



T Commands

The commands shown in this chapter apply to the Catalyst 8540 MSR, Catalyst 8510 MSR, and LightStream 1010 ATM switch routers. Where an entire command or certain attributes of a command have values specific to a particular switch or switch router, an exception is indicated by the following callouts:

- Catalyst 8540 MSR
- Catalyst 8510 MSR and LightStream 1010



Note

Commands that are identical to those documented in the Cisco IOS software documentation have been removed from this chapter.



Note

Commands that no longer function as expected in ATM environments have also been removed from this chapter.

Refer to Appendix D of this command reference for a detailed list of commands that have been removed, changed or replaced.

tag-switching atm allocation-mode

To control the mode used for handling tag binding requests on TC ATM interfaces, use the **tag-switching atm allocation-mode** global configuration command. To set the allocation mode to its default, use the **no** form of this command.

tag-switching atm allocation-mode { **optimistic** | **conservative** }

no tag-switching atm allocation-mode { **optimistic** | **conservative** }

Syntax Description	optimistic	conservative
	Tag binding is returned immediately and packets are discarded until the downstream setup is complete.	Waits until the tag VC is set up downstream before returning a tag binding.

Defaults conservative

Command Modes Global configuration

Command History	Release	Modification
	11.3(3a)	New command

Examples The following example sets the mode for handling binding requests to **optimistic** on TC ATM interfaces.

```
Switch# configure terminal
Switch(config)# tag-switching atm allocation-mode optimistic
```

tag-switching atm control-vc

To configure the VPI/VCI to be used for the initial link to the tag switching peer, use the **tag-switching atm control-vc** interface configuration command. This control VC is used to establish the TDP session and carry non-IP traffic. To set the control VPI/VCI to the default, use the **no** form of this command.

tag-switching atm control-vc *vpi vci*

no tag-switching atm control-vc *vpi vci*

Syntax Description

<i>vpi</i>	Virtual path identifier, in the range of 0 to 255.
<i>vci</i>	Virtual channel identifier, in the range of 1 to 65535.

Defaults

0/32

Command Modes

Interface configuration

Command History

Release	Modification
11.3(3a)	New command

Usage Guidelines

On a VP tunnel, the default VPI is the tunnel number and the default VCI is 32.

Examples

The following example shows how to select VPI 1 and VCI 34 as the control VC.

```
Switch# configure terminal
Switch(config)# interface atm 3/0/1
Switch(config-if)# tag-switching ip
Switch(config-if)# tag-switching atm control-vc 1 34
```

Related Commands

Command	Description
tag-switching ip (interface)	Enables tag switching of IPv4 packets on an interface.

tag-switching atm vc-merge

To control whether VC-merge (multipoint-to-point VCs) is supported for unicast tag VCs, use the **tag-switching atm vc-merge** global configuration command. To disable this feature, use the **no** form of this command.

tag-switching atm vc-merge

no tag-switching atm vc-merge

Syntax Description This command has no keywords or arguments.

Defaults Enabled

Command Modes Global configuration

Command History	Release	Modification
	11.3(3a)	New command

Usage Guidelines This feature is enabled by default.

Examples Because this feature is enabled by default, it is not necessary to issue the **tag-switching atm vc-merge** command. However, to disable VC merge, you must enter the **no** form of the command.

```
Switch# configure terminal
Switch(config)# no tag-switching atm vc-merge
```

Related Commands	Command	Description
	show tag-switching atm-tdp bindings	Displays the requested entries from the ATM TDP tag binding database.
	show tag-switching atm-tdp capability	Displays the ATM TDP tag capabilities for all interfaces.

tag-switching atm vpi

To configure the range of values to use in the VPI field for tag VCs, use the **tag-switching atm vpi** interface configuration command. To clear the interface configuration, use the **no** form of this command.

tag-switching atm vpi *vpi* [- *vpi*]

no tag-switching atm vpi

Syntax Description	<i>vpi</i>	Low end of the VPI range (0 to 255).
	- <i>vpi</i>	High end of the VPI range (2 to 255).
Defaults	1 - 1	
Command Modes	Interface configuration	
Command History	Release	Modification
	11.3(3a)	New command
Usage Guidelines	<p>The value will be negotiated with its peer.</p> <p>You cannot enter a VPI range on a VP tunnel; the VPI is the PVP number of the tunnel.</p> <p>If the TDP neighbor is a router, the VPI range cannot be larger than 2; for example, from 5 to 6 (a range of 2), not 5 to 7 (a range of 3).</p>	
Examples	<p>The following example shows you how to select a VPI range from 5 to 6.</p> <pre>Switch# configure terminal Switch(config)# interface atm 3/0/1 Switch(config-if)# tag-switching ip Switch(config-if)# tag-switching atm vpi 5 - 6</pre>	

tag-switching ip (global)

To allow tag switching of IPv4 packets, use the **tag-switching ip** global configuration command. To disable IP tag switching across all interfaces, use the **no** form of this command.

tag-switching ip

no tag-switching ip

Syntax Description This command has no keywords or arguments.

Defaults Enabled

Command Modes Global configuration

Command History	Release	Modification
	11.3(3a)	New command

Usage Guidelines Dynamic tag switching (that is, the distribution of tags based on routing protocols) is allowed by this optional command, but is not actually enabled until the interface-level **tag-switching ip** command is issued on at least one interface.

The **no** form of this command stops the distribution of dynamic tags and the sending of outgoing tagged packets on all interfaces. The sending of tagged packets on TSP tunnels is not affected by this command.

For TC ATM, the **no** form of this command prevents tag VCs beginning at, terminating at, or passing through the platform.

Examples The following example shows how to enable the distribution of dynamic tags on all interfaces.

```
Switch# configure terminal
Switch(config)# tag-switching ip
```

Related Commands	Command	Description
	tag-switching ip (interface)	Enables tag switching of IPv4 packets on an interface.

tag-switching ip (interface)

To enable tag switching of IPv4 packets on an interface, use the **tag-switching ip** interface configuration command. To disable IP tag switching on an interface, use the **no** form of this command.

tag-switching ip

no tag-switching ip

Syntax Description This command has no keywords or arguments.

Defaults Disabled

Command Modes Interface configuration

Command History	Release	Modification
	11.3(3a)	New command

Usage Guidelines The first time this command is issued on any interface, dynamic tag switching is enabled on the entire switch router. TDP Hellos are issued on this interface. When an outgoing tag for a destination routed out through this interface is received, packets sent to that destination are tagged as outgoing.

The **no** form of this command causes packets routed out through this interface to be sent as untagged, and outgoing TDP Hellos are no longer sent.

When the **no** form is issued on the only interface for which tag switching is enabled, dynamic tag switching is disabled on the entire switch router.

For TC ATM, the **no** form of this command prevents tag VCs beginning at, terminating at, or passing through the interface.

Examples In the following example, tag switching is enabled on ATM interface 1/1/0.

```
Switch# configure terminal
Switch(config)# interface atm 1/1/0
Switch(config-if)# tag-switching ip
```

Related Commands	Command	Description
	tag-switching atm allocation-mode	Controls the mode used for handling tag binding requests on TC ATM interfaces.
	tag-switching ip (global)	Enables tag switching of IPv4 packets.

tag-switching tdp discovery

To configure the interval between transmission of TDP discovery Hello messages and the hold time for a TDP transport connection, use the **tag-switching tdp discovery** global configuration command. To set the interval and hold time to their defaults, use the **no** form of this command.

```
tag-switching tdp discovery {hello | directed-hello} {holdtime | interval} seconds
```

```
tag-switching tdp discovery {hello | directed-hello} {holdtime | interval}
```

Syntax Description

hello	Intervals and hold times for directly connected neighbors.
directed-hello	Intervals and hold times for neighbors that are not directly connected; for example, TDP sessions that run over a TSP tunnel.
holdtime	Interval for which a connection stays up if no Hello messages are received. The default is 15 seconds.
interval	Period between sending Hello messages. The default is 5 seconds.
<i>seconds</i>	Hold time or interval, in the range of 1 to 2147483647.

Defaults

See "Syntax Description."

Command Modes

Global configuration

Command History

Release	Modification
11.3(3a)	New command

Examples

In the following example, the interval for which a connection stays up if no Hello packets are received is set to 5 seconds.

```
Switch# configure terminal
Switch(config)# tag-switching tdp discovery hello holdtime 5
```

Related Commands

Command	Description
show tag-switching interfaces	Displays information about interfaces that have tag switching enabled.
show tag-switching atm-tdp summary	Displays summary information on ATM tag bindings.
show tag-switching tdp parameters	Displays available TDP parameters.

tag-switching tdp holdtime

To configure the hold time for a TDP session, use the **tag-switching tdp holdtime** global configuration command. To set the hold time to the default, use the **no** form of this command.

tag-switching tdp holdtime *seconds*

Syntax Description	<i>seconds</i>	The time, in seconds, that a TDP session is maintained in the absence of TDP messages from the session peer (1 to 2147483647).				
Defaults	15 seconds					
Command Modes	Global configuration					
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>11.3(3a)</td> <td>New command</td> </tr> </tbody> </table>	Release	Modification	11.3(3a)	New command	
Release	Modification					
11.3(3a)	New command					
Usage Guidelines	<p>When a TDP session is initiated, the hold time is negotiated to the lower of the values configured at the two ends.</p> <p>This command configures the hold time determined by this tag switch.</p>					
Examples	<p>The following example configures the hold time of TDP sessions to 30 seconds.</p> <pre>Switch# configure terminal Switch(config)# tag-switching tdp holdtime 30</pre>					
Related Commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>show tag-switching tdp parameters</td> <td>Displays available TDP parameters.</td> </tr> </tbody> </table>	Command	Description	show tag-switching tdp parameters	Displays available TDP parameters.	
Command	Description					
show tag-switching tdp parameters	Displays available TDP parameters.					

tag-switching tsp-tunnels

To enable support for TSP tunnel negotiation, use the **tag-switching tsp-tunnels** global configuration command or interface configuration command. To disable support for TSP tunnel negotiation, use the **no** form of this command.

tag-switching tsp-tunnels

no tag-switching tsp-tunnels

Syntax Description This command has no keywords or arguments.

Defaults Disabled

Command Modes Global configuration
Interface configuration

Command History	Release	Modification
	11.3(3a)	New command

Usage Guidelines Enabling TSP tunnel negotiation using the **tag-switching tsp-tunnels** command in the interface configuration mode has no effect unless the command is also issued in the global configuration mode.

Examples The following example shows how to enable TSP tunnel negotiation globally, then enable it at the interface.

```
Switch# configure terminal
Switch(config)# tag-switching tsp-tunnels
Switch(config)# interface atm 1/1/1
Switch(config-if)# tag-switching tsp-tunnels
```

Related Commands	Command	Description
	show tag-switching tsp-tunnels	Displays TSP tunnel status and configuration.

tftp-server

To specify that the switch or Flash device operates as a TFTP server, use the **tftp-server** global configuration commands. To remove a previously defined filename, use the **no** form of this command with the appropriate filename.

tftp-server *device:filename* [**alias name**] [*ip-access-list*]

no tftp-server *device:filename* [**alias name**] [*ip-access-list*]

Syntax Description	<p>device: Specifies TFTP service of a file on a memory device. The colon (:) is required. Valid devices include the following:</p> <ul style="list-style-type: none"> • bootflash: This device is the internal Flash memory. • slot0: This device is the first PC slot on the route processor card. • slot1: This device is the second PC slot on the route processor card. • nvr: This device is nonvolatile random-access memory.
	<p>filename Name of a file that the TFTP server uses in answering TFTP Read Requests.</p>
	<p>alias Specifies an alternate name for the file that the TFTP server uses in answering TFTP Read Requests.</p>
	<p>ip-access-list IP access list of requesting hosts.</p>

Defaults Disabled

Command Modes Global configuration

Command History	Release	Modification
	11.1(4)	New command

Usage Guidelines You can specify multiple filenames by repeating the **tftp-server** command. The system sends a copy of the system image contained in memory to any client that issues a TFTP Read Request with this filename.

If the specified *filename* exists in memory, a copy of the image is sent.

Images that run from ROM cannot be loaded over the network. Therefore, you should not use TFTP to offer the ROMs on these images.

The system sends a copy of the file to any client that issues a TFTP Read Request with its filename.

Examples

In the following example, the system uses TFTP to send a copy of the *version-11.1* file located in Flash memory in response to a TFTP Read Request for that file. The requesting host is checked against access list 22.

```
Switch# configure terminal
Switch(config)# tftp-server flash version-11.1 22
```

In the following example, the system uses TFTP to send a copy of the *version-11.1.4* file in response to a TFTP Read Request for that file. The file is located on the Flash memory card inserted in slot 0 of the route processor card.

```
Switch# configure terminal
Switch(config)# tftp-server flash slot0:version-11.1.4
```

Related Commands

Command	Description
access-list (extended)	Defines an extended IP access list. Currently, this command only supports the IP host.

timer

To configure the PNNI timers, use the **timer** PNNI node configuration command. To return to the default values, use the **no** form of this command.

```
timer [ack delay tenths-of-seconds] [called-integrity seconds] [calling-integrity seconds]
[hello-holddown tenths-of-seconds] [hello-interval seconds] [hrz-link-inactivity seconds]
[inactivity-factor number] [retransmit-interval seconds]
```

```
no timer [ack delay] [called-integrity] [calling-integrity] [hello-holddown] [hello-interval]
[hrz-link-inactivity] [inactivity-factor] [retransmit-interval]
```

Syntax Description	
ack-delay	Specifies the waiting period before sending an accumulated PTSE acknowledgment packet. The default is 1 second.
called-integrity	Specifies the value used to initialize the SVC integrity timer at the node that accepts an LGN-to-LGN SVC RCC originated by a neighbor node. The default is 50 seconds.
calling-integrity	Specifies the value used to initialize the SVC integrity timer at the node that initiates an LGN-to-LGN SVC RCC. The SVC integrity timer determines how long this node waits for an SVC-based RCC to reach the two-way inside state before releasing it. The default is 35 seconds.
hello-holddown	Specifies the hold-down period for event-triggered Hellos. This is mainly used for Hello packets between outside neighbors. The default is 1 second.
hello-interval	Specifies the frequency, in seconds, at which Hello packets are transmitted. The default is 15 seconds.
hrz-link-inactivity	Specifies the length of time that this node continues to advertise a horizontal link for which it has not received and processed an LGN horizontal link extension information group piggybacked onto an SVC-RCC Hello packet. The default is 120 seconds.
inactivity-factor	Specifies the dead-interval time (the period after which a neighbor is declared down if no Hello is received) as a factor of the Hello interval. The default is 5 seconds.
retransmit-interval	Specifies the waiting period before retransmitting a PTSE, PTSE request, or database summary packet. The default is 5 seconds.

Defaults See "Syntax Description."

Command Modes PNNI node configuration

Command History	Release	Modification
	11.1(4)	New command

Usage Guidelines

Decreasing the **hello-interval** allows PNNI to detect neighbor nodes that have stopped functioning more quickly. The **inactivity-factor** is used as a multiplier of the **hello interval** in received Hello packets to determine the dead interval, the time after which the neighbor node is declared down if no Hello packets are received. The **inactivity-factor** can be increased on unreliable interfaces to avoid false alarms.

Decreasing the **retransmit-interval** causes retransmission to increase when a PNNI packet gets lost. However, this increases the risk of unnecessarily retransmitting PNNI packets that are delayed but actually reach the neighbor. Increasing **ack-delay** causes more PTSEs to be acknowledged in one **ack** packet. Lowering **hello-holddown** allows another Hello packet to be sent shortly after one was sent. To avoid an overload in switch processing, you should adjust these parameters carefully.

For more information, refer to the *ATM Switch Router Software Configuration Guide*.

Examples

The following script shows how to change the **hello-interval to 5 seconds**.

```
Switch# configure terminal
Switch(config)# atm router pnni
Switch(config-atm-router)# node 1
Switch(config-pnni-node)# timer hello-interval 5
```

Related Commands

Command	Description
show atm pnni local-node	Displays information about a PNNI logical node running on the switch.

traceroute (user)

To trace the IP routes the packets actually take when traveling from the switch to their destination, use the **traceroute** EXEC command.

traceroute [*protocol*] [*destination*]

Syntax Description

<i>protocol</i>	Protocol that can be used is ip .
<i>destination</i>	Destination address or host name on the command line. The default parameters for the appropriate protocol are assumed, and the tracing action begins.

Defaults

The *protocol* argument is based on the switch router's examination of the format of the *destination* argument. For example, if the switch router finds a destination in IP format, the protocol defaults to **ip**.

Command Modes

EXEC

Command History

Release	Modification
12.0(10)W5(18)	Re-introduced into this manual. (Was previously in the LightStream 1010 Command Reference only.)

Usage Guidelines

The **traceroute** command works by taking advantage of the error messages generated by switch routers when a datagram exceeds its TTL value.

The **traceroute** command starts by sending probe datagrams with a TTL value of 1. This causes the first switch router to discard the probe datagram and send back an error message. The **traceroute** command sends several probes at each TTL level and displays the round-trip time for each.

The **traceroute** command sends out one probe at a time. Each outgoing packet may result in one or two error messages. A "time exceeded" error message indicates that an intermediate switch router detected and discarded the probe. A "destination unreachable" error message indicates that the destination node received and discarded the probe because it could not deliver the packet. If the timer goes off before a response comes in, **traceroute** prints an asterisk(*).

The **traceroute** command terminates when the destination responds, when the maximum TTL is exceeded, or when the user interrupts the trace with the escape sequence. By default, to invoke the escape sequence, enter **^X**.

Common Trace Problems

Due to bugs in the IP implementation of various hosts and switches, the **IP trace** command may behave in unexpected ways.

Not all destinations respond correctly to a probe message by sending back an "ICMP port unreachable" message. A long sequence of TTL levels with only asterisks, terminating only when the maximum TTL is reached, may indicate this problem.

There is a known problem with the way some hosts handle an “ICMP TTL exceeded” message. Some hosts generate in ICMP message, but they reuse the TTL of the incoming packet. Since this is zero, the ICMP packets do not make it back. When you trace the path to such a host, you may see a set of TTL values with asterisks (*). Eventually, the TTL gets high enough that the “ICMP” message can get back. For example, if the host is 6 hops away, **traceroute** times out in responses 6 through 11.

Examples

The following example displays sample IP **traceroute** output when a destination host name is specified:

```
Switch# traceroute ip ABA.NYC.mil

Type escape sequence to abort.
Tracing the route to ABA.NYC.mil (26.0.0.73)
 0  DEBRIS.CISCO.COM (131.108.1.6) 1000 msec 8 msec 4 msec
 1  BARNET-GW.CISCO.COM (131.108.16.2) 8 msec 8 msec 8 msec
 2  EXTERNAL-A-GATEWAY.STANFORD.EDU (192.42.110.225) 8 msec 4 msec 4 msec
 3  BB2.SU.BARNET.NET (131.119.254.6) 8 msec 8 msec 8 msec
 4  SU.ARC.BARNET.NET (131.119.3.8) 12 msec 12 msec 8 msec
 5  MOFFETT-FLD-MB.in.MIL (192.52.195.1) 216 msec 120 msec 132 msec
 6  ABA.NYC.mil (26.0.0.73) 412 msec 628 msec 664 msec
```

Table 19-1 describes the fields shown in the display.

Table 19-1 Trace Field Descriptions

Field	Description
1	Indicates the sequence number of the switch router in the path to the host.
DEBRIS.CISCO.COM	Host name of this switch router.
131.108.1.61	IP address of this switch router.
1000 msec 8 msec 4 msec	Round-trip time for each of the three probes that are sent.

Table 19-2 describes the characters that can appear in **traceroute** output.

Table 19-2 IP Trace Text Characters

Character	Description
nn msec	For each node, the round-trip time in milliseconds for the specified number of probes.
*	The probe timed out.
?	Unknown packet type.
Q	Source quench.
P	Protocol unreachable.
N	Network unreachable.
U	Port unreachable.
H	Host unreachable.

Related Commands	Command	Description
	traceroute (privileged)	See Appendix D.

transit-restricted

To indicate to the network that this node does not allow calls to transit through, use the **transit-restricted** PNNI node configuration command. To allow calls to transit through the node, use the **no** form of this command.

transit-restricted

no transit-restricted

Syntax Description This command has no keywords or arguments.

Defaults Enabled

Command Modes PNNI node configuration

Command History	Release	Modification
	11.1(4)	New command

Usage Guidelines This command enables the network administrator to prevent connections from transiting nodes that only originate or terminate connections, for example, low-end edge switches that do not have the capacity to support transit calls.

For more information, refer to the *ATM Switch Router Software Configuration Guide*.

Examples The following script shows how to access the **transit-restricted** PNNI node configuration command.

```
Switch# configure terminal
Switch(config)# atm router pnni
Switch(config-atm-router)# node 1
Switch(config-pnni-node)# transit-restricted
```

Related Commands	Command	Description
	show atm pnni local-node	Displays information about a PNNI logical node running on the switch.

t1 framing

To configure T1 framing mode, use the **t1 framing** controller configuration command.

```
t1 line-number framing {esf | sf}
```

Syntax Description	<i>line-number</i>	Specifies a T1 line, from 1 to 28.
	esf	Specifies that extended super frame is used as the T1 framing type.
	sf	Specifies that super frame is used as the T1 framing type.

Defaults **esf**

Command Modes Controller configuration

Command History	Release	Modification
	12.0(3c)W5(9)	New command

Usage Guidelines Use the **t1 framing** controller configuration command to specify the framing mode used by the t1 line.

Examples The following example sets the framing mode on the t1 interface on line 1 to **esf** and on line 2 to **sf**.

```
Switch# configure terminal
Switch(config)# controller t3 3/1/0
Switch(config-controller)# t1 1 framing esf
Switch(config-controller)# t1 2 framing sf
```

t1 yellow

To configure T1 autoalarm detection and generation, use the **t1 yellow** controller configuration command. To disable autoalarm detection and generation, use the **no** form of this command.

t1 *line-number* **yellow** {**generation** | **detection**}

Syntax Description		
	<i>line-number</i>	Specifies a T1 line, from 1 to 28.
	generation	Generates yellow alarms.
	detection	Detects yellow alarms.

Defaults Yellow alarms are detected and generated on the T1 channel.

Command Modes Controller configuration

Command History	Release	Modification
	12.0(3c)W5(9)	New command

Usage Guidelines A yellow alarm indicates a loss of frame alignment at the remote end. Use the **t1 yellow** command to turn the generation or detection of yellow alarms on or off.



Note

If you use the **t1 framing** command to select the **sf** framing mode, you should consider turning off alarm detection because the yellow alarms might be detected incorrectly with **sf** framing enabled.

Examples The following example enables autoalarm detection.

```
Switch# configure terminal
Switch# (config)# controller t3 1/1/0
Switch# (config-controller)# t1 1 yellow detection
```

Related Commands	Command	Description
	show controllers	Displays information about a physical port device.