



TCP Window Scaling

Feature History

Release	Modification
12.2(8)T	This feature was introduced.

This document describes the TCP Window Scaling feature and includes the following sections:

- [Feature Overview, page 1](#)
- [Supported Platforms, page 2](#)
- [Supported Standards, MIBs, and RFCs, page 3](#)
- [Prerequisites, page 3](#)
- [Configuration Tasks, page 4](#)
- [Configuration Examples, page 4](#)
- [Command Reference, page 5](#)
- [Glossary, page 7](#)

Feature Overview

The TCP Window Scaling feature adds support for the Window Scaling option in RFC 1323. A larger window size is recommended to improve TCP performance in network paths with large bandwidth, long-delay characteristics that are called Long Fat Networks (LFNs). This TCP Window Scaling enhancement provides that support.

The window scaling extension in Cisco IOS software expands the definition of the TCP window to 32 bits and then uses a scale factor to carry this 32-bit value in the 16-bit window field of the TCP header. The window size can increase to a scale factor of 14. Typical applications use a scale factor of 3 when deployed in LFNs.

Benefits

The Cisco IOS window scaling feature complies with RFC 1323, *TCP Extensions for High Performance*. The maximum window size has been increased to 1,073,741,823 bytes. The larger scalable window size will allow TCP to perform better over LFNs.

Related Features and Technologies

- TCP/IP

Related Documents

- *Cisco IOS IP Configuration Guide*, Release 12.2.

Supported Platforms

- Cisco 800
- Cisco 805
- Cisco 820
- Cisco 1400 series
- Cisco 1600 series
- Cisco 1600R
- Cisco 1700 series
- Cisco 2600 series
- Cisco 3620
- Cisco 3640
- Cisco 3660
- Cisco 7100 series
- Cisco 7200 series
- Cisco 7500 series
- Cisco VG200
- Cisco CVA120 series
- Cisco soho70
- Cisco uBR7200 series
- Cisco uBR920
- Cisco uBR925

Determining Platform Support Through Cisco Feature Navigator

Cisco IOS software is packaged in feature sets that support specific platforms. To get updated information regarding platform support for this feature, access Cisco Feature Navigator. Cisco Feature Navigator dynamically updates the list of supported platforms as new platform support is added for the feature.

Cisco Feature Navigator is a web-based tool that enables you to quickly determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image. You can search by feature or release. Under the release section, you can compare releases side by side to display both the features unique to each software release and the features in common.

To access Cisco Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions at <http://www.cisco.com/register>.

Cisco Feature Navigator is updated regularly when major Cisco IOS software releases and technology releases occur. For the most current information, go to the Cisco Feature Navigator home page at the following URL:

<http://www.cisco.com/go/fn>

Supported Standards, MIBs, and RFCs

Standards

No new or modified standards are supported by this feature.

MIBs

No new or modified MIBs are supported by this feature.

To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at the following URL:

<http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml>

RFCs

- RFC 1323, *TCP Extensions for High Performance*, the Window Scaling option

Prerequisites

Both sides of the link must be configured to support window scaling or the default of 65,535 bytes will apply as the maximum window size.

Configuration Tasks

See the following sections for configuration tasks for the TCP Window Scaling feature. Each task in the list is identified as either required or optional.

- [Setting the TCP Window Size](#) (required)
- [Verifying the Window Scaling Configuration](#) (optional)

Setting the TCP Window Size

To set the TCP window size and enable window scaling, use the following command in global configuration mode:

Command	Purpose
Router(config)# <code>ip tcp window-size bytes</code>	Specifies the scaled TCP window size. The <i>bytes</i> argument can be set to an integer from 0 to 1,073,741,823. To enable window scaling to support LFNs, the TCP window size must be more than 65,535. The default window size is 4128 if window scaling is not configured.

Verifying the Window Scaling Configuration

Enter the **show running-config EXEC** command to determine if TCP window scaling is enabled. In the following example output—abbreviated to show only the window size configuration—the TCP window size is set to a number greater than 65,535, indicating that the TCP Window Scaling feature is enabled:

```
Router# show running-config
ip tcp window-size 750000
```

Troubleshooting Tips

Use the **debug ip tcp Winscale EXEC** command to enable diagnostic output concerning various events relating to the operation of the TCP Window Scaling feature to be displayed on a console. The **debug ip tcp Winscale** command is intended only for troubleshooting purposes because the volume of output generated by the software when it is used can result in severe performance degradation on the router.

Configuration Examples

The following configuration example shows a TCP window size of 750,000 bytes being configured:

```
ip tcp window-size 750000
```

Command Reference

This section documents the modified **ip tcp window-size** command. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

ip tcp window-size

To alter the TCP window size, use the **ip tcp window-size** command in global configuration mode. To restore the default value, use the **no** form of this command.

ip tcp window-size *bytes*

no ip tcp window-size

Syntax Description	<i>bytes</i>	Window size (in bytes). An integer from 0 to 1,073,741,823. The default value is 4128 bytes. Window scaling is enabled when the window size is greater than 65,535 bytes.
---------------------------	--------------	---

Defaults The default window size is 4128 bytes when window scaling is not enabled. If only one neighbor is configured for the window scaling extension, the default window size is 65,535 bytes.

Command Modes Global configuration

Command History	Release	Modification
	9.1	This command was introduced.
	12.2(8)T	Default window size and maximum window scaling factor were increased.

Usage Guidelines Do not use this command unless you clearly understand why you want to change the default value. To enable window scaling to support Long Fat Networks (LFNs), the TCP window size must be more than 65,535 bytes. The remote side of the link also needs to be configured to support window scaling. If both sides are not configured with window scaling, the default maximum value of 65,535 bytes is applied.

The scale factor is automatically calculated based on the window-size you configure. You cannot directly configure the scale factor.

Examples The following example sets the TCP window size to 750,000 bytes:

```
ip tcp window-size 750000
```

Glossary

LFN—Long Fat Networks. Large bandwidth, long-delay networks where the throughput is high and the transmission distance is long. Networks with satellite connections are one example of an LFN. Satellite links always have high propagation delays and typically have high bandwidth.

TCP—Transmission Control protocol. Connection-oriented transport layer protocol that provides reliable full-duplex data transmission. TCP is part of the TCP/IP protocol stack.

