



Release Notes for Cisco SN 5428 Storage Router Release 2.5.1

02 December, 2002



Note

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.

These release notes support Cisco SN 5428 Storage Router software release 2.5.1.

For a list of software caveats that apply to Release 2.5.1, see the “[Caveats](#)” section. The caveats are updated for every maintenance release and are located on Cisco.com and the Documentation CD-ROM.

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Introduction

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

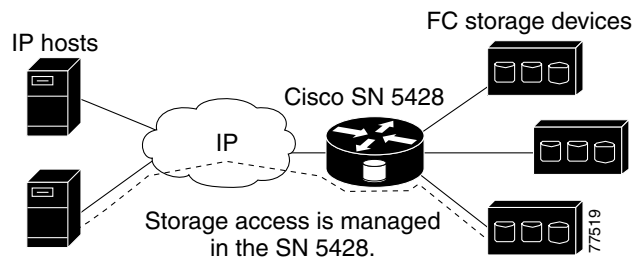
SCSI routing provides IP hosts with access to Fibre Channel (FC) storage devices, using iSCSI protocol. The iSCSI protocol is an IETF-defined protocol for IP storage (ips).


Note

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

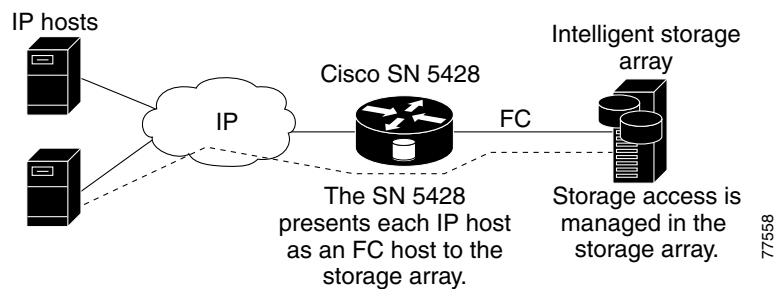
With SCSI routing, storage device access is managed primarily in the SN 5428. (See [Figure 1](#).)

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*



In addition to providing services for accessing storage over IP networks, the SN 5428 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 through SNMP using selected MIBs
- Gigabit Ethernet Interface features—provides the ability to assign a management IP address per Gigabit Ethernet interface, multiple IP address per SCSI routing instance, and an optional secondary Gigabit Ethernet interface per IP address used for SCSI routing or SN 5428 management
- 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 to learn dynamic routing using RIP (version 1 or version 2) listening
- 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

**Note**

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

For information about features that are new with Release 2.5.1, see the [“New and Changed Information” section on page 13](#).

System Requirements

This section describes the system requirements for Release 2.5.1 and includes the following information:

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

Network Equipment

- The Gigabit Ethernet interfaces on the SN 5428 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 Storage Router is connected.
- If the SN 5428 Storage Router is participating in a cluster, 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 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. On the SN 5428 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's web-based GUI officially supports the following browsers:

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

The browser must be enabled to support JavaScript and style sheets.

iSCSI Driver Version Support

A Cisco SN 5428 Storage Router running software release 2.5.1 or later is compatible with an IP host running any Cisco iSCSI Driver version 2.1.1 or later; it is not compatible with an IP host running any Cisco iSCSI Driver version 1.8.x.

Interoperability Information

SN 5428 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 **Instructions and Guides** 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 Storage Router Interoperability Test Matrix** link.
-

Installation Notes

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

- [Obtaining Updated Software and iSCSI Drivers, page 5](#)
- [Determining the SN 5428 Software Version, page 6](#)
- [Upgrading to a New Software Release, page 6](#)
- [Uninstalling an Upgrade, page 12](#)

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, release notes and example configuration files 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.
-

Configuration guides and release notes are available online. You can access online documentation by following these instructions:

-
- Step 1** At <http://www.cisco.com>, under Technical Documentation, click **Technical Documentation on Cisco Connection Online**.
- Step 2** At the Cisco Documentation web page, under Cisco Product Documentation, click **Storage Networking Products**.
- Step 3** At the Storage Networking Products documentation web page, click the appropriate links to access the appropriate documentation.
-

Determining the SN 5428 Software Version

To determine the version of SN 5428 software running on the Cisco SN 5428 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 software by using the SN 5428 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-A01]$ show version
Cisco SN 5428 Storage Router

      CLI Version: 2.1
      iSCSI Version: 2/2 (Min/Max)
→     System Bootstrap: 2.5.1-K9
→     Operating System: 2.5.1-K9
      Application: 2.5.1-K9
      Web Server: R6_1_0
      OpenSSH: 3.4p1
      OpenSSL: 0.9.6e
      Zlib: 1.1.4

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```

Upgrading to a New Software Release

Because of software changes, including an increased download file size, several normal upgrade procedures cannot be used. In order to successfully upgrade from SN 5428 software release 2.2.x or 2.3.x to release 2.5.1, you **must** follow the instructions in the [“Using the GUI” section on page 7](#) or in the [“Using the CLI” section on page 10](#).



Note

If you are upgrading from SN 5428 Storage Router software release 2.2.x to 2.5.x, you must also follow the additional procedures described in the [“Upgrading from Release 2.2.x to 2.5.x” section on page 11](#) after upgrading your software to assure a successful transition to the new release.

Using the GUI

When downloading the SN 5428 Storage Router software release 2.5.1, you **cannot** use the following GUI facilities:

- Maintenance > Upgrade > HTTP > Get Version
- Maintenance > Upgrade > HTTP > Get Url
- Maintenance > Upgrade > Proxy > Get Version
- Maintenance > Upgrade > Proxy > Get Url

These facilities will not work because of a limitation in the released software that restricts download file sizes to less than 20MB when using HTTP-based download functions.

To avoid this problem, use one of the following methods to perform the software download function:

- [TFTP Get Version, page 7](#)
- [TFTP Get File, page 8](#)
- [HTTP Put File, page 9](#)



Note

To use any of the TFTP download facilities, you must have a TFTP server available, and you must download the SN 5428 software from Cisco.com and copy it to the TFTP server. If you are not familiar with TFTP, Cisco suggests that you use the HTTP Put File facility.

TFTP Get Version

To download software release 2.5.1 to the SN 5428 Storage Router, follow these instructions:

-
- Step 1** Log in as “admin”.
 - 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** Click **TFTP Get Version**. The Upgrade Storage Router Software from a TFTP Server page displays.
 - Step 4** Enter **2.5.1-K9** in the **Version** field.
 - Step 5** Enter the name of the host on which the TFTP service is executing in the **Hostname** field.
 - Step 6** (Optional) If you are not downloading the software from the default TFTP download directory (/tftpboot), enter the name of the download directory in the **Directory** field.
 - Step 7** Click **Upgrade** to download the software (see [Figure 3](#)).
 - Step 8** Click **System Reset**. The Currently Running Version page displays.
 - Step 9** Click the **Select next boot version** drop-down arrow and choose 2.5.1-K9 as the next boot version.
 - Step 10** (Optional) To save any configuration changes before rebooting, check the **Save unsaved changes** check box.
 - Step 11** Click **Reset System** to restart the SN 5428 Storage Router.
 - Step 12** After the storage router has rebooted, verify that it is running the new software. (See the “[Determining the SN 5428 Software Version](#)” section on page 6.)
-

Figure 3 Upgrading via TFTP Get Version

The screenshot shows the Cisco Storage Network 5428 Storage Router web interface. The page title is "Upgrade Storage Router Software from a TFTP Server". The interface includes a navigation menu with options: Monitor, Configuration, Maintenance, Troubleshooting, Support, Home, and Help. On the left, there is a sidebar with categories: Maintenance, Software (with sub-options: Show, Verify), Upgrade (with sub-options: HTTP, Proxy, TFTP), Configuration (with sub-options: Backup, Restore), and System (with sub-option: Reset). The main content area contains the following fields and controls:

- Version:** Input field containing "2.5.1-K9".
- Hostname:** Input field containing "tiger".
- Directory:** Empty input field.
- Two checkboxes labeled "Save as default" are positioned to the right of the Hostname and Directory fields.
- An "Upgrade" button is located below the Directory field.

The Cisco logo and "EMPOWERING THE INTERNET GENERATION" tagline are visible in the top left. The text "CISCO STORAGE NETWORK 5428 STORAGE ROUTER" is in the top right. A small number "86125" is visible in the bottom right corner of the interface.

TFTP Get File

To download software release 2.5.1 to the SN 5428 Storage Router, follow these instructions:

- Step 1** Log in as "admin".
- 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** Click **TFTP Get File**. The Upgrade Storage Router Software from a TFTP Server page displays.
- Step 4** Enter the name of the host on which the TFTP service is executing in the **Hostname** field.
- Step 5** Enter **sn5428-sw-2.5.1-K9.tar** in the **Filename** field.
- Step 6** Click **Upgrade** to download the software (see [Figure 4](#)).
- Step 7** Click **System Reset**. The Currently Running Version page displays.
- Step 8** Click the **Select next boot version** drop-down arrow and choose 2.5.1-K9 as the next boot version.
- Step 9** (Optional) To save any configuration changes before rebooting, check the **Save unsaved changes** check box.
- Step 10** Click **Reset System** to restart the SN 5428 Storage Router.
- Step 11** After the storage router has rebooted, verify that it is running the new software. (See the ["Determining the SN 5428 Software Version"](#) section on page 6.)

Figure 4 Upgrading via TFTP Get File

The screenshot shows the Cisco Storage Router web interface. At the top left is the Cisco Systems logo with the tagline 'EMPOWERING THE INTERNET GENERATION'. At the top right, it says 'CISCO STORAGE NETWORK 5428 STORAGE ROUTER'. Below this are navigation tabs: Monitor, Configuration, Maintenance, Troubleshooting, Support, Home, and Help. The main content area is titled 'Upgrade Storage Router Software from a TFTP Server'. On the left is a sidebar menu with categories: Maintenance, Software (with sub-items Show, Verify), Upgrade (with sub-items HTTP, Proxy, TFTP), Configuration (with sub-items Backup, Restore), and System (with sub-item Reset). The main area contains two input fields: 'Hostname' with the value 'tiger' and 'Filename' with the value 'sn5428-sw-2.5.1-K9.tar'. Below these fields is an 'Upgrade' button. The number '86124' is visible in the bottom right corner of the interface.

HTTP Put File



Caution

The HTTP Put File function does not work with Microsoft Internet Explorer 5.5 (service pack 2). If you are using this browser version, please upgrade to Microsoft Internet Explorer version 6 before attempting to download the file.

To download software release 2.5.1 to the SN 5428 Storage Router, follow these instructions:

- Step 1** Log in as “admin”.
- 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** Click **HTTP Put File**. The Upgrade Storage Router Software page displays.
- Step 4** Enter the fully qualified path and file name in the **Download path and file from** field, or click **Browse** to navigate to the appropriate file.
- Step 5** Click **Download** to download the software (see [Figure 5](#)).
- Step 6** Click **System Reset**. The Currently Running Version page displays.
- Step 7** Click the **Select next boot version** drop-down arrow and choose 2.5.1-K9 as the next boot version.
- Step 8** (Optional) To save any configuration changes before rebooting, check the **Save unsaved changes** check box.

- Step 9** Click **Reset System** to restart the SN 5428 Storage Router.
- Step 10** After the storage router has rebooted, verify that it is running the new software. (See the [“Determining the SN 5428 Software Version”](#) section on page 6.)

Figure 5 Upgrading via HTTP Put File



Using the CLI

When downloading the SN 5428 Storage Router software release 2.5.1, you **cannot** use the following CLI commands:

- **download software http version**
- **download software http url**
- **download software proxy version**
- **download software proxy url**

These commands will not work because of a limitation in the released software that restricts download file sizes to less than 20MB when using HTTP-based download functions. To avoid these problems, you must use the TFTP download facility.



Note

To use the TFTP download facility, you must have a TFTP server available and you must download the SN 5428 software from Cisco.com and copy it to the TFTP server. If you are not familiar with TFTP, Cisco suggests that you use the GUI HTTP Put File facility. See [“Using the GUI”](#) section on page 7 for more information.

To use the CLI to download software via TFTP, log in to the SN 5428 and follow these instructions:

	Command	Description
Step 1	enable	Enter Administrator mode.
Step 2	show software version all	Display information about the software versions currently available to the storage router. If multiple versions of software are available, issue the delete software version command to delete each version of software except the currently running version.
Step 3	software tftp hostname <i>tiger</i> or software tftp hostname <i>tiger</i> directory <i>/update</i>	Configure the name or IP address of the TFTP server for the software download process. (In this example, the TFTP server name is <i>tiger</i> . If a DNS is not defined for the SN 5428, enter the IP address of the TFTP server.) If you have already configured a default TFTP server for download purposes, this step is optional. Use the directory keyword only if the SN 5428 software will not be downloaded from the default TFTP download directory (/tftpboot).
Step 4	download software tftp version 2.5.1-K9	Download software version 2.5.1-K9 from the default TFTP server.
Step 5	software version 2.5.1-K9	Set the new software as the version to run with the SN 5428 is rebooted. The system checks the integrity of the specified software version to be sure that it is bootable.
Step 6	reboot	Reboot the SN 5428 Storage Router.

After the storage router has rebooted, verify that it is running the new software. (See the [“Determining the SN 5428 Software Version”](#) section on page 6.)

Upgrading from Release 2.2.x to 2.5.x

If you are upgrading from SN 5428 Storage Router software release 2.2.x, additional procedures are required.

To complete the upgrade process using the CLI, follow these instructions:

- Step 1** The logging algorithms changed in software release 2.3.1 and later. You must restore the default logging rules to the logging table or the SN 5428 will not log any event messages after the upgrade from release 2.2.x to 2.5.1. Use the CLI command **clear logging table to factory_defaults** to restore the default logging rules.


For details on the new logging algorithms and information about customizing the SN 5428 logging table, see the section “Using the SN 5428 Logging Facilities” in Chapter 10, “Maintaining and Managing the SN 5428 Storage Router,” of the *Cisco SN 5428 Storage Router Software Configuration Guide, Release 2.5*.

Step 2 (Optional) If you are going to attach to a Fibre Channel fabric through an inter-switch link or by connecting to another SN 5428, you must change the port type to generic loop (GL_Port) and reset the interface. For example, to change the port type for Fibre Channel interface *fc3*, use the CLI command **interface fc3 type gl-port**. To reset the *fc3* interface, disable and enable the interface using the **no interface fc3 enable** and **interface fc3 enable** CLI commands.

For details on configuring the SN 5428 for FC fabric zoning participation, see Chapter 5, “Configuring Fibre Channel Interfaces,” in the *Cisco SN 5428 Storage Router Software Configuration Guide, Release 2.5*

Uninstalling an Upgrade

To return to a previous SN 5428 software release (2.3.x or 2.2.x) and remove the updated SN 5428 software using the CLI, follow these instructions:

	Command	Description
Step 1	enable	Enter Administrator mode
Step 2	show software version all	Verify that the previous version of SN 5428 software is still available. If it is not, see the section “Installing Updated Software” in Chapter 10, “Maintaining and Managing the SN 5428 Storage Router,” of the <i>Cisco SN 5420 Storage Router Software Configuration Guide, Release 2.5</i> .
Step 3	software version 2.3.1	Select the software to be booted when the system next starts; for example, boot version 2.3.1 when the system restarts. This may take several minutes.
Step 4	reboot	Reboot the SN 5428 Storage Router.  Caution Do not use the reboot fast command. Downgrading software requires a reboot with diagnostics.
Step 5	enable	Enter Administrator mode after the SN 5428 reboots.
Step 6	show version	Verify that the SN 5428 Storage Router is now running the correct software.
Step 7	delete software version 2.5.1	(Optional) Remove the updated software from the SN 5428 Storage Router.

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

-
- Step 1** Log in as Admin.
- 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 reboots, verify that it is running the selected software. (See [“Determining the SN 5428 Software Version” section on page 6.](#))
- 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 Storage Router.
-

New and Changed Information

The following features are new to the SN 5428 in Release 2.5.1:

- Fibre Channel (FC) zoning management—provides the ability to manage FC zoning
- Inactive session timeout value—provides the ability to automatically terminate inactive CLI sessions based on a configurable time interval
- Enable authentication—extends AAA authentication to users issuing the CLI **enable** command and attempting to access the SN 5428 via FTP
- Login authentication—extends AAA authentication to users establishing a Monitor-mode CLI session with the SN 5428
- Named server groups—provides the ability to configure groups of RADIUS and TACACS+ servers to be used for specific authentication purposes
- RADIUS server dead time—provides the ability to improve RADIUS response time when some servers might be unavailable
- Specify source interface for RADIUS and TACACS+ communications—provides the ability to specify a single network interface to be used as the source IP address for all outgoing AAA requests to RADIUS and TACACS+ servers
- Multiple IP addresses for SCSI routing instances—provides the ability to assign multiple IP addresses to a single SCSI routing instance, allowing easier access from multiple network segments
- Use a Gigabit Ethernet IP address for system management—provides the ability to manage the SN 5428 from the data path side (in-band management) by assigning an IP address on each Gigabit Ethernet interface for management purposes
- Redundant Gigabit Ethernet interfaces—provides the ability to assign a single Gigabit Ethernet IP address for a SCSI routing instance, or for system management, that can be presented on either Gigabit Ethernet interface, providing redundant pathing for enhanced reliability

- Secure Shell (SSH) support—provides the ability to access the SN 5428 via SSH for system management
- Routing Information Protocol (RIP) listening support—allows the SN 5428 to learn dynamic routing using RIP (version 1 or version 2) listening
- Configure connection performance options on a per-target basis—provides the ability to disable the use of initial iSCSI Ready-to-Transfer (R2T) on a per-target basis, providing enhanced connection performance
- Support for GS-3 management server commands—allows the use of storage management tools for in-band management of the SN 5428 integrated FC switch component, along with other switches in the fabric
- 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
- Device discovery timer—provides the ability to enable automatic device rediscovery on a periodic basis in environments where LUNs can be created on FC targets, but no event occurs to cause devices to be rediscovered

The following SN 5428 features are changed or enhanced in Release 2.5.1:

- Named authentication lists for iSCSI authentication—provides the ability to configure named lists of authentication services and enable a SCSI routing instance to use a specific named list
- Administrator-mode and Monitor-mode passwords are now cluster elements, shared by all SN 5428s in a high availability cluster
- AAA configuration becomes a cluster element, shared by all SN 5428s in a high-availability cluster
- Failover by eligibility—provides an enhanced failover algorithm for SCSI routing instances running in a high availability cluster. HA now bases the decision to automatically fail over a SCSI routing instance to another SN 5428 in a cluster based on the Fibre Channel and other resources available to that SCSI routing instance.

In release 2.5.1, failover occurs when:

- All mapped targets are unavailable, or a critical resource for the SCSI routing instance is unavailable, and some or all mapped targets would be available from another SN 5428 in the cluster. A critical resource can be a configured Gigabit Ethernet interface, a required Fibre Channel interface, or an internal resource needed to run the SCSI routing instance.
- Some mapped targets are unavailable and all mapped targets are available on another SN 5428 in the cluster.
- All mapped targets are available, but another SN 5428 in the cluster also has all targets available and is designated as the primary for the SCSI routing instance.
- The SN 5428 stops receiving heartbeats from another SN 5428 within the cluster.

Failover by eligibility is enabled by default. However, failover by eligibility will not occur between SN 5428s in a cluster until all SN 5428s are running software capable of handling this new feature.

For example, if you upgrade one SN 5428 in a cluster, failover by eligibility will not occur until the other SN 5428 in the cluster is also upgraded. Until both SN 5428s are running software capable of handling failover by eligibility, failover will only occur if a critical resource is unavailable, or if all mapped targets are unavailable.

- LUN identifier replaces LUN world-wide name (WWN)—improves target mapping by replacing LUN mapping using LUN WWN with LUN mapping using a unique LUN identifier

- Force LUN mapping— provides the ability to allow mapping of the same storage array control LUN in multiple targets
- CLI syntax for the **interface fc** commands (for global FC configuration) changed to **fcswitch**—avoids confusion with the commands to configure individual FC interfaces

Limitations and Restrictions on SN 5428 Storage Router Clusters

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

- A cluster can contain up to two SN 5428 Storage Routers.
- A cluster can contain up to 12 SCSI routing instances.
- A cluster can support up to 100 iSCSI targets.

Important Notes

The SN 5428 Gigabit Ethernet ports, GE 1 and GE 2, can use either MT-RJ small form-factor pluggable (SFP) modules or LC SFP modules. The Cisco product numbers for those SFP modules are listed as follows:

- MT-RJ SFP module – Cisco Product Number SN-SFP-GEMM-MTRJ
- LC SFP module – Cisco Product Number SN-SFP-FCGEMM-LC

The availability of the MT-RJ SFP modules may be limited; if they are unavailable, you can use LC SFP modules in place of the MT-RJ modules. If you are using LC SFP modules in place of MT-RJ SFP modules, make sure that you use the appropriate cable. For example, if you are connecting an LC SFP module in an SN 5428 to an MT-RJ connector in an external end system, switch, or router, you would need a cable with an LC connector at one end and an MT-RJ connector at the other end.

Caveats

Caveats describe unexpected behavior or defects in SN 5428 software releases. 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.

- 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.

Open Caveats

All the caveats in this section are open in SN 5428 software release 2.5.1.

Configuration-Mgmt

- CSCdy57320
RIP settings cannot be restored from a saved configuration file.
Workaround: Use the GUI or the CLI to reconfigure RIP settings.

FC-Switch

- CSCdy75912
Interrupting power during diagnostics may cause a device failure. When upgrading software from 2.2.x or 2.3.x to 2.5.1, critical diagnostic activities occur that cannot be interrupted. After setting the new software version and issuing the **reboot** command, the device will begin POST and then diagnostics. Interrupting the execution of diagnostics, or bypassing diagnostics (using the **reboot fast** command) may cause flash memory on the device to become corrupt. This is not field serviceable.
Workaround: Do not interrupt the boot process after issuing the **reboot** command. Do not use the **reboot fast** command when upgrading software.
- CSCdy89123
When there is an active zone set, attempts to clear the local or fabric zoning database fail.
Workaround: Disable the active zone set, and then issue the command to clear the zoning database.

FC-Switch-Manager

- CSCdz26228
Enabling the FC interface after performing an internal loopback test in diagnostic mode may fail to restore the interface to an operational state.
Workaround: After performing the internal loopback test, disable, enable and then reset the FC interface to restore it to an operational state. For example, issue the following CLI commands to restore the interface *fc3* to an operational state after performing an internal loopback test in diagnostic mode:

```
[SN5428A]# no interface fc3 enable
[SN5428A]# interface fc3 enable
[SN5428A]# interface fc3 reset
```

GUI

- CSCdy06532
SN 5428 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 software using the HTTP Put File function.

- CSCdy53007

When a user attempts to remove a zone from a zone set using the GUI, a blank Modify FC Zoneset web page displays and the zone is not removed from the zone set.

Workaround: Use the CLI **delete zoneset** command with the **zone** keyword to remove the specified zone from the zone set.

- CSCdy53500

When restoring configuration information for the integrated FC switch component from a saved configuration file, the “fcswitch zoning default” value is not restored. This value identifies the level of communication between the SN 5428 and devices in the fabric when there is no active zone set. Valid values are All or None.

Workaround: If the value in the saved configuration file differs from the current value, use the CLI or the GUI to reset the “fcswitch zoning default” value.

- CSCdy58558

AAA configuration information is not propagated to other nodes in a high availability cluster when configuration is done via the SN 5428 GUI.

Workaround: After performing AAA configuration and maintenance via the GUI, issue one of the following CLI commands from the SN 5428 that is performing AAA management functions:

```
[sn5428a] save all bootconfig
[sn5428a] save aaa bootconfig
```

- CSCdy77046

When using the GUI Put File functionality to upgrade SN 5428 software and the upgrade process fails because there is not sufficient space available, the GUI displays an error message indicating the process failed. However, the partially loaded version of software is not removed from the filesystem. If you subsequently attempt to download software via the CLI, the transfer appears to hang.

Workaround: Verify that there is sufficient space available (at least 30 MB) before attempting to upgrade SN 5428 software. If the GUI Put File fails due to lack of space, manually remove that version of software before attempting another download.

Other

- CSCdy73264

The capacity of some target LUNs is erroneously displayed as 0 KB when a **show devices** command is issued. This can occur if a target rejects the SCSI Read Capacity command issued by the SN 5428.

Workaround: Issue the **show devices rediscover** command. This will force a retry of the SCSI Read Capacity to the target LUN.

SNMP

- CSCdx20426

SNMP does not always return the correct value for the object ifLinkUpDownTrapEnable for the SN 5428 management or HA interfaces. It may report the value as enabled(1) when it should be reporting disabled(2).

Workaround: Use the CLI or the GUI to check the value of the SN 5428 trap setting for the interface.

Software-Mgmt

- CSCdy66285

When using an HTTP server that requires authorization to access directories and files, the authorization fails when trying to download a new version of SN 5428 software using the CLI.

Workaround: Use the SN 5428 GUI HTTP functions to download new SN 5428 software versions.

- CSCdy66379

The SN 5428 Storage Router may fail to boot successfully because the integrated Fibre Channel switch component does not retain the default IP address. This problem can only occur in two situations. The user will only encounter one of these situations.

The first situation occurs during diagnostics, when test 18 fails with the following message:

```
Starting -> 18 - FC switch startup Test...Waiting for switch to reboot
Failed!
curTest = 00018, error code = 06000000
Test Number = HL 18
Execution Count = 1
Voltage Margin = Nominal
Date/Time of failure: TUE SEP 17 19:12:09 2002
Error code = 0600-0000
Severity = Fatal
Failed FC Switch logic ping command
FRU Replacement List = FC Switch Logic, CISCO SN5428, END.
Failure address = 00000000
Expected -> 00 00 <- Received
```

The second situation occurs during initialization, when the Fibre Channel switch application attempts to ping the integrated switch components and diagnostics are disabled. In this situation, the following message displays:

```
"Switch ping check failed"
```

In either of these situations, the user will be brought to the vxWorks console prompt.

Workaround: Contact Cisco TAC for more information on this defect.

Software-Other

- CSCdx65931

Telnet sessions appear to hang or are terminated while extensive logging is occurring to the Telnet session. This may occur when failovers are being performed and extensive messages are being logged, or if debug level logging is enabled for the session.

Workaround: Press the Enter key several times, and the Telnet session will usually terminate. The user can then restart a Telnet session. The user can also close the hung Telnet window and simply start a new Telnet session in another window.

TCP-IP

- CSCdy53545

When running with RIP enabled and overlapping subnet routes are being used, only one of the routes will be installed in the SN 5428 routing table. For example, if a route to 10.0.0.0/8 and a route to 10.0.0.0/24 are both learned by RIP, only one of the routes will be used.

Workaround: When RIP is enabled, do not use overlapping subnet routes.

Resolved Caveats

All of the caveats listed in this section are resolved in SN 5428 software release 2.5.1.

Configuration-Mgmt

- CSCdy13704

NTP client initialization is not performed during startup, preventing the use of date and time services from an NTP server.

Workaround: Manually restart the NTP client after each reboot by reconfiguring the NTP server IP address (or name) used by the SN 5428 to query current time.

- CSCdy38892

Executing the CLI command **show tech support** or **show bootconfig** may cause the SN 5428 to lock up. The UI task fails with a memory error if a configuration requires a large buffer to hold the target information being displayed.

Workaround: None.

FC-Switch

- CSCdy28618

An EMC FC4700 CLARiiON array may not be able to login successfully to an FC interface on the SN 5428 when the interface is configured as F, FL, G or GL port types.

Workaround: Configure the SN 5428 port type as TL, with a mode of autobridge. For example:

```
[SN5428A]# interface fc1 type tl-port mode autobridge
```

- CSCdy77012

Fibre channel (FC) ports will not become active when targets or HBAs are connected.

Workaround: Lock down the link speed on the affected FC interfaces, if possible. For example, if the FC interface is connected to a 1 Gigabit target or HBA, explicitly set the link speed on the FC interface to 1 Gigabit.

GUI

- CSCdy78589

The SN 5428 may unexpectedly restart when using the GUI to add a target to a SCSI routing instance.

Workaround: If the problem occurs, use the CLI to add targets to SCSI routing instances.

SCSI

- CSCdx66563

The SN 5428 stops traffic and displays the following errors:

```
May 22 13:37:58:srsSessScsiData:AS_CRIT :Task itt=000004b9 sent 4096 / credit 0
bytes on conn 10.1.10.12:1254<->10.1.10.143:3260. Aborting task
May 22 13:37:58:srsConnScsiData:AS_CRIT :Dropping data PDU (ttt=ffffffff,
itt=000004b9) on connection 10.1.10.12:1254<->10.1.10.143:3260
May 22 13:37:58:srsSessScsiData:AS_CRIT :Task itt=000004ba sent 4096 / credit 0
bytes on conn 10.1.10.12:1254<->10.1.10.143:3260. Aborting task
May 22 13:37:58:srsConnScsiData:AS_CRIT :Dropping data PDU (ttt=ffffffff,
itt=000004ba) on connection 10.1.10.12:1254<->10.1.10.143:3260
May 22 13:37:58:srsSessScsiData:AS_CRIT :F-bit set before data transfer complete
(4096/65536). Aborting task 000004bb on connection 10.1.10.12:1254<->10.1.10.143:3260
May 22 13:37:58:srsConnScsiData:AS_CRIT :Dropping data PDU (ttt=ffffffff,
itt=000004bb) on connection 10.1.10.12:1254<->10.1.10.143:3260
May 22 13:37:58:srsSessScsiData:AS_CRIT :F-bit set before data transfer complete
(4096/65536).
```

Workaround: None.

- CSCdy05764

While running traffic to XIOTech disk devices attached to the SN5428 FC port, and power cycling other SN5428s on the switch, data corruption to one disk on the XioTech array was detected. The data corruption occurred while reading data from the device; data was returned incorrectly from the disk. Subsequent reads of the same information worked properly. This problem is extremely rare.

Workaround: Currently, there is no known workaround for this problem. If corruption is detected, data can be re-read correctly from the disk device. Avoid pulling cables or power cycling SN 5428s while traffic is running to these types of disk devices.

- CSCdy14572

Deleting targets in transparent mode can create an out-of-sync condition between the standard SN 5428 displays and SCSI trace (tfestatus) information.

Workaround: None.

SNMP

- CSCdx39505

A memory leak may occur when walking the CDP MIB. A bulk walk that traverses cdpVTPMgmtDomain has caused a leak of approximately 1.2KB.

Workaround: Avoid bulk walks of the CDP MIB.

Software-Mgmt

- CSCdy07835

The TFTP download of a file does not appear to terminate. This can occur if the network connection drops while downloading a file via TFTP to the SN 5428 and the network connection is never reestablished. The background download progress indicator is not being correctly informed that the TFTP download process has failed and the progress indicator continues to display.

Workaround: Either reestablish the network connection, or reboot the SN 5428 Storage Router.

- CSCdy53636

When attempting to update SN 5428 software, an HTTP download fails with the following message:

```
Can't download software: TarPostFail:
```

The download fails because the file size of the software download exceeds a predefined maximum image size.

Workaround: When upgrading from either release 2.2.2 or 2.3.1 to release 2.5.1, download the software from the TFTP server, or use the GUI Put File facility to move the software to the SN 5428. The file size limitation is removed in release 2.5.1 software.

Software-Other

- CSCdy06564

If you are using TFTP for the software download process and receive a TFTP error, the SN 5428 may restart. For example, if you are attempting to download a specific version of software and the file cannot be found on the TFTP server, TFTP returns an error. During the cleanup process, a memory exception causes the SN 5428 to reboot.

Workaround: Verify that the software version to be downloaded is on the TFTP server. Use the **download software** command with the **version** keyword, rather than the **filename** keyword.

Documentation Updates

This section describes corrections to the Cisco SN 5428 Storage Router Release 2.5 documentation set since initial publication.

- Added the CLI command **fcswitch devlog enable**

The **fcswitch devlog enable** command is a new command, added as part of the resolution to caveat CSCdy77012. To enable development logging for the integrated Fibre Channel (FC) switch component, use the **fcswitch devlog enable** command. To disable development logging, use the **no** form of this command. This command is an Administrator mode command.

fcswitch devlog enable

no fcswitch devlog enable

The **fcswitch devlog enable** command is designed for debug purposes, and should be used under the guidance of a Cisco Technical Support professional.

- Added the CLI command **fcswitch log interface**

The **fcswitch log interface** command is a new command, added as part of the resolution to caveat CSCdy77012. To restrict the integrated FC switch logging to a specific port (fc1 through fc8), use the **fcswitch log interface** command. To remove the restriction, use the **no** form of this command. This command is an Administrator mode command.

fcswitch log interface *fc?*

no fcswitch log interface *fc?*

The **fcswitch log interface** command is designed for debug purposes, and should be used under the guidance of a Cisco Technical Support professional.

- Added the CLI command **fswitch syslog enable**

The **fswitch syslog enable** command is a new command, added as part of the resolution to caveat CSCdy77012. To enable system logging for the integrated Fibre Channel (FC) switch component, use the **fswitch syslog enable** command. To disable system logging, use the **no** form of this command. This command is an Administrator mode command.

fswitch syslog enable

no fswitch syslog enable

The **fswitch syslog enable** command is designed for debug purposes, and should be used under the guidance of a Cisco Technical Support professional.

- Added the CLI command **interface fc? reset**

The **interface fc? reset** command is a new command, added as part of the resolution to caveat CSCdy77012. To disable and then enable the specified FC interface (fc1 through fc8), use the **interface fc? reset** command. This command is an Administrator mode command.

interface fc? reset

This command is functionally equivalent to issuing a **no interface fc? enable** command, followed by an **interface fc? enable** command.

- Added the CLI command **interface fci? devicediscoverytimer**

The **interface fci? devicediscoverytimer** command is a new command, added as part of the resolution to caveat CSCdy69379. To enable the SN 5428 internal Fibre Channel (FC) interfaces to perform background device rediscovery for all attached FC targets at specific time intervals, use the **interface fci? devicediscoverytimer** command. This command is an Administrator mode command.

interface fci? devicediscoverytimer nn

The device discovery timer is set in minutes. The default value is 0, indicating that automatic background device rediscovery is disabled.

Use this command to enable automatic device rediscovery on a periodic basis in environments where LUNs can be created on FC targets, but no event occurs to cause devices to be rediscovered. This situation may occur with certain RAID controllers or virtualization type devices.

You do not need to issue the **interface fci? devicediscoverytimer** command for both internal FC interfaces. When you enable automatic background device rediscovery for one internal FC interface (for example, fci1), the same setting is enabled for the other internal FC interface (for example, fci2).

```
[SN5428A]# interface fci2 devicediscoverytimer 20
→ device discovery timer changed to 20 minutes on interface fci1
→ device discovery timer changed to 20 minutes on interface fci2
```

To disable automatic background device rediscovery, set the device discovery timer interval to 0. (This is the default setting.) For example:

```
[SN5428A]# interface fci2 devicediscoverytimer 0
→ device discovery timer changed to 0 minutes on interface fci1
→ device discovery timer changed to 0 minutes on interface fci2
```

When automatic background device rediscovery is enabled, use the **show interface** command with the **stats** keyword to display the current device discovery timer configuration. In the following example, the SN 5428 will perform background device rediscovery every 10 minutes.

```
[SN5428B]# show interface fc11 stats
loop:          LOOP READY
connection:    F Port
Data Rate:     2 Gb/s
port id:       0x20f00
ALPA:          0x0
firmware:      READY
→ device rediscovery timer:  10 minutes
. . .
```

**Note**

The device rediscovery timer information does not display if automatic background device rediscovery is not enabled.

- Added keywords to the **show debug fcswitch** CLI command

On page 11-339 of the *Cisco SN 5428 Storage Router Software Configuration Guide*, three keywords should be added to the **show debug fcswitch** command. The **memory** keyword displays memory usage for the integrated FC switch component. The **tech-support** keyword displays technical support information for the integrated FC switch component. The **clish** keyword, followed by the appropriate quoted switch command, displays internal operational information for the integrated FC switch component.

The syntax of the modified command is:

```
show debug fcswitch {all | brief | memory | tech-support}
```

```
show debug fcswitch clish text
```

**Note**

The **show debug fcswitch clish** command is to be used under the guidance of Cisco Technical Support personnel only.

- Changing zoning default configuration

On page 11-120 of the *Cisco SN 5428 Storage Router Software Configuration Guide*, add the following paragraph at the end of the “Usage Guidelines” section.

Before changing the default behavior, disconnect any ISL links to other fabric entities to prevent unintended disruption of fabric traffic.

- Enable and Login authentication

On page 8-3 of the *Cisco SN 5428 Storage Router Software Configuration Guide*, the second paragraph under the section “Login Authentication” is incorrect and should be removed. Enable authentication, not Login authentication, extends to users attempting to access the SN 5428 Storage Router via FTP.

The paragraph should be corrected and added as the second paragraph in the “Enable Authentication” section, also on page 8-3 of the *Cisco SN 5428 Storage Router Software Configuration Guide*, as follows:

If the SN 5428 is configured to allow FTP access, Enable authentication also authenticates users attempting to login and establish an FTP session with the SN 5428.

- Initiator interfaces
On page 11-347 of the *Cisco SN 5428 Storage Router Software Configuration Guide*, the “Usage Guidelines” section incorrectly identifies the SN 5428 FC initiator interfaces as fci0 and fci1. The second paragraph should be corrected to read as follows:
The output of this command is limited to devices that are visible to the SN 5428 FC initiator interfaces (fci1 and fci2).
- Internal FC interface types
On page 11-66 of the *Cisco SN 5428 Storage Router Software Configuration Guide*, the port type keyword following **type g-port** in the “Syntax Description” table for the **debug interface fc?** command is incorrect. The port type keyword should be changed to **type gl-port**. The description of the keyword is correct.
- Maximum concurrent CLI management sessions
On page 11-407 of the *Cisco SN 5428 Storage Router Software Configuration Guide*, the “Usage Guidelines” section incorrectly indicates the maximum number of concurrent CLI management sessions is 16. The sentence should be corrected to read as follows:
There are a maximum of eight concurrent CLI management sessions per SN 5428.
- Prerequisite tasks for configuring a high availability cluster
On page 9-1 of the *Cisco SN 5428 Storage Router Software Configuration Guide*, the first paragraph in the “Prerequisite Tasks” section should be updated to read as follows:
All SN 5428 Storage Routers that will participate in a cluster must have connectivity to the same hosts and the same storage systems, and must be connected to each other through their management and HA interfaces. At least one of the interface connections (management or HA) must be live; you cannot connect SN 5428s in a cluster using crossover cables.
- Recovering lost console passwords
The URL listed on page 10-20 of the *Cisco SN 5428 Storage Router Software Configuration Guide Release 2.5*, for password recovery procedures may not include procedures for the SN 5428. If you require assistance in recovering a lost console password and cannot locate the appropriate procedures at the documented URL, contact the Cisco Technical Assistance Center. (See the [“Obtaining Technical Assistance” section on page 27](#) for details.)
- Resetting the FC interface after performing diagnostic tests
On page 11-132 of the *Cisco SN 5428 Storage Router Software Configuration Guide*, the “Usage Guidelines” section should be updated to read as follows:
Use this command to change the named FC interface to diagnostic mode prior to performing an internal or external loopback test. When testing is complete, issue the **interface fc? reset** command (or the **no interface fc? enable** command, followed by the **interface fc? enable** command) to enable the interface and allow access to storage targets.
- Switch configuration for VLAN support
On page 4-1 of the *Cisco SN 5428 Storage Router Software Configuration Guide*, the following sentence should be added as the last sentence of the note in the “VLAN Encapsulation” section:
The switch port must also be set to VLAN 1.
- The **show logging** command with the **match** keyword accepts regular expressions
On page 11-383 of the *Cisco SN 5428 Storage Router Software Configuration Guide*, the **match** keyword description should be expanded to include strings and regular expressions.

The first sentence of the second bullet point in the “Usage Guidelines” section should be updated to read as follows:

- Use the match parameter to display messages in the SN 5428 log file that match the specified string or regular expression.

On page 11-384, the following example should be added at the end of the “Examples” section:

The following example displays all messages from the UI or IF facility, or all messages at notice or debug level. Only the last 50 log messages are searched for matches.

```
[sn5428a]# show logging last 50 match "(%UI|IF)-|[67]-)"
Oct 10 13:28:45: %UI-5-EWSSSL: Starting SSL OpenSSL 0.9.6e 30 Jul 2002 Port 443
Oct 10 13:28:53: %HA-6-HHMTMEC: HA_monitor_task: monitor event change with
scsirouter/foo
Oct 10 13:29:09: %UI-5-NSCL: Successful CLI login from [console]
Oct 10 13:29:09: %UI-6-CCEMCS: Executed command "enable" return code is 0
Oct 10 13:29:14: %UI-6-CCEMCS: Executed command "show logging" return code is 0
```

Related Documentation

The following sections describe the related documentation available for Cisco SN 5428 Storage Router Release 2.5.1. These documents consist of hardware installation and software configuration guides, and platform-specific release notes, readme and example configuration files for the Cisco iSCSI drivers.

Release-Specific Documents

This release notes document is the only document specific to SN 5428 Release 2.5.1. 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, readme and example configuration files for Cisco iSCSI drivers, version 2.1.x and 2.2.x. The files are currently available in electronic format only. See the [“Obtaining Updated Software and iSCSI Drivers” section on page 5](#) for details.

Hardware Documents

Refer to the *Cisco SN 5428 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 Storage Router Software Configuration Guide Release 2.5*, 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 web-based GUI, refer to the SN 5428 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**

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.

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 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 5420 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.
-

Obtaining Documentation

These sections explain how to obtain documentation from Cisco Systems.

World Wide Web

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

<http://www.cisco.com>

Translated documentation is available at this URL:

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 is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Ordering Documentation

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/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:
<http://www.cisco.com/go/subscription>
- 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. In the Cisco Documentation home page, click the **Fax** or **Email** option in the “Leave Feedback” section at the bottom of the page.

You can e-mail your comments to bug-doc@cisco.com.

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

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

We appreciate your comments.

Obtaining Technical Assistance

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

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com is a highly integrated Internet application and a powerful, easy-to-use tool that provides a broad range of features and services to help you with these tasks:

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- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

If you want to obtain customized information and service, you can self-register on Cisco.com. To access Cisco.com, go to this URL:

<http://www.cisco.com>

Technical Assistance Center

The Cisco Technical Assistance Center (TAC) is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two levels of support are available: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Cisco TAC inquiries are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

The Cisco TAC resource that you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

You can use the Cisco TAC Web Site to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, 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 Web Site. The Cisco TAC Web Site requires 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://www.cisco.com/register/>

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

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

If you have Internet access, we recommend that you open P3 and P4 cases through the Cisco TAC Web Site.

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 level of 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.

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



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