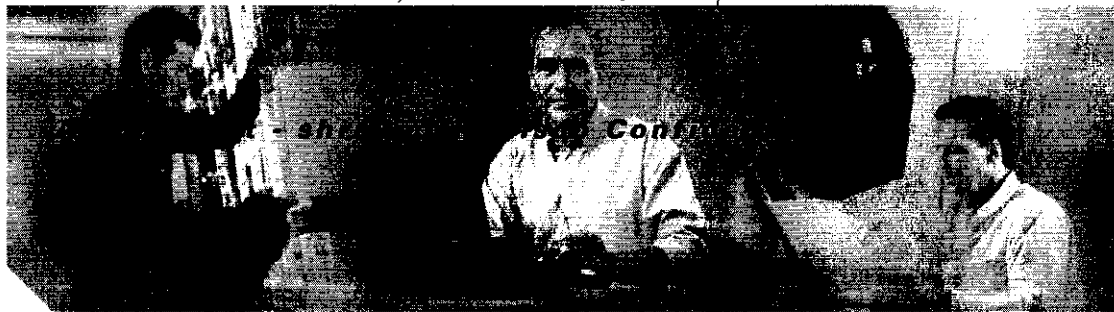


Edited in pencil  
for transmittal  
by PDF scan

In from Sheela 10/5/04

645



Edited  
The Group  
10/6/2004

## OAM Segment Endpoint

The OAM Segment Endpoint feature terminates segment Operation, Administration and Maintenance (OAM) cells arriving on the L2 transport virtual circuit (VC).

Sp: Layer 2

### Feature History for the OAM Segment Endpoint Feature

Release	Modification
12.0(30)S	This feature was introduced.

### Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

## Contents

- Prerequisites for OAM Segment Endpoint, page 1
- Restrictions for OAM Segment Endpoint, page 2
- Information About OAM Segment Endpoint, page 2
- How to Configure OAM Segment Endpoint, page 2
- Configuration Examples for OAM Segment Endpoint, page 4
- Additional References, page 6
- Command Reference, page 8
- Glossary, page 10

## Prerequisites for OAM Segment Endpoint

This feature can be enabled only under L2 transport PVC sub mode.

Is this the actual  
name of a mode?  
If not, L2 and  
PVC should be  
expanded.



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# Restrictions for OAM Segment Endpoint

The following restrictions apply to the OAM Segment Endpoint feature:

- The oam attach card (ac) segment endpoint configuration is applicable only in the case of L2 Transport Virtual Circuits (VCs) / Virtual Paths (VPs).
- In 7200 routers, by default the segment loop back cells for VPs are handled in the providers edge (PE) and ~~are~~ not transported on the pseudo wire transparently.
- In GSR, the loop back segment OAM cells in VCs with encapsulation ATM adaptation layer 5 (AAL5) are handled in the PE and ~~are~~ not transported on the pseudo wire transparently.

Cisco 12000 Series Internet router

Could not find the phrase "attach card" in all of CCO or verify this (ac) lowercase acronym. Please confirm the expression. Is acronym actually needed?

Sp. Caps needed here? Is it a special term? If not, what word does the slash stand for?

# Information About OAM Segment Endpoint

To configure <sup>the</sup> OAM Segment Endpoint feature, you should understand the following concept:

- F5 Segment Loopback, page 2

Cisco 12000 series Internet router

Global: loopback (one word) throughout

# F5 Segment Loopback

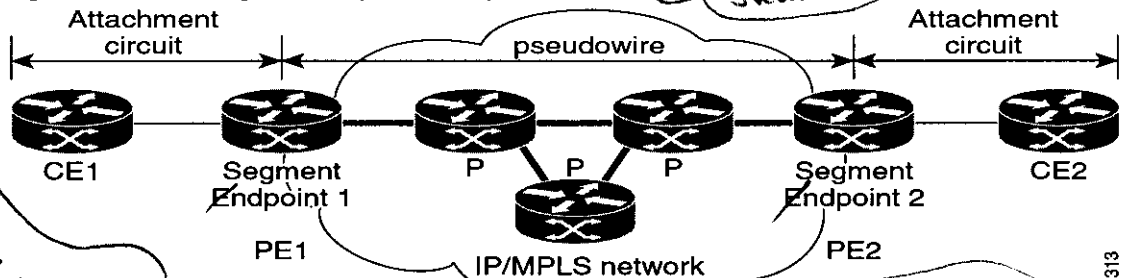
The Segment loop back management is not done based on F5 segment loop back cells. The GSR or 7200 router responds only to an incoming command F5 segment loop back cells.

- L2 transport VCs <sup>singular</sup>
- If the OAM Segment Endpoint feature is configured, the F5 segment loop back cells are terminated; otherwise they are transferred on the pseudo wire.

- Non-L2 Transport VCs <sup>plural</sup>
- By default, all the terminating PVCs manage F5 segment loop back cells.

Figure 1 shows the working of <sup>the</sup> OAM Segment Endpoint <sup>feature (?)</sup>.

Figure 1 OAM Segment Endpoint



Since this section is supposed to explain the concept named in the heading, please say what F5 segment loopback is. Otherwise this section is not titled correctly.

Should these be block labels? Check capitalization. If bullets, what are they structurally?

What is it that's being shown?

Please read this sentence for sense. I don't see what it means.

This figure has been stretched. Must not resize figures. Please restore original size.

# How to Configure OAM Segment Endpoint

See the following sections for task <sup>s</sup> that use <sup>the</sup> oam-ac segment endpoint command to terminate the segment OAM cells on a VC.

keep with next

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- Configuring OAM Segment Endpoint, page 3 (Required)
- Verifying OAM Segment Endpoint, page 4 (Optional)

*lowercase*

*please verify that lowercase acronym is correct (see p. 2)*

## Configuring OAM Segment Endpoint

This feature coexists with OAM emulation for L2 VCs. If OAM emulation is enabled already, oam ac segment endpoint configuration is redundant. By default, F4 distributed Operations, Administration and Maintenance (dOAM) is enabled.

*Sp.*

*caps*

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm slot/port.subinterface-number**
4. **pvc vpi/vci l2transport**
5. **oam-ac segment endpoint**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  Example: Router> enable	Enables privileged EXEC mode.  • Enter your password if prompted.
Step 2	<b>configure terminal</b>  Example: Router# configure terminal	Enters global configuration mode.
Step 3	<b>interface atm slot/port.subinterface-number</b>  Example: Router# interface atm1/1	Enters <u>atm</u> interface mode.
Step 4	<b>pvc vpi/vci l2transport</b>  Example: Router# pvc 0/100 l2transport	Creates an ATM PVC and enters L2 transport <u>atm</u> virtual circuit configuration sub mode.
Step 5	<b>oam-ac segment endpoint</b>  Example: Router# oam-ac segment endpoint	Terminates loop back cells arriving on the L2 transport VC.

**Alpha Draft - shravich - Cisco Confidential****Verifying OAM Segment Endpoint**

To verify that the OAM Segment Endpoint feature is working correctly, use the following steps to monitor the loop back cells (arriving on the L2 transport VC) that are being terminated on ATM links in a network.

Sp.

**SUMMARY STEPS**

1. **enable**
2. **attach slot-number**
3. **enable**
4. **show atm pvc [vpi/vci | name | interface atm interface-number]**

**DETAILED STEPS**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode.  • Enter your password if prompted.
<b>Step 2</b>	<b>attach slot-number</b>  <b>Example:</b> Router# attach 1	Connects to the line card in slot 1.
<b>Step 3</b>	<b>enable</b>  <b>Example:</b> Lc-Slot1> enable	Enables privileged EXEC mode in the line card.  • Enter your password if prompted.
<b>Step 4</b>	<b>show atm pvc [vpi/vci   name   interface atm interface-number]</b>  <b>Example:</b> Router# show atm pvc 0/100	Displays all ATM PVCs and traffic information.

**Configuration Examples for OAM Segment Endpoint**

This section contains the following configuration and verification examples:

- OAM Segment Endpoint Configuration: Example, page 4
- Verification Examples, page 5

**OAM Segment Endpoint Configuration: Example**

(Block label) ~~+~~ VC L2 transport

```

Router(config)# interface atm1/1
Router(config-if)# pvc 0/100 l2transport

```

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```
Router(cfg-if-atm-l2trans-pvc)# oam-ac segment endpoint
Router(cfg-if-atm-l2trans-pvc)# end
```

Block label

**2. VP L2 transport**

```
Router(config)# interface atm1/1
Router(config-if)# atm pvp 40 l2transport
Router(cfg-if-atm-l2trans-pvp)# oam-ac segment endpoint
Router(cfg-if-atm-l2trans-pvp)# end
```

The following is the sample output for the oam-ac segment endpoint command:

```
Router# show run interface atm1/1

Building configuration...

Current configuration : 177 bytes
!
interface ATM1/1
 no ip address
 no ip directed-broadcast
 atm pvp 80
 no atm enable-ilmi-trap
 no atm ilmi-keepalive
 pvc 0/100 l2transport
  oam-ac segment endpoint
!
end
```

This is sample output for the show run interface command.

Command has to be shown in full (show running-config) and not abbreviated in examples.

**Verification Examples**

The following is a sample output from the show atm pvc command. It provides the segment oam cell configuration and status information.

```
Lc-Slot1# show atm pvc 0/100

AVC 0/100 doesn't exist on interface ATM1/0 - cannot display
ATM1/1: VCD: 47, VPI: 0, VCI: 100
UBR, PeakRate: N/A (UBR VC)
AAL5 L2transport, etype:0xF, Flags: 0x10000C2E, VCmode: 0x0
OAM Cell Emulation: not configured
OAM Segment Endpoint: enabled
Interworking Method: Not Configured
Remote Circuit Status = No Alarm, Alarm Type = None
InPkts: 0, OutPkts: 0, InBytes: 0, OutBytes: 0
InPRoc: 0, OutPRoc: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
Out CLP=1 Pkts: 0
OAM cells received: 0
F5 InEndloop: 0, F5 InSegloop: 0,
F5 InEndcc: 0, F5 InSegcc: 0, F5 InAIS: 0, F5 InRDI: 0
OAM cells sent: 0
F5 OutEndloop: 0, F5 OutSegloop: 0,
F5 OutEndcc: 0, F5 OutSegcc: 0, F5 OutAIS: 0, F5 OutRDI: 0
OAM cell drops: 0
Status: UP

Lc-Slot1# show atm pvc 40/3
```

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```

ATM1/1: VCD: 48, VPI: 40, VCI: 3
UBR, PeakRate: N/A (UBR VC)
AAL5-MUX, etype:0x0, Flags: 0xD2C, VCmode: 0x0
OAM frequency: 0 second(s), OAM retry frequency: 0 second(s) OAM up retry count: 0, OAM
down retry count: 0 OAM Segment Endpoint: enabled OAM END CC Activate retry count: 0, OAM
END CC Deactivate retry count: 0 OAM END CC retry frequency: 0 second(s), OAM SEGMENT CC
Activate retry count: 0, OAM SEGMENT CC Deactivate retry
count: 0
OAM SEGMENT CC retry frequency: 0 second(s),
OAM Loopback status: OAM Disabled
OAM VC state: Not Managed
ILMI VC state: Not Managed
OAM END CC status: OAM CC Ready
OAM END CC VC state: Not Managed
OAM SEGMENT CC status: OAM CC Ready
OAM SEGMENT CC VC state: Not Managed
InARP DISABLED
InPkts: 0, OutPkts: 0, InBytes: 0, OutBytes: 0
InProc: 0, OutProc: 0, Broadcasts: 0
InFast: 0, OutFast: 0, InAS: 0, OutAS: 0
Out CLP=1 Pkts: 0
OAM cells received: 0
F4 InEndloop: 0, F4 InSegloop: 0, F4 InAIS: 0, F4 InRDI: 0
OAM cells sent: 0
F4 OutEndloop: 0, F4 OutSegloop: 0, F4 OutAIS: 0, F4 OutRDI: 0 OAM cell drops: 0
Status: UP
    
```

## Additional References

The following sections provide references related to <sup>the</sup> OAM Segment Endpoint feature.

### Related Documents

*Italics for doc. titles; give locator info. — doc type (feature module?), release*

Related Topic	Document Title
Configurations with or without OAM	Using OAM for PVC Management
<u>Show atm oam auto-detect command: complete command syntax, command mode, command history, defaults, usage guidelines, and examples</u>	ATM OAM Traffic Reduction
Detecting failures when using OAM cells and PVC management	Troubleshooting PVC Failures When Using OAM Cells and PVC Management
<del>Wide-Area Networking Configuration Guide</del>	<del>WCJ Cisco IOS Wide-Area Networking Configuration Guide</del>
<del>Wide-Area Networking Command Reference</del>	<del>WRI Cisco IOS Wide-Area Networking Command Reference</del>
Any Transport over MPLS	Any Transport over MPLS, Cisco IOS <del>Software</del> Release 12.0(28)S

WAN  
WAN

*Ital.*

*How is this subject related? ATM is not mentioned in this document.*

*Release number*

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**Standards**

Standards <sup>1</sup>	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

1. Not all supported standards are listed.

*Italics for title*

*Is this part of title? If so, initial cap.*

**MIBs**

MIBs	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

**RFCs**

RFCs	Title
RFC xxxx	<i>Encapsulation Methods for Transport of PPP/HDLC Over IP and MPLS Networks</i>
RFC xxxx	<i>PWE3 Architecture</i> Balaji: I've checked the following links (given in the func spec) in IETF and both the links resulted in "the page cannot be displayed" error. Please confirm. <a href="ftp://ftp.rfc-editor.org/in-notes/internet-drafts/draft-ietf-pwe3-atm-encap-01.txt">ftp://ftp.rfc-editor.org/in-notes/internet-drafts/draft-ietf-pwe3-atm-encap-01.txt</a> <a href="ftp://ftp.rfc-editor.org/in-notes/internet-drafts/draft-ietf-pwe3-arch-02.txt">ftp://ftp.rfc-editor.org/in-notes/internet-drafts/draft-ietf-pwe3-arch-02.txt</a>

*Fill in*

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## Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 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.	<a href="http://www.cisco.com/public/support/tac/home.shtml">http://www.cisco.com/public/support/tac/home.shtml</a>

## Command Reference

This section documents a new command.

### New Command

- oam-ac segment endpoint

# oam-ac segment endpoint

To terminate segment OAM cells on the virtual circuit (VC), use the **oam-ac segment endpoint** command in ATM vc configuration mode. To disable this, use the **no** form of this command.

**oam-ac segment endpoint**

**no oam-ac segment endpoint**

Alliene: Though segment and endpoint are required keywords I've parsed them in the syntax description table because 1. there isn't any other keyword or argument in this command to be described (in the syntax description table), 2. the IOS SAWG template guide says that the syntax description table is required if there is a command reference page in a feature module.

This command has no arguments or keywords

Can't have them both in the command name and in the syntax. A syntax description section is required, but its content may say "this command has no arguments or keywords."

**Syntax Description**

<b>segment</b>	Enables segment OAM.
<b>endpoint</b>	Enables segment OAM termination.

**Defaults**

F4 distributed Operations, Administration and Maintenance is enabled by default

**Command Modes**

ATM vc

**Command History**

Release	Modification
12.0(30)S	This command was introduced.

**Usage Guidelines**

The segment OAM cells arriving on a VC are terminated in the L2 Transport circuits. This is done by using **oam-ac segment endpoint** command in ATM VC configuration mode.

**Examples**

The following examples show how segment oam cells are monitored to detect failures on the PE in the ATM VC mode.

```

1. VC L2 transport
Router(config)# interface atm1/1
Router(config-if)# pvc 0/100 l2transport
Router(cfg-if-atm-l2trans-pvc)# oam-ac segment endpoint
Router(cfg-if-atm-l2trans-pvc)# end

2. VP L2 transport
Router(config)# interface atm1/1
Router(config-if)# atm pvp 40 l2transport
Router(cfg-if-atm-l2trans-pvp)# oam-ac segment endpoint
Router(cfg-if-atm-l2trans-pvp)# end
    
```

Block labels

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Related Commands	Command	Description
	<b>atm oam distributed</b>	Distributes the OAM processing to the <del>Line Cards (LCs)</del> .
	<b>debug atm oam</b>	Displays debugging output for ATM OAM distributed processes.
	<b>debug atm packet</b>	Displays debugging information about OAM cell contents.
	<b>debug atm event</b>	Displays debugging information about OAM events.
	<b>debug atm xdr</b>	Displays debugging information about the transfer of OAM configuration information from the RP to the line card and OAM status change notification from the line card to the RP.
	<b>show atm oam</b>	Displays the OAM status information in the line card.
	<b>show atm oam auto-detect</b>	Displays the number of number of VCs in different auto-detection states.
	<b>show atm pvc</b>	Displays all ATM PVCs and traffic information.
	<b>show atm vc summary</b>	Displays the number of VCs in different OAM VC states on a particular interface.

↓ **Glossary**

*new page*

**Customer Edge (CE) router**—a router that belongs to a customer network, which connects to a **Provider Edge (PE) router** to utilize Multiprotocol Label Switching (MPLS) Virtual Private Network (VPN) network services.

**Provider Edge (PE) router**—~~the PE router is the~~ entry point into the ~~Service Provider~~ network. The PE router is typically deployed on the edge of the network and is administered by the ~~Service Provider~~. The PE router is the redistribution point between Enhanced Interior Gateway Routing Protocol (EIGRP) and Border Gateway Protocol (BGP) in PE to CE networking.

**VPN**—~~Virtual Private Network~~. Allows IP traffic to travel securely over public TCP/IP networks and the Internet by encapsulating and encrypting all IP packets. VPN uses a tunnel to encrypt all information at the IP level.

**Note**

Refer to *Internetworking Terms and Acronyms* for terms not included in this glossary.

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