

Send documentation comments to mdsfeedback-doc@cisco.com.



Cisco MDS 9000 Family Release Notes for Storage Services Interface Image Release 3.2(3t)

Release Date: April 9, 2010

Text Part Number: OL-16144-06

This document describes the caveats and limitations for the Storage Service Interface (SSI) software for the Cisco MDS Storage Services Module (SSM). Use this document in conjunction with the documents listed in the “[Related Documentation](#)” section on page 10.



Note

Release notes are sometimes updated with new information on restrictions and caveats. Refer to the following website for the most recent version of the *Cisco MDS 9000 Family Release Notes*:
http://www.cisco.com/en/US/products/ps5989/prod_release_notes_list.html

Contents

This document includes the following sections:

- [Introduction](#), page 2
- [System Requirements](#), page 2
- [Image Upgrade](#), page 8
- [New Features](#), page 9
- [Limitations](#), page 9
- [Compatibility Matrix](#), page 10
- [Caveats](#), page 10
- [Related Documentation](#), page 10



Americas Headquarters:

Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

[Send documentation comments to mdsfeedback-doc@cisco.com.](mailto:mdsfeedback-doc@cisco.com)

- [Obtaining Documentation, Obtaining Support, and Security Guidelines, page 13](#)

Introduction

The SSM provides distributed intelligent storage services for the Cisco MDS 9000 Family and supports up to 32 Fibre Channel ports. It provides the following:

- Network-based volume management
- Management and copy services
- Network assisted storage applications via SANTap
- 32 autosensing 1-Gbps/2-Gbps Fibre Channel interfaces
- Hot-swappable Fibre Channel small form-factor pluggable (SFP) transceiver connectivity
 - Short wavelength (SWL) for connectivity up to 500 m
 - Long wavelength (LWL) for connectivity up to 10 km
 - Coarse wavelength-division multiplexing (CWDM) for connectivity up to 100 km and aggregation of up to 8 ports onto a single optical fiber
- Fibre Channel Write Acceleration (FC-WA) and SCSI Flow Statistics
- Network-Accelerated Serverless Backup (NASB)

System Requirements

This section describes the system requirements for Cisco MDS SAN-OS Release 3.2(3t) and includes the following topics:

- [Components Supported, page 2](#)
- [Determining the Software Version, page 8](#)

Components Supported

[Table 1](#) lists the software and hardware components supported by the Cisco MDS 9000 Family.

Table 1 Cisco MDS 9000 Family Supported Software and Hardware Components

Component	Part Number	Description	Applicable Product
Software	M95S2K9-3.2.3t	MDS 9500 Supervisor/Fabric-2, SAN-OS software.	
	M95S1K9-3.2.3t	MDS 9500 Supervisor/Fabric-I, SAN-OS software.	
	M92S2K9-3.2.3t	MDS 9222 Supervisor/Fabric-2, SAN-OS software.	MDS 9200 Series only
	M92S1K9-3.2.3t	MDS 9216 Supervisor/Fabric-I, SAN-OS software.	MDS 9200 Series only
	M91S2K9-3.2.3t	Supervisor/Fabric-2, SAN-OS software	
	M91S1K9-3.2.3t	MDS 9100 Supervisor/Fabric-I, SAN-OS software.	
	M91S1K9-3.2.3 ¹	MDS 9000 Storage Services Interface	MDS 9500 Series and MDS 9216

Send documentation comments to mdsfeedback-doc@cisco.com.

Table 1 *Cisco MDS 9000 Family Supported Software and Hardware Components (continued)*

Component	Part Number	Description	Applicable Product
License	M9500ENT1K9	Enterprise package.	MDS 9500 Series
	M9200ENT1K9	Enterprise package.	MDS 9200 Series
	M9100ENT1K9	Enterprise package.	MDS 9100 Series
	M9500FIC1K9	Mainframe package.	MDS 9500 Series
	M9200FIC1K9	Mainframe package.	MDS 9200 Series
	M9100FIC1K9	Mainframe package.	MDS 9100 Series
	M9100FIC1EK9	FICON license.	MDS 9100 Series

Send documentation comments to mdsfeedback-doc@cisco.com.

Table 1 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)

Component	Part Number	Description	Applicable Product
License	M9500FMS1K9	Fabric Manager Server package.	MDS 9500 Series
	M9200FMS1K9	Fabric Manager Server package.	MDS 9200 Series
	M9100FMS1K9	Fabric Manager Server package.	MDS 9100 Series
	M9500EXT1K9	SAN Extension over IP package for IPS-8 module.	MDS 9500 Series
	M9200EXT1K9	SAN Extension over IP package for IPS-8 module.	MDS 9200 Series
	M9500EXT14K9	SAN Extension over IP package for IPS-4 module.	MDS 9500 Series
	M9200EXT14K9	SAN Extension over IP package for IPS-4 module.	MDS 9200 Series
	M9500EXT12K9	SAN Extension over IP package for MPS-14/2 module.	MDS 9500 Series
	M9200EXT12K9	SAN Extension over IP package for MPS-14/2 module.	MDS 9200 Series
	M9500EXT1AK9	SAN Extension over IP package for MSM-18/4 module or MSFM-18/4 FIPS module.	MDS 9500 Series
	M9200EXT1AK9	SAN Extension over IP package for MSM-18/4 module or MSFM-18/4 FIPS module.	MDS 9200 Series
	M9500SSE1K9	Storage Services Enabler package.	MDS 9500 Series with SSM
	M9200SSE1K9	Storage Services Enabler package.	MDS 9200 Series with SSM
	M9500SME1MK9	Cisco Storage Media Encryption package for MSM-18/4 module	MDS 9500 Series with MSM
	M9200SME1MK9	Cisco Storage Media Encryption package for MSM-18/4 module	MDS 9200 Series with MSM
	M9200SME1FK9	Cisco Storage Media Encryption package for fixed slot	MDS 9222i Switch only
	M95DMMS1K9	Data Mobility Manager (DMM)	MDS 9500 Series with SSM
	M92DMMS1K9	Data Mobility Manager (DMM)	MDS 9200 Series with SSM
	M95DMMTS1K9	Data Mobility Manager (DMM) for 180 days	MDS 9500 Series with SSM
	M92DMMTS1K9	Data Mobility Manager (DMM) for 180 days	MDS 9200 Series with SSM
	M9124PL8-4G	On-Demand Ports Activation License	MDS 9124 Switch
	M9134PL8-4G	On-Demand Ports Activation License	MDS 9134 Switch
	M9134PL2-10G	On-Demand Ports Activation License	MDS 9134 Switch
	HP-PL12-4G	On-Demand Ports Activation License	Cisco Fabric Switch for HP c-Class BladeSystem only
	IBM-PL10-4G	On-Demand Ports Activation License	Cisco Fabric Switch for IBM BladeCenter only

Send documentation comments to mdsfeedback-doc@cisco.com.

Table 1 *Cisco MDS 9000 Family Supported Software and Hardware Components (continued)*

Component	Part Number	Description	Applicable Product
Chassis	DS-C9513	MDS 9513 director (13-slot modular chassis with 11 slots for switching modules, and 2 slots reserved for Supervisor 2 modules only—SFPs ² sold separately).	MDS 9513 Switch only
	DS-C9509	MDS 9509 director, base configuration (9-slot modular chassis includes 7 slots for switching modules and 2 slots for supervisor modules—SFPs sold separately).	MDS 9509 Switch only
	DS-C9506	MDS 9506 director (6-slot modular chassis includes 4 slots for switching modules and 2 slots for supervisor modules—SFPs sold separately).	MDS 9506 Switch only
	DS-C9222i-K9	MDS 9222i Multiservice Modular Switch (includes 18 4-Gbps Fibre Channel ports and 4 Gigabit Ethernet IP storage services ports, and a modular expansion slot for Cisco MDS 9000 Family Switching and Service modules.)	MDS 9222i Switch only
	DS-C9216-K9	MDS 9216 16-port semi-modular fabric switch (includes 16 1-Gbps/2-Gbps Fibre Channel ports, power supply, and expansion slot—SFPs sold separately).	MDS 9216 Switch only
	DS-C9216A-K9	MDS 9216A 16-port semi-modular fabric switch (includes 16 1-Gbps/2-Gbps Fibre Channel ports, power supply, and expansion slot—SFPs sold separately).	MDS 9216A Switch only
	DS-C9216i-K9	MDS 9216i 16-port semi-modular fabric switch (includes 14 1-Gbps/2-Gbps Fibre Channel ports, 2 Gigabit Ethernet ports, power supply, and expansion slot—SFPs sold separately).	MDS 9216i Switch only
	DS-C9140-K9	MDS 9140 fixed configuration (non-modular) fabric switch (includes 8 full rate ports and 32 host-optimized ports).	MDS 9140 Switch only
	DS-C9124-K9	MDS 9124 fixed configuration (non-modular) multilayer fabric switch (includes 8 enabled ports; an on-demand ports activation license can enable 8 additional ports, up to 24 ports).	MDS 9124 Switch only
	DS-C9134-K9	MDS 9134 fixed configuration (non-modular) multilayer fabric switch (includes 24 enabled 4-Gbps ports; an on-demand ports activation license can enable 8 additional ports, up to 32 4-Gbps ports. An additional port activation license can enable 2 10-Gbps ports.).	MDS 9134 Switch only
	DS-C9120-K9	MDS 9120 fixed configuration, non-modular, fabric switch (includes 4 full rate ports and 16 host-optimized ports).	MDS 9120 Switch only
	DS-HP-FC-K9	Cisco Fabric Switch for HP c-Class BladeSystem (includes sixteen internal and eight external active ports and four 4-Gb SFPs installed, or eight internal and four external active ports and two 4-Gb SFPs installed).	Cisco Fabric Switch for HP c-Class BladeSystem only
	DS-IBM-FC-K9	Cisco Fabric Switch for IBM BladeCenter (includes fourteen internal and six external ports)	Cisco Fabric Switch for IBM BladeCenter only

Send documentation comments to mdsfeedback-doc@cisco.com.

Table 1 *Cisco MDS 9000 Family Supported Software and Hardware Components (continued)*

Component	Part Number	Description	Applicable Product
External crossbar module	DS-13SLT-FAB1	MDS 9513 crossbar fabric module.	MDS 9513 Switch only
Supervisor modules	DS-X9530-SF2-K9	MDS 9500 Supervisor-2, module.	MDS 9500 Series only
	DS-X9530-SF1-K9	MDS 9500 Supervisor/Fabric-I module.	
Switching modules	DS-X9016	MDS 9000 16-port 1-Gbps/2-Gbps Fibre Channel module (SFPs sold separately).	MDS 9500 Series and 9200 Series
	DS-X9032	MDS 9000 32-port 1-Gbps/2-Gbps Fibre Channel module (SFPs sold separately).	
	DS-X9112	MDS 9000 12-port 4-Gbps Fibre Channel module (SFPs sold separately).	MDS 9500 Series and 9200 Series, except for the MDS 9216 Switch
	DS-X9124	MDS 9000 24-port 4-Gbps Fibre Channel module (SFPs sold separately).	MDS 9500 Series and 9200 Series, except for the MDS 9216 Switch
	DS-X9148	MDS 9000 48-port 4-Gbps Fibre Channel module (SFPs sold separately).	MDS 9500 Series and 9200 Series, except for the MDS 9216 Switch
	DS-X9704	MDS 9000 4-port 10-Gbps Fibre Channel module (SFPs sold separately)	MDS 9500 Series and 9200 Series, except for the MDS 9216 Switch
Services modules	DS-X9308-SMIP	8-port Gigabit Ethernet IP Storage services module.	MDS 9500 Series and 9200 Series
	DS-X9304-SMIP	4-port Gigabit Ethernet IP Storage services module.	
	DS-X9032-SSM	MDS 9000 32-port 1-Gbps/2-Gbps Fibre Channel Storage Services Module (SSM).	
	DS-X9302-14K9	14-port Fibre Channel/2-port Gigabit Ethernet Multiprotocol Services (MPS-14/2) module.	
	DS-X9304-18K9	18-port Fibre Channel/4-port Gigabit Ethernet Multiservice (MSM-18/4) module.	
	DS-X9304-18FK9	18-port Fibre Channel/4-port Gigabit Ethernet Multiservice FIPS (MSFM-18/4) module.	
Optics	DS-X2-FC10G-SR	X2/SC optics, 10-Gbps Fibre Channel for Short Reach.	MDS 9500 Series and 9200 Series, except for the MDS 9216 Switch
	DS-X2-FC10G-LR	X2/SC optics, 10-Gbps Fibre Channel for Long Reach.	
	DS-X2-FC10G-ER	X2/SC optics, 10-Gbps Fibre Channel for Extended Reach (40 km).	
	DS-X2-E10G-SR	X2/SC optics, 10-Gbps Ethernet for Short Reach	
	DS-X2-FC10G_CX4	X2/CX-4 optics, 10-Gbps Fibre Channel, copper	

Send documentation comments to mdsfeedback-doc@cisco.com.

Table 1 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)

Component	Part Number	Description	Applicable Product
LC-type fiber-optic SFP	DS-SFP-FC-2G-SW	2-Gbps/1-Gbps Fibre Channel—short wavelength SFP.	MDS 9500 Series and 9200 Series, except for the MDS 9216 Switch
	DS-SFP-FC-2G-LW	2-Gbps/1-Gbps Fibre Channel—long wavelength SFP.	
	DS-SFP-FCGE-SW	1-Gbps Ethernet and 1-Gbps/2-Gbps Fibre Channel—short wavelength SFP.	
	DS-SFP-FCGE-LW	1-Gbps Ethernet and 1-Gbps/2-Gbps Fibre Channel—long wavelength SFP.	
	DS-SFP-GE-T	1-Gbps Ethernet SFP.	
	DS-SFP-FC4G-SW	4-Gbps/2-Gbps/1-Gbps Fibre Channel—short wavelength SFP for DS-X91xx switching modules.	
	DS-SFP-FC4G-MR	4-Gbps/2-Gbps/1-Gbps Fibre Channel—long wavelength SFP for DS-X91xx switching modules only. Supports distances up to 4 km.	
	DS-SFP-FC4G-LW	4-Gbps/2-Gbps/1-Gbps Fibre Channel—long wavelength SFP for DS-X91xx switching modules only. Supports distances up to 10 km.	
CWDM ³	DS-CWDM-xxxx	Gigabit Ethernet and 1-Gbps/2-Gbps/4-Gbps Fibre Channel SFP LC interface xxxx nm, where xxxx = 1470, 1490, 1510, 1530, 1550, 1570, 1590, or 1610 nm.	
	DS-CWDM-MUX-4	Add/drop multiplexer for four CWDM wavelengths.	
	DS-CWDM-MUX-8	Add/drop multiplexer for eight CWDM wavelengths.	
	DS-CWDMCHASSIS	Two slot chassis for CWDM add/drop multiplexers.	
Power supplies	DS-CAC-6000W	6000-W AC power supply.	MDS 9513 only
	DS-CAC-2500W	2500-W AC power supply.	MDS 9509 only
	DS-CDC-2500W	2500-W DC power supply.	
	DS-CAC-3000W	3000-W AC power supply.	
	DS-CAC-4000W-US	4000-W AC power supply for US (cable attached).	
	DS-CAC-4000W-INT	4000-W AC power supply international (cable attached).	MDS 9506 only
	DS-CAC-1900W	1900-W AC power supply.	
	DS-CDC-1900W	1900-W DC power supply.	MDS 9200 Series only
	DS-CAC-845W	845-W AC power supply.	
		⁴	
CompactFlash	MEM-MDS-FLD51M	MDS 9500 supervisor CompactFlash disk, 512 MB.	MDS 9500 Series only

Send documentation comments to mdsfeedback-doc@cisco.com.

Table 1 Cisco MDS 9000 Family Supported Software and Hardware Components (continued)

Component	Part Number	Description	Applicable Product
Port analyzer adapter	DS-PAA-2, DS-PAA	A standalone Fibre Channel-to-Ethernet adapter that allows for simple, transparent analysis of Fibre Channel traffic in a switched fabric.	
CD-ROM	M90FMK9-CD322=	MDS 9000 Management Software and Documentation CD-ROM, spare.	

1. Supports the Storage Services Module (SSM) only. The last SSI image supported on the ASM is SSI-M9K9-2.1.1.
2. SFP = small form-factor pluggable
3. CWDM = coarse wavelength division multiplexing
4. W = Watt

Determining the Software Version



Note

We strongly recommend that you use the latest available software release supported by your vendor for all Cisco MDS 9000 Family products.

To determine the version of the Cisco SAN-OS software currently running on a Cisco MDS 9000 Family switch using the CLI, log into the switch and enter the **show version EXEC** command.

To determine the version of the Cisco SAN-OS software currently running on a Cisco MDS 9000 Family switch using the Fabric Manager, from the Switches tab in the information pane, locate the switch using the IP address, logical name, or WWN, and then check its version in the Release column.

Downloading Software

To download the latest Cisco software, access the Software Center at this URL:

<http://www.cisco.com/public/sw-center>



Note

If you would like to request code to be provided under the terms of either GNU General Public License (GPL) or the GNU Lesser General Public License (LGPL), please contact mds-software-disclosure@cisco.com.

Image Upgrade

If SSMs are present in a Cisco MDS 9000 Family switch, several kinds of upgrade may be performed as required—upgrading a previously provided package, upgrading the SAN-OS image, or reformatting the SSM add-on image.

If you need additional information about installing or upgrading the SSM, refer to the *Cisco MDS 9000 Family Storage Services Module Software Installation and Upgrade Guide*.

Send documentation comments to mdsfeedback-doc@cisco.com.

New Features

This section describes the new features introduced in this release. For more information about the features listed, refer to the documentation set listed in the [“Related Documentation”](#) section on page 10.

There are no new features in this release.

The SSI Release 3.2(3t) image is compatible with the following Cisco MDS SAN-OS images:

- Release 3.3(3)
- Release 3.3(2)
- Release 3.2(3)
- Release 3.3(1c)
- Release 3.2(2c)

Limitations

This sections lists limitations or restrictions associated with this release.

Configuring SSM Ports in Auto Mode

Starting with Cisco MDS SAN-OS Release 3.0(1), the SSM front panel ports can no longer be configured in auto mode. Because auto mode is the default for releases prior to Release 3.0(1), you should modify the configuration of the ports before upgrading the SAN-OS software image to Release 3.2(2c) to avoid any traffic disruption.

For information on how to reconfigure the SSM ports, refer to the “Reconfiguring SSM Ports Before Upgrading to SAN-OS Release 3.2(2c)” section of the [Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Release 3.2\(2c\)](#).

Deleting SANTap Configurations Required Before Downgrade

If you are running Cisco MDS NX-OS Release 4.1(1b) in combination with the SSI 4.1(1b) image and you wish to downgrade to Cisco SAN-OS Release 3.3(2) and an SSI 3.2(3*) image, you must delete all SANTap configurations prior to the downgrade. Downgrading without completely deleting the SANTap configurations is not supported.

[Send documentation comments to mdsfeedback-doc@cisco.com.](mailto:mdsfeedback-doc@cisco.com)

Compatibility Matrix

The latest *Cisco MDS SAN-OS Release Compatibility Matrix for Storage Service Interface Images* is available from the following Cisco Systems website.

http://www.cisco.com/en/US/products/ps5989/products_device_support_tables_list.html

Caveats

This section lists the open and resolved caveats for this release. Use [Table 2](#) to determine the status of a particular caveat. In the table, “O” indicates an open caveat and “R” indicates a resolved caveat.

Table 2 *Open and Resolved Caveats for Cisco MDS SSI Release 3.2(3t)*

DDTS Number	Status
Severity 3	
CSCsu01445	R
CSCsy72949	R
CSCsy76995	R

Resolved Caveats

- CSCsu01445
Symptom: DVTs stay online after the ISL to the target switch goes down.
Workaround: This issue is resolved.
- CSCsy72949
Symptom: iSAPI does not clear any LUN I/O records.
Workaround: This issue is resolved.
- CSCsy76995
Symptom: When you add or delete taraget LUNs in SANTap, the PSS is corrupted.
Workaround: This issue is resolved.

Related Documentation

The documentation set for the Cisco MDS 9000 Family includes the following documents. To find a document online, use the Cisco MDS SAN-OS Documentation Locator at:

http://www.cisco.com/en/US/docs/storage/san_switches/mds9000/roadmaps/doclocator.htm

For information on IBM TotalStorage SAN Volume Controller Storage Software for the Cisco MDS 9000 Family, refer to the IBM TotalStorage Support website.

Send documentation comments to mdsfeedback-doc@cisco.com.

Release Notes

- *Cisco MDS 9000 Family Release Notes for Cisco MDS SAN-OS Releases*
- *Cisco MDS 9000 Family Release Notes for Storage Services Interface Images*
- *Cisco MDS 9000 Family Release Notes for Cisco MDS SVC Releases*
- *Cisco MDS 9000 Family Release Notes for Cisco MDS 9000 EPLD Images*

Compatibility Information

- *Cisco MDS 9000 SAN-OS Hardware and Software Compatibility Information*
- *Cisco MDS 9000 Family Interoperability Support Matrix*
- *Cisco MDS Storage Services Module Interoperability Support Matrix*
- *Cisco MDS SAN-OS Release Compatibility Matrix for IBM SAN Volume Controller Software for Cisco MDS 9000*
- *Cisco MDS SAN-OS Release Compatibility Matrix for Storage Service Interface Images*

Regulatory Compliance and Safety Information

- *Regulatory Compliance and Safety Information for the Cisco MDS 9000 Family*

Hardware Installation

- *Cisco MDS 9124 Multilayer Fabric Switch Quick Start Guide*
- *Cisco MDS 9500 Series Hardware Installation Guide*
- *Cisco MDS 9200 Series Hardware Installation Guide*
- *Cisco MDS 9100 Series Hardware Installation Guide*
- *Cisco MDS 9020 Fabric Switch Hardware Installation Guide*

Cisco Fabric Manager

- *Cisco MDS 9000 Family Fabric Manager Quick Configuration Guide*
- *Cisco MDS 9000 Family Fabric Manager Configuration Guide*
- *Cisco MDS 9000 Fabric Manager Online Help*
- *Cisco MDS 9000 Fabric Manager Web Services Online Help*
- *Cisco MDS 9000 Family Fabric Manager Database Schema*

[Send documentation comments to mdsfeedback-doc@cisco.com.](mailto:mdsfeedback-doc@cisco.com)

Command-Line Interface

- *Cisco MDS 9000 Family Software Upgrade and Downgrade Guide*
- *Cisco MDS 9000 Family Storage Services Module Software Installation and Upgrade Guide*
- *Cisco MDS 9000 Family CLI Quick Configuration Guide*
- *Cisco MDS 9000 Family CLI Configuration Guide*
- *Cisco MDS 9000 Family Command Reference*
- *Cisco MDS 9000 Family Quick Command Reference*
- *Cisco MDS 9020 Fabric Switch Configuration Guide and Command Reference*
- *Cisco MDS 9000 Family SAN Volume Controller Configuration Guide*

Intelligent Storage Networking Services Configuration Guides

- *Cisco MDS 9000 Family Data Mobility Manager Configuration Guide*
- *Cisco MDS 9000 Family Storage Media Encryption Configuration Guide*
- *Cisco MDS 9000 Family Secure Erase Configuration Guide - For Cisco MDS 9500 and 9200 Series*

Troubleshooting and Reference

- *Cisco MDS 9000 Family Troubleshooting Guide*
- *Cisco MDS 9000 Family MIB Quick Reference*
- *Cisco MDS 9020 Fabric Switch MIB Quick Reference*
- *Cisco MDS 9000 Family SMI-S Programming Reference*
- *Cisco MDS 9000 Family System Messages Reference*
- *Cisco MDS 9020 Fabric Switch System Messages Reference*

Installation and Configuration Note

- *Cisco MDS 9000 Family SSM Configuration Note*
- *Cisco MDS 9000 Family Port Analyzer Adapter Installation and Configuration Note*
- *Cisco 10-Gigabit Fibre Channel X2 Transceiver Module Installation Note*

Send documentation comments to mdsfeedback-doc@cisco.com.

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New* in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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

CCDE, CCENT, CCSI, Cisco Eos, Cisco Explorer, Cisco HealthPresence, Cisco IronPort, the Cisco logo, Cisco Nurse Connect, Cisco Pulse, Cisco SensorBase, Cisco StackPower, Cisco StadiumVision, Cisco TelePresence, Cisco TrustSec, Cisco Unified Computing System, Cisco WebEx, DCE, Flip Channels, Flip for Good, Flip Mino, Flipshare (Design), Flip Ultra, Flip Video, Flip Video (Design), Instant Broadband, and Welcome to the Human Network are trademarks; Changing the Way We Work, Live, Play, and Learn, Cisco Capital, Cisco Capital (Design), Cisco:Financed (Stylized), Cisco Store, Flip Gift Card, and One Million Acts of Green are service marks; and Access Registrar, Aironet, AllTouch, AsyncOS, Bringing the Meeting To You, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, CCSP, CCVP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Lumin, Cisco Nexus, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Collaboration Without Limitation, Continuum, EtherFast, EtherSwitch, Event Center, Explorer, Follow Me Browsing, GainMaker, iLYNX, IOS, iPhone, IronPort, the IronPort logo, Laser Link, LightStream, Linksys, MeetingPlace, MeetingPlace Chime Sound, MGX, Networkers, Networking Academy, PCNow, PIX, PowerKEY, PowerPanels, PowerTV, PowerTV (Design), PowerVu, Prisma, ProConnect, ROSA, SenderBase, SMARTnet, Spectrum Expert, StackWise, WebEx, and the WebEx logo are registered trademarks of Cisco and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1002R)

Any Internet Protocol (IP) addresses used in this document are not intended to be actual addresses. Any examples, command display output, and figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses in illustrative content is unintentional and coincidental.

© 2010 Cisco Systems, Inc. All rights reserved.

Send documentation comments to mdsfeedback-doc@cisco.com.