show fras

To display notification that the Frame Relay access support (FRAS) dial backup over data-link switching plus (DLSw+) feature is active, information about the connection state in FRAS, and information about current boundary network node, boundary access node (BAN), and dial backup, use the **show fras** command in privileged EXEC mode.

show fras

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **show fras** command:

```
Router# show fras

Boundary Network Node (BNN):
DLCI: 66
  Type   Destination      Int    LSap  RSap   Role  State
  fr                             4      4     S     ls_reset (Backup is enabled)
  llc    0000.f63a.2f50   To0    4      4     P     ls_contacted
```

Table 71 describes the significant fields shown in the display.

Table 71 show fras Field Descriptions

Field	Description
Type	Connection type. The display example shows Logical Link Control (LLC) and Frame Relay.
Destination	Destination MAC address from the perspective of the Cisco IOS software.
Int	Interface on which the connection resides.
LSap	Local service access point (SAP) value.
RSap	Remote SAP value.
Role	Local link station role; P means primary and S means secondary.

Table 71 show fras Field Descriptions (continued)

Field	Description
State	Link station protocol machine state. This value may be one of the following states: • ls_reset—Initial state. • ls_RqOpnStnSent—TEST frame sent; request to open a connection endpoint. • ls_ExchgXid—exchange identification (XID) negotiation taking place. • ls_ConnRqSent—Set Asynchronous Balanced Mode Extended (SABME) sent (connecting side). • ls_SigStnWait—Waiting for signal to clean up the congestion and respond to polling with an Receiver Not Ready (RNR). • ls_ConnRspWait—Wait for the other connection endpoint to bring up the link. • ls_ConnRspSent—A unnumbered acknowledgement (UA) has been sent and the router is waiting for a Receive Ready (RR) to clear up the flow. • ls_Contacted—Everything is connected • ls_DiscWait—Wait for acknowledge to disconnect request.
Backup is enabled	Notification displayed when the FRAS dial backup feature is configured.

show fras map

To display the mapping and connection state of Frame Relay access support (FRAS), use the **show fras map** command in privileged EXEC mode.

show fras map

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **show fras map** command:

```
Router# show fras map

Type Destination    Int   LSap   RSap   Role   State
tr   0800.5a8f.8802 tr0   4      4      P      ls_contacted
fr   200            s0    4      4      S      ls_contacted
```

Table 72 describes the significant fields shown in the display.

Table 72 show fras map Field Descriptions

Field	Description
Type	Connection type. The display example shows Logical Link Control (LLC) and Frame Relay.
Destination	Destination MAC address from the perspective of the Cisco IOS software.
Int	Interface on which the connection resides.
LSap	Local service access point (SAP) value.
RSap	Remote SAP value.
Role	Local link station role; P means primary and S means secondary.
State	Connection type. The display example shows Logical Link Control (LLC) and Frame Relay.

show fras-host

To display the status of Logical Link Control, type 2 (LLC2) sessions using the Frame Relay access support (FRAS) Host feature, use the **show fras-host** command in user EXEC or privileged EXEC mode.

show fras-host [*interface*] [**dlci** *dlci-num*] [**detail**]

Syntax Description

interface	(Optional) Only display LLC2 sessions from a specified Frame Relay interface or subinterface.
dlci *dlci-number*	(Optional) Only display LLC2 sessions from a specified data-link connection identifier (DLCI).
detail	(Optional) Display additional information such as the Routing Information Field (RIF)s and statistics associated with the LLC2 sessions.

Command Modes

User EXEC
Privileged EXEC

Command History

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

Examples

The following is sample output from the **show fras-host** command:

```
router# show fras-host

Number of Active Control Blocks = 2
Number of Available Control Blocks in Pool = 126

PortDLCITypeFrRsapFrLSapHostSapVMacHostMac
Se0 16  BNN 04  08  04  4000.ABBA.001E4000.3000.2000
Se1 37  BAN 04  04  04  4000.0223.00194000.3000.2000
```

Table 73 describes the significant fields shown in the display.

Table 73 show fras-host Field Descriptions

Field	Description
Port	Frame Relay interface or subinterface associated with this LLC2 session.
DLCI	DLCI number associated with this LLC2 session
Type	FRAS encapsulation type associated with this LLC2 session

Table 73 show fras-host Field Descriptions (continued)

Field	Description
FrRsap	Frame Relay Remote LLC2 service access point (SAP) associated with this LLC2 session. This SAP is the source sap on LLC2 frames sent by the remote Frame Relay access device (FRAD).
FrLSap	Frame Relay Local LLC2 SAP associated with this LLC2 session. This SAP is the destination SAP on LLC2 frames sent by the remote FRAD.
HostSap	Destination SAP on LLC2 frames sent to the Channel Interface Processor (CIP) or LAN-attached AS/400. This SAP is identical to FrLsap unless the **hsap** keyword is specified on the **fras-host bnn** command.
VMac	MAC address associated with the remote FRAD for this LLC2 session.
HostMac	MAC address associated with the host for this LLC2 session.

Related Commands

Command	Description
fras-host ban	Enables the FRAS Host function for BAN.
fras-host bnn	Enables the FRAS Host function for boundary network node.
fras-host dlsw-local-ack	Enables LLC2 local termination for FRAS Host connections using the virtual Token Ring.

show interfaces channel

To display information about the Cisco Mainframe Channel Connection (CMCC) adapter interfaces, use the **show interfaces channel** command in privileged EXEC mode. This command displays information that is specific to the interface hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

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

Syntax Description

slot	Slot number.
port	Port number.
accounting	(Optional) Displays interface accounting information.

Command Modes

Privileged EXEC

Command History

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

Examples

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

```
Router# show interfaces channel 3/0

Channel3/0 is up, line protocol is up
  Hardware is cxBus IBM Channel
  Internet address is 10.92.1.145, subnet mask is 255.255.255.248
  MTU 4096 bytes, BW 0 Kb, DLY 0 usec, rely 255/255, load 1/255
  Encapsulation CHANNEL, loopback not set, keepalive not set
  ECA type daughter card
  Data transfer rate 12 Mbytes  Number of subchannels 1
  Last input never, output never, output hang never
  Last clearing of "show interface" counters 0:00:04
  Output queue 0/0, 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 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets, 0 restarts
```

Table 74 describes the fields shown in the display.

Table 74 show interfaces channel Field Descriptions

Field	Description
Channel... is up	Indicates whether the interface hardware is active (whether synchronization is achieved on an ESCON channel, or whether operational out is enabled on a parallel channel) and whether it has been taken down by an administrator.
line protocol is up	Indicates whether the software processes that handle the line protocol “think” the line is usable (that is, whether keepalives are successful).
Hardware is	Hardware type.
Internet address is	IP address and 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. The calculation uses the value from the **bandwidth** interface configuration command.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether loopbacks are set.
keepalive	Indicates whether keepalives are set.
daughter card	Type of adapter card.
Data transfer rate	Rate of data transfer.
Number of subchannels	Number of subchannels.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface. Useful for knowing when a dead interface first failed. This counter is updated only when packets are process switched, not when packets are fast switched.
Last output	Number of hours, minutes, and seconds since the last packet was successfully sent 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 data that took too long to send. 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 74 show interfaces channel Field Descriptions (continued)

Field	Description
Last clearing	The time at which the counters that measure cumulative statistics (such as number of bytes sent 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. These asterisks (***) indicate 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 due to a full queue.
Five minute input rate, Five minute output rate	Average number of bits and packets sent per second in the last five 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 Ethernets 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 medium's minimum packet size.
giants	Number of packets that are discarded because they exceed the medium's maximum packet size.
input errors	Total number of buffer, runts, giants, cyclic redundancy checks (CRC), frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum may not balance with the other counts.
CRC	Number of code violation errors seen on the ESCON interface, where a received transmission character is recognized as invalid. On a parallel interface, the number of parity errors seen.
frame	Number of received packets having an incorrect CRC error and a noninteger number of octets. This value is always 0.
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. This value is always 0.
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 "no buffer" description. Broadcast storms and bursts of noise can cause the ignored count to be increased.

Table 74 show interfaces channel Field Descriptions (continued)

Field	Description
abort	Illegal sequence of one bits on a serial interface. This usually indicates a clocking problem between the serial interface and the data-link equipment. This value is always 0.
packets output	Total number of messages sent by the system.
bytes	Total number of bytes, including data and MAC encapsulation, sent by the system.
underruns	Sum of all errors that prevented the final sending 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.
output errors	Number of output errors.
collisions	Number of collisions detected. This value is always 0.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for sending were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the send 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. On the CMCC adapter, this may occur if the host software is not requesting data.
restarts	Number of times the controller was restarted because of errors.

show interfaces crb

To display the configuration for each interface that has been configured for routing or bridging, use the **show interfaces crb** command in privileged EXEC mode.

show interfaces crb

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

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

Examples

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

```
Router# show interfaces crb

Ethernet0/0

Routed protocols on Ethernet0/0:
appletalk decnet ip novell

Ethernet0/1

Routed protocols on Ethernet0/1:
appletalk  decnet  ip  novell

Ethernet0/2

Routed protocols on Ethernet0/2:
appletalk  ip

Bridged protocols on Ethernet0/2:
clns  decnet  vines  apollo
novell  xns

Software MAC address filter on Ethernet0/2
Hash Len   Address         Matches   Act   Type
0x00: 0    ffff.ffff.ffff  0         RCV   Physical broadcast
0x00: 1    ffff.ffff.ffff  0         RCV   Appletalk zone
0x2A: 0    0900.2b01.0001  0         RCV   DEC spanning tree
0x49: 0    0000.0c36.7a45  0         RCV   Interface MAC address
0xc0: 0    0100.0ccc.cccc  20        RCV   CDP
0xc2: 0    0180.c200.0000  0         RCV   IEEE spanning tree
0xF8: 0    0900.07ff.ffff  0         RCV   Appletalk broadcast
```

```
Ethernet0/3

Routed protocols on Ethernet0/3:
appletalk  ip

Bridged protocols on Ethernet0/3:
clns  decnet  vines  apollo
novell  xns

Software MAC address filter on Ethernet0/3
Hash Len   Address         Matches   Act   Type
0x00: 0    ffff.ffff.ffff  0         RCV   Physical broadcast
0x00: 1    ffff.ffff.ffff  0         RCV   Appletalk zone
0x2A: 0    0900.2b01.0001  0         RCV   DEC spanning tree
0x49: 0    0000.0c36.7a45  0         RCV   Interface MAC address
0xc0: 0    0100.0ccc.cccc  48        RCV   CDP
0xc2: 0    0180.c200.0000  0         RCV   IEEE spanning tree
0xF8: 0    0900.07ff.ffff  0         RCV   Appletalk broadcast
```

Table 75 describes the significant fields shown in the display.

Table 75 show interfaces crb Field Descriptions

Field	Description
Routed protocols on…	List of the routed protocols configured for the specified interface.
Bridged protocols on…	List of the bridged protocols configured for the specified interface.
Software MAC address filter on…	Table of software MAC address filter information for the specified interface.
Hash	Hash key/relative position in the keyed list for this MAC-address entry.
Len	Length of this entry to the beginning element of this hash chain.
Address	Canonical (Ethernet ordered) MAC address.
Matches	Number of received packets matched to this MAC address.
Act	Action to be taken when that address is looked up; choices are to receive or discard the packet.
Type	MAC address type.

show interfaces irb

To display the configuration for each interface that has been configured for integrated routing or bridging, use the **show interfaces irb** command in privileged EXEC mode.

show interfaces {**ethernet** | **fastethernet**} [*interface* | *slot*/*port*] **irb**

Syntax Description

ethernet	Specify Ethernet interface.
fastethernet	Specify Fast Ethernet interface.
interface	(Optional) Specific interface, such as Ethernet 0.
slot/*port*	(Optional) Specific slot and port, such as Fast Ethernet 3/0.

Command Modes

Privileged EXEC

Command History

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

Examples

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

```
Router# show interfaces ethernet 2 irb

Ethernet 2

Routed protocols on Ethernet 2:
appletalk ip

Bridged protocols on Ethernet 2:
appletalk   clns   decnet   vines
apollo      ipx    xns

Software MAC address filter on Ethernet 2
Hash Len  Address         Matches  Act   Type
0x00: 0   ffff.ffff.ffff  4886     RCV   Physical broadcast
0x1F: 0   0060.3e2b.a221  7521     RCV   Appletalk zone
0x1F: 1   0060.3e2b.a221  0        RCV   Bridge-group Virtual Interface
0x2A: 0   0900.2b01.0001  0        RCV   DEC spanning tree
0x05: 0   0900.0700.00a2  0        RCV   Appletalk zone
0xC2: 0   0180.c200.0000  0        RCV   IEEE spanning tree
0xF8: 0   0900.07ff.ffff  2110     RCV   Appletalk broadcast
```

The following example shows that IP is configured for the first PA-12E/2FE interface of the port adapter in slot 3:

```
Router# show interfaces fastethernet 3/0 irb

Fast Ethernet3/0
```

```
Routed protocols on Fast Ethernet3/0:
 ip

Bridged protocols on Fast Ethernet3/0:
 appletalk  clns       decnet     ip
 vines      apollo     ipx        xns

Software MAC address filter on Ethernet3/0
 Hash Len    Address      Matches  Act      Type
 0x00:  0 ffff.ffff.ffff         0 RCV Physical broadcast
 0x2A:  0 0900.2b01.0001         0 RCV DEC spanning tree
 0xC2:  0 0180.c200.0000         0 RCV IEEE spanning tree
 0xC7:  0 00e0.f7a4.5130         0 RCV Interface MAC address
 0xC7:  1 00e0.f7a4.5130         0 RCV Bridge-group Virtual Interface
```

Table 76 describes the significant fields shown in the displays.

Table 76 show interfaces irb Field Descriptions

Field	Description
Routed protocols on…	List of the routed protocols configured for the specified interface.
Bridged protocols on…	List of the bridged protocols configured for the specified interface.
Software MAC address filter on…	Table of software MAC address filter information for the specified interface.
Hash	Hash key/relative position in the keyed list for this MAC-address entry.
Len	Length of this entry to the beginning element of this hash chain.
Address	Canonical (Ethernet ordered) MAC address.
Matches	Number of received packets matched to this MAC address.
Act	Action to be taken when that address is looked up; choices are to receive or discard the packet.
Type	MAC address type.

show interfaces tokenring (IBM)

To display information about the Token Ring interface and the state of source-route bridging (SRB), use the **show interfaces tokenring** command in privileged EXEC mode.

show interfaces tokenring [*number*]

Syntax Description

number	(Optional) Interface number. If you do not provide a value, the command will display statistics for all Token Ring interfaces.

Command Modes

Privileged EXEC

Command History

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

Examples

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

```
Router# show interfaces tokenring

TokenRing 0 is up, line protocol is up
Hardware is 16/4 Token Ring, address is 5500.2000.dc27 (bia 0000.3000.072b)
   Internet address is  10.136.230.203, subnet mask is 255.255.255.0
   MTU 8136 bytes, BW 16000 Kb, DLY 630 usec, rely 255/255, load 1/255
   Encapsulation SNAP, loopback not set, keepalive set (10 sec)
   ARP type: SNAP, ARP Timeout 4:00:00
   Ring speed: 16 Mbps
   Single ring node, Source Route Bridge capable
   Group Address: 0x00000000, Functional Address: 0x60840000
   Last input 0:00:01, output 0:00:01, 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
   16339 packets input, 1496515 bytes, 0 no buffer
        Received 9895 broadcasts, 0 runts, 0 giants
        0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     32648 packets output, 9738303 bytes, 0 underruns
0 output errors, 0 collisions, 2 interface resets, 0 restarts
     5 transitions
```

Table 77 describes the significant fields shown in the display.

Table 77 show interfaces tokenring Field Descriptions

Field	Description
Token Ring is up	Interface is currently active and inserted into ring (up) or inactive and not inserted (down).
Token Ring is Reset	Hardware error has occurred. This is not in the sample output; it is informational only.
Token Ring is Initializing	Hardware is up, in the process of inserting the ring. This is not in the sample output; it is informational only.
Token Ring is Administratively Down	Hardware has been taken down by an administrator. This is not in the sample output; it is informational only. "Disabled" indicates the Cisco IOS software has received over 5000 errors in a keepalive interval, which is 10 seconds by default.
line protocol is up	Indicates whether the software processes that handle the line protocol believe the interface is usable (that is, whether keepalives are successful).
Hardware	Specifies the hardware type. "Hardware is ciscoBus Token Ring" indicates that the board is a CSC-C2CTR board. "Hardware is 16/4 Token Ring" indicates that the board is a CSC-1R, CSC-2R, or a CSC-R16M board. Also shows the address of the interface.
Internet address	Lists the Internet address followed by the 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.
keepalive	Indicates whether keepalives are set.
ARP type	Type of Address Resolution Protocol assigned.
Ring speed	Speed of Token Ring—4 or 16 Mbps.
Single ring node	Indicates whether a node is enabled to collect and use source RIF for routable Token Ring protocols.
Group Address	Interface's group address, if any. The group address is a multicast address; any number of interfaces on the ring may share the same group address. Each interface may have at most one group address.
Functional Address	Bit-significant group address. Each "on" bit represents a function performed by the station.

Table 77 show interfaces tokenring Field Descriptions (continued)

Field	Description
Last input	Number of hours, minutes, and seconds since the last packet was received by an 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 the data took too long to send. 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.
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 due to a full queue.
Five minute input rate, Five minute output rate	Average number of bits and packets sent per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
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 medium's minimum packet size.
giants	Number of packets that are discarded because they exceed the medium's maximum packet size.
CRC	Cyclic redundancy check (CRC) generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or problems sending data on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of a station sending bad data.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets.
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 than 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 sent by the system.
bytes	Total number of bytes, including data and MAC encapsulation, sent by the system.
underruns	Number of times that the far-end sender has been running faster than the near-end router's receiver can handle. This may never be reported on some interfaces.

Table 77 show interfaces tokenring Field Descriptions (continued)

Field	Description
output errors	Sum of all errors that prevented the final sending of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, because some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
collisions	Because a Token Ring cannot have collisions, this statistic is nonzero only if an unusual event occurred when frames were being queued or dequeued by the system software.
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 Token Ring interfaces.
transitions	Number of times the ring made a transition from up to down, or vice versa. A large number of transitions indicates a problem with the ring or the interface.

show llc2

To display the Logical Link Control, type 2 (LLC2) connections active in the router, use the **show llc2** command in privileged EXEC mode.

show llc2 [**brief**]

Syntax Description

brief	(Optional) Displays information about the LLC2 connections that are active in the router.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
10.0	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(33)SXI	This command was integrated into a release earlier than Cisco IOS Release 12.2(33)SXI.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1.

Examples

The following is sample output from the **show llc2** command:

```
Router# show llc2

TokenRing0 DTE=1000.5A59.04F9,400022224444 SAP=04/04, State=NORMAL
V(S)=5, V(R)=5, Last N(R)=5, Local window=7, Remote Window=127
ack-max=3, n2=8, Next timer in 7768
xid-retry timer 0/60000 ack timer 0/1000
p timer 0/1000 idle timer 7768/10000
rej timer 0/3200 busy timer 0/9600
ack-delay timer 0/3200
CMNS Connections to:
Address 1000.5A59.04F9 via Ethernet2
Protocol is up
Interface type X25-DCE RESTARTS 0/1
Timers: T10 1 T11 1 T12 1 T13 1
```

The display includes a Connection-Mode Network Service (CMNS) addendum, indicating the LLC2 is running with CMNS. When LLC2 is not running with CMNS, the **show llc2** command does not display a CMNS addendum.

Table 78 describes the significant fields shown in the display.

Table 78 show llc2 Field Descriptions

Field	Description
TokenRing0	Name of interface on which the session is established.
DTE=1000.5A59.04F9, 400022224444	Address of the station to which the router is talking on this session. The address is the MAC address of the interface on which the connection is established, except when Local Acknowledgment or SDLC Logical Link Control (SDLLC) is used, in which case the address used by the Cisco IOS software is shown as in this example, following the DTE address and separated by a comma.
SAP=04/04	Other station's and the router's (remote or local) service access point (SAP) for this connection. The SAP is analogous to a "port number" on the router and allows for multiple sessions between the same two stations.

Table 78 show llc2 Field Descriptions (continued)

Field	Description
State=NORMAL	Current state of the LLC2 session. The values are: • ADM—Asynchronous Disconnect Mode. A connection is not established, and either end can begin one. • SETUP—Request to begin a connection has been sent to the remote station, and this station is waiting for a response to that request. • RESET—A previously open connection has been reset because of some error by this station, and this station is waiting for a response to that reset command. • D_CONN—This station has requested a normal, expected, end of communications with the remote, and is waiting for a response to that disconnect request. • ERROR—This station has detected an error in communications and has told the other station of this. This station is waiting for a reply to its posting of this error. • NORMAL—Connection between the two sides is fully established, and normal communication is occurring. • BUSY—Normal communication state exists, except busy conditions on this station make it such that this station cannot receive information frames from the other station at this time. • REJECT—Out-of-sequence frame has been detected on this station, and this station has requested that the other resend this information. • AWAIT—Normal communication exists, but this station has had a timer expire, and is trying to recover from it (usually by resending the frame that started the timer). • AWAIT_BUSY—A combination of the AWAIT and BUSY states. • AWAIT_REJ—A combination of the AWAIT and REJECT states.
V(S)=5	Sequence number of the next information frame this station will send.
V(R)=5	Sequence number of the next information frame this station expects to receive from the other station.
Last N(R)=5	Last sequence number of this station's sent frames acknowledged by the remote station.
Local window=7	Number of frames this station may send before requiring an acknowledgment from the remote station.
Remote Window=127	Number of frames this station can accept from the remote.
ack-max=3	Maximum number of packets to receive before sending an acknowledgment.
n2=8	Number of times to retry operations.
Next timer in 7768	Number of milliseconds before the next timer, for any reason, goes off.

Table 78 show llc2 Field Descriptions (continued)

Field	Description
xid-retry timer 0/60000	Number of milliseconds to wait for a reply to exchange identification (XID) frames before dropping a session. This timer value is in the form of next-time/time-between, where “next-time” is the next time, in milliseconds, that the timer will wake, and “time-between” is the time, in milliseconds, between each timer wakeup. A “next-time” of zero indicates that the timer is not enabled, and will never wake.
ack timer 0/1000	Number of milliseconds to wait before sending an acknowledgment. This timer value is in the form of next-time/time-between, where “next-time” is the next time, in milliseconds, that the timer will wake, and “time-between” is the time, in milliseconds, between each timer wakeup. A “next-time” of zero indicates that the timer is not enabled, and will never wake.
p timer 0/1000	Number of milliseconds to wait for a final response to a poll frame before resending the poll frame. This timer value is in the form of next-time/time-between, where “next-time” is the next time, in milliseconds, that the timer will wake, and “time-between” is the time, in milliseconds, between each timer wakeup. A “next-time” of zero indicates that the timer is not enabled, and will never wake.
idle timer 7768/10000	Number of milliseconds that can pass with no traffic before the LLC2 station sends a Receiver Ready frame. This timer value is in the form of next-time/time-between, where “next-time” is the next time, in milliseconds, that the timer will wake, and “time-between” is the time, in milliseconds, between each timer wakeup. A “next-time” of zero indicates that the timer is not enabled, and will never wake.
rej timer 0/3200	Number of milliseconds to wait for a resend of a rejected frame before sending a reject command to the remote station. This timer value is in the form of next-time/time-between, where “next-time” is the next time, in milliseconds, that the timer will wake, and “time-between” is the time, in milliseconds, between each timer wakeup. A “next-time” of zero indicates that the timer is not enabled, and will never wake.
busy timer 0/9600	Number of milliseconds to wait before repolling a busy remote station. This timer value is in the form of next-time/time-between, where “next-time” is the next time, in milliseconds, that the timer will wake, and “time-between” is the time, in milliseconds, between each timer wakeup. A “next-time” of zero indicates that the timer is not enabled, and will never wake.
ack-delay timer 0/3200	Number of milliseconds to allow incoming information frames to stay unacknowledged. This timer value is in the form of next-time/time-between, where “next-time” is the next time, in milliseconds, that the timer will wake, and “time-between” is the time, in milliseconds, between each timer wakeup. A “next-time” of zero indicates that the timer is not enabled, and will never wake.
CMNS Connections to:	List of values that affect the interface if CMNS is enabled.
Address 1000.5A59.04F9 via Ethernet2	MAC address of remote station.

Table 78 show llc2 Field Descriptions (continued)

Field	Description
Protocol is up	Up indicates that the LLC2 and X.25 protocols are in a state where incoming and outgoing Call Requests can be made on this LLC2 connection.
Interface type X25-DCE	One of X25-DCE, X25-DTE, or X25-DXE (both DTE and DCE).
RESTARTS 0/1	Restarts sent/received on this LLC2 connection.
Timers:	T10, T11, T12, T13 (or T20, T21, T22, T23 for DTE); these are Request packet timers. These are similar in function to X.25 parameters of the same name.

Related Commands

Command	Description
llc2 ack-delay-time	Sets the amount of time the Cisco IOS software waits for an acknowledgment before sending the next set of information frames.
llc2 ack-max	Controls the maximum amount of information frames the Cisco IOS software can receive before it must send an acknowledgment.
llc2 idle-time	Controls the frequency of polls during periods of idle time (no traffic).
llc2 local-window	Controls the maximum number of information frames the Cisco IOS software sends before it waits for an acknowledgment.
llc2 n2	Controls the number of times the Cisco IOS software retries sending unacknowledged frames or repolls remote busy stations.
llc2 t1-time	Controls the amount of time the Cisco IOS software will wait before resending unacknowledged information frames.
llc2 tbusy-time	Controls the amount of time the Cisco IOS software waits until repolling a busy remote station.
llc2 tpf-time	Sets the amount of time the Cisco IOS software waits for a final response to a poll frame before resending the poll frame.
llc2 trej-time	Controls the amount of time the Cisco IOS software waits for a correct frame after sending a reject command to the remote LLC2 station.
llc2 xid-neg-val-time	Controls the frequency of XID transmissions by the Cisco IOS software.
llc2 xid-retry-time	Sets the amount of time the Cisco IOS software waits for a reply to XID frames before dropping the session.

show lnm bridge

Note Effective with release 12.3(4)T, the **show lnm bridge** command is no longer available in Cisco IOS 12.3T releases.

To display all currently configured bridges and all parameters that are related to the bridge as a whole, not to one of its interfaces, use the **show lnm bridge** command in privileged EXEC mode.

show lnm bridge

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.3(4)T	This command is no longer available in Cisco IOS 12.3T releases.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show lnm bridge** command:

```
Router# show lnm bridge

Bridge 001-2-003, Ports 0000.3000.abc4, 0000.0028.abcd
Active Links: 0000.0000.0000 0000.0000.0000 0000.0000.0000 0000.0000.0000
Notification: 0 min, Threshold 00.10%
```

Table 79 describes the significant fields shown in the display.

Table 79 show lnm bridge Field Descriptions

Field	Description
Bridge 001-2-003	Ring and bridge numbers of this bridge.
Ports 0000.3000.abc4....	MAC addresses of the two interfaces of this bridge.
Active Links:	Any LAN Network Manager (LNM) stations that are connected to this bridge. An entry preceded by an asterisk is the controlling LNM.
Notification: 0 min	Current counter notification interval in minutes.
Threshold 00.10%	Current loss threshold (in percent) that will trigger a message to the LNM.

show lnm config

Note Effective with release 12.3(4)T, the **show lnm config** command is no longer available in Cisco IOS 12.3T releases.

To display the logical configuration of all bridges configured in a router, use the **show lnm config** command in privileged EXEC mode. This information is needed to configure an LAN Network Manager (LNM) Management Station to communicate with a router. This is especially important when the router is configured as a multiport bridge, thus employing the concept of a virtual ring.

show lnm config

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.3(4)T	This command is no longer available in Cisco IOS 12.3T releases.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show lnm config** command for a simple two-port bridge:

```
Router# show lnm config

Bridge(s) currently configured:

          From     ring 001, address 0000.3000.abc4
          Across bridge 002
          To       ring 003, address 0000.0028.abcd
```

The following is sample output from the **show lnm config** command for a multiport bridge:

```
Router# show lnm config

Bridge(s) currently configured:

          From     ring 001, address 0000.0028.abc4
          Across bridge 001
          To       ring 008, address 4000.0028.abcd

          From     ring 002, address 0000.3000.abc4
          Across bridge 002
          To       ring 008, address 4000.3000.abcd
```

```
From     ring 003, address 0000.3000.5735
Across bridge 003
To       ring 008, address 4000.3000.5735
```

Table 80 describes the significant fields shown in the display.

Table 80 show lnm config Field Descriptions

Field	Description
From ring 001	Ring number of the first interface in the two-port bridge.
address 0000.3000.abc4	MAC address of the first interface in the two-port bridge.
Across bridge 002	Bridge number assigned to this bridge.
To ring 003	Ring number of the second interface in the two-port bridge.
address 0000.0028.abcd	MAC address of the second interface in the two-port bridge.

show lnm interface

Note Effective with release 12.3(4)T, the **show lnm interface** command is no longer available in Cisco IOS 12.3T releases.

To display all LAN Network Manager (LNM)-related information about a specific interface or all interfaces, use the **show lnm interface** command in privileged EXEC mode.

show lnm interface [*type number*]

Syntax Description

type	(Optional) Interface type.
number	(Optional) Interface number.

Defaults

The *type* argument is not specified, information about all interface types is displayed.
If *number* is not specified, information about all interface numbers is displayed.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.3(4)T	This command is no longer available in Cisco IOS 12.3T releases.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

This command is for all types of interfaces, including Token Ring interfaces. If you want information specific to Token Ring, use the **show lnm ring** command.

Examples

The following is sample output from the **show lnm interface** command:

```
Router# show lnm interface

 nonisolating error counts
interface  ring   Active Monitor  SET   dec   lost   cong.  fc    freq.token
TokenRing1 0001*  1000.5a98.23a0  00200 00001 00000  00000  00000 0000000002

Notification flags: FE00, Ring Intensive: FFFF, Auto Intensive: FFFF
Active Servers: LRM LBS REM RPS CRS
Last NNIN:   never, from 0000.0000.0000.
Last Claim:  never, from 0000.0000.0000.
Last Purge:  never, from 0000.0000.0000.
Last Beacon: never, 'none' from 0000.0000.0000.
```

```
Last MonErr: never, 'none' from 0000.0000.0000.

                isolating error counts
station         int ring   loc.   weight line   inter  burst  ac    abort
1000.5a98.23a0  T1  0001   0000   00 - N00000   00000  00000  00000 00000
1000.5a98.239e  T1  0001   0000   00 - N00000   00000  00000  00000 00000
1000.5a6f.bc15  T1  0001   0000   00 - N00000   00000  00000  00000 00000
0000.3000.abc4  T1  0001   0000   00 - N00000   00000  00000  00000 00000
1000.5a98.239f  T1  0001   0000   00 - N00000   00000  00000  00000 00000
```

Table 81 describes the significant fields shown in the display. See the **show lnm station** command for a description of the fields that follow after the "isolating error counts" line in the sample output.

Table 81 show lnm interface Field Descriptions

Field	Description
interface	Interface about which information was requested.
ring	Number assigned to that Token Ring. An asterisk following the ring number indicates that stations with nonzero error counters are present on that ring.
Active Monitor	Address of the station that is providing "Active Monitor" functions to the ring. The description of this server can be found in the *IBM Token Ring Architecture Reference Manual.*
SET	Current soft error reporting time for the ring in units of tens of milliseconds.
dec	Rate at which the various counters of nonisolating errors are being decreased. This number is in errors per 30 seconds.
lost, cong., fc, freq.token	Current values of the five nonisolating error counters specified in the 802.5 specification. These are Lost Frame errors, Receiver Congestion errors, FC errors, Frequency errors, and Token errors.
Notification flags:	Representation of which types of ring errors are being reported to LNM. The description of this number can be found in the *IBM Token Ring Architecture Reference Manual.*
Ring Intensive:	Representation of which specific ring error messages are being reported to LNM when in the "Ring Intensive" reporting mode. The description of this number can be found in the *IBM Token Ring Architecture Reference Manual.*
Auto Intensive:	Representation of which specific ring error messages are being reported to LNM when in the "Auto Intensive" reporting mode. The description of this number can be found in the *IBM Token Ring Architecture Reference Manual.*

Table 81 show lnm interface Field Descriptions (continued)

Field	Description
Active Servers:	A list of which servers are active on this Token Ring. The acronyms and their meanings are as follows: • CRS—Configuration Report Server • LRM—LAN Reporting Manager • LBS—LAN Bridge Server • REM—Ring Error Monitor • RPS—Ring Parameter Server The description of these servers can be found in the *IBM Token Ring Architecture Reference Manual*.
Last NNIN:	Time since the last "Neighbor Notification Incomplete" frame was received, and the station that sent this message.
Last Claim:	Time since the last "Claim Token" frame was received, and the station that sent this message.
Last Purge:	Time since the last "Purge Ring" frame was received, and the station that sent this message.
Last Beacon:	Time since the last "Beacon" frame was received, the type of the last beacon frame, and the station that sent this message.
Last Mon Err:	Time since the last "Report Active Monitor Error" frame was received, the type of the last monitor error frame, and the station that sent this message.

Related Commands

Command	Description
show lnm ring	Displays all LNM information about a specific Token Ring or all Token Rings.
show lnm station	Displays LNM-related information about a specific station or all known stations on all rings.

show lnm ring

Note Effective with release 12.3(4)T, the **show lnm ring** command is no longer available in Cisco IOS 12.3T releases.

To display all LAN Network Manager (LNM) information about a specific Token Ring or all Token Rings, use the **show lnm ring** command in privileged EXEC mode.

show lnm ring [*ring-number*]

Syntax Description

ring-number	(Optional) Number of a specific Token Ring. It can be a value in the range from 1 to 4095.

Defaults

If the *ring-number* argument is not specified, information about all Token Rings is displayed.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.3(4)T	This command is no longer available in Cisco IOS 12.3T releases.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

If a specific interface is requested, it also displays a list of all active stations on that interface.

The output of this command is the same as the output of the **show lnm interface** command. See the **show lnm interface** and **show lnm station** commands for sample output and a description of the fields. The same information can be obtained by using the **show lnm interface** command, but instead of specifying an interface number, you specify a ring number as an argument.

Related Commands

Command	Description
show lnm interface	Displays all LNM-related information about a specific interface or all interfaces.
show lnm station	Displays LNM-related information about a specific station or all known stations on all rings.

show lnm station

Note Effective with release 12.3(4)T, the **show lnm station** command is no longer available in Cisco IOS 12.3T releases.

To display LAN Network Manager (LNM)-related information about a specific station or all known stations on all rings, use the **show lnm station** command in privileged EXEC mode

show lnm station [*address*]

Syntax Description

address	(Optional) Address of a specific LNM station.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.3(4)T	This command is no longer available in Cisco IOS 12.3T releases.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

If a specific station is requested, it also displays a detailed list of that station's current MAC-level parameters.

Examples

The following is sample output from the **show lnm station** command when a particular address has been specified:

```
Router# show lnm station 1000.5a6f.bc15

                                          isolating error counts
    station      int  ring  loc.   weight   line  inter burst   ac  abort
1000.5a6f.bc15    T1  0001  0000   00 - N   00000 00000 00000 00000 00000

Unique ID:  0000.0000.0000          NAUN: 0000.3000.abc4
Functional: C000.0000.0000         Group: C000.0000.0000
Physical Location:   00000        Enabled Classes:  0000
Allowed Priority:    00000        Address Modifier: 0000
Product ID:     00000000.00000000.00000000.00000000.0000
Ucode Level:    00000000.00000000.0000
Station Status: 00000000.0000
Last transmit status: 00
```

Table 82 describes the significant fields shown in the display.

Table 82 show lnm station Field Descriptions

Field	Description
station	MAC address of the given station on the Token Ring.
int	Interface used to reach the given station.
ring	Number of the Token Ring where the given station is located.
loc.	Physical location number of the given station.
weight	Weighted accumulation of the errors of the given station, and of its nearest active upstream neighbor (NAUN). The three possible letters and their meanings are as follows:[1] • N—not in a reported error condition. • P—in a "preweight" error condition. • W—in a "preweight" error condition.
isolating error counts	Current values of the five isolating error counters specified in the 802.5 specification. These are Line errors, Internal errors, Burst errors, AC errors, and Abort errors.
Values below this point will be zero unless the LNM has previously requested this information.	
Unique ID:	Uniquely assigned value for this station.
NAUN:	MAC address of this station's "upstream" neighbor.
Functional:	MAC-level functional address currently in use by this station.
Group:	MAC-level group address currently in use by this station.
Physical Location:	Number assigned to this station as its "Physical Location" identifier.
Enabled Classes:	Functional classes that the station is allowed to send.
Allowed Priority:	Maximum access priority that the station may use when sending onto the Token Ring.
Address Modifier:	Reserved field.
Product ID:	Encoded 18-byte string used to identify what hardware and software combination is running on this station.
Ucode Level:	10-byte extended binary coded decimal interchange code (EBCDIC) string indicating the microcode level of the station.
Station Status:	Implementation-dependent vector that is not specified anywhere.
Last transmit status:	Contains the strip status of the last "Report Transmit Forward" MAC frame forwarded by this interface.

1. The description of these error conditions can be found in the *IBM Architecture Reference Manual*.

show local-ack

To display the current state of any current local acknowledgment for both Logical Link Control, type 2 (LLC2) and SDLC Logical Link Control (SDLLC) connections, and for any configured pass-through rings, use the **show local-ack** command in privileged EXEC mode.

show local-ack

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **show local-ack** command:

```
Router# show local-ack

local 1000.5a59.04f9, lsap 04, remote 4000.2222.4444, dsap 04
llc2 = 1798136, local ack state = connected
Passthrough Rings: 4 7
```

Table 83 describes the significant fields shown in the display.

Table 83 show local-ack Field Descriptions

Field	Description
local	MAC address of the local Token Ring station with which the route has the LLC2 session.
lsap	Local service access point (LSAP) value of the Token Ring station with which the router has the LLC2 session.
remote	MAC address of the remote Token Ring on whose behalf the router is providing acknowledgments. The remote Token Ring station is separated from the device via the TCP backbone.
dsap	Destination service access point (SAP) value of the Token Ring station on whose behalf the router is providing acknowledgments.
llc2	Pointer to an internal data structure used by the manufacturer for debugging.

Table 83 show local-ack Field Descriptions (continued)

Field	Description
local ack state	State of the local acknowledgment for both LLC2 and Synchronous Data Link Control (SDLC) connections. The states are as follows: • disconnected—No session between the two end nodes. • connected—Full data transfer between the two. • awaiting connect—Cisco IOS software is waiting for the other end to confirm a session establishment with the remote host.
Passthrough Rings	Ring numbers of the virtual rings that have been defined as pass-throughs using the **source-bridge passthrough** command. If a ring is not a pass-through, it is locally terminated.

show ncia circuits

To display the state of all circuits involving this MAC address as a source and destination, use the **show ncia circuits** command in privileged EXEC mode.

show ncia circuits [*id-number*]

Syntax Description

id-number	(Optional) Number assigned to identify the circuit. If no ID number is specified, the command lists information for all circuits.

Command Modes

Privileged EXEC

Command History

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

Usage Guidelines

Use the **show ncia client** command to list the active circuits by circuit ID number, then use a specific circuit ID number in the **show ncia circuits** command.

Examples

The following is sample output from the **show ncia circuits** command:

```
Router# show ncia circuits

IP              State                    ID        Mac             SAP CW  GP
10.2.20.125     START_DL_RCVD   (Client)10000000  1000.0000.0001  4   0   0
                                (Server)163D04    4000.1060.1000  4   10  0
```

Table 84 describes the significant fields shown in the display.

Table 84 show ncia circuits Field Descriptions

Field	Description
IP	IP address of the client.
State	Communication state of the circuit.
ID	Circuit ID number. The server circuit ID is used by the server to identify a circuit. Use this ID in the **show ncia circuits** command. The client circuit ID is for information only.
Mac	Client MAC address is the MAC address used by the client; server MAC address is the MAC address used by the host. In a downstream physical unit (DSPU) configuration, the server MAC address is the one defined in the **dspu ncia** command as *server-virtual-mac-address*.

Table 84 show ncia circuits Field Descriptions (continued)

Field	Description
SAP	Local address (LSAP), specified in the **dspu enable-pu** command.
CW	Current window, the number of packets that can be increased or decreased for each Increment or Decrement operation.
GP	Granted packets, the number of packets the client or server is permitted to send to the other.

show ncia client

To display the status of the native client interface architecture (NCIA) client, use the **show ncia client** command in user EXEC or privileged EXEC mode.

show ncia client [**sap-list**] [*ip-address*]

Syntax Description

sap-list	(Optional) Display the service access points (SAP) supported by the client. If the **sap-list** option is not specified, the command does not display service access point (SAP) list information.
ip-address	(Optional) Client IP address. If no IP address is specified, the command lists information for all clients.

Command Modes

User EXEC
Privileged EXEC

Command History

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

Usage Guidelines

Use the **show ncia server** command to list the active clients by IP address, then use a specific IP address in the **show ncia client** command.

Examples

The following are sample outputs from the **show ncia client** command:

```
Router# show ncia client

IP              State  MacAddr         Flags   Num SAP    PktRxd  PktTxd  Drop
10.2.20.123         4  1000.0000.0011  0x0800     3           27      36     0
    Circuit[1] : 791F8C
10.2.20.126         4  1000.0000.0011  0x0800     1           28      58     0
    Circuit[2] : 793500

Router# show ncia client sap-list 10.2.20.123

IP              Num SAPS  Sap List
10.2.20.123        3      4 8 c
```

Table 85 describes the significant fields shown in the display.

Table 85 show ncia client Field Descriptions

Field	Description
IP	IP address of the client.
State	Communication state of the client. Values are: • 0 CLOSED—Read and write pipe closed • 1 OPEN_WAIT—Active open. • 2 CAP_WAIT—Waiting for a cap exchange request. • 3 CAP_NEG—Waiting for a cap exchange req/rsp. • 4 OPENED—Both pipes opened. • 5 BUSY—WAN transport is congested. • 6 CLOSE_WAIT—Close connection. • 7 SHUTDOWN_PENDING—TCP, HOST, or router shutdown.
MacAddr	MAC address of the client.
Flags	Current operational status of the client. Values are: • 0x0100—Client is configured. • 0x0200—Client is registered (a client connects to the server to register itself, and then disconnects). • 0x0800—Client is active.
Num SAP	Number of SAPs supported by this client; 0 indicates that this client supports all SAPs.
PktRxd	Number of packets sent downstream from the server toward a client workstation.
PktTxd	Number of packets the server received from a downstream client workstation.
Drop	Number of packets that should have been sent to a downstream client, but were dropped by the server because the TCP connection has failed. Normally, no packets should be dropped.
Circuit[*x*]	Bracketed decimal indicates the order of the circuit in the list. The hexadecimal circuit ID is used by the server to identify a circuit. The circuit ID can be used to query circuit status in the **show ncia circuits** command.
SAP List	List of SAPs supported by this client. A client can specify a maximum of 16 SAPs. If the “Num SAP” field is 0, no SAPs are displayed in this field.

show ncia server

To display the state of the native client interface architecture (NCIA) server, use the **show ncia server** command in user EXEC or privileged EXEC mode.

show ncia server [*server-number*]

Syntax Description

server-number	(Optional) NCIA server number. If no server number is specified, the command lists information for all servers.

Command Modes

User EXEC
Privileged EXEC

Command History

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

Examples

The following is sample output from the **show ncia server** command:

```
Router# show ncia server

NCIA Server [1]:
    IP address: 10.2.20.4
    Server Virtual MAC address: 4000.3174.0001
    Starting MAC address: 1000.0000.0001
    MAC address range: 128
    Flags: 0x02
    Number of MAC addresses being used: 0
```

show netbios-cache

To display a list of NetBIOS cache entries, use the **show netbios-cache** command in privileged EXEC mode.

show netbios cache

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **show netbios-cache** command:

```
Router# show netbios-cache

  HW Addr          Name            How       Idle      NetBIOS Packet Savings
1000.5a89.449a     IC6W06_B        TR1       6         0
1000.5a8b.14e5     IC_9Q07A        TR1       2         0
1000.5a25.1b12     IC9Q19_A        TR1       7         0
1000.5a25.1b12     IC9Q19_A        TR1       10        0
1000.5a8c.7bb1     BKELSA1         TR1       4         0
1000.5a8b.6c7c     ICELSB1         TR1       -         0
1000.5a31.df39     ICASC_01        TR1       -         0
1000.5ada.47af     BKELSA2         TR1       10        0
1000.5a8f.018a     ICELSC1         TR1       1         0
```

Table 86 describes the significant fields shown in the display.

Table 86 show netbios-cache Field Descriptions

Field	Description
HW Addr	MAC address mapped to the NetBIOS name in this entry.
Name	NetBIOS name mapped to the MAC address in this entry.
How	Interface through which this information was learned.
Idle	Period of time (in seconds) since this entry was last accessed. A hyphen in this column indicates it is a static entry in the NetBIOS name cache.
NetBIOS Packet Savings	Number of packets to which local replies were made (thus preventing sending of these packets over the network).

Related Commands

Command	Description
netbios name-cache	Defines a static NetBIOS name cache entry, tying the server with the name netbios-name to the mac-address, and specifying that the server is accessible either locally through the interface-name specified, or remotely through the ring-group group-number specified.
netbios name-cache timeout	Enables NetBIOS name caching and sets the time that entries can remain in the NetBIOS name cache.

show qllc

To display the current state of any Qualified Logical Link Control (QLLC) connections, use the **show qllc** command in privileged EXEC mode.

show qllc

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **show qllc** command.

```
Router# show qllc

QLLC Connections:
Serial2: 1000.5a35.3a4f->1000.5a59.04f9. SAPs 4 4. Rings Src 200, Tgt 100.
State Connect
Remote DTE 1002. QLLC Protocol State NORMAL lci 1 (PVC)
```

In the display, the first two lines of the **show qllc** command show that there is a QLLC session between a Token Ring device and an X.25 remote device. The X.25 device has a virtual MAC address of 100.5a35.3a4f with a service access point (SAP) of 04. It is using a permanent virtual circuit (PVC) with logical channel number 1. The Token Ring device has a MAC address of 1000.5a59.04f9 with a service access point (SAP) of 04. The state of the QLLC session is CONNECTED.

Table 87 describes the fields shown in the display.

Table 87 show qllc Field Descriptions

Field	Description
Serial2	Serial interface for the X.25 link.
1000.5a35.3a4f	Virtual MAC address for the X.25 attached device.
1000.5a59.04f9	MAC address of the Token Ring attached device with which the X.25 attached device is communicating. This device might be on a local Token Ring or attached via source-route bridging (SRB) or remote source-route bridging (RSRB).
SAPs 4 4	Source SAP value at the virtual MAC address and destination SAP value at the Token Ring station.
Rings Src 200	Ring number for the source virtual ring defined by the **qllc srb** command.

Table 87 show qllc Field Descriptions (continued)

Field	Description
Tgt 100	Ring number for the target virtual ring defined by the **source-bridge ring-group** command.
State	State of the QLLC-Logical Link Control, type 2 (LLC2) conversion. This can be any of the following: • DISCONNECT—No connection exists. • NET DISC WAIT—X.25 device is disconnecting. The QLLC conversion is waiting for the Token Ring device to disconnect. • QLLC DISC WAIT—The Token Ring device is disconnecting. The QLLC conversion is waiting for the X.25 device to disconnect. • QLLC PRI WAIT—Connection is being established. The Token Ring device is ready to complete the connection, and the Cisco IOS software is establishing the QLLC connection with the X.25 device. • NET CONTACT REPLY WAIT—Remote X.25 device is a front-end processor (FEP), and has made contact with the Cisco IOS software. The software is attempting to reach Token Ring device. • QLLC SEC WAIT—Connection is being established. • NET UP WAIT—Connection is being established. QLLC connection to X.25 device has been established; awaiting completion on the connection to the Token Ring attached device. • Connect—Connections from the software to X.25 and Token Ring devices are established. Data can flow end to end.
Remote DTE 1002	X.121 address of X.25 connected device.
QLLC Protocol State	State of the QLLC protocol between the software and the X.25 attached device. These states are different from the state of the underlying X.25 virtual circuit. Values are as follows: • ADM—Asynchronous Disconnected Mode. • SETUP—Cisco IOS software has initiated QLLC connection, awaiting confirmation from the X.25 device. • RESET—Cisco IOS software has initiated QLLC reset, awaiting confirmation from the X.25 device. • DISCONNECTING—Cisco IOS software has initiated QLLC disconnect, awaiting confirmation from the X.25 device. • NORMAL—QLLC connection has been completed. Systems Network Architecture (SNA) data can be sent and received.
lci 1 (PVC)	Logical channel number used on the X.25 interface.

show rif

To display the current contents of the Routing Information Field (RIF) cache, use the **show rif** command in privileged EXEC mode.

show rif

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **show rif** command:

```
Router# show rif

Codes: * interface, - static, + remote
Hardware Addr  How   Idle (min)  Routing Information Field
5C02.0001.4322 rg5           -   0630.0053.00B0
5A00.0000.2333 TR0           3   08B0.0101.2201.0FF0
5B01.0000.4444 -             -   -
0000.1403.4800 TR1           0   -
0000.2805.4C00 TR0           *   -
0000.2807.4C00 TR1           *   -
0000.28A8.4800 TR0           0   -
0077.2201.0001 rg5          10   0830.0052.2201.0FF0
```

In the display, entries marked with an asterisk (*) are the router's interface addresses. Entries marked with a dash (-) are static entries. Entries with a number denote cached entries. If the RIF timeout is set to something other than the default of 15 minutes, the timeout is displayed at the top of the display. Table 88 describes the significant fields shown in the display.

Table 88 show rif Field Descriptions

Field	Description
Hardware Addr	Lists the MAC-level addresses.
How	Describes how the RIF has been learned. Values are ring group (rg) or interface (TR).
Idle (min)	Indicates how long, in minutes, since the last response was received directly from this node.
Routing Information Field	Lists the RIF.

Related Commands

Command	Description
multiring	Enables collection and use of RIF information.

show sdllc local-ack

To display the current state of any current local acknowledgment connections, and any configured pass-through rings, use the **show sdllc local-ack** command in privileged EXEC mode.

show sdllc local-ack

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **show sdllc local-ack** command:

```
Router# show sdllc local-ack

local 1000.5a59.04f9, lsap 04, remote 4000.2222.4444, dsap 04
llc2 = 1798136, local act state = connected
Passthrough Rings: 4 7
```

In the display, the first two lines of the **show sdllc local-ack** command show that there is a local acknowledgment session between two Token Ring devices. The device on the local ring has a MAC address of 1000.5a59.04f9 with a service access point (SAP) of 04. The remote device has a MAC address of 4000.2222.4444 with a SAP of 04. The state of the local acknowledgment session is connected.

The pass-through rings display is independent of the rest of the **show sdllc local-ack** command. The pass-through rings display indicates that there are two rings, 4 and 7, configured for pass-through. This means that stations on these rings will not have their sessions locally acknowledged but will instead have their acknowledgments end-to-end.

Table 89 describes the significant fields shown in the display.

Table 89 show sdllc local-ack Field Descriptions

Field	Description
local	MAC address of the local Token Ring station with which the router has the Logical Link Control, type 2 (LLC2) session.
lsap	Local SAP value of the Token Ring station with which the router has the LLC2 session.

Table 89 show sdllc local-ack Field Descriptions (continued)

Field	Description
remote	MAC address of the remote Token Ring station on whose behalf the router is providing acknowledgments. The remote Token Ring station is separated from the router via the TCP backbone.
dsap	Destination SAP value of the remote Token Ring station on whose behalf the router is providing acknowledgments.
llc2	Pointer to an internal data structure used by technical support staff for debugging.
local ack state	Current state. Values are as follows: • disconnected—No session between the two end hosts. • connected—Full data transfer between the two end hosts. • awaiting connect—This router is waiting for the other end to confirm a session establishment with the remote host.
Passthrough Rings	Ring number of the start ring and destination ring for the two IBM machines when you do not have local acknowledgment for LLC2 configured for your routers using remote source-route bridging (RSRB).

show sna

To display the status of the Systems Network Architecture (SNA) Service Point feature, use the **show sna** command in privileged EXEC mode.

show sna [**pu** *host-name* [**all**]]

Syntax Description

pu	(Optional) Name of a host defined in an **sna host** command.
host-name	(Optional) Name of a host defined in an **sna host** command.
all	(Optional) Displays detailed status.

Command Modes

Privileged EXEC

Command History

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

Examples

The following is sample output from the **show sna** command. It shows a summary of the Systems Network Architecture (SNA) features status.

```
Router# show sna

sna host HOST_NAMEA TokenRing1 PU STATUS active
FRAMES RECEIVED 00450 FRAMES SENT 00010
LUs USED BY DSPU nnn LUs ACTIVE nnn
LUs USED BY API nnn LUs ACTIVE nnn
LUs ACTIVATED BY HOST BUT NOT USED nnn
```

The following is sample output from the **show sna** command with the **pu** keyword:

```
Router# show sna pu putest

sna host PUTEST TokenRing1 PU STATUS active
RMAC 400000000004 RSAP 04 LSAP 04
XID 05d00001 RETRIES 255 RETRY_TIMEOUT 30
WINDOW 7 MAXIFRAME 1472
FRAMES RECEIVED 0450 FRAMES SENT 0010
LUs USED BY DSPU nnn LUs ACTIVE nnn
LUs USED BY API nnn LUs ACTIVE nnn
LUs ACTIVATED BY HOST BUT NOT USED nnn
```

Because the **all** keyword refers to logical unit (LU)s under the physical unit (PU), this has no significance for the service point host.

show snasw class-of-service

To display the class of service (CoS) definitions predefined to Switching Services (SNASw), use the **show snasw class-of-service** command in privileged EXEC mode.

show snasw class-of-service [**brief** | **detail**]

Syntax Description

brief	(Optional) Indicates a one-line display per displayed resource. The brief version displays CoS name, transmission priority, and number of node and Transmission Group (TG) rows.
detail	(Optional) Indicates a detailed, multiline display of all fields returned for CoS display.

Command Modes

Privileged EXEC

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is a truncated example of the **show snasw class-of-service** command:

```
Router# show snasw class-of-service

Number of class of service definitions 7

      SNA Classes of Service
        Name    Trans. Pri.  Node Rows  TG Rows
      --------  -----------  ---------  -------
   1> #BATCH    Low               8         8
   2> #INTER    High              8         8
   3> CPSVCMG   Network           8         8
   4> #BATCHSC  Low               8         8
   5> #CONNECT  Medium            8         8
   6> #INTERSC  High              8         8
   7> SNASVCMG  Network           8         8

Router# show snasw class-of-service detail

Number of class of service definitions 7

1>
Class of service name                              #BATCH
Transmission priority                              Low
Number of node rows                                8
Number of TG rows                                  8
```

```
1.1>Node row weight                          5
Congestion min                               No
Congestion max                               No
Route additional resistance min              0
Route additional resistance max              31
```

Related Commands

Command	Description
show snasw mode	Displays the SNASw modes.

show snasw connection-network

To display the connection networks (virtual nodes) defined to the local node, use the **show snasw connection-network** command in privileged EXEC.

show snasw connection-network [**brief** | **detail**]

Syntax Description

brief	(Optional) Indicates a one-line display per resource. The brief version displays the connection network name, the number of attached ports, and the port names in the connection network.
detail	(Optional) Indicates a detailed, multiline display of all fields returned for connection-network display.

Command Modes

Privileged EXEC

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output form the **show snasw connection-network** command:

```
Router# show snasw connection-network

Connection network definitions 1

      SNA Connection Networks
        Resource Name    Attached Ports            Port Name(s)
      -----------------  --------------  --------------------------------
   1> CISCO.VN                      1     TR0

Router# show snasw connection-network detail

Connection network definitions 1

1>
Connection network name                          CISCO.VN
Effective capacity                               16 Mbps
Cost per connect time                            0
Cost per byte                                    0
Propagation delay                                384 microseconds
User defined parameter 1                         128
User defined parameter 2                         128
User defined parameter 3                         128
```

```
Security                                        Nonsecure

1.1>Port name                                   TR0
```

Related Commands

Command	Description
show snasw link	Displays the Switching Services (SNASw) link objects.

show snasw directory

To display the Switching Services (SNASw) directory entries, use the **show snasw directory** command in EXEC mode.

show snasw directory [**name** *resource-name-filter*] [**brief** | **detail**]

Syntax Description

name *resource-name-filter*	(Optional) Indicates the fully qualified name of the resource (1 to 17 characters). Only resource names that match the specified name are displayed.
brief	(Optional) Indicates a one-line display for each resource. The brief version displays resource name, owning control point (CP) name, network node server name, and entry type.
detail	(Optional) Indicates a detailed, multiline display of all fields returned for the directory display.

Command Modes

EXEC

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show snasw directory** and **show snasw directory detail** commands:

```
Router# show snasw directory

Total Directory Entries 2

      SNA Directory Entries
        Resource Name     Owning CP Name        NN Server      Entry Type
      ----------------  ----------------  ----------------  ----------
   1> CISCO.A           CISCO.A           CISCO.B           Registry
   2> CISCO.B           CISCO.B           CISCO.B           Home

Router# show snasw directory detail

Total Directory Entries 2

1>
Resource name                                    CISCO.A
NN server name                                   CISCO.B
```

```
Entry type                                      Registry
Location                                        Local to this domain
Resource owner's CP name                        CISCO.A
Apparent resource owner's CP name
Wildcard                                        Explicit

2>
Resource name                                   CISCO.B
NN server name                                  CISCO.B
Entry type                                      Home
Location                                        Local to this node
Resource owner's CP name                        CISCO.B
Apparent resource owner's CP name
Wildcard                                        Explicit
```

Related Commands

Command	Description
snasw location	Configures the location of a resource.

show snasw dlctrace

To display the captured Data-link control (DLC) trace information to the console, use the **show snasw dlctrace** command.

show snasw dlctrace [**id** *recordid*] [**all** | **last** *number-records* | **next** *number-records*] [**brief** | **detail**] [**filter** *filter-string*]

Syntax Description

id *recordid*	(Optional) Indicates that the 1 to 999,999 trace record identifier. Only the frame ID that matches the record specified is displayed.
all	(Optional) Indicates that all records in the dlctrace buffer are displayed.
last *number-records*	(Optional) Indicates that the last *x* frames before the record identified in the ID operand (or before the last record in the trace if the ID operand is not coded) are displayed.
next *number-records*	(Optional) Indicates that the next frames after the record identified in the ID operand (or from the beginning of the trace if the ID operand is not coded) are displayed.
brief	(Optional) Indicates a one-line display per trace entry describing the type of frame traced.
detail	(Optional) Indicates a detailed, multiline display of the frame that displays the brief information plus a hexadecimal dump of the entire frame.
filter *filter-string*	(Optional) Indicates that a string follows against which the formatted trace output is filtered. Only frames that contain the filter string are displayed.

Command Modes

EXEC

Defaults

If **id** *recordid* is specified, **next** is the default parameter; if not, **last** is the default parameter.

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show snasw dlctrace** command:

```
Router# show snasw dlctrace id 2467 next 20
DLC Trace Output

2467   LINKT    In  sz:43   HPR +Rsp IPM     slctd nws:0007
2468   LINKT    In  sz:212  HPR +Rsp IPM     slctd nws:0007
```

```
2469   LINKT    In  sz:52   HPR CP CAPABILITIES
2470   LINKT    In  sz:221  HPR CP CAPABILITIES
2471   LINKT    Out sz:282  HPR MIS
2472   LINKT    Out sz:43   HPR +Rsp IPM     slctd nws:0007
2473   LINKT    In  sz:154  HPR Rq Bind CISCO.B CISCO.A
2474   LINKT    In  sz:323  HPR Rq Bind CISCO.B CISCO.A
2475   LINKT    Out sz:361  HPR MIS
2476   LINKT    Out sz:132  HPR +Rsp Bind
2477   LINKT    In  sz:102  HPR fmh5 CP CAPABILITIES
2478   LINKT    In  sz:271  HPR fmh5 CP CAPABILITIES
2479   LINKT    Out sz:282  HPR MIS
2480   LINKT    Out sz:43   HPR +Rsp IPM     slctd nws:0007
2481   LINKT    Out sz:291  HPR MIS
2482   LINKT    Out sz:52   HPR CP CAPABILITIES
2483   LINKT    In  sz:43   HPR +Rsp IPM     slctd nws:0007
2484   LINKT    In  sz:212  HPR +Rsp IPM     slctd nws:0007
2485   LINKT    Out sz:45   HPR
2486   LINKT    In  sz:45   HPR

Router# show snasw dlctrace id 2486 detail

DLC Trace Output

2486   LINKT    In  sz:45   HPR
 10:08:36.14, 14 March 1993
   0000 C60080FF 00000000 00010000 00000400  *F...............*
   0010 0A000000 00000001 7E050E00 00000000  *........=.......*
   0020 01000001 7E000000 00000000 00        *....=........   *
```

Related Commands

Command	Description
snasw dlctrace	Traces frames arriving and leaving SNASw.
snasw dlcfilter	Filters frames being captured.

show snasw dlus

To display the Switching Services (SNASw) Dependent Logical Unit Server (DLUS) objects, use the **show snasw dlus** command.

show snasw dlus [**brief** | **detail**]

Syntax Description

brief	(Optional) Indicates that one line per DLUS is displayed. The brief version includes the DLUS name, state (active or inactive), port name, cpname, node type, and number of active physical unit (PU)s on the DLUS.
detail	(Optional) Indicates the detailed, multiline display that shows all fields returned for DLUS displayed.

Command Modes

EXEC

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show snasw dlus** command:

```
Router# show snasw dlus

Number of Dependent LU Servers2
SNA Dependent LU Servers
          DLUS Name      Default?  Backup?  Pipe State          PUs
      -----------------  --------  -------  ----------------  -------
   1> NETA.SJMVS3        Yes       No       Active               1
   2> NETA.SJMVS4        No        Yes      Inactive             0

Router# show snas dlus detail

Number of Dependent LU Servers2

1>
DLUS name                                        NETA.SJMVS3
Is this the default DLUS                         Yes
Is this the backup default DLUS                  No
Pipe state                                       Active
Number of active PUs                             1
DLUS pipe statistics:
  REQACTPUs sent                                 1
  REQACTPU responses received                    1
```

```
ACTPUs received                          1
ACTPU responses sent                     1
DACTPUs received                         0
DACTPU responses sent                    0
REQDACTPUs sent                          0
REQDACTPU responses received             0
ACTLUs received                          16
ACTLU responses sent                     1
DACTLUs received                         0
DACTLU responses sent                    0
SSCP-PU MUs sent                         0
SSCP-PU MUs received                     0
SSCP-LU MUs sent                         19
SSCP-LU MUs received                     3
```

Related Commands

Command	Description
snasw dlus	Specifies parameters related to DLUR/DLUS functionality.

show snasw ipstrace

To display the interprocess signal (IS) trace on the router console, use the **show snasw ipstrace** command.

show snasw ipstrace [**id** *recordid*] [**all** | **next** *number-records* | **last** *number-records*] [**filter** *filter-string*]

Syntax Description

id *recordid*	(Optional) Indicates that the 1 to 999,999 trace record identifier. Only the frame ID that matches the record specified is displayed.
all	(Optional) Specifies that all records are displayed
next *number-records*	(Optional) Displays records from beginning or following record IS.
last *number-records*	(Optional) Indicates that the last *x* frames before the record identified in the ID operand (or before the last record in the trace if the ID operand is not coded) are displayed.
filter *filter-string*	(Optional) Indicates that a string follows against which the formatted trace output is filtered. Only frames that contain the filter-string are displayed.

Command Modes

EXEC

Defaults

No default behaviors or values

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show snasw ipstrace** command:

```
Router# show snasw ipstrace

423452 : DLC_UI_MU : PC(2350000) -> DLC(2300000) Q 2
 03/14/1993 10:11:36.18
    00000000 00000000 61BB3F50 00800000 00000000 00000000 00000000 00000000
    000000FF 000000FF 00000000 00000000 05010000 000000FF 50130000 002D00D2
    02340000 03000000 00000000 61BB3FB0 00140050 0000017E 000100FF 00000000
    00000000 01000000 00000000 00000000 0000017E 00000000 00000000 00000000
    00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
    00000000 00000000 00000000 00000000 00000000 00000000 00000000 00000000
    00000000 00000000 00000000 00000000 00C6C600 80FF0000 00000001 00000000
    04000A00 00000000 00017E05 0E000000 01000100 00017E00 00000000 00000000
```

Related Commands

Command	Description
snasw ipstrace	Sets up a trace buffer and begins tracing IPS trace elements
snasw ipsfilter	Filters interprocess signal trace elements being traced using the **snasw ipstrace** or **debug snasw ips** commands.

show snasw link

To display the Switching Services (SNASw) link objects, use the **show snasw link** command.

show snasw link [**brief** | **detail**] [**active** | **not-active**] [**cpname** *cp-name-filter*] [**name** *linknamefilter*] [**port** *port-name-filter*] [**rmac** *mac-filter*] [**xid** *xid-filter*]

Syntax Description

brief	(Optional) Indicates that one line per link is displayed. The brief version includes the link name, state (active or inactive), port name, adjacent control point (CP) name, node type information, number of sessions, and HPR support. The number of sessions does not include HPR sessions.
detail	(Optional) Indicates that a detailed, multiline display that shows all fields returned for links are displayed.
active	(Optional) Displays active snasw links.
not-active	(Optional) Displays snasw links that are not active.
cpname *cp-name-filter*	(Optional) Indicates a fully qualified cpname (1 to 17 characters). Only links with CP names (as known to the router) that match the specified cpname are displayed.
name *linknamefilter*	(Optional) Indicates the name of the link to be displayed. Only links matching this name are displayed.
port *port-name-filter*	(Optional) Indicates the handle “naming” for the specific port (1 to 8 characters). All links associated with a port matching the filter are displayed.
rmac *mac-filter*	(Optional) Indicates a 48-bit MAC address in hexadecimal form. Only links with a remote MAC address matching the MAC address specified are displayed.
xid *xid-filter*	(Optional) Indicates a 4-byte exchange identification (XID) (idnum/idblk) specified in hexadecimal form. Only links matching the configured XID are displayed.

Command Modes

EXEC

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples

The following is sample output from the **show snasw link** command:

```
Router# show snasw link

Number of links 1

      SNA Links                                                          HPR
      Link Name   State    Port Name Adjacent CP Name  Node Type     Sess  Sup
      ---------  -------   --------- ----------------  ------------  ----  ---
   1> LINKT      Active    TR0       CISCO.B           Network Node     0  Yes
```

```
Router# show snasw link detail

Number of links 1

1>
Link name                                          LINKT
Port name                                          TR0
DLC type                                           Token-ring
Destination DLC Address                            000B.1AA4.9280.04
Link state                                         Active
Link substate                                      Active
Number of active sessions traversing link          0
Adjacent Node Id                                   X'FFF00000'
Max send frame data (BTU) size                     4400
Adjacent node CP name                              CISCO.B
Adjacent node type                                 Network Node
CP-CP session support                              Yes
Link station role                                  Secondary
Transmission group number                          21
Limited resource                                   No
Effective capacity                                 16 Mbps
Cost per connect time                              0
Cost per byte                                      0
Propagation delay                                  384 microseconds
User defined parameter 1                           128
User defined parameter 2                           128
User defined parameter 3                           128
Security                                           Nonsecure
Routing Information Field
Primary DLUS Name
Backup DLUS Name
Downstream PU Name
Retry link station                                 Yes
Dynamic link station                               No
Adjacent node is a migration node                  No
Link station statistics:
  Total XID bytes sent                             466
  Total XID bytes received                         344
  Total XID frames sent                            5
  Total XID frames received                        4
  Total data bytes sent                            752
  Total data bytes received                        685
  Total data frames sent                           8
  Total data frames received                       9
  Total session control frames sent                0
  Total session control frames received            0
  Total number of successful XID exchanges         1
  Total number of unsuccessful XID exchanges       0
```

Related Commands

Command	Description
snasw link	Configures upstream links.

show snasw lu

To display the SNA Switching Services (SNASw) dependent logical units (LU)s, use the **show snasw lu** command in user EXEC or privileged EXEC mode.

show snasw lu [**brief** | **detail**] [**name** *lu-name*] [**pu** *pu-name*]

Syntax Description

brief	(Optional) Indicates that one line per LU is displayed. The brief display includes LU name, physical unit (PU) name, dependent logical unit server (DLUS) name, and primary logical unit (PLU) name.
detail	(Optional) Indicates that a detailed, multiline display that shows all fields returned for the link is displayed.
name *lu-name*	(Optional) Indicates an LU name to filter. Only LUs matching the specified name are displayed.
pu *pu-name*	(Optional) Indicates a PU name to filter. Only LUs for the specified name are displayed.

Defaults

The default display is brief.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following sample display is from the **show snasw lu** command:

```
Router# show snasw lu

Number of DLUR LUs 49

      SNA DLUR LUs
      LU Name   PU Name   DLUS Name           PLU Name
      --------  --------  ------------------  -----------------
   1> CWBC0601  CWBC06    NETA.MVSD
   2> CWBC0602  CWBC06    NETA.MVSD
```

The following is sample output from the **show snasw lu detail** command:

```
Router# show snasw lu detail

Number of DLUR LUs 49

1>
LU name                                                 CWBC0601
LU status                                               Active
SLU status                                              No session
PU name                                                 CWBC06
DLUS name                                               NETA.MVSD
Primary LU name
LU location                                             Downstream
LU  FSM history                                         (00,00)->(01,01)->(02,0E)->(03,03)->04
SLU FSM history                                         (00,10)->00
```

Table 90 describes the significant fields shown in the output.

Table 90 show snasw lu Field Descriptions

Field	Description
LU name	The name of the LU.
PU name	The physical unit this LU is defined to.
DLUS name	Dependent LU server for the PU and LU.
PLU name	The name of the host LU that this LU is in session with. If the LU is not in session, no PLU name will be displayed.
LU status	The state of the system services control points (SSCP)-LU session. States are: • Active—The SSCP-LU is active and available for LU-LU sessions. • Pend ACTLU rsp—The SSCP-LU session is pending activation. • Pend DACTLU rsp—The SSCP-LU session is pending deactivation. • Reset—The SSCP-LU session is not active.
SLU status	The current state of the LU-LU session. States are: • In Session—The LU-LU session is active. • No Session—The LU-LU session is not active. • Pend BIND rsp—The LU-LU session is pending activation. • Pend UNBIND rsp—The LU-LU session is pending deactivation.
Primary LU name	The name of the host LU that this LU is in session with. If the LU is not in session, no PLU name will be displayed.
LU location: Downstream	Indicates that the LU resides on a node downstream from this SNASw node.
LU FSM history	A history of the states and actions of the SSCP-LU session for diagnostic use by Cisco technical support.
SLU FSM history	A history of the states and actions of the LU-LU session for diagnostic use by Cisco technical support.

Related Commands

Command	Description
show snasw dlus	Displays the SNASw DLUS objects.
show snasw pu	Displays the SNASw PUs that require or request SSCP-PU services.

show snasw mode

To display the Switching Services (SNASw) modes, use the **show snasw mode** command.

show snasw mode

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Defaults

No default behaviors or values

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show snasw mode** command:

```
Router# show snasw mode

Number of modes 8

      SNA Modes
        Name      Associated COS
      ---------   --------------
   1> #BATCH      #BATCH
   2> #INTER      #INTER
   3> CPSVCMG     CPSVCMG
   4>             #CONNECT
   5> #BATCHSC    #BATCHSC
   6> #INTERSC    #INTERSC
   7> CPSVRMGR    SNASVCMG
   8> SNASVCMG    SNASVCMG
```

Related Commands

Command	Description
show snasw class-of-service	Displays the class of service (CoS) definitions predefined to SNASw.

show snasw node

To display details and statistics of the Switching Services (SNASw) operation, use the **show snasw node** command.

show snasw node

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Defaults

No default behaviors or values

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.
12.1	Additional fields were added to the command output.
12.2	Additional fields were added to the command output to describe RTP information.
12.3	The Alert focal point field was added to the command output.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show snasw node** command:

```
Router# show snasw node

Node type                                       Branch Network Node
Node name                                       NETA.NODE
CP alias                                        NODE
Node ID                                         X'FFF00000'
Time active                                     9 days,  11 hrs,  57 mins,  13 secs
Defined LS good XID exchanges                   2
Defined LS bad XID exchanges                    0
Dynamic LS good XID exchanges                   243
Dynamic LS bad XID exchanges                    0
Number of active ISR sessions                   0
DLUR release level                              1
Branch extender architecture version            1
Mode to COS mapping supported                   No
MS includes Multiple Domain Support             Yes
MDS send alert queue size                       10
Maximum locates                                 10000
Directory cache size                            10000
Maximum directory entries (0 is unlimited)      0
Locate timeout in seconds (0 is no timeout)     540
```

```
COS cache size                                  8
Topology database routing tree cache size       8
Topology database routing tree cache use limit  1
Maximum nodes stored in database (0 unlimited)  0
Maximum TGs stored in database (0 unlimited)    0
Maximum allowed ISR sessions                    22000
Maximum receive RU size for ISR sessions        61440
Maximum receive pacing window                   7
Storing endpoint RSCVs for debug                Yes
Storing ISR RSCVs for debug                     No
Storing DLUR RSCVs for debug                    No
DLUR support                                    Yes
HPR support                                     Yes
RTP short request retry limit                   6
RTP path switch route attempts                  6
RTP path switch time LOW priority               480 seconds
RTP path switch time MEDIUM priority            240 seconds
RTP path switch time HIGH priority              120 seconds
RTP path switch time NETWORK priority           60 seconds
Alert focal point                               NETA.ND
PD log capture level                            Problem level entries
PD log size                                     500 kilobytes
PD log path                                     disk0:
IPS tracing                                     Inactive
DLC tracing                                     Active
DLC trace format                                Detailed
DLC trace size                                  500 kilobytes
DLC trace path                                  tftp://10.102.16.25/tftp/node.dlct
Number of links                                 3
Number of local endpoint sessions               4
Number of non-DLUR intermediate sessions        0
Number of DLUR intermediate sessions            0
Number of DLUR PUs                              0
Number of DLUR LUs                              0
```

Related Commands

Command	Description
show snasw statistics	Displays the SNASw node-wide information.

show snasw pdlog

To display entries in the cyclical problem determination log to the console, use the **show snasw pdlog** command.

show snasw pdlog [**brief** | **detail**] [**id** *record-id*] [**all** | **next** *number-records* | **last** *number-records*] [**filter** *filter-string*]

Syntax Description

brief	(Optional) Indicates that a one-line description for each pdlog entry is returned.
detail	(Optional) Indicates that a multiline display is returned.
id *record-id*	(Optional) Indicates that the 1 to 99999 trace record identifier. Only the frame ID that matches the record specified is displayed.
all	(Optional) Specifies that all records are displayed.
next *number-records*	(Optional) Displays records from the beginning, or following a record ID.
last *number-records*	(Optional) Displays records from the end or prior to the record ID. Indicates that the last *x* frames before the record identified in the ID operand (or before the last record in the trace if the ID operand is not coded) are displayed.
filter *filter-string*	(Optional) Indicates that a string follows against which the formatted trace output is filtered. Only frames that contain the *filter-string* argument are displayed.

Command Modes

EXEC

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show snasw pdlog** command:

```
Router# show snasw pdlog

Problem Determination Log Output

**** 00000014 - AUDIT 512:727 (0) ****
CP-CP sessions established
 Adjacent CP name = CISCO.A
 1015 compliant   = 01
 Topology awareness of CP-CP sessions support = 01
 CP Capabilities :

   000C12C1 00000000 82844000
>From ../dcl/nssrcctp.c 589 :at 0:10:24, 1 March 93
```

Related Commands

Command	Description
snasw pdlog	Controls message logging to the console and the Systems Network Architecture (SNA) problem determination log cyclic buffer.

show snasw port

To display the Switching Services (SNASw) port objects, use the **show snasw port** command.

show snasw port [**brief** | **detail**] [**active** | **not-active**] [**name** *port-name-filter*]

Syntax Description

brief	(Optional) Indicates that a one-line description for each port entry is displayed.
detail	(Optional) Indicates that a multiline display is returned.
active	(Optional) Displays all active snasw ports.
not-active	(Optional) Displays all snasw ports that are not active.
name *port-name-filter*	(Optional) Indicates the name of the port to filter for which information is displayed. Only ports matching name are displayed.

Command Modes

EXEC

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples

The following is sample output from the **show snasw port** command:

```
Router# show snasw port

Number of ports 3

      SNA Ports
        Name     State    SAP  HPR-SAP  Interface
      --------  --------  ---  -------  ---------------------
   1> ETH0      Active    x04    xC8    Ethernet0/0
   2> SER1      Active           xC8    Serial0/0
   3> TR0       Active    x04    xC8    TokenRing0/0

Router# show snasw port detail

Number of ports 3

1>
Port name                                          ETH0
Interface name                                     Ethernet0/0
DLC name                                           ETH0
Port state                                         Active
SAP                                                X'04'
HPR SAP                                            X'C8'
Port type                                          Shared Access Transport Facility
Port number                                        0
```

```
Link station role                                Negotiable
Limited resource                                 No
Max send frame data (BTU) size                   1436
Maximum receive BTU size                         1436
Effective capacity                               16 Mbps
Cost per connect time                            0
Cost per byte                                    0
Propagation delay                                384 microseconds
User defined parameter 1                         128
User defined parameter 2                         128
User defined parameter 3                         128
Security                                         Nonsecure
Total available link stations                    3000
Number reserved for inbound link stations        0
Number reserved for outbound link stations       0
HPR support                                      No
HPR requires link level error recovery           No
Retry link stations                              Yes
Maximum activation attempts                      0
Implicit links are uplink to End Nodes           No
Activation XID exchange limit                    9
Non-activation XID exchange limit                5
Target pacing window size                        7
```

Related Commands

Command	Description
snasw port	Specifies the DLCs used by SNASw.

show snasw pu

To display the Switching Services (SNASw) physical unit (PU)s that require or request system services control points (SSCP)-PU services, use the **show snasw pu** command.

show snasw pu [**brief | detail**] [**active | not-active**] [**dlus** *dlus-filter*] [**name** *pu-name-filter*]

Syntax Description

brief	(Optional) Indicates that one line per PU is displayed. The brief version includes the PU name, PU ID, state, defined Dependent Logical Unit Server (DLUS), and current DLUS.
detail	(Optional) Indicates that a detailed, multiline display that shows all fields returned for a link is displayed.
active	(Optional) Displays the active snasw PUs.
not-active	(Optional) Displays the PUs that are not active.
dlus *dlus-filter*	(Optional) Indicates the fully qualified DLUS name (1 to 17 characters). Only PUs that are served by the DLUS specified are displayed.
name *pu-name-filter*	(Optional) Indicates a PU name to filter (1 to 8 characters). Only PUs matching this name are displayed.

Command Modes

EXEC

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples

The following is sample output from the **show snasw pu** command:

```
Router# show snasw pu

Number of DLUR PUs 1
SNA DLUR PUs
      PU Name    PU ID     State    Defined DLUS       Current DLUS
      --------  --------  --------  -----------------  -----------------
   1> PL9101    19103001  Active                       NETA.SJMVS3

Router# show snasw pu detail

Number of DLUR PUs 1
1>
PU name                                          PL9101
Define DLUS name
Backup DLUS name
Active DLUS name                                 NETA.SJMVS3
PU ID (IDBLK/IDNUM)                              X'19103001'
```

```
PU location                                    Downstream
PU status                                      Active
DLUS session state                             Active
Automatic Network Shutdown support             Stop
DLUS retry timeout (seconds)                   0
DLUS retry limit                               0
DLUS pipe PCID                                 X'FC0B862E4B1CE8FB'
DLUS pipe CP Name                              NETA.DLUR2
```

Related Commands

Command	Description
show snasw dlus	Displays the SNASw DLUS objects.

show snasw rtp

To display the SNA Switching Services (SNASw) Rapid Transit Protocol (RTP) connections, use the **show snasw rtp** command in user EXEC or privileged EXEC mode.

show snasw rtp [**brief** | **detail**] [**class-of-service** *cos-name*] [**cpname** *netid.cpname*] [**name** *connection-name-filter*] [**tcid** *tcid-connection*] [**history**] [**connected** | **pathswitch**]

Syntax Description

brief	(Optional) Indicates that one-line per RTP is displayed. The brief version of the display includes the RTP name, local transport connection identifier (TCID), remote TCID, remote control point (CP) name, and class of service (CoS).
detail	(Optional) Indicates that a detailed, multiline display, which shows all the fields for RTP is displayed.
class-of-service *cos-name*	(Optional) Shows specific High-Performance Routing (HPR) RTP connections by CoS name.
cpname *netid.cp-name*	(Optional) Displays specific HPR RTP connections by a fully qualified partner CP name, consisting of both the network ID and the CP name.
name *connection-name-filter*	(Optional) Indicates the name of the RTP connection (1 to 8 characters). Only the origins of transmission group (TG) records or destinations that match the specified name or node records appear.
tcid *tcid-connection*	(Optional) Displays the specific HPR RTP connection for the local TCID connections.
history	(Optional) Displays the HPR RTP rate graphs for each RTP connection. These graphs include the last 60 seconds, 60 minutes, and 72 hours for the Adaptive Rate Based (ARB) allowed send rate and actual receive rate. Graphs are not available for RSETUP pipes.
connected	(Optional) Displays RTP connections that are active and not currently path switching.
pathswitch	(Optional) Displays RTP connections that are currently attempting a path switch.

Defaults

The default display is brief.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.

Release	Modification
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.4(10)	The **history** keyword was added to provide the history of HPR RTP rate graphs for each RTP connection.

Usage Guidelines

HPR RTP pipes use a unique flow and congestion control algorithm called ARB flow control. ARB allows HPR pipes to measure the network's level of congestion and dynamically adjust the rate of data input into the network, so that the network is highly utilized and congestion is avoided. If actual losses occur, ARB can also react to those losses.

Examples

show snasw rtp Command Example

The following is sample output from the **show snasw rtp** command and shows a CP-CP session pipe to CISCO.B:

```
Router# show snasw rtp

Number of RTP connections 1

      SNA RTP Connections
      Local TCID (hex)  Remote TCID (hex)   Remote CP Name      COS
      ----------------  ------------------  ------------------  --------
   1> 0000000001000000  0000000001000000   CISCO.B             CPSVCMG

Router# show snasw rtp detail

Number of RTP connections 1
1>
Local NCEID                                      X'4052303030303031'
Local TCID                                       X'0000000001000000'
Remote TCID                                      X'0000000001000000'
Remote CP name                                   CISCO.B
Class of service name                            CPSVCMG
Liveness timer                                   180
Short request timer                              704
Number of short request timeouts                 0
Total bytes sent                                 484
Total bytes received                             484
Total bytes resent                               0
Total bytes discarded                            0
Total packets sent                               24
Total packets received                           25
Total packets resent                             0
Total packets discarded                          0
Total Session Connector frames sent              2
Total Session Connector frames received          2
Number of invalid SNA frames received            0
Number of gaps detected                          0
Minimum send rate                                1597
Current send rate                                1597
Maximum send rate                                1597
Minimum receive rate                             0
Current receive rate                             0
Maximum receive rate                             0
Burst size                                       8192
Smoothed round trip delay time                   352
Last round trip delay time                       8
```

```
Number of active sessions                  2
Link name of first hop                     LINKT
Performing ISR boundary function           No
RTP connection type                        CP-CP session
RSCV Length                                18
Route                                      CISCO.A
                                           <-tg21-> CISCO.B
```

show snasw session

To display the Switching Services (SNASw) session objects, use the **show snasw session** command.

show snasw session [**local | dlur | intermediate**] [**name** *session-name-filter*] [**pcid** *pcid-filter*] [**brief | detail | intermediate**] [**active | not-active**]

Syntax Description

local	(Optional) Indicates that the scope of the display is limited to the types of sessions indicated. Local sessions are those that terminate on the node. Examples include control point (CP)-CP sessions and Dependent Logical Unit Requestor (DLUR)-Dependent Logical Unit Server (DLUS) sessions.
dlur	(Optional) Indicates that the scope of the display is limited to the types of sessions indicated. DLUS sessions are logical unit (LU)-LU sessions passing through the node, which are using the DLUR for dependent session.
intermediate	(Optional) Indicates that the scope of the display is limited to the types of sessions indicated. Intermediate sessions are LU-LU sessions passing through the node and are not DLUR-associated.
name *session-name-filter*	(Optional) Indicates the fully qualified name (1 to 17 characters). Only sessions that have a local or remote endpoint LU name matching the supplied name are displayed.
pcid *pcid-filter*	(Optional) Indicates an 8-byte procedure correlation identifier (PCID) specified in hexadecimal form. All sessions matching the PCID filter are displayed.
brief	(Optional) Indicates that one line per session is displayed. The brief version includes PCID, state (active or inactive), session endpoint LU names, and mode.
detail	(Optional) Indicates that a detailed, multiline display that shows all fields returned for the session is displayed.
active	(Optional) Displays the active snasw sessions.
not-active	(Optional) Displays the snasw sessions that are not active.

Command Modes

EXEC

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples

The following is sample output from the **show snasw session** command:

```
Router# show snasw session

Number of local endpoint sessions 4

      SNA Local Endpoint Sessions
         PCID (hex)      Partner LU Name   Link Name   Mode     COS
      ----------------  -----------------  --------- -------- -------
   1> F4276146FE1472AB  CISCO.C            @I000003  CPSVCMG  CPSVCMG
   2> F42754959A918058  CISCO.C            @I000003  CPSVCMG  CPSVCMG
   3> F4276146FE1472AA  CISCO.A            @R000002  CPSVCMG  CPSVCMG
   4> F4276DF74485118B  CISCO.A            @R000002  CPSVCMG  CPSVCMG

Number of intermediate sessions 2

      SNA Intermediate Sessions
         PCID (hex)     Primary LU Name    Secondary LU Name   Mode      COS
      ----------------  -----------------  -----------------  -------- -------
   1> F42754959A918059  CISCO.C            CISCO.A            SNASVCMG SNASVCMG
   2> F42754959A91805A  CISCO.C            CISCO.A            #INTER   #INTER

Number of intermediate DLUR sessions 0

      SNA DLUR Assisted Intermediate Sessions
         PCID (hex)     Primary LU Name    Secondary LU Name   Mode      COS
      ----------------  -----------------  -----------------  -------- -------
```

The following is sample output from the **show snasw session detail** command:

```
Router# show snasw session detail

Number of local endpoint sessions 4

1>
Partner LU name                                 CISCO.C
Mode name                                       CPSVCMG
Class of service name                           CPSVCMG
Transmission priority                           Network
Carried over a limited resource                 No
Polarity                                        Primary
Contention                                      CONWINNER
SSCP ID received in ACTPU                       X'000000000000'
Session timeout period (ms)                     0
Outbound LFSID (SIDH,SIDL,ODAI)                 X'02',X'00',B'0'
Procedure correlator ID (PCID)                  X'F4276146FE1472AB'
PCID generator CP name                          CISCO.B
FID2 Session ID                                 X'F4276146FE1472AB'
Link name                                       @I000003
Session statistics:
  Maximum send RU size                          1152
  Maximum receive RU size                       1152
  Total data frames sent                        3
  Total data frames received                    1
  Total FMD data frames sent                    3
  Total FMD data frames received                1
  Total bytes sent                              511
  Total bytes received                          15
  Max send pacing window                        7
  Max receive pacing window                     7
  Current send pacing window                    7
  Current receive pacing window                 7
```

Related Commands

Command	Description
show snasw link	Displays SNASw link objects.

show snasw statistics

To display Switching Services (SNASw) node-wide information, use the **show snasw statistics** command.

show snasw statistics

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Defaults

No default behaviors or values

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show snasw statistics** command:

```
Router# show snasw statistics

SNASw Subsystem Uptime                        3 hrs, 19 mins, 36 secs

Directory Statistics:
  Maximum number of cache entries                 10000
  Current number of cache entries                 0
  Current number of home entries                  2
  Current number of registry entries              4
  Total number of entries in directory            6
  Total cache hits                                0
  Total cache misses                              0
  Number of directed locates sent                 2
  Number of directed locates returned not found   0
  Number of directed locates received             0
  Number of broadcast locates sent                0
  Number of broadcast locates returned not found  0
  Number of broadcast locates received            0
  Number of locates outstanding                   0

Topology Statistics:
  Maximum number of nodes                         0
  Current number of nodes                         4
  Total number of received TDUs                   0
  Total number of sent TDUs                       0
  Total received TDUs with lower RSN              0
  Total received TDUs with equal RSN              0
```

```
  Total received TDUs with higher RSN              0
  Total received TDUs with higher odd value RSN    0
  Total node state changes requiring TDUs          0
  Total database inconsistencies detected          0
  Total number of timer based TDUs generated       0
  Total number of node records purged              0
  Total received TG updates with lower RSN         0
  Total received TG updates with equal RSN         0
  Total received TG updates with higher RSN        0
  Total received TG updates with higher odd RSN    0
  Total TG state changes requiring TG updates      5
  Total TG database inconsistencies detected       0
  Total number of timer TG updates generated       0
  Total number of TG records purged                0
  Total number of routes calculated                2
  Total number of routes rejected                  0
  Total number of cache hits in route calculation  0
  Total number of cache misses in rte calculation  7
  Total number of TDU wars detected                0

Number of processes 23
      CPU/Memory usage per SNA Switch process
      Process Name                          CPU Time (ms)  Memory Used (bytes)
      ------------------------------------  -------------  -------------------
   1> NOF API                                         20                 20
   2> N-Base allocated memory                          0              79484
   3> Buffer Manager (BM)                             12                232
   4> Node Operator Facility (NOF)                   152              13188
   5> Address Space Manager (ASM)                     28               1296
   6> Address Space (AS)                              24                  0
   7> Session Services (SS)                           36               1676
   8> Directory Services (DS)                         92             550036
   9> Configuration Services (CS)                     48               9148
  10> Management Services (MS)                         4                252
  11> Multiple Domain Support (MDS)                    0               3792
  12> Topology & Routing Services (TRS)               24              22368
  13> Session Connector Manager (SCM)                 12               2232
  14> Session Connector (SCO)                          0               1232
  15> Session Manager (SM)                            56              13416
  16> Resource Manager (RM)                           64                  0
  17> Presentation Services (PS)                      68                  0
  18> Half Session (HS)                               29                  0
  19> Path Control (PC)                              188              50712
  20> Data Link Control (DLC)                        112                144
  21> Dependent LU Requester (DR)                     12               7032
  22> High Performance Routing (HPR)                  12               3632
  23> Rapid Transport Protocol (RTP)                 116              18460
```

Related Commands

Command	Description
show snasw node	Displays details and statistics of the SNASw operation.

show snasw summary-ipstrace

To display the continuously running "footprint" summary interprocess signal trace on the router console, use the **show snasw summary-ipstrace** command.

show snasw summary-ipstrace [**id** *recordid*] [**all** | **next** *number-records* | **last** *number-records*] [**filter** *filter-string*]

Syntax Description

id *recordid*	(Optional) Indicates that the 1 to 99999 trace record identifier. Only the frame ID that matches the record specified is displayed.
all	(Optional) Specifies that all records are displayed.
next *number-records*	(Optional) Displays records from the beginning, or following a record ID.
last *number-records*	(Optional) Displays records from the end or prior to the record ID. Indicates that the last *x* frames before the record identified in the ID operand (or before the last record in the trace if the ID operand is not coded) are displayed.
filter *filter-string*	(Optional) Indicates that a string follows against which the formatted trace output is filtered. Only frames that contain the *filter-string* argument are displayed.

Command Modes

EXEC

Defaults

No default behaviors or values

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.0(7)T	This command was integrated into Cisco IOS Release 12.0 T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show snasw summary-ipstrace** command:

```
Router# show snasw summary-ipstrace

IPS Trace Output

433414 : VERB_SIGNAL : SCM(20E0000) -> TRS(20D0000) Q 1
433415 : VERB_SIGNAL : --(0) -> TRS(20D0000) Q 1
433416 : VERB_SIGNAL : TRS(20D0000) -> SS(2080000) Q 1
433417 : VERB_SIGNAL : --(0) -> SS(2080000) Q 1
433418 : VERB_SIGNAL : SS(2080000) -> CS(20A0000) Q 2
433419 : VERB_SIGNAL : --(0) -> CS(20A0000) Q 2
433420 : VERB_SIGNAL : CS(20A0000) -> --(2040000) Q 1
```

```
433421 : VERB_SIGNAL : --(0) -> --(2040000) Q 1
433422 : VERB_SIGNAL : --(0) -> NOF(2050000) Q 80
433423 : VERB_SIGNAL : --(0) -> NOF(2050000) Q 80
433424 : VERB_SIGNAL : NOF(2050000) -> DS(2090000) Q 1
433425 : VERB_SIGNAL : --(0) -> DS(2090000) Q 1
433426 : VERB_SIGNAL : DS(2090000) -> --(2040000) Q 1
433427 : VERB_SIGNAL : --(0) -> --(2040000) Q 1
433428 : VERB_SIGNAL : --(0) -> NOF(2050000) Q 80
433429 : VERB_SIGNAL : --(0) -> NOF(2050000) Q 80
433430 : VERB_SIGNAL : NOF(2050000) -> TRS(20D0000) Q 1
433431 : VERB_SIGNAL : --(0) -> TRS(20D0000) Q 1
433432 : VERB_SIGNAL : TRS(20D0000) -> --(2040000) Q 1
433433 : VERB_SIGNAL : --(0) -> --(2040000) Q 1
```

Related Commands

Command	Description
snasw dump	Copies problem determination logs and traces from internal buffers to an external file server.

show snasw topology

To display Switching Services (SNASw) topology records, use the **show snasw topology** command.

show snasw topology [**name** *cp-name-filter*] [**brief** | **detail**]

Syntax Description

name *cp-name-filter*	(Optional) Indicates the fully qualified name of the control point (CP) (1 to 17 characters). Only records that match the cpname specified are displayed.
brief	(Optional) Indicates one line per topology record is displayed.
detail	(Optional) Indicates that a detailed, multiline display of topology information.

Command Modes

EXEC

Defaults

The default display is brief.

Command History

Release	Modification
12.0(5)XN	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show snasw topology** command:

```
Router# show snasw topology

Number of topology entries 2

      SNA Topology Entries
       Dest. Node Name   Type  TG#      TG Type             TG Status
      -----------------  ----  ---  ----------------  --------------------
   1> NETA.MVSD          Intr   21  Uplink            CP-CP sessions active
   2> NETA.BERNIEPU      Enpt    0  Downlink          Active
```

The following is sample output from the **show snasw topology detail** command:

```
Router# show snasw topo detail
Number of topology entries 2

1>
Destination node name                           NETA.MVSD
Destination node type                           Intermediate
Transmission Group Number                       21
Destination address
Resource Sequence Number                        0
TG status                                       CP-CP sessions active
Active CP-CP sessions for this TG               Yes
Is this a branch TG                             No
```

```
Branch link type                                Uplink
Effective capacity                              16 Mbps
Cost per connect time                           196
Cost per byte                                   196
Propagation delay                               384 microseconds
User defined parameter 1                        128
User defined parameter 2                        128
User defined parameter 3                        128
Security                                        Nonsecure

2>
Destination node name                           NETA.BERNIEPU
Destination node type                           Endpoint
Transmission Group Number                       0
Destination address
Resource Sequence Number                        0
TG status                                       Active
Active CP-CP sessions for this TG               No
Is this a branch TG                             No
Branch link type                                Downlink
Effective capacity                              16 Mbps
Cost per connect time                           196
Cost per byte                                   196
Propagation delay                               384 microseconds
User defined parameter 1                        128
User defined parameter 2                        128
User defined parameter 3                        128
Security                                        Nonsecure
```

Related Commands

Command	Description
show snasw link	Displays SNASw link objects.

show source-bridge

To display the current source bridge configuration and miscellaneous statistics, use the **show source-bridge** command in privileged EXEC mode.

show source-bridge [**interface**]

Syntax Description

interface	(Optional) Displays the current source bridge configuration over all interfaces and a summary of all packets sent and received over each interface, not just the number of packets forwarded through the bridge.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.2	The **interface** keyword was added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show source-bridge** command:

```
Router# show source-bridge

Local Interfaces:                              receive     transmit
             srn bn  trn r p s n  max hops     cnt         cnt        drops
TR0            5  1   10 *   *          7    39:1002     23:62923

Ring Group 10:
  This peer: TCP 10.136.92.92
   Maximum output TCP queue length, per peer: 100
  Peers:                 state   lv  pkts_rx  pkts_tx  expl_gn    drops TCP
   TCP  10.136.92.92     -       2       0        0          0     0    0
   TCP  10.136.93.93     open    2*     18       18          3     0    0
Rings:
   bn: 1 rn: 5    local  ma: 4000.3080.844b TokenRing0            fwd: 18
   bn: 1 rn: 2   remote  ma: 4000.3080.8473 TCP  10.136.93.93     fwd: 36

Explorers: ------- input -------             ------- output -------
       spanning  all-rings     total      spanning  all-rings     total
  TR0         0          3         3             3          5         8
```

The following is sample output from the **show source-bridge** command when Token Ring LAN emulation (LANE) is configured.

```
Router# show source-bridge

Local Interfaces:                              receive     transmit
             srn bn  trn r p s n  max hops     cnt         cnt        drops
AT2/0.1     2048  5  256 *   f    7  7  7     5073        5072         0
To3/0/0        1  1  256 *   f    7  7  7     4719        4720         0

Global RSRB Parameters:
 TCP Queue Length maximum: 100

Ring Group 256:
  No TCP peername set, TCP transport disabled
   Maximum output TCP queue length, per peer: 100
  Rings:
   bn: 5  rn: 2048 local  ma: 4000.0ca0.5b40 ATM2/0.1              fwd: 5181
   bn: 1  rn: 1    local  ma: 4000.3005.da06 TokenRing3/0/0        fwd: 5180

Explorers: ------- input -------              ------- output -------
         spanning  all-rings     total      spanning  all-rings     total
AT2/0.1         9           1        10            10           0        10
To3/0/0        10           0        10             9           1        10

  Local: fastswitched 20        flushed 0         max Bps 38400

         rings      inputs         bursts         throttles     output drops
       To3/0/0          10              0                 0                0
```

The following is sample output from the **show source-bridge** command with the **interface** keyword specified:

```
Router# show source-bridge interface

                                          v p s n r                    Packets
 Interface  St  MAC-Address    srn bn  trn r x p b c IP-Address         In   Out

 To0/0      up 0000.300a.7c06    1  1 2009 *   b   F 10.2.0.9        63836 75413
 To0/1      up 0000.300a.7c86    2  1 2009 *   b   F 10.1.0.9        75423 63835
 To0/2      up 0000.300a.7c46 1001  1 2009 *   b   F                  5845  5845
```

Table 91 describes the significant fields shown in the displays.

Table 91 show source-bridge Field Descriptions

Field	Description
Local Interfaces:	Description of local interfaces.
srn	Ring number of this Token Ring.
bn	Bridge number of this router for this ring.
trn	Group in which the interface is configured. Can be the target ring number or virtual ring group.
r	Ring group is assigned. An asterisk (*) in this field indicates that a ring group has been assigned for this interface.
p	Interface can respond with proxy explorers. An asterisk (*) in this field indicates that the interface can respond to proxy explorers.

Table 91 show source-bridge Field Descriptions (continued)

Field	Description
s	Spanning-tree explorers enabled on the interface. An asterisk (*) indicates that this interface will forward spanning-tree explorers.
n	Interface has NetBIOS name caching enabled. An asterisk (*) in this field indicates that the interface has NetBIOS name caching enabled.
max hops	Maximum number of hops.
receive cnt	Bytes received on the interface for source bridging.
transmit cnt	Bytes sent on the interface for source bridging.
drops	Number of dropped packets.
Ring Group *n*:	The number of the ring group.
This peer:	Address and address type of this peer.
Maximum output TCP queue length, per peer:	Maximum number of packets queued on this peer before the Cisco IOS software starts dropping packets.
Peers:	Addresses and address types of the ring group peers.
state	Current state of the peer, open or closed. A hyphen indicates this router.
lv	Indicates local acknowledgment.
pkts_rx	Number of packets received.
pkts_tx	Number of packets sent.
expl_gn	Explorers generated.
drops	Number of packets dropped.
TCP	Lists the current TCP backup queue length.
Rings:	Describes the ring groups. Information displayed is the bridge groups, ring groups, whether each group is local or remote, the MAC address, the network address or interface type, and the number of packets forwarded. A type shown as “locvrt” indicates a local virtual ring used by SDLLC or SR/TLB; a type shown as “remvrt” indicates a remote virtual ring used by SDLC Logical Link Control (SDLLC) or source-route translational bridging (SR/TLB).
Explorers:	This section describes the explorer packets that the Cisco IOS software has sent and received.
input	Explorers received by Cisco IOS software.
output	Explorers generated by Cisco IOS software.
TR0	Interface on which explorers were received.
spanning	Spanning-tree explorers.
all-rings	All-rings explored.
total	Summation of spanning and all-rings.
fastswitched	Number of fast-switched packets.
flushed	Number of flushed packets.
max Bps	Maximum bytes per second.
rings	Interface for the particular ring.

Table 91 show source-bridge Field Descriptions (continued)

Field	Description
inputs	Number of inputs.
bursts	Number of bursts.
throttles	Number of throttles.
output drops	Number of output drops.

show span

To display the spanning-tree topology known to the router, use the **show span** command in user EXEC or privileged EXEC mode.

show span

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

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

Examples

The following is sample output from the **show span** command:

```
Router# show span

Bridge Group 1 is executing the IBM compatible Spanning Tree Protocol
  Bridge Identifier has priority 32768, address 0000.0c0c.f68b
  Configured hello time 2, max age 6, forward delay 4
  Current root has priority 32768, address 0000.0c0c.f573
  Root port is 001A (TokenRing0/0), cost of root path is 16
  Topology change flag not set, detected flag not set
  Times:  hold 1, topology change 30, notification 30
          hello 2, max age 6, forward delay 4, aging 300
  Timers: hello 0, topology change 0, notification 0
Port 001A (TokenRing0/0) of bridge group 1 is forwarding. Path cost 16
   Designated root has priority 32768, address 0000.0c0c.f573
   Designated bridge has priority 32768, address 0000.0c0c.f573
   Designated port is 001B, path cost 0, peer 0
   Timers: message age 1, forward delay 0, hold 0
Port 002A (TokenRing0/1) of bridge group 1 is blocking. Path cost 16
   Designated root has priority 32768, address 0000.0c0c.f573
   Designated bridge has priority 32768, address 0000.0c0c.f573
   Designated port is 002B, path cost 0, peer 0
   Timers: message age 0, forward delay 0, hold 0
Port 064A (spanRSRB) of bridge group 1 is disabled. Path cost 250
   Designated root has priority 32768, address 0000.0c0c.f573
   Designated bridge has priority 32768, address 0000.0c0c.f68b
   Designated port is 064A, path cost 16, peer 0
   Timers: message age 0, forward delay 0, hold 0
```

A port (spanRSRB) is created with each virtual ring group. The port will be disabled until one or more peers go into open state in the ring group.

show spanning-tree

To display spanning-tree information for the specified spanning-tree instances, use the **show spanning-tree** command in privileged EXEC mode.

Cisco 2600, 3660, and 3845 Series Switches

show spanning-tree [*bridge-group*] [**active | backbonefast | blockedports | bridge | brief | inconsistentports | interface** *interface-type interface-number*| **root | summary** [**totals**] **| uplinkfast | vlan** *vlan-id*]

Cisco 6500/6000 Catalyst Series Switches and Cisco 7600 Series Routers

show spanning-tree [*bridge-group* **| active | backbonefast | bridge** [*id*] **| detail | inconsistentports | interface** *interface-type interface-number* [**portfast** [**edge**]] **| mst** [*list* **| configuration** [**digest**]] **| root | summary** [**totals**] **| uplinkfast | vlan** *vlan-id* **| port-channel** *number* **| pathcost** *method*]

Syntax Description

bridge-group	(Optional) Specifies the bridge group number. The range is 1 to 255.
active	(Optional) Displays spanning-tree information on active interfaces only.
backbonefast	(Optional) Displays spanning-tree BackboneFast status.
blockedports	(Optional) Displays blocked port information.
bridge	(Optional) Displays status and configuration of this switch.
brief	(Optional) Specifies a brief summary of interface information.
configuration [**digest**]	(Optional) Displays the multiple spanning-tree current region configuration.
inconsistentports	(Optional) Displays information about inconsistent ports.
interface *interface-type interface-number*	(Optional) Specifies the type and number of the interface. Enter each interface designator, using a space to separate it from the one before and the one after. Ranges are not supported. Valid interfaces include physical ports and virtual LANs (VLANs). See the "Usage Guidelines" for valid values.
list	(Optional) Specifies a multiple spanning-tree instance list.
mst	(Optional) Specifies multiple spanning-tree.
portfast [**edge**]	(Optional) Displays spanning-tree PortFast edge interface operational status. Beginning with Cisco IOS Release 12.2(33)SXI, the **edge** keyword is required. In earlier releases, the **edge** keyword is not used.
root	(Optional) Displays root-switch status and configuration.
summary	(Optional) Specifies a summary of port states.
totals	(Optional) Displays the total lines of the spanning-tree state section.
uplinkfast	(Optional) Displays spanning-tree UplinkFast status.
vlan *vlan-id*	(Optional) Specifies the VLAN ID. The range is 1 to 1005. Beginning with Cisco IOS Release 12.4(15)T, the valid VLAN ID range is from 1 to 4094. If the *vlan-id* value is omitted, the command applies to the spanning-tree instance for all VLANs.

id	(Optional) Identifies the spanning tree bridge.
detail	(Optional) Shows status and configuration details.
port-channel *number*	(Optional) Identifies the Ethernet channel associated with the interfaces.
pathcost *method*	(Optional) Displays the default path-cost calculation method that is used. See the "Usage Guidelines" section for the valid values.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(1)T	This command was introduced.
12.0(5.2)WC(1)	This command was integrated into Cisco IOS Release 12.0(5.2)WC(1).
12.1(6)EA2	This command was integrated into Cisco IOS Release 12.1(6)EA2. The following keywords and arguments were added: *bridge-group*, **active**, **backbonefast**, **blockedports**, **bridge**, **inconsistentports**, **pathcost** *method*, **root**, **totals**, and **uplinkfast**.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(15)ZJ	The syntax added in Cisco IOS Release 12.1(6)EA2 was implemented on the Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.3(4)T	The platform support and syntax added in Cisco IOS Release 12.2(15)ZJ was integrated into Cisco IOS Release 12.3(4)T.
12.4(15)T	This command was modified to extend the range of valid VLAN IDs to 1–4094 for specified platforms.
12.2(33)SXI	This command was modified to require the **edge** keyword after **portfast**. The command output was modified to show the status of Bridge Assurance and PVST Simulation.

Usage Guidelines

The keywords and arguments that are available with the **show spanning-tree** command vary depending on the platform you are using and the network modules that are installed and operational.

Cisco 2600, 3660, and 3845 Series Switches

The valid values for **interface** *interface-type* are:

- **fastethernet**—Specifies a Fast Ethernet IEEE 802.3 interface.
- **port-channel**—Specifies an Ethernet channel of interfaces.

Cisco 6500/6000 Catalyst Switches and 7600 Series Routers

The **port-channel** *number* values from 257 to 282 are supported on the Content Switching Module (CSM) and the Firewall Services Module (FWSM) only.

The *interface-number* argument designates the module and port number. Valid values for *interface-number* depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 2 to 13 and valid values for the port number are from 1 to 48.

When checking spanning tree-active states and you have a large number of VLANs, you can enter the **show spanning-tree summary total** command. You can display the total number of VLANs without having to scroll through the list of VLANs.

The valid values for **interface** *interface-type* are:

- **fastethernet**—Specifies a Fast Ethernet IEEE 802.3 interface.
- **port-channel**—Specifies an Ethernet channel of interfaces.
- **atm**—Specifies an Asynchronous Transfer Mode (ATM) interface.
- **gigabitethernet**—Specifies a Gigabit Ethernet IEEE 802.3z interface.
- **multilink**—Specifies a multilink-group interface.
- **serial**—Specifies a serial interface.
- **vlan**—Specifies a catalyst VLAN interface.

The valid values for keyword **pathcoast** *method* are:

- **append**—Appends the redirected output to a URL (supporting the append operation).
- **begin**—Begins with the matching line.
- **exclude**—Excludes matching lines.
- **include**—Includes matching lines.
- **redirect**—Redirects output to a URL.
- **tee**—Copies output to a URL.

When you run the **show spanning-tree** command for a VLAN or an interface the switch router will display the different port states for the VLAN or interface. The valid spanning-tree port states are listening, learning, forwarding, blocking, disabled, and loopback. See Table 0-92 for definitions of the port states:

Table 0-92 show spanning-tree vlan Command Port States

Field	Definition
LIS	Listening is when the port spanning tree initially starts to listen for BPDU packets for the root bridge.
LRN	Learning is when the port sets the proposal bit on the BPDU packets it sends out
FWD	Forwarding is when the port is sending and listening to BPDU packets and forwarding traffic.
BLK	Blocked is when the port is still sending and listening to BPDU packets but is not forwarding traffic.
DIS	Disabled is when the port is not sending or listening to BPDU packets and is not forwarding traffic.
LBK	Loopback is when the port receives its own BPDU packet back.

Examples

Cisco 2600, 3660, and 3845 Series Switches

The following example shows that bridge group 1 is running the VLAN Bridge Spanning Tree Protocol:

```
Router# show spanning-tree 1

Bridge group 1 is executing the VLAN Bridge compatible Spanning Tree Protocol
Bridge Identifier has priority 32768, address 0000.0c37.b055
Configured hello time 2, max age 30, forward delay 20
We are the root of the spanning tree
Port Number size is 10 bits
Topology change flag not set, detected flag not set
Times: hold 1, topology change 35, notification 2
      hello 2, max age 30, forward delay 20
Timers: hello 0, topology change 0, notification 0
  bridge aging time 300

Port 8 (Ethernet1) of Bridge group 1 is forwarding
   Port path cost 100, Port priority 128
   Designated root has priority 32768, address 0000.0c37.b055
   Designated bridge has priority 32768, address 0000.0c37.b055
   Designated port is 8, path cost 0
   Timers: message age 0, forward delay 0, hold 0
   BPDU: sent 184, received 0
```

The following is sample output from the **show spanning-tree summary** command:

```
Router# show spanning-tree summary

UplinkFast is disabled

Name                 Blocking Listening Learning Forwarding STP Active
-------------------- -------- --------- -------- ---------- ----------
VLAN1                23       0         0        1          24
-------------------- -------- --------- -------- ---------- ----------
               1 VLAN 23       0         0        1          24
```

Table 93 describes the significant fields shown in the display.

Table 93 show spanning-tree summary Field Descriptions

Field	Description
UplinkFast	Indicates whether the spanning-tree UplinkFast feature is enabled or disabled.
Name	Name of VLAN.
Blocking	Number of ports in the VLAN in a blocking state.
Listening	Number of ports in a listening state.
Learning	Number of ports in a learning state.
Forwarding	Number of ports in a forwarding state.
STP Active	Number of ports using the Spanning-Tree Protocol.

The following is sample output from the **show spanning-tree brief** command:

```
Router# show spanning-tree brief

VLAN1
  Spanning tree enabled protocol IEEE
  ROOT ID     Priority 32768
              Address 0030.7172.66c4
              Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
VLAN1
  Spanning tree enabled protocol IEEE
  ROOT ID     Priority 32768
              Address 0030.7172.66c4
Port                            Designated
Name     Port ID Prio Cost Sts  Cost  Bridge ID      Port ID
-------- ------- ---- ---- ---  ----  -------------- -------
Fa0/11   128.17  128  100  BLK  38    0404.0400.0001 128.17
Fa0/12   128.18  128  100  BLK  38    0404.0400.0001 128.18
Fa0/13   128.19  128  100  BLK  38    0404.0400.0001 128.19
Fa0/14   128.20  128  100  BLK  38    0404.0400.0001 128.20
Fa0/15   128.21  128  100  BLK  38    0404.0400.0001 128.21
Fa0/16   128.22  128  100  BLK  38    0404.0400.0001 128.22
Fa0/17   128.23  128  100  BLK  38    0404.0400.0001 128.23
Fa0/18   128.24  128  100  BLK  38    0404.0400.0001 128.24
Fa0/19   128.25  128  100  BLK  38    0404.0400.0001 128.25
Fa0/20   128.26  128  100  BLK  38    0404.0400.0001 128.26
Fa0/21   128.27  128  100  BLK  38    0404.0400.0001 128.27

Port                            Designated
Name     Port ID Prio Cost Sts  Cost  Bridge ID      Port ID
-------- ------- ---- ---- ---  ----  -------------- -------
Fa0/22   128.28  128  100  BLK  38    0404.0400.0001 128.28
Fa0/23   128.29  128  100  BLK  38    0404.0400.0001 128.29
Fa0/24   128.30  128  100  BLK  38    0404.0400.0001 128.30 Hello Time   2 sec  Max Age 20
sec  Forward Delay 15 sec
```

Table 94 describes the significant fields shown in the display.

Table 94 show spanning-tree brief Field Descriptions

Field	Description
VLAN1	VLAN for which spanning-tree information is shown.
Spanning tree enabled protocol	Type of spanning tree (IEEE, IBM, CISCO).
ROOT ID	Indicates the root bridge.
Priority	Priority indicator.
Address	MAC address of the port.
Hello Time	Amount of time, in seconds, that the bridge sends bridge protocol data units (BPDUs).
Max Age	Amount of time, in seconds, that a BPDU packet should be considered valid.
Forward Delay	Amount of time, in seconds, that the port spends in listening or learning mode.
Port Name	Interface type and number of the port.
Port ID	Identifier of the named port.
Prio	Priority associated with the port.

Table 94 show spanning-tree brief Field Descriptions (continued)

Field	Description
Cost	Cost associated with the port.
Sts	Status of the port.
Designated Cost	Designated cost for the path.
Designated Bridge ID	Bridge identifier of the bridge assumed to be the designated bridge for the LAN associated with the port.

The following is sample output from the **show spanning-tree vlan 1** command:

```
Router# show spanning-tree vlan 1

Spanning tree 1 is executing the IEEE compatible Spanning Tree protocol
  Bridge Identifier has priority 32768, address 00e0.1eb2.ddc0
  Configured hello time 2, max age 20, forward delay 15
  Current root has priority 32768, address 0010.0b3f.ac80
  Root port is 5, cost of root path is 10
  Topology change flag not set, detected flag not set, changes 1
  Times:  hold 1, topology change 35, notification 2
          hello 2, max age 20, forward delay 15
  Timers: hello 0, topology change 0, notification 0

Interface Fa0/1  in Spanning tree 1 is down
   Port path cost 100, Port priority 128
   Designated root has priority 32768, address 0010.0b3f.ac80
Designated bridge has priority 32768, address 00e0.1eb2.ddc0
   Designated port is 1, path cost 10
   Timers: message age 0, forward delay 0, hold 0
   BPDU: sent 0, received 0
```

Table 95 describes the significant fields shown in the display.

Table 95 show spanning-tree vlan Field Descriptions

Field	Description
Spanning tree	Type of spanning tree (IEEE, IBM, CISCO).
Bridge Identifier	Part of the bridge identifier and taken as the most significant part for bridge ID comparisons.
address	Bridge MAC address.
Root port	Identifier of the root port.
Topology change	Flags and timers associated with topology changes.

The following is sample output from the **show spanning-tree interface fastethernet0/3** command:

```
Router# show spanning-tree interface fastethernet0/3

Interface Fa0/3 (port 3) in Spanning tree 1 is down
   Port path cost 100, Port priority 128
   Designated root has priority 6000, address 0090.2bba.7a40
   Designated bridge has priority 32768, address 00e0.1e9f.4abf
   Designated port is 3, path cost 410
   Timers: message age 0, forward delay 0, hold 0
   BPDU: sent 0, received 0
```

Cisco 6500/6000 Series Catalyst Switches and 7600 Series Routers

This example shows how to display a summary of interface information:

```
Router# show spanning-tree

VLAN0001
  Spanning tree enabled protocol ieee
  Root ID    Priority    4097
             Address     0004.9b78.0800
             This bridge is the root
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    4097   (priority 4096 sys-id-ext 1)
             Address     0004.9b78.0800
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
             Aging Time 15

Interface        Port ID                     Designated                 Port ID
Name             Prio.Nbr      Cost Sts      Cost Bridge ID             Prio.Nbr
---------------- -------- --------- --- --------- -------------------- --------
Gi2/1            128.65           4 LIS         0  4097 0004.9b78.0800 128.65
Gi2/2            128.66           4 LIS         0  4097 0004.9b78.0800 128.66
Fa4/3            128.195         19 LIS         0  4097 0004.9b78.0800 128.195
Fa4/4            128.196         19 BLK         0  4097 0004.9b78.0800 128.195

Router#
```

Table 96 describes the fields that are shown in the example.

Table 96 show spanning-tree Command Output Fields

Field	Definition
Port ID Prio.Nbr	Port ID and priority number.
Cost	Port cost.
Sts	Status information.

This example shows how to display information about the spanning tree on active interfaces only:

```
Router# show spanning-tree active

UplinkFast is disabled
BackboneFast is disabled

 VLAN1 is executing the ieee compatible Spanning Tree protocol
  Bridge Identifier has priority 32768, address 0050.3e8d.6401
  Configured hello time 2, max age 20, forward delay 15
  Current root has priority 16384, address 0060.704c.7000
  Root port is 265 (FastEthernet5/9), cost of root path is 38
  Topology change flag not set, detected flag not set
  Number of topology changes 0 last change occurred 18:13:54 ago
  Times:  hold 1, topology change 24, notification 2
          hello 2, max age 14, forward delay 10
  Timers: hello 0, topology change 0, notification 0

Router#
```

This example shows how to display the status of spanning-tree BackboneFast:

```
Router# show spanning-tree backbonefast

BackboneFast is enabled

BackboneFast statistics
-----------------------
Number of transition via backboneFast (all VLANs) : 0
Number of inferior BPDUs received (all VLANs)     : 0
Number of RLQ request PDUs received (all VLANs)   : 0
Number of RLQ response PDUs received (all VLANs)  : 0
Number of RLQ request PDUs sent (all VLANs)       : 0
Number of RLQ response PDUs sent (all VLANs)      : 0
Router#
```

This example shows how to display information about the spanning tree for this bridge only:

```
Router# show spanning-tree bridge

VLAN1
  Bridge ID  Priority    32768
             Address     0050.3e8d.6401
             Hello Time   2 sec  Max Age 20 sec  Forward Delay 15 sec
.
Router#
```

This example shows how to display detailed information about the interface:

```
Router# show spanning-tree detail

VLAN1 is executing the ieee compatible Spanning Tree protocol
Bridge Identifier has priority 4096, address 00d0.00b8.1401
Configured hello time 2, max age 20, forward delay 15
We are the root of the spanning tree
Topology change flag not set, detected flag not set
Number of topology changes 9 last change occurred 02:41:34 ago
from FastEthernet4/21
Times: hold 1, topology change 35, notification 2
hello 2, max age 20, forward delay 15
Timers: hello 1, topology change 0, notification 0, aging 300


Port 213 (FastEthernet4/21) of VLAN1 is forwarding
Port path cost 19, Port priority 128, Port Identifier 128.213.
Designated root has priority 4096, address 00d0.00b8.1401
Designated bridge has priority 4096, address 00d0.00b8.1401
Designated port id is 128.213, designated path cost 0
Timers: message age 0, forward delay 0, hold 0
Number of transitions to forwarding state: 1
BPDU: sent 4845, received 1
Router#
```

This example shows how to display information about the spanning tree for a specific interface:

```
Router# show spanning-tree interface fastethernet 5/9

Interface Fa0/10 (port 23) in Spanning tree 1 is ROOT-INCONSISTENT
Port path cost 100, Port priority 128
Designated root has priority 8192, address 0090.0c71.a400
Designated bridge has priority 32768, address 00e0.1e9f.8940
```

This example shows how to display information about the spanning tree for a specific bridge group:

```
Router# show spanning-tree 1

UplinkFast is disabled
 BackboneFast is disabled

  Bridge group 1 is executing the ieee compatible Spanning Tree protocol
   Bridge Identifier has priority 32768, address 00d0.d39c.004d
   Configured hello time 2, max age 20, forward delay 15
   Current root has priority 32768, address 00d0.d39b.fddd
   Root port is 7 (FastEthernet2/2), cost of root path is 19
   Topology change flag set, detected flag not set
   Number of topology changes 3 last change occurred 00:00:01 ago
           from FastEthernet2/2
   Times:  hold 1, topology change 35, notification 2
           hello 2, max age 20, forward delay 15
   Timers: hello 0, topology change 0, notification 0  bridge aging time 15

Port 2 (Ethernet0/1/0) of Bridge group 1 is down

    Port path cost 100, Port priority 128
    Designated root has priority 32768, address 0050.0bab.1808
    Designated bridge has priority 32768, address 0050.0bab.1808
    Designated port is 2, path cost 0
    Timers: message age 0, forward delay 0, hold 0
    BPDU: sent 0, received 0
Router#
```

This example shows how to display a summary of port states:

```
Router# show spanning-tree summary

Root bridge for: Bridge group 1, VLAN0001, VLAN0004-VLAN1005
 VLAN1013-VLAN1499, VLAN2001-VLAN4094
EtherChannel misconfiguration guard is enabled
Extended system ID is enabled
Portfast is enabled by default
PortFast BPDU Guard is disabled by default
Portfast BPDU Filter is disabled by default
Loopguard is disabled by default
UplinkFast is disabled
BackboneFast is disabled
Pathcost method used is long
Name                   Blocking Listening Learning Forwarding STP Active
---------------------- -------- --------- -------- ---------- ----------
1 bridge               0        0         0        1          1
3584 vlans 3584 0 0 7168 10752


Blocking Listening Learning Forwarding STP Active
---------------------- -------- --------- -------- ---------- ----------
Total                  3584     0         0        7169       10753
Router#
```

This example shows how to display the total lines of the spanning-tree state section:

```
Router#  show spanning-tree summary total
Root bridge for:Bridge group 10, VLAN1, VLAN6, VLAN1000.
Extended system ID is enabled.
PortFast BPDU Guard is disabled
EtherChannel misconfiguration guard is enabled
UplinkFast is disabled
BackboneFast is disabled
```

```
Default pathcost method used is long

Name                 Blocking Listening Learning Forwarding STP Active
-------------------- -------- --------- -------- ---------- ----------
            105 VLANs 3433     0         0        105        3538

BackboneFast statistics
-----------------------
Number of transition via backboneFast (all VLANs) :0
Number of inferior BPDUs received (all VLANs)     :0
Number of RLQ request PDUs received (all VLANs)   :0
Number of RLQ response PDUs received (all VLANs)  :0
Number of RLQ request PDUs sent (all VLANs)       :0
Number of RLQ response PDUs sent (all VLANs)      :0
Router#
```

This example shows how to display information about the spanning tree for a specific VLAN:

```
Router# show spanning-tree vlan 200
VLAN0200
 Spanning tree enabled protocol ieee
 Root ID Priority 32768
    Address 00d0.00b8.14c8
    This bridge is the root
    Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
 Bridge ID Priority 32768
    Address 00d0.00b8.14c8
    Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
    Aging Time 300
Interface Role Sts Cost Prio.Nbr Status
---------------- ---- --- --------- -------- --------------------------------
Fa4/4 Desg FWD 200000 128.196 P2p
Fa4/5 Back BLK 200000 128.197 P2p
Router#
```

Table 0-97 describes the fields that are shown in the example.

Table 0-97 show spanning-tree vlan Command Output Fields

Field	Definition
Role	Current 802.1w role; valid values are Boun (boundary), Desg (designated), Root, Altn (alternate), and Back (backup).
Sts	Spanning-tree states; valid values are BKN* (broken)[1], BLK (blocking), DWN (down), LTN (listening), LBK (loopback), LRN (learning), and FWD (forwarding).
Cost	Port cost.

Table 0-97 show spanning-tree vlan Command Output Fields (continued)

Field	Definition
Prio.Nbr	Port ID that consists of the port priority and the port number.
Status	Status information; valid values are as follows: • P2p/Shr—The interface is considered as a point-to-point (resp. shared) interface by the spanning tree. • Edge—PortFast has been configured (either globally using the **default** command or directly on the interface) and no BPDU has been received. • *ROOT_Inc, *LOOP_Inc, *PVID_Inc and *TYPE_Inc—The port is in a broken state (BKN*) for an inconsistency. The port would be (respectively) Root inconsistent, Loopguard inconsistent, PVID inconsistent, or Type inconsistent. • Bound(type)—When in MST mode, identifies the boundary ports and specifies the type of the neighbor (STP, RSTP, or PVST). • Peer(STP)—When in PVRST rapid-pvst mode, identifies the port connected to a previous version of the 802.1D bridge.

1. For information on the *, see the definition for the Status field.

This example shows how to determine if any ports are in the root-inconsistent state:

```
Router#  show spanning-tree inconsistentports

Name                 Interface            Inconsistency
-------------------- -------------------- ------------------
 VLAN1               FastEthernet3/1      Root Inconsistent

Number of inconsistent ports (segments) in the system :1
Router#
```

Related Commands

Command	Description
spanning-tree backbonefast	Enables BackboneFast on all Ethernet VLANs.
spanning-tree cost	Sets the path cost of the interface for STP calculations.
spanning-tree guard	Enables or disables the guard mode.
spanning-tree pathcost method	Sets the default path-cost calculation method.
spanning-tree portfast (interface configuration mode)	Enables PortFast mode.
spanning-tree portfast bpdufilter default	Enables BPDU filtering by default on all PortFast ports.
spanning-tree portfast bpduguard default	Enables BPDU guard by default on all PortFast ports.
spanning-tree port-priority	Sets an interface priority when two bridges vie for position as the root bridge.
spanning-tree uplinkfast	Enables UplinkFast.
spanning-tree vlan	Enables the Spanning Tree Protocol (STP) on a VLAN.

show stun

To display the current status of serial tunnel (STUN) connections, use the **show stun** command in privileged EXEC mode.

show stun [**group** *stun-group-number*] [**address** *address-list*]

Syntax Description

group *stun-group-number*	(Optional) STUN group number. Valid numbers are decimal integers in the range from 1 to 255.
address *address-list*	(Optional) List of poll addresses.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.2(11)T	The **group** and **address** keywords were added.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following is sample output from the **show stun** command:

```
Router# show stun

This peer: 10.108.10.1
Serial0 -- 3174 Controller for test lab (group 1 [sdlc])
                         state   rx-pkts  tx-pkts  drops  poll
  7[1] IF Serial1        open     20334    86440      5  8P
 10[1] TCP 10.108.8.1    open      6771     7331      0
all[1] TCP 10.108.8.1    open    612301  2338550   1005
```

In the display, the first entry reports proxy that polling is enabled for address 7 and that serial 0 is running with modulus 8 on the primary side of the link. The link has received 20,334 packets, sent 86,440 packets, and dropped 5 packets.

Table 98 describes the significant fields shown in the output.

Table 98 show stun Field Descriptions

Field	Description
This peer	Lists the peer name or address. The interface name (as defined by the **description** command), its STUN group number, and the protocol associated with the group are shown on the header line.
STUN address	Address or the word *all* if the default forwarding entry is specified, followed by a repeat of the group number given for the interface.

Table 98 show stun Field Descriptions (continued)

Field	Description
Type of link	Description of link, either a serial interface using serial transport (indicated by IF followed by interface name), or a TCP connection to a remote router (TCP followed by IP address).
state	State of the link: open is the normal, working state; direct indicates a direct link to another line, as specified with the **direct** keyword in the **stun route** command.
rx-pkts	Number of received packets.
tx-pkts	Number of sent packets.
drops	Number of packets that for whatever reason had to be dropped.
poll	Report of the proxy poll parameters, if any. P indicates a primary and S indicates a secondary node. The number before the letter is the modulus of the link.

show subscriber-policy

To display the details of a subscriber policy, use the **show subscriber-policy** command in user EXEC or privileged EXEC mode.

show subscriber-policy *range*

Syntax Description

range	Range of subscriber policy numbers (range 1 to 100).

Command Modes

User EXEC
Privileged EXEC

Command History

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

Examples

The following is sample output from the **show subscriber-policy** command:

```
Router# show subscriber-policy 1

ARP: Permit
Broadcast: Deny
Multicast: Permit
Unknown: Deny
STP: Disable
CDP: Disable
```

Related Commands

Command	Description
bridge protocol	Defines the type of Spanning Tree Protocol.
bridge subscriber-policy	Binds a bridge group with a subscriber policy.
show bridge	Displays classes of entries in the bridge forwarding database.
subscriber-policy	Defines or modifies the forward and filter decisions of the subscriber policy.

shutdown (CMCC)

To shut down an interface or the virtual interface on the Cisco Mainframe Channel Connection (CMCC) adapter when the router is in interface configuration mode, use the **shutdown** command in interface configuration mode. The **shutdown** TN3270 server command also shuts down TN3270 entities, such as physical unit (PU), Dependent Logical Unit Requestor (DLUR), and DLUR service access point (SAP), depending on which configuration mode the router is in when the command is issued. To restart the interface or entity, use the **no** form of this command. The entity affected depends on the mode in which the command is issued.

shutdown

no shutdown

Syntax Description

This command has no arguments or keywords.

Defaults

The interface or entity is enabled.

Command Modes

Interface configuration

Command History

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

Usage Guidelines

When using this command on a channel interface, the command applies to the entire CMCC adapter.

Examples

The following example issued in interface configuration mode shuts down the entire CMCC adapter:

```
shutdown
```

shutdown (TN3270)

To shut down TN3270 entities, such as physical unit (PU), Dependent Logical Unit Requestor (DLUR), and DLUR service access point (SAP), use the **shutdown** command in the appropriate TN3270 server command modes. To restart the interface or entity, use the **no** form of this command.

shutdown

no shutdown

Syntax Description

This command has no arguments or keywords.

Defaults

The interface or entity is enabled.

Command Modes

TN3270 server configuration

PU configuration

DLUR configuration

DLUR PU configuration

DLUR SAP configuration

Listen-point configuration

Listen-point PU configuration

Command History

Release	Modification
10.2	This command was introduced.
11.2	Support was added for the following configuration modes: • TN3270 • PU • DLUR • DLUR SAP
11.2(18)BC	Support was added for the following configuration modes: • Listen-point • Listen-point PU
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The **shutdown** TN3270 command shuts down the TN3270 entities according to which configuration mode the router is in when the command is issued.

- In TN3270 server configuration mode, the command shuts down the entire TN3270 server function.
- In PU configuration mode, the command shuts down an individual PU entity within the TN3270 server.
- In DLUR configuration mode, the command shuts down the whole DLUR subsystem within the TN3270 server.
- In DLUR PU configuration mode, the command shuts down an individual PU within the Systems Network Architecture (SNA) session switch configuration in the TN3270 server.
- In DLUR SAP configuration mode, the command shuts down the local SAP (LSAP) and its associated links within the SNA session switch configuration.

Examples

The following example issued in TN3270 server configuration mode shuts down the entire TN3270 server:

```
shutdown
```