



# Release Notes for Cisco SN 5428-2 Storage Router Release 3.3.2

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June 25, 2003



**Note**

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You can find the most current documentation on Cisco.com. This set of electronic documents may contain updates and modifications made after the hard-copy documents were printed.

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These release notes support Cisco SN 5428-2 Storage Router software release 3.3.2.

For a list of software caveats that apply to Release 3.3.2, see the “[Caveats](#)” section. The caveats are updated for every maintenance release and are located on Cisco.com and the Documentation CD-ROM.

## Contents

These release notes describe the following topics:

- [Introduction, page 2](#)
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# Introduction

The Cisco SN 5428-2 Storage Router provides universal access to storage over IP networks. The storage router software controls the operation of the Cisco SN 5428-2 Storage Router. You can configure the software to provide one of the following types of access to storage over IP networks; SCSI routing, Transparent SCSI routing, or FCIP.

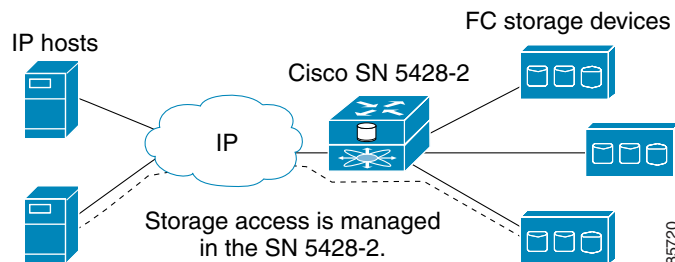
SCSI routing provides IP hosts with access to Fibre Channel (FC) storage devices, using iSCSI protocol. The iSCSI protocol is an IETF-defined protocol for IP storage (ips).


**Note**

For more information about the iSCSI protocol, refer to the IETF standards for IP storage at <http://www.ietf.org>.

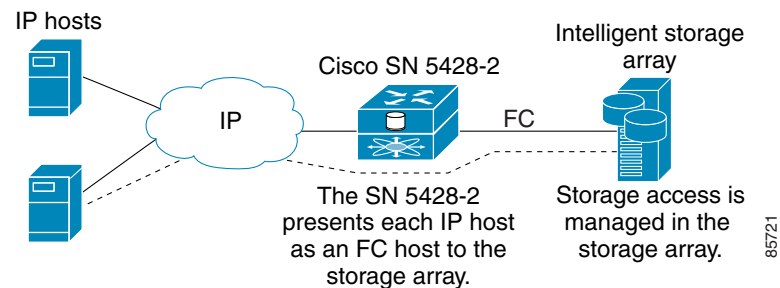
With SCSI routing, storage device access is managed primarily in the SN 5428-2. (See [Figure 1.](#))

**Figure 1** *SCSI Routing*

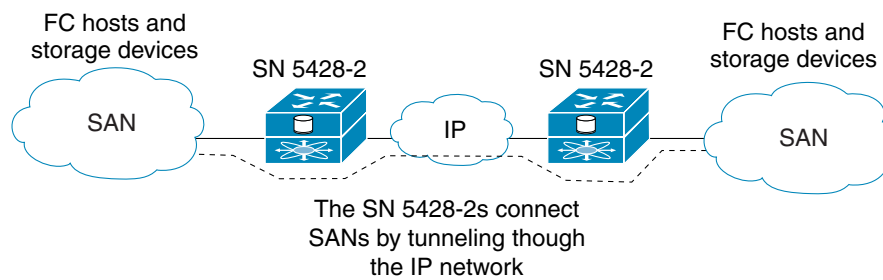


Transparent SCSI routing provides IP hosts with transparent access to intelligent storage arrays using iSCSI protocol; that is, each IP host is presented as an FC host to an intelligent storage array. With transparent SCSI routing, availability of storage devices is managed primarily in the intelligent storage array. (See [Figure 2.](#))

**Figure 2** *Transparent SCSI Routing*



Fibre Channel over IP (FCIP) enables SN 5428-2 Storage Routers to provide connectivity by tunneling through an IP network between storage area networks (SANs). (See [Figure 3.](#))

**Figure 3 FCIP**

In addition to providing services for accessing storage over IP networks, the SN 5428-2 Storage Router software provides the following services:

- VLAN Access Control—provides IP access control to storage based on a VLAN identifier (VID) number (in addition to access control through access lists)
- Authentication—provides iSCSI, Enable and Login authentication using AAA authentication methods
- High Availability (HA)—provides the ability to group storage routers in a cluster for intelligent failover and other cluster-related functions (for SCSI routing only)
- E\_Port with FC Fabric Zoning—provides the ability to connect FC ports to FC switches and participate in fabric zoning, manage zoning, and support zone mergers
- SNMP/MIB support—provides network management of the SN 5428-2 through SNMP using selected MIBs
- Gigabit Ethernet Interface features—provides the ability to assign a management IP address per Gigabit Ethernet interface, multiple IP addresses per SCSI routing instance, and an optional secondary Gigabit Ethernet interface per IP address used for SCSI routing or SN 5428-2 management. When the SN 5428-2 is deployed for FCIP, provides primary and optional secondary Gigabit Ethernet interfaces to the FCIP peer.
- Buffer credit extension—enables the SN 5428-2 to donate buffer credits from a donor port to selected FC ports
- Secure Sockets Layer support—provides HTTPS connection for secure access through the web-based GUI
- Secure Shell (SSH) protocol version 2 support—provides high encryption and authentication for interactive management sessions, and is a common replacement for Telnet
- Routing Information Protocol (RIP) listening support—allows the SN 5428-2 to learn dynamic routing using RIP (version 1 or version 2) listening
- Service Location Protocol (SLP) Support—provides the ability to advertise targets of specified SCSI routing instances
- TCP Window Tuning—provides the ability to maximize bandwidth across the network by automatically setting the local TCP receive window size to the remote TCP receive window size without user intervention
- A command-line interface (CLI) and a web-based GUI—provides user interfaces for configuration and maintenance of an SN 5428-2



**Note** The web-based GUI is not available in SN 5428-2s deployed for transparent SCSI routing.

# System Requirements

This section describes the system requirements for release 3.3.2 and includes the following information:

- [Network Equipment, page 4](#)
- [IP Hosts, page 4](#)
- [Graphical User Interface, page 5](#)
- [iSCSI Driver Version Support, page 5](#)
- [Interoperability Information, page 5](#)

## Network Equipment

- The Gigabit Ethernet interfaces on the SN 5428-2 Storage Router use a flow control mechanism for stopping and starting traffic that prevents the loss of data. Flow control should also be turned on at the router's Gigabit Ethernet interfaces where the SN 5428-2 Storage Router is connected.
- If the SN 5428-2 Storage Router is participating in a cluster (SCSI routing only), and the HA or management interfaces are plugged into a switch that has Spanning Tree Protocol (STP) enabled, the storage router should be considered as an end station and the affected ports on the switch should be configured appropriately. For example, set "portfast" on Cisco switches to cause the ports to immediately switch from blocking mode to forwarding mode. This helps prevent time-outs, which can cause unexpected behavior when storage routers join a cluster.

## IP Hosts

To ensure the best performance for the SN 5428-2 Storage Router and the iSCSI drivers, the extended windowing feature of TCP and the receive and transmit flow control feature of the Gigabit Ethernet driver should be enabled on all IP hosts connecting to the SN 5428-2. On the SN 5428-2 Storage Router, you can use the CLI **show scsirouter all connection tcp** command to display the current and maximum TCP window size for each connected host.

## Graphical User Interface

The SN 5428-2 Storage Router web-based GUI officially supports the following browsers. The browser must be enabled to support JavaScript and style sheets.

Browser	Platform
Microsoft Internet Explorer version 5.5 with service pack 2, or later	Microsoft Windows NT 4.0, Microsoft Windows 2000
Netscape Navigator version 4.76	Linux
Netscape Navigator version 4.7	Sun Solaris



### Note

With certain versions of Microsoft Internet Explorer 6, the links in the left frame may fail to function after performing a remote backup. If this occurs, click on the Maintenance menu link at the top of the page to reactivate the links.

## iSCSI Driver Version Support

A Cisco SN 5428-2 Storage Router running software release 3.3.2 or later is interoperable with an IP host running any Cisco iSCSI Driver version 2.1.1 or later. It is not interoperable with an IP host running any Cisco iSCSI Driver version 1.8.x.

A Cisco SN 5428-2 Storage Router running software release 3.3.2 or later is also interoperable with a Cisco SN 5420 Storage Router deployed for iSCSI SAN Interconnect.

## Interoperability Information

SN 5428-2 interoperability information is available on Cisco.com. You can access the interoperability matrix by following these instructions:

- 
- Step 1** At <http://www.cisco.com>, click **Products & Services**, and select **Storage Networking Products** from the menu.
  - Step 2** At the Cisco Storage Networking Products web page, click the **Cisco SN 5400 Series Storage Routers** link.
  - Step 3** At the Cisco SN 5400 Series Storage Routers web page, click **Technical Documentation** from the navigation menu on the left side of the page.
  - Step 4** Click the **Technical References** link, and then click the **Cisco SN 5428-2 Storage Router Interoperability Test Matrix** link.
-

# Installation Notes

This section describes how to obtain updated SN 5428-2 software and upgrade an existing SN 5428-2 software installation, and includes the following information:

- [Obtaining Updated Software and iSCSI Drivers, page 6](#)
- [Determining the SN 5428-2 Software Version, page 7](#)
- [Upgrading to a New Software Release, page 7](#)
- [Limitations and Restrictions on SN 5428-2 Storage Router Clusters, page 9](#)

## Obtaining Updated Software and iSCSI Drivers

Registered Cisco.com users can download the most current SN 5400 Series system software, Cisco iSCSI drivers, readme files and release notes from Cisco.com. In addition, information about driver compatibility and other relevant driver information is available on Cisco.com. You can access software and related information by following these instructions:

- 
- Step 1** At <http://www.cisco.com>, log in to Cisco.com. Click **Technical Support** and **Software Center**.
- Step 2** At the Software Center web page, under Software Products & Downloads, click **Storage Networking Software**.
- Step 3** At the Storage Networking Software web page, click the appropriate link for your software.
- Step 4** At the Software Download web page, click the file that you want to download. Another software download web page will be displayed with detailed information about the download file and Cisco's Software License Agreement. Follow the instructions on that and any subsequent web pages to download the software.
- Step 5** To install and configure storage router software, see the appropriate storage router software configuration guide and release notes. To install and configure an iSCSI driver, see the readme file that accompanies the iSCSI driver (in the downloaded driver archive file) and the appropriate release notes.
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Configuration guides and release notes are available online. You can access online documentation by following these instructions:

- 
- Step 1** At <http://www.cisco.com>, click **Products & Services** and **Storage Networking Products**.
- Step 2** At the Cisco Storage Networking Products web page, click **Cisco SN 5400 Series Storage Routers**.
- Step 3** At the Cisco SN 5400 Series Storage Routers web page, click **Technical Documentation**. On the Technical Documentation web page, choose the appropriate link for documentation, release notes, or other related information.
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## Determining the SN 5428-2 Software Version

To determine the version of SN 5428-2 software running on the Cisco SN 5428-2 Storage Router, establish a Telnet or console port session with the storage router, and enter the CLI **show version** command. (See [Example 1](#).)

The Application field displays the version of software currently running on the storage router. The System Bootstrap field displays the software version that will run the next time the storage router is restarted.

You can also check the version of the SN 5428-2 software by using the SN 5428-2 web-based GUI. Log in as **monitor** to display the Processor and Software Information table, or click **Processor and SW** (under System) in the Monitor dynamic menu list in the left frame. The Software Version field contains the current software version information.

### Example 1 Determining the Software Version

```
[SN5428-2A01]$ show version
Cisco SN 5428-2-K9 Storage Router

      CLI Version: 2.1
      iSCSI Version: 0/2 (Min/Max)
      System Bootstrap: 3.3.2-K9
      Operating System: 3.3.2-K9
      Switch Version: V1.4.0.43-0
      Application: 3.3.2-K9
      Web Server: R6_1_0
      OpenSSH: 3.4p1
      OpenSSL: 0.9.6e
      Zlib: 1.1.4

Copyright (c) 1986-2002 by Cisco Systems, Inc
```

## Upgrading to a New Software Release

For information about upgrading to new SN 5428-2 software using the CLI, see the section “Installing Updated Software” in Chapter 11, “Maintaining and Managing the SN 5428-2 Storage Router,” of the *Cisco SN 5428-2 Storage Router Software Configuration Guide, Release 3.3*.

To upgrade to new SN 5428-2 software using the web-based GUI, follow these instructions.

- 
- Step 1** In the web-based GUI, log in as “admin”. To access the GUI, enter the URL for the SN 5428-2 by pointing your browser to the SN 5428-2 management interface IP address using the HTTP protocol (for example, type **http://10.1.10.244**).
  - Step 2** Click **Maintenance** to view information about the software versions currently available to the storage router. If multiple versions of software are available, delete all versions except the currently running version.
  - Step 3** (Optional) Based on your storage router configuration, click the appropriate link in the Upgrade section of the **Maintenance** dynamic menu list in the left frame to download a list of currently available software versions. Use this list to determine the software version you want to download.
  - Step 4** Click the appropriate link in the Upgrade section of the **Maintenance** dynamic menu list to download the desired version of software.

- Step 5** After you have downloaded the new version of software, click **Reset** in the System section of the **Maintenance** dynamic menu list.
- Step 6** At **Select next boot version**, select the new software version. If you have made configuration changes to the storage router that have not been saved, click the **Save unsaved changes?** checkbox to save any configuration changes that have been made but not saved to the storage router's bootable configuration.
- Step 7** Click **Reset System**.
- Step 8** After the storage router has rebooted, verify that it is running the new software. (See the [“Determining the SN 5428-2 Software Version”](#) section on page 7.)

If the storage router is deployed for transparent SCSI routing, the upgrade to version 3.3.2 from any version prior to 3.3.1 places the storage router in dynamic mode. Dynamic mode resets iSCSI client-to-FC WWPN bindings upon reboots or iSCSI logouts, and requires an intelligent storage array that supports an extended iSCSI FC PLOGI frame. To change the mode of an existing transparent SCSI routing deployment, you must completely clear the storage router configuration. When the storage router reboots, follow the prompts from the initial configuration script to complete the new system configuration and select the desired mode for transparent SCSI routing.

For more information about clearing the storage router configuration, see the section “Resetting the System” in Chapter 11, “Maintaining and Managing the SN 5428-2 Storage Router,” of the *Cisco SN 5428-2 Storage Router Software Configuration Guide, Release 3.3*.

For more information about static and dynamic modes for transparent SCSI routing, see the section “Summary of Configuration Process” in Chapter 7, “Configuring Transparent SCSI Routing,” of the *Cisco SN 5428-2 Storage Router Software Configuration Guide, Release 3.3*.


## Uninstalling an Upgrade



**Note** Previous versions of software do not support the static mode for transparent SCSI routing.

To return to a previous SN 5428-2 software release, and remove the updated SN 5428-2 software using the CLI, follow these instructions:

	Command	Description
<b>Step 1</b>	<b>enable</b>	Enter Administrator mode
<b>Step 2</b>	<b>show software version all</b>	Verify that the previous version of SN 5428-2 software is still available. If it is not, see the section “Installing Updated Software” in Chapter 11, “Maintaining and Managing the SN 5428-2 Storage Router,” of the <i>Cisco SN 5428-2 Storage Router Software Configuration Guide, Release 3.3</i> .
<b>Step 3</b>	<b>software version 3.3.1</b>	Select the software to be booted when the system next starts — for example, boot version 3.3.1 — when the system restarts. This may take several minutes.

	Command	Description
Step 4	<b>reboot</b>	Reboot the SN 5428-2 Storage Router.   <b>Caution</b> Do not use the <b>reboot fast</b> command. Downgrading software requires a reboot with diagnostics.
Step 5	<b>enable</b>	Enter Administrator mode after the SN 5428-2 reboots.
Step 6	<b>show version</b>	Verify that the SN 5428-2 Storage Router is now running the correct software.
Step 7	<b>delete software version 3.3.2</b>	(Optional) Remove the updated software from the SN 5428-2 Storage Router.

To return to a previous SN 5428-2 software release and remove the updated SN 5428-2 software using the SN 5428-2 web-based GUI, follow these instructions:

- 
- Step 1** In the web-based GUI, log in as “admin”. To access the GUI, enter the URL for the SN 5428-2 by pointing your browser to the SN 5428-2 management interface IP address using the HTTP protocol (for example, type **http://10.1.10.244**).
- Step 2** Click **Maintenance** to display the dynamic Maintenance menu list in the left frame.
- Step 3** Click **Reset** from the dynamic Maintenance menu list.
- Step 4** Click the **Select next boot version** drop-down arrow to view the list of available software versions. Choose the version of software to run when the system is booted.
- Step 5** (Optional) To save configuration changes before rebooting, check the **Save unsaved changes** checkbox. If the checkbox is not checked, any unsaved configuration changes will be lost.
- Step 6** Click **Reset System**.
- Step 7** After the SN 5428-2 reboots, verify that it is running the selected software. (See [“Determining the SN 5428-2 Software Version”](#) section on page 7.)
- Step 8** (Optional) Click **Maintenance** and then click the **Delete** link to the right of the updated software in the Show Storage Router Software table to remove it from the SN 5428-2 Storage Router.
- 

## Limitations and Restrictions on SN 5428-2 Storage Router Clusters

This release includes the following restrictions on SN 5428-2 Storage Router clusters:

- A cluster can be composed of up to two SN 5428-2 Storage Routers, or one SN 5428-2 and one SN 5428 Storage Router.
- A cluster can support up to 12 SCSI routing instances.
- A cluster can support up to 100 iSCSI targets.

# Caveats

Caveats describe unexpected behavior or defects in the specified SN 5428-2 software release. Severity 1 caveats are the most serious caveats; severity 2 caveats are less serious.

This document describes open and resolved severity 1 and 2 caveats and selected caveats of other severities, for release 3.3.2.

- The “[Open Caveats](#)” section lists caveats that are open in the current release and may be open in previous releases.
- The “[Resolved Caveats](#)” section lists caveats that are resolved in this release, but open in previous releases.

Within the sections, the caveats are sorted alphanumerically by caveat number.



## Note

If you have an account with Cisco.com, you can use Bug Navigator II to find caveats of any severity for any release. You can reach Bug Navigator II on Cisco.com at Service & Support: [http://www.cisco.com/cgi-bin/Support/Bugtool/launch\\_bugtool.pl](http://www.cisco.com/cgi-bin/Support/Bugtool/launch_bugtool.pl).

## Open Caveats

The caveats listed in this section are open in SN 5428-2 software release 3.3.2.

### FC-Driver

- CSCea72301

The host aborts pending SCSI commands that fail to complete within the timeout period, and SCSI Read commands complete with Data Underrun conditions. This problem may occur when SCSI traffic is running over an E-port between two storage routers and the target device is connected to the fabric via an arbitrated loop. This problem has been observed with target devices that use half-duplex OPNs to the storage router when sending frames to the initiator.

The server may automatically recover from these errors, so they may only appear as intermittent performance issues.

Workaround: If possible, change the target device connection topology to point-to-point instead of arbitrated loop.

- CSCea75379

The storage router is unable to send or receive traffic on the FC interface that is bridged to an iSCSI interface. The interface immediately closes all attempted Opens from other devices on the arbitrated loop. The FC interface erroneously believes that it is unable to accept frames from any device on the loop.

This condition has been observed when a large number of SCSI commands from the iSCSI interface are aborted. This results in a large number of ABTS frames on the FC interface.

Workaround: Disconnect and reconnect the storage router FC initiator interface, or restart the initiator interface. For example, issue the following command to restart the fci1 interface:

```
[SN5428-2A] debug interface fci1 lldRestartfcfw
```

## FC-Switch

- CSCdx80621

SNMP Walks of the FCMGMT MIB may result in the following error:

```
%SNMP-3-FSSPRQF: fcSwSnmpPktRegeust() failed.
```

The Network Management tool(s) may report “Generic error” and the fail the MIB walk. This can occur when there are many devices.

Workaround: Use the GUI Monitor Fibre Channel screen or the CLI **show interface** command to display fibre channel interface information.

- CSCea71673

The storage router is unable to send or receive traffic on the FC interface, because the interface is caught in a loop initialization state. This condition has been observed in conjunction with a large number of ABTS frames on the loop.

Workaround: Disconnect and reconnect the storage router FC interface or reset the interface. For example, issue the following commands to reset the *fc1* interface:

```
[SN5428-2A] no interface fc1 enable
[SN5428-2A]* interface fc1 enable
```

- CSCeb02063

The integrated FC switch software may hang the port after the timeout, instead of aborting the frame. The port may hang if a frame cannot be delivered in the configured error detect timeout value (edtov). The port hang would only occur if error detect timeout value for all Fibre Channel interfaces is set to a value other than 1200 milliseconds. The default setting is 2000 milliseconds.

Workaround: If unexplained port hangs occur, set the error detect timeout value to 1200. For example, issue the following CLI command:

```
[Lab1] fcswitch edtov 1200
```

You may need to change the error detect timeout values on other devices in your fabric. Error detect timeout values should be the same for all storage routers or switches in the fabric.

## GUI

- CSCdy06532

SN 5428-2 software download fails when using the HTTP Put File function from Microsoft Internet Explorer version 5.5 with service pack 2. The user may receive a “page cannot be displayed error” or the download may appear to hang. This is bug in Microsoft Internet Explorer.

Workaround: Use Microsoft Internet Explorer 6.0 to download SN 5428-2 software using the HTTP Put File function.

## SCSI

- CSCin43529

Compaq SecurePath Manager software does not work with iSCSI and an MSA1000. This configuration is not currently supported.

Workaround: None.

## Resolved Caveats

The caveats listed in this section are resolved in SN 5428-2 software release 3.3.2.

### CLI

- CSCdy05687

Event messages may appear during the initial configuration script or following a **clear conf all** command. This may make it difficult to complete the script, since event messages may overwrite the last question on the screen. Automated scripts may fail unexpectedly, since no prompt is returned after an event message.

Workaround: If the unit is being configured manually, you can usually get the last question to repeat by simply hitting the **Enter** key. If you have lost your place in the script and want to start over, **Ctrl-C** will restart the script. There is no workaround for an automated script except to be careful that nothing is going on in the network that would cause messages to appear on the console (for example, other units rebooting).

## Documentation Updates

This section describes corrections to the Cisco SN 5428-2 Storage Router Release 3.3 documentation set since initial publication.

- Added switch version to the **show version** CLI command display

On page 12-510 of the *Cisco SN 5428-2 Storage Router Software Configuration Guide*, the example show be updated to include the switch version in the display, as follows:

```
[SN5428A]# show version

CISCO SN 5428-2 Storage Router

      CLI Version: 2.1
      iSCSI Version: 0/2 (Min/Max)
      System Bootstrap: 3.3.1-K9
      Operating System: 3.3.1-K9
      Switch Version: V1.4.0.43-0
      Application: 3.3.1-K9
      Web Server: R6_1_0
      OpenSSH: 3.4p1
      OpenSSL: 0.9.6e
      Zlib: 1.1.4
```

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On page 12-511, the following should be added to Table 11-38, after Operating System:

Field: Switch Version

Description: The version of the storage router integrated FC switch component.

- Deployment mode can be set for transparent SCSI routing
  - In the *Cisco SN 5428-2 Storage Router Software Configuration Guide Release 3.3*, page 7-2, add the following note to the end of the page:




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**Note** To view the mode—static or dynamic—currently being deployed, use the **show scsirouter** CLI command.

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- In the *Cisco SN 5428-2 Storage Router Software Configuration Guide Release 3.3*, page 7-4, modify the first table in Example 7-1 as follows. Note that the Mode column shows whether the storage router is currently deployed in dynamic or static mode:

Router	Stat	Mode	Retry	Reset	Description
transparent	A	dynamic	6	no	(not set)

- Modified CLI command **fcip destination config**

The list of operational parameters for the **fcip destination config** command on page 12-117 of the *Cisco SN 5428-2 Storage Router Software Configuration Guide Release 3.3* requires the following addition:

**fcip name destination name config batchtcp {yes | no}**

Syntax description: Batch multiple FC frames in one TCP segment. Default is yes. This parameter is applicable only to TCP client and TCP server connections.

- Modified CLI command **zone member**

On page 12-565 of the *Cisco SN 5428-2 Storage Router Software Configuration Guide*, add a keyword to the zone member command. The **all** keyword adds all WWPNs known to the storage router (that are not already zone members) to the zone.

The syntax of the modified command is:

**zone name member wwpn all**

- Time change require system reboot

After a time change via the CLI or the GUI, a system reboot is required to synchronize the system timestamp with the timestamps on the integrated FC switch log files, syslog and devlog.

For example, after issuing the **clock set** command, the following warning appears:

```
[techpubs4]# clock set 14:47:05 04 28 2003
WARNING: After a time change a reboot is required to
synchronize syslog and devlog timestamps
```

## Related Documentation

The following sections describe the related documentation available for Cisco SN 5428-2 Storage Router release 3.3.2. These documents consist of hardware installation and software configuration guides, and platform-specific release notes and readme files for the Cisco iSCSI drivers.

## Release-Specific Documents

This release notes document is the only document specific to SN 5428-2 release 3.3.2. It is only available as an electronic document on Cisco.com and the Documentation CD-ROM.

## Platform-Specific Documents

Platform-specific documents consist of the release notes and readme files for Cisco iSCSI Drivers, version 2.1.x or later. The files are currently available in electronic format only. See the [“Obtaining Updated Software and iSCSI Drivers”](#) section on page 6 for details.

## Hardware Documents

Refer to the *Cisco SN 5428-2 Storage Router Hardware Installation Guide* for hardware installation procedures. This document is available as a printed manual. It is also available as an electronic document on Cisco.com and the Documentation CD-ROM.

## Software Documents

Refer to the *Cisco SN 5428-2 Storage Router Software Configuration Guide Release 3.3*, for configuration information and procedures. This document is available as a printed manual. It is also available as an electronic document on Cisco.com and the Documentation CD-ROM.

For documentation on the SN 5428-2 web-based GUI, refer to the SN 5428-2 Storage Router web-based GUI online Help system.

## Service and Support

For service and support for a product purchased from a reseller, contact the reseller, who offers a wide variety of Cisco service and support programs described in “Service and Support” of Cisco Information Packet shipped with your product.

**Note**

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If you purchased your product from a reseller, you can access Cisco.com as a guest. Cisco.com is Cisco Systems' primary real-time support channel. Your reseller offers programs that include direct access to Cisco.com services.

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For service and support for a product purchased directly from Cisco, use Cisco.com.

## Software Configuration Tips on the Cisco TAC Home Page

A variety of Cisco SN 5428-2 Storage Router software installation, configuration and usage tips are available on the Cisco Technical Assistance Center (TAC) Web Site.

You can access “tech tips” by following these instructions:

- 
- Step 1** At <http://www.cisco.com>, log in to Cisco.com. Click **Technical Support**, and select **Hardware Support** from the menu.
  - Step 2** At the Hardware Support web page, click **Storage Networking Devices** from the Hardware Support menu on the left side of the page.
  - Step 3** At the Storage Networking Devices web page, click the appropriate link for your system. For example, click the **SN 5428-2 Storage Routers** link.
  - Step 4** Click the **Troubleshooting** link, and then click the appropriate links for information about installing, configuring, and troubleshooting SN 5400 Series system software and iSCSI drivers.
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## Obtaining Documentation

Cisco provides several ways to obtain documentation, technical assistance, and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

### Cisco.com

You can access the most current Cisco documentation on the World Wide Web at this URL:

<http://www.cisco.com/univercd/home/home.htm>

You can access the Cisco website at this URL:

<http://www.cisco.com>

International Cisco websites can be accessed from this URL:

[http://www.cisco.com/public/countries\\_languages.shtml](http://www.cisco.com/public/countries_languages.shtml)

### Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which may have shipped with your product. The Documentation CD-ROM is updated regularly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual or quarterly subscription.

Registered Cisco.com users can order a single Documentation CD-ROM (product number DOC-CONDOCCD=) through the Cisco Ordering tool:

[http://www.cisco.com/en/US/partner/ordering/ordering\\_place\\_order\\_ordering\\_tool\\_launch.html](http://www.cisco.com/en/US/partner/ordering/ordering_place_order_ordering_tool_launch.html)

All users can order monthly or quarterly subscriptions through the online Subscription Store:

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

## Ordering Documentation

You can find instructions for ordering documentation at this URL:

[http://www.cisco.com/univercd/cc/td/doc/es\\_inpk/pdi.htm](http://www.cisco.com/univercd/cc/td/doc/es_inpk/pdi.htm)

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:

<http://www.cisco.com/en/US/partner/ordering/index.shtml>

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

## Documentation Feedback

You can submit comments electronically on Cisco.com. On the Cisco Documentation home page, click **Feedback** at the top of the page.

You can e-mail your comments to [bug-doc@cisco.com](mailto:bug-doc@cisco.com).

You can submit comments by using the response card (if present) behind the front cover of your document or by writing to the following address:

Cisco Systems  
Attn: Customer Document Ordering  
170 West Tasman Drive  
San Jose, CA 95134-9883

We appreciate your comments.

## Obtaining Technical Assistance

Cisco provides Cisco.com, which includes the Cisco Technical Assistance Center (TAC) website, as a starting point for all technical assistance. Customers and partners can obtain online documentation, troubleshooting tips, and sample configurations from the Cisco TAC website. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC website, including TAC tools and utilities.

## Cisco.com

Cisco.com offers a suite of interactive, networked services that let you access Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com provides a broad range of features and services to help you with these tasks:

- Streamline business processes and improve productivity
- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise

- Register for online skill assessment, training, and certification programs

To obtain customized information and service, you can self-register on Cisco.com at this URL:

<http://tools.cisco.com/RPF/register/register.do>

## Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available: the Cisco TAC website and the Cisco TAC Escalation Center. The type of support that you choose depends on the priority of the problem and the conditions stated in service contracts, when applicable.

We categorize Cisco TAC inquiries according to urgency:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration. There is little or no impact to your business operations.
- Priority level 3 (P3)—Operational performance of the network is impaired, but most business operations remain functional. You and Cisco are willing to commit resources during normal business hours to restore service to satisfactory levels.
- Priority level 2 (P2)—Operation of an existing network is severely degraded, or significant aspects of your business operations are negatively impacted by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.
- Priority level 1 (P1)—An existing network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

## Cisco TAC Website

The Cisco TAC website provides online documents and tools to help troubleshoot and resolve technical issues with Cisco products and technologies. To access the Cisco TAC website, go to this URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC website. Some services on the Cisco TAC website require a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

<http://tools.cisco.com/RPF/register/register.do>

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC website, you can open a case online at this URL:

<http://www.cisco.com/tac/caseopen>

If you have Internet access, we recommend that you open P3 and P4 cases online so that you can fully describe the situation and attach any necessary files.

## Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses priority level 1 or priority level 2 issues. These classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer automatically opens a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to this URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, please have available your service agreement number and your product serial number.

## Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- The *Cisco Product Catalog* describes the networking products offered by Cisco Systems, as well as ordering and customer support services. Access the *Cisco Product Catalog* at this URL:

[http://www.cisco.com/en/US/products/products\\_catalog\\_links\\_launch.html](http://www.cisco.com/en/US/products/products_catalog_links_launch.html)

- Cisco Press publishes a wide range of networking publications. Cisco suggests these titles for new and experienced users: *Internetworking Terms and Acronyms Dictionary*, *Internetworking Technology Handbook*, *Internetworking Troubleshooting Guide*, and the *Internetworking Design Guide*. For current Cisco Press titles and other information, go to Cisco Press online at this URL:

<http://www.ciscopress.com>

- *Packet* magazine is the Cisco quarterly publication that provides the latest networking trends, technology breakthroughs, and Cisco products and solutions to help industry professionals get the most from their networking investment. Included are networking deployment and troubleshooting tips, configuration examples, customer case studies, tutorials and training, certification information, and links to numerous in-depth online resources. You can access *Packet* magazine at this URL:

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

- iQ Magazine is the Cisco bimonthly publication that delivers the latest information about Internet business strategies for executives. You can access iQ Magazine at this URL:

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

- Internet Protocol Journal is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

[http://www.cisco.com/en/US/about/ac123/ac147/about\\_cisco\\_the\\_internet\\_protocol\\_journal.html](http://www.cisco.com/en/US/about/ac123/ac147/about_cisco_the_internet_protocol_journal.html)

- Training—Cisco offers world-class networking training. Current offerings in network training are listed at this URL:

[http://www.cisco.com/en/US/learning/le31/learning\\_recommended\\_training\\_list.html](http://www.cisco.com/en/US/learning/le31/learning_recommended_training_list.html)

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This document is to be used in conjunction with the documents listed in the [“Related Documentation”](#) section.



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