

Interface Commands

This chapter describes the function and displays the syntax of each interface command. For more information about defaults and usage guidelines, see the corresponding chapter of the *Router Products Command Reference* publication.

async default ip address *ip-address*

no async default ip address

To assign the interface address that is used by the device connecting to the router via PPP or SLIP, unless you override the address at the command line, use the **async default ip address** interface configuration command. Use the **no** form of the command to remove the address from your configuration.

ip-address Address of the client interface

[no] async dynamic address

To specify an address on an asynchronous interface (rather than using the default address), use the **async dynamic address** interface configuration command. Use the **no** form of this command to disable dynamic addressing.

[no] async dynamic routing

To implement asynchronous routing on an interface, use the **async dynamic routing** interface configuration command. The **no** form of this command disables use of routing protocols; static routing will still be used.

async mode dedicated

no async mode

To place a line into network mode using SLIP or PPP encapsulation, use the **async mode dedicated** interface configuration command. The **no** form of this command returns the line to interactive mode.

async mode interactive
no async mode

To enable the **slip** and **ppp** EXEC commands, use the **async mode interactive** line configuration command. Use the **no** form of this command to prevent users from implementing SLIP and PPP at the EXEC level.

atm-dxi map *protocol address vpi vci* [**broadcast**]
no atm-dxi map *protocol address*

To map a given VPI and VCI to a DXI frame address, use the **atm-dxi map** interface configuration command. Use the **no** form of this command to remove the definition.

<i>protocol</i>	Specifies the protocol: apollo , appletalk , bridge , clns , decnet , ip , ipx , vines , xns .
<i>address</i>	Protocol-specific address.
<i>vpi</i>	Specifies the Virtual Path Identifier in the range 0 to 15.
<i>vci</i>	Specifies the Virtual Circuit Identifier in the range 0 to 63.
broadcast	(Optional) Broadcasts should be forwarded to this address.

[**no**] **backup delay** {*enable-delay* | **never**} {*disable-delay* | **never**}

To define how much time should elapse before a secondary line is set up or taken down after a primary line transition, use the **backup delay** interface configuration command. Use the **no** form of this command to remove the definition.

<i>enable-delay</i>	Integer that specifies the delay in seconds after the primary line goes down before the secondary line is activated.
never	Prevents the secondary line from being activated.

<i>disable-delay</i>	Integer that specifies the delay in seconds after the primary line goes up before the secondary line is deactivated.
never	Prevents the secondary line from being deactivated.

[no] backup interface *interface-name*

backup interface *interface-name slot/port* (for the Cisco 7000 series)

To configure the serial interface as a secondary, or dial backup line, use the **backup interface** interface configuration command. Use the **no** form of this command with the appropriate serial port designation to disable this feature.

<i>interface-name</i>	Serial port to be set as the secondary interface line.
<i>slot</i>	On the Cisco 7000 series, specifies the slot number.
<i>port</i>	On the Cisco 7000 series, specifies the port number.

[no] backup load {*enable-threshold* | **never**} {*disable-load* | **never**}

To set the traffic load thresholds for dial backup service, use the **backup load** interface configuration command. Use the **no** form of this command to remove the setting.

<i>enable-threshold</i>	Integer that specifies a percentage of the primary line's available bandwidth
never	Sets the secondary line to never be activated due to load
<i>disable-load</i>	Integer that specifies a percentage of the primary line's available bandwidth.
never	Sets the secondary line to never be deactivated due to load.

bandwidth *kilobits*
no bandwidth

To set a bandwidth value for an interface, use the **bandwidth** interface configuration command. Use the **no** form of this command to restore the default values.

kilobits Intended bandwidth in kilobits per second.
For a full bandwidth DS3, enter the value **44736**.

channel-group *number timeslots range* [**speed** {**48** | **56** | **64**}]

Use the **channel-group** controller configuration command to define the timeslots that belong to each T1 circuit.

number Channel-group number. Channel-group numbers can be a value from 0 to 23.

timeslots range Timeslot or range of timeslots belonging to the channel-group. The first timeslot is numbered 1; the last timeslot is numbered 24.

speed {**48** | **56** | **64**} (Optional) Specifies the line speed (in kilobits per second) of the T1 link. The default is 56 kbps.

clear controller lex *number* [*prom*]

clear controller lex *slot/port* [*prom*] (for the Cisco 7000 series)

To reboot the LAN Extender and restart its operating software, use the **clear controller lex** privileged EXEC command.

<i>number</i>	Number of the LEX interface corresponding to the LAN Extender to be rebooted.
prom	(Optional) Forces a reload of the PROM image, regardless of any Flash image.
<i>slot</i>	On the Cisco 7000 series, specifies the backplane slot number. On the Cisco 7000, the value can be 0, 1, 2, 3, or 4. On the Cisco 7010, the value can be 0, 1, or 2.
<i>port</i>	On the Cisco 7000 series, specifies the port number of the interface. The value can be 0, 1, 2, or 3 for the serial interface.

clear controller t1 *slot/port*

Use the **clear controller t1** EXEC command to reset the T1 controller interface on the Cisco 7000.

<i>slot</i>	Backplane slot number; can be 0, 1, 2, 3, or 4. The slots are numbered from left to right.
<i>port</i>	Port number of the interface. It can be 0 or 1 for the MIP (Multichannel Interface Processor). Ports on each interface processor are numbered from the top down.

clear counters [*type number*] [**ethernet** | **serial**]

clear counters [*type slot/port*] [**ethernet** | **serial**] (for the Cisco 7000 series)

To clear the interface counters, use the **clear counters** EXEC command.

<i>type</i>	(Optional) Specifies the interface type; it is one of the keywords listed in the Clear Counters Interface Type Keywords table.
<i>number</i>	(Optional) Specifies the interface counter displayed with the show interfaces command.
ethernet	(Optional) If the <i>type</i> is lex , you can clear the interface counters on the Ethernet interface.
serial	(Optional) If the <i>type</i> is lex , you can clear the interface counters on the serial interface.
<i>slot</i>	(Optional) On the Cisco 7000 series, specifies the backplane slot number. On the 7000, value can be 0, 1, 2, 3, or 4. On the 7010, value can be 0, 1, or 2.
<i>port</i>	(Optional) On the Cisco 7000 series, specifies the port number of the interface. Value can be 0, 1, 2, or 3 for the serial interface.

clear interface *type number*

clear interface *type slot/port* (on a Cisco 7000 series)

clear interface *type slot/port* [*:channel-group*] (on a Cisco 7000 series MIP T1 interface)

To reset the hardware logic on an interface, use the **clear interface** EXEC command.

<i>type</i>	Specifies the interface type; it is one of the keywords listed in the Interface Type Keywords table of the <i>Router Products Command Reference</i> publication.
<i>number</i>	Specifies the port, connector, or interface card number.
<i>slot</i>	In a Cisco 7000, specifies the backplane slot number and can be 0, 1, 2, 3, or 4. In a Cisco 7010, the value can be 0, 1, or 2.

port On a Cisco 7000 series, specifies the port number of the interface and can be 0, 1, 2, 3, 4 or 5 depending on the type of interface, as follows:

- AIP** (ATM Interface Processor)—0
- EIP** (Ethernet Interface Processor)—0, 1, 2, 3, 4, or 5
- FIP** (FDDI Interface Processor)—0
- HIP** (HSSI Interface Processor)—0
- TRIP** (Token Ring Interface Processor)—0, 1, 2, or 3

:channel-group (Optional) On the Cisco 7000 series supporting Channelized T1, specifies the channel in the range of 0 to 23.

clear rif-cache

To clear entries from the Routing Information Field (RIF) cache, use the **clear rif-cache EXEC** command.

clock rate *bps* **no clock rate**

To configure the clock rate for appliques (connector hardware) on the serial interface of the MCI and SCI cards to an acceptable bit rate, use the **clock rate** interface configuration command. Use the **no clock rate** command to remove the clock rate if you change the interface from a DCE to a DTE device.

bps Desired clock rate in bits per second: 1200, 2400, 4800, 9600, 19200, 34800, 56000, 64000, 72000, 125000, 148000, 500000, 800000, 1000000, 1300000, 2000000, or 4000000.

clock source {line | internal}

Use the **clock source** controller configuration command to set the T1-line clock-source for the MIP in the Cisco 7000 series.

- line** Specifies the T1 line as the clock source.
- internal** Specifies the MIP as the clock source.

clock source {line | internal}

no clock source

To control which clock a G.703-E1 interface will use to clock its transmitted data from, use the **clock source** interface configuration command. The **no** form of this command restores the default value.

- line** Specifies that the interface will clock its transmitted data from a clock recovered from the line's receive data stream (default).
- internal** Specifies that the interface will clock its transmitted data from its internal clock.

cmt connect [*interface-name* [**phy-a** | **phy-b**]]

To start the processes that perform the connection management (CMT) function and allow the ring on one fiber to be started, use the **cmt connect EXEC** command.

- interface-name* (Optional) Specifies the FDDI interface
- phy-a** (Optional) Selects Physical Sublayer A
- phy-b** (Optional) Selects Physical Sublayer B

cmt disconnect [*interface-name* [**phy-a** | **phy-b**]]

To stop the processes that perform the connection management (CMT) function and allow the ring on one fiber to be stopped, use the **cmt disconnect EXEC** command.

- interface-name* (Optional) Specifies the FDDI interface

- phy-a** (Optional) Selects Physical Sublayer A
- phy-b** (Optional) Selects Physical Sublayer B

[no] compress predictor

To configure point-to-point software compression for a LAPB or X.25 link, use the **compress predictor** interface configuration command. To disable compression, use the **no** form of this command.

controller t1 slot/port

To configure a T1 controller interface and enter controller configuration mode, use the **controller t1** global configuration command. This command is used only on a Cisco 7000 series router.

- slot* Specifies the backplane slot number. In the Cisco 7000, can be 0, 1, 2, 3, or 4. In the Cisco 7010, can be 0, 1, or 2. The slots are numbered from left to right.
- port* Specifies the port number of the interface. It can be 0 or 1 for the MIP (Multichannel Interface Processor). Ports on each interface processor are numbered from the top down.

copy flash lex number

To download an executable image from Flash memory on the core router to the LAN Extender, use the **copy flash lex** privileged EXEC command.

- number* Number of the LEX interface to which to download an image from Flash

copy tftp lex *number*

To download an executable image from a TFTP server to the LAN Extender, use the **copy tftp lex** privileged EXEC command.

number Number of the LEX interface to which to download an image

crc *size* no crc

To set the length of the cyclic redundancy check (CRC) on a Fast Serial Interface Processor (FSIP) of the Cisco 7000 series, use the **crc** interface configuration command. To set the CRC length to 16 bits, use the **no** form of this command.

size CRC size (16 or 32 bits); the default is 16 bits.

[no] crc4

To enable generation of the G.703-E1 CRC4, use the **crc4** interface configuration command. To disable this feature, use the **no** form of this command.

[no] dce-terminal-timing enable

When running a line at high speeds and long distances, use the **dce-terminal-timing enable** interface configuration command to prevent phase shifting of the data with respect to the clock. If SCTE is not available from the DTE, use the **no** form of this command, which causes the DCE to use its own clock instead of SCTE from the DTE.

delay *tens-of-microseconds*

no delay

To set a delay value for an interface, use the **delay** interface configuration command. Use the **no** form of this command to restore the default delay value.

tens-of-microseconds Integer that specifies the delay in tens of microseconds for an interface or network segment

description *string* (controller configuration)

no description

To add a description to a T1 controller interface on a Cisco 7000 series router, use the **description** controller configuration command. Use the **no description** command to remove the description.

string Comment or a description to help you remember what is attached to the interface

description *string* (interface configuration)

no description

To add a description to an interface configuration, use the **description** interface configuration command. Use the **no** form of this command to remove the description.

string Comment or a description to help you remember what is attached to this interface

down-when-looped

To configure an interface to inform the system it is down when loopback is detected, use the **down-when-looped** interface configuration command.

[no] dte-invert-txc

On the Cisco 4000 platform, you can specify the serial Network Interface Module timing signal configuration. When the board is operating as a DTE, the **dte-invert-txc** command inverts the TXC clock signal it gets from the DCE that the DTE uses to transmit data. Use the **no** form of this command if the DCE accepts SCTE from the DTE.

[no] early-token-release

To enable early token release, a method whereby the Token Ring interfaces can release the token back onto the ring immediately after transmitting rather than waiting for the frame to return, use the **early-token-release** interface configuration command. This feature helps increase the total bandwidth of the Token Ring.

The CSC-C2CTR, CSC-R16 (or CSC-R16M), CSC-2R, and CSC-1R cards and the Token Ring Interface Processor (TRIP) on the Cisco 7000 all support early token release. Once enabled, use the **no** form of this command to disable this feature.

encapsulation *encapsulation-type*

To set the encapsulation method used by the interface, use the **encapsulation** interface configuration command.

encapsulation-type Encapsulation type. See the Encapsulation Types table of the *Router Products Command Reference* publication for a list of supported encapsulation types.

encapsulation atm-dxi

Use the **encapsulation atm-dxi** interface configuration command to enable ATM-DXI encapsulation. The **no encapsulation atm-dxi** command disables ATM-DXI encapsulation.

fdi burst-count *number*

no fdi burst-count

To allow the FCI card to preallocate buffers to handle bursty FDDI traffic (for example, NFS bursty traffic), use the **fdi burst-count** interface configuration command. Use the **no** form of this command to revert to the default value.

number Number of preallocated buffers. Valid values are in the range from 1 to 10; the default is 3 buffers.

fdi c-min *microseconds*

no fdi c-min

To set the C-Min timer on the PCM, use the **fdi c-min** interface configuration command. Use the **no** form of this command to revert to the default value.

microseconds Sets the timer value in microseconds.

fdi cmt-signal-bits *signal-bits* [**phy-a** | **phy-b**]

To control the information transmitted during the connection management (CMT) signaling phase, use the **fdi cmt-signal-bits** interface configuration command. If neither the **phy-a** nor **phy-b** keyword is specified, the signal bits apply to both physical connections.

<i>signal-bits</i>	<p>A hexadecimal number preceded by 0x; for example, 0x208. The FDDI standard defines ten bits of signaling information that must be transmitted, as follows:</p> <ul style="list-style-type: none">bit 0—Escape bit. Reserved for future assignment by the FDDI standards committee.bits 1 and 2—Physical type, as defined in Table 6-4 of the <i>Router Products Command Reference</i> publication.bit 3—Physical compatibility. Set if topology rules include the connection of a physical-to-physical type at the end of the connection.bits 4 and 5—Link Confidence test duration; set as defined in Table 6-5 of the <i>Router Products Command Reference</i> publication.bit 6—Media Access Control (MAC) available for link confidence test.bit 7—Link confidence test failed. The setting of bit 7 indicates that the link confidence was failed by the Cisco end of the connection.bit 8—MAC for local loop.bit 9—MAC on physical output.
phy-a	(Optional) Selects Physical Sublayer A.
phy-b	(Optional) Selects Physical Sublayer B.

[no] fdi duplicate-address-check

To enable the duplicate address detection capability on the FDDI, use the **fdi duplicate-address-check** interface configuration command. Use the **no** form of this command to disable this feature.

[no] fddi encapsulate

To specify encapsulating bridge mode on the CSC-C2/FCIT interface card, use the **fddi encapsulate** interface configuration command. Use the **no** form of this command to turn off encapsulation bridging and return the FCIT interface to its translational, nonencapsulating mode.

[no] fddi smt-frames

To enable the SMT frame processing capability on the FDDI, use the **fddi smt-frames** interface configuration command. Use the **no** form of this command to disable this feature, in which case the router will not generate or respond to SMT frames.

fddi tb-min *milliseconds*
no fddi tb-min

To set the TB-Min timer in the physical connection management (PCM), use the **fddi tb-min** interface configuration command. Use the **no** form of this command to revert to the default value.

milliseconds Sets the TM-Min timer value in milliseconds. The default is 100 milliseconds.

fddi tl-min-time *microseconds*

To control the TL-Min time (the minimum time to transmit a Physical Sublayer, or PHY line state, before advancing to the next physical connection management (PCM) state, as defined by the X3T9.5 specification), use the **fddi tl-min-time** interface configuration command.

microseconds Integer that specifies the time used during the connection management (CMT) phase to ensure that signals are maintained for at least the value of TL-Min so the remote station can acquire the signal. The default is 30 microseconds.

fdi token-rotation-time *microseconds*

To control ring scheduling during normal operation and to detect and recover from serious ring error situations, use the **fdi token-rotation-time** interface configuration command.

microseconds Integer that specifies the token rotation time (TRT). The default is 5000 microseconds.

fdi t-out *milliseconds*

no fdi t-out

To set the timeout timer in the physical connection management (PCM), use the **fdi t-out** interface configuration command. Use the **no** form of this command to revert to the default value.

milliseconds Sets the timeout timer. The default is 100 milliseconds.

fdi valid-transmission-time *microseconds*

To recover from a transient ring error, use the **fdi valid-transmission-time** interface configuration command.

microseconds Integer that specifies the transmission valid timer (TVX) interval. The default is 2500 microseconds.

framing {**sf** | **esf**}

Use the **framing** controller configuration command to select the frame type for the T1 line.

sf Specifies super frame as the T1 frame type. The default is **sf**.

esf Specifies extended super frame as the T1 frame type.

hold-queue *length* { **in** | **out** }

no hold-queue { **in** | **out** }

To specify the hold-queue limit of an interface, use the **hold-queue** interface configuration command. Use the **no** form of this command with the appropriate keyword to restore the default values for an interface.

length Integer that specifies the maximum number of packets in the queue. Default input hold-queue limit is 75 packets. Default output hold-queue limit is 40 packets.

in Specifies the input queue.

out Specifies the output queue.

[no] hssi external-loop-request

To allow the router to support a CSU/DSU that uses the LC signal to request a loopback from the router, use the **hssi external-loop-request** interface configuration command. Use the **no** form of this command to disable the feature.

[no] hssi internal-clock

To convert the HSSI interface into a 45-MHz clock master, use the **hssi internal-clock** interface configuration command. Use the **no** form of this command to disable the clock master mode.

interface *type number*
interface *type slot/port* (for the Cisco 7000 series)
interface *type slot/port:channel-group*
(for channelized T1 on the Cisco 7000 series)
interface *type number.subinterface-number* [**multipoint** |
point-to-point]
interface *type slot/port.subinterface-number* [**multipoint** |
point-to-point] (for the Cisco 7000 series)

To configure an interface or subinterface type and enter interface configuration mode, use the **interface** global configuration command.

<i>type</i>	Type of interface to be configured. See the Interface Type Keywords table of the <i>Router Products Command Reference</i> publication.
<i>number</i>	Port, connector, or interface card number. The numbers are assigned at the factory at the time of installation or when added to a system, and can be displayed with the show interfaces command.
<i>slot</i>	On the Cisco 7000 series, specifies the backplane slot number; can be 0, 1, 2, 3, or 4 on the Cisco 7000. On the Cisco 7010, can be 0, 1, or 2. The slots are numbered from left to right.

<i>port</i>	<p>On the Cisco 7000 series, specifies the port number of the interface. It can be 0, 1, 2, 3, 4, or 5 depending on the type of interface, as follows:</p> <p>AIP (ATM Interface Processor)—0 EIP (Ethernet Interface Processor)—0, 1, 2, 3, 4, or 5 FIP (FDDI Interface Processor)—0 FSIP (Fast Serial Interface Processor)—0, 1, 2, or 3 HIP (HSSI Interface Processor)—0 TRIP (Token Ring Interface Processor)—0, 1, 2, or 3</p> <p>Ports on each interface processor are numbered from the top down.</p>
<i>channel-group</i>	<p>On the Cisco 7000, specifies the T1 circuit number in the range of 0 to 23 defined with the channel-group controller configuration command.</p>
<i>.subinterface-number</i>	<p>Subinterface number in the range 1 to 4294967293. The <i>number</i> that precedes the period (.) must match the <i>number</i> this subinterface belongs to.</p>
multipoint point-to-point	<p>(Optional) Specifies a multipoint or point-to-point subinterface. The default is multipoint.</p>

[no] invert-transmit-clock

Delays between the SCTE clock and data transmission indicate that the transmit clock signal might not be appropriate for the interface rate and length of cable being used. Different ends of the wire may have variances that differ slightly. To invert the clock signal to compensate for these factors, use the **invert-transmit-clock** interface configuration command. This command applies to the Cisco 7000 series.

[no] isdn caller *number*

To configure ISDN caller ID screening, use the **isdn caller** interface configuration command. To disable this feature, use the **no** form of this command.

number Telephone number for which to screen. Specify an *x* to represent a single “don’t-care” character. The maximum length is 25 characters.

[no] isdn spid1 *spid-number* [*ldn*]

Use the **isdn spid1** interface configuration command to define at the router the SPID number that has been assigned by the ISDN service provider for the B1 channel. Use the **no isdn spid1** command to disable the specified SPID, thereby preventing access to the switch. If you include the LDN in the **no** form of this command, the access to the switch is permitted, but the other B channel might not be able to receive incoming calls.

spid-number Number identifying the service to which you have subscribed. This value is assigned by the ISDN service provider and is usually a ten-digit telephone number with some extra digits.

ldn (Optional) Local directory number. This is a seven-digit number also assigned by the service provider.

[no] isdn spid2 *spid-number* [*ldn*]

Use the **isdn spid2** interface configuration command to define at the router the SPID number that has been assigned by the ISDN service provider for the B2 channel. Use the **no isdn spid2** command to disable the specified SPID, thereby preventing access to the switch. If you

include the LDN in the **no** form of this command, the access to the switch is permitted, but the other B channel might not be able to receive incoming calls.

- spid-number* Number identifying the service to which you have subscribed. This value is assigned by the ISDN service provider and is usually a ten-digit telephone number with some extra digits.
- ldn* (Optional) Local directory number. This is a seven-digit number also assigned by the service provider.

isdn switch-type *switch-type*

To configure a central office switch on the ISDN interface, use the **isdn switch-type** global configuration command.

- switch-type* Central office switch type; see the ISDN Office Switch Types table of the *Router Products Command Reference* publication for a list of supported switches.

isdn tei [**first-call** | **powerup**] **no isdn tei**

To configure when ISDN terminal endpoint identifier (TEI) negotiation should occur, use the **isdn tei** global configuration command. Use the **no** form of this command to restore the default.

- first-call** (Optional) ISDN TEI negotiation should occur when the first ISDN call is placed or received.
- powerup** (Optional) ISDN TEI negotiation should occur when the router is powered on. The default is **powerup**.

[no] keepalive [*seconds*]

Use the **keepalive** interface configuration command to set the keepalive timer for a specific interface. The **no** form of this command turns off keepalives entirely.

seconds (Optional) Unsigned integer value greater than 0.
The default is 10 seconds.

lex burned-in-address *ieee-address*

no lex burned-in-address

To set the burned-in MAC address for a LEX interface, use the **lex burned-in-address** interface configuration command. To clear the burned-in MAC address, use the **no** form of this command.

ieee-address 48-bit IEEE MAC address written as a dotted triplet of four-digit hexadecimal numbers

lex input-address-list *access-list-number*

no lex input-address-list

To assign an access list that filters on MAC addresses, use the **lex input-address-list** interface configuration command. To remove an access list from the interface, use the **no** form of this command.

access-list-number Number of the access list you assigned with the **access-list** global configuration command. It can be a number from 700 to 799.

lex input-type-list *access-list-number*

no lex input-type-list

To assign an access list that filters Ethernet packets by type code, use the **lex input-type-list** interface configuration command. To remove an access list from the interface, use the **no** form of this command.

access-list-number Number of the access list you assigned with the **access-list** global configuration command. It can be a number in the range 200 to 299.

lex priority-group *group*
no lex priority-group

To activate priority output queuing on the LAN Extender, use the **lex priority-group** interface configuration command. To disable priority output queuing, use the **no** form of this command.

group Number of the priority group. It can be a number in the range 1 to 10.

lex retry-count *number*
no lex retry-count [*number*]

To define the number of times to resend commands to the LAN Extender, use the **lex retry-count** interface configuration command. To return to the default value, use the **no** form of this command.

number Number of times to retry sending commands to the LAN Extender. It can be a number in the range 0 to 100. The default is 10 times.

lex timeout *milliseconds*
no lex timeout [*milliseconds*]

To define the amount of time to wait for a response from the LAN Extender, use the **lex timeout** interface configuration command. To return to the default time, use the **no** form of this command.

milliseconds Time, in milliseconds, to wait for a response from the LAN Extender before resending the command. It can be a number in the range 500 to 60000. The default is 2000 milliseconds (2 seconds).

linecode {**ami** | **b8zs**}

Use the **linecode** command to select the line-code type for the T1 line.

ami Specifies AMI as the line-code type. This is the default.

b8zs Specifies B8ZS as the line-code type.

[no] loopback

To diagnose equipment malfunctions between interface and device, use the **loopback** interface configuration command. The **no** form of this command disables the test.

[no] loopback applique

To configure an internal loop on the HSSI applique, use the **loopback applique** interface configuration command. To remove the loop, use the **no** form of this command.

[no] loopback dte

To loop packets to DTE internally within the CSU/DSU at the DTE interface, when the device supports this feature, use the **loopback dte** interface configuration command. To remove the loop, use the **no** form of this command.

[no] loopback line

To loop packets completely through the CSU/DSU to configure the CSU loop, when the device supports this feature, use the **loopback line** interface configuration command. To remove the loop, use the **no** form of this command.

[no] loopback local

To loop packets at the router physical interface on a T1 line, use the **loopback local** controller configuration command. To remove the loop, use the **no** form of this command.

[no] loopback remote

To loop packets completely through the CSU/DSU, over the DS3 link, to the remote CSU/DSU and back, use the **loopback remote** controller configuration command. To remove the loop, use the **no** form of this command.

[no] media-type [au1 | 10baset]

To specify the Ethernet Network Interface Module configuration on the Cisco 4000 series, use the **media-type** interface configuration command.

- au1** (Optional) Selects a 15-pin physical connection.
- 10baset** (Optional) Selects an RJ45 10BaseT physical connection.

[no] mop enabled

To enable an interface to support the Maintenance Operation Protocol (MOP), use the **mop enabled** interface configuration command. To disable MOP on an interface, use the **no** form of this command.

[no] mop sysid

To enable an interface to send out periodic Maintenance Operation Protocol (MOP) system identification messages, use the **mop sysid** interface configuration command. To disable MOP message support on an interface, use the **no** form of this command.

mtu bytes

no mtu

To adjust the maximum packet size or maximum transmission unit (MTU) size, use the **mtu** interface configuration command. Use the **no** form of this command to restore the MTU value to its original default value.

- bytes* Desired size in bytes

[no] nrzi-encoding

To enable non-return to zero inverted (NRZI) line coding format, use the **nrzi-encoding** interface configuration command. Use the **no** form of this command to disable this capability.

ppp [default | client [@tacacs-server]] [/routing]

To make an asynchronous connection from the auxiliary port using the Point-to-Point Protocol (PPP), enter the **ppp** EXEC command.

default	(Optional) Makes PPP connection when a default address has been configured.
<i>client</i>	(Optional) IP address or the name of the client workstation or PC.
<i>@tacacs-server</i>	(Optional) IP address or IP host name of the TACACS server to which the user's TACACS authentication request is to be sent.
/routing	(Optional) Indicates asynchronous routing is enabled.

ppp authentication chap [if-needed]

no ppp authentication chap

To enable Challenge Handshake Authentication Protocol (CHAP) on a serial interface, use the **ppp authentication chap** interface configuration command. Use the **no ppp authentication chap** command to disable this encapsulation.

if-needed	(Optional) Indicates that the system will not perform CHAP authentication if the user has already been authenticated. This option applies only to asynchronous and virtual asynchronous interfaces.
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ppp authentication pap [if-needed]
no ppp authentication pap

To enable Password Authentication Protocol (PAP) on a serial interface, use the **ppp authenticate pap** interface configuration command. To disable this feature, use the **no** form of this command.

if-needed (Optional) Indicates that the system will not perform PAP authentication if the user has already been authenticated. This option applies only to asynchronous and virtual asynchronous interfaces.

ppp quality *percentage*
no ppp quality

To enable Link Quality Monitoring (LQM) on a serial interface, use the **ppp quality** interface configuration command. Use the **no** form of this command to disable LQM.

percentage Specifies the link quality threshold. Range is 1 to 100.

pri-group [timeslots *range*]
no pri-group

To specify ISDN Primary Rate Interface (PRI) on a channelized T1 card on the Cisco 7000 series, use the **pri-group** controller configuration command. Use the **no pri-group** command to remove the ISDN PRI.

timeslots (Optional) Specifies a single range of values
range from 1 to 23.

pulse-time *seconds*

no pulse-time

To enable pulsing DTR signal intervals on the serial interfaces, use the **pulse-time** interface configuration command. Use the **no** form of this command to restore the default interval.

seconds Integer that specifies the DTR signal interval in seconds. The default is 0 seconds.

ring-speed *speed*

To set the ring speed for the CSC-1R, CSC-2R, and IGS/TR Token Ring interfaces, use the **ring-speed** interface configuration command.

speed Integer that specifies the ring speed, either 4 for 4-Mbps or 16 for 16-Mbps operation. The default is 16-Mbps operation.

show async status

To list the status of the asynchronous interface 1 associated with the router auxiliary port, use the **show async status** user EXEC command.

show compress

To display compression statistics, use the **show compress** EXEC command.

show controllers bri *number*

To display information about the ISDN Basic Rate Interface (BRI), use the **show controllers bri** privileged EXEC command.

number Interface number. The value is 0 through 7 if the router has one BRI NIM or 0 through 15 if the router has two BRI NIMs.

show controllers cbus

Use the **show controllers cbus** privileged EXEC command on the AGS+ to display all information under the ciscoBus controller card. This command also shows the capabilities of the card and reports controller-related failures.

show controllers cxbus

Use the **show controllers cxbus** privileged EXEC command to display information about the switch processor (SP) CxBus controller on the Cisco 7000 series. 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 controllers ethernet *interface-number*

Use the **show controllers ethernet** EXEC command to display information on the Cisco 2500, Cisco 3000, or Cisco 4000.

interface-number Interface number of the Ethernet interface

show controllers fddi

Use the **show controllers fddi** user EXEC command to display all information under the FDDI controller card on the AGS+ or FDDI Interface Processor (FIP) on the Cisco 7000 series.

show controllers lex [*number*]

show controllers lex [*slot/port*](for the Cisco 7000 series)

To show hardware and software information about the LAN Extender, use the **show controllers lex** EXEC command.

<i>number</i>	(Optional) Number of the LEX interface about which to display information.
<i>slot</i>	(Optional) Specifies the backplane slot number on the Cisco 7000 series, and can be 0, 1, 2, 3, or 4.
<i>port</i>	(Optional) Specifies the port number of the controller and can be 0 or 1.

show controllers mci

Use the **show controllers mci** privileged EXEC command to display all information under the Multiprot Communications Interface card or the SCI. This command displays information the system uses for bridging and routing that is specific to the interface hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

show controllers serial

Use the **show controllers serial** privileged EXEC command to display information specific to the interface hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

show controllers t1 [*slot/port*]

Use the **show controllers t1** privileged EXEC command on the Cisco 7000 to display information about the T1 links supported by the Multichannel Interface Processor (MIP). This command displays

controller status information that is specific to the controller hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

slot (Optional) Specifies the backplane slot number and can be 0, 1, 2, 3, or 4.

port (Optional) Specifies the port number of the controller and can be 0, 1, 2, or 3.

show controllers token

Use the **show controllers token** privileged EXEC command to display information about memory management, error counters, and the CSC-R, CSC-1R, CSC-2R, C2CTR, and CSC-R16 (or CSC-R16M) Token Ring interface cards or Token Ring Interface Processor (TRIP), in the case of the Cisco 7000 series.

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

show interfaces [*type* [*slot/port*]] [**accounting**] (for the Cisco 7000)

Use the **show interfaces** EXEC command to display statistics for all interfaces configured on the router. The resulting output varies, depending on the network for which an interface has been configured.

type number (Optional) Specify that information for a particular interface controller be displayed. Allowed values for *type* include **async**, **bri0**, **ethernet**, **fdi**, **hssi**, **loopback**, **null**, **serial**, **tokenring**, and **tunnel**. For the Cisco 7000 series, *type* can be **atm**, **ethernet**, **fdi**, **serial**, or **tokenring**.

The argument *number* must match a port number on the selected interface controller.

first last (Optional) The Cisco 2500 and Cisco 3000 support the ISDN Basic Rate Interface (BRI). The argument *first* can be either 1 or 2. The argument *last* can only be 2, indicating B channels 1 and 2. D-channel information is obtained by using the command without the optional arguments.

accounting	(Optional) Displays the number of packets of each protocol type that has been sent through the interface. You can show these numbers for all interfaces, or you can specify a specific <i>type</i> and <i>number</i> .
<i>slot</i>	Specifies the backplane slot number and can be 0, 1, 2, 3, or 4.
<i>port</i>	Specifies the port number of the interface and can be 0, 1, 2, 3, 4, or 5 depending on the type of interface, as follows: AIP (ATM Interface Processor)—0 EIP (Ethernet Interface Processor)—0, 1, 2, 3, 4, or 5 FIP (FDDI Interface Processor)—0 FSIP (Fast Serial Interface Processor)—0, 1, 2, or 3 HIP (HSSI Interface Processor) 0 TRIP (Token Ring Interface Processor)—0, 1, 2, or 3

show interfaces async [*number*] [**accounting**]

Use the **show interfaces async** privileged EXEC command to display information about the serial interface.

<i>number</i>	(Optional) Must be 1.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.

show interfaces atm [*slot/port*]

Use the **show interfaces atm** EXEC command to display information about the ATM interface.

<i>slot/port</i>	(Optional) In the Cisco 7000, <i>slot</i> can be 0, 1, 2, 3, or 4. In the Cisco 7010, <i>slot</i> can be 0, 1, or 2. Port must be 0.
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show interfaces bri *number* [*first*] [*last*] [**accounting**]

Use the **show interfaces bri** privileged EXEC command to display information about the BRI D and B channels.

- | | |
|-------------------|---|
| <i>number</i> | Interface number. The value is 0 through 7 if the router has one BRI NIM or 0 through 15 if the router has two BRI NIMs. Specifying just the <i>interface-number</i> will display the D channel and both B channels for that BRI interface. (On the Cisco 2500 or Cisco 3000, only the D channel would be displayed.) |
| <i>first last</i> | (Optional) The argument <i>first</i> can be either 1 or 2. The argument <i>last</i> can only be 2, indicating B channels 1 and 2. D-channel information is obtained by using the command without the optional arguments. |
| accounting | (Optional) Displays the number of packets of each protocol type that have been sent through the interface. |

show interfaces ethernet *number* [**accounting**]

show interfaces ethernet [*slot/port*] [**accounting**] (for the Cisco 7000 series)

Use the **show interfaces ethernet** privileged EXEC command to display information about an Ethernet interface on the router.

- | | |
|-------------------|--|
| <i>number</i> | Must match a port number on the selected interface. |
| accounting | (Optional) Displays the number of packets of each protocol type that have been sent through the interface. |
| <i>slot</i> | (Optional) On a Cisco 7000 series, slot location of the interface processor. |
| <i>port</i> | (Optional) On a Cisco 7000 series, port number on the interface. |

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

show interfaces fddi [*slot/port*] [**accounting**] (for the Cisco 7000 series)

Use the **show interfaces fddi** user EXEC command to display information about the FDDI interface.

<i>number</i>	Must match a port number on the selected interface.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
<i>slot</i>	(Optional) On a Cisco 7000 series, slot location of the interface processor.
<i>port</i>	(Optional) On a Cisco 7000 series, port number on the interface.

show interfaces hssi *number* [**accounting**]

show interfaces hssi [*slot/port*] [**accounting**] (for the Cisco 7000 series)

Use the **show interfaces hssi** privileged EXEC command to display information about the HSSI interface.

<i>number</i>	Must match a port number on the selected interface.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
<i>slot</i>	(Optional) On a Cisco 7000 series, slot location of the interface processor.
<i>port</i>	(Optional) On a Cisco 7000 series, port number on the interface.

show interfaces lex *number* [ethernet | serial]

To display statistics about a LEX interface, use the **show interface lex EXEC** command.

- number* Number of the LEX interface that resides on the core router about which to display statistics.
- ethernet** (Optional) Displays statistics about the Ethernet interface that resides on the LAN Extender.
- serial** (Optional) Displays statistics about the serial interface that resides on the LAN Extender.

show interfaces loopback [*number*] [accounting]

Use the **show interfaces loopback** privileged EXEC command to display information about the dialer interface.

- number* (Optional) Must match a port number on the selected interface.
- accounting** (Optional) Displays the number of packets of each protocol type that have been sent through the interface.

show interfaces serial [*number*] [accounting]

show interfaces serial [*slot/port*] [accounting] (for the Cisco 7000 series)

Use the **show interfaces serial** privileged EXEC command to display information about a serial interface.

- number* (Optional) Must match an interface port number.
- accounting** (Optional) Displays the number of packets of each protocol type that have been sent through the interface.
- slot* (Optional) On a Cisco 7000 series, slot location of the interface processor.
- port* (Optional) On a Cisco 7000 series, port number on interface.

show interfaces tokenring [*number*] [**accounting**]
show interfaces tokenring [*slot/port*] [**accounting**] (for the Cisco 7000 series)

Use the **show interfaces tokenring** privileged EXEC command to display information about the Token Ring interface and the state of source route bridging.

<i>number</i>	(Optional) Must match an interface port line number.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
<i>slot</i>	On a Cisco 7000 series, optional slot location of the interface processor. Value can be 0, 1, 2, 3, or 4 in the Cisco 7000. In the Cisco 7010, value can be 0, 1, or 2.
<i>port</i>	On a Cisco 7000 series, optional port number on interface. Value can be 0, 1, 2, or 3.

show interfaces tunnel *number* [**accounting**]

To list tunnel interface information, use the **show interfaces tunnel** privileged EXEC command.

<i>number</i>	Must match the interface port line number.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.

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

To list a summary of an interface's IP information and status, use the **show ip interface** privileged EXEC command.

brief	(Optional) Displays a brief summary of IP status and configuration.
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type (Optional) Specifies that information be displayed about that interface type only. The possible value depends on the type of interfaces the system has. For example, it could be **ethernet**, **null**, **serial**, **tokenring**, etc.

number (Optional) Interface number.

show rif

Use the **show rif** EXEC command to display the current contents of the RIF cache.

[no] shutdown

To disable an interface, use the **shutdown** interface configuration command. To restart a disabled interface, use the **no** form of this command.

slip [default | client [*@tacacs-server*]] [/routing] [/compressed]

To make a SLIP connection on the auxiliary port, use the **slip** user EXEC command.

default (Optional) Makes a SLIP connection when a default address has been configured.

client (Optional) IP address or the name of the client workstation or PC.

@tacacs-server (Optional) IP address or IP hostname of the TACACS server to which the user's TACACS authentication request is sent.

/routing (Optional) Indicates routing is enabled. Asynchronous interface 1 must be configured for **async dynamic routing**.

/compressed (Optional) Indicates IP header compression should be used on the link.

smt-queue-threshold *number*

no smt-queue-threshold

To set the maximum number of unprocessed FDDI station management (SMT) frames that will be held for processing, use the **smt-queue-threshold** global configuration command. Use the **no** form of this command to restore the queue to the default.

<i>number</i>	Number of buffers used to store unprocessed SMT messages that are to be queued for processing. Acceptable values are positive integers. The default threshold value is equal to the number of FDDI interfaces installed in the router.
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[no] squelch { **normal** | **reduced** }

To extend the Ethernet twisted-pair 10BaseT capability beyond the standard 100 meters on the Cisco 4000 platform, use the **squelch** interface configuration command. To restore the default, use the **no** form of the command.

normal	Allows normal capability. The default value is normal range.
reduced	Allows extended 10BaseT capability.

timeslot *start-slot* – *stop-slot*

no timeslot

To enable framed mode on a G.703-E1 interface, use the **timeslot** interface configuration command. To restore the default, use the **no** form of the command or set the start-slot to 0.

<i>start-slot</i>	The first subframe in the major frame. Range is 1 to 31 and must be less than or equal to <i>stop-slot</i> .
<i>stop-slot</i>	The last subframe in the major frame. Range is 1 to 31 and must be greater than or equal to <i>start-slot</i> .

[no] transmit-clock-internal

When a DTE does not return a transmit clock, use the **transmit-clock-internal** interface command to enable the internally generated clock on a serial interface on a Cisco 7000. Use the **no** form of this command to disable the feature.

transmitter-delay {*microseconds* | *hdlc-flags*}

no transmitter-delay

To specify a minimum dead-time after transmitting a packet, use the **transmitter-delay** interface configuration command. The **no** form of this command restores the default.

microseconds Approximate number of microseconds of minimum delay after transmitting a packet on the MCI and SCI interface cards. The default is 0 microseconds.

hdlc-flags Minimum number of HDLC flags to be sent between each packet on the HIP, HSCI, FSIP, or HSSI. The valid range on the HSSI is 2 to 128000.

[no] ts16

To control the use of time slot 16 for data on a G.703-E1 interface, use the **ts16** interface configuration command. To restore the default, use the **no** form of the command.

[no] tunnel checksum

To enable encapsulator-to-decapsulator checksumming of packets on a tunnel interface, use the **tunnel checksum** interface configuration command. To disable checksumming, use the **no** form of the command.

tunnel destination {*hostname* | *ip-address*}

no tunnel destination

To specify a tunnel interface's destination, use the **tunnel destination** interface configuration command. To remove the destination, use the **no** form of this command.

<i>hostname</i>	Name of the host destination
<i>ip-address</i>	IP address of the host destination expressed in decimal in four-part, dotted notation

tunnel key *key-number*

no tunnel key

To enable an ID key for a tunnel interface, use the **tunnel key** interface configuration command. To remove the ID key, use the **no** form of this command.

<i>key-number</i>	Integer from 0 to 4294967295
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tunnel mode {**aurp** | **cayman** | **dvmrp** | **eon** | **gre ip** | **nos**}

no tunnel mode

To set the encapsulation mode for the tunnel interface, use the **tunnel mode** interface configuration command. To set to the default, use the **no** form of this command.

aurp	AppleTalk Update Routing Protocol (AURP)
cayman	Cayman TunnelTalk AppleTalk encapsulation
dvmrp	Distance Vector Multicast Routing Protocol
eon	EON compatible CLNS tunnel
gre ip	Generic route encapsulation (GRE) protocol over IP
nos	KA9Q/NOS compatible IP over IP

[no] tunnel sequence-datagrams

To configure a tunnel interface to drop datagrams that arrive out of order, use the **tunnel sequence-datagrams** interface configuration command. To disable this function, use the **no** form of this command.

tunnel source { *ip-address* | *interface-type interface-number* }

no tunnel source

To set a tunnel interface's source address, use the **tunnel source** interface configuration command. To remove the source address, use the **no** form of this command.

<i>ip-address</i>	IP address to use as the source address for packets in the tunnel.
<i>interface-type</i>	All types.
<i>interface-number</i>	Specifies the port, connector, or interface card number. The numbers are assigned at the factory at the time of installation or when added to a system, and can be displayed with the show interfaces command.

tx-queue-limit *number*

To control the number of transmit buffers available to a specified interface on the MCI and SCI cards, use the **tx-queue-limit** interface configuration command.

<i>number</i>	Maximum number of transmit buffers that the specified interface can subscribe. Defaults and specified limits are displayed with the show controllers mci EXEC command.
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