



# Release Notes for Cisco 6400 NSP for Cisco IOS Release 12.1(3) DB

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February 14, 2002



**Note**

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You can find the most current Cisco IOS documentation on Cisco Connection Online (CCO). The electronic documents might contain updates and modifications made after the hardcopy documents were printed.

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These release notes for the Cisco 6400 node switch processor (NSP) describe the enhancements provided in Cisco IOS Release 12.1(3) DB1. These release notes are updated as needed.

For a list of the software caveats that apply to Release 12.1(3) DB1, see the “Preexisting NSP Hardware Caveats” section on page 8 and *Caveats for Cisco IOS Release 12.1 T*. The caveats document is updated for every maintenance release and is located on Cisco Connection Online (CCO) and the Documentation CD-ROM.

Use these release notes in conjunction with the cross-platform *Release Notes for Cisco IOS Release 12.1* located on Cisco Connection Online (CCO) and the Documentation CD-ROM.

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# System Requirements

This section describes the system requirements for Cisco IOS Release 12.1(3) DB1:

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## Memory Recommendations

**Table 1** Memory Recommendations for the Cisco 6400 NSP

Product Name	Image Names	Recommended Main Memory
Cisco 6400 Series IOS FOR NSP	c6400s-wp-mz c6400s-html.tar	The standard 64 MB DRAM memory configuration supports up to 12K virtual circuits (VCs). 128 MB DRAM is recommended for supporting up to 32K VCs, or for using ATM RMON or ATM Accounting. For an upgrade from an earlier release to Cisco IOS Release 12.1(1)DB1, 128 MB DRAM is recommended.

## Hardware Supported

Cisco IOS Release 12.1(3) DB1 supports the Cisco 6400 NSP and the NSP with Stratum 3/BITS (NSP-S3B). The NSP-S3B, otherwise identical to the NSP, is required to use the Building Integrated Timing Supply (BITS) Network Clocking software feature.

## Software Compatibility

Cisco recommends that Cisco IOS Release 12.1(3) DB1 be used concurrently with Cisco IOS Release 12.1(3) DC for the Cisco 6400 node route processor (NRP). For information about Release 12.1(3) DC for the NRP, see the *Release Notes for Cisco 6400 Node Route Processor (NRP) for Cisco IOS Release 12.1(3) DC*.

## Determining the Software Version

To determine the version of Cisco IOS software currently running on the Cisco 6400 NSP, log in to the NSP and enter the **show version EXEC** command:

```
Router> show version
Cisco Internetwork Operating System Software
IOS (tm) C6400 Software (C6400S-WP-M), Version 12.1(3) DB1, EARLY DEPLOYMENT
RELEASE SOFTWARE (fc1)
```

The output includes additional information including processor revision numbers, memory amounts, hardware IDs, and partition information.

## Upgrading to a New Software Release

For information about upgrading software on the Cisco 6400 Universal Access Concentrator (UAC), including upgrading a single- or dual-NSP system to a new software release, see the software note *Upgrading Software on the 6400 UAC* located at:

[http://www.cisco.com/univercd/cc/td/doc/product/dsl\\_prod/6400/softnote/upgradsw.htm](http://www.cisco.com/univercd/cc/td/doc/product/dsl_prod/6400/softnote/upgradsw.htm)

For general information about upgrading to a new software release, see the product bulletin *Cisco IOS Upgrade Ordering Instructions* located at:

[http://www.cisco.com/warp/public/cc/cisco/mkt/ios/prodlit/957\\_pp.htm](http://www.cisco.com/warp/public/cc/cisco/mkt/ios/prodlit/957_pp.htm)

If you do not have an account on CCO and want general information about upgrading to a new software release, see the product bulletin *Cisco IOS Software Release 11.3 Upgrade Paths and Packaging Simplification (#703: 12/97)* on CCO at:

**Technical Documents: Product Bulletins: Software: Cisco IOS 11.3: Cisco IOS Software Release 11.3 Upgrade Paths No. 703**

This product bulletin does not contain information specific to Cisco IOS Release 12.1 DB1 but provides generic upgrade information that may apply to Cisco IOS Release 12.1 DB1.

## Feature Table

The Cisco IOS software is packaged in software images. Each image contains a specific set of Cisco IOS features. Table 2 lists the features supported by the Cisco 6400 NSP image called c6400s-wp-mz in this release.



### Note

Table 2 contains a selected list of features. The table is not a cumulative or complete list of all the features in this image.

**Table 2 Features Supported by the Cisco 6400 NSP in Cisco IOS Release 12.1(3) DB1**

Access lists on Interim Local Management Interface (ILMI) registration
Asynchronous Transfer Mode (ATM) access lists
ATM accounting
ATM accounting enhancements
ATM Address Resolution Protocol (ARP) client on NSP
ATM ARP server on NSP
ATM remote monitoring (RMON)
ATM soft restart
BITS External Network Clock Source
Closed user groups (CUGs)
Dual leaky bucket policing
Dynamic Host Configuration Protocol (DHCP) client support

**Table 2 Features Supported by the Cisco 6400 NSP in Cisco IOS Release 12.1(3) DB1**

E.164 address translation and autoconversion
Hardware redundancy
Interim-Interswitch Signaling Protocol (IISP)
ILMI version 4.0
Internet Protocol (IP)
LANE <sup>1</sup> client (LEC) and LANE Services (LES <sup>2</sup> /BUS <sup>3</sup> /LECS <sup>4</sup> ) on NSP
Left-justified E.164 authority and format identifier (AFI) support
Logical multicast support (up to 254 leaves per output port, per point-to-multipoint virtual circuits [VCs])
Multiple, weighted, dynamic thresholds for selective packet marking and discard
Multipoint-to-point User-Network Interface (UNI) signaling
Multiprotocol Label Switching (MPLS) Label Switch Router (LSR)
Network clocking enhancements for smooth switchover
Network Time Protocol (NTP)
Operation, administration, and maintenance (OAM) F4 and F5
Per-VC or per-VP nondisruptive snooping
Private Network Node Interface (PNNI) hierarchy
Point-to-point and point-to-multipoint permanent virtual channel connections (VCCs) and virtual path connections (VPCs)
Point-to-point and point-to-multipoint switched VCCs and VPCs (UNI 3.0)
Point-to-point and point-to-multipoint switched VCCs and VPCs (UNI 3.1)
Point-to-point and point-to-multipoint switched VCCs and VPCs (UNI 4.0)
Port snooping
Scheduler/Service Class/permanent virtual circuit (PVC) configuration
Shaped virtual private tunnels for constant bit rate (CBR) traffic
Signaling diagnostics and Management Information Base (MIB)
Simple Network Management Protocol (SNMP)
Soft VCCs and VPCs
Stratum 3 Internal Clock Accuracy
Substitution of other service categories in shaped virtual private tunnels
Support for non zero minimum cell rate (MCR) on available bit rate (ABR) connections
Synchronous Optical Network (SONET) automatic protection switching (APS) support
Telco alarm support
Telnet
Terminal Access Controller Access Control System Plus (TACACS+)
Token Ring LANE services

**Table 2** *Features Supported by the Cisco 6400 NSP in Cisco IOS Release 12.1(3) DB1*


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 Virtual path identifier/virtual channel identifier (VPI/VCI) range support in ILMI 4.0
 

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 Virtual private tunneling
 

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 Web-based configuration
 

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1. LANE = LAN emulation
2. LES = LAN Emulation Server
3. BUS = broadcast and unknown server
4. LECS = LAN Emulation Configuration Server

## New and Changed Information

The following sections list the new hardware and software features supported by the Cisco 6400 NSP for Release 12.1 DB1.

### No New Features in Release 12.1(3) DB1

There are no new hardware and software features in Cisco IOS Release 12.1(3) DB1.

### No New Features in Release 12.1(3) DB

There are no new hardware and software features in Cisco IOS Release 12.1(3) DB.

### No New Features in Release 12.1(1) DB1

There are no new hardware and software features in Cisco IOS Release 12.1(1) DB1.

## Important Notes

The following sections contain important information about the use of your Cisco 6400 UAC NSP.

### Web Console Issues

The Web Console application is designed to use JavaScript, which is available with both Netscape Navigator and Microsoft Internet Explorer. However, a number of issues are present when using either application. To date, using Netscape Navigator 4.x has resulted in fewer issues than Microsoft Internet Explorer 4.x.

Before using the Web Console application, verify that your browser is set to use at least 4 MB (4096 KB) of cache memory.

The following sections tell how to deal with some of the browser issues affecting each application.

## Microsoft Internet Explorer 4.x

Web Console might not reflect the most current redundancy status and autosynchronization setting because the check box and option buttons are not displayed properly. Therefore, you must verify your configuration by viewing the configuration file.

An empty dialog box might display after you apply new settings in any of the Web Console pages. If an empty dialog box is displayed, click the Internet Explorer **Refresh** button to view your new settings.

The **show interface** command on the Status page fails with Internet Explorer. There is no workaround, so this function is not available.

## Netscape Navigator 4.x

If a blank window is displayed after you resize your Navigator window, click the **Reload** button to redisplay the page. Frequent and rapid clicking on the Web Console Status page can cause syntax and LED errors. This problem is eliminated if the browser cache is set to 4096 KB.

## ATM Generic Flow Control Field

When an ATM cell is received on the NSP, the generic flow control (GFC) field of the ATM cell is passed without modification to the outbound virtual circuit. This is not compliant with the ATM Forum UNI specification, version 3.1, which requires all bits of the GCF field to be reset to zero.

## Using Verbose Debug Options

On a dual-NSP system, switchovers can occur if verbose debugging commands, such as **debug all** or **debug oir** commands, are used. To avoid this situation when using verbose **debug** commands, execute the **redundancy keepalive disable** command at the EXEC prompt prior to turning on the **debug** command. After debugging is disabled, enter the **redundancy keepalive enable** command to restore normal system operation.

## Software Caveats

Caveats describe unexpected behavior in the Cisco IOS software releases. Severity 1 caveats are the most serious caveats; severity 2 caveats are less serious. This section contains open caveats for the current Cisco 6400 NSP IOS release only.

Caveats in Cisco IOS Release 12.1 T also apply to Release 12.1 DB. For information on caveats in Cisco IOS Release 12.1 T, see *Caveats for Cisco IOS Release 12.1 T* located on CCO and the Documentation CD-ROM.



### Note

If you have an account with CCO, you can use Bug Navigator II to find caveats of any severity for any release. To reach Bug Navigator II on CCO, click on **Technical Assistance Center**, then **Software Bug Toolkit**. Another option is to go to <http://www.cisco.com/support/bugtools>.

## Open Caveats—Release 12.1(3) DB1

There are no open caveats in Cisco IOS Release 12.1(3) DB1.

## Closed and Resolved Caveats—Release 12.1(3) DB1

All the caveats listed in this section are resolved in Cisco IOS Release 12.1(3) DB1. This section describes only severity 1 and 2 caveats and select severity 3 caveats.

- CSCdw65903

An error can occur with management protocol processing. Please use the following URL for further information:

<http://www.cisco.com/cgi-bin/bugtool/onebug.pl?bugid=CSCdw65903>

## Open Caveats—Release 12.1(3) DB

There are no open caveats in Cisco IOS Release 12.1(3) DB.

## Closed and Resolved Caveats—Release 12.1(3) DB

There are no closed and resolved caveats in Cisco IOS Release 12.1(3) DB.

## Open Caveats—Release 12.1(1) DB1

There are no open caveats in Cisco IOS Release 12.1(1) DB1.

## Closed and Resolved Caveats—Release 12.1(1) DB1

This section describes caveats that have been closed and resolved in Cisco IOS Release 12.1(1) DB1.

- CSCdr88996

During the NRP boot/initialization cycle, memory may be allocated to the Point-to-Point Protocol (PPP) process. This memory may be held onto for a long time, while subsequent system attempts to acquire additional memory fail resulting in messages that indicate that malloc failed.

This behavior occurs due to a lock in an internal communication path between the NRP and the NSP. Messages back up on the NRP and are never transmitted to the NSP. The response of these messages is required to free the memory held by the PPP process.

To detect the locked-up communication path, execute the **show buffers** command on the NRP. If the section “PAM Mbox Pak buffers” shows a value with more buffers than the maximum allowed and that value is growing, the lock condition has occurred. There is no workaround.

# Preexisting NSP Hardware Caveats

This section describes possible unexpected behavior by earlier hardware versions of the NSP. To determine your NSP part number (P/N) and hardware version, see the section “Determining Your NSP Part Number and Hardware Version” on page 9.

- CSCdk47837—NRPs reset when you reload or reset a nonredundant NSP in Slot 0A.

Affected Part Number:  
800-03785-03

Symptom:  
While the NSP is in Slot 0A of a single NSP system, the NRPs reset during NSP reloads or resets.

Workaround:  
In a nonredundant system using an NSP of P/N 800-03785-03, place the NSP in Slot 0B.
- CSCdk55268—After a bus error, the system does not reboot with autoboot enabled.

Affected Part Number:  
800-03785-03

Symptom:  
The system remains at the ROMMON prompt after a crash instead of rebooting automatically.

Workaround:  
To prevent this problem, set the config register boot field to 0x2.

If the workaround does not work, replace the NSP with P/N 800-03785-04 or higher.
- CSCdm55885—NSPs might experience dropped cells.

A small percentage of NSPs might experience dropped cells. To determine if your NSP is affected, use the **show controllers atm 0/0/0 EXEC** command and check the values in the TPE column.

This field counts the number of transmit parity errors and should display all zeros for a good system. If a non-zero value is displayed in the TPE column, replace the NSP with P/N 800-03785-05 or higher.
- CSCdm78716—NME cable consolidation feature hardware requirement.

Affected Part Numbers:  
800-03785-03 (without Deviation D99-3628), 800-03785-04, 800-03785-05

Symptoms:  
The NSP’s network management Ethernet (NME) interface might lock up and require a reset with a “shut” and “no shut” sequence or a complete board reset.

The NSP might crash with a "Write Exception," "Bus Exception," or "System Reserved Exception" error message.

Because these symptoms might be caused by other problems, use the following table to determine the likelihood of this particular problem:

NME Cable Consolidation is Enabled?	System Uses Redundant NSPs?	Likelihood that CSCdm78716 is the Cause of the Problems
No	No	Not possible—no backplane Ethernet traffic to the NSPs
No	Yes	Possible, but unlikely
Yes	Yes or No	Likely

**Workaround:**

If you experience this problem, replace your NSP with P/N 800-03785-06 or higher, or with P/N 800-03785-03 with deviation sticker D99-3628 applied.

- CSCdr16154—NRP unrecognized card type.

**Affected Part Numbers:**

800-03785-01, 800-03785-02, 800-03785-03, 800-03785-04, 800-03785-05, 800-03785-06, 800-03785-07

**Symptom:**

NSP reports unknown cardtype when the chassis is populated primarily with NRPs.

**Workaround (use one of the following):**

- Reduce the number of NRPs in the system
- Make sure all the NRPs are P/N 800-03655-09 or higher
- Make sure the NSP is P/N 800-03785-08 or higher.

## Determining Your NSP Part Number and Hardware Version

To determine the part number and hardware version of the NSP, use one of the following methods with information from Table 3:

- If you are holding the board, look at the 800- part number label on the back of the NSP.
- If you can only view the faceplate of the NSP, look at the CLEI code label.
- Enter the **show hardware EXEC** command to display the NSP-PC and NSP-SC part numbers and hardware versions.

The following example displays the **show hardware** command output for an NSP:

```
Switch# show hardware
```

```
6400 named Switch, Date:17:51:21 UTC Thu Mar 9 2000
Feature Card's FPGA Download Version:0
```

Slot	Ctrlr-Type	Part No.	Rev	Ser No	Mfg Date	RMA No.	Hw Vrs	Tst	EEP
1/0	NRP	73-3082-08	F0	17827878	Feb 02 00	00-00-00	4.255	0	2
2/0	NRP	73-3082-08	F0	17828272	Feb 02 00	00-00-00	4.255	0	2
3/0	NRP	73-3082-08	F0	17800617	Feb 16 00	00-00-00	4.255	0	2
4/0	NRP	73-3082-08	F0	17801802	Feb 22 00	00-00-00	4.255	0	2
5/0	NRP	73-3082-08	F0	17828075	Feb 06 00	00-00-00	4.255	0	2
7/0	NRP	73-3082-08	F0	17800637	Feb 16 00	00-00-00	4.255	0	2
8/0	622SM NLC	73-3868-02	A0	14327690	Oct 15 99	00-00-00	1.0	0	2
→ 0B/FC	NSP-PC	<b>73-2996-06</b>	A0	15794042	Mar 05 00	00-00-00	<b>1.1</b>	0	2
0B/PC	FC-PFQ	73-2281-04	B0	17803407	Mar 05 00	00-00-00	4.1	0	2
→ 0B/PC	NSP-SC	<b>73-2997-06</b>	A0	17826384	Mar 05 00	00-00-00	<b>1.0</b>	0	2

```
Primary NSP:Slot 0B
```

```
DS1201 Backplane EEPROM:
```

Model	Ver.	Serial	MAC-Address	MAC-Size	RMA	RMA-Number	MFG-Date
C6400	2	17900239	000142C04900	128	0	0	Mar 04 2000

```
Switch#
```



**Note**

If your **show hardware** output shows the NSP-PC Part No. as 73-2996-03 and the NSP-SC Part No. as 73-2997-02, you have an NSP on which the part numbers were incorrectly programmed. Use the CLEI code to determine your NSP part number. If you cannot physically see the NSP, assume you have P/N 800-03785-03.

**Table 3** NSP Part Numbers and Hardware Versions

CLEI Code	800- Part Number	NSP-PC		NSP-SC	
		Part No.	Hw Vrs	Part No.	Hw Vrs
BAC7R2HCAA	800-03785-08	73-2996-06	any	73-2997-08	any
BAC5DD7DAA	800-03785-07	73-2996-06	any	73-2997-07	any
BAC5DDVDAA	800-03785-06	73-2996-06	any	73-2997-06	any
BAC5DDVDAA	800-03785-05	73-2996-05	any	73-2997-05	any
BAC5DD0DAB	800-03785-04	73-2996-05	any	73-2997-04	any
BAC5DD0DAA	800-03785-03 (Deviation D99-3628) (Deviation D99-3178)	73-2996-04	1.1 (Dev. D99-3628 put Hw Vrs to 1.1)	73-2997-03	any
	800-03785-03 (Deviation D99-3628)	73-2996-04	1.1 (Dev. D99-3628 put Hw Vrs to 1.1)	73-2997-03	any
	800-03785-03 (Deviation D99-3178)	73-2996-04	any	73-2997-03	any
	800-03785-03	73-2996-04	any	73-2997-03	any



**Note**

Deviation labels might not be visible. If you cannot verify that your NSP has a particular deviation, assume it does not.

## Related Documentation

The following sections describe the documentation available for the Cisco 6400 universal access concentrator. The most up-to-date documentation can be found on the Web via Cisco Connection Online (CCO) and on the Documentation CD-ROM. These electronic documents might contain updates and modifications made after the hard-copy documents were printed.

These release notes should be used in conjunction with the documents listed in the following sections:

- Release-Specific Documents, page 11
- Platform-Specific Documents, page 11
- Feature Modules, page 12
- Cisco IOS Software Documentation Set, page 13

## Release-Specific Documents

The following documents are specific to Cisco IOS Release 12.1 and are located on CCO and the Documentation CD-ROM:

- *Cross-Platform Release Notes*

On CCO at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Release Notes**

On the Documentation CD-ROM at:

**Cisco IOS Software Configuration: Cisco IOS Release 12.1: Release Notes**

- Product bulletins, field notices, and other release-specific documents on CCO at:

**Technical Documents**

## Platform-Specific Documents

The documents listed in Table 4 are available for the Cisco 6400 UAC on CCO and the Documentation CD-ROM.

To access Cisco 6400 documentation on CCO, follow this path:

**Technical Documents: Documentation Home Page: Aggregation Solutions: Cisco 6400 Universal Access Concentrator**

To access Cisco 6400 documentation on the Documentation CD-ROM, follow this path:

**Aggregation Solutions: Cisco 6400 Universal Access Concentrator**

**Table 4 Platform Documents for the Cisco 6400 Universal Access Concentrator**

Document Title	Chapter Topics
<i>Cisco 6400 UAC Hardware Installation Guide</i>	About This Manual Hardware Description Preparing for Installation Installing the Cisco 6400 Troubleshooting Maintaining the Cisco 6400 System Specifications Glossary Configuration Worksheets Installing the AC-Input Power Shelf and Power Supply
<i>Cisco 6400 UAC Site Planning Guide</i>	About This Guide Cisco 6400 Overview Site Planning Considerations System Specifications Cabling Specifications Glossary

**Table 4 Platform Documents for the Cisco 6400 Universal Access Concentrator (continued)**

Document Title	Chapter Topics
<i>Regulatory Compliance and Safety Information for the Cisco 6400</i>	Overview of the Cisco 6400 Universal Access Concentrator General Documentation Information Agency Approvals Translated Safety Warnings Cisco Connection Online
<i>Cisco 6400 UAC Software Configuration Guide and Command Reference</i>	About This Guide Product Overview and Configuration Cisco IOS Software Fundamentals Using the Web Console Configuring the NSP Configuring System Features Configuring the NRP Configuring Interfaces Command Reference MIB Information Resolving Error Messages Glossary
<i>Cisco 6400 FRU Installation and Replacement</i>	Tools and Equipment Required General Safety Precautions and Maintenance Guidelines Replacing the Front Cover Powering Down the System Backing Up the PCMCIA Card Maintaining the Air Filter Replacing an NSP Module Replacing an NRP Module Installing or Replacing a Half-Height NLC Replacing a PEM Replacing the Blower Module and Fans Verifying Plug-In Module and Component Installation

## Feature Modules

Feature modules describe new features supported by Cisco IOS Release 12.1 DB and are updates to the Cisco IOS documentation set. A feature module consists of a brief overview of the feature, benefits, configuration tasks, and a command reference. As updates, the feature modules are available online only. Feature module information is incorporated in the next printing of the Cisco IOS documentation set.

On CCO at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: New Feature Documentation: New Features in 12.1-Based Limited Lifetime Releases: New Features in Release 12.1 DB**

On the Documentation CD-ROM at:

**Cisco IOS Software Configuration: Cisco IOS Release 12.1: New Feature Documentation: New Features in 12.1-Based Limited Lifetime Releases: New Features in Release 12.1 DB**

## Cisco IOS Software Documentation Set

The Cisco IOS software documentation set consists of the Cisco IOS configuration guides, Cisco IOS command references, and several other supporting documents that are shipped with your order in electronic form on the Documentation CD-ROM—unless you specifically ordered the printed versions.

### Documentation Modules

Each module in the Cisco IOS documentation set consists of two books: a configuration guide and a corresponding command reference. Chapters in a configuration guide describe protocols, configuration tasks, and Cisco IOS software functionality, and contain comprehensive configuration examples.

Chapters in a command reference provide complete command syntax information. Use each configuration guide with its corresponding command reference.

On CCO and the Documentation CD-ROM, two master hot-linked documents provide information for the Cisco IOS software documentation set.

On CCO at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1: Configuration Guides and Command References**

On the Documentation CD-ROM at:

**Cisco IOS Software Configuration: Cisco IOS Release 12.1: Configuration Guides and Command References**

### Cisco IOS Release 12.1 Documentation Set

Table 5 describes the contents of the Cisco IOS Release 12.1 software documentation set, which is available in electronic form and in printed form, if ordered.

**Note**

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You can find the most current Cisco IOS documentation on CCO and the Documentation CD-ROM. These electronic documents may contain updates and modifications made after the hard-copy documents were printed.

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On CCO at:

**Technical Documents: Documentation Home Page: Cisco IOS Software Configuration: Cisco IOS Release 12.1**

On the Documentation CD-ROM at:

**Cisco IOS Software Configuration: Cisco IOS Release 12.1**

**Table 5 Cisco IOS Software Release 12.1 Documentation Set**

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Configuration Fundamentals Configuration Guide</i></li> <li>• <i>Cisco IOS Configuration Fundamentals Command Reference</i></li> </ul>	Configuration Fundamentals Overview Cisco IOS User Interfaces Cisco IOS File Management Cisco IOS System Management Cisco IOS User Interfaces Commands Cisco IOS File Management Commands Cisco IOS System Management Commands
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Bridging and IBM Networking Configuration Guide</i></li> <li>• <i>Cisco IOS Bridging and IBM Networking Command Reference, Volume I</i></li> <li>• <i>Cisco IOS Bridging and IBM Networking Command Reference, Volume II</i></li> </ul>	Transparent Bridging Source-Route Bridging Token Ring Inter-Switch Link Remote Source-Route Bridging DLSw+ Serial Tunnel and Block Serial Tunnel Commands LLC2 and SDLC Commands IBM Network Media Translation Commands SNA Frame Relay Access Support Commands NCI Client/Server Commands Airline Product Set Commands
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Dial Services Configuration Guide: Terminal Services</i></li> <li>• <i>Cisco IOS Dial Services Configuration Guide: Network Services</i></li> <li>• <i>Cisco IOS Dial Services Command Reference</i></li> </ul>	Preparing for Dial Access Modem Configuration and Management ISDN and Signalling Configuration PPP Configuration Dial-on-Demand Routing Configuration Dial-Backup Configuration Terminal Service Configuration Large-Scale Dial Solutions Cost-Control Solutions Virtual Private Networks X.25 on ISDN Solutions Telco Solutions Dial-Related Addressing Services Dial Access Scenarios
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Interface Configuration Guide</i></li> <li>• <i>Cisco IOS Interface Command Reference</i></li> </ul>	Interface Configuration Overview Configuring LAN Interfaces Configuring Serial Interfaces Configuring Logical Interfaces
<ul style="list-style-type: none"> <li>• <i>Cisco IOS IP and IP Routing Configuration Guide</i></li> <li>• <i>Cisco IOS IP and IP Routing Command Reference</i></li> </ul>	IP Overview IP Addressing and Services IP Routing Protocols IP Multicast
<ul style="list-style-type: none"> <li>• <i>Cisco IOS AppleTalk and Novell IPX Configuration Guide</i></li> <li>• <i>Cisco IOS AppleTalk and Novell IPX Command Reference</i></li> </ul>	AppleTalk and Novell IPX Overview Configuring AppleTalk Configuring Novell IPX

**Table 5 Cisco IOS Software Release 12.1 Documentation Set (continued)**

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Configuration Guide</i></li> <li>• <i>Cisco IOS Apollo Domain, Banyan VINES, DECnet, ISO CLNS, and XNS Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Overview</li> <li>Configuring Apollo Domain</li> <li>Configuring Banyan VINES</li> <li>Configuring DECnet</li> <li>Configuring ISO CLNS</li> <li>Configuring XNS</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Multiservice Applications Configuration Guide</i></li> <li>• <i>Cisco IOS Multiservice Applications Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Multiservice Applications Overview</li> <li>Voice</li> <li>Video</li> <li>Broadband</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Quality of Service Solutions Configuration Guide</i></li> <li>• <i>Cisco IOS Quality of Service Solutions Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Quality of Service Overview</li> <li>Classification</li> <li>Congestion Management</li> <li>Congestion Avoidance</li> <li>Policing and Shaping</li> <li>Signalling</li> <li>Link Efficiency Mechanisms</li> <li>Quality of Service Solutions</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Security Configuration Guide</i></li> <li>• <i>Cisco IOS Security Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Security Overview</li> <li>Authentication, Authorization, and Accounting (AAA)</li> <li>Security Server Protocols</li> <li>Traffic Filtering and Firewalls</li> <li>IP Security and Encryption</li> <li>Configuring Passwords and Privileges</li> <li>Neighbor Router Authentication</li> <li>Configuring IP Security Options</li> </ul>
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Switching Services Configuration Guide</i></li> <li>• <i>Cisco IOS Switching Services Command Reference</i></li> </ul>	<ul style="list-style-type: none"> <li>Cisco IOS Switching Services Overview</li> <li>Cisco IOS Switching Paths</li> <li>Cisco Express Forwarding</li> <li>NetFlow Switching</li> <li>Multiprotocol Label Switching</li> <li>Multilayer Switching</li> <li>Multicast Distributed Switching</li> <li>Virtual LANs</li> <li>LAN Emulation</li> </ul>

**Table 5 Cisco IOS Software Release 12.1 Documentation Set (continued)**

Books	Major Topics
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Wide-Area Networking Configuration Guide</i></li> <li>• <i>Cisco IOS Wide-Area Networking Command Reference</i></li> </ul>	Introduction: Wide-Area Networking Overview Configuring ATM Configuring Frame Relay Configuring Frame Relay-ATM Interworking Configuring SMDS Configuring X.25 and LAPB
<ul style="list-style-type: none"> <li>• <i>Cisco IOS Configuration Master Index</i></li> <li>• <i>Cisco IOS Command Reference Master Index</i></li> <li>• <i>Cisco IOS Debug Command Reference</i></li> <li>• <i>Cisco IOS Dial Services Quick Configuration Guide</i></li> <li>• <i>Cisco IOS Software System Error Messages</i></li> <li>• <i>Cisco IOS Configuration Guide Master Index</i></li> <li>• <i>New Features in 12.1-Based Limited Lifetime Releases</i></li> <li>• <i>New Features in Release 12.1 T</i></li> <li>• Release Notes (Release note and caveat documentation for 12.1-based releases and various platforms)</li> </ul>	



**Note**

*Cisco Management Information Base (MIB) User Quick Reference* is no longer published. For the latest list of MIBs supported by Cisco, see the *Cisco Network Management Toolkit* on CCO: **Software Center: Network Mgmt Products: Cisco Network Management Toolkit: Cisco MIB.**

## Obtaining Documentation

### World Wide Web

You can access the most current Cisco documentation on the World Wide Web at <http://www.cisco.com>. Translated documentation can be accessed at [http://www.cisco.com/public/countries\\_languages.shtml](http://www.cisco.com/public/countries_languages.shtml).

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- Telnet: [cco.cisco.com](telnet://cco.cisco.com)
- Modem using standard connection rates and the following terminal settings: VT100 emulation; 8 data bits; no parity; and 1 stop bit.
  - From North America, call 408 526-8070
  - From Europe, call 33 1 64 46 40 82

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### Technical Assistance Center

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To contact TAC by e-mail, use one of the following:

Language	E-mail Address
English	<a href="mailto:tac@cisco.com">tac@cisco.com</a>
Hanzi (Chinese)	<a href="mailto:chinese-tac@cisco.com">chinese-tac@cisco.com</a>
Kanji (Japanese)	<a href="mailto:japan-tac@cisco.com">japan-tac@cisco.com</a>
Hangul (Korean)	<a href="mailto:korea-tac@cisco.com">korea-tac@cisco.com</a>
Spanish	<a href="mailto:tac@cisco.com">tac@cisco.com</a>
Thai	<a href="mailto:thai-tac@cisco.com">thai-tac@cisco.com</a>

In North America, TAC can be reached at 800 553-2447 or 408 526-7209. For other telephone numbers and TAC e-mail addresses worldwide, consult the following web site:  
<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>.

## Software Configuration Tips on the Cisco Technical Assistance Center Home Page

If you have a CCO log-in account, you can access the following URL, which contains links and tips on configuring your Cisco products:

[http://www.cisco.com/kobayashi/technotes/serv\\_tips.shtml](http://www.cisco.com/kobayashi/technotes/serv_tips.shtml)

This URL is subject to change without notice. If it changes, point your Web browser to CCO, press **Login**, and click on this path: **Technical Assistance Center: Technical Tips**.

The following sections are provided from the Technical Tips page:

- **Access Dial Cookbook**—Contains common configurations or recipes for configuring various access routes and dial technologies.
- **Field Notices**—Notifies you of any critical issues regarding Cisco products and includes problem descriptions, safety or security issues, and hardware defects.
- **Frequently Asked Questions**—Describes the most frequently asked technical questions about Cisco hardware and software.
- **Hardware**—Provides technical tips related to specific hardware platforms.
- **Hot Tips**—Describes popular tips and hints gathered from the Cisco Technical Assistance Center (TAC). Most of these documents are available from the TAC Fax-on-demand service. To reach Fax-on-demand and receive documents at your fax machine from the United States, call 888 50-CISCO (888 502-4726). From other areas, call 650 596-4408.
- **Internetworking Features**—Lists tips on using Cisco IOS software features and services.
- **Sample Configurations**—Provides actual configuration examples that are complete with topology and annotations.

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This document is to be used in conjunction with the documents listed in the “Related Documentation” section on page 10

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