

ATM PVC F5 OAM Recovery Traps

The ATM PVC F5 OAM Recovery Traps feature introduces Simple Network Management Protocol (SNMP) traps that notify the administrator when a permanent virtual circuit (PVC) has recovered from F5 Operation, Administration, and Maintenance (OAM) end-to-end loopback failures, and F5 OAM alarm indication signal/remote defect indication (AIS/RDI) failures.

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Prerequisites for ATM PVC F5 OAM Recovery Traps

Extended ATM PVC up and down traps and ATM PVC traps for, OAM F5 AIS/RDI, and OAM F5 loopback failures and recoveries cannot be used at the same time as the legacy ATM PVC trap. The legacy ATM PVC trap must be disabled by using the **no snmp-server enable traps atm pvc** command before extended ATM PVC up and down traps and ATM PVC traps for OAM F5 CC, OAM F5 AIS/RDI, and OAM F5 loopback failures and recoveries can be configured.

OAM management must be enabled on the PVC before you can use any ATM PVC traps.

Restrictions for ATM PVC F5 OAM Recovery Traps

The F5 OAM recovery traps are supported for ATM PVCs only.

Information About ATM PVC F5 OAM Recovery Traps

F5 OAM Recovery Traps for ATM PVCs

F5 OAM cells are used to detect connectivity failures and recoveries at the ATM layer. Before the introduction of this feature, Cisco IOS software provided support for SNMP traps (also called SNMP notifications) for F5 end-to-end loopback, and F5 AIS/RDI connectivity failures on a PVC. The ATM PVC F5 OAM Recovery Traps feature introduces SNMP traps that notify the network management system (NMS) when connectivity is restored to a PVC after the following types of failures:

- F5 OAM end-to-end loopback failures
- F5 OAM segment AIS/RDI failures
- F5 OAM end-to-end AIS/RDI failures

Information in the traps includes the number of PVCs that recovered and time stamps indicating when the first and last recoveries occurred during the notification interval.

To limit the amount of traffic that can be generated by the F5 OAM failure and recovery traps, only one trap of each type can be generated in each trap interval. Each trap can report on multiple PVCs, and successive PVCs that have the same failure or recovery are reported as a range.

In addition to the traps, MIB tables are maintained to provide information about the failures and recoveries on PVCs.

For a complete description of the extended ATM PVC Trap MIB, including the supported notifications and tables, see the MIB file called CISCO-ATM-PVCTRAP-EXTN-MIB.my, available through Cisco.com at the following URL:

http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

Benefits of F5 OAM Recovery Traps for ATM PVCs

Before the introduction of this feature, when F5 OAM failures were detected on PVCs, failure notifications were sent to the NMS, and the operational state of the PVC was kept up. There was no mechanism for notifying the NMS when connectivity was restored to the PVCs after F5 OAM failures. The F5 OAM Recovery Traps feature introduces traps that asynchronously notify the NMS when PVCs have recovered from F5 OAM failures.

How to Configure F5 OAM Recovery Traps for ATM PVCs

Configuring ATM OAM Support

Perform this task to configure ATM OAM support on an ATM PVC.

SUMMARY STEPS

1. **enable**

2. **configure terminal**
3. **interface atm** *number*
4. **ip address** *ip-address mask*
5. **pvc** [*name*] *vpi* / *vci*
6. **oam-pvc manage** [**keep-vc-up** [**end aisrdi failure** | **seg aisrdi failure**]]

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**interface atm** *number* **Example:** `Router(config)# interface atm 0`	Specifies an interface for configuration and enters interface configuration mode.
Step 4	**ip address** *ip-address mask* **Example:** `Router(config-if)# ip address 10.0.0.3 255.255.255.0`	Sets a primary or secondary IP address for an interface.
Step 5	**pvc** [*name*] *vpi* / *vci* **Example:** `Router(config-if)# pvc 0/40`	Creates an ATM PVC and enters ATM virtual circuit configuration mode.
Step 6	**oam-pvc manage** [**keep-vc-up** [**end aisrdi failure**	**seg aisrdi failure**]] **Example:** `Router(config-if-atm-vc)# oam-pvc manage`	Configures ATM OAM management.

Enabling OAM F5 Failure and Recovery Traps

Perform this task to enable the MIB and SNMP notifications that support ATM OAM F5 CC management.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server enable traps atm pvc extension** {**up** | **down** | **oam failure** [**aisrdi** | **loopback** }

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**snmp-server enable traps atm pvc extension** {**up**	**down**	**oam failure** [**aisrdi**	**loopback** } **Example:** `Router(config)# snmp-server enable traps atm pvc extension oam failure aisrdi`	Enables ATM OAM F5 AIS/RDI failure and recovery traps and ATM OAM F5 end-to-end loopback failure and recovery traps.

Troubleshooting Tips

To troubleshoot PPP sessions establishment, use the following commands:

- **debug ppp authentication**
- **debug ppp negotiation**

To troubleshoot the establishment of PPP sessions that are authenticated by a RADIUS or TACACS server, use the following commands:

- **debug aaa authentication**
- **debug aaa authorization**



Caution Use **debug** commands with extreme caution because they are CPU-intensive and can seriously impact your network.

Configuration Examples for ATM PVC F5 OAM Recovery Traps

Enabling OAM PVC Managment Example

The following example shows how to enable ATM PVC OAM management.

```
Router(config)# interface ATM0/3/0.100 point-to-point

Router(config-subif)# pvc pvc100 0/100

Router(config-if-atm-vc)# oam-pvc manage
Router(config-if-atm-vc)# end
```

Note Enhanced Interior Gateway Routing Protocol (EIGRP) must be configured on the router if you want the notification packets to be sent to the NMS.

ATM PVC Extended Up and Down Notifications Example

Enabling ATM PVC extended up and down notifications: Example

The following example shows how to enable ATM PVC extended up and down notifications:

```
snmp-server community public RW
snmp-server host 172.16.61.90 public
snmp-server enable traps atm pvc extension up
snmp-server enable traps atm pvc extension down
snmp-server host 10.0.0.115 vrf Mgmt-intf version 2c public udp-port 2030
```

ATM PVC Down Notification: Example

The following sample output shows an ATM PVC in the DOWN state:

```
Router# show atm vc
Codes: DN - DOWN, IN - INACTIVE
           VCD /                                              Peak Av/Min Burst
Interface  Name         VPI   VCI Type    Encaps     SC     Kbps   Kbps Cells St
0/3/0.100  pvc100         0   100 PVC     SNAP       UBR  149760              DN
```

The following example shows the corresponding output for the ATM PVC extended down notification:

```
Received SNMPv2c Trap:
Community: public
From: 10.0.0.54
sysUpTimeInstance = 1918435
snmpTrapOID.0 = catmIntfPvcDownTrap
ifIndex.52 = 52
atmIntfPvcFailures.15 = 4
atmIntfCurrentlyFailingPVcls.15 = 1
ifDescr.52 = ATM0/3/0.100
catmPVclCurFailTime.52.0.100 = 1915435
```

```
catmPVclPrevRecoverTime.52.0.100 = 259552
catmPVclFailureReason.52.0.100 = catmLoopbackOAMFailure(1)
```

ATM PVC Up Notification: Example

The following sample output shows an ATM PVC in the UP state:

```
Router# show atm vc
Codes: DN - DOWN, IN - INACTIVE
           VCD /                                          Peak Av/Min Burst
Interface  Name         VPI   VCI Type    Encaps     SC     Kbps   Kbps Cells St
0/3/0.100  pvc100         0   100 PVC     SNAP       UBR  149760              UP
```

The following example shows the corresponding output for the ATM PVC extended up notification:

```
Received SNMPv2c Trap:
Community: public
From: 9.0.0.54
sysUpTimeInstance = 1933376
snmpTrapOID.0 = catmIntfPvcUp2Trap
ifIndex.52 = 52
catmIntfCurrentlyDownToUpPVcls.15 = 1
ifDescr.52 = ATM0/3/0.100
catmPVclCurRecoverTime.52.0.100 = 1930676
catmPVclPrevFailTime.52.0.100 = 1915435
catmPVclRecoveryReason.52.0.100 = catmLoopbackOAMRecover(1)
```

ATM OAM Failure Looback Notification Example

Enabling ATM OAM Failure Loopback Notification: Example

```
The following example shows how to enable ATM PVC OAM failure loopback notifications and
extended up and down notifications:
snmp-server community public RW
snmp-server enable traps atm pvc extension up
snmp-server enable traps atm pvc extension down
snmp-server enable traps atm pvc extension oam failure loopback
snmp-server host 10.0.0.115 vrf Mgmt-intf version 2c public udp-port 2030
```

Note If you configure the **snmp-server enable traps atm pvc extension oam failure** command, you may not see up or down traps when an OAM failure trap is generated. Additionally, the PVC will stay in the UP state.

OAM Loopback Failure Notification: Example

The following sample output shows an ATM PVC that has failed. Note that the output indicates the PVC is still in the UP state.

```
Router# show atm vc
Codes: DN - DOWN, IN - INACTIVE
           VCD /                                          Peak Av/Min Burst
Interface  Name         VPI   VCI Type    Encaps     SC     Kbps   Kbps Cells St
0/3/0.100  pvc100         0   100 PVC     SNAP       UBR  149760              UP
```

The following example shows the corresponding output for the OAM loopback failure notification:

```
Received SNMPv2c Trap:
Community: public
From: 9.0.0.54
sysUpTimeInstance = 1964155
snmpTrapOID.0 = catmIntfPvcOAMFailureTrap
ifIndex.52 = 52
catmIntfOAMFailedPVcls.15 = 65
catmIntfCurrentOAMFailingPVcls.15 = 1
ifDescr.52 = ATM0/3/0.100
catmPVclStatusTransition.52.0.100 = 1
catmPVclStatusChangeStart.52.0.100 = 1961155
catmPVclStatusChangeEnd.52.0.100 = 1961155
```

OAM Loopback Recovery Notification: Example

The following sample output shows an ATM PVC in the UP state:

```
Router# show atm vc
Codes: DN - DOWN, IN - INACTIVE
           VCD /                                            Peak Av/Min Burst
Interface  Name          VPI   VCI Type    Encaps     SC     Kbps   Kbps Cells St
0/3/0.100  pvc100          0   100 PVC     SNAP       UBR  149760              UP
```

The following example shows the corresponding output for the OAM loopback recovery notification:

```
Received SNMPv2c Trap:
Community: public
From: 9.0.0.54
sysUpTimeInstance = 1986456
snmpTrapOID.0 = catmIntfPvcOAMRecoverTrap
ifIndex.52 = 52
catmIntfOAMRcovedPVcls.15 = 10
catmIntfCurrentOAMRcovingPVcls.15 = 1
ifDescr.52 = ATM0/3/0.100
catmPVclStatusUpTransition.52.0.100 = 1
catmPVclStatusUpStart.52.0.100 = 1983456
catmPVclStatusUpEnd.52.0.100 = 1983456
```

Additional References

Related Documents

Related Topic	Document Title
OAM and ATM PVC trap support commands	*Cisco IOS Asynchronous Transfer Mode Command Reference*

Standards

Standards	Title
No new or modified standards are supported by this feature.	--

MIBs

MIBs	MIBs Link
• CISCO-ATM-PVCTRAP-EXTN-MIB.my.	To locate and download MIBs for selected platforms, Cisco IOS XE software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFCs	Title
No new or modified RFCs are supported by this features.	--

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/techsupport

Feature Information for ATM PVC F5 OAM Recovery Traps

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for ATM PVC F5 OAM Recovery Traps

Feature Name	Releases	Feature Information
ATM PVC F5 OAM Recovery Traps	Cisco IOS XE Release 2.3	The ATM PVC F5 OAM Recovery Traps feature introduces SNMP traps that notify the administrator when a PVC has recovered from F5 OAM end-to-end loopback failures and F5 OAM AIS/RDI failures. The following command was introduced: **snmp-server enable traps atm pvc extension**.