CHAPTER 7

ATM Module Command Reference

You access the ATM module by creating a session with it. To open a session with the ATM module, use the **session** *mod_num* command from the Console> prompt. After you enter this command, the switch responds with the **Enter Password** prompt. Enter **atm** as the default password. At this point, you are at the **ATM#>** prompt, and you have direct access to only the ATM module that you have established a session with.

Once you are connected to the ATM module, a subset of the Internetwork Operating System (IOS) commands normally available for Cisco routers is available for configuring it. Some of these commands have been slightly modified to accommodate the differences specific to the ATM module in the Catalyst 5000 series switch.

The IOS commands for the Catalyst 5000 series switch ATM module are divided into the following categories:

- ATM Module User Interface Commands
- Configuration Commands
- ATM Commands
- LAN Emulation Commands

ATM Module User Interface Commands

This section describes the commands used to enter and exit the various Cisco Internetwork Operating System (Cisco IOS) configuration command modes. It provides a description of the **help** command and help features, lists the command editing keys and functions, and details the command history feature.

You can abbreviate the syntax of Cisco IOS configuration commands. The ATM module recognizes a command when you enter enough characters of the command to uniquely identify it.

For user interface task information and examples, see the “Administrative Interfaces” chapter.

disable

Use the **disable** EXEC command to exit privileged EXEC mode and return to user EXEC mode. After executing this command, the > prompt appears.

disable [*level*]

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Usage Guidelines

Use this command with the **level** option to reduce the privilege level. If a level is not specified, it defaults to the user EXEC mode, which is level 1.

Example

In the following example, entering the **disable** command causes the system to exit privileged EXEC mode and return to user EXEC mode as indicated by the angle bracket (>):

```
ATM# disable
ATM>
```

Related Command

enable

editing

Use the **editing** line configuration command to enable enhanced editing mode. To disable the enhanced editing mode, use the **no** form of this command.

editing
no editing

Syntax Description

This command has no arguments or keywords.

Default

Enabled

Command Mode

Line configuration

Usage Guidelines

Table 7-1 provides a description of the keys used to enter and edit commands. Ctrl indicates the Control key. It must be pressed simultaneously with its associated letter key. Esc indicates the Escape key. It must be pressed first, followed by its associated letter key. Keys are not case sensitive.

Table 7-1 Editing Keys and Functions

Keys	Function
Tab	Completes a partial command name entry. When you enter a unique set of characters and press the Tab key, the system completes the command name. If you enter a set of characters that could indicate more than one command, the system beeps to indicate an error. Enter a question mark (?) immediately following the partial command (no space). The system provides a list of commands that begin with that string.
Delete or Backspace	Erases the character to the left of the cursor.
Return	At the command line, pressing the Return key processes a command. At the "---More---" prompt on a terminal screen, pressing the Return key scrolls down a line.
Spacebar	Allows you to see more output on the terminal screen. Press the Spacebar when you see "---More---" on the screen to display the next screen.
Left Arrow[1]	Moves the cursor one character to the left. When you enter a command that extends beyond a single line, you can press the Left Arrow key repeatedly to scroll back toward the system prompt and verify the beginning of the command entry.
Right Arrow[1]	Moves the cursor one character to the right.
Up Arrow[1] or Ctrl-P	Recalls commands in the history buffer, beginning with the most recent command. Repeat the key sequence to recall successively older commands.
Down Arrow[1] or Ctrl-N	Return to more recent commands in the history buffer after recalling commands with the Up Arrow or Ctrl-P. Repeat the key sequence to recall successively more recent commands.
Ctrl-A	Moves the cursor to the beginning of the line.
Ctrl-B	Moves the cursor back one character.

Keys	Function
Ctrl-D	Deletes the character at the cursor.
Ctrl-E	Moves the cursor to the end of the command line.
Ctrl-F	Moves the cursor forward one character.
Ctrl-K	Deletes all characters from the cursor to the end of the command line.
Ctrl-L or Ctrl-R	Redisplays the system prompt and command line.
Ctrl-T	Transposes the character to the left of the cursor with the character located at the cursor.
Ctrl-U or Ctrl-X	Deletes all characters from the cursor back to the beginning of the command line.
Ctrl-V or Esc Q	Inserts a code to indicate to the system that the keystroke immediately following should be treated as a command entry, *not* as an editing key.
Ctrl-W	Deletes the word to the left of the cursor.
Ctrl-Y	Recalls the most recent entry in the delete buffer. The delete buffer contains the last ten items you have deleted or cut. Ctrl-Y can be used in conjunction with Esc Y.
Ctrl-Z	Ends configuration mode and returns you to the EXEC prompt.
Esc B	Moves the cursor back one word.
Esc C	Capitalizes from the cursor to the end of the word.
Esc D	Deletes from the cursor to the end of the word.
Esc F	Moves the cursor forward one word.
Esc L	Changes to lowercase from the cursor to the end of the word.
Esc U	Capitalizes from the cursor to the end of the word.
Esc Y	Recalls the next buffer entry. The buffer contains the last ten items you have deleted. Press Ctrl-Y first to recall the most recent entry. Then press Esc Y up to nine times to recall the remaining entries in the buffer. If you bypass an entry, continue to press Esc Y to cycle back to it.

1. The arrow keys function only with ANSI-compatible terminals.

Example

In the following example, enhanced editing mode is disabled on virtual terminal line 3:

```
ATM#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
ATM(config)#line vty 3
ATM(config-line)#no editing
ATM(config-line)#
```

enable

Use the enable EXEC command to enter privileged EXEC mode.

enable

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Usage Guidelines

Because many of the privileged commands set operating parameters, privileged access should be password-protected to prevent unauthorized use. If the system administrator has set a password with the enable password global configuration command, you are prompted to enter it before being allowed access to privileged EXEC mode. The password is case sensitive. The factory default password on the ATM module is **atm**.

Example

In the following example, the user enters the enable command and is prompted to enter a password. The password is not displayed on the screen. After entering the password, the system enters privileged command mode as indicated by the pound sign (#).

```
ATM> enable
Password:
ATM#
```

Related Commands

disable

end

Use the **end** global configuration command to exit configuration mode.

end

Syntax Description

This command has no arguments or keywords.

Command Mode

Global configuration

Usage Guidelines

You can also press Ctrl-Z to exit configuration mode.

Example

In the following example, the switch name is changed to george using the hostname global configuration command. Entering the **end** command causes the system to exit configuration mode and return to EXEC mode.

```
ATM (config)# write memory
Remote host [0.0.0.0]? 131.108.1.111
Name of configuration file to write [Catalyst-confg]?
Write file Catalyst-confg on host 131.108.1.111? [confirm]
#
Writing Router-confg !! [OK]
ATM (config)#
write terminal
ATM(config)# hostname george
ATM(config)# end
ATM#
```

exit

Use the **exit** command at the system prompt to exit any command mode or close an active terminal session and terminate the EXEC.

exit

Syntax Description

This command has no arguments or keywords.

Command Mode

Available in all command modes

Usage Guidelines

When you enter the **exit** command at the EXEC level, the EXEC mode is ended. Use the **exit** command at the configuration level to return to privileged EXEC mode. Use the **exit** command in interface and line command modes to return to global configuration mode. Use the **exit** command in subinterface configuration mode to return to interface configuration mode. You can also press Ctrl-Z from any configuration mode to return to privileged EXEC mode.

Examples

The following example shows how to exit an active session.

```
ATM> exit
```

full-help

Use the **full-help** command to get help for the full set of user-level commands.

full-help

Syntax Description

This command has no arguments or keywords.

Default

Disabled

Command Mode

Available in all command modes.

Usage Guidelines

The full-help command enables (or disables) an unprivileged user to see all of the help messages available. It is used with the show ? command.

Example

The following example is output for show ? with the **full-help** command disabled:

```
ATM>show ?
  atm        ATM information
  clock[1]     Display the system clock
  history    Display the session command history
  hosts[1]     IP domain-name, lookup style, nameservers, and host table
  lane       LAN Emulation information
  sessions   Information about Telnet connections
  terminal   Display terminal configuration parameters
  users      Display information about terminal lines
  version    System hardware and software status
```

1. Although this command appears, it is currently not supported in this software release.

Related Commands

help

help

Use the **help** command to display a brief description of the help system.

help

Syntax Description

This command has no arguments or keywords.

Command Mode

Available in all command modes

Usage Guidelines

The help command provides a brief description of the context-sensitive help system.

- To list all commands available for a particular command mode, enter a question mark (?) at the system prompt.
- To obtain a list of commands that begin with a particular character string, enter the abbreviated command entry immediately followed by a question mark (?). This form of help is called word help, because it lists only the keywords or arguments that begin with the abbreviation you entered.
- To list a command´s associated keywords or arguments, enter a question mark (?) in place of a keyword or argument on the command line. This form of help is called command syntax help, because it lists the keywords or arguments that apply based on the command, keywords, and arguments you have already entered.

Examples

Enter the help command for a brief description of the help system:

```
ATM# help
Help may be requested at any point in a command by entering
a question mark '?'. If nothing matches, the help list will
be empty and you must backup until entering a '?' shows the
available options.
Two styles of help are provided:
1. Full help is available when you are ready to enter a
   command argument (e.g. 'show ?') and describes each possible
   argument.
2. Partial help is provided when an abbreviated argument is entered
   and you want to know what arguments match the input
   (e.g. 'show pr?'.)
```

The following example shows how to use word help to display all the privileged EXEC commands that begin with the letters ¨co¨:

```
ATM# co?
configure  connect  copy
```

Related Commands

full-help

history

Use the **history** line configuration command to enable the command history function, or to change the command history buffer size for a particular line. To disable the command history feature, use the **no** form of this command.

history [size *number-of-lines***]**
no history [size *number-of-lines***]**

Syntax Description

size *number-of-lines*	(Optional) Specifies the number of command lines that the system will record in its history buffer. The range is 0 to 256.

Default

10 lines

Command Mode

Line configuration

Usage Guidelines

The **history** command, without the **size** keyword and the *number-of-lines* argument, enables the history function with the last buffer size specified or with the default of 10 lines, if there was not a prior setting.

The **no history** command, without the **size** keyword and the *number-of lines* argument, disables the history feature but remembers the buffer size if it was something other than the default. The **no history size** command resets the buffer size to 10.

The command history feature provides a record of EXEC commands you have entered. This feature is particularly useful for recalling long or complex commands or entries, including access lists.

Table 7-2 lists the keys and functions you can use to recall commands from the command history buffer.

Table 7-2 History Keys

Key	Function
Up Arrow or Ctrl-P [1]	Recalls commands in the history buffer in a backward sequence, beginning with the most recent command. Repeat the key sequence to recall successively older commands.
Down Arrow or Ctrl-N[1]	Returns to more recent commands in the history buffer after recalling commands with the Up Arrow or Ctrl-P . Repeat the key sequence to recall successively more recent commands.

1. The arrow keys function only with ANSI-compatible terminals such as VT100s.

Example

In the following example, virtual terminal line 4 is configured with a history buffer size of 35 lines:

```
ATM#config terminal
Enter configuration commands, one per line.  End with CNTL/Z.
ATM(config)#line vty 4
ATM(config-line)#history size 35
ATM(config-line)#
```

Related Commands

show history

show history

Use the **show history** EXEC command to list the commands you have entered in the current EXEC session.

show history

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Usage Guidelines

The command history feature provides a record of EXEC commands you have entered. The number of commands the history buffer will record is determined by the **history size** line configuration command or the **terminal history size** EXEC command.

Table 7-3 lists the keys and functions you can use to recall commands from the command history buffer.

Table 7-3 History Keys

Key	Function
Up Arrow or Ctrl-P [1]	Recalls commands in the history buffer in a backward sequence, beginning with the most recent command. Repeat the key sequence to recall successively older commands.
Down Arrow or Ctrl-N [1.]	Returns to more recent commands in the history buffer after recalling commands with Ctrl-P or the Up Arrow. Repeat the key sequence to recall successively more recent commands.

1. The arrow keys function only with ANSI-compatible terminals such as VT100's.

Example

The following is sample output from the **show history** command, which lists the commands the user has entered in EXEC mode for this session:

```
ATM# show history
help
  where
  show hosts
  show history
ATM#
```

terminal

Use the **terminal** command to set the number of lines displayed.

terminal length *screen-length*
terminal no length

Syntax Description

screen length	(Optional) Specifies the desired number of lines. The default length is 24 lines. A value of 0 disables pausing between screens of output.

Command Mode

EXEC

Example

In the following example, the terminal is set to 0 so that output scrolls on the screen without pausing:

```
ATM>terminal length 0
```

Configuration Commands

This section describes the commands available to configure Flash memory on the ATM module.

reload

Use the **reload** EXEC command to reload the operating system.

reload

Syntax Description

This command has no arguments or keywords.

Command Type

IOS Cnfiguration command.

Command Mode

EXEC

Usage Guidelines

The **reload** command halts the ATM module. If the ATM module is set to restart on error, it reboots itself. Use the **reload** command after configuration information is entered into a file and saved to the startup configuration.

You cannot reload from a virtual terminal if the system is not set up for automatic booting. This prevents the system from dropping to the ROM monitor and thereby taking the system out of the remote user's control.

If you modify your configuration file, the system prompts you to save the configuration. During a save operation, the system asks you if you want to proceed with the save if the CONFIG_FILE environment variable points to a startup configuration file that no longer exists. If you say "yes" in this situation, the system goes to **setup** mode upon reload.

Example

The following example illustrates how to enter the **reload** command at the privileged EXEC prompt:

```
ATM>reload
```

show version

Use the **show version** EXEC command to display the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images.

show version

Syntax Description

This command has no arguments or keywords.

Command Type

IOS Cnfiguration command.

Command Mode

EXEC

Example

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

```
ATM>show version
Cisco Internetwork Operating System Software
IOS (tm) cisco Software, Version 11.0(3340) [integ 103]
Copyright (c) 1986-1995 by cisco Systems, Inc.
Compiled Tue 29-Aug-95 14:36
Image text-base: 0x40010000, data-base: 0x401843F0

ROM: System Bootstrap, Version 4.4(1023), SOFTWARE

ATM uptime is 42 minutes
System restarted by power-on
Running default software

cisco SYNALC (68360) processor (revision 0x00) with 1059840K/512K bytes of memory.
Processor board serial number 01244583
1 Ethernet/IEEE 802.3 interface.
1 ATM network interface.
127K bytes of non-volatile configuration memory.

Configuration register is 0x1900

ATM>
```

Table 7-4 describes significant fields shown in the display.

Table 7-4 show version Field Descriptions

Field	Description
IOS Software, Version X.X	Always specify the complete version number when reporting a possible software problem.
System Bootstrap, Version	Bootstrap version string.

Field	Description
Current date and time Boot date and time ATM Module uptime is	Current date and time, the date and time the system was last booted, and *uptime*, or the amount of time the system has been up and running.
System restarted by power-on	Also displayed is a log of how the system was last booted, both as a result of normal system startup and of system error. For example, information can be displayed to indicate a bus error that is generally the result of an attempt to access a nonexistent address, as follows: `System restarted by bus error at PC 0xC4CA, address 0x210C0C0`
Running default software	If the software was booted over the network, the Internet address of the boot host is shown. If the software was loaded from onboard ROM, this line reads "running default software." In addition, the names and sources of the host and network configuration files are shown.
cisco....	The remaining output shows the hardware configuration and any nonstandard software options. The configuration register contents are displayed in hexadecimal notation.

The output of the **show version** EXEC command can also provide certain messages, such as bus error messages. If such error messages appear, report the complete text of this message to your technical support specialist.

write erase

Use the **write erase** EXEC command to erase the configuration information in nonvolatile memory. The NVRAM will then be filled with the default configuration.

write erase

Syntax Description

This command has no arguments or keywords.

Command Type

IOS Cnfiguration command.

Command Mode

EXEC

Example

The following example illustrates how to erase the configuration in nonvolatile memory:

```
ATM# write erase
```

To copy the current configuration information to nonvolatile memory, use the **write memory** EXEC command:

```
ATM# write memory
```

write memory

Use the **write memory** command in conjunction with the reload command to restart the Catalyst 5000 series switch with the configuration information stored in NVRAM.

Syntax Description

This command has no arguments or keywords.

Command Type

IOS Cnfiguration command.

Command Mode

EXEC

Usage Guidelines

If you issue the **write memory** command from a bootstrap system image, a warning displays that the previous NVRAM configuration will be overwritten and some of the configuration commands will be lost unless you answer no. This warning will not display if NVRAM does not contain a valid configuration or if the previous configuration in NVRAM was generated by a bootstrap system image.

Examples

The following example illustrates how to copy the current configuration information to nonvolatile memory:

```
ATM# write memory
### [OK]
```

Related Commands

reload

write terminal

Use the **write terminal** command in conjunction with the show configuration command to compare the information in running memory to the information stored in NVRAM.

write terminal

Syntax Description

This command has no arguments or keywords.

Command Type

IOS Cnfiguration command.

Command Mode

EXEC

Example

The following example illustrates how to display the current configuration information:

ATM# **write terminal**

ATM Commands

This section describes the commands available to configure an ATM interface. For ATM configuration information and examples, refer to the chapter entitled "Configuring the ATM Module."

atm vc-per-vp

Use the **atm vc-per-vp** interface configuration command to set the maximum number of VCIs to support per VPI. The **no** form of this command restores the default value.

atm vc-per-vp *number*
no atm vc-per-vp

Syntax Description

number	Maximum number of VCIs to support per VPI. Valid values are 32, 64, 128, 256, 512 or 1024.

Default

1024

Command Type

IOS ATM command.

Command Mode

Interface configuration

Usage Guidelines

This command controls the memory allocation in the Catalyst 5000 series switch for the VCI table. It defines the maximum number of VCIs to support per VPI; it does not designate the VCI numbers.

An invalid VCI causes a warning message to be displayed.

Example

In the following example, the maximum number of VCIs to support per VPI is set to 512:

```
ATM(config-if)#atm vc-per-vp 512
```

atmsig close

Use the **atmsig close** EXEC command to disconnect an SVC.

atmsig close atm 0 *vcd*

Syntax Description

vcd	Virtual circuit descriptor of the SVC to close.

Command Type

IOS ATM command.

Command Mode

EXEC

Usage Guidelines

You must execute this command if you want to close a particular SVC. Since VCs are numbered per interface, you must specify 0 as the ATM interface number.

Example

The following example closes SVC 2 on ATM interface 0:

```
ATM# atmsig close atm0 2
```

show atm interface atm

Use the **show atm interface atm** privileged EXEC command to display ATM-specific information about an interface.

show atm interface atm 0

Syntax Description

This command has no arguments or keywords.

Command Type

IOS ATM command.

Command Mode

EXEC

Example

The following is sample output from the **show atm interface atm** command to display statistics on the ATM module:

```
ATM#show atm interface atm 0
ATM interface ATM0:
AAL enabled:  AAL5 , Maximum VCs: 1024, Current VCs: 6
Tx buffers 32, Rx buffers 32, Exception Queue: 32, Raw Queue: 32
VP Filter: 0x0, VCIs per VPI: 1024, Max. Datagram Size:1580
PLIM Type:INVALID, No Framing, TX clocking: LINE
881 input, 880 output, 0 IN fast, 0 OUT fast
New Config. is ACTIVE in -3700 seconds
ATM#
```

Table 7-5 describes the fields shown in the display.

Table 7-5 show atm interface atm Command Field Descriptions

Field	Description
ATM interface	The ATM interface is 0.
AAL enabled	Type of AAL.
Maximum VCs	Maximum number of virtual circuits this interface can support.
Current VCs	Number of active virtual circuits.
Tx buffers, Rx buffers	Number of buffers.
VCIs per VPI	Maximum number of VCIs to support per VPI, as configured by the **atm vc-per-vp** command.
PLIM Type	Physical Layer Interface Module (PLIM) type
input	Number of packets received and process switched.
output	Number of packets sent from process switch.

Field	Description
Config.	ACTIVE or VALID in *n* SECONDS. ACTIVE indicates that the current Catalyst 5000 configuration has been loaded into the Catalyst 5000 and is being used. There is a 5-second inactive period whenever a new configuration is sent to the Catalyst 5000.

show atm traffic

Use the **show atm traffic** privileged EXEC command to display current, global ATM traffic information to and from all ATM networks connected to the ATM module.

show atm traffic

Syntax Description

This command has no arguments or keywords.

Command Type

IOS ATM command.

Command Mode

Privileged EXEC

Example

The following is sample output from the **show atm traffic** command:

```
ATM#show atm traffic
949 Input packets
948 Output packets
0 Broadcast packets
0 Packets for non-existent VC
0 OAM cells received
0 OAM cells sent
ATM#
```

Table 7-6 describes the fields shown in the display.

show atm vc

Use the **show atm vc** privileged EXEC command to display all active ATM virtual circuits (PVCs and SVCs) and traffic information.

show atm vc [*vcd*]

Syntax Description

vcd	(Optional) Specifies which VC to display information about.

Command Type

IOS ATM command.

Command Mode

Privileged EXEC

Usage Guidelines

If no VCD is specified, the command displays information for all SVCs. The output is in summary form (one line per VC).

Examples

The following is sample output from the **show atm vc** command when no VCD is specified, displaying statistics for all VCs:

```
ATM# show atm vc

ATM#show atm vc
Intfc.      VCD   VPI   VCI    Type   AAL/Encaps    Peak   Avg.   Burst
ATM0        1     0     5      PVC    AAL5-SAAL     0      0      0
ATM0        2     0     16     PVC    AAL5-ILMI     0      0      0
ATM0        9     0     32     SVC    LANE-LEC      0      0      0
ATM0        10    0     33     SVC    LANE-LEC      0      0      0
ATM0        11    0     34     SVC    LANE-LEC      0      0      0
ATM0        12    0     35     SVC    LANE-LEC      0      0      0
ATM#
```

show sscop

Use the **show sscop** privileged EXEC command to show Service-Specific Connection Oriented Protocol (SSCOP) details for all ATM interfaces.

show sscop

Syntax Description

This command has no arguments or keywords.

Command Type

IOS ATM command.

Command Mode

Privileged EXEC

Example

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

```
synergy atm interface# show sscop
SSCOP details for interface 0
   Current State = Data Transfer Ready
   Send Sequence Number: Current = 2,  Maximum = 9
   Send Sequence Number Acked = 3
   Rcv Sequence Number: Lower Edge = 2, Upper Edge = 2, Max = 9
   Poll Sequence Number = 1876, Poll Ack Sequence Number = 2
   Vt(Pd) = 0
   Connection Control:  timer = 1000
   Timer currently Inactive
   Keep Alive Timer = 30000
   Current Retry Count = 0, Maximum Retry Count = 10
      Statistics -
      Pdu's Sent = 0, Pdu's Received = 0, Pdu's Ignored = 0
      Begin = 0/1, Begin Ack = 1/0, Begin Reject = 0/0
      End = 0/0, End Ack = 0/0
      Resync = 0/0, Resync Ack = 0/0
      Sequenced Data = 2/0, Sequenced Poll Data = 0/0
      Poll = 1591/1876, Stat = 0/1591, Unsolicited Stat = 0/0
      Unassured Data = 0/0, Mgmt Data = 0/0, Unknown Pdu's = 0
```

Table 7-6 describes the fields shown in the display. Interpreting this output requires a good understanding of the SSCOP; it is usually displayed by Cisco technicians to help diagnose network problems.

Table 7-6 show sscop Command Field Descriptions

Field	Description
SSCOP details for interface	Interface slot and port.
Current State	SSCOP state for the interface.
Send Sequence Number	Current and maximum send sequence number.
Send Sequence Number Acked	Sequence number of packets already acknowledged.

Field	Description
Rcv Sequence Number	Sequence number of packets received.
Poll Sequence Number	Current poll sequence number.
Poll Ack Sequence Number	Poll sequence number already acknowledged.
Vt(Pd)	Number of Pd frames sent which triggers a sending of a Poll frame.
Connection Control	Timer used for establishing and terminating SSCOP.
Keep Alive Timer	Timer used to send keepalives on an idle link.
Current Retry Count	Current count of the retry counter.
Maximum Retry Count	Maximum value the retry counter can take.
Pdu's Sent	Total number of SSCOP frames sent.
Pdu's Received	Total number of SSCOP frames received.
Pdu's Ignored	Number of invalid SSCOP frames ignored.
Begin	Number of Begin frames sent/received.
Begin Ack	Number of Begin Ack frames sent/received.
Begin Reject	Number of Begin Reject frames sent/received.
End	Number of End frames sent/received.
End Ack	Number of End Ack frames sent/received.
Resync	Number of Resync frames sent/received.
Resync Ack	Number of Resync Ack frames sent/received.
Sequenced Data	Number of Sequenced Data frames sent/received.
Sequenced Poll Data	Number of Sequenced Poll Data frames sent/received.
Poll	Number of Poll frames sent/received.
Stat	Number of Stat frames sent/received.
Unsolicited Stat	Number of Unsolicited Stat frames sent/received.
Unassured Data	Number of Unassured Data frames sent/received.
Mgmt Data	Number of Mgmt Data frames sent/received.
Unknown Pdu's	Number of Unknown SSCOP frames sent/received.

sscop cc-timer

Use the **sscop cc-timer** interface configuration command to change the connection control timer. The **no** form of this command restores the default value.

sscop cc-timer *seconds*
no sscop cc-timer

Syntax Description

seconds	Number of seconds between Begin messages.

Default

10 seconds

Command Type

IOS ATM command.

Command Mode

Interface configuration

Usage Guidelines

The connection control timer determines the time between transmission of BGN, END, or RS PDUs as long as an acknowledgment has not been received.

Example

In the following example, the connection control timer is set to 15 seconds:

```
ATM(config-if)# sscop cc-timer 15
```

Related Command

sscop max-cc

sscop keepalive-timer

Use the **sscop keepalive-timer** interface configuration command to change the keepalive timer. The **no** form of this command restores the default value.

sscop keepalive-timer *seconds*
no sscop keepalive-timer *seconds*

Syntax Description

seconds	Number of seconds the ATM module waits between transmission of POLL PDUs when no SD or SDP PDUs are queued for transmission or are outstanding pending acknowledgments.

Default

30 seconds

Command Type

IOS ATM command.

Command Mode

Interface configuration

Example

In the following example, the keepalive timer is set to 15 seconds:

```
ATM(config-if)# sscop keepalive-timer 15
```

sscop max-cc

Use the **sscop max-cc** interface configuration command to change the retry count of connection control. The **no** form of this command restores the default value.

sscop max-cc *retries*
no sscop max-cc

Syntax Description

retries	Number of times that SSCOP will retry to transmit BGN, END, or RS PDUs as long as an acknowledgment has not been received. Valid range is 1 to 6000.

Default

10 retries

Command Type

IOS ATM command.

Command Mode

Interface configuration

Example

In the following example, the retry count of the connection control is set to 20:

```
ATM(config-if)# sscop max-cc 20
```

Related Command

sscop cc-timer

sscop poll-timer

Use the **sscop poll-timer** interface configuration command to change the poll timer. The **no** form of this command restores the default value.

sscop poll-timer *seconds*
no sscop poll-timer

Syntax Description

seconds	Number of seconds the ATM module waits between transmission of POLL PDUs.

Default

10 seconds

Command Type

IOS ATM command.

Command Mode

Interface configuration

Usage Guidelines

The poll timer controls the maximum time between transmission of POLL PDUs when SD or SDP PDUs are queued for transmission or are outstanding pending acknowledgments.

Example

In the following example, the poll timer is set to 15 seconds:

```
ATM(config-if)# sscop poll-timer 15
```

sscop rcv-window

Use the **sscop rcv-window** interface configuration command to change the receiver window. The **no** form of this command restores the default value.

sscop rcv-window *packets*
no sscop rcv-window

Syntax Description

packets	Number of packets the interface can receive before it must send an acknowledgment to the ATM switch. Valid range is 1 to 6000.

Default

7 packets

Command Type

IOS ATM command.

Command Mode

Interface configuration

Example

In the following example, the receiver's window is set to 10 packets:

```
ATM(config-if)# sscop rcv-window 10
```

sscop send-window

Use the **sscop send-window** interface configuration command to change the transmitter window. The **no** form of this command restores the default value.

sscop send-window *packets*
no sscop send-window

Syntax Description

packets	Number of packets the interface can send before it must receive an acknowledgment from the ATM switch. Valid range is 1 to 6000.

Default

7 packets

Command Type

IOS ATM command.

Command Mode

Interface configuration

Example

In the following example, the transmitter's window is set to 10 packets:

```
ATM(config-if)# sscop send-window 10
```

LAN Emulation Commands

This section describes the commands available to configure a LAN client on the ATM interface for LAN emulation (LANE). For ATM LANE configuration information and examples, refer to the chapter entitled “Configuring the ATM Module.”

Because some LANE commands are used often and others are used very rarely, the command descriptions in this chapter identify the commands you are most likely to use. Look under “Usage Guidelines” for the indicator *This command is ordinarily used*.

lane client

Use the **lane client** interface configuration command to activate a LANE client on the specified subinterface. To remove a previously activated LANE client on the subinterface, use the **no** form of this command.

lane client ethernet *vlan#* [*elan-name*]
no lane client [**ethernet *vlan#*** [*elan-name*]]

Syntax Description

ethernet	Identifies the type of emulated LAN attached to this subinterface.
elan-name	(Optional) Name of the emulated LAN. This argument is optional because the client obtains its emulated LAN name from the configuration server. Maximum length is 32 characters.
vlan#	Identifies the number of the vlan that corresponds to the specified emulated LAN.

Default

None

Command Type

IOS LAN emulation command.

Command Mode

Interface configuration

Usage Guidelines

This command is ordinarily used.

If a **lane client** command has already been entered on the subinterface for a different emulated LAN, then the client initiates termination procedures for that emulated LAN and joins the new emulated LAN.

If you do not provide an *elan-name* value, the client contacts the server to find which emulated LAN to join. If you do provide an emulated LAN name, the client consults the configuration server to ensure that no conflicting bindings exist.

Example

In the following example, the LANE client is activated for VLAN 3 called *eng*:

```
ATM(config-if)# lane client ethernet vlan 3 eng
```

Related Command

lane client-atm-address

lane client-atm-address

Use the **lane client-atm-address** interface configuration command to specify an ATM address, and thus override the automatic ATM address assignment, for the LANE client on the specified subinterface. To remove the ATM address previously specified for the LANE client on the specified subinterface and thus revert to the automatic address assignment, use the **no** form of this command.

lane client-atm-address *atm-address-template*
no client-atm-address [*atm-address-template*]

Syntax Description

atm-address-template	ATM address or a template in which wildcard characters are replaced by any nibble or group of nibbles of the prefix bytes, the ESI bytes, or the selector byte of the automatically assigned ATM address.

Default

Automatic ATM address assignment.

Command Type

IOS LAN emulation command.

Command Mode

Interface configuration

Usage Guidelines

Use of this command on a selected subinterface, but with a different ATM address than was used previously, replaces the LANE client's ATM address.

ATM Addresses. A LANE ATM address has the same syntax as an NSAP (but it is not a network-level address):

- A 13-byte prefix that includes the following fields defined by the ATM Forum: AFI (Authority and Format Identifier) field (1 byte), DCC (Data Country Code) or ICD (International Code Designator) field (2 bytes), DFI field (Domain Specific Part Format Identifier) (1 byte), Administrative Authority field (3 bytes), Reserved field (2 bytes), Routing Domain field (2 bytes), and Area field (2 bytes).
- A 6-byte end-system identifier (ESI)
- A 1-byte selector field

Address Templates. LANE ATM address templates can use two types of wildcards: an asterisk (*) to match any single character, and an ellipsis (...) to match any number of leading or trailing characters. The values of the characters replaced by widlcards come from the automatically assigned ATM address.

In LANE, a *prefix template* explicitly matches the ATM address prefix but uses wildcards for the ESI and selector fields. An *ESI template* explicitly matches the ESI field but uses wildcards for the prefix and selector.

In Cisco's implementation of LANE, the prefix corresponds to the switch, the ESI corresponds to the ATM interface, and the Selector field corresponds to the specific subinterface of the interface.

For a discussion of Cisco's method of automatically assigning ATM addresses, refer to the "Configuring LAN Emulation" chapter in the *Router Products Configuration Guide*.

Examples

The following example uses an ESI template to specify the part of the ATM address corresponding to the interface; the remaining parts of the ATM address come from automatic assignment:

```
ATM(config-if)# lane client-atm-address...0800.200C.1001.**
```

The following example uses a prefix template to specify the part of the ATM address corresponding to the switch; the remaining parts of the ATM address come from automatic assignment:

```
ATM(config-if)# lane client-atm-address 47.000014155551212f.00.00...
```

Related Command

lane client

lane config-atm-address

Use the **lane config-atm-address** interface configuration command to specify a given configuration server's ATM address. To remove an assigned ATM address, use the **no** form of this command**.**

lane config-atm-address *atm-address-template*
no lane config-atm-address [*atm-address-template*]

Syntax Description

atm-address-template	ATM address or a template in which wildcard characters are replaced by any nibble or group of nibbles of the prefix bytes, the ESI bytes, or the selector byte of the automatically assigned ATM address.

Default

No specific ATM address or method is set.

Command Type

IOS LAN emulation command.

Command Mode

Interface configuration

Usage Guidelines

This command causes the LANE client on the subinterface to use the specified ATM address (rather than the ATM address provided by the ILMI) to locate the configuration server.

ATM Addresses. A LANE ATM address has the same syntax as an NSAP (but it is not a network-level address):

- A 13-byte prefix that includes the following fields defined by the ATM Forum: AFI (Authority and Format Identifier) field (1 byte), DCC (Data Country Code) or ICD (International Code Designator) field (2 bytes), DFI field (Domain Specific Part Format Identifier) (1 byte), Administrative Authority field (3 bytes), Reserved field (2 bytes), Routing Domain field (2 bytes), and Area field (2 bytes).
- A 6-byte end-system identifier (ESI)
- A 1-byte selector field

Address Templates. LANE ATM address templates can use two types of wildcards: an asterisk (*) to match any single character, and an ellipsis (...) to match any number of leading or trailing characters. The values of the characters replaced by wildcards come from the automatically assigned ATM address.

In LANE, a *prefix template* explicitly matches the ATM address prefix but uses wildcards for the ESI and selector fields. An *ESI template* explicitly matches the ESI field but uses wildcards for the prefix and selector.

In Cisco's implementation of LANE, the prefix corresponds to the switch, the ESI corresponds to the ATM interface, and the Selector field corresponds to the specific subinterface of the interface.

For a discussion of Cisco's method of automatically assigning ATM addresses, refer to the "Configuring the ATM Module" chapter.

Example

The following example specifies the LANE configuration server's ATM address:

```
ATM(config-subif)#lane config-atm-address 39.000000000000014155551211.0800200c1001.00
```

lane le-arp

Use the **lane le-arp** interface configuration command to add a static entry to the LE ARP table of the LANE client configured on the specified subinterface. To remove a static entry from the LE ARP table of the LANE client on the specified subinterface, use the **no** form of this command.

lane le-arp *mac-address atm-address*
no lane le-arp *mac-address atm-address*

Syntax Description

mac-address	MAC address to bind to the specified ATM address.
atm-address	ATM address.

Default

No static address bindings are provided.

Command Type

IOS LAN emulation command.

Command Mode

Interface configuration

Usage Guidelines

This command only adds or removes a static entry binding a MAC address to an ATM address. It does not add or remove dynamic entries. Removing the static entry for a specified ATM address from an LE ARP table does not release Data Direct VCCs established to that ATM address. However, clearing a static entry clears any fast-cache entries that were created from the MAC address-to-ATM address binding.

Static LE ARP entries are not aged and are not removed automatically.

To remove dynamic entries from the LE ARP table of the LANE client on the specified subinterface, use the **clear lane le-arp** command.

Example

The following command adds a static entry to the LE ARP table:

```
ATM(config-if)# lane le-arp 0800.aa00.0101 47.000014155551212f.00.00.0800.200C.1001.01
```

lane pvc

Use the **lane pvc** interface configuration command to associate an ATM address, and optionally a LANE client ID, with a PVC previously created on the specified subinterface. To remove a prior entry, use the **no** form of this command.

lane pvc *vcd atm-address* (for LANE client configuration)
no lane pvc *vcd* [*atm-address* [*lec-id*]]

Syntax Description

vcd	Virtual channel descriptor that identifies the PVC.
atm-address	ATM address of the LANE component at the other end of the PVC.
lec-id	(Not used when the command is used to configure a LANE client; required when the command is used to configure a LANE server) Number in the range 1 to 65279 that uniquely identifies the LANE client connected to this PVC.

Defaults

No PVC is created. No virtual channel descriptor (VCD), ATM address, and LANE client ID are provided for PVCs.

Command Type

IOS LAN emulation command.

Command Mode

Interface configuration

Usage Guidelines

Ordinarily, switched virtual circuits (SVCs) are used instead of PVCs for communication within emulated LANs, and unique LANE client IDs are assigned dynamically by the LANE server. This command is used only when PVCs are used.

Use this command to configure a LANE client when PVCs are used instead of SVCs for Data Direct circuits between LANE clients; this command identifies the ATM address of the LANE client at the other end of the virtual circuit. In this case, do not use the *lec-id* argument.

To create the PVC, use the **atm pvc** command. The *vcd* value in the **lane pvc** command must match a *vcd* value in an **atm pvc** command.

Use of the **lane pvc** command on a LANE client and the **lane register** command on a LANE server enable the use of PVCs, instead of SVCs alone, for LANE.

If you use PVCs for the Control Direct VCCs, you must also use PVCs for the Control Distribute VCCs. If you use PVCs for the Multicast Send VCCs, you must also use PVCs for the Multicast Forward VCCs.

Example

The following example associates an ATM address with PVC 100:

```
ATM(config-subif)#lane pvc 100 55.00550055005500550055.00000C0425C2.00
```

Related Commands

lane register

lane register

Use the **lane register** interface configuration command to register a LANE client that is connected by PVC to the LANE server on the specified subinterface. To remove a prior entry, use the **no** form of this command.

lane register *vcd mac-address atm-address*
no lane register *vcd* [*mac-address atm-address*]

Syntax Description

vcd	Virtual channel descriptor of the Server Direct PVC through which the LANE client is connected to the LANE server.
mac-address	MAC address of the LANE client.
atm-address	ATM address of the LANE client.

Defaults

No PVC is defined. No MAC address and ATM address are provided.

Command Type

IOS LAN emulation command.

Command Mode

Interface configuration

Usage Guidelines

Ordinarily, SVCs are used instead of PVCs for communications within emulated LANs, and registration occurs dynamically via the LANE protocol. This command is used only when PVCs are used.

When PVCs are used instead of SVCs for Server Direct circuits between the LANE server and LANE clients, use this command on the LANE server to identify the MAC address and the ATM address of the LANE client at the other end of a virtual circuit. If the client at the other end has a different ATM address, it is not allowed to join the emulated LAN. This can function as a security check.

Use the **lane pvc** command on a LANE client and the **lane register** command on a LANE server to enable use of PVCs, instead of SVCs alone, for LANE. The *vcd* value in the **lane register** command must match the *vcd* value in a **lane pvc** command and in an **atm pvc** command.

If you use PVCs for the Control Direct VCCs, you must also use PVCs for the Control Distribute VCCs. If you use PVCs for the Multicast Send VCCs, you must also use PVCs for the Multicast Forward VCCs

Related Commands

lane pvc

show lane

Use the **show lane** EXEC command to display global and per-VCC LANE information for all the LANE components configured on an interface or any of its subinterfaces, on a specified subinterface, or on an emulated LAN.

show lane [**interface atm 0** [**.***subinterface-number*] | **name** *elan-name*] [**brief**]

Syntax Description

interface atm 0	(Optional) ATM interface 0.
.*subinterface-number*	(Optional) Subinterface number.
name *elan-name*	(Optional) Name of emulated LAN. Maximum length is 32 characters.
brief	(Optional) Keyword used to display the global information, but not the per-VCC information.

Command Type

IOS LAN emulation command.

Command Mode

EXEC

Usage Guidelines

Entering the **show lane** command is equivalent to entering the **show lane client** commands.

Example

The following is sample output of the **show lane** command:

```
ATM#show lane
LE Client ATM0.2  ELAN name: blue  Admin: up  State: operational
Client ID: 1
HW Address: 0040.0bf0.0020   Type: ethernet            Max Frame Size: 1516
ATM Address: 39.000000550055005500550055.00400BF00020.02

 VCD  rxFrames  txFrames  Type       ATM Address
 0         0         0  configure 39.000000550055005500550055.00000C0425C2.00
 14        3         4  direct    39.000000550055005500550055.00000C0425C0.01
 15        1         0  distribute39.000000550055005500550055.00000C0425C0.01
 16        0         8  send      39.000000550055005500550055.00000C0425C1.01
 17        14        0  forward   39.000000550055005500550055.00000C0425C1.01
 18        25        28 data      39.000000550055005500550055.00400BF00420.00

ATM#
```

Table 7-7 describes significant fields in the example.

Table 7-7 show lane Command Field Descriptions

Field	Description
LE Client	Identifies the following lines as applying to a LANE client. These lines are also displayed in output from the **show lane client** command.
ATM 0.1	Interface or subinterface this LANE client is on.
ELAN name	Name of the emulated LAN this client is linked to.
State	Status of this LANE client. Possible states include initialState, lecsConnect, configure, join, busConnect, and operational.
HW Address	MAC address, in dotted hexadecimal notation, assigned to this LANE client.
Type	Type of emulated LAN.
Max Frame Size	Maximum frame size on this type of LAN.
ATM Address	ATM address of this LANE client.
VCD	Virtual channel descriptor for each of the VCCs established for this LANE client.
rxFrames	Number of frames received on the VCC.
txFrames	Number of frames transmitted on the VCC.
Type	Type of VCC; same as the SVC and PVC types. Possible VCC types are configure, direct, distribute, send, forward, and data.
ATM Address	ATM address of the LANE component at the other end of the VCC.

show lane client

Use the **show lane client** EXEC command to display global and per-VCC LANE information for all the LANE clients configured on an interface or any of its subinterfaces, on a specified subinterface, or on an emulated LAN.

show lane client [**interface atm 0** [**.***subinterface-number*] **| name** *elan-name*] [**brief**]

Syntax Description

interface atm 0	(Optional) ATM interface 0.
.*subinterface-number*	(Optional) Subinterface number.
name *elan-name*	(Optional) Name of the emulated LAN. Maximum length is 32 characters.
brief	(Optional) Keyword used to display the global information, but not the per-VCC information.

Command Type

IOS LAN emulation command.

Command Mode

EXEC

Example

The following is sample output from the **show lane client** command:

```
Router# show lane client

LE Client ATM0.2  ELAN name: blue  Admin: up  State: operational
Client ID: 1
HW Address: 0040.0bf0.0020   Type: ethernet            Max Frame Size: 1516
ATM Address: 39.000000550055005500550055.00400BF00020.02

 VCD  rxFrames  txFrames  Type       ATM Address
 0         0         0  configure 39.000000550055005500550055.00000C0425C2.00
 14      3       4 direct   39.000000550055005500550055.00000C0425C0.01  15      1
0  distribute39.000000550055005500550055.00000C0425C0.01
 16        0         8  send      39.000000550055005500550055.00000C0425C1.01
 17        14        0  forward   39.000000550055005500550055.00000C0425C1.01
 18        25        28  data     39.000000550055005500550055.00400BF00420.00

ATM#
```

Table 7-7 describes significant fields in the example.

Table 7-8 show lane client Command Field Descriptions

Field	Description
LE Client	Identifies the following lines as applying to a LANE client. These lines are also displayed in output from the **show lane client** command.
ATM 0.1	Interface or subinterface this LANE client is on.
ELAN name	Name of the emulated LAN this client is linked to.
State	Status of this LANE client. Possible states include initialState, lecsConnect, configure, join, busConnect, and operational.
HW Address	MAC address, in dotted hexadecimal notation, assigned to this LANE client.
Type	Type of emulated LAN.
Max Frame Size	Maximum frame size on this type of LAN.
ATM Address	ATM address of this LANE client.
VCD	Virtual channel descriptor for each of the VCCs established for this LANE client.
rxFrames	Number of frames received on the VCC.
txFrames	Number of frames transmitted on the VCC.
Type	Type of VCC; same as the SVC and PVC types. Possible VCC types are configure, direct, distribute, send, forward, and data.
ATM Address	ATM address of the LANE component at the other end of the VCC.

show lane le-arp

Use the **show lane le-arp** EXEC command to display the LANE ARP table of the LANE client configured on an interface or any of its subinterfaces, on a specified subinterface, or on an emulated LAN.

show lane le-arp [**interface atm 0** [**.***subinterface-number*] | **name** *elan-name*]

Syntax Description

interface atm 0	(Optional) ATM interface 0.
.*subinterface-number*	Subinterface number.
name *elan-name*	(Optional) Specifies the name of the emulated LAN. Maximum length is 32 characters.

Command Type

IOS LAN emulation command.

Command Mode

EXEC

Example

The following is sample output of the **show lane le-arp** command:

```
ATM# show lane le-arp
Hardware Addr   ATM Address                                  VCD  Interface
0000.0c15.a2b5  39.000000000000000000000000.00000C15A2B5.01  39  ATM 0.1
0000.0c15.f3e5  39.000000000000000000000000.00000C15F3E5.01  25* ATM 0.1
```

Table 7-9 describes significant fields shown in the display.

Table 7-9 show lane le-arp Command Field Descriptions

Field	Description
Hardware Addr	The MAC address, in dotted hexadecimal notation, assigned to the LANE component at the other end of this VCD.
ATM Address	ATM address of the LANE component at the other end of this VCD.
VCD	Virtual circuit descriptor.
Interface	Interface or subinterface used to reach the specified component.