



# Release Notes for Cisco SN 5420 Storage Router Release 2.1.1

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February 27, 2002



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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 5420 Storage Router software release 2.1.1.

For a list of software caveats that apply to Release 2.1.1, 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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**Corporate Headquarters:**  
Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

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# Introduction

The Cisco SN 5420 Storage Router provides universal access to storage over IP networks. The storage router software controls the operation of the Cisco SN 5420 Storage Router. You can configure the software to provide one of three types of access to storage over IP networks:

- SCSI routing
- Transparent SCSI routing
- iSCSI SAN interconnect

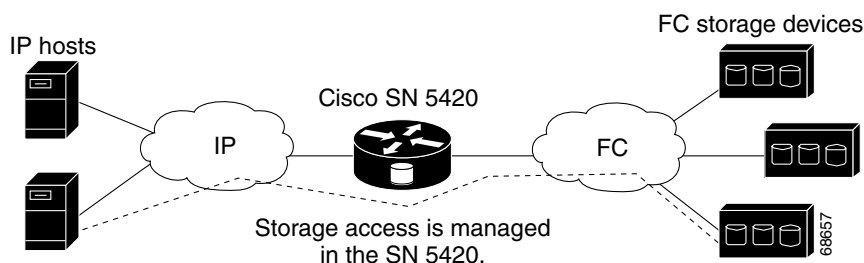
SCSI routing provides IP hosts with access to Fibre Channel (FC) storage devices, using iSCSI protocol.


**Note**

The iSCSI protocol is an IETF-defined protocol for IP storage (ips). For more information about the iSCSI protocol, refer to the IETF standards for IP storage at <http://www.ietf.org>.

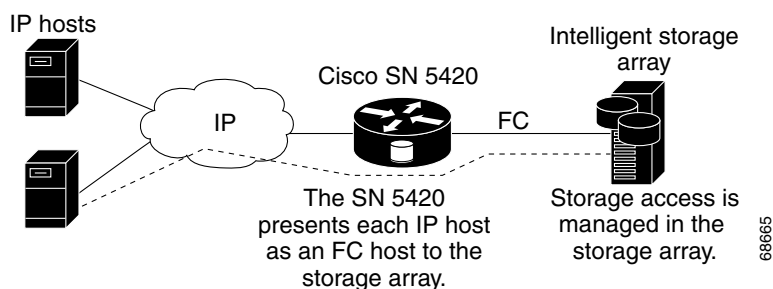
With SCSI routing, storage device access is managed primarily in the SN 5420. (See [Figure 1](#).)

**Figure 1** SCSI Routing



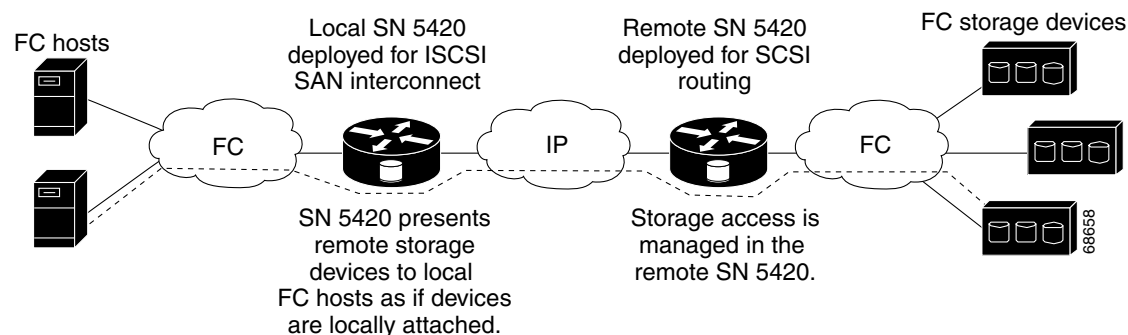
Transparent SCSI routing provides IP hosts with transparent access to intelligent storage arrays using iSCSI protocol; that is, each IP host is presented as an FC host to an intelligent storage array. With transparent SCSI routing, availability of storage devices is managed primarily in the intelligent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

**Figure 2** Transparent SCSI Routing



iSCSI SAN interconnect provides FC hosts with IP access to remote FC storage devices, using iSCSI protocol. With iSCSI SAN interconnect, storage device access is managed primarily in a remote SN 5420 Storage Router that is deployed for SCSI routing. Storage devices that are made available by a remote storage router are presented to FC hosts as if the storage devices are locally attached FC storage devices. (See [Figure 3](#).)

**Figure 3** *iSCSI SAN Interconnect*



In addition to providing services for accessing storage over IP networks, the SN 5420 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 authentication using AAA authentication methods
- High Availability (HA)—provides the ability to group storage routers in a cluster for failover and other cluster-related functions (for SCSI routing only)
- SNMP/MIB support—provides network management of the SN 5420 through SNMP using selected MIBs; includes access through CiscoWorks
- A command-line interface (CLI) and a web-based GUI—provides user interfaces for configuration and maintenance of an SN 5420



**Note** The web-based GUI is not available in SN 5420s deployed for transparent SCSI routing.

## System Requirements

This section describes the system requirements for Release 2.1.1 and includes the following information:

- [Network Equipment, page 4](#)
- [IP Hosts, page 4](#)
- [Graphical User Interface, page 4](#)
- [iSCSI Driver Version Support, page 4](#)
- [Obtaining Updated Software and iSCSI Drivers, page 4](#)
- [Determining the SN 5420 Software Version, page 5](#)

## Network Equipment

- The SN 5420 Storage Router's Gigabit Ethernet interface uses 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 interface where the SN 5420 Storage Router is connected.
- If the SN 5420 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 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 5420. On the SN 5420 Storage Router, you can use the CLI **show scsirouter connection tcp** command to display the current and maximum TCP window size for each connected host.

## Graphical User Interface

- If you are accessing the GUI from a browser running on a Microsoft Windows platform, Cisco recommends the use of Microsoft Internet Explorer version 5.5 with service pack 2 or Netscape Navigator 4.71, or later. Earlier versions of Microsoft Internet Explorer running on Microsoft Windows platforms may return an "Access Denied" message when attempting to restore files or make updated software available to the storage router. (This problem does not occur with Microsoft Internet Explorer version 5.0x running on UNIX or other platforms.)
- To access the online Help system for the SN 5420 web-based GUI, use a browser that is compatible with HTML 3.2, such as Internet Explorer 3.0 or later, or Netscape Navigator 3.0 or later. Any browser that does not provide full support for Dynamic HTML (such as Netscape Navigator) must be enabled to support Java, JavaScript and style sheets. This browser restriction applies only to the online Help system.

## iSCSI Driver Version Support

A Cisco SN 5420 Storage Router running software release 2.1.1 or later is compatible with an IP host running any Cisco Storage Networking iSCSI Driver version 2.1.1 or later; it is not compatible with an IP host running any Cisco Storage Networking iSCSI Driver version 1.1.x.

## Obtaining Updated Software and iSCSI Drivers

From time to time, Cisco releases updated versions of SN 5420 Storage Router software and iSCSI drivers. Updated versions of storage router software and the Cisco Storage Networking iSCSI drivers, accompanying readme files, release notes and example configuration file are available for download.

If you are a registered Cisco.com user, you can download SN 5420 Storage Router software and iSCSI drivers. If you are a non-registered Cisco.com user, you can download only iSCSI drivers.

You can access software by following these instructions:

- 
- Step 1** At <http://www.cisco.com> (or <http://www.cisco.com/login/cisco/>, if you are a registered Cisco.com user and logged in), under **Service & Support**, click **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. For example, click **Cisco SN 5420 Storage Router Software** for SN 5420 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 instructions on that page 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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## Determining the SN 5420 Software Version

To determine the version of SN 5420 software running on the Cisco SN 5420 Storage Router, establish a Telnet or console port session with the storage router, and enter the CLI **show version** command. (See [Example 1](#).)

### **Example 1** *Determining the Software Version*

```
[SN5420-A01]$ show version

CISCO SN 5420 Storage Router

Operating System Software Ver: 2.1.1
→ System Bootstrap Ver: 2.1.1
→ Application Software Ver: 2.1.1
CLI Version 2.1

Copyright (c) 1986-2001 by Cisco Systems, Inc
```

The *Application Software* 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.

If the storage router is deployed for SCSI routing or iSCSI SAN interconnect, you can also check the version of the SN 5420 software by using the SN 5420 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.

# Upgrading from SN 5420 Software Release 1.1.8

This section describes the procedures to follow when upgrading a Cisco SN 5420 Storage Router from release 1.1.8 to release 2.1.x and includes the following information:

- [Prerequisite Tasks, page 6](#)
- [Upgrading a Standalone Storage Router, page 6](#)
- [Upgrading a Storage Router in a Cluster, page 7](#)
- [Uninstalling an Upgrade, page 8](#)

If you have questions or concerns about the upgrade process, see the [“Obtaining Technical Assistance”](#) section on page 14.

## Prerequisite Tasks

- Before upgrading to release 2.1.x, the storage router must be running software release 1.1.8 (or later). Follow the procedures in the section “Installing Updated Software” in Chapter 6, “Maintaining and Managing the SN 5420,” of the *Cisco SN 5420 Storage Router Software Configuration Guide Release 1.1*.
- As a best practice, Cisco recommends that you back up the storage router configuration before beginning the upgrade process. Follow the procedures in the section “Backing Up System Configuration” in Chapter 6, “Maintaining and Managing the SN 5420,” of the *Cisco SN 5420 Storage Router Software Configuration Guide Release 1.1*.
- Schedule a planned system downtime. The upgrade process from release 1.1.x software requires downtime because the SN 5420 and all IP hosts must be upgraded at the same time. The length of the system downtime depends on the number of storage routers and IP hosts to be upgraded.



### Note

Upgrading to release 2.1.x software automatically deploys the storage router for SCSI routing. If you want to choose another deployment option, use the **clear conf** command after a successful upgrade process to delete the existing storage router configuration. You will then be able to select another deployment option when the initial configuration script runs after the storage router is rebooted.

## Upgrading a Standalone Storage Router

Follow these procedures to upgrade a standalone Cisco SN 5420 Storage Router running software release 1.1.8 (or later) to software release 2.1.x:

- Step 1** Be sure there are no active connections from IP hosts to the storage router. For example, use the following command to display current connection activity:  

```
show scsirouter all connection
```
- Step 2** Download the appropriate software release to the storage router. See the [“Obtaining Updated Software and iSCSI Drivers”](#) section on page 4 for details.
- Step 3** Verify the software download and set the downloaded software as the version to be run when the storage router reboots. Follow the procedures in the section “Installing Updated Software” in Chapter 6, “Maintaining and Managing the SN 5420,” of the *Cisco SN 5420 Storage Router Software Configuration Guide Release 1.1*.

**Step 4** Reboot the storage router. For example, use the following command:

```
reboot
```



**Note** If the storage router did not have a system name, you will be prompted to add that information when the storage router restarts. A system name is now required, not optional.

**Step 5** Verify that the appropriate software is running and that the SCSI routing instances are active. For example, enter the following commands:

```
show software version all
show cluster
```

**Step 6** (Optional) If zoning by WWPN or WWNN is active on the fabric network, you must change zoning configuration to reflect the new WWPN or WWNN presented by the SN 5420 Storage Router. The WWPN format for the Fibre Channel interface was changed from IEEE format (0x1) to IEEE extended format (0x2). WWNN format also changed from “0x2” to “0x1”. The SN 5420 Storage Router running software release 2.1.1 presents WWPNs as “0x2” and WWNNs as “0x1”.

**Step 7** Download the appropriate iSCSI driver software for the IP hosts that access the storage router. See the [“Obtaining Updated Software and iSCSI Drivers” section on page 4](#) for details.

**Step 8** Follow the procedures in the iSCSI driver readme files and the associated online Release Notes documents to complete the upgrade of the iSCSI driver software in the IP hosts. Once the new iSCSI driver is active on the IP host, iSCSI connections will be established and storage devices will become visible.



**Note** In release 2.1.1, the port number used for iSCSI traffic has been officially assigned by IANA as 3260. The port number 5003, previously used in release 1.1.8, is no longer in use for iSCSI traffic.

## Upgrading a Storage Router in a Cluster

Follow these procedures to upgrade a high availability cluster of SN 5420 Storage Routers running software release 1.1.8 (or later) to software release 2.1.x. The second storage router to join the cluster is removed from the cluster and upgraded. The remaining storage router and IP hosts are upgraded, and then the storage routers are returned to a clustered configuration.

These steps use the example storage router names *SN5420A* and *SN5420B*. The storage router named *SN5420A* is the first storage router in the cluster.

**Step 1** *SN5420B* will be updated first. Use the **set cluster** command on *SN5420B* to change the cluster name, effectively removing the storage router from the existing cluster. When prompted to merge or delete, select the “delete” option. The storage router will reboot.

**Step 2** After *SN5420B* reboots, download the appropriate software release to the storage router. See the [“Obtaining Updated Software and iSCSI Drivers” section on page 4](#) for details.

**Step 3** Reboot *SN5420B*. For example, use the following command:

```
reboot
```

**Step 4** Verify that the appropriate software is running. For example, use the following command on *SN5420B*:

```
show software version all
```

**Step 5** Upgrade *SN5420A* by following the steps for upgrading a standalone storage router in the [“Upgrading a Standalone Storage Router”](#) section on page 6.

**Step 6** Add *SN5420B* back into the original cluster. For example, use the following command:

```
setup cluster
```

When prompted for HA configuration, select “clustered.” When prompted for cluster name, enter the original cluster name. When prompted to retain or delete configuration information, select “delete.” The storage router will reboot.

**Step 7** When *SN 5420B* reboots, verify that it is now a member of the original cluster. For example, use the following command:

```
show cluster
```

**Step 8** If necessary, failover one or more SCSI routing instances from *SN 5420A* to *SN 5420B* to return to the original cluster configuration.




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**Note** Any SCSI routing instance that had previously used the primary attribute to assign a preferred storage router for the instance must be modified. The primary attribute now requires a storage router system name, rather than an IP address. See the **scsirouter primary** command in Chapter 11, “Command Line Interface Reference,” of the *Cisco SN 5420 Storage Router Software Configuration Guide Release 2.1*.

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## Uninstalling an Upgrade

Schedule a planned system downtime. The uninstall process requires downtime because the software on the SN 5420 Storage Router and all IP hosts must be changed at the same time. The length of the system downtime depends on the number of storage routers and IP hosts involved.

To return to Cisco SN 5420 Storage Router software release 1.1.8 (or later) and remove the updated SN 5420 software release 2.1.x using the CLI, follow these instructions:

**Step 1** Verify that release 1.1.8 (or later) of SN 5420 software is still available on the storage router. If it is not, see the section “Installing Updated Software” in Chapter 10, “Maintaining and Managing the SN 5420” of the *Cisco SN 5420 Storage Router Software Configuration Guide Release 2.1*.

**Step 2** Verify that there are no active connections from IP hosts to the storage router. For example, use the following command to display current connection activity:

```
show scsirouter all connection
```

**Step 3** Set release 1.1.8 as the version to be run when the storage router reboots. For example, use the following command:

```
software version 1.1.8
```

**Step 4** Reboot the storage router. For example, use the following command:

```
reboot
```

- Step 5** Verify that release 1.1.8 software is running and that the SCSI routing instances are active. For example, enter the following commands:
- ```
show software
show cluster
```
- Step 6** (Optional) If zoning by WWPN or WWNN (world-wide node name) is active on the fabric network, you must change zoning configuration to reflect the original WWPN or WWNN format presented by the SN 5420 Storage Router. The SN 5420 Storage Router running software release 1.1.8 presents WWPNs as “0x1” and WWNNs as “0x2”.
- Step 7** Follow the procedures in the iSCSI driver readme files and the associated online Release Notes documents to uninstall the upgrade of iSCSI driver software in the IP hosts. Once the previous iSCSI driver is active on the IP host, iSCSI connections will be established and storage devices will become visible.




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**Note** In release 1.1.8, the port number used for iSCSI traffic will be 5003.

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## Limitations and Restrictions on SN 5420 Storage Router Clusters

- A storage router cluster can contain up to four SN 5420 Storage Routers.
- A cluster can contain up to 12 SCSI routing instances.
- A cluster can support up to 100 iSCSI targets.

## Caveats

Caveats describe unexpected behavior or defects in SN 5420 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 list caveats resolved in this release, but open in previous releases.

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



**Note**

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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)

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## Open Caveats

All the caveats listed in this section are open in SN 5420 software release 2.1.1.

### SCSI

- CSCdw79917

Using the CLI command **delete scsirouter all** may cause the HA application monitor task to suspend with a data exception error. This results from a synchronization problem between the HA application control task and the HA monitor task, which causes the HA monitor task to try accessing structures for a SCSI routing instance that no longer exists. The SN 5420 Storage Router will have to reboot to recover from this state.

Workaround: Instead of using the delete scsirouter all command, delete each SCSI routing instance individually.

### VLAN

- CSCdw74461

The Cisco SN 5420 Storage Router does not obtain the VLAN domain information via VTP from a directly connected Cisco Cat4K switch that is running the Catalyst OS software. The problem only occurs when the VTP mode setting in the switch is set to Client.

Workaround: Change the VTP mode setting in the switch to VTP server.

## Resolved Caveats

All of the caveats listed in this section are resolved in SN 5420 software release 2.1.1.

### Gigabit Ethernet

- CSCdw17171

If the Gigabit Ethernet interface goes down while SCSI routing instances are being failed over, there is a very intermittent chance that all SCSI routing instances will not be failed over appropriately. One or more SCSI routing instances may be stuck in a terminating state.

Workaround: The problem has been resolved by flushing the driver's buffers when the Gigabit Ethernet interface goes down.

### TCP/IP

- CSCdw17111

When adding a new host route to the SN 5420 Storage Router routing table, routes may not be available to the storage router until it is rebooted.

Workaround: The problem has been resolved by flushing cached routes when changes are made to the SN 5420 Storage Router routing table. Any routing table changes that affect existing connections are flagged with a warning message.

# Documentation Updates

This section describes changes to the Cisco SN 5420 Storage Router documentation set since initial publication.

- Fibre Channel Port Cabling Specifications

On page B-2 of the *Cisco SN 5420 Storage Router Hardware Installation Guide*, Table, B-2, “Fibre Channel Port Cabling Specifications,” the values in the Maximum Cable Distance column should be changed as follows:

- Row 1: Change 300 ft (91 m) to 984 ft (300 m).
- Row 2: Change 500 ft (152 m) to 1640 ft (500 m).

- References to iSCSI driver CD

On page 1-1 of the *Cisco SN 5420 Storage Router Hardware Installation Guide*, there is a reference to a Cisco Storage Networking iSCSI Drivers CD. The iSCSI drivers, readme and example configuration files referenced there are currently available only through the Cisco.com website. The Cisco SN 5420 Storage Router does not currently ship with a Cisco Storage Networking iSCSI Drivers CD.

See the [“Obtaining Updated Software and iSCSI Drivers” section on page 4](#) for details on obtaining iSCSI drivers.

- Incorrect syntax shown for the **save scsirouter** command

On page 10-22 of the *Cisco SN 5420 Storage Router Software Configuration Guide Release 2.1*, the command shown in Step 4 of the first table is incorrect. The description of the command is correct as stated.

The command should be updated to read as follows:

```
save scsirouter scsi2 bootconfig
```

## Related Documentation

The following sections describe the related documentation available for Cisco SN 5420 Storage Router Release 2.1.1. These documents consist of hardware installation and software configuration guides, and platform-specific release notes, readme and example configuration files for the Cisco Storage Networking iSCSI drivers.

## Release-Specific Documents

This Release Notes document is the only document specific to SN 5420 Release 2.1.1. 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 Storage Networking iSCSI drivers, version 2.1.1. The files are currently available in electronic format only. See the [“Obtaining Updated Software and iSCSI Drivers” section on page 4](#) for details.

## Hardware Documents

Refer to the *Cisco SN 5420 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 5420 Storage Router Software Configuration Guide Release 2.1* 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 5420 web-based GUI, refer to the SN 5420 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 5420 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> (or <http://www.cisco.com/login/cisco/>, if you are a registered Cisco.com user and logged in), under **Products & Technologies**, select **Routers** from the drop-down list.
  - Step 2** At the Cisco Routers web page, under **Cisco SN 5420 Storage Router Software**, click **Product Support**.
  - Step 3** At the Cisco SN 5420 Storage Router Product Support web page, click the appropriate links for additional information about installing and configuring storage router software.
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# Obtaining Documentation

The following 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 the following URL:

<http://www.cisco.com>

Translated documentation is available at the following 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 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

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco product documentation from the Networking Products MarketPlace:  
[http://www.cisco.com/cgi-bin/order/order\\_root.pl](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 corporate headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

## Documentation Feedback

If you are reading Cisco product documentation on Cisco.com, you can submit technical comments electronically. Click **Leave Feedback** at the bottom of the Cisco Documentation home page. After you complete the form, print it out and fax it to Cisco at 408 527-0730.

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

To submit your comments by mail, use the response card behind the front cover of your document, or write 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 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 to

- 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

You can self-register on Cisco.com to obtain customized information and service. To access Cisco.com, go to the following URL:

<http://www.cisco.com>

## 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 through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC 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.

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

## Cisco TAC Web Site

The Cisco TAC Web Site allows you 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 the following URL:

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

All customers, partners, and resellers who have a valid Cisco services 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 the following URL to register:

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

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

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

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

## Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; 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 will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following 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). In addition, please have available your service agreement number and your product serial number.

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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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