



Dynamic Subscriber Bandwidth Selection

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History for the Dynamic Subscriber Bandwidth Selection Feature

Release	Modification
12.2(4)B	This feature was introduced.
12.2(13)T	This feature was integrated into Cisco IOS Release 12.2(13)T.
12.2(28)SB	This feature was integrated into Cisco IOS Release 12.2(28)SB.

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This document describes the Dynamic Subscriber Bandwidth Selection feature and includes the following sections:

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- [Configuration Tasks, page 3](#)
- [Monitoring and Maintaining DBS, page 10](#)
- [Configuration Examples, page 11](#)
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- [Command Reference, page 13](#)
- [Glossary, page 18](#)



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Feature Overview

The Dynamic Subscriber Bandwidth Selection (DBS) feature enables wholesale service providers to sell different classes of service to retail service providers by controlling bandwidth at the ATM Virtual Circuit (VC) level. ATM Quality of Service (QoS) parameters from the subscriber domain are applied to the ATM PVC on which a PPPoE or PPPoA session is established.

Using DBS you can set the ATM permanent virtual circuit (PVC) traffic shaping parameters to be dynamically changed based on the RADIUS profile of a PPP over Ethernet (PPPoE) or PPP over ATM (PPPoA) user logging in on the PVC. If the user is the first user on that PVC, then the RADIUS profile values override the default values of the PVC. If users already exist on the PVC, then the new value overrides the existing configuration only if it is higher than the existing value. If multiple PPPoE sessions are allowed on a subscriber VC, then the highest peak cell rate (PCR) and sustainable cell rate (SCR) of all the sessions is selected as the PCR and SCR of the VC.

You can apply DBS QoS parameters per user as well as per domain. If you apply DBS QoS parameters under a domain profile, all users in that profile are assigned the same DBS QoS parameters. These parameters are assigned to the RADIUS profile for that domain. You can also apply distinctive DBS QoS parameters via the RADIUS user profile.

Traffic shaping parameters can be locally configured by IOS CLI in VC-mode, VC-class, range mode, or PVC-in-range mode. These parameters have a lower priority and are overridden by the shaping parameters specified in the domain service profile. Traffic shaping parameters that are CLI configured at the VC class interface or subinterface level are treated as the default QoS parameters for the PVCs to which they apply. These parameters are overridden by the domain service profile QoS parameters of the domain the user is logged in to. If no VC class is configured, the default is the unspecified bit rate (UBR).

When a network access server (NAS) sends a domain authorization request and receives an affirmative response from the RADIUS server, this response may include a “QoS-management” string via vendor-specific attribute (VSA) 26 for QoS management in the NAS. The QoS management values are configured as part of the domain service profile attributes on the RADIUS server. These values contain PCR and SCR values for a particular user or domain. If the QoS specified for a domain or user cannot be applied on the PVC that the session belongs to, the session is not established.

Changing PVC traffic parameters because of new simultaneous PPPoE sessions on the PVC does not cause existing PPPoE sessions that are already established to disconnect. Changing domain service profile QoS parameters on the RADIUS server does not cause traffic parameters to automatically change for PVCs that have existing sessions.

When you enter the **dbns enable** or **no dbns enable** commands to configure or unconfigure DBS, existing sessions are not disconnected. If you have a session that has been configured for DBS and you configure the **no dbns enable** command on a VC, additional sessions that are configured will display DBS-configured QoS values until the first new session is up. After the first session is brought up, the VC has default and locally configured values. If you configure the **dbns enable** command after multiple sessions are already up on the VC, all sessions on that VC have DBS QoS parameters.

Benefits

DBS provides the following benefits:

- Wholesale service providers can provide different bandwidth options to their retail service provider customers such as ISPs and enterprises.
- Subscribers can choose between enhanced or basic service with a fixed billing plan for each service.

Restrictions

The DBS feature does not support the following:

- Switched virtual circuit (SVC).
- PA-A1 or PA-A2 port adapters installed in a Cisco 7200 series router.
- When changing QoS values dynamically on a VC, there will be some duration (typically milliseconds) during which traffic on the VC is dropped.

Related Features and Technologies

- Cisco Subscriber Edge Services Manager.
- HTTP Redirect-Login in Cisco IOS Release 12.1(5)DC on 6400 series routers. See the “Service Selection Gateway” chapter of the *Cisco 6400 Feature Guide* for Releases 12.1(5)DB and 12.1(5)DC for more information.

Prerequisites

A Cisco 7200 series router or Cisco 7401ASR router must have a PA-A3 port adapter installed to enable DBS.

Configuration Tasks

See the following sections for configuration tasks for the Dynamic Subscriber Bandwidth Selection feature. Each task in the list is identified as either required or optional.

- [Configuring DBS Under a VC Class](#) (optional)
- [Configuring DBS on a PVC](#) (optional)
- [Configuring DBS on a Range of PVCs](#) (optional)
- [Configuring DBS on a PVC Within a PVC Range](#) (optional)
- [Configuring the RADIUS Attributes for DBS](#) (optional)
- [Verifying DBS](#) (optional)

Configuring DBS Under a VC Class

To configure DBS under a VC class, follow the steps below, beginning in interface configuration mode:

	Command	Purpose
Step 1	Router(config-if)# vc-class atm <i>name</i>	Configures a VC class for an ATM VC or interface. <ul style="list-style-type: none"> • <i>name</i>—Name of the VC class.
Step 2	Router(config-vc-class)# db s enable	Applies DBS QoS parameters.

Configuring DBS on a PVC

To configure DBS for a PVC, follow the steps below, beginning in interface configuration mode:

	Command	Purpose
Step 1	Router(config-if)# pvc [name] vpi/vci	<p>Specifies an ATM PVC and creates or assigns a name to an ATM PVC, or enters interface-ATM-VC configuration mode.</p> <ul style="list-style-type: none"> <i>name</i> —(Optional) The name of the PVC or map. The name can be up to 16 characters long. <i>vpi</i>—ATM network virtual path identifier (VPI) for this PVC. The absence of the “/” and a <i>vpi</i> value defaults the <i>vpi</i> value to 0. The <i>vpi</i> value ranges from 0 to 255. <i>vci</i>—ATM network virtual channel identifier (VCI) for this PVC. This value ranges from 0 to 1 less than the maximum value set for this interface by the atm vc-per-vc command. Typically, lower values 0 to 31 are reserved for specific traffic (for example, F4 OAM, SVC signaling, ILMI, and so on) and should not be used. <p>The VCI is a 16-bit field in the header of the ATM cell. The VCI value is unique only on a single link, not throughout the ATM network, because it has local significance only.</p> <p>Note The arguments <i>vpi</i> and <i>vci</i> cannot both be set to 0; if one is 0, the other cannot be 0.</p>
Step 2	Router(config-if-atm-vc)# dbns enable	Applies DBS QoS parameters.
Step 3	Router(config-if-atm-vc)# protocol pppoe	Specifies PPPoE as the protocol of the ATM PVC.

Configuring DBS on a Range of PVCs

To configure DBS for a range of PVCs, follow the steps below, beginning in subinterface configuration mode:

	Command	Purpose
Step 1	Router(config-subif)# range [<i>range-name</i>] pvc <i>start-vpi/start-vci end-vpi/end-vci</i>	Defines a range of ATM PVCs and enables PVC range configuration mode. <ul style="list-style-type: none"> • <i>range-name</i>—(Optional) Name of the range. The range name can be a maximum of 15 characters. • <i>start-vpi</i>—Beginning value for a range of virtual path identifiers (VPIs). In the absence of the “/” and a <i>vpi</i> value, the <i>vpi</i> value defaults to 0. The <i>vpi</i> value ranges from 0 to 255. • <i>start-vci</i>—Beginning value for a range of virtual channel identifiers (VCIs). The <i>vci</i> value ranges from 32 to 65535. • <i>end-vpi</i>—End value for a range of virtual path identifiers (VPIs). In the absence of an <i>end-vpi</i> value, the <i>end-vpi</i> value defaults to the <i>start-vpi</i> value. The <i>vpi</i> value ranges from 0 to 255. • <i>end-vci</i>—End value for a range of virtual channel identifiers (VCIs). The <i>vci</i> value ranges from 32 to 65535.
Step 2	Router(config-if-atm-range)# db s enable	Applies DBS QoS parameters.

Configuring DBS on a PVC Within a PVC Range

To configure DBS for a specific PVC within a range of PVCs, follow the steps below, beginning in interface configuration mode:

	Command	Purpose
Step 1	Router(config-if)# range [<i>range-name</i>] pvc <i>start-vpi/start-vci end-vpi/end-vci</i>	Defines a range of ATM PVCs.

	Command	Purpose
Step 2	Router(config-if-atm-range)# pvc-in-range [<i>pvc-name</i>] [[<i>vpi</i> / <i>vci</i>]	<p>Defines an individual PVC within a PVC range and enables PVC-in-range configuration mode.</p> <ul style="list-style-type: none"> <i>pvc-name</i>—(Optional) Name given to the PVC. The PVC name can have a maximum of 15 characters. <i>vpi</i>—(Optional) ATM network virtual path identifier (VPI) for this PVC. In the absence of the “/” and a <i>vpi</i> value, the <i>vpi</i> value defaults to 0. The <i>vpi</i> value ranges from 0 to 255. <i>vci</i>—(Optional) ATM network virtual channel identifier (VCI) for this PVC. The <i>vci</i> value ranges from 32 to 2047.
Step 3	Router(cfg-if-atm-range-pvc)# dbns enable	Applies DBS QoS parameters.

Configuring the RADIUS Attributes for DBS

You can apply DBS QoS parameters per user as well as per domain. If you apply DBS QoS parameters under a domain profile, all users in that profile are assigned the same DBS QoS parameters. These parameters are assigned to the RADIUS profile for that domain. You can also apply distinctive DBS QoS parameters via the RADIUS user profile.

Configure the RADIUS attributes listed in this section in the user or domain profiles on the authentication, authorization, and accounting (AAA) server. The user or domain profile is downloaded from the AAA server as part of user authentication.

The QoS management string for DBS has the following syntax:

```
Cisco-Avpair = atm:peak-cell-rate=155000
```

```
Cisco-Avpair = atm:sustainable-cell-rate=155000
```

You must configure the peak cell rate (PCR). Configuring the sustainable cell rate (SCR) is optional. If you configure only the PCR, the ATM service type is an unspecified bit rate (UBR). If you specify both the SCR and the PCR, then the ATM service type is a variable bit rate non-real-time (VBR-rt) connection.

If the peak rate is greater than the maximum rate permitted on the ATM physical interface, then the PCR applied on the ATM PVC is set to the maximum rate. If the specified PCR is less than the minimum rate, then the PCR applied on the ATM PVC is the minimum rate.

If the “sustainable-cell-rate” (in Kbps) applied exceeds the maximum for the interface, the session is rejected.

Verifying DBS

Step 1 Enter the **show atm pvc vpi/vci** command to view details about ATM PVCs or VCs:

```
Router# show atm pvc 0/75
```

```
ATM1/0.4:VCD:1, VPI:0, VCI:75
UBR, PeakRate:149760
AAL5-LLC/SNAP, etype:0x0, Flags:0xC20, VCmode:0x0
OAM frequency:0 second(s), OAM retry frequency:1 second(s)
```

```

OAM up retry count:3, OAM down retry count:5
OAM Loopback status:OAM Disabled
OAM VC state:Not Managed
ILMI VC state:Not Managed
PA TxRingLimit:40 particles
PA Rx Limit:1600 particles
InARP frequency:15 minutes(s)
Transmit priority 4
InPkts:18, OutPkts:21, InBytes:1263, OutBytes:1476
InPRoc:18, OutPRoc:3
InFast:0, OutFast:0, InAS:0, OutAS:0
InPktDrops:0, OutPktDrops:0/0/0 (holdq/outputq/total)
CrcErrors:0, SarTimeOuts:0, OverSizedSDUs:0, LengthViolation:0,
CPIErrors:0
Out CLP=1 Pkts:0
OAM cells received:0
F5 InEndloop:0, F5 InSegloop:0, F5 InAIS:0, F5 InRDI:0
F4 InEndloop:0, F4 InSegloop:0, F4 InAIS:0, F4 InRDI:0
OAM cells sent:0
F5 OutEndloop:0, F5 OutSegloop:0, F5 OutRDI:0
F4 OutEndloop:0, F4 OutSegloop:0, F4 OutRDI:0
OAM cell drops:0
Status:UP
PPPOE enabled.
DBS enabled.

```

- Step 2** Enter the **show atm pvc dbs** command to display information about ATM PVCs that have DBS QoS parameters applied:

```

Router# show atm pvc dbs

```

Interface	VCD / Name	VPI	VCI	Type	Encaps	SC	Peak Kbps	Avg/Min Kbps	Burst Cells
1/0.7	3	0	95	PVC	MUX	VBR	2000	700	94

```

UP

```

- Step 3** Enter the **show running-config** command to verify that DBS QoS parameters have been applied. If you enter the **dbs enable** or the **no dbs enable** command, it appears in the output of the **show running-config** command. If you enter the **default dbs enable** command, it does not appear.

```

Router# show running-config
Building configuration...

Current configuration : 2902 bytes
!
version 12.2
no service single-slot-reload-enable
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname host1
!
aaa new-model
!
!
aaa authentication ppp default group radius
aaa authorization network default group radius
aaa session-id common
!
username usera password 0 password0
username lac password 0 password1
username lns password 0 password2

```



```
!  
!  
interface ATM1/0.5 point-to-point  
 ip address 10.1.1.6 255.255.255.0  
 no ip route-cache  
 no ip mroute-cache  
 pvc 0/85  
 !  
!  
interface ATM1/0.7 point-to-point  
 ip address 10.1.1.6 255.255.255.0  
 no ip route-cache  
 no ip mroute-cache  
 pvc 0/95  
  class-vc pppoa  
  ubr 5000  
 !  
!  
interface ATM1/0.10 point-to-point  
 no ip route-cache  
 no ip mroute-cache  
 range pvc 0/101 0/500  
  class-range pppoe  
 !  
  pvc-in-range 0/102  
  no dbs enable  
 !  
!  
interface Virtual-Template1  
 ip unnumbered Loopback1  
 ip mtu 1492  
 no keepalive  
 peer default ip address pool local_pool  
 ppp authentication chap  
 !  
interface Virtual-Template2  
 ip address negotiated  
 ip mtu 1492  
 peer default ip address pool local_pool  
 ppp authentication chap  
 !  
interface Virtual-Template10  
 ip address 192.168.11.1 255.255.255.0  
 no keepalive  
 peer default ip address pool p3  
 ppp authentication chap  
 !  
interface Virtual-Template11  
 ip address negotiated  
 no keepalive  
 ppp chap hostname host1  
 ppp chap password password1  
 !  
ip local pool p3 192.168.0.0 192.168.12.250  
ip local pool local_pool 172.16.3.1 172.16.10.250  
ip default-gateway 10.0.74.1  
ip classless  
ip route 10.0.0.0 10.0.0.0 10.0.74.1  
ip route 10.107.164.0 255.255.255.0 FastEthernet0/0  
no ip http server  
!  
!  
!  
radius-server host 172.18.0.0 auth-port 1645 acct-port 1646
```

```

radius-server retransmit 3
radius-server key cisco
call rsvp-sync
!
!
mgcp profile default
!
!
gatekeeper
shutdown
!
!
line con 0
line aux 0
line vty 5 15
!
!
end

```

Monitoring and Maintaining DBS

Use the commands listed below to monitor and maintain DBS:

Command	Purpose
Router# debug atm events	Displays the normal set of ATM events when a session comes up or goes down.
Router# debug atm errors	Displays protocol errors and error statistics associated with VCs.
Router# debug atm status	Displays changes in the status of a VC when a session comes up or goes down or when the VC configuration is changed.
Router# debug ppp authentication	Displays authentication protocol messages, including Challenge Authentication Protocol (CHAP) packet exchanges and Password Authentication Protocol (PAP) exchanges.
Router# debug ppp error	Displays protocol errors and error statistics associated with PPP connection negotiation and operation.
Router# debug ppp negotiation	Enables debugging of PPP negotiation process.
Router# debug radius	Displays detailed debugging information associated with RADIUS.
Router# debug vpdn event	Displays L2TP errors and events that are a part of normal tunnel establishment or shutdown for VPDNs.
Router# debug vpdn l2x-errors	Displays L2F and L2TP protocol errors that prevent tunnel establishment or normal operation.
Router# debug vpdn l2x-events	Displays L2F and L2TP events that are part of tunnel establishment or shutdown.
Router# debug vpdn pppoe-errors	Displays PPPoE protocol errors that prevent a session from being established or errors that cause an established session to be closed.

Command	Purpose
Router# <code>debug vpdn pppoe-events</code>	Displays PPPoE protocol messages about events that are part of normal session establishment or shutdown.
Router# <code>show atm pvc</code>	Displays all ATM PVCs and traffic information.
Router# <code>show atm pvc dbs</code>	Displays ATM PVCs that have DBS QoS parameters applied.
Router# <code>show atm vc detailed</code>	Displays information about ATM PVCs and SVCs.
Router# <code>show interfaces virtual-access</code>	Displays status, traffic data, and configuration information about a specified virtual access interface.

Configuration Examples

This section provides the following configuration examples:

- [Configuring DBS for a VC: Example, page 11](#)
- [Configuring DBS for a PVC: Example, page 11](#)
- [Configuring DBS for a Range of PVCs: Example, page 11](#)
- [Configuring DBS for a PVC Within a PVC Range: Example, page 12](#)
- [Configuring RADIUS Attributes: Examples, page 12](#)

Configuring DBS for a VC: Example

In the following example, DBS QoS parameters have been applied to a VC called “cisco”:

```
vc-class atm cisco
dbs enable
```

Configuring DBS for a PVC: Example

In the following example, DBS QoS parameters have been applied on a PVC called “cisco”:

```
interface atm0/0/0.5 point-to-point
ip address 10.0.0.0 255.255.255.0
pvc cisco 0/100
dbs enable
protocol pppoe
```

Configuring DBS for a Range of PVCs: Example

In the following example, DBS QoS parameters have been applied on a range of PVCs. The range is named “cisco range” and has a *start-vpi* of 0, a *start-vci* of 50, an *end-vpi* of 0, and an *end-vci* of 70:

```
interface atm0/0/0.1 multipoint
ip address 10.0.0.0 255.255.255.0
range cisco pvc 0/50 0/70
dbs enable
```

Configuring DBS for a PVC Within a PVC Range: Example

In the following example, DBS parameters have been applied on PVC 60, which is part of the PVC range called "cisco":

```
interface atm0/0/0.1 multipoint
  range cisco pvc 0/50 0/70
  pvc-in-range 60
  dbs enable
```

Configuring RADIUS Attributes: Examples

The following example shows how to configure RADIUS attributes for a domain profile for DBS:

```
cisco.com Password = "cisco", Service-Type = Outbound
  Service-Type = Outbound,
  Cisco-Avpair = "vpdn:tunnel-id=shiva",
  Cisco-Avpair = "vpdn:tunnel-type=l2tp",
  Cisco-Avpair = "vpdn:l2tp-tunnel-password=password2",
  Cisco-Avpair = "vpdn:ip-addresses=172.16.0.0",
  Cisco-Avpair = "atm:peak-cell-rate=155000",
  Cisco-Avpair = "atm:sustainable-cell-rate=155000"
```

The following example shows how to configure RADIUS attributes for a user profile for DBS:

```
user1@cisco.com Password = "userpassword1", Service-Type = Outbound
  Service-Type = Outbound,
  Cisco-Avpair = "vpdn:tunnel-id=shiva",
  Cisco-Avpair = "vpdn:tunnel-type=l2tp",
  Cisco-Avpair = "vpdn:l2tp-tunnel-password=password2",
  Cisco-Avpair = "vpdn:ip-addresses=172.16.0.0",
  Cisco-Avpair = "atm:peak-cell-rate=155000",
  Cisco-Avpair = "atm:sustainable-cell-rate=155000"
```

Additional References

The following sections provide references related to Dynamic Subscriber Bandwidth Selection.

Related Documents

Related Topic	Document Title
APN Manager Application Programming Guide	APN Manager Application Programming Guide
Cisco 6400 Software Configuration tasks and Commands List	Cisco 6400 Software Configuration Guide and Command Reference
Cisco IOS Voice, Video, and Fax Commands List	Cisco IOS Voice, Video, and Fax Command Reference , Release 12.2
Cisco IOS Voice, Video, and Fax Configuration Tasks	Cisco IOS Voice, Video, and Fax Configuration Guide , Release 12.2
Cisco Subscriber Edge Services Manager	Cisco Subscriber Edge Services Manager Documentation
Configuring Radius	Configuring RADIUS

Standards

Standard	Title
None	—

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco IOS 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 Technical Support & Documentation website contains thousands of 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.	http://www.cisco.com/techsupport

Command Reference

This section documents the new commands needed to apply Dynamic Subscriber Bandwidth Selection QoS parameters.

- [db](#)s enable
- [show atm pvc db](#)s

dbns enable

To apply Dynamic Subscriber Bandwidth Selection (DBS) QoS parameters, use the **dbns enable** command in the appropriate configuration mode. To remove DBS QoS parameters, use the **no** form of this command.

dbns enable

no dbns enable

Syntax Description This command has no arguments or keywords.

Command Default DBS QoS parameters are not applied.

Command Modes

- ATM VC class configuration
- ATM VC configuration
- ATM PVC range configuration
- ATM PVC-in-range configuration

Command History	Release	Modification
	12.2(4)B	This command was introduced.
	12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
	12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Usage Guidelines The **no dbns enable** command configured in any configuration mode overrides the **dbns enable** command configured in any configuration mode. Both the **dbns enable** and **no dbns enable** commands are saved in the running configuration and appear, when configured, in the output of the **show running-config** command. The **default dbns enable** command does not appear in the output of the **show running-config** command when configured.

When you enter the **dbns enable** or **no dbns enable** command, existing sessions are not disconnected. If you have a session that has been configured for DBS and you configure the **no dbns enable** command on a VC, additional sessions that are configured will display DBS-configured QoS values until the first new session is up. After the first session is brought up, the VC has default and locally configured values. If you configure the **dbns enable** command after multiple sessions are already up on the VC, all sessions on that VC have DBS QoS parameters.

RADIUS QoS attributes are applied to PVCs when a new PPP over Ethernet (PPPoE) session has peak cell rate (PCR) and sustainable cell rate (SCR) values that are higher than existing PPPoE sessions. If a new PPPoE session with lower PCR and SCR values is added to a PVC, the RADIUS QoS attributes are not applied to the new session. If the user of the PPPoE session that has the higher PCR and SCR values logs out, the QoS attributes are set to those of the lower bandwidth user.

RADIUS QoS attributes override attributes on a PVC configured in ATM PVC-in-range or ATM PVC range configuration mode. If the RADIUS QoS attributes cannot be applied to a PVC, PPPoE and PPPoA sessions cannot be established.

When DBS is configured, normal ATM precedences apply. PVC configurations take precedence over VC class configurations. Thus, if DBS QoS parameters are applied on a VC class and disabled on one PVC in that VC class, DBS QoS parameters are not applied on the PVC. ATM PVC-in-range configurations take precedence over PVC range configurations.

When you configure DBS on a PVC, existing sessions on that PVC remain connected.

Examples

The following example configures DBS in ATM VC class configuration mode:

```
vc-class atm pppoe
dbs enable
```

The following example configures DBS in ATM VC configuration mode:

```
interface atm0/0/0.5 point-to-point
ip address 10.0.0.0 255.255.255.0
pvc 0/100
dbs enable
protocol pppoe
```

The following example configures DBS in ATM PVC range configuration mode:

```
interface atm0/0/0.1 multipoint
ip address 10.0.0.0 255.255.255.0
range pvc 0/50 0/70
dbs enable
```

The following example configures DBS in ATM PVC-in-range configuration mode:

```
interface atm0/0/0.1 multipoint
range pvc 0/50 0/70
pvc-in-range 60
dbs enable
```

Related Commands

Command	Description
pvc	Creates or assigns a name to an ATM PVC, specifies the encapsulation type on an ATM PVC, or enters interface-ATM-VC configuration mode.
pvc-in-range	Configures an individual PVC within a PVC range.
range pvc	Defines a range of ATM PVCs.
show atm pvc dbs	Displays all ATM PVCs on which DBS QoS parameters are applied.
vc-class atm	Configures a VC class for an ATM VC or interface.

show atm pvc dbs

To display all ATM permanent virtual circuits (PVCs) that have Dynamic Subscriber Bandwidth Selection (DBS) quality of service (QoS) parameters applied, use the **show atm pvc dbs** command in privileged EXEC mode.

show atm pvc dbs

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(4)B	This command was introduced.
	12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
	12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Usage Guidelines Use the **show atm pvc dbs** command to display information about ATM PVCs that have DBS QoS parameters applied. To view information about all ATM PVCs in your system, use the **show atm pvc** command.

Examples The following example displays information about ATM PVCs that have DBS QoS parameters applied:

```
Router# show atm pvc dbs
```

```

          VCD /
Interface  Name      VPI  VCI  Type  Encaps  SC   Peak  Avg/Min  Burst
1/0.7     3              0   95   PVC   MUX     VBR   2000   700     94  UP

```

[Table 1](#) describes the significant fields shown in the display.

Table 1 *show atm pvc dbs* Field Descriptions

Field	Description
Interface	Identifies the interface and subinterface and the slot number.
VCD/Name	Identifies the Virtual Connection Descriptor (VCD). The connection name is displayed when a name for the virtual circuit was defined using the pvc command.
VPI	Identifies the network virtual path identifier (VPI) name for this PVC.
VCI	Identifies the ATM network virtual channel identifier (VCI) for the PVC.

Table 1 *show atm pvc dbs Field Descriptions (continued)*

Field	Description
Type	Identifies the type of PVC detected from PVC Discovery. <ul style="list-style-type: none"> • PVC-D—Indicates a PVC created due to PVC Discovery. • PVC-L—Indicates that the corresponding peer of this PVC could not be found on the switch. • PVC-M—Indicates that some or all of the QoS parameters of this PVC do not match the QoS parameters of the corresponding peer.
Encaps	Identifies the ATM encapsulation type of the VC.
SC	Identifies the service category for the VC.
Peak Kbps	Identifies the number of kilobits per second sent at the peak rate.
Avg/Min Kbps	Identifies the number of kilobits per second sent at the average rate.
Burst Cells	Identifies the burst cell size in terms of number of cells. This number is the maximum number of ATM cells the VC can send at the peak rate.
Sts	Identifies the status of the virtual circuit.

Related Commands

Command	Description
dbas enable	Enables DBS.
pvc	Creates or assigns a name to an ATM PVC, specifies the encapsulation type on an ATM PVC, or enters interface-ATM-VC configuration mode.
pvc-in-range	Configures an individual PVC within a PVC range.
range pvc	Defines a range of ATM PVCs.
show atm pvc	Displays all ATM PVCs and traffic information.
vc-class atm	Configures a VC class for an ATM VC or interface.

Glossary

ABR—available bit rate. QoS class defined by the ATM Forum for ATM networks. ABR is used for connections that do not require timing relationships between source and destination. ABR provides no guarantees in terms of cell loss or delay, providing only best-effort service. Traffic sources adjust their transmission rate in response to information they receive describing the status of the network and its capability to successfully deliver data.

ACR—allowed cell rate. A parameter defined by the ATM Forum for ATM traffic management. ACR varies between the MCR and the PCR, and is controlled dynamically using congestion control mechanisms.

CBR—constant bit rate. QoS class defined by the ATM Forum for ATM networks. CBR is used for connections that depend on precise clocking to ensure undistorted delivery.

MCR—minimum cell rate. Parameter defined by the ATM Forum for ATM traffic management. MCR is defined only for ABR transmissions, and specifies the minimum value for the ACR.

Multipoint subinterface—Multipoint networks have three or more routers in the same subnet. If you put the PVC in a point-to-multipoint subinterface or in the main interface (which is multipoint by default), you need to either configure a static mapping or enable inverse Address Resolution Protocol (ARP) for dynamic mapping.

NAS—Network access server. Cisco platform (or collection of platforms, such as an AccessPath system) that interfaces between the packet world (for example, the Internet) and the circuit world (for example, the PSTN).

PCR—peak cell rate. Parameter defined by the ATM Forum for ATM traffic management. In Constant Bit Rate (CBR) transmissions, PCR determines how often data samples are sent. In ABR transmissions, PCR determines the maximum value of the ACR.

Point-to-point subinterface—With point-to-point subinterfaces, each pair of routers has its own subnet. If you put the PVC on a point-to-point subinterface, the router assumes that there is only one point-to-point PVC configured on the subinterface. Therefore, any IP packets with a destination IP address in the same subnet are forwarded on this VC. This is the simplest way to configure the mapping and is therefore the recommended method.

PPP—Point-to-Point Protocol. PPP is the successor to Serial Line Internet Protocol (SLIP) that provides router-to-router and host-to-network connections over synchronous and asynchronous circuits. Whereas SLIP was designed to work with IP, PPP was designed to work with several network layer protocols, such as IP, IPX, and ARA. PPP also has built-in security mechanisms, such as CHAP and PAP. PPP relies on two protocols: Link Control Protocol (LCP) and Network Control Protocol (NCP).

PPPoA—Point-to-Point Protocol over ATM. The PPPoA feature enables a high-capacity central site router with an Asynchronous Transfer Mode (ATM) interface to terminate multiple remote Point-to-Point Protocol (PPP) connections.

PPPoE—Point-to-Point Protocol over Ethernet. PPPoE allows a PPP session to be initiated on a simple bridging Ethernet connected client.

PVC—permanent virtual circuit. A virtual circuit that is permanently established. PVCs save bandwidth associated with circuit establishment and tear down in situations where certain virtual circuits must exist all the time. In ATM terminology, called a permanent virtual connection.

QoS—Quality of Service. Cisco IOS QoS technology lets complex networks control and predictably service a variety of networked applications and traffic types.

RADIUS—Remote Authentication Dial-in User Service

SCR—sustainable cell rate. Parameter defined by the ATM Forum for ATM traffic management. For VBR connections, SCR determines the long-term average cell rate that can be transmitted.

UBR—unspecified bit rate. 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.

VBR—variable bit rate. QoS class defined by the ATM Forum for ATM networks. VBR is subdivided into a real time (rt) class and non-real time (nrt) class. VBR (rt) is used for connections in which there is a fixed timing relationship between samples. VBR (nrt) is used for connections in which there is no fixed timing relationship between samples but that still need a guaranteed QoS.

VPDN—Virtual Private Dial Network. A VPDN is a network that extends remote access to a private network using a shared infrastructure. VPDNs use Layer 2 tunnel technologies (L2F, L2TP, and PPTP) to extend the Layer 2 and higher parts of the network connection from a remote user across an ISP network to a private network. VPDNs are a cost effective method of establishing a long distance, point-to-point connection between remote dial users and a private network.

VSA—Vendor-Specific Attribute. An attribute that has been implemented by a particular vendor. It uses the attribute Vendor-Specific to encapsulate the resulting AV pair: essentially, Vendor-Specific = protocol:attribute = value.

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