 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
```

```
2631 packets output, 268395 bytes, 0 underruns
0 output errors, 0 collisions, 2 interface resets
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
```

Related Commands

Command	Description
show controllers gigabitethernet	Displays initialization block information, transmit ring, receive ring, and errors for the interface controllers for the Gigabit Ethernet interface of the Cisco 7200-I/O-GE+E.

show interfaces hssi

To display information about the high-speed serial interface (HSSI), use the **show interfaces hssi** command in privileged EXEC mode.

show interfaces hssi *unit* [**accounting**]

Cisco 7500 Series

show interfaces hssi [*slot*/*port*] [**accounting**]

Syntax Description

unit	Must match a port number on the selected interface.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
slot	(Optional) Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information.
port	(Optional) Number of the port being configured. Refer to the appropriate hardware manual for slot and port information.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.

Examples

The following is sample output from the **show interfaces hssi** command when HSSI is enabled:

```
Router# show interfaces hssi 0

HSSI 0 is up, line protocol is up
Hardware is cBus HSSI
Internet address is 131.136.67.190, subnet mask is 255.255.255.0
MTU 4470 bytes, BW 45045 Kbit, DLY 20000 usec, rely 255/255, load 1/255
Encapsulation HDLC, loopback not set, keepalive set (10 sec)
Last input 0:00:03, output 0:00:00, output hang never
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
Five minute input rate 0 bits/sec, 0 packets/sec
Five 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 parity, 0 rx disabled
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
17 packets output, 994 bytes, 0 underruns
0 output errors, 0 applique, 4 interface resets, 0 restarts
2 carrier transitions
```

Table 24 describes significant fields shown in the display.

Table 24 show interfaces hssi Field Descriptions

Field	Description
HSSI is {up | down | administratively down}	Indicates whether the interface hardware is currently active (whether carrier detect is present) and whether it has been taken down by an administrator. “Disabled” indicate that the router has received over 5000 errors in a keepalive interval, which is 10 seconds by default.
line protocol is {up | down | administratively down}	Indicates whether the software processes that handle the line protocol consider the line usable (that is, whether keepalives are successful).
Hardware	Specifies the hardware type.
Internet address	Lists the Internet address followed by subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether loopback is set and type of loopback test.
keepalive	Indicates whether keepalives are set or not.
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 counter is updated only when packets are process switched, not when packets are fast switched.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process switched, not when packets are fast switched.
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 printed. If that field overflows, asterisks are printed.

Table 24 show interfaces hssi Field Descriptions (continued)

Field	Description
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. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 2^{31} ms (and less than 2^{32} ms) ago.
Output queue, drops Input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
Five minute input rate, Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernet networks and bursts of noise on serial lines are often responsible for no input buffer events.
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	Number of packets that are discarded because they exceed the maximum packet size of the medium.
parity	Report of the parity errors on the HSSI.
rx disabled	Indicates that the HSSI could not find a free buffer on the ciscoBus controller to reserve for use for the HSSI receiver. When this happens, the HSSI shuts down its receiver and waits until a buffer is available. Data is not lost unless a packet comes in and overflows the HSSI FIFO. Usually, the receive disables are frequent but do not last for long, and the number of dropped packets is less than the count in the "rx disabled" field. A receive disabled condition can happen in systems that are under heavy traffic load and that have shorter packets. In this situation, the number of buffers available on the ciscoBus controller is at a premium. One way to alleviate this problem is to reduce the MTU on the HSSI interface from 4500 (FDDI size) to 1500 (Ethernet size). Doing so allows the software to take the fixed memory of the ciscoBus controller and divide it into a larger number of smaller buffers, rather than a small number of large buffers. Receive disables are not errors, so they are not included in any error counts.

Table 24 show interfaces hssi Field Descriptions (continued)

Field	Description
input errors	Sum of all errors that prevented the receipt of datagrams on the interface being examined. 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.
CRC	Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. On a serial link CRCs usually indicate noise, gain hits, or other transmission problems on the data link. CRC errors are also reported when a far-end abort occurs, and when the idle flag pattern is corrupted. This makes it possible to get CRC errors even when there is no data traffic.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a serial line, this is usually the result of noise or other transmission problems.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the ability of the receiver 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 mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased.
abort	Number of packets whose receipt was aborted.
packets output	Total number of messages transmitted by the system.
bytes output	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Number of times that the far-end transmitter has been running faster than the near-end router receiver can handle.
congestion drop	Number of messages discarded because the output queue on an interface grew too long. This can happen on a slow, congested serial link.
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.
applique	Indicates that an unrecoverable error has occurred on the HSA applique. The system then invokes an interface reset.

Table 24 show interfaces hssi Field Descriptions (continued)

Field	Description
interface resets	Number of times that an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds time. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.
restarts	Number of times that the controller was restarted because of errors.
carrier transitions	Number of times that the carrier detect signal of the interface has changed state. Indicates modem or line problems if the carrier detect line is changing state often.
Protocol	Protocol that is operating on the interface.
Pkts In	Number of packets received for that protocol.
Chars In	Number of characters received for that protocol.
Pkts Out	Number of packets transmitted for that protocol.
Chars Out	Number of characters transmitted for that protocol.

The following is sample output from the **show interfaces hssi** command on a Cisco 7500 series router:

```
Router# show interfaces hssi 1/0

Hssi1/0 is up, line protocol is up
  Hardware is cxBus HSSI
  Internet address is 131.108.38.14, subnet mask is 255.255.255.0
  MTU 1500 bytes, BW 45045 Kbit, DLY 1000000 usec, rely 255/255, load 1/255
  Encapsulation HDLC, loopback not set, keepalive set (10 sec)
  Last input 0:00:00, output 0:00:08, output hang never
  Last clearing of "show interface" counters never
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 1000 bits/sec, 2 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
     630573548 packets input, 2077237628 bytes, 0 no buffer
     Received 2832063 broadcasts, 0 runts, 0 giants
              0 parity, 1970 rx disabled
     113 input errors, 20 CRC, 93 frame, 0 overrun, 0 ignored, 0 abort
     629721628 packets output, 1934313295 bytes, 0 underruns
     0 output errors, 0 applique, 62 interface resets, 0 restarts
     309 carrier transitions
```

The following is sample output from the **show interfaces hssi** command with the **accounting** option on a Cisco 7500 series routers:

```
Router# show interfaces hssi 1/0 accounting

HIP1/0
       Protocol    Pkts In   Chars In   Pkts Out  Chars Out
             IP       7344    4787842       1803    1535774
      Appletalk      33345    4797459      12781    1089695
        DEC MOP          0          0        127       9779
            ARP          7        420         39       2340
```