

ATM Hierarchical Shaping ATM VC into VP Shaping

Traffic shaping is a quality of service (QoS) mechanism that is used to manage the network traffic by shaping the traffic to a specified rate. Traffic shaping enables the network administrator to:

- Control access to the available bandwidth.
- Ensure that the traffic conforms to the policies.
- Regulate the flow of traffic to avoid congestion that can occur when the transmitted traffic exceeds the access speed of its remote target interface.

Traffic shaping uses queues to constrain data bursts, limit peak data rate, and smooth jitters so that traffic will fit within the promised envelope. Traffic shaping limits the throughput by buffering excess traffic instead of dropping packets.

ATM VP/VC hierarchical shaping provides two levels of traffic shaping--per-VC and per-VP--to control or modify the flow of traffic on an interface. The shaping function also ensures that the traffic from one VC does not adversely impact another VC, thus preventing the loss of data. The traffic is shaped first at the VC level and then at the VP level.

- Restrictions for ATM Hierarchical Shaping, on page 1
- Information About ATM Hierarchical Shaping, on page 2
- How to Configure ATM Hierarchical Shaping, on page 2
- Configuration Examples for ATM Hierarchical Shaping, on page 4
- Additional References, on page 4
- Feature Information for ATM Hierarchical Shaping, on page 5

Restrictions for ATM Hierarchical Shaping

All virtual channels (VCs) within a given virtual path (VP) must belong to the same ATM service category.

Information About ATM Hierarchical Shaping

ATM Hierarchical Shaping

If a service (or an application) wants to use an ATM network to transport a particular kind of traffic, it must first inform the network about what kind of traffic is to be transported, and the performance requirements of that traffic. The ATM service categories provide a method to relate traffic characteristics and QoS requirements to network behavior. Hierarchical shaping requires that all VCs belonging to a given VP have the same ATM service category. This hierarchy ensures that packets are shaped first at the VC level and then at the VP level. At the interface level, the priority is based on the ATM service category. The service category is determined by the first PVC that is configured under a VP. The priority is in the following order:

1. Constant Bit Rate (CBR)
2. Unspecified Bit Rate (UBR)
3. Unspecified Bit Rate + (UBR+)
4. Variable Bit Rate Non Real-Time (VBR-nRT)
5. Real-time Variable Bit Rate (VBR-RT)

If no service category is specified at the VC level, the default is unshaped UBR. The ATM Hierarchical Shaping feature is supported for the all the above ATM traffic service categories.

For VBR-nRT traffic the output sustainable cell rate (SCR) value that is configured will be taken into account for VC shaping. For UBR traffic, the output peak cell rate (PCR) value that is configured will be taken into account for VC shaping.

The ATM Hierarchical Shaping feature supports over-subscription. Over-subscription occurs when the sum of the configured rate of UBR and VBR PVCs exceeds the line rate.

How to Configure ATM Hierarchical Shaping

Configuring ATM Hierarchical Shaping

Perform this task to configure ATM hierarchical shaping.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm** *interface-number* [**.** *subinterface-number* {**multipoint** | **point-to-point**}]
4. **pvc** *vpi* **/** *vci*
5. **exit**
6. **ubr** *output-pcr*
7. **exit**
8. **create on-demand**

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** *interface-number* [**.** *subinterface-number* {**multipoint** | **point-to-point**}] **Example:** `Router(config)# interface atm 0/3/2.1 point-to-point`	Configure an ATM interface and enters subinterface configuration mode.
Step 4	**pvc** *vpi* **/** *vci* **Example:** `Router(config-subif)# pvc 2/200`	Creates or assigns a name to an ATM PVC and enters ATM virtual circuit configuration mode.
Step 5	**exit** **Example:** `Router(config-if-atm-vc)# exit`	Exits ATM virtual circuit configuration mode and returns to subinterface configuration mode.
Step 6	**ubr** *output-pcr* **Example:** `Router(config-if-atm-vc)# ubr`	Configures UBR QoS and specifies the output PCR for an ATM PVC, PVC range, switched virtual circuit (SVC), VC class, or VC bundle member.
Step 7	**exit** **Example:** `Router(config-if-atm-vc)# exit`	Exits ATM virtual circuit configuration mode and returns to subinterface configuration mode.
Step 8	**create on-demand** **Example:** `Router(config-if-atm-vc)# create on-demand`	Configures ATM PVC autoprovisioning, which enables a PVC or range of PVCs to be created automatically on demand.

Configuration Examples for ATM Hierarchical Shaping

Example Configuring ATM Hierarchical Shaping

The following example shows how to configure ATM hierarchical shaping:

```
enable
 configure terminal
  interface atm 0/3/2.1 multipoint
   atm pvp 2
   pvc 2/200
    exit
   range range1 pvc 2/100 2/102
    ubr 4000
    exit
   atm pvp 3
   pvc 3/100
    vbr-nrt 1000 1000
    create on-demand
    end
```

Additional References

Related Documents

Related Topic	Document Title
ATM commands	*Cisco IOS Asynchronous Transfer Mode Command Reference*

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

MIBs

MIB	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 software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	--

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for ATM Hierarchical Shaping

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 Hierarchical Shaping

Feature Name	Releases	Feature Information
ATM Hierarchical Shaping--ATM VC into VP Shaping	Cisco IOS XE Release 3.3S	ATM VP/VC hierarchical shaping provides two levels of traffic shaping--per-VC and per-VP--to control or modify the flow of traffic on an interface. The shaping function also ensures that traffic from one VC does not adversely impact another VC, thus preventing loss of data. The traffic is shaped first at the VC level and then at the VP level.