ATM OAM Ping

First Published: 12.0(21)S
Last Updated: February 28, 2006

The ATM OAM Ping feature sends an ATM Operation, Administration, and Maintenance (OAM) packet to confirm the connectivity of a specific permanent virtual circuit (PVC). The status of the PVC is displayed when a response to the OAM packet is received. The ATM OAM Ping feature allows the network administrator to verify PVC integrity and facilitates ATM network troubleshooting.

History for the ATM OAM Ping Feature

Release	Modification
12.0(21)S	This feature was introduced.
12.2(13)T	This feature was integrated into Cisco IOS Release 12.2(13)T.
12.2(25)S	This feature was integrated into Cisco IOS Release 12.2(25)S.
12.2(18)SXE	This feature was integrated into Cisco IOS Release 12.2(18)SXE.
12.2(28)SB	This feature was integrated into Cisco IOS Release 12.2(28)SB.

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Contents

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Prerequisites for ATM OAM Ping

A PVC corresponding to the virtual path identifier (VPI) and virtual channel identifier (VCI) values entered with the **ping** command should already exist. (For Cisco 827 series routers, the virtual circuit need not exist.)

For information about how to configure ATM PVCs, see the section "Configuring PVCs" in the chapter "Configuring ATM" in the *Cisco IOS Wide-Area Networking Configuration Guide*, Release 12.3.

Restrictions for ATM OAM Ping

The ATM OAM Ping feature does not support pings based on the following:

- Network service access point (NSAP) addresses
- Multiple-hop loopbacks
- Loopback location identification

Information About ATM OAM Ping

To use the ATM OAM Ping, you must understand the following concept:

Uses for ATM OAM Ping Command

The ATM OAM Ping feature modifies the **ping** command, which can be used to send an OAM packet to verify the PVC connectivity. The status of the PVC is displayed when a response to the OAM packet is received. This is a common method for testing the accessibility of the devices.

The **ping atm interface atm** command provides two ATM OAM ping options:

- End loopback—Verifies end-to-end PVC integrity.
- Segment loopback—Verifies PVC integrity to the immediate neighboring ATM device.

The **ping atm interface atm** command is used to determine the following:

- Whether a remote host is active or inactive.
- The round-trip delay in communicating with the host.
- Packet loss.

The simpler **ping** command provides an interactive mode for testing ATM network connectivity. The **ping** command first sends an OAM command loopback cell to the destination and then waits for an OAM response loopback cell. The ping is successful only when the following criteria are met:

- The OAM command loopback cell reaches the destination.
- The destination is able to send an OAM loopback response cell back to the source within a predetermined time called a *timeout*. The default value of the timeout is 2 seconds on Cisco routers.

How to Use ATM OAM Ping

See the following sections for tasks that use **ping** commands to test network connectivity in an ATM network. The tasks in this list are optional.

- Testing Network Connectivity Using ATM Interface Ping (Normal Mode), page 3
- Testing Network Connectivity Using ATM Interface Ping (Interactive Mode), page 4
- Aborting a Ping Session, page 5

Testing Network Connectivity Using ATM Interface Ping (Normal Mode)

The task in this section tests network connectivity using the **ping atm interface atm** command in normal mode; that is, by entering all values for the **ping** test on the command line.

SUMMARY STEPS

1. **enable**
2. **ping atm interface atm** *interface-number vpi-value vci-value* [**end-loopback** [*repeat* [*timeout*]] | **seg-loopback** [*repeat* [*timeout*]]]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**ping atm interface atm** *interface-number vpi-value vci-value* [**end-loopback** [*repeat* [*timeout*]] | **seg-loopback** [*repeat* [*timeout*]]] **Example:** `Router# ping atm interface atm 1/1.1 0 500 end-loopback 1 2`	Displays a response to confirm the connectivity of a specific PVC. • **atm** *interface-number*—ATM interface name. • *vpi-value*—Virtual path identifier. Range: 0 to 255. • *vci-value*—Virtual channel identifier. Range: 0 to 65535. • **end-loopback**—Sends ATM end loopback cells. This is the default. • **seg-loopback**—Sends ATM segment loopback cells. • *repeat*—Number of ping packets that are sent to the destination. Range: 1 to 1000. Default: 5. • *timeout*—Timeout interval, in seconds. Range: 1 to 30. Default: 2.

Testing Network Connectivity Using ATM Interface Ping (Interactive Mode)

The task in this section tests network connectivity using the **ping** command by providing inputs in the interactive mode; that is, by providing values for the **ping** test by typing the value after the prompts displayed and pressing the Enter key. Press the Enter key without supplying a value to use the default.

SUMMARY STEPS

1. **enable**
2. **ping**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**ping** **Example:** `Router# ping`	Displays a response to confirm the connectivity of a specific PVC.

Aborting a Ping Session

To terminate a ping session, type the escape sequence—by default, **Ctrl-Shift-6**.

Configuration Examples for ATM OAM Ping

This section provides the following configuration examples:

Verifying the Connectivity of a Specific PVC: Example

The following example helps verify the connectivity of a specific PVC by sending an ATM OAM packet and confirms the connectivity when it is successful:

```
Router# show atm pvc 0/500

VC 0/500 doesn't exist on interface ATM1/0 - cannot display
ATM1/1.1: VCD: 2, VPI: 0, VCI: 500
UBR, PeakRate: N/A (UBR VC)
AAL5-LLC/SNAP, etype:0x0, Flags: 0xC20, VCmode: 0x0
OAM frequency: 10 second(s), OAM retry frequency: 1 second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM END CC Activate retry count: 3, OAM END CC Deactivate retry count: 3
OAM END CC retry frequency: 30 second(s),
OAM SEGMENT CC Activate retry count: 3, OAM SEGMENT CC Deactivate retry count: 3
OAM SEGMENT CC retry frequency: 30 second(s),
OAM Loopback status: OAM Received
OAM VC state: Verified
ILMI VC state: Not Managed
OAM END CC status: OAM CC Ready
OAM END CC VC state: Verified
OAM SEGMENT CC status: OAM CC Ready
OAM SEGMENT CC VC state: Verified
VC is managed by OAM.
InARP frequency: 15 minutes(s)
InPkts: 289035, OutPkts: 217088, InBytes: 21165546, OutBytes: 17367793
InPRoc: 289039, OutPRoc: 289274
InFast: 0, OutFast: 0, InAS: 1, OutAS: 2
Out CLP=1 Pkts: 0
OAM cells received: 119900
F5 InEndloop: 119809, F5 InSegloop: 0,
F5 InEndcc: 0, F5 InSegcc: 0, F5 InAIS: 92, F5 InRDI: 0
OAM cells sent: 119902
F5 OutEndloop: 119810, F5 OutSegloop: 0,
F5 OutEndcc: 0, F5 OutSegcc: 0, F5 OutAIS: 0, F5 OutRDI: 92
OAM cell drops: 0
Status: UP
```

Normal Mode ping atm interface atm Command: Example

The following example shows sample output for the **ping atm interface atm** command in normal mode:

```
Router# ping atm interface atm1/1.1 0 500

Type escape sequence to abort.
Sending 5, 53-byte end-to-end OAM echoes, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/16/52 ms

Router# ping atm interface atm1/1.1 0 500 seg-loopback

Type escape sequence to abort.
Sending 5, 53-byte segment OAM echoes, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms

Router# ping atm interface atm1/1.1 0 500 end-loopback 100 25

Type escape sequence to abort.
Sending 100, 53-byte end-to-end OAM echoes, timeout is 25 seconds:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (100/100), round-trip min/avg/max = 4/13/180 ms

Router# ping atm interface atm1/1.1 0 500 seg-loopback 50 20

Type escape sequence to abort.
Sending 50, 53-byte segment OAM echoes, timeout is 20 seconds:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (50/50), round-trip min/avg/max = 1/1/4 ms

Router# show atm pvc 0/500

VC 0/500 doesn't exist on interface ATM1/0 - cannot display
ATM1/1.1: VCD: 2, VPI: 0, VCI: 500
UBR, PeakRate: N/A (UBR VC)
AAL5-LLC/SNAP, etype:0x0, Flags: 0xC20, VCmode: 0x0
OAM frequency: 10 second(s), OAM retry frequency: 1 second(s)
OAM up retry count: 3, OAM down retry count: 5
OAM END CC Activate retry count: 3, OAM END CC Deactivate retry count: 3
OAM END CC retry frequency: 30 second(s),
OAM SEGMENT CC Activate retry count: 3, OAM SEGMENT CC Deactivate retry count: 3
OAM SEGMENT CC retry frequency: 30 second(s),
OAM Loopback status: OAM Received
OAM VC state: Verified
ILMI VC state: Not Managed
OAM END CC status: OAM CC Ready
OAM END CC VC state: Verified
OAM SEGMENT CC status: OAM CC Ready
OAM SEGMENT CC VC state: Verified
VC is managed by OAM.
InARP frequency: 15 minutes(s)
InPkts: 290975, OutPkts: 219031, InBytes: 21306632, OutBytes: 17509085
InPRoc: 290979, OutPRoc: 291219
InFast: 0, OutFast: 0, InAS: 1, OutAS: 2
Out CLP=1 Pkts: 0
OAM cells received: 120881
F5 InEndloop: 120734, F5 InSegloop: 55,
F5 InEndcc: 0, F5 InSegcc: 0, F5 InAIS: 92, F5 InRDI: 0
OAM cells sent: 120882
F5 OutEndloop: 120735, F5 OutSegloop: 55,
F5 OutEndcc: 0, F5 OutSegcc: 0, F5 OutAIS: 0, F5 OutRDI: 92
OAM cell drops: 0
Status: UP
```

Interactive ping Command: Example

The following is sample output for the **ping** command in the interactive mode:

```
Router# ping

Protocol [ip]: atm

ATM Interface: atm1/1.1

VPI value [0]: 0

VCI value [1]: 500

Loopback - End(0), Segment(1) [0]:
Repeat Count [5]:
Timeout [2]:
Type escape sequence to abort.
Sending 5, 53-byte end-to-end OAM echoes, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/9/12 ms
```

Additional References

The following sections provide references related to the ATM OAM Ping.

Related Documents

Related Topic	Document Title
Configuring PVCs and mapping a protocol address to a PVC while configuring ATM	"Creating PVCs" chapter in the *Cisco IOS Wide-Area Networking Configuration Guide*, Release 12.3
Configuring ATM	"Configuring ATM" chapter in the *Cisco IOS Wide-Area Networking Configuration Guide*, Release 12.3
WAN commands, complete command syntax, command mode, command history, defaults, usage guidelines, and examples	*Cisco IOS Wide-Area Networking Command Reference*, Release 12.3
Configuring ATM OAM traffic reduction	*ATM OAM Traffic Reduction* feature module
Configuring PVCs with or without OAM	*Using OAM for PVC Management* sample configuration
Detecting failures when using OAM cells and PVC management	*Troubleshooting PVC Failures When Using OAM Cells and PVC Management* technical note

Standards

Standards	Title
ITU-T Specification I.610 (ITU-T specification for B-ISDN operation and maintenance principles and functions).	*I.610 Series I: Integrated Services Digital Network, Maintenance principles*

MIBs

MIBs	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFCs	Title
None	—

Technical Assistance

Description	Link
The Cisco Technical Support & Documentation website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport

Command Reference

This section documents a modified command only.

- **ping atm interface atm**

ping atm interface atm

To perform an ATM Operation Administration Maintenance (OAM) ping on a specific permanent virtual circuit (PVC), use the **ping atm interface atm** command in privileged EXEC mode.

ping atm interface atm *interface-number vpi-value vci-value* [**end-loopback** [*repeat* [*timeout*]] | **seg-loopback** [*repeat* [*timeout*]]]

Syntax Description

atm *interface_number*	ATM interface name.
vpi-value	Virtual path identifier. Range: 0 to 255.
vci-value	Virtual channel identifier. Range: 0 to 65535.
end-loopback	(Optional) Send ATM end loopback cells. This is the default.
seg-loopback	(Optional) Send ATM segment loopback cells.
repeat	(Optional) Number of ping packets that are sent to the destination address. Range: 1 to 1000. Default: 5.
timeout	(Optional) Timeout interval, in seconds. Range: 1 to 30. Default: 2.

Command Default

End loopback
Repeats: 5
Timeout interval: 2 seconds

Command Modes

Privileged EXEC

Command History

Release	Modification
11.4	This command was introduced on the LightStream 1010.
12.0(21)S	Support for this command was integrated into Cisco IOS Release 12.0(21)S.
12.2(13)T	Support for this command was integrated into Cisco IOS Release 12.2(13)T.
12.2(25)S	Support for this command was integrated into Cisco IOS Release 12.2(25)S.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Usage Guidelines

The **ping atm interface atm** command sends an OAM packet and indicates when a response is received. It can be used either in normal mode or in interactive mode. The **ping atm interface atm** command provides two ATM OAM ping options:

- End loopback—Verifies end-to-end PVC integrity.
- Segment loopback—Verifies PVC integrity to the neighboring ATM device.

Examples

In the following example, an ATM OAM ping with a 15-second timeout verifies end-to-end connectivity for PVC 0/500 in the normal mode:

```
Router# ping atm interface atm 1/1.1 0 500 end-loopback 30 15

Type escape sequence to abort.
Sending 30, 53-byte end-to-end OAM echoes, timeout is 15 seconds:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (30/30), round-trip min/avg/max = 1/1/4 ms
```

In the following example, an ATM OAM ping verifies connectivity to the first-hop ATM switch on PVC 1/100 in the normal mode:

```
Router# ping atm interface atm 1/1.1 0 500 seg-loopback 30 10

Type escape sequence to abort.
Sending 30, 53-byte segment OAM echoes, timeout is 10 seconds:
!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
Success rate is 100 percent (30/30), round-trip min/avg/max = 1/1/4 ms
```

Table 1 describes the significant fields shown in the display.

Table 1 ping atm Field Descriptions

Field	Description
Success rate is 100 percent	Percentage of packets successfully echoed back to the router. Anything less than 80 percent is usually considered problematic.
!!!!!!	Each exclamation point (!) indicates receipt of a reply. A period (.) indicates that an OAM response cell was not received within the timeout interval.
round-trip min/avg/max = 1/1/4 ms	Round-trip travel time intervals for the OAM loopback cells, including minimum/average/maximum (in milliseconds).

The following example verifies connectivity to the neighboring ATM device for the ATM PVC with the virtual path identifier (VPI)/virtual channel identifier (VCI) value 0/500 in the interactive mode:

```
Router# ping

Protocol [ip]:atm

ATM Interface:atm1/1.1

VPI value [0]:0

VCI value [1]:500

Loopback - End(0), Segment(1) [0]:1

Repeat Count [5]:
Timeout [2]:

Type escape sequence to abort.
Sending 5, 53-byte segment OAM echoes, timeout is 2 seconds:
!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

Table 2 describes the **ping** fields shown in the display.

Table 2 ping Field Descriptions for ATM

Field	Description
Protocol [ip]:	Prompt for a supported protocol.
ATM Interface:	Prompt for the ATM interface.
VPI value [0]:	Prompt for the virtual path identifier. Default: 0.
VCI value [1]:	Prompt for the virtual channel identifier. Default: 1.
Loopback - End(0), Segment(1) [0]:	Prompt to specify end loopback, which verifies end-to-end PVC integrity, or segment loopback, which verifies PVC integrity to the neighboring ATM device. Default: end loopback.
Repeat Count [5]:	Number of ping packets that will be sent to the destination. Default: 5.
Timeout [2]:	Timeout interval, in seconds. Default: 2.

Related Commands

Command	Description
debug atm oam	Displays information about ATM OAM events.
show atm pvc	Displays the OAM status information.
show atm oam auto-detect	Displays ATM OAM autodetect statistics.