



## IPv6 ICMP Rate Limiting

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The IPv6 ICMP rate limiting feature implements a token bucket algorithm for limiting the rate at which IPv6 Internet Control Message Protocol (ICMP) error messages are sent out on the network.

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## Information About IPv6 ICMP Rate Limiting

### IPv6 ICMP Rate Limiting

The IPv6 ICMP rate limiting feature implements a token bucket algorithm for limiting the rate at which IPv6 ICMP error messages are sent out on the network. The initial implementation of IPv6 ICMP rate limiting defined a fixed interval between error messages, but some applications such as traceroute often require replies to a group of requests sent in rapid succession. The fixed interval between error messages is not flexible enough to work with applications such as traceroute and can cause the application to fail.

Implementing a token bucket scheme allows a number of tokens--representing the ability to send one error message each--to be stored in a virtual bucket. The maximum number of tokens allowed in the bucket can be specified, and for every error message to be sent, one token is removed from the bucket. If a series of error messages is generated, error messages can be sent until the bucket is empty. When the bucket is empty of tokens, no IPv6 ICMP error messages are sent until a new token is placed in the bucket. The token bucket algorithm does not increase the average rate limiting time interval, and it is more flexible than the fixed time interval scheme.

# How to Configure IPv6 ICMP Rate Limiting

## Customizing IPv6 ICMP Rate Limiting

### SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `ipv6 icmp error-interval milliseconds [bucketsize]`

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"><li>• Enter your password if prompted.</li></ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
Step 3	<b>ipv6 icmp error-interval milliseconds [bucketsize]</b>  <b>Example:</b> Device(config)# ipv6 icmp error-interval 50 20	Customizes the interval and bucket size for IPv6 ICMP error messages.

## Configuration Examples for IPv6 ICMP Rate Limiting

### Example: IPv6 ICMP Rate Limiting Configuration

The following example shows an interval of 50 milliseconds and a bucket size of 20 tokens being configured for IPv6 ICMP error messages:

```
ipv6 icmp error-interval 50 20
```

## Example: Displaying Information About ICMP Rate-Limited Counters

In the following example, information about ICMP rate-limited counters is displayed:

```
Device# show ipv6 traffic
```

```
ICMP statistics:
```

```
Rcvd: 188 input, 0 checksum errors, 0 too short
      0 unknown info type, 0 unknown error type
unreach: 0 routing, 0 admin, 0 neighbor, 0 address, 0 port
parameter: 0 error, 0 header, 0 option
0 hopcount expired, 0 reassembly timeout, 0 too big
0 echo request, 0 echo reply
0 group query, 0 group report, 0 group reduce
1 router solicit, 175 router advert, 0 redirects
0 neighbor solicit, 12 neighbor advert
Sent: 7376 output, 56 rate-limited
unreach: 0 routing, 15 admin, 0 neighbor, 0 address, 0 port
parameter: 0 error, 0 header, 0 option
0 hopcount expired, 0 reassembly timeout, 0 too big
15 echo request, 0 echo reply
0 group query, 0 group report, 0 group reduce
0 router solicit, 7326 router advert, 0 redirects
2 neighbor solicit, 22 neighbor advert
```

## Additional References

### Related Documents

Related Topic	Document Title
IPv6 addressing and connectivity	<i>IPv6 Configuration Guide</i>
Cisco IOS commands	<a href="#">Cisco IOS Master Commands List, All Releases</a>
IPv6 commands	<i>Cisco IOS IPv6 Command Reference</i>
Cisco IOS IPv6 features	<a href="#">Cisco IOS IPv6 Feature Mapping</a>

### Standards and RFCs

Standard/RFC	Title
RFCs for IPv6	<i>IPv6 RFCs</i>

**MIBs**

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

**Technical Assistance**

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