show queue

To display the contents of packets inside a queue for a particular interface or virtual circuit (VC), use the **show queue** privileged EXEC command.

show queue *interface-name interface-number* [**vc** [*vpi*/] *vci*]]

Syntax Description

interface-name	The name of the interface.
interface-number	The number of the interface.
vc	(Optional) For ATM interfaces only, shows the fair queueing configuration for a specified permanent virtual circuit (PVC). The name can be up to 16 characters long.
vpi/	(Optional) ATM network virtual path identifier (VPI) for this PVC. The absence of the "/" and a *vpi* value defaults the *vpi* value to 0. On the Cisco 7200 and 7500 series routers, this value ranges from 0 to 255. The *vpi* and *vci* arguments cannot both be set to 0; if one is 0, the other cannot be 0. If this value is omitted, information for all VCs on the specified ATM interface or subinterface is displayed.
vci	(Optional) 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-vp** command. Typically, lower values 0 to 31 are reserved for specific traffic (F4 Operation, Administration, and Maintenance (OAM), switched virtual circuit (SVC) signalling, Integrated Local Management Interface (ILMI), and so on) and should not be used. 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. The *vpi* and *vci* arguments cannot both be set to 0; if one is 0, the other cannot be 0.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.2	This command was introduced.

Usage Guidelines

This command displays the contents of packets inside a queue for a particular interface or VC. The **show queue** command is primarily for internal debugging purposes and custom queueing.

This command does not support VIP-distributed Weighted Random Early Detection WRED (DWRED). You can use the **vc** keyword and the **show queue** command arguments to display output for a PVC only on Enhanced ATM port adapters (PA-A3) that support per-VC queueing.

This command is not recommended for use with the modular QoS CLI (MQC) features. Use the **show policy interface** command.

Examples

The following examples show sample output when the **show queue** command is entered and either weighted fair queueing (WFQ), WRED, or flow-based WRED are configured.

WFQ Example

The following is sample output from the **show queue** command for PVC 33 on the atm2/0.33 ATM subinterface. Two conversations are active on this interface. WFQ ensures that both data streams receive equal bandwidth on the interface while they have messages in the pipeline.

```
Router# show queue atm2/0.33 vc 33

Interface ATM2/0.33 VC 0/33
  Queueing strategy: weighted fair
  Total output drops per VC: 18149
  Output queue: 57/512/64/18149 (size/max total/threshold/drops)
     Conversations  2/2/256 (active/max active/max total)
     Reserved Conversations 3/3 (allocated/max allocated)

  (depth/weight/discards/tail drops/interleaves) 29/4096/7908/0/0
  Conversation 264, linktype: ip, length: 254
  source: 10.1.1.1, destination: 10.0.2.20, id: 0x0000, ttl: 59,
  TOS: 0 prot: 17, source port 1, destination port 1

  (depth/weight/discards/tail drops/interleaves) 28/4096/10369/0/0
  Conversation 265, linktype: ip, length: 254
  source: 10.1.1.1, destination: 10.0.2.20, id: 0x0000, ttl: 59,
  TOS: 32 prot: 17, source port 1, destination port 2
```

Table 31 describes the significant fields shown in the display.

Table 31 show queue Field Descriptions for WFQ

Field	Description
Queueing strategy	Type of queueing active on this interface.
Total output drops per VC	Total output packet drops.
Output queue	Output queue size, in packets. Max total defines the aggregate queue size of all the WFQ flows. Threshold is the individual queue size of each conversation. Drops are the dropped packets from all the conversations in WFQ.
Conversations	WFQ conversation number. A conversation becomes inactive or times out when its queue is empty. Each traffic flow in WFQ is based on a queue and represented by a conversation. Max active is the number of active conversations that have occurred since the queueing feature was configured. Max total is the number of conversations allowed simultaneously.

Table 31 show queue Field Descriptions for WFQ (continued)

Field	Description
Reserved Conversations	Traffic flows not captured by WFQ, such as class-based weighted fair queueing (CBWFQ) configured by the bandwidth command or a Resource Reservation Protocol (RSVP) flow, have a separate queue that is represented by a reserved conversation. Allocated is the current number of reserved conversations. Max allocated is the maximum number of allocated reserved conversations that have occurred.
depth	Queue depth for the conversation, in packets.
weight	Weight used in WFQ.
discards	Number of packets dropped from the conversation's queue.
tail drops	Number of packets dropped from the conversation when the queue is at capacity.
interleaves	Number of packets interleaved.
linktype	Protocol name.
length	Packet length.
source	Source IP address.
destination	Destination IP address.
id	Packet ID.
ttl	Time to live count.
TOS	IP type of service.
prot	Layer 4 protocol number.

Flow-Based WRED Example

The following is sample output from the **show queue** command issued for serial interface 1 on which flow-based WRED is configured. The output shows information for each packet in the queue; the data identifies the packet by number, the flow-based queue to which the packet belongs, the protocol used, and so forth.

```
Router# show queue Serial1

   Output queue for Serial1 is 2/0

   Packet 1, flow id:160, linktype:ip, length:118, flags:0x88
     source:10.1.3.4, destination:10.1.2.2, id:0x0000, ttl:59,
     TOS:32 prot:17, source port 1, destination port 515
       data:0x0001 0x0203 0x0405 0x0607 0x0809 0x0A0B 0x0C0D
             0x0E0F 0x1011 0x1213 0x1415 0x1617 0x1819 0x1A1B

   Packet 2, flow id:161, linktype:ip, length:118, flags:0x88
     source:10.1.3.5, destination:10.1.2.2, id:0x0000, ttl:59,
     TOS:64 prot:17, source port 1, destination port 515
       data:0x0001 0x0203 0x0405 0x0607 0x0809 0x0A0B 0x0C0D
             0x0E0F 0x1011 0x1213 0x1415 0x1617 0x1819 0x1A1B
```

Table 32 describes the significant fields shown in the display.

Table 32 show queue Field Descriptions for Flow-Based WRED

Field	Description
Packet	Packet number.
flow id	Flow-based WRED number.
linktype	Protocol name.
length	Packet length.
flags	Internal version-specific flags.
source	Source IP address.
destination	Destination IP address.
id	Packet ID.
ttl	Time to live count.
prot	Layer 4 protocol number.
data	Packet data.

WRED Example

The following is sample output from the **show queue** command issued for serial interface 3 on which WRED is configured. The output has been truncated to show only 2 of the 24 packets.

```
Router# show queue Serial3

   Output queue for Serial3 is 24/0

   Packet 1, linktype:ip, length:118, flags:0x88
     source:10.1.3.25, destination:10.1.2.2, id:0x0000, ttl:59,
     TOS:192 prot:17, source port 1, destination port 515
       data:0x0001 0x0203 0x0405 0x0607 0x0809 0x0A0B 0x0C0D
             0x0E0F 0x1011 0x1213 0x1415 0x1617 0x1819 0x1A1B

   Packet 2, linktype:ip, length:118, flags:0x88
     source:10.1.3.26, destination:10.1.2.2, id:0x0000, ttl:59,
     TOS:224 prot:17, source port 1, destination port 515
       data:0x0001 0x0203 0x0405 0x0607 0x0809 0x0A0B 0x0C0D
             0x0E0F 0x1011 0x1213 0x1415 0x1617 0x1819 0x1A1B
```

Related Commands

Command	Description
atm vc-per-vp	Sets the maximum number of VCIs to support per VPI.
custom-queue-list	Assigns a custom queue list to an interface.
fair-queue (class-default)	Specifies the number of dynamic queues to be reserved for use by the class-default class as part of the default class policy.
fair-queue (WFQ)	Enables WFQ for an interface.
priority-group	Assigns the specified priority list to an interface.
random-detect (interface)	Enables WRED or DWRED.
random-detect flow	Enables flow-based WRED.

Command	Description
show frame-relay pvc	Displays information and statistics about WFQ for a VIP-based interface.
show queueing	Lists all or selected configured queueing strategies.

show queueing

To list all or selected configured queueing strategies, use the **show queueing** privileged EXEC command.

show queueing [**custom** | **fair** | **priority** | **random-detect** [**interface** *atm-subinterface* [**vc** [[*vpi*/] *vci*]]]]

Syntax Description

custom	(Optional) Status of the custom queueing list configuration.
fair	(Optional) Status of the fair queueing configuration.
priority	(Optional) Status of the priority queueing list configuration.
random-detect	(Optional) Status of the Weighted Random Early Detection (WRED) and distributed WRED (DWRED) configuration, including configuration of flow-based WRED.
interface *atm-subinterface*	(Optional) Displays the WRED parameters of every virtual circuit (VC) with WRED enabled on the specified ATM subinterface.
vc	(Optional) Displays the WRED parameters associated with a specific VC. If desired, both the virtual path identifier (VPI) and virtual circuit identifier (VCI) values, or just the VCI value, can be specified.
vpi/	(Optional) Specifies the VPI. If the *vpi* argument is omitted, 0 is used as the VPI value for locating the permanent virtual circuit (PVC). If the *vpi* argument is specified, the **/** separator is required.
vci	(Optional) Specifies the VCI.

Defaults

If no keyword is entered, this command shows the configuration of all interfaces.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.3	This command was introduced.
12.0(4)T	This command was integrated into Cisco IOS Release 12.0(4)T. The **red** keyword was changed to **random-detect**.
12.1(2)T	This command was integrated into Cisco IOS Release 12.1(2)T. This command was modified to include information about the Frame Relay PVC Interface Priority Queueing (FR PIPQ) feature.

Examples

FR PIPQ Example

The following sample output shows that FR PIPQ (referred to as "DLCI priority queue") is configured on serial interface 0. The output also shows the size of the four data-link connection identifier (DLCI) priority queues.

```
Router# show queueing
```

```
Current fair queue configuration:

  Interface           Discard     Dynamic      Reserved
                      threshold   queue count  queue count
  Serial3/1           64          256          0
  Serial3/3           64          256          0

Current DLCI priority queue configuration:

  Interface           High    Medium  Normal  Low
                      limit   limit   limit   limit
  Serial0             20      40      60      80

Current priority queue configuration:

List   Queue  Args
1      low    protocol ipx
1      normal protocol vines
1      normal protocol appletalk
1      normal protocol ip
1      normal protocol decnet
1      normal protocol decnet_node
1      normal protocol decnet_rout
1      normal protocol decnet_rout
1      medium protocol xns
1      high   protocol clns
1      normal protocol bridge
1      normal protocol arp
Current custom queue configuration:
Current random-detect configuration:
```

Weighted Fair Queueing Example

The following is sample output from the **show queueing** command. There are two active conversations in serial interface 0. Weighted fair queueing (WFQ) ensures that both of these IP data streams—both using TCP—receive equal bandwidth on the interface while they have messages in the pipeline, even though more FTP data is in the queue than remote-procedure call (RCP) data.

```
Router# show queueing

Current fair queue configuration:
Interface           Discard     Dynamic      Reserved
                    threshold   queue count  queue count
  Serial0             64          256          0
  Serial1             64          256          0
  Serial2             64          256          0
  Serial3             64          256          0

Current priority queue configuration:
List   Queue  Args
1      high   protocol cdp
2      medium interface Ethernet1

Current custom queue configuration:

Current random-detect configuration:
  Serial5
    Queueing strategy:random early detection (WRED)
    Exp-weight-constant:9 (1/512)
    Mean queue depth:40

    Class   Random       Tail    Minimum    Maximum     Mark
              drop       drop  threshold  threshold  probability
```

```
      0       1401       9066        20          40       1/10
      1          0          0        22          40       1/10
      2          0          0        24          40       1/10
      3          0          0        26          40       1/10
      4          0          0        28          40       1/10
      5          0          0        31          40       1/10
      6          0          0        33          40       1/10
      7          0          0        35          40       1/10
      rsvp       0          0        37          40       1/10
```

Custom Queueing Example

The following is sample output from the **show queueing custom** command:

```
Router# show queueing custom

Current custom queue configuration:
List   Queue  Args
3      10     default
3      3      interface Tunnel3
3      3      protocol ip
3      3      byte-count 444 limit 3
```

Flow-Based WRED Example

The following is sample output from the **show queueing random-detect** command. The output shows that the interface is configured for flow-based WRED to ensure fair packet drop among flows. The **random-detect flow average-depth-factor** command was used to configure a scaling factor of 8 for this interface. The scaling factor is used to scale the number of buffers available per flow and to determine the number of packets allowed in the output queue of each active flow before the queue is susceptible to packet drop. The maximum flow count for this interface was set to 16 by the **random-detect flow count** command.

```
Router# show queueing random-detect

    Current random-detect configuration:
      Serial1
        Queueing strategy:random early detection (WRED)
        Exp-weight-constant:9 (1/512)
        Mean queue depth:29
        Max flow count:16       Average depth factor:8
        Flows (active/max active/max):39/40/16

        Class   Random       Tail    Minimum    Maximum     Mark
                  drop       drop  threshold  threshold  probability
          0         31          0         20         40     1/10
          1         33          0         22         40     1/10
          2         18          0         24         40     1/10
          3         14          0         26         40     1/10
          4         10          0         28         40     1/10
          5          0          0         31         40     1/10
          6          0          0         33         40     1/10
          7          0          0         35         40     1/10
         rsvp        0          0         37         40     1/10
```

DWRED Example

The following is sample output from the **show queueing random-detect** command for DWRED:

```
Current random-detect configuration:
  FastEthernet2/0/0
    Queueing strategy:fifo
    Packet drop strategy:VIP-based random early detection (DWRED)
    Exp-weight-constant:9 (1/512)
```

```
Mean queue depth:0
Queue size:0       Maximum available buffers:6308
Output packets:5  WRED drops:0  No buffer:0

Class    Random       Tail    Minimum    Maximum     Mark       Output
           drop       drop  threshold  threshold  probability  Packets
  0           0          0        109        218      1/10           5
  1           0          0        122        218      1/10           0
  2           0          0        135        218      1/10           0
  3           0          0        148        218      1/10           0
  4           0          0        161        218      1/10           0
  5           0          0        174        218      1/10           0
  6           0          0        187        218      1/10           0
  7           0          0        200        218      1/10           0
```

Table 33 describes the significant fields shown in the display.

Table 33 show queueing Field Descriptions

Field	Description
Discard threshold	Number of messages allowed in each queue.
Dynamic queue count	Number of dynamic queues used for best-effort conversations.
Reserved queue count	Number of reservable queues used for reserved conversations.
High limit	High DLCI priority queue size in maximum number of packets.
Medium limit	Medium DLCI priority queue size, in maximum number of packets.
Normal limit	Normal DLCI priority queue size, in maximum number of packets.
Low limit	Low DLCI priority queue size, in maximum number of packets.
List	Custom queueing—Number of the queue list. Priority queueing—Number of the priority list.
Queue	Custom queueing—Number of the queue. Priority queueing—Priority queue level (**high**, **medium**, **normal**, or **low** keyword).
Args	Packet matching criteria for that queue.
Exp-weight-constant	Exponential weight factor.
Mean queue depth	Average queue depth. It is calculated based on the actual queue depth on the interface and the exponential weighting constant. It is a moving average. The minimum and maximum thresholds are compared against this value to determine drop decisions.
Class	IP Precedence value.
Random drop	Number of packets randomly dropped when the mean queue depth is between the minimum threshold value and the maximum threshold value for the specified IP Precedence value.
Tail drop	Number of packets dropped when the mean queue depth is greater than the maximum threshold value for the specified IP Precedence value.
Minimum threshold	Minimum WRED threshold, in number of packets.

Table 33 show queueing Field Descriptions (continued)

Field	Description
Maximum threshold	Maximum WRED threshold, in number of packets.
Mark probability	Fraction of packets dropped when the average queue depth is at the maximum threshold.

Related Commands

Command	Description
custom-queue-list	Assigns a custom queue list to an interface.
exponential-weighting-constant	Configures the exponential weight factor for the average queue size calculation for a WRED parameter group.
fair-queue (WFQ)	Enables WFQ for an interface.
frame-relay interface-queue priority	Enables the FR PIPQ feature.
precedence (WRED group)	Configures a WRED group for a particular IP Precedence.
priority-group	Assigns the specified priority list to an interface.
priority-list interface	Establishes queueing priorities on packets entering from a given interface.
priority-list queue-limit	Specifies the maximum number of packets that can be waiting in each of the priority queues.
queue-list interface	Establishes queueing priorities on packets entering on an interface.
queue-list queue byte-count	Specifies how many bytes the system allows to be delivered from a given queue during a particular cycle.
random-detect (interface)	Enables WRED or DWRED.
random-detect flow average-depth-factor	Sets the multiplier to be used in determining the average depth factor for a flow when flow-based WRED is enabled.
random-detect flow count	Sets the flow count for flow-based WRED.
show interfaces	Displays the statistical information specific to a serial interface.
show queue	Displays the contents of packets inside a queue for a particular interface or VC.
show queueing interface	Displays the queueing statistics of an interface or VC.

show queueing interface

To display the queueing statistics of an interface or a virtual circuit (VC), use the **show queueing interface** privileged EXEC command.

show queueing interface *interface-number* [**vc** [[*vpi*/] *vci*]]

Syntax Description

interface-number	Specifies the number of the interface.
vc	(Optional) Shows the weighted fair queueing (WFQ) and Weighted Random Early Detection (WRED) parameters associated with a specific VC. If desired, both the virtual path identifier (VPI) and virtual channel identifier (VCI) values, or just the VCI value, can be specified.
vpi/	(Optional) Specifies the VPI. If the *vpi* argument is omitted, 0 is used as the VPI value for locating the permanent virtual circuit (PVC). If the *vpi* argument is specified, the **/** separator is required.
vci	(Optional) Specifies the VCI.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1(22)CC	This command was introduced.

Examples

The following is sample output from the **show queueing interface** command:

```
Router# show queueing interface atm2/0

  Interface ATM2/0 VC 201/201
  Queueing strategy:random early detection (WRED)
    Exp-weight-constant:9 (1/512)
    Mean queue depth:49
    Total output drops per VC:759

    Class   Random       Tail    Minimum    Maximum     Mark
              drop       drop  threshold  threshold  probability
      0        165         26         30         50     1/10
      1        167         12         32         50     1/10
      2        173         14         34         50     1/10
      3        177         25         36         50     1/10
      4          0          0         38         50     1/10
      5          0          0         40         50     1/10
      6          0          0         42         50     1/10
      7          0          0         44         50     1/10
     rsvp        0          0         46         50     1/10
```

Related Commands

custom-queue-list	Assigns a custom queue list to an interface.
fair-queue (class-default)	Specifies the number of dynamic queues to be reserved for use by the class-default class as part of the default class policy.
fair-queue (WFQ)	Enables WFQ for an interface.
priority-group	Assigns the specified priority list to an interface.
random-detect (interface)	Enables WRED or DWRED.
random-detect (per VC)	Enables per-VC WRED or per-VC DWRED.
random-detect flow	Enables flow-based WRED.
show frame-relay pvc	Displays information and statistics about WFQ for a VIP-based interface.
show policy-map interface	Displays the configuration of all classes configured for all service policies on the specified interface or displays the classes for the service policy for a specific PVC on the interface.
show queueing	Lists all or selected configured queueing strategies.

show tech-support rsvp

To generate a report of all Resource Reservation Protocol (RSVP)-related information, use the **show tech-support rsvp** privileged EXEC command.

show tech-support rsvp

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command is not required for normal use of the operating system. This command is useful when you contact technical support personnel with questions regarding RSVP. The **show tech-support rsvp** command generates a series of reports that can be useful to technical support personnel attempting to solve problems.

Any issues or caveats that apply to the **show tech-support** command also apply to this command. For example, the enable password, if configured, is not displayed in the output of the **show running-config** command.

The **show tech-support rsvp** command is equivalent to issuing the following commands:

- **show ip rsvp installed**
- **show ip rsvp interface**
- **show ip rsvp neighbor**
- **show ip rsvp policy cops**
- **show ip rsvp reservation**
- **show ip rsvp sender**
- **show running-config**
- **show version**

These commands are documented in various chapters of this book. Refer to the displays and descriptions for the individual commands for information about the **show tech-support rsvp** command display.

show traffic-shape

To display the current traffic-shaping configuration, use the **show traffic-shape** EXEC command.

show traffic-shape [*interface-type interface-number*]

Syntax Description

interface-type	(Optional) The type of the interface. If no interface is specified, traffic-shaping details for all configured interfaces are shown.
interface-number	(Optional) The number of the interface.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

You must have first enabled traffic shaping using the **traffic-shape rate**, **traffic-shape group**, or **frame-relay traffic-shaping** command to display traffic-shaping information.

Examples

The following is sample output from the **show traffic-shape** command:

```
Router# show traffic-shape

Interface   Fa0/0
       Access Target     Byte   Sustain   Excess    Interval  Increment Adapt
VC     List   Rate       Limit  bits/int  bits/int  (ms)      (bytes)   Active
-             1000000    6250   25000     25000     25        3125      -
```

Table 34 describes the significant fields shown in the display.

Table 34 show traffic-shape Field Descriptions

Field	Description
Interface	Interface type and number.
VC	Virtual circuit. **Note** If you configure traffic shaping at a VC level instead of an interface level, a number appears in this field.
Access List	Number of the access list, if one is configured.
Target Rate	Rate that traffic is shaped to, in bits per second.
Byte Limit	Maximum number of bytes sent per internal interval.
Sustain bits/int	Configured sustained bits per interval.
Excess bits/int	Configured excess bits in the first interval.

Table 34 show traffic-shape Field Descriptions (continued)

Field	Description
Interval (ms)	Interval (in milliseconds) being used internally, which may be smaller than the committed burst divided by the committed information rate, if the router determines that traffic flow will be more stable with a smaller configured interval.
Increment (bytes)	Number of bytes that will be sustained per internal interval.
Adapt Active	Contains "BECN" if Frame Relay has backward explicit congestion notification (BECN) adaptation configured.

Related Commands

Command	Description
frame-relay cir	Specifies the incoming or outgoing committed information rate (CIR) for a Frame Relay virtual circuit.
frame-relay traffic-rate	Configures all the traffic-shaping characteristics of a virtual circuit (VC) in a single command.
frame-relay traffic-shaping	Enables both traffic shaping and per-VC queueing for all PVCs and SVCs on a Frame Relay interface.
show traffic-shape queue	Displays information about the elements queued by traffic shaping at the interface level or the DLCI level.
show traffic-shape statistics	Displays the current traffic-shaping statistics.
traffic-shape adaptive	Configures a Frame Relay subinterface to estimate the available bandwidth when BECN signals are received.
traffic-shape fecn-adapt	Replies to messages with the FECN bit (which are set with TEST RESPONSE messages with the BECN bit set).
traffic-shape group	Enables traffic shaping based on a specific access list for outbound traffic on an interface.
traffic-shape rate	Enables traffic shaping for outbound traffic on an interface.

show traffic-shape queue

To display information about the elements queued by traffic shaping at the interface level or the data-link connection identifier (DLCI) level, use the **show traffic-shape queue** EXEC command.

show traffic-shape queue [*interface-number* [**dlci** *dlci-number*]]

Syntax Description

interface-number	(Optional) The number of the interface.
dlci	(Optional) The specific DLCI for which you wish to display information about queued elements.
dlci-number	(Optional) The number of the DLCI.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.
12.0(3)XG	This command was integrated into Cisco IOS Release 12.0(3)XG. The *dlci* argument was added.
12.0(4)T	This command was integrated into Cisco IOS Release 12l.0(4)T. The *dlci* argument was added.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0(5)T. This command was modified to include information on the special voice queue that is created using the **queue** keyword of the **frame-relay voice bandwidth** command.

Usage Guidelines

When no parameters are specified with this command, the output displays information for all interfaces and DLCIs containing queued elements. When a specific interface and DLCI are specified, information is displayed about the queued elements for that DLCI only.

Examples

The following is sample output for the **show traffic-shape queue** command when weighted fair queueing is configured on the map class associated with DLCI 16:

```
Router# show traffic-shape queue Serial1/1 dlci 16

Traffic queued in shaping queue on Serial1.1 dlci 16
  Queueing strategy: weighted fair
  Queueing Stats: 1/600/64/0 (size/max total/threshold/drops)
     Conversations  0/16 (active/max total)
     Reserved Conversations 0/2 (active/allocated)
  (depth/weight/discards) 1/4096/0
  Conversation 5, linktype: ip, length: 608

source: 172.21.59.21, destination: 255.255.255.255, id: 0x0006, ttl: 255,
  TOS: 0 prot: 17, source port 68, destination port 67
```

The following is sample output for the **show traffic-shape queue** command when priority queueing is configured on the map class associated with DLCI 16:

```
Router# show traffic-shape queue Serial1/1 dlci 16

Traffic queued in shaping queue on Serial1.1 dlci 16
  Queueing strategy: priority-group 4
  Queueing Stats: low/1/80/0 (queue/size/max total/drops)

Packet 1, linktype: cdp, length: 334, flags: 0x10000008
```

The following is sample output for the **show traffic-shape queue** command when first-come, first-serve queueing is configured on the map class associated with DLCI 16:

```
Router# show traffic-shape queue Serial1/1 dlci 16

Traffic queued in shaping queue on Serial1.1 dlci 16
  Queueing strategy: fcfs
  Queueing Stats: 1/60/0 (size/max total/drops)

Packet 1, linktype: cdp, length: 334, flags: 0x10000008
```

The following is sample output for the **show traffic-shape queue** command displaying statistics for the special queue for voice traffic that is created automatically when the **frame-relay voice bandwidth** command is entered:

```
Router# show traffic-shape queue serial 1 dlci 45

 Voice queue attached to traffic shaping queue on Serial1 dlci 45
 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
    Voice Queueing Stats: 0/100/0 (size/max/dropped)
    ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
 Traffic queued in shaping queue on Serial1 dlci 45
   Queueing strategy: weighted fair
   Queueing Stats: 0/600/64/0 (size/max total/threshold/drops)
      Conversations  0/16 (active/max total)
      Reserved Conversations 0/2 (active/allocated)
```

Table 35 describes the significant fields shown in the display.

Table 35 show traffic-shape queue Field Descriptions

Field	Description
Queueing strategy	When Frame Relay Traffic Shaping (FRTS) is configured, the queueing type can be weighted fair, custom-queue, priority-group, or fcfs (first-come, first-serve), depending on what is configured on the Frame Relay map class for this DLCI. The default is fcfs for FRTS. When generic traffic shaping is configured, the only queueing type available is weighted fair queueing (WFQ).
Queueing Stats	Statistics for the configured queueing strategy, as follows: • size—Current size of the queue. • max total—Maximum number of packets of all types that can be queued in all queues. • threshold—For WFQ, the number of packets in the queue after which new packets for high-bandwidth conversations will be dropped. • drops—Number of packets discarded during this interval.

Table 35 show traffic-shape queue Field Descriptions (continued)

Field	Description
Conversations active	Number of currently active conversations.
Conversations max total	Maximum allowed number of concurrent conversations.
Reserved Conversations active	Number of currently active conversations reserved for voice.
Reserved Conversations allocated	Maximum configured number of conversations reserved.
depth	Number of packets currently queued.
weight	Number used to classify and prioritize the packet.
discards	Number of packets discarded from queues.
Packet	Number of queued packet.
linktype	Protocol type of the queued packet. (cdp = Cisco Discovery Protocol)
length	Number of bytes in the queued packet.
flags	Number of flag characters in the queued packet.
source	Source IP address.
destination	Destination IP address.
id	Packet ID.
ttl	Time to live count.
TOS	IP type of service.
prot	Layer 4 protocol number. Refer to RFC 943 for a list of protocol numbers. (17 = User Datagram Protocol (UDP))
source port	Port number of source port.
destination port	Port number of destination port.

Related Commands

Command	Description
show frame-relay fragment	Displays Frame Relay fragmentation details.
show frame-relay pvc	Displays statistics about PVCs for Frame Relay interfaces.
show frame-relay vofr	Displays details about FRF.11 subchannels being used on VoFR DLCIs.
show traffic-shape	Displays the current traffic-shaping configuration.
show traffic-shape statistics	Displays the current traffic-shaping statistics.

show traffic-shape statistics

To display the current traffic-shaping statistics, use the **show traffic-shape statistics** EXEC command.

show traffic-shape statistics [*interface-type interface-number*]

Syntax Description

interface-type	(Optional) The type of the interface. If no interface is specified, traffic-shaping statistics for all configured interfaces are shown.
interface-number	(Optional) The number of the interface.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

You must have first enabled traffic shaping using the **traffic-shape rate**, **traffic-shape group**, or **frame-relay traffic-shaping** command to display traffic-shaping information.

Examples

The following is sample output from the **show traffic-shape statistics** command:

```
Router# show traffic-shape statistics

          Access Queue     Packets   Bytes     Packets   Bytes     Shaping
I/F       List   Depth                        Delayed   Delayed   Active
Et0       101    0         2         180       0         0         no
Et1              0         0         0         0         0         no
```

Table 36 describes the significant fields shown in the display.

Table 36 show traffic-shape statistics Field Descriptions

Field	Description
I/F	Interface.
Access List	Number of the access list.
Queue Depth	Number of messages in the queue.
Packets	Number of packets sent through the interface.
Bytes	Number of bytes sent through the interface.
Packets Delayed	Number of packets sent through the interface that were delayed in the traffic-shaping queue.
Bytes Delayed	Number of bytes sent through the interface that were delayed in the traffic-shaping queue.
Shaping Active	Contains “yes” when timers indicate that traffic shaping is occurring and “no” if traffic shaping is not occurring.

Related Commands

Command	Description
frame-relay traffic-shaping	Enables both traffic shaping and per-VC queueing for all PVCs and SVCs on a Frame Relay interface.
show interfaces	Displays statistics for all interfaces configured on the router or access server.
show ip rsvp neighbor	Displays RSVP-related interface information.
traffic-shape adaptive	Configures a Frame Relay subinterface to estimate the available bandwidth when BECN signals are received.
traffic-shape group	Enables traffic shaping based on a specific access list for outbound traffic on an interface.
traffic-shape rate	Enables traffic shaping for outbound traffic on an interface.

traffic-shape adaptive

To configure a Frame Relay subinterface to estimate the available bandwidth when backward explicit congestion notification (BECN) signals are received, use the **traffic-shape adaptive** interface configuration command. To disregard the BECN signals and not estimate the available bandwidth, use the **no** form of this command.

traffic-shape adaptive *bit-rate*

no traffic-shape adaptive

Syntax Description

bit-rate	Lowest bit rate that traffic is shaped to, in bits per second. The default *bit rate* value is 0.

Defaults

This command is not enabled by default.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command specifies the boundaries in which traffic will be shaped when BECN signals are received. You must enable traffic shaping on the interface with the **traffic-shape rate** or **traffic-shape group** command before you can use the **traffic-shape adaptive** command.

The bit rate specified for the **traffic-shape rate** command is the upper limit, and the bit rate specified for the **traffic-shape adaptive** command is the lower limit to which traffic is shaped when BECN signals are received on the interface. The rate actually shaped to will be between these two bit rates.

You should configure this command and the **traffic-shape fecn-adapt** command on both ends of the connection to ensure adaptive traffic shaping over the connection, even when traffic is flowing primarily in one direction. The **traffic-shape fecn-adapt** command configures the router to reflect forward explicit congestion notification (FECN) signals as BECN signals.

Examples

The following example configures traffic shaping on serial interface 0.1 with an upper limit of 128 kbps and a lower limit of 64 kbps. This configuration allows the link to run from 64 to 128 kbps, depending on the congestion level.

```
interface serial 0
 encapsulation-frame-relay
interface serial 0.1
 traffic-shape rate 128000
 traffic-shape adaptive 64000
 traffic-shape fecn-adapt
```

Related Commands

Command	Description
show traffic-shape	Displays the current traffic-shaping configuration.
show traffic-shape statistics	Displays the current traffic-shaping statistics.
traffic-shape fecn-adapt	Replies to messages with the FECN bit (which are set with TEST RESPONSE messages with the BECN bit set).
traffic-shape group	Enables traffic shaping based on a specific access list for outbound traffic on an interface.
traffic-shape rate	Enables traffic shaping for outbound traffic on an interface.

traffic-shape fecn-adapt

To reply to messages with the forward explicit congestion notification (FECN) bit (which are sent with TEST RESPONSE messages with the BECN bit set), use the **traffic-shape fecn-adapt** interface configuration command. To stop backward explicit congestion notification (BECN) signal generation, use the **no** form of this command.

traffic-shape fecn-adapt

no traffic-shape fecn-adapt

Syntax Description

This command has no arguments or keywords.

Defaults

Traffic shaping is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

Enable traffic shaping on the interface with the **traffic-shape rate** or **traffic-shape group** command. FECN is available only when traffic shaping is configured.

Use this command to reflect FECN bits as BECN bits. Reflecting FECN bits as BECN bits notifies the sending DTE that it is transmitting at a rate too fast for the DTE to handle. Use the **traffic-shape adaptive** command to configure the router to adapt its transmission rate when it receives BECN signals.

You should configure this command and the **traffic-shape adaptive** command on both ends of the connection to ensure adaptive traffic shaping over the connection, even when traffic is flowing primarily in one direction.

Examples

The following example configures traffic shaping on serial interface 0.1 with an upper limit of 128 kbps and a lower limit of 64 kbps. This configuration allows the link to run from 64 to 128 kbps, depending on the congestion level. The router reflects FECN signals as BECN signals.

```
interface serial 0
 encapsulation-frame-relay
interface serial 0.1
 traffic-shape rate 128000
 traffic-shape adaptive 64000
 traffic-shape fecn-adapt
```

Related Commands

Command	Description
show traffic-shape	Displays the current traffic-shaping configuration.
show traffic-shape statistics	Displays the current traffic-shaping statistics.
traffic-shape adaptive	Configures a Frame Relay subinterface to estimate the available bandwidth when BECN signals are received.
traffic-shape group	Enables traffic shaping based on a specific access list for outbound traffic on an interface.
traffic-shape rate	Enables traffic shaping for outbound traffic on an interface.

traffic-shape group

To enable traffic shaping based on a specific access list for outbound traffic on an interface, use the **traffic-shape group** interface configuration command. To disable traffic shaping on the interface for the access list, use the **no** form of this command.

traffic-shape group *access-list bit-rate* [*burst-size* [*excess-burst-size*]]

no traffic-shape group *access-list*

Syntax Description

access-list	Number of the access list that controls the packets that traffic shaping is applied to on the interface.
bit-rate	Bit rate that traffic is shaped to, in bits per second. This is the access bit rate that you contract with your service provider, or the service levels you intend to maintain.
burst-size	(Optional) Sustained number of bits that can be sent per interval. On Frame Relay interfaces, this is the Committed Burst size contracted with your service provider.
excess-burst-size	(Optional) Maximum number of bits that can exceed the burst size in the first interval in a congestion event. On Frame Relay interfaces, this is the Excess Burst size contracted with your service provider. The default is equal to the *burst-size* argument.

Defaults

Traffic shaping is not on by default.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

Generic traffic shaping is not supported on ISDN and dialup interfaces. Is is also not supported on nongeneric routing encapsulation tunnel interfaces. Traffic shaping is not supported with flow switching.

Traffic shaping uses queues to limit surges that can congest a network. Data is buffered and then sent into the network in regulated amounts to ensure that traffic will fit within the promised traffic envelope for the particular connection.

The **traffic-shape group** command allows you to specify one or more previously defined access list to shape traffic on the interface. You must specify one **traffic-shape group** command for each access list on the interface.

The **traffic-shape group** command supports both standard and extended access lists.

Use traffic shaping if you have a network with differing access rates or if you are offering a subrate service. You can configure the values according to your contract with your service provider or the service levels you intend to maintain.

An interval is calculated as follows:

- If the *burst-size* is not equal to zero, the interval is the *burst-size* divided by the *bit-rate*.
- If the *burst-size* is zero, the interval is the *excess-burst-size* divided by the *bit-rate*.

Traffic shaping is supported on all media and encapsulation types on the router. To perform traffic shaping on Frame Relay virtual circuits, you can also use the **frame-relay traffic-shaping** command. For more information on Frame Relay Traffic Shaping, refer to the "Configuring Frame Relay" chapter in the *Cisco IOS Wide-Area Networking Configuration Guide*.

If traffic shaping is performed on a Frame Relay network with the **traffic-shape rate** command, you can also use the **traffic-shape adaptive** command to specify the minimum bit rate to which the traffic is shaped.

Examples

The following example enables traffic that matches access list 101 to be shaped to a certain rate and traffic matching access list 102 to be shaped to another rate on the interface:

```
interface serial 1
 traffic-shape group 101 128000 16000 8000
 traffic-shape group 102 130000 10000 1000
```

Related Commands

Command	Description
access-list (IP Standard)	Defines a standard IP access list.
show traffic-shape	Displays the current traffic-shaping configuration.
show traffic-shape statistics	Displays the current traffic-shaping statistics.
traffic-shape adaptive	Configures a Frame Relay subinterface to estimate the available bandwidth when BECN signals are received.
traffic-shape fecn-adapt	Replies to messages with the FECN bit (which are set with TEST RESPONSE messages with the BECN bit set).
traffic-shape rate	Enables traffic shaping for outbound traffic on an interface.

traffic-shape rate

To enable traffic shaping for outbound traffic on an interface, use the **traffic-shape rate** interface configuration command. To disable traffic shaping on the interface, use the **no** form of this command.

traffic-shape rate *bit-rate* [*burst-size* [*excess-burst-size*]] [*buffer-limit*]]

no traffic-shape rate

Syntax Description

bit-rate	Bit rate that traffic is shaped to, in bits per second. This is the access bit rate that you contract with your service provider, or the service levels you intend to maintain.
burst-size	(Optional) Sustained number of bits that can be sent per interval. On Frame Relay interfaces, this is the Committed Burst size contracted with your service provider.
excess-burst-size	(Optional) Maximum number of bits that can exceed the burst size in the first interval in a congestion event. On Frame Relay interfaces, this is the Excess Burst size contracted with your service provider. The default is equal to the *burst-size* argument.
buffer-limit	(Optional) Maximum buffer limit in bps. Valid entries are numbers in the range of 0 to 4096.

Defaults

Traffic shaping is disabled.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

Generic traffic shaping is not supported on ISDN and dialup interfaces. Is is also not supported on nongeneric routing encapsulation tunnel interfaces. Traffic shaping is not supported with flow switching.

Traffic shaping uses queues to limit surges that can congest a network. Data is buffered and then sent into the network in regulated amounts to ensure that traffic will fit within the promised traffic envelope for the particular connection.

Use traffic shaping if you have a network with differing access rates or if you are offering a subrate service. You can configure the values according to your contract with your service provider or the service levels you intend to maintain.

An interval is calculated as follows:

- If the *burst-size* is not equal to zero, the interval is the *burst-size* divided by the *bit-rate*.
- If the *burst-size* is zero, the interval is the *excess-burst-size* divided by the *bit-rate*.

Traffic shaping is supported on all media and encapsulation types on the router. To perform traffic shaping on Frame Relay virtual circuits, you can also use the **frame-relay traffic-shaping** command. For more information on Frame Relay Traffic Shaping, refer to the "Configuring Frame Relay" chapter in the *Cisco IOS Wide-Area Networking Configuration Guide*.

If traffic shaping is performed on a Frame Relay network with the **traffic-shape rate** command, you can also use the **traffic-shape adaptive** command to specify the minimum bit rate to which the traffic is shaped.

Examples

The following example enables traffic shaping on serial interface 0 using the bandwidth required by the service provider:

```
interface serial 0
 traffic-shape rate 128000 16000 8000
```

Related Commands

Command	Description
show traffic-shape	Displays the current traffic-shaping configuration.
show traffic-shape statistics	Displays the current traffic-shaping statistics.
traffic-shape adaptive	Configures a Frame Relay subinterface to estimate the available bandwidth when BECN signals are received.
traffic-shape fecn-adapt	Replies to messages with the FECN bit (which are set with TEST RESPONSE messages with the BECN bit set).
traffic-shape group	Enables traffic shaping based on a specific access list for outbound traffic on an interface.

tx-ring-limit

To limit the number of particles or packets that can be used on a transmission ring on an interface, use the **tx-ring-limit** ATM VC configuration command. To not limit the number of particles or packets that can be used on an interface, use the **no** form of this command.

tx-ring-limit *ring-limit*

no tx-ring-limit *ring-limit*

Syntax Description

ring-limit	Specifies the maximum number of allowable particles or packets that can be placed on the transmission ring.

Defaults

This command has no default behavior or values.

Command Modes

ATM VC Configuration

Command History

Release	Modification
12.0(7)XE1	This command was introduced.
12.0(9)S	This command was integrated into Cisco IOS Release 12.0 S.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

The transmission ring limit value is limited to values from 3 to 6000.

For Cisco 2600 series routers and Cisco 3600 series routers, you can specify the number of packets. For Cisco 7200 series routers and Cisco 7500 series routers, you can specify the number of particles.

This command allows you to reduce the size of the FIFO (first-in, first-out) queue. Reducing the size of the transmit ring in the queue has two benefits:

- It reduces the amount of time packets wait in the FIFO queue before being segmented.
- It accelerates the use of QoS in the Cisco IOS software.

Examples

The following example configures the transmission ring limit to seven particles on an ATM interface:

```
Router(config)# interface atm 1/0/0

Router(config-if)# atm pvc 32 0 32 aal5snap 10000 8000 2000 tx-ring-limit 7
```

The following example configures the transmission ring limit to ten particles on an ATM permanent virtual circuit (PVC) subinterface:

```
Router(config)# interface ATM1/0/0.1 point-to-point

Router(config-subif)# pvc 2/200

Router(config-if-atm-vc)# tx-ring-limit 10
```

Related Commands

Command	Description
show atm vc	Displays information about ATM PVCs and SVCs.
tx-queue-limit	Controls the number of transmit buffers available to a specified interface on the MCI and SCI cards.

vc-hold-queue

To configure the per-virtual circuit (VC) hold queue on an ATM adapter, use the **vc-hold-queue** interface configuration command. To return to the default value of the per-VC hold queue, use the **no** form of this command.

vc-hold-queue *number-of-packets*

no vc-hold-queue *number-of-packets*

Syntax Description

number-of-packets	Specifies number of packets that can be configured for the per-VC hold queue. Number of packets can be a minimum of 5 to a maximum of 1024.

Defaults

The default value of the hold queue is set by the queueing mechanism in use.

Command Modes

Interface configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

This command can only be used on Cisco 7200 series routers and on Cisco 2600 and 3600 adapters that support per-VC queueing.

This command is configurable at the VC level only.

Examples

The following example sets the per-VC hold queue to 55:

```
interface atm2/0.1
 pvc 1/101
  vc-hold-queue 55
```

Related Commands

Command	Description
hold-queue	Specifies the hold-queue limit of an interface.
show interfaces	Displays statistics for all interfaces configured on the router or access server.
show queueing interface	Displays the queueing statistics of an interface or VC.