



Release Notes for Cisco 2700 and 2710 Location Appliances for Software Release 4.0.38.0

Last Revised: March 17, 2011

These release notes describe changes to the software for Cisco Location Appliances since release 4.0.33.0 and list caveats for software release 4.0.38.0. This release introduces no new features.



Note

Location appliances are identified as *location servers* in Cisco WCS and in supporting documentation.



Note

For details about compatibility with Cisco Wireless LAN Controllers and the Cisco Wireless Control System (WCS), refer to the “[System Requirements](#)” section on [page 2](#) prior to installing this software.



Note

Refer to the online version of the *Cisco 2700 Series Location Appliance Installation and Configuration Guide* for details on the physical installation and initial configuration of the location appliance:
http://www.cisco.com/en/US/products/ps6386/prod_installation_guides_list.html

Contents

These release notes contain the following sections:

- [Introduction, page 2](#)
- [System Requirements, page 2](#)
- [Important Notes, page 4](#)
- [Caveats, page 8](#)
- [Troubleshooting, page 12](#)
- [Related Documentation, page 12](#)
- [Obtaining Documentation, Support, and Security Guidelines, page 13](#)



Americas Headquarters:

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

Introduction

Location appliances compute, collect, and store historical location data using Cisco wireless LAN controllers and access points to track the physical location of wireless devices. The collected location data can be viewed in GUI format in Cisco WCS.

System Requirements

You can install this software release on any 2700 or 2710 location appliance.

[Table 1](#) summarizes the controller and Cisco WCS software releases that are compatible with the location appliance.

Table 1 Minimum Software Requirements

System	Minimum Software Release
Controller	5.0.148.2
Cisco WCS	5.0.72.0
Cisco WCS Navigator	1.2.72.0

Compatibility of Location Appliance Software

Location appliance software is compatible with the previous two location appliance releases. Therefore, you can only upgrade two releases forward. For example, you can directly upgrade from release 3.0 or 3.1 to 4.0, but you cannot directly upgrade to release 4.0 from releases 1.1, 1.2, 2.0, or 2.1.

Upgrading to this Software Release

For instructions on using either Cisco WCS or a console port to download this software to location appliances, refer to the “Updating Location Appliance Software” section in the “Installation and Configuration” chapter of the *Cisco 2700 Series Installation and Configuration Guide* (version 78-17180-02 and later):

http://www.cisco.com/en/US/products/ps6386/prod_installation_guides_list.html

Backup of Release 2.0.x or Later Cannot Be Restored on Earlier Releases

A backup of location appliance software releases 2.0.x and later cannot be restored on any location appliance running an earlier software release. Before you upgrade a location appliance to 2.0.x release or later, Cisco recommends that you create a backup of the earlier release and archive it. This will enable you to convert an upgraded system to an earlier release, if necessary.

Location Appliance Image Is Compressed

If you download the server image *.gz file using Cisco WCS, the location appliance automatically decompresses (unzips) it, and you can proceed with the installation as before. If you manually download the compressed *.gz file using FTP, you must decompress the files before running the installer. These files are compressed under the LINUX operating system and must be decompressed using the *gunzip* utility program. The unzip method you use is defined by the filename you are trying to unzip.

To make the bin file executable, use the following command:

```
chmod +x filename.bin
```

Database File Must Be Copied to a Separate Directory Prior to Software Upgrade

To prevent an overwrite of the location appliance database during a software upgrade, you must back up (less than 8 GB) or copy (more than 8 GB) the database file *server-eng.db* to a secure location before installing release 2.1.x or later.



Note Cisco recommends transferring the database file using FTP or SFTP to a different machine or an */opt/backups* directory to ensure security.



Note After the new software is installed, you must transfer the database file *server-eng.db* back into the */opt/locserver* directory.

- If the database file is less than 8 GB, backup the database file before installing the upgrade.
- If the database file is 8 GB or larger, enter the following commands to copy the database file *server-eng.db* to a secure directory. In the example below, */opt/backups* is the target backup directory:

```
mkdir /opt/backups
cp /opt/locserver/db/linux/server-eng.db /opt/backups
cp /opt/locserver/db/linux/solid.ini /opt/backups
cp /opt/locserver/db/dbopts.db /opt/backups (if it exists)
cp -r /opt/locserver/attach /opt/backups
```

- To transfer the database file *server-eng.db* back into the */opt/locserver* directory after the software is installed, enter the following commands:

```
cp /opt/backups/server-eng.db /opt/locserver/db/linux
cp /opt/backups/solid.ini /opt/locserver/db/linux
cp /opt/backups/dbopts.db /opt/locserver/db/linux (if it exists)
cp -r /opt/backups/attach /opt/locserver/
```



Note The database file can be copied to any secure directory other than */opt/locserver*. For more details, refer to the WCS database backup and restore processes in Chapter 11 of the *Cisco Wireless Control System Configuration Guide, Release 5.0* at:
<http://www.cisco.com/en/US/docs/wireless/wcs/5.0/configuration/guide/wcsmain.html>



Note To keep the database under 8 GB in size, you can reduce the frequency of polling for client and tag history and increase the frequency of history pruning to reduce the overall database size (Location > Location Servers > Administration > History Parameters).

Updated Location Appliance Software Version Shown in Cisco WCS After Polling

After a software update, the new location appliance software version does not immediately appear in location appliance queries on Cisco WCS. Up to five minutes is required for the new version to appear. Cisco WCS, by default, queries the location appliance every five minutes for status.

Synchronization Required After Upgrading SNMP Version

After upgrading from one SNMP version to another (such as an upgrade from SNMP v2 to SNMP v3) the location appliance and controller must be manually synchronized in order to maintain connectivity.

If you have auto synchronization configured for the location appliance, this synchronization will automatically occur at the regularly scheduled interval; however, you will not have SNMP connectivity until that time. Refer to Chapter 3 of the *Cisco Location Appliance Configuration Guide, Release 4.0* for more details. (CSCsl61808)

Secure Shell V1.0 Is No Longer Supported

Secure shell (SSH) version 1 (v1) is not supported in releases 4.0, 3.1, 3.0, and 2.1 because of known security issues; however, SSH version 2 (v2) is supported.



Note

After installing release 4.0, 3.1, 3.0, and 2.1, you must reboot the location appliance to remove support of SSH v1.

Important Notes

This section contains important information about new features and operational notes for software release 4.0.38.0 for location appliances.

Operational Notes

The following operational notes are relevant to this release.

Controller and Associated Location Appliances Must Be Mapped to the Same NTP and WCS Server

Communications between the location appliance, Cisco WCS, and the controller are in universal time code (UTC). Configuring NTP on these devices provides devices with the UTC time through the NTP server.

The location appliance and its associated controllers must be mapped to the same NTP server and the same Cisco WCS server.

Local time zones can be configured on a location appliance to assist network operations center (NOC) personnel in finding events within logs.



Note

You can configure NTP server settings within the automatic installation script. Refer to the *Cisco 2700 Series Location Appliance Getting Started Guide* for details on the automatic installation script: http://www.cisco.com/en/US/products/ps6386/prod_installation_guides_list.html

Mandatory Default Root Password Change

You must change the default root password during initial configuration of the location appliance to ensure optimum network security.

- You are prompted to change the password during the setup script.
- You can also change the password using the Linux command, **passwd**.

Automatic Installation Script for Initial Setup

An automatic setup wizard is available to help you through the initial setup of the location appliance. You can also set up the location appliance manually.

An example of the complete automatic setup script (and manual setup process) is provided in the *Cisco 2700 Series Installation and Configuration Guide*:

http://www.cisco.com/en/US/products/ps6386/prod_installation_guides_list.html

Configuration Changes for Greater Location Accuracy

In some RF environments, where location accuracy is around 60 to 70% or where incorrect client or tag floor location map placements occur, you might need to modify the moment RSSI thresholds in the *aes-config.xml* file in the *opt/locserver/conf/* directory of the location server (CSCsw17583).

The RSSI parameters that might need modification are:

- locp-individual-rssi-change-threshold
- locp-aggregated-rssi-change-threshold
- locp-many-new-rssi-threshold-in-percent
- locp-many-missing-rssi-threshold-in-percent



Caution

Please contact TAC for assistance in modifying these parameters.

Location History Timestamps Match Browser's Location

The Cisco WCS timestamp is based on the browser's location and not on the location appliance settings. Changing the time zone of the Cisco WCS or on the location appliance does not change the timestamp for the location history.

PDA's with Limited Probe Requests Might Affect Location

Many PDAs do not continuously send out probe requests after initial association to the Cisco Unified Wireless Network (CUWN). Therefore, accurately calculating the location of PDAs using RSSI readings might not always be possible.

Mandatory Setting Required on Intel 802.11n and 802.11 b/g/n Client Cards for Accurate Calibration

Few data points are collected with Intel 802.11n and 802.11 b/g/n client cards during calibration when the Cisco Compatible Client Extension (CX) RM option within the Enterprise Security Profile is not enabled.

You can use the Intel Client Software PROSET package to ensure that the Enterprise Security Profile is selected and that the Cisco Compatible CX RM option in this profile is enabled (CSCsl40623).

History Collection Not Supported for Wired Stations

History cannot be collected for wired stations. Wired stations are incorrectly noted as a configurable option on the History Parameters page (Location > Location Servers > *Server Name* > *Administration* > *History Parameters*).

New Feature Support

There are no new features in this release. However, the following features are supported in release 4.0 and later:

Accuracy Tool (Tool Bar Option)

Accessible from the Cisco WCS tool bar, the Accuracy Tool provides a single window to configure and execute either a scheduled or on-demand location accuracy test.

By verifying location accuracy, you are verifying the ability of the existing access point deployment to estimate the true location of an element within 10 meters at least 90% of the time.

Path: Tools > Accuracy Tool

Refer to the “Using the Accuracy Tool to Conduct Accuracy Testing” section in Chapter 7 of the *Cisco Location Appliance Configuration Guide, Release 4.0* for configuration steps and reporting capabilities:

http://www.cisco.com/en/US/products/ps6386/products_installation_and_configuration_guides_list.html

Linear Point Collection of Calibration Data (Monitor Parameter)

Linear point collection allows you to select a series of linear paths for faster data point collection. As you traverse the path with a laptop, data is collected and calculated. Data point collection, introduced previously, can be used to augment linear point data collection for locations missed by the linear paths.

Path: Monitor > Maps > *Name* > *RF Calibration Models*

Refer to the “Creating and Applying Calibration Models” section in Chapter 7 of the *Cisco Location Appliance Configuration Guide, Release 4.0* for configuration steps and reporting capabilities:

http://www.cisco.com/en/US/products/ps6386/products_installation_and_configuration_guides_list.html

Location Optimized Monitor Mode (Access Point and 802.11b/g Radio Parameter)

To optimize monitoring and location calculation of tags, you can enable Location Optimized Monitor Mode (LOMM) on up to four channels within the 2.4-GHz band (802.11b/g radio) of an access point. This enables you to focus channel scans only on those channels on which tags are usually programmed to operate (such as channels 1, 6, and 11).

LOMM is enabled at the access point and the 802.11 b/g radio levels.

Path: Configure > Access Point > *AP Name* and Configure > Access Point > *Radio*

Refer to the “Using Location Optimized Monitor Mode to Enhance Tag Location Reporting” section in Chapter 7 of the *Cisco Location Appliance Configuration Guide, Release 4.0* at:

http://www.cisco.com/en/US/products/ps6386/products_installation_and_configuration_guides_list.html

Location Presence (Administration Parameter)

You can enable the location presence feature by location appliance to provide expanded Civic (city, state, postal code, country) and GEO (longitude, latitude) location information beyond the Cisco default setting (campus, building, floor, and X, Y coordinates). This information can then be requested by clients at any time for use by location-based services and applications.

Location Presence can be configured when a new Campus, Building, Floor, or Outdoor Area is being added or configured at a later date.

Path: Location > Location Servers > *Server Name* > Administration > Presence Parameters

Refer to the “Enabling Location Presence on a Location Appliance” section in Chapter 7 of the *Cisco Location Appliance Configuration Guide, Release 4.0*:

http://www.cisco.com/en/US/products/ps6386/products_installation_and_configuration_guides_list.html

Location Transitions Reported to History Log (History Parameter)

You can track significant location transitions for clients, asset tags, and rogue clients and access points. Inter-floor changes and location changes to an area that is at least 30 feet (9.14 meters) from its previous reference point (x,y coordinates) are logged.

Path: Location > Location Servers > *Server Name* > Administration > History Parameters

Refer to the “Editing History Parameters” section in Chapter 4 of the *Cisco Location Appliance Configuration Guide, Release 4.0* at:

http://www.cisco.com/en/US/products/ps6386/products_installation_and_configuration_guides_list.html

Not Tracked Elements Value (Tracking Parameters Field)

With release 3.1 and later, you can specify the elements (client stations, active asset tags, rogue clients and rogue access points) that you want to actively track. Additionally, out of the 2,500 trackable elements, you can specify how many of a given element you want the controller to track.

In release 4.0, a Not Tracking value indicates by how much the tracking limit for a designated element has been exceeded. Elements tracked can include client stations, active asset tags, rogue clients and rogue access points ([Figure 1](#)).

Figure 1 Administration > Tracking Parameters

Wireless Control System

Username: root | Logout | Refresh | Print View

Monitor | Reports | Configure | Location | Administration | Tools | Help

Location Server > Tracking Parameters > 'EW-Sanity'

Tracking Parameters

Enable	Tracking Parameters	Enable Limiting	Limit Value	Active Value	Not Tracked
<input checked="" type="checkbox"/>	Client Stations	<input type="checkbox"/>	0	70	0
<input checked="" type="checkbox"/>	Asset Tags	<input type="checkbox"/>	0	4	0
<input type="checkbox"/>	Rogue Clients and AccessPoints	<input type="checkbox"/>	0	0	0
<input type="checkbox"/> Exclude Ad-Hoc Rogues					

SNMP Parameters

The SNMP parameters are applicable for Controller version 4.1 or below

SNMP Retry Count: 3

SNMP Timeout (secs): 5

SNMP Parameters

	SNMP Polling Interval (secs)
Client Stations	300
Asset Tags	600
Rogue Clients and AccessPoints	600
Statistics	900

**Note**

Only those elements designated for tracking by the controller are visible in Cisco WCS maps, queries, and reports. No events and alarms are collected for non-tracked elements and they are not used in calculating the 2,500 element limit.

Path: Location > Location Servers > *Server Name* > Administration > Tracking Parameters

Refer to the “Editing Tracking Parameters” section in Chapter 4 of the *Cisco Location Appliance Configuration Guide, Release 4.0*:

http://www.cisco.com/en/US/products/ps6386/products_installation_and_configuration_guides_list.html

Caveats

This section lists open, closed, and resolved caveats in location appliance release 4.0.38.0.

Open Caveats

The following caveats are open (unresolved) in this release:

- CSCsk17031—The history page loads slowly when you query the location history of a tag or client.

Workaround: You can increase the interval between historical readings of client, tags, and rogue clients and access points. You can also prune the data more frequently (Location Server > Administration > History Parameters).

- CSCsk18826—Cisco WCS might experience slower refresh and rendering times when managing large controller networks (200 or more) because of increased page synchronization requirements. Additionally, the CPU use for the web browser increases substantially and the browser might be unresponsive for a short period of time.

Workaround: None.

- CSCsk74074—In some cases, when you select the Synchronize Servers option (Location > Location Servers > *Server Name* > *Location* > *Synchronize Server*) for a selected location appliance, it synchronizes all reachable location appliances in addition to the selected location appliance. Eventually, an error appears indicating that the location appliances cannot be synchronized because they are unreachable.

Workaround: Remove the unreachable location appliance from WCS by choosing Location Servers > *Server Name* and choosing **Delete Servers** from the Select a Command drop-down menu. This restores the normal loading time for these pages.

- CSCsk87607—When location accuracy test is tracking a large number of elements and it is left in the enabled state for a number of days, large log files might fill the logs directory. A subsequent download of a given log file might time-out given the size of the file.

Workaround: Log into the location appliance via SSH and move or remove log files of the following format: rf-MAC-address.log (rf-00-0c-cc-5c-07-18.log) from the */opt/locserver/logs* directory.

- CSCsk88821—When you try to add datapoints to a calibration model and you select a campus and a building but do not select a floor, you see an unknown exception.

Workaround: Create a floor map and continue calibration by selecting that floor.

- CSCsl38408—When using the Map Editor, you are unable to resize the map using the link found at the top of the page. Clicking the *To resize based on available browser space click here* link does not resize the map.

Workaround: Close the window directly using the X box on the top right-hand side of the browser.

- CSCsl40623—Few data points are collected with Intel 802.11n and 802.11 b/g/n client cards during calibration when the Cisco Compatible Client Extension (CX) RM option within the Enterprise Security Profile is not enabled.

Workaround: Use the Intel Client Software PROSET package to ensure that the Enterprise Security Profile is selected and that the Cisco Compatible CX RM option in this profile is enabled.

- CSCsl77797—The Location Accuracy Tool (Tools > Location Accuracy Tool) does not generate a spatial image when the imported map is a file format other than JPEG (such as a GIF file).

Workaround: Import maps as JPEG files.

- CSCsw17583—In some RF environments, where location accuracy is around 60 to 70% or where incorrect client or tag floor location placements occur, you might need to modify the moment RSSI thresholds in the *aes-config.xml* file in the */opt/locserver/conf/* directory of the location server.

Workaround: Contact TAC with assistance in modifying the RSSI threshold parameters in the *aes-config.xml* file on the location server.

Resolved Caveats

The following caveats have been resolved:

- CSCsh47150—Moving a building from one location to another within a campus no longer causes synchronization errors. The synchronization page indicated that the building already existed and attempted to pull it. If you initiated a synchronization at this time, then it sometimes resulted in an inaccurate mapping of access points. Workaround was to unassign the campus or building elements from the location appliance, synchronize and then reassign the campus or building elements and then synchronize again.
- CSCsh79227—When connectivity between the location appliance and the controller was lost, alerts were not reported in Cisco WCS. Alerts were only reported when Cisco WCS lost connectivity to a controller.
- CSCsi12681—In cases where secure shell (SSH) versions earlier than 4.2, which did not support the GSSAPIDelegateCredentials option, were installed on the location appliance, third party security scanners would indicate security problems.
- CSCsi17755—When the time in the location appliance was updated manually to adjust for daylight savings time, Cisco WCS did not display the manually entered time.
- CSCsi21064—Chokepoint heatmap circles on the map did not automatically resize after using the zoom in and out feature. Chokepoint mapping was only accurate when displaying in the default map size.
- CSCsi34248—The test fire function did not work for location change and battery level notifications. Test-fire verifies that an event notification is sent by the location appliance when a defined event definitions is triggered.
- CSCsi45791—When the battery remaining percentage (%) value was unknown (binary 1111), Cisco WCS displayed the battery remaining percentage (%) in the Battery Life field for Cisco CX version1 asset tags as "-1%" rather than the correct value of "unknown."
- CSCsi46367— For some asset tags, the location history function (Monitor > Tags > *Location History*) did not automatically display any tag entries beyond the first listed when the play button was clicked.
- CSCsi51747—Cisco WCS did not display a tamper count for tampering notifications received from the Cisco CX version1 tags.
- CSCsj54172—SNMP initialization failed and subsequent initialization of the location module failed when the /etc/hosts file did not have an entry for the location appliance's host name and IP address. The location appliance would continue to run but SNMP polling and location calculation did not occur and did not report in the log file.
- CSCsj71650—The serial console port on the location appliance could hang when connected to certain models of USB serial converters.
- CSCsj99244—The location server backup function in release 4.2 of Cisco WCS (Location > Location Servers > Maintenance > Backup) did not work on Japanese Windows 2003 SP2. The workaround was to modify the AM/PM portion of the backup file name to English before performing the backup. For example, given the backup file name, *ls-sanity_071015_0410AM.lsbackup* (shown in English) you would change the "AM" portion of the file text.
- CSCsk62082—In some cases, enabling one of the location smoothing options (less, average, more or max smoothing) on a location appliance sometimes resulted in inaccurate location calculations for elements (Location > Location Server > *Location Server* > *Server Name* > *Advanced* > *Location Parameter*). Workaround was to turn off smoothing.

- CSCsk71342—When sorting on the controller or profile name column headings on the Clients detail window (Monitor > Clients > *Total Clients*), an error message similar to the following appeared: “No clients found on the location server(s) for the chosen criteria. Make sure that you have location servers added to Cisco WCS otherwise search on WCS Controllers.” No sorting errors existed for the other column headings on the Clients detail window.
- CSCsk71692—After clicking a map icon on the Monitor > Maps > *Map Name* window to open a full-screen view of that map, you are unable to exit that view. The workaround was to enter the Cisco WCS IP address into the browser URL field.
- CSCsk74908—After enabling limiting for clients and tags on the Tracking Parameters window (Location > Location Servers > *Location Server* > Administration > *Tracking Parameters*), the calculation for “not tracked” elements was not always reflected correctly. This item was not displayed or supported on the Tracking Parameters window of Cisco WCS in release 4.2 but was incorrectly noted as supported in the Cisco WCS online help.
- CSCsk79730—When multiple location appliances were added to Cisco WCS and one or more location appliances were not reachable, then the user could not launch Monitor Lite. This happened only when a location appliance in the network was unreachable. The workaround was to log into Cisco WCS as an admin user and remove the unreachable location appliance from the All Location Servers summary window (Location > Location Servers) and then login as a Monitor Lite user. Monitor Lite would then launch correctly.
- CSCsk83415—When a location object was returned through the SOAP API, the floorHierarchy element list was always empty rather than returning campus, building, floor, and group elements. This generally occurred whenever a location object was requested. The workaround was for users to view the hierarchy within the fullHierarchy and simpleHierarchy elements in the location object. The location object information is presented in a string format and is separated by a bar (|).
- CSCsl54522—The port number that displays in the pop-up when you mouse over a client icon in a map now displays correctly, matching the port number that displays in the client general properties panel when you click the map’s client icon.
- CSCsl63883—Lower location accuracy was seen for non-Cisco CX compatible Aeroscout tags with firmware versions earlier than 0415.
- CSCsm93369—After you assign a location server to the network design and click Synchronize, WCS no longer returns to the synchronize servers page still showing the design as unassigned. WCS now synchronizes the network design correctly and the design shows as assigned.
- CSCso29306—When a CAD image was imported for use as a floor map, the image was not pushed to the location appliance during synchronization. So, when a network design object was retrieved from the location appliance (through APIs or to other Cisco WCS stations), the map image was empty. The CAD image now synchronizes correctly to the location appliance.
- CSCso69865—The location server no longer triggers a NullPointerException error in the Event Log when RSSI values are very low.
- CSCsq61215—In Cisco WCS, the serial numbers of location servers now appear correctly in the Location Server > Advanced Parameters window.
- CSCsr29356—In some circumstances, access points from different, non-overlapping coverage regions would report a location for the same element (such as a client, tag or rogue client). This disparate location reporting resulted in an incorrect location calculation for the element. The calculation method was modified to exclude some ineligible access points from the calculation to reduce the number of calculation errors.

Closed Caveats

- CSCsk83459—When starting a location accuracy test, clicking the Start button for two MAC addresses simultaneously might result in unexpected results.

Workaround: Start location accuracy tests for MAC addresses at different times (releases 3.135 and earlier) or use the Accuracy Tool (Tools > Accuracy Tool) found in release 4.0.

If You Need More Information

If you need information about a specific caveat that does not appear in these release notes, you can use the Cisco Bug Toolkit to find caveats of any severity:

<http://tools.cisco.com/Support/BugToolKit/>

If you request a defect that cannot be displayed, the defect number might not exist, the defect might not yet have a customer-visible description, or the defect might be marked Cisco Confidential.

Troubleshooting

For the most up-to-date, detailed troubleshooting information, refer to the Cisco TAC website at:

<http://www.cisco.com/cisco/web/support/index.html>

Click **Troubleshooting**. Then choose your product (Wireless > Unified Wireless LAN Management > Cisco Wireless Location Appliance) and then select the **Troubleshoot and Alerts** heading on the product page to find information on the problem you are experiencing and other service advisories.

Related Documentation

The following documents are related to location appliances:

- *Cisco 2700 Series Location Appliance Installation and Configuration Guide*
- *Cisco Location Appliance Configuration Guide, Release 4.0*
- *Cisco Wireless Control System Configuration Guide, Release 5.0*
- *Cisco Wireless LAN Controller Configuration Guide, Release 5.0*



Note

You can see the latest online versions of these documents by selecting the Wireless category and then the appropriate product from the Wireless LAN Controller and Wireless LAN Management > Unified Wireless LAN Management sub-category panels at the following link:

<http://www.cisco.com/cisco/software/navigator.html>

Obtaining Documentation, 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>

Cisco and the Cisco Logo are trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and other countries. A listing of Cisco's trademarks can be found at www.cisco.com/go/trademarks. Third party trademarks mentioned 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. (1005R)

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.

© 2008 Cisco Systems, Inc. All rights reserved.

