

Enhanced ATM VC Configuration and Management Overview

Feature Summary

The Enhanced ATM VC Configuration and Management feature set includes new and enhanced capabilities that allow you to create and manage ATM PVCs and SVCs with more ease and improved integrity. This feature set includes the following five subfeatures:

- New VC Configuration

The New VC Configuration subfeature allows you to create ATM permanent virtual circuits (PVCs), switched virtual circuits (SVCs), static maps, and associated virtual circuit (VC) parameters more easily and with fewer errors using new ATM commands in new VC command modes.

- VC Integrity Management

The VC Integrity Management subfeature allows you to manage your ATM PVCs and SVCs so that your router receives immediate notification of when these VCs go down in your network. Upon notification, protocols can reroute packets and prevent unpredictable and relatively long timeout periods.

- PVC Discovery

The PVC Discovery subfeature allows you to enable your router to automatically assign (or discover) PVCs on an ATM interface or subinterface using information from an attached adjacent switch.

- Multiprotocol Inverse ARP

The Multiprotocol Inverse ARP subfeature allows you to enable a dynamic protocol mapping between an ATM PVC and a network address by configuring Inverse Address Resolution Protocol (Inverse ARP) on ATM PVCs running IP or IPX.

- Rate Queue Tolerance

The Rate Queue Tolerance subfeature allows you to configure a range of peak rates on a single rate queue, thereby improving ATM rate queue usage.

Benefits

Use the Enhanced ATM VC Configuration and Management feature set to simplify and expedite PVC and SVC configurations and improve the management of PVC and SVC integrity. The benefits of this feature set include:

- Simplified ATM PVC, SVC, and static map configuration.

- VC management that detects connections and disconnections of PVCs and SVCs immediately so that packets are rerouted upon notification.
- Automatic assignment (or discovery) of ATM PVCs on an ATM interface or subinterface using information from an attached adjacent switch.
- Dynamic protocol mapping between a PVC and a network address so that you no longer have to manually configure an ATM static map.
- Improved rate queue usage when you configure a range of peak rates on a single rate queue.

List of Terms

Interim Local Management Interface (ILMI)—Specification developed by the ATM Forum for incorporating network-management capabilities into the ATM UNI.

Inverse Address Resolution Protocol (Inverse ARP)—Method of building dynamic routes in a network. Allows an access server to discover the network address of a device associated with a virtual circuit.

Operations, Administration, and Management (OAM)—ATM Forum specification for cells used to monitor virtual circuits. OAM cells provide a virtual circuit-level loopback in which a router responds to the cells, demonstrating that the circuit is up, and the router is operational.

Quality of Service (QOS)—Measure of performance for a transmission system that reflects its transmission quality and service availability.

rate queue—In ATM, a value associated with one or more virtual circuits that defines the speed at which an individual virtual circuit transmits data to the remote end. Each rate queue represents a portion of the overall bandwidth available on an ATM link. The combined bandwidth of all configured rate queues should not exceed the total available bandwidth.

Simple Network Management Protocol (SNMP)—Network management protocol used almost exclusively in TCP/IP networks. SNMP provides a means to monitor and control network devices, and to manage configurations, statistics collection, performance, and security.

Unspecified Bit Rate (UBR)—QOS class defined by the ATM Forum for ATM networks. UBR allows any amount of data up to a specified maximum to be sent across the network, but there are no guarantees in terms of cell loss rate and delay.

Variable Bit Rate–Non Real Time (VBR–NRT)—VBR–NRT is used for connections in which there is no fixed timing relationship between samples, but that still need a guaranteed QOS.

virtual circuit (VC)—Logical circuit created to ensure reliable communication between two network devices. A virtual circuit is defined by a VPI/VCI pair, and can be either permanent (a PVC) or switched (an SVC). In ATM, a virtual circuit is also called a virtual channel.

Virtual Circuit-Alarm Indication Signals (VC-AIS)—Generated by a VCC node at a connecting point to alert the downstream VCC nodes that a failure has been detected upstream. The VC-AIS can be caused by the detection of a VCC failure or by the notification of a physical layer failure.

Virtual Circuit-Remote Detect Indicator (VC-RDI)—Upon receiving a VC-AIS, the VCC end-point at the public UNI will return a VC-RDI to alert the upstream nodes that a failure has been detected downstream.

Restrictions

For configuring ATM PVCs and SVCs, do not use the commands prior to this release (for example, the **atm pvc** command) in combination with the commands presented in this document. To configure any of the new subfeatures introduced in this release, you must use the new command syntax.

The following restrictions apply to the Multiprotocol Inverse ARP subfeature:

- Only primary IP addresses and primary IPX network numbers are supported.
- A device receiving an Inverse ARP request will only generate an Inverse ARP reply for an IP host on the same subnet. Because the subnet mask of the requesting device is unknown, the receiving device will only respond to an Inverse ARP request if the incoming IP address is in its subnet per its subnet mask. For IPX, Inverse ARP replies are also generated for network numbers of 0 or if the network numbers match.
- Only ATM Inverse ARP over PVCs with AAL5 LLC-SNAP encapsulation configured is supported.

Platforms

The Enhanced ATM VC Configuration and Management feature set is supported on these platforms:

- Cisco 4500 and 4700
- Cisco 7200 series
- Cisco 7500 series

Note The Rate Queue Tolerance subfeature is not supported on the ATM port adapter and therefore it is not supported on Cisco 7200 series routers.

Prerequisites

Before you configure ATM PVCs and SVCs, you must enable your Cisco router platform. Refer to one of the following chapters in the Cisco IOS Release 11.3 *Wide-Area Networking Configuration Guide* for enabling your platform:

- Configuring ATM on the AIP for Cisco 7500 Series Routers
- Configuring ATM on the ATM Port Adapter for Cisco 7200 and 7500 Series Routers
- Configuring ATM on the NPM for Cisco 4500 and 4700 Routers

For PVC Discovery, the attached adjacent switch must support UNI version 3.1 or higher.

Supported MIBs and RFCs

Multiprotocol Inverse ARP supports the following RFCs:

- RFC 1293
- RFC 1577

Enhanced ATM VC Configuration and Management does not support any MIBs.

What to Do Next

To configure the subfeatures of the Enhanced ATM VC Configuration and Management feature set, refer to the following chapters:

- New VC Configuration
- VC Integrity Management
- PVC Discovery
- Multiprotocol Inverse ARP
- Rate Queue Tolerance

Refer to the “Enhanced ATM VC Configuration and Management Commands” chapter for command reference and debug command documentation.