ATM AC VC Signaling and Provisioning

Bidirectional Forwarding Detection (BFD) is a generic protocol that detects faults in the bidirectional path between two forwarding engines. Virtual Circuit Connectivity Verification (VCCV), as applied to a pseudowire (PW), is a protocol that addresses the end-to-end fault detection and diagnostics for a pseudowire, for health monitoring purposes.

In the event of a fault in the local attachment circuit (AC), the ATM asynchronous feature supports keeping the virtual circuits (VC) or path provisioned on the data plane. The data plane remains continuously active so that the BFD VCCV packets are passed on to the peer within the Multiprotocol Label Switching (MPLS) core. When the interface goes down, the PVC is disabled in the line card; when the interface is up or enabled, the PVC is enabled once again.

Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

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Prerequisites for ATM AC VC Signaling and Provisioning

You need to configure the **atm asynchronous** command under the main ATM interface.

Cisco IOS Release 12.2(33)SRE and later support the ATM Attachment Circuit--VC Signaling and Provisioning feature only on Cisco 7600 series routers and the SIP-400 line card with Warlord Shared Port Adapter (SPA)(SPA-2XOC3-ATM) and Circuit Emulation over Packet (CEoP) SPAs and Black Russian SPAs (SPA-1CHOC3-CE-ATM).

Restrictions for ATM AC VC Signaling and Provisioning

- Local switching is not supported.

- PW redundancy is not supported.

- A maximum of 2000 VCs are supported with or without OAM emulation.

- Configuring the ATM asynchronous feature is only allowed under the main interface and not supported under the subinterface. The ATM interface with the ATM Asynchronous feature supports only L2transport virtual path (VP) and L2transport VC. All the other features such as bridging, VC bundle, and IP are not supported.

- Any change to the ATM VC parameters results in the disconnection of the PW.

- Enabling or disabling the ATM Asynchronous feature on a VC causes malfunction of ATM and BFD VCCV. Once the ATM Asynchronous feature is enabled, changing the interface configuration is not recommended.

- Service Policy installation on ATM VP or L2transport VP is not supported.

Information About ATM AC VC Signaling and Provisioning

When an ATM interface is shut down (Customer Edge or Provider Edge, or the ATM link is down), all the VCs and VPs configured on the interface are removed from the driver. As a result, all types of traffic including VCCV and data traffic are blocked.

When there is a fault in the access side of the ATM network, or if the ATM link facing the Customer Edge router is down on the Provider Edge (PE) router, the ATM Attachment Circuit--VC Signaling and Provisioning feature ensures that the data plane is active on the Provider Edge (PE) routers that the BFD VCCV control packets are passed on to the Route Processor from the line card for BFD VCCV processing. The ATM VCs and VPs remain provisioned in the forwarding table entries on the Network Processor and line card. As a result, when the access side network is down, the health of the MPLS core can still be monitored and there is less programming required when the fault is removed from the access side network. Additionally, the Route Processor bundles a number of requests and sends a single message to the line cards for performing different operations on the VP or VCs that contribute to better performance under scale situations.

In addition, for the ATM Attachment Circuit--VC Signaling and Provisioning feature, the following criteria apply:

- AAL5 and AAL0 encapsulation with cell packing is supported.

- The Packet Switched Network is based on a transport technology such as MPLS or Layer 2 Tunnel Protocol Version 3 (L2TPv3).

- BFD provides a generalized Hello protocol for fast failure detection of network resources such as when the interface is in a shut down state and link failures.

- VCCV provides a control channel and manages the ingress and egress points so that connectivity verification messages can be sent.

- BFD VCCV control channel mechanisms exchange connectivity packets between ingress and egress points over PW.

- When the ATM interface is shut down, all the VCs and VPs configured on the interface are disconnected from the driver, resulting in blocking of all traffic including VCCV and data traffic.

How to Configure ATM AC VC Signaling and Provisioning

Configuring ATM AC VC Signaling and Provisioning

Perform this task to configure the ATM Attachment Circuit--VC Signaling and Provisioning feature.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm** *interface-number* / *slot* / *port*
4. **atm asynchronous**
5. **atm mcpt-timers** *timer1 timer2 timer3*
6. **cell-packing** *maxcells* **mcpt-timer** *timer-number*
7. **xconnect** *peer-ipaddress* *vc-id* **encapsulation mpls**
8. **xconnect** *peer-ipaddress* *vc-id* **pw-class** *pw-class-name*
9. **end**
10. **show atm [vc| vp]**
11. **show atm [vc| vp] detail**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	**Purpose**
Step 2	**configure terminal** **Example:** Router# configure terminal	Enters global configuration mode.
Step 3	**interface atm** *interface-number* / *slot* / *port* **Example:** Router(config)# interface atm 2/0/0	Enables the ATM interface. Enter the interface number, the slot number and port number.
Step 4	**atm asynchronous** **Example:** Router(config-if)# atm asynchronous	Enable the ATM Asynchronous feature.
Step 5	**atm mcpt-timers** *timer1 timer2 timer3* **Example:** Router(config-if)# atm mcpt-timers 100 1000 1000	(Only for AAL0 encapsulation) Sets Martini Cell Packing Timer (MCPT) values in microseconds. The range for timer1 and timer2 is 10 to 4095. The range for timer 3 is 20 to 4095. MCPT timer sets the time that the router waits for the raw cells (AAL0 encapsulation) to be packed into a single packet for punting into the pseudowire.
Step 6	**cell-packing** *maxcells* **mcpt-timer** *timer-number* **Example:** Router(config-if)# cell-packing 20 mcpt-timer 2	Enables ATM over MPLS to pack multiple ATM cells into each MPLS packet within the MCPT timing.
Step 7	**xconnect** *peer-ipaddress* *vc-id* **encapsulation mpls** **Example:** Router(config-if)# xconnect 22.22.22.22 101 encapsulation mpls	Enables the attachment circuit. Specify the IP address of the peer, and a VC ID. The range of the VC ID is from 1 to 4294967295. You must also specify the data encapsulation method, in this case MPLS.
Step 8	**xconnect** *peer-ipaddress* *vc-id* **pw-class** *pw-class-name* **Example:** Router(config-if)# xconnect 22.22.22.22 101 pw-class BFD_dyn	(Optional) Specifies the pseudowire class for advanced configuration. Enables the attachment circuit. Specify the IP address of the peer, and a VC ID. The range of the VC ID is from 1 to 4294967295.

	Command or Action	Purpose
Step 9	**end** **Example:** `Router(config-if-xconn)# end`	Exits Xconnect configuration mode and returns to global configuration mode.
Step 10	**show atm [vc| vp]** **Example:** `Router# show atm vc`	Displays ATM VC or VP information.
Step 11	**show atm [vc| vp] detail** **Example:** `Router# show atm vc detail`	Displays details of ATM VC or VP states.

Configuration Examples for ATM AC VC Signaling and Provisioning

Example Configuring ATM AC VC Signaling and Provisioning

This example shows the configuration on the PE router:

```
Router# interface ATM1/0/0
Router(config-if)# no ip address
Router(config-if)# no atm enable-ilmi-trap
Router(config-if)# pvc 2/210 l2transport
Router(config-if)# xconnect 3.1.1.3 1010 pw-class BFD_dyn
Router(config-if-xconn)# end
```

Example Verifying the VP States

```
This example shows the output of the show atm vp
 command and lists the statistics for all VPs on an interface:
Router# show atm vp
                   Data  CES    Peak    CES Avg/Min Burst   MCR
Interface   VPI SC  VCs  VCs    Kbps    Kbps  Kbps Cells   Kbps   CDVT  Status
1/1/0        29        0   0  149760       0   N/A   N/A    N/A    N/A  ACTIVE

1/1/0        40        0   0  149760       0   N/A   N/A    N/A    N/A  ACTIVE

1            90        0   0  149760       0   N/A   N/A    N/A    N/A
INACTIVE
10           25        0   0  149760       0   N/A   N/A    N/A    N/A
```

```
INACTIVE
10           30              0   0  149760     0   N/A  N/A    N/A    N/A
INACTIVE
```

Example Verifying the VC States

When the ATM interface is shut down, the VCs go into inactive state. This example shows the
output of the **show atm vc**
command that lists VC states:

```
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
1/1/0     1             2   200 PVC    AAL5     UBR  149760             UP
1/1/0     2            29     3 PVC    F4-OAM   UBR  149760             UP
1/1/0     3            29     4 PVC    F4-OAM   UBR  149760             UP
1/1/0     4            40     3 PVC    F4-OAM   UBR  149760             UP
1/1/0     5            40     4 PVC    F4-OAM   UBR  149760             UP
3/1/0     1             1   200 PVC    AAL0     UBR  149760             UP
```

This example shows the output of the **show atm vc detail**
command that lists the details of VC states:

```
Router# show atm vc detail
ATM4/0/0: VCD: 1, VPI: 2, VCI: 200
::
Status: INACTIVE
Async Status: SETUP_COMP, Admin Status: DISABLED, Flags: Setup

ATM4/0/0: VCD: 1, VPI: 2, VCI: 200
::
Status: UP
Async Status: SETUP_COMP, Admin Status: ENABLED, Flags: Enable
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
ATM commands	*Cisco IOS Asynchronous Transfer Mode Command Reference*

Standards

Standard	Title
None	

MIBs

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

RFCs

RFC	Title
None	

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/cisco/web/support/index.html

Feature Information for ATM AC VC Signaling and Provisioning

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.

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Table 1: Feature Information for ATM Attachment Circuit--VC Signaling and Provisioning

Feature Name	Releases	Feature Information
ATM Attachment Circuit--VC Signaling and Provisioning	15.0(1)S	The ATM Attachment Circuit--VC Signaling and Provisioning feature ensures that the data plane is active on the PE box, the BFD VCCV or control packets are passed on to the peer within the MPLS core (PE to PE MPLS cloud), and the smooth flow of data traffic.