Chapter 7

Configuring EP Rate Limiting
on the 9300 Series (with EP Modules)

This chapter describes how to configure rate limiting on devices with Enhanced Performance modules.

**NOTE:** To configure rate limiting on a Standard module, see “Configuring Rate Limiting on the 9300 Series (with M2, M4, and T-flow)” on page 6-1.

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**Adaptive Rate Limiting**

Line-rate rate limiting in hardware is available on the following devices:

- HP devices with EP modules running software release 07.6.01

You can configure the device to use one of the following modes of rate limiting:

- Port-based – Limits the rate on an individual port to the maximum bits per second (bps) you specify.
- Port-and-priority-based – Limits the rate on an individual hardware forwarding queue on an individual port.
- ACL-based – Limits the rate for IP traffic on an individual port that matches the permit conditions in IP Access Control Lists (ACLs). You can use standard or extended IP ACLs. Standard IP ACLs match traffic based on source IP address information. Extended ACLs match traffic based on source and destination IP address and IP protocol information. For TCP and UDP, they also match on source and destination TCP or UDP addresses.
- EP Layer 2 ACL-based – This feature is an extension to the existing IP ACL-based rate limiting on devices with EP modules. This feature enables you to limit traffic rates using the Layer 2 parameters defined in the associated EP Layer 2 ACL table.

**NOTE:** Port-and-priority-based rate limiting, ACL-based rate limiting, and EP Layer 2 ACL-based rate limiting are supported only for inbound rate limiting policies. Port-based rate limiting is supported for inbound and outbound rate limiting policies.
The device creates entries in Content Addressable Memory (CAM) for the rate limiting policies. The CAM entries enable the device to perform the rate limiting in hardware instead of sending the traffic to the CPU. The device sends the first packet in a given traffic flow to the CPU, which creates a CAM entry for the traffic flow. A CAM entry consists of the source and destination addresses of the traffic. The device uses the CAM entry for rate limiting all the traffic within the same flow. A rate limiting CAM entry remains in the CAM for two minutes before aging out.

**NOTE:** The adaptive rate limiting described in this section is supported on EP modules. This rate limiting is not supported on devices with Standard modules or on the 10 Gigabit Ethernet module.

### EP Rate Limiting Support for Release 07.6.01 and Greater

Table 7.1 lists the types of rate limiting supported on devices with EP modules, running software release 07.6.01.

<table>
<thead>
<tr>
<th>Product</th>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Port</td>
<td>Port- and-priority</td>
</tr>
<tr>
<td>9300 series</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

*a.ACL-based Adaptive Rate Limiting is supported on individual ports only, not on virtual routing interfaces. Up to ten ACL-based rate limiting policies are supported per port and up to 105 are supported per device. You cannot use the ACL-based mode along with features that modify the ToS value in IP traffic.

**Additional Notes**

- If you configure Adaptive Rate Limiting and ACLs on the same port, rate limiting stops working on the port and only the ACLs take effect.
- VLAN-based (VLAN / VE) rate limiting is not supported.
- Port-and-VLAN based rate limiting (Port / VLAN) is not supported.
- EP modules do not support adaptive rate limiting based on specific MAC addresses.

### Rate Limiting Algorithm and Parameters

Rate limiting uses the following algorithm:

\[ c = \left( \frac{R \times I \times 0.0192}{S \times 8} \right) \]

where:

- **C** is the number of Credits. A policy allows up to the number of bytes for which the policy has credits in a given Rate Limiting Interval. The algorithm rounds the value of C up to the next whole integer. Inbound rate limiting uses 32-byte credits. Outbound rate limiting uses 64-byte credits.
- **R** is the Average Rate. The Average Rate is the maximum number of bits the policy allows during one second. This parameter is configurable.
- **I \times 0.0000192** calculates the Rate Limiting Interval. The Rate Limiting Interval determines the granularity of the rate limiting. The value of I depends on the type of rate limiting (inbound or outbound) and the port type. See Table 7.2.
- **S** is the credit size. Multiplying S by 8 converts bits to bytes, since the Average Rate is expressed in bits per second but the Credits are based on bytes.

The device calculates the Credits based on the Average Rate and Rate Limiting Interval.
Table 7.2 lists the rate limiting parameters.

<table>
<thead>
<tr>
<th>Traffic Direction</th>
<th>Port Type</th>
<th>Minimum Average Rate (R)</th>
<th>Rate Increments (Granularity)(^a)</th>
<th>Time Interval (I)</th>
<th>Credit Size (S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inbound</td>
<td>10/100</td>
<td>256512 bps</td>
<td>256512 bps</td>
<td>52</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Gigabit</td>
<td>1025792 bps</td>
<td>1025792 bps</td>
<td>13</td>
<td>32</td>
</tr>
<tr>
<td>Outbound</td>
<td>10/100</td>
<td>1041910 bps</td>
<td>41500 bps</td>
<td>640</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Gigabit</td>
<td>20833792 bps</td>
<td>833024 bps</td>
<td>32</td>
<td>64</td>
</tr>
</tbody>
</table>

\(^a\)The rate increments are approximate.

The following sections describe the rate limiting parameters in detail.

**Average Rate**

The Average Rate is a parameter you specify when you configure a rate limiting policy. The Average Rate represents a percentage of an interface's line rate (bandwidth), expressed in bits per second (bps). The Average Rate specifies the maximum number of bits you want to allow a port to receive or forward during a one-second interval.

The Average Rate you can specify depends on the port's maximum line rate and whether you are configuring inbound rate limiting or outbound rate limiting. Table 7.2 lists the minimum Average Rate for each traffic direction and port type. The maximum Average Rate you can specify is the maximum line rate of the port.

**Adjusted Average Rate**

The software adjusts the Average Rate you enter so that the calculation of credits does not result in a remainder of a partial Credit. The CLI displays the adjusted rate. You also can display a table of the adjusted rate values. See “Displaying Adjusted Average Rates” on page 7-10.

For outbound rate limiting, it can take 30 – 60 seconds for a port’s rate to change to the adjusted Average Rate. This can occur in the following cases:

- When you apply an outbound rate limiting policy to the port.
- When the packet sizes of the traffic change dramatically within a short period of time.

**Credits**

A Credit is a forwarding allowance for a rate-limited port, and is the smallest number of bytes that can be allowed during a given Rate Limiting Interval. Inbound rate limiting uses 32-byte credits. Outbound rate limiting uses 64-byte credits.

During a Rate Limiting Interval, a port can send or receive only as many bytes as the port has Credits for. For example, if an inbound rate limiting policy results in a port receiving two Credits per rate limiting interval, the port can send or receive a maximum of 64 bytes of data during that interval.

**Rate Limiting Interval**

The Rate Limiting Interval is a specific number of milliseconds (ms) that determines the granularity of the rate limiting. Table 7.2 lists the rate limiting interval Average Rate for each traffic direction and port type. EP Adaptive Rate Limiting allocates Credits on an individual Rate Limiting Interval basis.
Rate Limiting of Control Packets
For the port-based and port-and-priority-based modes, rate limiting applies to all packets including the following control packets. For the ACL-based mode, rate limiting does not apply to any of these control packets. Table 7.3 lists the types of control packets that are not rate limited for the ACL-based mode.

<table>
<thead>
<tr>
<th>MAC Address</th>
<th>IP Address</th>
<th>IP Protocol or Application Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer 2 broadcast</td>
<td>FFFF:FFFF:FFFF</td>
<td></td>
</tr>
<tr>
<td>Layer 2 multicast</td>
<td>0100.5E00.0000 – 0100.5E00.FFFF</td>
<td></td>
</tr>
<tr>
<td>Layer 2 sub-net directed broadcast</td>
<td>Any</td>
<td></td>
</tr>
<tr>
<td>Layer 3 local multicast</td>
<td>E0.00.00.00 with mask E0.00.00.FF</td>
<td></td>
</tr>
<tr>
<td>Layer 3 IGMP multicast</td>
<td>E0.00.01.00 – EF:FF:FF:FF</td>
<td></td>
</tr>
<tr>
<td>PIM control packet</td>
<td>IP protocol 103</td>
<td></td>
</tr>
<tr>
<td>OSPF control packet</td>
<td>IP protocol 89</td>
<td></td>
</tr>
<tr>
<td>RIP packet</td>
<td>UDP port 520 (0x0208)</td>
<td></td>
</tr>
<tr>
<td>BGP control packet</td>
<td>TCP port 179 (0x00B3)</td>
<td></td>
</tr>
</tbody>
</table>

Configuration Considerations
• Inbound rate limiting and outbound rate limiting are completely independent of one another. You can configure rate limiting for either direction or both directions on the same port. However, for each traffic direction, there are some restrictions to the types of rate limiting you can use in combination for that traffic direction.
  • For outbound rate limiting, you can use port-based rate limiting only. Port-and-priority based rate limiting and ACL-based rate limiting are not supported.
  • For inbound rate limiting, Table 7.4 lists the types of rate limiting you can use together.

<table>
<thead>
<tr>
<th>Rate Limiting Type</th>
<th>Can be Used Together?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Port</td>
</tr>
<tr>
<td>Port</td>
<td>No</td>
</tr>
<tr>
<td>Port-and-Priority</td>
<td>No</td>
</tr>
<tr>
<td>ACL</td>
<td>Yes</td>
</tr>
</tbody>
</table>
NOTE: There is one exception to the support for both port and ACL-based rate limiting for inbound traffic. You cannot use port-based rate limiting on the first port on an IGC or IPC if you have already applied an ACL-based rate limiting policy to another port on the same IGC or IPC. If you want to use both types of rate limiting on ports managed by the same IGC or IPC, including the first port managed by the IGC or IPC, use an ACL-based rate limiting policy on the first port. You can then use port-based or ACL-based rate limiting policies on any of the other ports managed by the IGC or IPC.

- EP hardware-based rate limiting is not supported on trunk groups.
- For inbound traffic, you can use port-based or port-and-priority-based rate limiting on a port that is a member of a VLAN that has a virtual routing interface.
- You cannot use the ACL-based mode along with features that modify the Type-of-Service (ToS) value in IP traffic. For traffic that matches the permit conditions in a rate limiting ACL, the device leaves the ToS values unchanged even if other features on the device are configured to change the ToS values.
- If you configure an ACL-based rate limiting policy, the device sets the TCP and UDP ACL modes to strict TCP and non-strict UDP. These modes are required to create the CAM entries for rate limited traffic. When you are not using ACLs for rate limiting, the modes affect processing for ACL-based filtering.

NOTE: You cannot change the setting from strict TCP or non-strict UDP unless you remove the rate limiting policies first.

- Software-based rate limiting (the type supported on Chassis devices with Standard modules) is not supported.

NOTE: See also “EP Rate Limiting Support for Release 07.6.01 and Greater” on page 7-2.

**Configuring EP Adaptive Rate Limiting**

The following sections show examples for configuring rate limiting policies for each mode and describe the CLI syntax.

In each example, the CLI adjusts the Average Rate you enter to be valid for the Credit calculation. To display a table of adjusted Average Rates, see “Displaying Adjusted Average Rates” on page 7-10.

### Configuring a Port-Based Rate Limiting Policy

To configure an inbound port-based policy, enter commands such as the following:

```
ProCurveRS(config)# interface ethernet 1/1  
ProCurveRS(config-if-e100-1/1)# rate-limit in 600000  
The average rate has been adjusted to 513024
```

These commands configure an inbound policy on 10/100 Ethernet port 1/1 with an Average Rate of 513024 bps. The following commands configure an inbound rate limiting policy on a Gigabit Ethernet port.

```
ProCurveRS(config)# interface ethernet 2/1  
ProCurveRS(config-if-e1000-2/1)# rate-limit in 2000000  
The average rate has been adjusted to 2051328
```

To configure an outbound port-based policy, enter commands such as the following:

```
ProCurveRS(config)# interface ethernet 1/2  
ProCurveRS(config-if-e100-1/2)# rate-limit out 5000000  
The average rate has been adjusted to 5000192
```

These commands configure an outbound policy on 10/100 Ethernet port 1/2 with an Average Rate of 5000192 bps. The following commands configure an outbound rate limiting policy on a Gigabit Ethernet port.

```
ProCurveRS(config)# interface ethernet 2/2  
ProCurveRS(config-if-e1000-2/2)# rate-limit out 40000000
```
The average rate has been adjusted to 40000512

**Syntax:** [no] rate-limit in | out <average-rate>

See “Rate Limiting Syntax” on page 7-6.

### Configuring a Port-and-Priority-Based Rate Limiting Policy

Port-and-priority-based rate limiting is supported for inbound traffic only. To configure a port-and-priority-based policy, enter commands such as the following:

```
ProCurveRS(config)# interface ethernet 1/1
ProCurveRS(config-if-e100-1/1)# rate-limit in priority q0 q2 600000
```

The average rate has been adjusted to 513024

These commands configure an inbound policy on 10/100 Ethernet port 1/1, for hardware forwarding queues q0 and q2 with an Average Rate of 769280 bps. The policy applies only to traffic that is received on the port and is placed in the specified forwarding queues.

**Syntax:** [no] rate-limit in priority q0 | q1 | q2 | q3 <average-rate>

See “Rate Limiting Syntax” on page 7-6.

### Configuring an ACL-Based Rate Limiting Policy

You can use standard or extended IP ACLs for ACL-based rate limiting. ACL-based rate limiting is supported for inbound traffic only.

- Standard IP ACLs match traffic based on source IP address information.
- Extended ACLs match traffic based on source and destination IP address and IP protocol information. For TCP and UDP, they also match on source and destination TCP or UDP addresses.

**NOTE:** If you apply an ACL-based rate limiting policy to a port that belongs to a virtual routing interface, by default the policy applies only to routed traffic, not to traffic switched among ports within the VLAN.

To configure ACL-based policies on a port, enter commands such as the following:

```
ProCurveRS(config)# access-list 50 permit host 1.1.1.2
ProCurveRS(config)# access-list 60 permit host 2.2.2.3
ProCurveRS(config)# interface ethernet 1/1
ProCurveRS(config-if-e100-1/1)# rate-limit in access-group 50 600000
```

The average rate has been adjusted to 513024

```
ProCurveRS(config-if-e100-1/1)# rate-limit in access-group 60 3000000
```

The average rate has been adjusted to 3077120

These commands configure two inbound rate limiting policies on 10/100 Ethernet port 1/1. The first policy rate limits traffic from IP host 1.1.1.2. The second policy rate limits traffic from IP host 2.2.2.3.

**NOTE:** Use the *permit* condition for traffic that you want to include in the policy. If you use the *deny* condition, the policy does not apply to the specified traffic.

**NOTE:** You must configure the ACLs before you can use them to configure the rate limiting policy.

**Syntax:** [no] rate-limit in | out access-group <acl-id> <average-rate>

See “Rate Limiting Syntax”.

### Rate Limiting Syntax

**Syntax:** [no] rate-limit in | out priority q0 | q1 | q2 | q3 access-group <acl-id> <average-rate>


The **in** | **out** parameter specifies the traffic direction to which the policy applies.

**NOTE:** The **out** option is supported only for port-based rate limiting. The **out** option is not supported for port-and-priority-based rate limiting or ACL-based rate limiting.

The syntax allows you to configure a port-based policy, a port-and-priority-based policy, or an ACL-based policy.

- To create a port-based policy, do not use the **priority** or **access-group** parameters.
- To create a port-and-priority-based policy, use the **priority** parameter.
- To create an ACL-based policy, use the **access-group** parameter.

The **priority q0 | q1 | q2 | q3** parameter specifies the hardware forwarding queue to which the policy applies. Use this parameter only if you are configuring a port-and-priority-based policy. The device prioritizes the queues from **q0** (normal priority) to **q3** (highest priority).

The **access-group <acl-id>** parameter specifies an IP ACL. Use this parameter only if you are configuring an ACL-based policy.

The **<average-rate>** parameter specifies the maximum number of bits per second (bps) you want the device to allow on the port. You can specify a value in the following ranges:

- Inbound rate limiting on 10/100 Ethernet: 256512 – 100000000 bps.
- Inbound rate limiting on Gigabit Ethernet: 1025792 – 1000000000 bps.
- Outbound rate limiting on 10/100 Ethernet: 1041910 – 1000000000 bps.
- Outbound rate limiting on Gigabit Ethernet: 20833792 – 10000000000 bps.

**NOTE:** The software adjusts the Average Rate you enter so that the calculation of credits does not result in a remainder of a partial Credit. The CLI displays the adjusted rate. You also can display a table of the adjusted rate values. See “Displaying Adjusted Average Rates” on page 7-10.
Displaying the Policies

To display all the policies on the device, enter the following command at any level of the CLI. This example shows rate limiting polices on a device that is using the port-based rate limiting mode.

```
ProCurveRS(config-if-1/1)# show rate-limit hardware-rate-limit-status
******************************************************************************
* Inbound EP Rate Limiting   *
******************************************************************************

Module: 1
IPC number: 1
  Rate Limit Mode: Port Based
  Time Interval: 13*0.0192 (ms)
  Credit Size: 32
  Gig Enabled: Yes

  Port: 1/1, Rate: 3077120(bits/sec), Priority Queue: all, Dir: inbound, ACL: none
  Port: 1/2, Rate: 6153984(bits/sec), Priority Queue: all, Dir: inbound, ACL: none

IPC number: 2
  Rate Limit Mode: Port Based
  Time Interval: 13*0.0192 (ms)
  Credit Size: 32
  Gig Enabled: Yes

  Port: 1/6, Rate: 6153984(bits/sec), Priority Queue: all, Dir: inbound, ACL: none
  Port: 1/2, Rate: 3077120(bits/sec), Priority Queue: all, Dir: inbound, ACL: none

Module: 2
IPC number: 1
  Rate Limit Mode: Port Based
  Time Interval: 13*0.0192 (ms)
  Credit Size: 32
  Gig Enabled: Yes

  Port: 2/2, Rate: 3077120(bits/sec), Priority Queue: all, Dir: inbound, ACL: none
  Port: 2/3, Rate: 3077120(bits/sec), Priority Queue: all, Dir: inbound, ACL: none

IPC number: 2
  Rate Limit Mode: Port Based
  Time Interval: 13*0.0192 (ms)
  Credit Size: 32
  Gig Enabled: Yes

  Port: 2/7, Rate: 6153984(bits/sec), Priority Queue: all, Dir: inbound, ACL: none
  Port: 2/8, Rate: 6153984(bits/sec), Priority Queue: all, Dir: inbound, ACL: none
```
Outbound EP Rate Limiting

Module: 1
IPC number: 1
- Rate Limit Mode: Port Based
- Time Interval: 32*0.0192 (ms)
- Credit Size: 64
- Gig Enabled: Yes
  Port: 1/3, Rate: 30000128 (bits/sec), Priority Queue: all, Dir: outbound, ACL: none

IPC number: 2
- Rate Limit Mode: Port Based
- Time Interval: 32*0.0192 (ms)
- Credit Size: 64
- Gig Enabled: Yes
  Port: 1/8, Rate: 60000256 (bits/sec), Priority Queue: all, Dir: outbound, ACL: none

Module: 2
IPC number: 1
- Rate Limit Mode: Port Based
- Time Interval: 32*0.0192 (ms)
- Credit Size: 64
- Gig Enabled: Yes
  Port: 2/2, Rate: 30000128 (bits/sec), Priority Queue: all, Dir: outbound, ACL: none
  Port: 2/3, Rate: 30000128 (bits/sec), Priority Queue: all, Dir: outbound, ACL: none

IPC number: 2
- Rate Limit Mode: Port Based
- Time Interval: 32*0.0192 (ms)
- Credit Size: 64
- Gig Enabled: Yes
  Port: 2/5, Rate: 30000128 (bits/sec), Priority Queue: all, Dir: outbound, ACL: none

**Syntax:** show rate-limit hardware-rate-limit-status

This display shows the following information.

<table>
<thead>
<tr>
<th>Table 7.5: Rate Limiting Policy Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>This Line...</strong></td>
</tr>
<tr>
<td>Module</td>
</tr>
</tbody>
</table>
### Table 7.5: Rate Limiting Policy Information (Continued)

<table>
<thead>
<tr>
<th>This Line...</th>
<th>Displays...</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPC number</td>
<td>The IGC or IPC that the rate limiting information is for. Each Gigabit Ethernet module has two IGCS. • IGC 1 manages ports 1 – 4 on the module. • IGC 2 manages ports 5 – 8 on the module. Each 10/100 module has two IPCs: • IPC 1 manages ports 1 – 24 on the module. • IPC 2 manages ports 25 – 48 on the module.</td>
</tr>
<tr>
<td>Rate Limit Mode</td>
<td>The rate limiting mode that is enabled on the device. The mode can be one of the following: • Port Based • Port and Priority Based • L3/L4 Based The L3/L4 Based mode is the same as the ACL-based mode.</td>
</tr>
<tr>
<td>Time Interval</td>
<td>The length of each Rate Limiting Interval.</td>
</tr>
<tr>
<td>Credit Size</td>
<td>The number of bytes a Credit contains.</td>
</tr>
<tr>
<td>Gig Enabled</td>
<td>Whether a rate limiting policy has been configured on a Gigabit port.</td>
</tr>
<tr>
<td>Port</td>
<td>List the policies in effect on each port. Each row of information shows the following: • Port number • Average Rate • Hardware forwarding queue • Can be q0, q1, q2, or q3 or &quot;all&quot; for port-and-priority-based policies. • Can be &quot;all&quot; for the other modes. • Traffic direction • ACL number • &quot;none&quot; for port-based and port-and-priority-based modes. • An ACL number for ACL-based mode.</td>
</tr>
</tbody>
</table>

### Displaying Adjusted Average Rates

The CLI automatically adjusts the Average Rate that you enter to ensure that the rate limiting calculation results in a whole number of Credits. You can display the adjusted Average Rates that the CLI will use.
Displaying Adjusted Rates for Inbound Rate Limiting

To display the adjusted rates for a specific range of Average Rates for inbound rate limiting, enter a command such as the following:

ProCurveRS# show rate-limit adjusted-rate inbound 2000000 3000000

On 10/100 ports:

Time interval: 640 * 0.0192 ms
Rate 2000000 to 2179487 (bits/sec) will be mapped to 2051328 (bits/sec)
Rate 2179488 to 2435897 (bits/sec) will be mapped to 2307840 (bits/sec)
Rate 2435898 to 2692308 (bits/sec) will be mapped to 2564352 (bits/sec)
Rate 2692309 to 2948717 (bits/sec) will be mapped to 2820608 (bits/sec)
Rate 2948718 to 3000000 (bits/sec) will be mapped to 3077120 (bits/sec)

On Gig ports:

Time interval: 13 * 0.0192 ms
Rate 2000000 to 2564102 (bits/sec) will be mapped to 2051328 (bits/sec)
Rate 2564103 to 3000000 (bits/sec) will be mapped to 3077120 (bits/sec)

This example shows the adjusted rates for Average Rates between 2000000 and 3000000 bps. The rates for 10/100 Ethernet ports and Gigabit Ethernet ports are different and are listed separately.

Syntax: show rate-limit adjusted-rate inbound <start-rate> <end-rate>

The inbound parameter specifies that you want to display rates for inbound rate limiting. The adjusted rates for inbound rate limiting and outbound rate limiting are not the same. To display rates for outbound rate limiting, use the command in “Displaying Adjusted Rates for Outbound Rate Limiting” below.

The <start-rate> <end-rate> parameter specifies the range of Average Rates for which you want to list the adjusted rates. You can specify a range of up to 10000000 (10 million) bps. For example, you can specify 10000000 to 19999999, but not 10000000 to 20000000.

Displaying Adjusted Rates for Outbound Rate Limiting

To display the adjusted rates for a specific range of Average Rates for outbound rate limiting, enter a command such as the following:

ProCurveRS# show rate-limit adjusted-rate outbound gig-port 30000000 40000000

Time interval: 32 * 0.0192 ms
Rate 30000000 to 30416665 (bits/sec) will be mapped to 30000128 (bits/sec)
Rate 30416666 to 31249998 (bits/sec) will be mapped to 30833664 (bits/sec)
Rate 31249999 to 32083330 (bits/sec) will be mapped to 31666888 (bits/sec)
Rate 32083331 to 32916665 (bits/sec) will be mapped to 32500224 (bits/sec)
Rate 32916666 to 33749997 (bits/sec) will be mapped to 33333760 (bits/sec)
Rate 33749998 to 34583330 (bits/sec) will be mapped to 34166784 (bits/sec)
Rate 34583331 to 35416666 (bits/sec) will be mapped to 35000320 (bits/sec)
Rate 35416667 to 36249997 (bits/sec) will be mapped to 35833344 (bits/sec)
Rate 36249998 to 37083330 (bits/sec) will be mapped to 36666880 (bits/sec)
Rate 37083331 to 37916666 (bits/sec) will be mapped to 37500416 (bits/sec)
Rate 37916667 to 38749997 (bits/sec) will be mapped to 38333440 (bits/sec)
Rate 38749998 to 39583330 (bits/sec) will be mapped to 39166976 (bits/sec)
Rate 39583331 to 40000000 (bits/sec) will be mapped to 40000512 (bits/sec)

This command shows the adjusted rates between 30000000 and 40000000 bps for outbound rate limiting on a Gigabit Ethernet port.

Syntax: show rate-limit adjusted-rate outbound gig-port | non-gig-port <start-rate> <end-rate>
The **outbound** parameter specifies that you want to display rates for outbound rate limiting. The adjusted rates for inbound rate limiting and outbound rate limiting are not the same. To display rates for inbound rate limiting, use the command in "Displaying Adjusted Rates for Inbound Rate Limiting" above.

The **gig-port | non-gig-port** parameter specifies the port type. The valid rates differ depending on the port type.

The `<start-rate> <end-rate>` parameter specifies the range of Average Rates for which you want to list the adjusted rates. You can specify a range of up to 10000000 (10 million) bps. For example, you can specify 10000000 to 19999999, but not 10000000 to 20000000.