A 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.

access-list (extended)

Currently, this command only supports the IP host. To define an extended IP access list, use the extended version of the **access-list** global configuration command. To remove the access lists, use the **no** form of this command.

> **access-list** *access-list-number* [**dynamic** *list-name* [**timeout** *value*]] {**deny** | **permit**} *protocol source source-wildcard destination destination-wildcard* [**precedence** *precedence*] [**tos** *tos*] [**log**| **log-input**]

> **no access-list** *access-list-number*

For ICMP, you can also use the following syntax:

> **access-list** *access-list-number* [**dynamic** *list-name* [**timeout** *value*]] {**deny** | **permit**} **icmp** *source source-wildcard destination destination-wildcard* [*icmp-type* [*icmp-code*] | *icmp-message*] [**precedence** *precedence*] [**tos** *tos*] [**log** | **log-input**]

For TCP, you can also use the following syntax:

> **access-list** *access-list-number* [**dynamic** *list-name* [**timeout** *value*]] {**deny** | **permit**} **tcp** *source source-wildcard* [*operator port* [*port*]] *destination destination-wildcard* [*operator port* [*port*]] [**established**] [**precedence** *precedence*] [**tos** *tos*] [**log** | **log-input**]

For UDP, you can also use the following syntax:

> **access-list** *access-list-number* [**dynamic** *list-name* [**timeout** *value*]] {**deny** | **permit**} **udp** *source source-wildcard* [*operator port* [*port*]] *destination destination-wildcard* [*operator port* [*port*]] [**precedence** *precedence*] [**tos** *tos*] [**log** | **log-input**]

Syntax Description		
access-list-number	Number of an access list. This is a decimal number from 100 through 199.	
list-name	Name of a dynamic access list.	
deny	Denies access if the conditions are matched.	
permit	Permits access if the conditions are matched.	
protocol	Name or number of an Internet protocol. It can be one of the keywords eigrp, gre, icmp, igmp, igrp ip, ipinip, nos, ospf, tcp, udp, or an integer in the range 0 through 255 representing an IP protocol number. To match any Internet protocol, including ICMP, TCP, and UDP, use the keyword ip. Some protocols allow further qualifiers described below.	
source	Number of the network or host from which the packet is being sent. There are three ways to specify the source:	
	Use a 32-bit quantity in 4-part dotted-decimal format.	
	Use the keyword any as an abbreviation for a source and source-wildcard of 0.0.0.0 255.255.255.255.	
	Use host source as an abbreviation for a source and source-wildcard of source 0.0.0.0.	

source-wildcard	Wildcard bits to be applied to source. There are three ways to specify the source wildcard:
	Use a 32-bit quantity in 4-part dotted-decimal format. Place ones in the bit positions you want to ignore.
	Use the keyword any as an abbreviation for a source and source-wildcard of 0.0.0.0 255.255.255.255.
	Use host source as an abbreviation for a source and source-wildcard of source 0.0.0.0.
destination	Number of the network or host to which the packet is being sent. There are three ways to specify the destination:
	Use a 32-bit quantity in 4-part dotted-decimal format.
	Use the keyword **any** as an abbreviation for the *destination* and *destination-wildcard* of 0.0.0.0 255.255.255.255.
	Use **host** *destination* as an abbreviation for a *destination* and *destination-wildcard* of *destination* 0.0.0.0.
destination-wildcard	Wildcard bits to be applied to the destination. There are three ways to specify the destination wildcard:
	Use a 32-bit quantity in 4-part dotted-decimal format. Place ones in the bit positions you want to ignore.
	Use the keyword **any** as an abbreviation for a *destination* and *destination-wildcard* of 0.0.0.0 255.255.255.255.
	Use **host** *destination* as an abbreviation for a *destination* and *destination-wildcard* of *destination* 0.0.0.0.
precedence *precedence*	Packets can be filtered by precedence level, as specified by a number from 0 to 7, or by name, as listed in the section "Usage Guidelines."
tos *tos*	Packets can be filtered by type of service level, as specified by a number from 0 to 15, or by name, as listed in the section "Usage Guidelines."
icmp-type	ICMP packets can be filtered by ICMP message type. The type is a number from 0 to 255.
icmp-code	ICMP packets which are filtered by ICMP message type can also be filtered by the ICMP message code. The code is a number from 0 to 255.
icmp-message	ICMP packets can be filtered by an ICMP message type name or ICMP message type and code name. The possible names are listed in the section "Usage Guidelines."
igmp-type	IGMP packets can be filtered by IGMP message type or message name. A message type is a number from 0 to 15. IGMP message names are listed in the section "Usage Guidelines."
operator	Compares source or destination ports. Possible operands include **lt** (less than), **gt** (greater than), **eq** (equal), **neq** (not equal), and **range** (inclusive range).
	If the operator is positioned after the *source* and *source-wildcard*, it must match the source port.
	If the operator is positioned after the *destination* and *destination-wildcard*, it must match the destination port.
	The **range** operator requires two port numbers. All other operators require one port number.

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port	The decimal number or name of a TCP or UDP port. A port number is a number from 0 to 65535. TCP and UDP port names are listed in the section "Usage Guidelines."
	TCP port names can only be used when filtering TCP. UDP port names can only be used when filtering UDP.
established	For the TCP protocol only; indicates an established connection. A match occurs if the TCP datagram has the ACK or RST bits set. The nonmatching case is that of the initial TCP datagram to form a connection.
log	Causes an informational logging message about the packet that matches the entry to be sent to the console. (The level of messages logged to the console is controlled by the **logging console** command.)
	The message includes the access list number; whether the packet was permitted or denied; the protocol, whether it was TCP, UDP, ICMP or a number; and, if appropriate, the source and destination addresses and source and destination port numbers. The message is generated for the first packet that matches the entry and then at 5-minute intervals, including the number of packets permitted or denied in the prior 5-minute interval.
log-input	Log matches against this entry, including input interface.

Defaults   An extended access list defaults to a list that denies everything. An extended access list is terminated by an implicit deny statement.

Command Modes   Global configuration

Command History

Release	Modification
11.1(4)	New command

Usage Guidelines   You can use access lists to control the transmission of packets on an interface, control virtual terminal line access, and restrict contents of routing updates. The switch stops checking the extended access list after a match occurs.

Fragmented IP packets, other than the initial fragment, are immediately accepted by any extended IP access list. Extended access lists used to control virtual terminal line access or restrict contents of routing updates must not match against the TCP source port, the type of service value, or the packet's precedence.

> **Note**   After an access list is created initially, any subsequent additions (possibly entered from the terminal) are placed at the end of the list. In other words, you cannot selectively add or remove access list command lines from a specific access list.

The following is a list of precedence names:

- **critical**

- **flash**

- **flash-override**

- **immediate**

- **internet**

- **network**

- **priority**

- **routine**

The following is a list of TOS names:

- **max-reliability**

- **max-throughput**

- **min-delay**

- **min-monetary-cost**

- **normal**

The following is a list of ICMP message-type names and ICMP message-type and code names:

- **administratively-prohibited**

- **alternate-address**

- **conversion-error**

- **dod-host-prohibited**

- **dod-net-prohibited**

- **echo**

- **echo-reply**

- **general-parameter-problem**

- **host-isolated**

- **host-precedence-unreachable**

- **host-redirect**

- **host-tos-redirect**

- **host-tos-unreachable**

- **host-unknown**

- **host-unreachable**

- **information-reply**

- **information-request**

- **log in-put**

- **mask-reply**

- **mask-request**

- **mobile-redirect**

- **net-redirect**

- **net-tos-redirect**

- **net-tos-unreachable**

- **net-unreachable**

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- **network-unknown**
- **no-room-for-option**
- **option-missing**
- **packet-too-big**
- **parameter-problem**
- **port-unreachable**
- **precedence**
- **precedence-unreachable**
- **protocol-unreachable**
- **reassembly-timeout**
- **redirect**
- **router-advertisement**
- **router-solicitation**
- **source-quench**
- **source-route-failed**
- **time-exceeded**
- **timestamp-reply**
- **timestamp-request**
- **tos**
- **traceroute**
- **ttl-exceeded**
- **unreachable**

The following is a list of TCP port names that can be used instead of port numbers. Refer to the current Assigned Numbers RFC to find a reference to these protocols. Port numbers corresponding to these protocols can also be found by entering a **?** in the place of a port number.

- **bgp**
- **chargen**
- **cmd**
- **daytime**
- **discard**
- **domain**
- **echo**
- **exec**
- **finger**
- **ftp**
- **ftp-data**
- **gopher**
- **hostname**

- **ident**

- **irc**

- **klogin**

- **kshell**

- **lpd**

- **nntp**

- **pop2**

- **pop3**

- **smtp**

- **sunrpc**

- **syslog**

- **tacacs-ds**

- **talk**

- **telnet**

- **time**

- **uucp**

- **whois**

- **www**

The following is a list of UDP port names that can be used instead of port numbers. Refer to the current Assigned Numbers RFC to find a reference to these protocols. Port numbers corresponding to these protocols can also be found by entering a **?** in the place of a port number.

- **biff**

- **bootpc**

- **bootps**

- **discard**

- **dns**

- **dnsix**

- **echo**

- **mobile-ip**

- **nameserver**

- **netbios-dgm**

- **netbios-ns**

- **ntp**

- **rip**

- **snmp**

- **snmptrap**

- **sunrpc**

- **syslog**

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- **tacacs-ds**

- **talk**

- **tftp**

- **time**

- **who**

- **xdmcp**

Examples

In the following example, serial interface 0 is part of a Class B network with the address 128.88.0.0, and the mail host's address is 128.88.1.2. The keyword **established** is used only for the TCP protocol to indicate an established connection. A match occurs if the TCP datagram has the ACK or RST bits set, which indicate that the packet belongs to an existing connection.

```
Switch(config)# access-list 102 permit tcp 0.0.0.0 255.255.255.255 128.88.0.0 0.0.255.255
established access-list 102 permit tcp 0.0.0.0 255.255.255.255 128.88.1.2 0.0.0.0 eq 25
interface serial 0 ip access-group 102 in
```

The following example also permits DNS packets and ICMP echo and echo reply packets.

```
Switch(config)# access-list 102 permit tcp any 128.88.0.0 0.0.255.255 established
Switch(config)# access-list 102 permit tcp any host 128.88.1.2 eq smtp
Switch(config)# access-list 102 permit tcp any any eq domain
Switch(config)# access-list 102 permit udp any any eq domain
Switch(config)# access-list 102 permit icmp any any echo
```

Related Commands

Command	Description
access-list (extended)	Used to define an extended IP access list, and only supports an IP host.
access-list (standard)	Cisco IOS command removed from this manual. Refer to Appendix D.
interface	Used to configure an interface type and enter interface configuration mode.
logging console	Cisco IOS command removed from this manual. Refer to Appendix D.
show access-lists	Used to display information about the access list.
show ip access-lists	Used to display the contents of all current IP access lists.

access-template

To create a temporary access list entry to the connected switch, use the **access-template** EXEC command.

> **access-template** {*access-list-number* | *dynamic-name*} *temp-list source-addr dest-addr*
>   **timeout** *minutes*

Syntax Description

access-list-number	Number of the dynamic access list (100 to 199).
dynamic-name	Name of the dynamic access list.
temp-list	Name of the temporary list within the access list.
source-addr	Source address in the dynamic access list. The keywords **host** and **any** are allowed. All other attributes are inherited from the original access list entry.
dest-addr	Destination address in the dynamic access list. The keywords **host** and **any** are allowed. All other attributes are inherited from the original access list entry.
minutes	Specifies a maximum time limit for each entry in the dynamic list. It is the absolute time that an entry can reside in the list. The default is an infinite time limit and allows an entry to remain permanently (1 to 9999).

Command Modes   EXEC

Command History

Release	Modification
11.1(4)	New command

Usage Guidelines   This command provides a way to enable the lock-and-key access feature.

You should always define either an absolute timeout (with the **timeout** keyword in this command) or an idle timeout (with the **timeout** keyword in the **access-class** command). Otherwise, the dynamic access list remains, even after the user has terminated the session.

Examples   In the following example, IP access is enabled on incoming packets in which the source address is 171.69.1.129 and the destination address is 172.21.52.12. All other source and destination pairs are discarded.

```
Switch# access-template 101 payroll host 171.69.1.129 host 172.21.52.12 timeout 2
```

Related Commands

Command	Description
access-list (extended)	Used to define an extended IP access list.
autocommand	Cisco IOS command removed from this manual. Refer to Appendix D.
clear access-template	Cisco IOS command removed from this manual. Refer to Appendix D.

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administrative-weight

To configure the mode of default administrative weight assignment for PNNI interfaces, use the **administrative-weight** ATM router PNNI configuration command. To return to the default value, use the **no** form of this command.

administrative-weight {**linespeed** | **uniform**}

no administrative-weight

Syntax Description

linespeed	The default value of the administrative weight is based on the linespeed or MaxCR of an interface.
uniform	Assigns the weight of 5040 to interfaces that were not configured.

Defaults

uniform

Command Modes

ATM router configuration

Command History

Release	Modification
11.1(4)	New command

Usage Guidelines

Administrative weight is used as the primary routing metric to minimize use of network resources. In the absence of other constraints, this causes PNNI routing to minimize the number of hops. Basing administrative weight on **linespeed** allows path selection to prefer paths along higher bandwidth interfaces. Higher speed links have lower administrative weights and are preferred during routing. The value set in this command becomes the default for the **atm pnni admin-weight** command.

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

Examples

The following script shows how to access the **administrative-weight** ATM router PNNI configuration command.

```
Switch# configure terminal
Switch(config)# atm router pnni
Switch(config-atm-router)# administrative-weight uniform
```

Related Commands

Command	Description
atm pnni admin-weight	Used to specify the administrative weight of the ATM PNNI interface.
show atm pnni interface	Used to display specific information about an interface or to list the interfaces running on a PNNI node.
show atm pnni local-node	Used to display information about a PNNI logical node running on the switch.

aesa embedded-number left-justified

To enable the automatic conversion of E.164AESA prefixes into left-justified encoding format, use the **aesa embedded-number left-justified** command.

aesa embedded-number left-justified

Syntax Description	None

Defaults   None.

Command Modes   Interface configuration

Command History

Release	Modification
12.1(6)	New command

Usage Guidelines   The aesa embedded-number left-justified command causes the conversion of all reachable address prefixes with the E.164 Authority and Format Identifier (AFI), including reachable address prefixes advertised by remote PNNI nodes, routes learned by ILMI, and reachable address prefixes installed by the switch router automatically. This affects the atm route, auto-summary, summary-address, show atm route, and show atm pnni summary commands. The atm address, atm prefix, and show atm addresses commands are not affected because they do not use PNNI address prefixes.

Examples   The following example shows how to configure the switch router to convert the E.164 AESA prefixes to PNNI 2.0 format, beginning in global configuration mode:

```
Switch# configure terminal
Switch(config)# atm router pnni
Switch(config-atm-router)# aesa embedded-number left-justified
```

Related Commands

Command	Description
show atm pnni aesa embedded-number	Displays the configuration of the automatic conversion of E.164AESA prefixes into left-justified encoding format.

aggregation-mode

To specify the mode that is used to calculate the combined metrics from multiple lower-level PNNI links into individual aggregated links to be advertised by this node, use the **aggregation-mode** PNNI node configuration command.

aggregation-mode {**link** | **node**} {**abr** | **cbr** | **ubr** | **vbr-rt** | **vbr-nrt** | **all**} {**aggressive** | **best-link**}

Syntax Description

link	Specifies the aggregation mode service category for a link.
node	Specifies the aggregation mode service category for a node with complex node representation.
abr	Specifies the ABR service category.
cbr	Specifies the CBR service category.
ubr	Specifies the UBR service category.
vbr-rt	Specifies the VBR-RT service category.
vbr-nrt	Specifies the VBR-NRT service category.
all	Specifies all service categories.
aggressive	When specified for links, selects the best values for each individual metric from all links or paths that are being aggregated. In this mode, there might be no single lower-level link that is as good as the higher-level link for all of the metrics.
	When specified for complex nodes, the radius, spoke, and bypass paths are based on a single calculation between each pair of border nodes, which optimizes a single parameter.
best-link	When specified for links, one of the lower-level links is chosen as the best link based on one or two metrics. All metrics from the selected lower-level link are copied to the higher-level aggregated link. In this mode, there is at least one lower-level link with metrics matching the higher-level link.
	When specified for complex nodes, the radius, spoke, and bypass paths are based on the best values from two path calculations for each pair of border nodes, which optimize different parameters.

Defaults

best-link for all service categories

Command Modes

PNNI node configuration

Command History

Release	Modification
11.3(3a)	New command

Usage Guidelines

In the PNNI hierarchy, link aggregation is used to represent several parallel links between two peer groups as a single higher-level link. The aggregation modes control how the metrics for the higher level links are derived from the individual parallel links that have the same aggregation token.

Examples   The following example shows how to enter PNNI node configuration mode and specify a node.

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

The following example shows how to specify aggressive mode aggregation for the VBR-RT service category on links.

```
Switch(config-pnni-node)# aggregation-mode link vbr-rt aggressive
```

Related Commands

Command	Description
show atm pnni aggregation node	Used to show the PNNI nodal aggregation tables for a complex node.
nodal-representation	Used to specify the type of PNNI LGN representation.

arp (global)

To add a permanent entry in the ARP cache, use the **arp** global configuration command. To remove an entry from the ARP cache, use the **no** form of this command.

> **arp** *ip-address hardware-address type interface-type card/subcard/port* [**alias**]

> **no arp** *ip-address hardware-address type interface-type card/subcard/port* [**alias**]

Syntax Description

ip-address	IP address in four-part dotted-decimal format corresponding to the local data interface address.
hardware-address	Local data interface address (a 48-bit address).
type	Encapsulation description (**arpa**, **sap**, **smds**, or **snap**). For Ethernet interfaces, this is typically the **arpa** keyword.
interface-type	Type of interface to which this entry applies.
card/subcard/port	Specifies the card, subcard, and port numbers for the interface.
alias	Indicates that the switch should respond to ARP requests as if it were the owner of the specified address.

Defaults

No entries are permanently installed in the ARP cache.

Command Modes

Global configuration

Command History

Release	Modification
11.1(4)	New command

Usage Guidelines

The switch uses ARP cache entries to translate 32-bit IP addresses into 48-bit hardware addresses.

Because most hosts support dynamic resolution, you generally do not need to specify static ARP cache entries.

Examples

The following is an example of a static ARP entry for a typical Ethernet host.

```
Switch(config)# arp 192.31.7.19 0800.0900.1834 arpa
```

Related Commands

Command	Description
show arp	Used to display the entries in the ARP table.

arp (interface)

To control the interface-specific handling of IP address resolution into 48-bit Ethernet, use the **arp** interface configuration command. To disable an encapsulation type, use the **no** form of this command.

> **arp** {**arpa** | **frame-relay** | **probe** | **snap**}

> **no arp** {**arpa** | **frame-relay** | **probe** | **snap**}

Syntax Description

arpa	Standard Ethernet-style ARP (RFC 826).
frame-relay	ARP for a Frame Relay interface.
probe	HP Probe protocol for IEEE-802.3 networks.
snap	ARP packets conforming to RFC 1042.

Defaults

Standard Ethernet-style ARP

Command Modes

Interface configuration

Command History

Release	Modification
11.1(4)	New command

Usage Guidelines

Arguments to the **arp** command are not mutually exclusive. Each command enables or disables a specific type of ARP. For example, if you enter the **arp arpa** command followed by the **arp probe** command, the switch sends three packets (two for **probe** and one for **arpa**) each time it needs to discover a MAC address.

The **arp probe** command allows the switch to use the Probe protocol (in addition to ARP) whenever attempting to resolve an IEEE-802.3 or Ethernet local data interface address. The subset of Probe that performs address resolution is called Virtual Address Request and Reply. Using Probe, the switch communicates transparently with Hewlett-Packard IEEE-802.3 hosts using this type of data encapsulation.

Note   All interfaces that use Probe must be explicitly configured for **arp probe**.

The **show ima interface** EXEC command displays the type of ARP being used on a particular interface. To remove all nonstatic entries from the ARP cache, use the **clear atm pnni** privileged EXEC command.

associate (Catalyst 8540 MSR)

To logically associate two slots within one switch router for redundancy, use the **associate** command. To disable slot associations, use the **no** form of this command.

associate slot *slot_one slot_two*

no associate slot *slot_one slot_two*

Syntax Description

slot_one	Sets first slot to become associated. Valid range is from 0 to 12.
slot_two	Sets second slot to be associated with first slot. Valid range is from 0 to 12.

Defaults

Slots are not associated.

Command Modes

Redundancy configuration

Command History

Release	Modification
12.1(6)	New command

Usage Guidelines

Features such as APS (Automatic Protection Switching) utilize logical slot information for the purpose of processor route switchover. Both associated slots must use the same type of interface module. Only slots {0,2}, {1,3}, {9,11}, {10,12} can be associated.

Examples

The following example shows how to associate two separate slots within one switch.

```
Switch(config)# redundancy
Switch(config-r)# associate slot 10 12
Associate slot command accepted for slots 10 and 12
```

Related Commands

Command	Description
None	

auto-summary

To allow default summary addresses to be generated based on the switch's ATM address, use the **auto-summary** PNNI node configuration command. To disable generation of default summary addresses, use the **no** form of this command.

auto-summary

no auto-summary

Syntax Description   This command has no arguments or keywords.

Defaults   Enabled

Command Modes   PNNI node configuration

Command History

Release	Modification
11.1(4)	New command

Usage Guidelines   By default, lowest level PNNI nodes advertise 13-byte summary address prefixes based on the switch address or addresses. The summary address prefix or prefixes cover all end system addresses determined via ILMI address registration from the ILMI address prefix or prefixes, based on each switch's address. They do not cover end-system addresses determined via ILMI address registration from per-interface ILMI address prefixes (configured using the **atm pvc** command).

Using the **no** form of the **auto-summary** command causes PNNI to advertise all end-system addresses separately (unless other summary addresses matching the end system addresses were configured).

Higher level PNNI nodes (LGNs) have a single default address configured. The length of that summary for any LGN is equal to the level of the child peer group, and its value is equal to the first level bits of the child peer group identifier.

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

Examples   The following example shows how to access the **auto-summary** node-level subcommand.

```
Switch# configure terminal
Switch(config)# atm router pnni
Switch(config-atm-router)# node 1
Switch(config-pnni-node)# auto-summary
```

Related Commands

Command	Description
atm address	Used to assign a 20-byte ATM address to the switch.
atm prefix	Used to configure an ILMI address prefix for an ATM interface.

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Command	Description
show atm route	Used to display all local or network-wide reachable address prefixes in a switch router's ATM routing table.
summary-address	Used to configure summary address prefixes on a PNNI node.