



Cisco CallManager 3.3 Integration Guide for Cisco Unity Connection 1.1

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This document provides instructions for integrating the Cisco CallManager phone system with Cisco Unity Connection.

Integration Tasks

Before doing the following tasks to integrate Cisco Unity Connection with the Cisco CallManager phone system, confirm that the Cisco Unity Connection server is ready for the integration by completing the applicable tasks in the *Cisco Unity Connection Installation Guide*.

The following task lists describe the process for creating, changing, and deleting integrations.

Task List to Create the Integration

Use the following task list to set up a new integration with the Cisco CallManager phone system. If you are installing a new Cisco Unity Connection server by using the *Cisco Unity Connection Installation Guide*, you may have already completed some of the following tasks.

1. Review the system and equipment requirements to confirm that all phone system and Cisco Unity Connection server requirements have been met. See the [“Requirements” section on page 3](#).
2. Plan how the voice messaging ports will be used by Cisco Unity Connection. See the [“Planning How the Voice Messaging Ports Will Be Used by Cisco Unity Connection” section on page 6](#).
3. Program Cisco CallManager. See the [“Programming the Cisco CallManager Phone System” section on page 7](#).
4. Set up the gateways that service Cisco Unity Connection. See the [“Setting Up the Gateways That Service Cisco Unity Connection” section on page 15](#).
5. Create the integration. See the [“Creating a New Integration with the Cisco CallManager Phone System” section on page 16](#).



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Note An additional Cisco CallManager cluster can be added by creating a new phone system integration through the Phone System Integration Wizard. Each Cisco CallManager cluster is a separate phone system integration.

6. Test the integration. See the “[Testing the Integration](#)” section on page 19.
7. If this integration is a second or subsequent integration, add the applicable new user templates for the new phone system. See the [\(Multiple Integrations Only\) Adding New User Templates](#), page 23.

Task List to Make Changes to an Integration

Use the following task list to make changes to an integration after it has been created.

1. Start Cisco Unity Connection Administration.
2. Make the changes you want to the existing integration. See the “[Changing the Settings for an Existing Integration](#)” section on page 23.

Task List to Change the Number of Voice Messaging Ports

Use the following task list to change the number of voice messaging ports for an integration after it has been created.

1. Change the number of voice messaging ports in Cisco CallManager Administration and in Cisco Unity Connection Administration. See the “[Changing the Number of Voice Messaging Ports](#)” section on page 24.

Task List to Delete an Existing Integration

Use the following task list to remove an existing integration.

1. Start Cisco Unity Connection Administration.
2. Delete the existing integration. See the “[Deleting an Existing Phone System Integration](#)” section on page 26.

Task List to Add a Cisco CallManager Express Server to a Cisco CallManager Cluster

Use the following task list to add a Cisco CallManager Express server to a Cisco CallManager cluster.

1. Confirm that the Cisco CallManager Express server meets the requirements for integrating with Cisco Unity Connection. Refer to the *Cisco CallManager Express 3.x Integration Guide for Cisco Unity Connection 1.1* at http://www.cisco.com/en/US/products/ps6509/products_installation_and_configuration_guides_list.html.
2. Add the Cisco CallManager Express server to the port group for the Cisco CallManager phone system integration. See “[Adding a Cisco CallManager Express Server to a Cisco CallManager Phone System Integration](#)” section on page 27.

- If needed, add voice messaging ports. See the “[Changing the Number of Voice Messaging Ports](#)” section on page 24.

Requirements

The Cisco CallManager integration supports configurations of the following components:

Phone System

- A Cisco IP telephony applications server consisting of Cisco CallManager 3.3(x), running on a Cisco Media Convergence Server (MCS) or customer-provided server meeting approved Cisco configuration standards.
- IP phones for the Cisco CallManager extensions.
- A LAN connection in each location where you will plug an IP phone into the network.
- For multiple Cisco CallManager clusters, the capability for users to dial an extension on another Cisco CallManager cluster without having to dial a trunk access code or prefix.

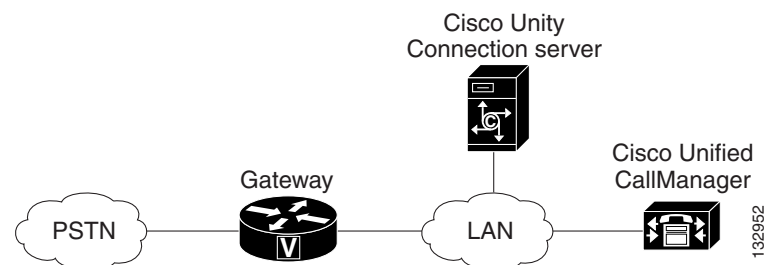
Cisco Unity Connection Server

- Cisco Unity Connection installed and ready for the integration, as described in the *Cisco Unity Connection Installation Guide* at http://www.cisco.com/en/US/products/ps6509/prod_installation_guides_list.html.
- The applicable Cisco Unity-CM TSP, installed. For details on compatible versions of the TSP, refer to the *Compatibility Matrix: Cisco Unity Connection, the Cisco Unity-CM TSP, Cisco CallManager, and Cisco CallManager Express* at <http://www.cisco.com/univercd/cc/td/doc/product/voice/uconn/cmptblty/uctspmtx.htm>.
- A license that enables the appropriate number of voice messaging ports.

Integration Description

The Cisco CallManager integration uses the LAN to connect Cisco Unity Connection and the phone system. The gateway provides connections to the PSTN. [Figure 1](#) shows the connections.

Figure 1 Connections Between the Phone System and Cisco Unity Connection



Call Information

The phone system sends the following information with forwarded calls:

- The extension of the called party
- The extension of the calling party (for internal calls) or the phone number of the calling party (if it is an external call and the system uses caller ID)
- The reason for the forward (the extension is busy, does not answer, or is set to forward all calls)

Cisco Unity Connection uses this information to answer the call appropriately. For example, a call forwarded to Cisco Unity Connection is answered with the personal greeting of the user. If the phone system routes the call to Cisco Unity Connection without this information, Cisco Unity Connection answers with the opening greeting.

Integration Features

The Cisco CallManager integration with Cisco Unity Connection provides the following features.

Call forward to personal greeting	When an incoming call is routed to an unanswered extension, the call is forwarded to the voice mail of the user. The caller then hears the personal greeting of the user and can leave a message.
Call forward to busy greeting	When an incoming call is routed to a busy extension, the call is forwarded to the voice mail of the user. The caller then hears the busy greeting (if the user enabled it) and can leave a message.
Caller ID	Cisco Unity Connection receives caller ID information from the phone system (if available). This information appears in the subject line of the message in the desktop messaging application.
Easy message access	A user can retrieve messages without entering an ID. Cisco Unity Connection identifies a user based on the extension from which the call originated. A password may be required.
Identified user messaging	Cisco Unity Connection automatically identifies a user who leaves a message during a forwarded internal call, based on the extension from which the call originated.
Message waiting indication	When a message is waiting for a user, Cisco Unity Connection notifies Cisco CallManager to activate the message waiting indicator (MWI) on the user extension.

When a Cisco Survivable Remote Site Telephony (SRST) router is part of the network and the Cisco SRST router takes over call processing functions from Cisco CallManager (for example, because the WAN link is down), phones at a branch office can continue to function. In this situation, however, the integration features have the following limitations:

- **Call forward to busy greeting**—When the Cisco SRST router uses FXO/FXS connections to the PSTN and a call is forwarded from a branch office to Cisco Unity Connection, the busy greeting cannot play.
- **Call forward to internal greeting**—When the Cisco SRST router uses FXO/FXS connections to the PSTN and a call is forwarded from a branch office to Cisco Unity Connection, the internal greeting cannot play. Because the PSTN provides the calling number of the FXO line, the caller is not identified as a user.

- **Call transfers**—Because an access code is needed to reach the PSTN, call transfers from Cisco Unity Connection to a branch office will fail.
- **Identified user messaging**—When the Cisco SRST router uses FXO/FXS connections to the PSTN and a user at a branch office leaves a message or forwards a call, the user is not identified. The caller appears as an unidentified caller.
- **Message waiting indication**—MWIs are not updated on branch office phones. So MWIs will not correctly reflect when new messages arrive or when all messages have been listened to. We recommend resynchronizing MWIs after the WAN link is reestablished.
- **Message notification**—Because an access code is needed to reach the PSTN, message notifications from Cisco Unity Connection to a branch office will fail.
- **Routing rules**—When the Cisco SRST router uses FXO/FXS connections to the PSTN and a call arrives from a branch office to Cisco Unity Connection (either a direct or forwarded call), routing rules will fail.

When the Cisco SRST router uses PRI/BRI connections, the caller ID for calls from a branch office to Cisco Unity Connection may be the full number (exchange plus extension) provided by the PSTN and therefore may not match the extension of the Cisco Unity Connection user. If this is the case, you can let Cisco Unity Connection recognize the caller ID by using alternate extensions (for instructions, see the “Appendix: Using Alternate Extensions and MWIs” section).

Redirected Dialed Number Information Service (RDNIS) needs to be supported when using SRST.

For information on setting up Cisco SRST routers, refer to the “Integrating Voice Mail with Cisco SRST” section of the “Cisco SRST System Administrator Guide,” available at <http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122limit/122z/122zj15/index.htm>.

Impact of Non-Delivery of RDNIS on Voice Mail Calls Routed via AAR

RDNIS needs to be supported when using Automated Alternate Routing (AAR).

AAR can route calls over the PSTN when the WAN is oversubscribed. However, when calls are rerouted over the PSTN, RDNIS can be affected. Incorrect RDNIS information can impact voice mail calls that are rerouted over the PSTN by AAR when Cisco Unity Connection is remote from its messaging clients. If the RDNIS information is not correct, the call will not reach the voice mail box of the dialed user but will instead receive the auto-attendant prompt, and the caller might be asked to reenter the extension number of the party they wish to reach. This behavior is primarily an issue when the telephone carrier is unable to ensure RDNIS across the network. There are numerous reasons why the carrier might not be able to ensure that RDNIS is properly sent. Check with your carrier to determine whether it provides guaranteed RDNIS delivery end-to-end for your circuits. The alternative to using AAR for oversubscribed WANs is simply to let callers hear reorder tone in an oversubscribed condition.

Integrations with Multiple Phone Systems

Cisco Unity Connection can be integrated with multiple phone systems at one time. For the most recent information on and instructions for integrating Cisco Unity Connection with multiple phone systems, refer to the *Multiple Phone System Integration Guide* at http://www.cisco.com/en/US/products/ps6509/products_installation_and_configuration_guides_list.html.

Planning How the Voice Messaging Ports Will Be Used by Cisco Unity Connection

Before programming the phone system, you need to plan how the voice messaging ports will be used by Cisco Unity Connection. The following considerations will affect the programming for the phone system (for example, setting up the hunt group or call forwarding for the voice messaging ports):

- The number of voice messaging ports installed.
- The number of voice messaging ports that will answer calls.
- The number of voice messaging ports that will only dial out, for example, to send message notification, to set message waiting indicators (MWIs), and to make telephone record and playback (TRAP) connections.

[Table 1](#) describes the voice messaging port settings in Cisco Unity Connection that can be set on Telephony Integrations > Port of Cisco Unity Connection Administration.

Table 1 Settings for the Voice Messaging Ports

Field	Considerations
Enabled	Check this check box to enable the port. The port is enabled during normal operation. Uncheck this check box to disable the port. When the port is disabled, calls to the port get a ringing tone but are not answered. Typically, the port is disabled only by the installer during testing.
Extension	Enter the extension for the port as assigned on the phone system.
Answer Calls	Check this check box to designate the port for answering calls. These calls can be incoming calls from unidentified callers or from users.
Perform Message Notification	Check this check box to designate the port for notifying users of messages. Assign Perform Message Notification to the least busy ports.
Send MWI Requests	Check this check box to designate the port for turning MWIs on and off. Assign Send MWI Requests to the least busy ports.
Allow TRAP Connections	Check this check box so that users can use the phone as a recording and playback device in Cisco Unity Connection web applications and e-mail clients. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Cisco Unity Connection will use the ports when dialing out (for example, if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections check box is checked). The highest numbers are used first. However, when multiple ports have the same Outgoing Hunt Order number, Cisco Unity Connection will use the port that has been idle the longest.

The Number of Voice Messaging Ports to Install

The number of voice messaging ports to install depends on numerous factors, including:

- The number of calls Cisco Unity Connection will answer when call traffic is at its peak.
- The expected length of each message that callers will record and that users will listen to.
- The number of users.
- The number of ports that will be set to dial out only.
- The number of calls made for message notification.

- The number of MWIs that will be activated when call traffic is at its peak.
- The number of TRAP connections needed when call traffic is at its peak. (TRAP connections are used by Cisco Unity Connection web applications and e-mail clients to play back and record over the phone.)
- The number of calls that will use the automated attendant and call handlers when call traffic is at its peak.

It is best to install only the number of voice messaging ports that are needed so that system resources are not allocated to unused ports.

The Number of Voice Messaging Ports That Will Answer Calls

The calls that the voice messaging ports answer can be incoming calls from unidentified callers or from users. Typically, the voice messaging ports that answer calls are the busiest.

You can set voice messaging ports to both answer calls and to dial out (for example, to send message notifications). However, when the voice messaging ports perform more than one function and are very active (for example, answering many calls), the other functions may be delayed until the voice messaging port is free (for example, message notifications cannot be sent until there are fewer calls to answer). For best performance, dedicate certain voice messaging ports for only answering incoming calls, and dedicate other ports for only dialing out. Separating these port functions eliminates the possibility of a collision, in which an incoming call arrives on a port at the same time that Cisco Unity Connection takes the port off-hook to dial out.

The Number of Voice Messaging Ports That Will Only Dial Out, and Not Answer Calls

Ports that will only dial out and will not answer calls can do one or more of the following:

- Notify users by phone, pager, or e-mail of messages that have arrived.
- Turn MWIs on and off for user extensions.
- Make a TRAP connection so that users can use the phone as a recording and playback device in Cisco Unity Connection web applications and e-mail clients.

Typically, these voice messaging ports are the least busy ports. They also have the highest port numbers for the phone system.



Caution

In programming the phone system, do not send calls to voice messaging ports in Cisco Unity Connection that cannot answer calls (voice messaging ports that are not set to Answer Calls). For example, if a voice messaging port is set only to Send MWI Requests, do not send calls to it.

Preparing for Programming the Phone System

Record your decisions about the voice messaging ports to guide you in programming the phone system.

Programming the Cisco CallManager Phone System

After Cisco CallManager software is installed, do the procedures in the order given.

To Add Partitions and a Calling Search Space to Contain the Voice Mail Ports

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- Step 1** In the Cisco CallManager Administration, click **Route Plan > Partition**.


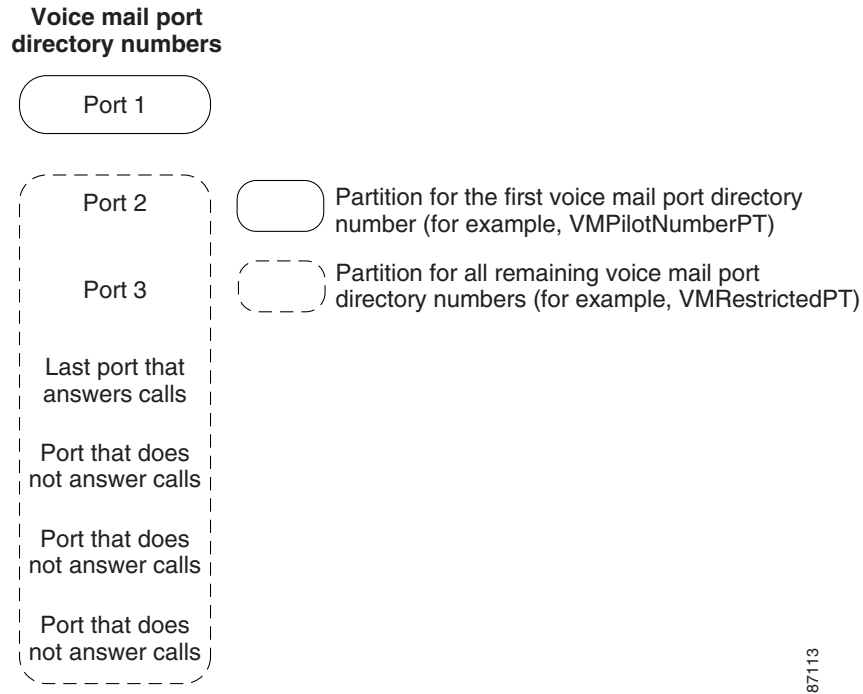
- Step 2** Click **Add a New Partition**.
- Step 3** Enter the name and description you want for the partition that will contain all voice mail port directory numbers except for the first voice mail port, which will be assigned the voice mail pilot number. For example, enter “VMRestrictedPT, Partition for voice mail port directory numbers.” For a diagram of the configuration, see [Figure 2](#).
- Step 4** Click **Insert**.
- Step 5** Click **Add a New Partition**.
- Step 6** Enter the name and description you want for the partition that will contain the directory number of the first voice mail port, which will be assigned the voice mail pilot number. For example, enter “VMPilotNumberPT, Partition for the voice mail pilot number.” For a diagram of the configuration, see [Figure 2](#).
- Step 7** Click **Insert**.
- Step 8** Click **Route Plan > Calling Search Space**.
- Step 9** Click **Add a New Calling Search Space**.
- Step 10** In the Calling Search Space Name field, enter a name for the calling search space that will include the partition created in [Step 2](#) through [Step 4](#). For example, enter “VMRestrictedCSS.”
- Step 11** If you want, in the Description field, enter a description of the calling search space. For example, enter “Voice mail port directory numbers.”
- Step 12** In the Available Partitions field, double-click the name of the partition created in [Step 2](#) through [Step 4](#). For example, double-click “VMRestrictedPT.” For a diagram of the configuration, see [Figure 2](#).
The name of the partition appears in the Selected Partitions field.
- Step 13** Click **Insert**.
- Step 14** Click **Back to Find/List Calling Search Spaces**.
- Step 15** Click the name of the calling search space that is used by user phones.
- Step 16** In the Available Partitions field, double-click the name of the partition created in [Step 5](#) through [Step 7](#). For example, double-click “VMPilotNumberPT.” For a diagram of the configuration, see [Figure 2](#).
-  **Caution** If the partition that contains the voice mail pilot number is not in the calling search space that is used by user phones, the phones will not be able to dial the Cisco Unity Connection server.
- Step 17** Click **Update**.
- Step 18** Repeat [Step 15](#) through [Step 17](#) for each remaining calling search space that needs to access Cisco Unity Connection.
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Figure 2 Partitions for Voice Mail Port Directory Numbers**To Add a Device Pool for the Voice Mail Ports**

- Step 1** In the Cisco CallManager Administration, click **System > Device Pool**.
- Step 2** On the Find and List Device Pools page, click **Add a New Device Pool**.
- Step 3** On the Device Pool Configuration page, enter the following device pool settings.

Table 2 Settings for the Device Pool Configuration Page

Field	Setting
Device Pool Name	Enter Cisco Unity Connection Voice Mail Ports or other description for this device pool.
Cisco CallManager Group	Click the Cisco CallManager group to assign to the voice mail ports in this device pool.
Date/Time Group	Click the date/time group to assign to the voice mail ports in this device pool.
Region	Click the Cisco CallManager region to assign to the voice mail ports in this device pool.
Softkey Template	Click the softkey template to assign to the voice mail ports in this device pool.
SRST Reference	Click the survivable remote site telephony (SRST) reference to assign to the voice mail ports in this device pool.

Table 2 Settings for the Device Pool Configuration Page (continued)

Field	Setting
Network Hold MOH Source	Click None .
User Hold MOH Audio Source	Click None .

Step 4 Click **Insert**.

In the following procedure, add a voice mail port to Cisco CallManager for each voice mail port that you will connect to Cisco Unity Connection.

To Add Voice Mail Ports to Cisco CallManager

Step 1 In the Cisco CallManager Administration, click **Feature > Voice Mail > Cisco Voice Mail Port Wizard**.

Step 2 Click **Create a New Cisco Voice Mail Server and Add Ports to It** and click **Next**.

Step 3 The name of the voice mail server appears. We recommend that you accept the default name for the voice mail server, or, if necessary, enter a different name with no more than nine characters, then click **Next**.

The voice mail server name must match the Device Name Prefix field in Cisco Unity Connection on the Port Group Basics page for the voice messaging ports.

Step 4 Enter the number of ports you want to add (which must not be more ports than the Cisco Unity Connection license enables), then click **Next**.

If you will integrate Cisco Unity Connection with multiple clusters of Cisco CallManager, the number you enter here cannot bring the total number of ports on all clusters integrated with Cisco Unity Connection to more than the number of ports enabled by the Cisco Unity Connection license.

Step 5 Enter the following voice mail device settings, then click **Next**.

Table 3 Settings for the Voice Mail Devices

Field	Setting
Description	Enter Cisco Voice Mail Port or other description that you want.
Device Pool	Click the name of the device pool you created for the voice mail ports. For example, click "Cisco Unity Connection Voice Mail Ports."
Calling Search Space	Click the name of a calling search space that allows calls to the user phones and any required network devices. This calling search space must include partitions that contain all devices Cisco Unity Connection needs to access (for example, during call transfers, message notifications, and MWI activations).
Location	Accept the default of None .

Enter the following voice mail directory number settings, then click Next.

Table 4 **Settings for the Voice Mail Directory Numbers**

Field	Setting
Pilot Number	Enter the pilot number for the voice mail ports. The pilot number is the extension number of the first voice mail port and is the number users enter to listen to their voice messages.
Partition	Click the name of the partition that you set up for all voice mail port directory numbers except the first voice mail port. For example, click “VMRestrictedPT.”
Calling Search Space	Click the name of a calling search space that you set up to contain the partition with all voice mail port directory numbers except the first voice mail port, as set in Step 9 of the “ To Add Partitions and a Calling Search Space to Contain the Voice Mail Ports ” section on page 7. For example, click “VMRestrictedCSS.” Because this calling search space is not used by user phones, users cannot dial any voice mail ports except the voice mail pilot number.
Display	Accept the default of Voicemail . This text appears on the phone when the pilot number is dialed.

- Step 6** Enter the operator number or the number you want the last port to forward to when busy, if applicable, and click **Next**.
- Step 7** The settings for the new ports appear. Click **Finish**.
- Step 8** Click **Go to Cisco Voice Mail Ports Page**.

To Set the Partition for the First Voice Mail Port

- Step 1** On the Cisco Voice Mail Port Configuration page, in the Cisco Voice Mail Ports list, click the first voice mail port, which is assigned the voice mail pilot number.
- Step 2** Under Directory Number Information, in the Partition field, click the partition that you set up to contain the first voice mail port. For example, click “VMPilotNumberPT.”
- Step 3** Click **Update**.

To Specify MWI Directory Numbers

- Step 1** In the Cisco CallManager Administration, click **Feature > Voice Mail > Message Waiting**.
- Step 2** In the Message Waiting Directory Numbers list of the Message Waiting Configuration page, click **Add a New Directory Number**.
- Step 3** Enter the following settings for turning MWIs on.

Table 5 Settings for Turning MWIs On

Field	Setting
Directory Number	Enter the unique extension that turns MWIs on.
Message Waiting Indicator	Click On .
Partition	Click the name of the partition that you set up for the first voice mail port. For example, click “VMPilotNumberPT.”
Calling Search Space	Click a calling search space that is used by user phones.

Step 4 Click **Insert**.

Step 5 In the Message Waiting Directory Numbers list, click **Add a New Directory Number**.

Step 6 Enter the following settings for turning MWIs off.

Table 6 Settings for Turning MWIs Off

Field	Setting
Directory Number	Enter the unique extension that turns MWIs off.
Message Waiting Indicator	Click Off .
Partition	Click the name of the partition that you set up for the first voice mail port. For example, click “VMPilotNumberPT.”
Calling Search Space	Click a calling search space that is used by user phones.

Step 7 Click **Insert**.

In the following procedure, you will add the voice mail pilot number, which is the extension that you dial to listen to your voice messages. Your Cisco IP phone automatically dials the voice mail pilot number when you press the Messages button.

To Add a Voice Mail Pilot Number for the Voice Mail Ports

Step 1 In the Cisco CallManager Administration, click **Feature > Voice Mail > Voice Mail Pilot**.

Step 2 In the Voice Mail Pilot Numbers list of the Voice Mail Pilot Configuration page, click **Add a New Voice Mail Pilot Number**.

Step 3 Enter the following voice mail pilot number settings.

Table 7 Settings for the Voice Mail Pilot Number

Field	Setting
Voice Mail Pilot Number	Enter the pilot number for the voice mail ports. This number must be the same pilot number that you entered when adding voice mail ports earlier. The pilot number is typically the extension number of the first voice mail port and is the number users enter to listen to their voice messages.
Description	Enter Cisco Unity Connection Pilot or another description that you want.
Calling Search Space	Click the calling search space that includes partitions containing the user phones and the partition you set up for the first voice mail port.
Make This the Default Voice Mail Pilot for the System	Check this check box. When this check box is checked, this voice mail pilot number replaces the current default pilot number.

Step 4 Click **Insert**.

To Set Up the Voice Mail Profile

Step 1 In the Cisco CallManager Administration, click **Feature > Voice Mail > Voice Mail Profile**.

Step 2 In the Find and List Voice Mail Profiles page, click **Add a New Voice Mail Profile**.

Step 3 In the Voice Mail Profiles Configuration page, enter the following voice mail profile settings.

Table 8 Settings for the Voice Mail Profile

Field	Setting
Voice Mail Profile Name	Enter a name to identify the voice mail profile.
Description	Enter Cisco Unity Connection Profile or another description that you want.
Voice Mail Pilot	Click one of the following: <ul style="list-style-type: none"> The applicable voice mail pilot number that you defined on the Voice Mail Pilot Configuration page None (to use the default voice mail pilot number)
Voice Mail Box Mask	When multitenant services are not enabled on Cisco CallManager, leave this field blank. When multitenant services are enabled, each tenant uses its own voice mail profile. Create a mask to identify the extensions (directory numbers) in each partition. For example, one tenant can use a mask 972813XXXX, while another tenant can use the mask 214333XXXX. Each tenant also uses its own translation patterns for MWIs.
Make This the Default Voice Mail Profile for the System	Check this check box to make this voice mail profile the default. If you check the check box, this voice mail profile replaces the current default voice mail profile.

Step 4 Click **Insert**.

To Set Up the Voice Mail Server Service Parameters

Step 1 In the Cisco CallManager Administration, click **Service > Service Parameters**.

Step 2 In the **Server** field on the Service Parameters Configuration page, click the voice mail server that you created earlier.

Step 3 In the Services list, click **Cisco CallManager**. The list of parameters appears.

Step 4 Scroll down the list until you locate the parameters listed in [Table 9](#).

Step 5 Enter the parameter settings shown in the following table.

Table 9 *Settings for the Service Parameters*

Service Parameter to Configure	Setting
Voice Mail Maximum Hop Count	Used together with AdvancedCallForwardHopFlag, the maximum number of voice mail ports skipped to find the next available voice mail port. Specify a value that is three less than the number of Cisco CallManager ports that are connected to the Cisco Unity Connection server. For example, if you have a 48-port Cisco Unity Connection system, enter 45 for this setting.
Multiple Tenant MWI Modes	Enables multitenant MWI notification. When set to True, Cisco CallManager uses any configured translation patterns to convert voice mail extensions into directory numbers when turning on or off an MWI.
H225 DTMF Duration	Specifies the duration (in milliseconds) of outbound DTMF digits for H.323 devices.
Advanced CallForward Hop Flag	Enables Cisco CallManager to skip busy or unregistered voice mail ports when searching for an available voice mail port. Set to True .

Step 6 Click **Update** to save the settings.

Step 7 Click **Select Another Service** at the top of the page.

Step 8 In the Services list, click **Cisco Messaging Interface**. The list of parameters appears.

Step 9 Confirm that the VoiceMailDn parameter setting is blank.

Step 10 If you changed the parameter setting to blank, click **Update** to save the setting.

Step 11 Shut down and restart the Cisco CallManager server.

If the plan for voice mail ports in Cisco Unity Connection (see the [“Planning How the Voice Messaging Ports Will Be Used by Cisco Unity Connection”](#) section on page 6) includes ports that do not answer calls (for example, ports that only dial out to set MWIs), do the following procedure so that incoming calls are not forwarded to these ports.

To Set Up Voice Mail Ports So Incoming Calls Are Forwarded Only to Answering Ports

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- Step 1** In the Cisco CallManager Administration, click **Feature > Voice Mail > Cisco Voice Mail Port**.
 - Step 2** In the Cisco Voice Mail Ports list of the Cisco Voice Mail Port Configuration page, click the name of the last voice mail port that answers calls in Cisco Unity Connection.
 - Step 3** Set the Forward Busy and Forward No Answer fields to forward to the first voice mail port that answers calls in Cisco Unity Connection.
 - Step 4** Click **Update**.
 - Step 5** In the Cisco Voice Mail Ports list, click the name of a the first voice mail port that does not answer calls in Cisco Unity Connection.
 - Step 6** Under Call Forwarding Information, delete the extensions in the Forward Busy field, and set the Forward No Answer field to forward to the first voice mail port that answers calls in Cisco Unity Connection.
 - Step 7** Click **Update**.
 - Step 8** Repeat [Step 5](#) through [Step 7](#) for all remaining voice mail ports that do not answer calls in Cisco Unity Connection.
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Note

You can use alternate extensions to create multiple line appearances, enable easy message access from cell phones, and simplify addressing messages to users at different locations in Cisco Unity Connection. When you enable alternate MWIs, Cisco Unity Connection can turn MWIs on at more than one extension. For details, see the [“Appendix: Using Alternate Extensions and MWIs” section on page 30](#).

Setting Up the Gateways That Service Cisco Unity Connection

In certain situations, DTMF digits are not recognized when processed through VoIP dial-peer gateways. To avoid this problem, certain gateways must be configured to enable DTMF relay. The DTMF relay feature is available in Cisco IOS software version 12.0(5) and later.

Cisco IOS software-based gateways that use H.245 out-of-band signaling must be configured to enable DTMF relay.

The Catalyst 6000 T1/PRI and FXS gateways enable DTMF relay by default and do not need additional configuration to enable this feature.

To Enable DTMF Relay

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- Step 1** On a VoIP dial-peer servicing Cisco Unity Connection, use the following command:
`dtmf-relay h245-alphanumeric`
 - Step 2** Create a destination pattern that matches the Cisco CallManager voice mail port numbers. For example, if the system has voice mail ports 1001 through 1016, enter the dial-peer destination pattern **10xx**.
 - Step 3** Repeat [Step 1](#) and [Step 2](#) for all remaining VoIP dial-peers servicing Cisco Unity Connection.
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Creating a New Integration with the Cisco CallManager Phone System

After ensuring that the Cisco CallManager phone system and Cisco Unity Connection are ready for the integration, do the following procedures to set up the integration and to enter the port settings.

To Create an Integration

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- Step 1** Log on to Cisco Unity Connection Administration.
 - Step 2** In Cisco Unity Connection Administration, expand **Telephony Integrations**, then click **Phone System**.
 - Step 3** On the Search Phone Systems page, on the Phone System menu, click **New Phone System**. The Phone System Integration Wizard appears.
 - Step 4** On the Select Phone System Manufacturer page, in the Manufacturer field, click **Cisco Systems** and click **Next**.
 - Step 5** On the Select Phone System Model page, in the Model field, click **CallManager** and click **Next**.
 - Step 6** On the Set Up Phone System page, in the Phone System Name field, accept the default name or enter the descriptive name that you want, and click **Next**.
 - Step 7** On the Select Port Group Template page, in the Port Group Template field, click **SCCP - Skinny Client Control Protocol** and click **Next**.
 - Step 8** On the Set Up Port Group page, enter the following settings and click **Next**.

Table 10 Settings for the Set Up Port Group Page

Field	Setting
Port Group Name	<the display name for the port group; accept the default name, which is composed of the phone system display name followed by an incrementing number, or enter another descriptive name>
Device Name Prefix	<the prefix that Cisco CallManager adds to the device name for voice messaging ports; this prefix must match the prefix used by Cisco CallManager>
MWI On Extension	<the extension that you specified in Cisco CallManager Administration for turning MWIs on>
MWI Off Extension	<the extension that you specified in Cisco CallManager Administration for turning MWIs off>
Security Mode	Non-secure (Cisco CallManager authentication and encryption are not available with this version of Cisco CallManager.)
Number of Ports	<the number of voice messaging ports that you want to create in this port group>
IP Address or Host Name	<the IP address (or host name) of the primary Cisco CallManager server that you are integrating with Cisco Unity Connection>
Test Address	Click this button to test the IP address that you entered. The results of the test appear in the field to the right of the button.

Table 10 Settings for the Set Up Port Group Page (continued)

Field	Setting
Port	<the TCP port of the primary Cisco CallManager server that you are integrating with Cisco Unity Connection; we recommend that you use the default setting>
TLS Port	<the TLS port of the primary Cisco CallManager server that you are integrating with Cisco Unity Connection; we recommend that you use the default setting>
Server Type	Cisco CallManager

- Step 9** On the Confirm Phone System Settings page, confirm the settings that you have entered and click **Finish**.
- Step 10** On the Phone System Creation Summary page, click **Close**.
- Step 11** In Cisco Unity Connection Administration, expand **Telephony Integrations**, then click **Port Group**.
- Step 12** On the Search Port Groups page, click the display name of the port group that you created with the phone system integration in [Step 9](#).



Note By default, the display name for a port group is composed of the phone system display name followed by an incrementing number.

- Step 13** On the Port Group Basics page, on the Edit menu, click **Servers**.
- Step 14** On the Edit Servers page, do the following substeps if the Cisco CallManager cluster has secondary servers. Otherwise, continue to [Step 15](#).
- Under Cisco CallManager Servers, click **Add**.
 - Enter the following settings for the secondary Cisco CallManager server and click **Save**.

Table 11 Settings for the Cisco CallManager Server

Field	Setting
Order	<the order of priority for the Cisco CallManager server; the lowest number is the primary Cisco CallManager server, the higher numbers are the secondary servers>
IP Address or Host Name	<the IP address (or host name) of the secondary Cisco CallManager server>
Port	<the TCP port of the Cisco CallManager server that you are integrating with Cisco Unity Connection; we recommend that you use the default setting>
TLS Port	<the TLS port of the Cisco CallManager server that you are integrating with Cisco Unity Connection; we recommend that you use the default setting>
Server Type	Cisco CallManager



Note You can click **Ping** to verify the IP address (or host name) of the Cisco CallManager server.

- Repeat [Step 14a](#). and [Step 14b](#). for all remaining secondary Cisco CallManager servers in the cluster.

- Step 15** In Cisco Unity Connection Administration, expand **Telephony Integrations**, then click **Port**.
- Step 16** On the Search Ports page, click the display name of the first voice messaging port that you created for this phone system integration.



Note By default, the display names for the voice messaging ports are composed of the port group display name followed by incrementing numbers.

- Step 17** On the Port Basics page, set the voice messaging port settings as applicable. The fields in the following table are the ones that you can change.

Table 12 *Settings for the Voice Messaging Ports*

Field	Considerations
Enabled	Check this check box to enable the port. The port is enabled during normal operation. Uncheck this check box to disable the port. When the port is disabled, calls to the port get a ringing tone but are not answered. Typically, the port is disabled only by the installer during testing.
Extension	Enter the extension for the port as assigned on the phone system.
Answer Calls	Check this check box to designate the port for answering calls. These calls can be incoming calls from unidentified callers or from users.
Perform Message Notification	Check this check box to designate the port for notifying users of messages. Assign Perform Message Notification to the least busy ports.
Send MWI Requests	Check this check box to designate the port for turning MWIs on and off. Assign Send MWI Requests to the least busy ports.
Allow TRAP Connections	Check this check box so that users can use the phone as a recording and playback device in Cisco Unity Connection web applications and e-mail clients. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Cisco Unity Connection will use the ports when dialing out (for example, if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections check box is checked). The highest numbers are used first. However, when multiple ports have the same Outgoing Hunt Order number, Cisco Unity Connection will use the port that has been idle the longest.
Security Mode	Click Non-secure . (Cisco CallManager authentication and encryption are not available.)

- Step 18** Click **Save**.
- Step 19** Click **Next**.
- Step 20** Repeat [Step 17](#) through [Step 19](#) for all remaining voice messaging ports for the phone system.
- Step 21** If another phone system integration exists, in Cisco Unity Connection Administration, expand **Telephony Integrations**, then click **Trunk**. Otherwise, skip to [Step 25](#).
- Step 22** On the Search Phone System Trunks page, on the Phone System Trunk menu, click **New Phone System Trunk**.
- Step 23** On the New Phone System Trunk page, enter the following settings for the phone system trunk and click **Save**.

Table 13 **Settings for the Phone System Trunk**

Field	Setting
From Phone System	<the display name of the phone system that you are creating a trunk for>
To Phone System	<the display name of the previously existing phone system that the trunk will connect to>
Trunk Access Code	<the extra digits that Cisco Unity Connection must dial to transfer calls through the gateway to extensions on the previously existing phone system>

- Step 24** Repeat [Step 22](#) and [Step 23](#) for all remaining phone system trunks that you want to create.
- Step 25** If prompted to restart Cisco Unity Connection, in the Windows task bar, right-click the **Cisco Unity Connection** icon and click **Restart > Voice Processing Server Role**.
- Step 26** When prompted to confirm stopping the Voice Processing server role, click **Yes**.
- Step 27** In Cisco Unity Connection Administration, in the Related Links drop-down list, click **Check Telephony Configuration** and click **Go** to confirm the phone system integration settings.
- If the test is not successful, the Task Execution Results displays one or more messages with troubleshooting steps. After correcting the problems, test the connection again.
- Step 28** In the Task Execution Results window, click **Close**.
- Step 29** Log off Cisco Unity Connection Administration.

Testing the Integration

To test whether Cisco Unity Connection and the phone system are integrated correctly, do the following procedures in the order listed.

If any of the steps indicate a failure, refer to the following documentation as applicable:

- The installation guide for the phone system.
- The setup information earlier in this guide.

To Set Up the Test Configuration

- Step 1** Set up two test extensions (Phone 1 and Phone 2) on the same phone system that Cisco Unity Connection is connected to.
- Step 2** Set Phone 1 to forward calls to the Cisco Unity Connection pilot number when calls are not answered.



Caution The phone system must forward calls to the Cisco Unity Connection pilot number in no fewer than four rings. Otherwise, the test may fail.

- Step 3** To create a test user for testing, in Cisco Unity Connection Administration, click **Users**.
- Step 4** On the Search Users page, on the User menu, click **New User**.
- Step 5** On the New User page, enter the following settings.

Table 14 Settings for the New User Page

Field	Setting
User Type	User with Voice Mailbox
User Template	<the applicable user template>
Alias	testuser
First Name	Test
Last Name	User
Display Name	Test User
Extension	<the extension of Phone 1>

- Step 6** Click **Save**.
- Step 7** On the User Basics page, in the Voice Name field, record a voice name for the test user.
- Step 8** In the Phone System field, confirm that the phone system selected is the phone system that Phone 1 is connected to.
- Step 9** Uncheck the **Set for Self-enrollment at Next Login** check box.
- Step 10** Click **Save**.
- Step 11** On the Edit menu, click **Message Waiting Indicators**.
- Step 12** On the Message Waiting Indicators page, click the message waiting indicator. If no message waiting indication is in the table, click **Add New**.
- Step 13** On the Edit Message Waiting Indicator page, enter the following settings.

Table 15 Settings for the Edit MWI Page

Field	Setting
Enabled	Check this check box to enable MWIs for the test user.
Display Name	Accept the default or enter a different name.
Inherit User's Extension	Check this check box to enable MWIs on Phone 1.
Extension	<the extension of Phone 1>
Phone System	<the phone system that Phone 1 is connected to>

- Step 14** Click **Save**.
- Step 15** On the Edit menu, click **Transfer Options**.
- Step 16** On the Edit Transfer Option page, under Call Transfer, click the **Extension** option and enter the extension of Phone 1.
- Step 17** In the Transfer Type field, click **Release to Switch**.
- Step 18** Click **Save**.
- Step 19** Minimize the Cisco Unity Connection Administration window.
- Do not close the Cisco Unity Connection Administration window because you will use it again in a later procedure.

- Step 20** On the Cisco Unity Connection desktop, double-click the **Tools Depot** icon.
- Step 21** In the left pane of the Tools Depot window, expand **Switch Integration Tools**, then double-click **Port Status Monitor**. The Port Status Monitor window appears.
- Step 22** On the Ports menu, click **Start All**, and arrange the port monitors so that you can notice which port will handle the calls that you will make.
-

To Test an External Call with Release Transfer

- Step 1** From Phone 2, enter the access code necessary to get an outside line, then enter the number outside callers use to dial directly to Cisco Unity Connection.
- Step 2** In the Port Status Monitor, note which port handles this call.
- Step 3** When you hear the opening greeting, enter the extension for Phone 1. Hearing the opening greeting means that the port is configured correctly.
- Step 4** Confirm that Phone 1 rings and that you hear a ringback tone on Phone 2. Hearing a ringback tone means that Cisco Unity Connection correctly released the call and transferred it to Phone 1.
- Step 5** Leaving Phone 1 unanswered, confirm that the state of the port handling the call changes to “Idle.” This state means that release transfer is successful.
- Step 6** Confirm that, after the number of rings that the phone system is set to wait, the call is forwarded to Cisco Unity Connection and that you hear the greeting for the test user. Hearing the greeting means that the phone system forwarded the unanswered call and the call-forward information to Cisco Unity Connection, which correctly interpreted the information.
- Step 7** On the Port Status Monitor, note which port handles this call.
- Step 8** Leave a message for the test user and hang up Phone 2.
- Step 9** In the Port Status Monitor, confirm that the state of the port handling the call changes to “Idle.” This state means that the port was successfully released when the call ended.
- Step 10** Confirm that the MWI on Phone 1 is activated. The activated MWI means that the phone system and Cisco Unity Connection are successfully integrated for turning on MWIs.
-

To Test Listening to Messages

- Step 1** From Phone 1, enter the internal pilot number for Cisco Unity Connection.
- Step 2** When asked for your password, enter the password for the test user. Hearing the request for your password means that the phone system sent the necessary call information to Cisco Unity Connection, which correctly interpreted the information.
- Step 3** Confirm that you hear the recorded voice name for the test user (if you did not record a voice name for the test user, you will hear the extension number for Phone 1). Hearing the voice name means that Cisco Unity Connection correctly identified the user by the extension.
- Step 4** Listen to the message.
- Step 5** After listening to the message, delete the message.
- Step 6** Confirm that the MWI on Phone 1 is deactivated. The deactivated MWI means that the phone system and Cisco Unity Connection are successfully integrated for turning off MWIs.

- Step 7** Hang up Phone 1.
- Step 8** On the Port Status Monitor, confirm that the state of the port handling the call changes to “Idle.” This state means that the port was successfully released when the call ended.
-

To Set Up Supervised Transfer on Cisco Unity Connection

- Step 1** In Cisco Unity Connection Administration, on the Edit Transfer Option page for the test user, in the Transfer Type field, click **Supervise Transfer**.
- Step 2** In the Rings to Wait For field, enter **3**.
- Step 3** Click **Save**.
- Step 4** Minimize the Cisco Unity Connection Administration window.
- Do not close the Cisco Unity Connection Administration window because you will use it again in a later procedure.
-

To Test Supervised Transfer

- Step 1** From Phone 2, enter the access code necessary to get an outside line, then enter the number outside callers use to dial directly to Cisco Unity Connection.
- Step 2** On the Port Status Monitor, note which port handles this call.
- Step 3** When you hear the opening greeting, enter the extension for Phone 1. Hearing the opening greeting means that the port is configured correctly.
- Step 4** Confirm that Phone 1 rings and that you do not hear a ringback tone on Phone 2. Instead, you should hear the indication your phone system uses to mean that the call is on hold (for example, music).
- Step 5** Leaving Phone 1 unanswered, confirm that the state of the port handling the call remains “Busy.” This state and hearing an indication that you are on hold mean that Cisco Unity Connection is supervising the transfer.
- Step 6** Confirm that, after three rings, you hear the greeting for the test user. Hearing the greeting means that Cisco Unity Connection successfully recalled the supervised-transfer call.
- Step 7** During the greeting, hang up Phone 2.
- Step 8** On the Port Status Monitor, confirm that the state of the port handling the call changes to “Idle.” This state means that the port was successfully released when the call ended.
- Step 9** Exit the Port Status Monitor.
-

To Delete the Test User

- Step 1** In Cisco Unity Connection Administration, click **Users**.
- Step 2** On the Search Users page, check the check box to the left of the test user.
- Step 3** Click **Delete Selected**.
-

(Multiple Integrations Only) Adding New User Templates

When you create the first phone system integration, this phone system is automatically selected in the default user template. The users that you add after creating this phone system integration will be assigned to this phone system by default.

However, for each additional phone system integration that you create, you must add the applicable new user templates that will assign users to the new phone system. You must add the new templates before you add new users who will be assigned to the new phone system.

For details on adding new user templates, refer to the “Adding, Changing, or Deleting an Account Template” chapter in the *Cisco Unity Connection User Moves, Adds, and Changes Guide* at http://www.cisco.com/en/US/products/ps6509/prod_maintenance_guides_list.html.


For details on selecting a user template when adding a new user, refer to the applicable chapter for adding user accounts in the *Cisco Unity Connection User Moves, Adds, and Changes Guide* at http://www.cisco.com/en/US/products/ps6509/prod_maintenance_guides_list.html.

Changing the Settings for an Existing Integration

After the integration is set up, if you want to change any of its settings (for example, to change the MWI settings), do the following procedure.

If you want to change the number of voice messaging ports, see the [Changing the Number of Voice Messaging Ports, page 24](#).

To Change the Settings for an Integration

-
- Step 1** Log on to Cisco Unity Connection Administration.
- Step 2** In Cisco Unity Connection Administration, expand **Telephony Integrations**.
- Step 3** Click the applicable location:
- **Phone System**
 - **Port Group**
 - **Port**
- Step 4** On the Search page, click the phone system, port group, or port for which you want to change settings.
- Step 5** Enter new settings in the fields that you want to change.
-  **Caution** If you are adding or removing voice messaging ports, make sure you change the settings for the individual ports so that there are an appropriate number of ports set to answer calls and an appropriate number of ports set to dial out.
-
- Step 6** Click **Save**.
- Step 7** If prompted to restart Cisco Unity Connection, in the Windows task bar, right-click the **Cisco Unity Connection** icon and click **Restart > Voice Processing Server Role**.
- Step 8** When prompted to confirm stopping the Voice Processing server role, click **Yes**.
- Step 9** In Cisco Unity Connection Administration, in the Related Links drop-down list, click **Check Telephony Configuration** and click **Go** to confirm the phone system integration settings.

If the test is not successful, the Task Execution Results displays one or more messages with troubleshooting steps. After correcting the problems, test the connection again.

- Step 10** In the Task Execution Results window, click **Close**.
- Step 11** Log off Cisco Unity Connection Administration.
-

Changing the Number of Voice Messaging Ports

To change the number of voice messaging ports in Cisco CallManager and in Cisco Unity Connection for an existing integration, do the following procedures.

To Change the Number of Voice Mail Ports in Cisco CallManager Administration

- Step 1** On the Cisco CallManager server, use Cisco Voice Mail Port Wizard to change the number of voice mail ports. Refer to the following:
- To add voice mail ports in Cisco CallManager Administration by using the Cisco Voice Mail Port Wizard, see the [“To Add Voice Mail Ports to Cisco CallManager” procedure on page 10](#).
 - To remove voice mail ports in Cisco CallManager Administration by using the Cisco Voice Mail Port Wizard, refer to the Cisco CallManager Administration Help.
-

If you are adding voice messaging ports, do the [“To Add Voice Messaging Ports in Cisco Unity Connection Administration” procedure on page 24](#).

If you are deleting voice messaging ports, do the [“To Delete Voice Messaging Ports in Cisco Unity Connection Administration” procedure on page 25](#).

To Add Voice Messaging Ports in Cisco Unity Connection Administration

- Step 1** If the Cisco Unity Connection license does not enable the additional voice messaging ports you added, see your sales representative to request the applicable license.
- Step 2** When you have the license, log on to Cisco Unity Connection Administration.
- Step 3** In Cisco Unity Connection Administration, expand **System Settings**, then click **Licenses**.
- Step 4** On the Search License page, on the Licenses menu, click **New License**.
- Step 5** On the Upload License File page, click **Browse**.
- Step 6** In the Choose File dialog box, browse to license file and click **Open**.
- Step 7** On the Upload License File page, click **Submit**.
- Step 8** On the Search Licenses page, check the check box next to the license file that you uploaded in [Step 7](#) and click **Install Selected**.
- Step 9** In Cisco Unity Connection Administration, expand **Telephony Integrations**, then click **Port**.
- Step 10** On the Search Ports page, under Port Search Results, click **Add New**.
- Step 11** On the New Port page, enter the applicable settings and click **Save**.

**Caution**

Make sure that there are an appropriate number of ports set to answer calls and an appropriate number of ports set to dial out. Otherwise, the integration will not function correctly. For details, see to the “Planning How the Voice Messaging Ports Will be Used by Cisco Unity Connection” section.

-
- Step 12** If prompted to restart Cisco Unity Connection, in the Windows task bar, right-click the **Cisco Unity Connection** icon and click **Restart > Voice Processing Server Role**.
- Step 13** When prompted to confirm stopping the Voice Processing server role, click **Yes**.
- Step 14** In Cisco Unity Connection Administration, in the Related Links drop-down list, click **Check Telephony Configuration** and click **Go** to confirm the phone system integration settings.
- If the test is not successful, the Task Execution Results displays one or more messages with troubleshooting steps. After correcting the problems, test the connection again.
- Step 15** In the Task Execution Results window, click **Close**.
- Step 16** Log off Cisco Unity Connection Administration.
-

To Delete Voice Messaging Ports in Cisco Unity Connection Administration

-
- Step 1** Log on to the Cisco Unity Connection Administration.
- Step 2** Go to the **Telephony Integrations > Ports** page.
- Step 3** Under Port Search Results, check the check boxes next to the voice messaging ports that you want to delete.
- Step 4** Click **Delete Selected**.
- Step 5** For the remaining voice messaging ports in the port group, change the settings as necessary so that there are an appropriate number of voice messaging ports set to answer calls and an appropriate number of voice messaging ports set to dial out.
- Step 6** In the Windows task bar, right-click the **Cisco Unity Connection** icon and click **Restart > Voice Processing Server Role**.
- Step 7** When prompted to confirm stopping the Voice Processing server role, click **Yes**.
- Step 8** In Cisco Unity Connection Administration, in the Related Links drop-down list, click **Check Telephony Configuration** and click **Go** to confirm the phone system integration settings.
- If the test is not successful, the Task Execution Results displays one or more messages with troubleshooting steps. After correcting the problems, test the connection again.
- Step 9** In the Task Execution Results window, click **Close**.
- Step 10** Log off the Cisco Unity Connection Administration.
-

Deleting an Existing Phone System Integration

If you want to delete an existing phone system integration (for example, you have replaced the phone system with which Cisco Unity Connection originally integrated), confirm that the following items are deleted or associated to another phone system:

- Users (including MWI devices and notification devices) who are associated with the phone system that you want to delete.

To see a list of users associated with the phone system, in Cisco Unity Connection Administration, expand **Telephony Integrations > Phone System**; click the name of the phone system; on the Phone System Basics page, on the Edit menu, click **Phone System Associations**.

- User templates that are associated with the phone system that you want to delete.
- System call handlers that are associated with the phone system that you want to delete.
- Call handler templates that are associated with the phone system that you want to delete.

If users, user templates, call handlers, MWI devices, or notification devices are associated with this phone system, Cisco Unity Connection cannot delete the phone system.

When you attempt to delete a phone system that still has these items associated with it, a status warning will appear with a link to the Delete Phone System Wizard. This wizard will guide you to associate all items from the phone system that you want to delete to another phone system.

All users, user templates, call handlers, MWI devices and notification devices that are associated with a phone system must be reassigned before the phone system can be deleted.



Note

You can see a list of users who are associated with a phone system on the Phone System Associations page for the phone system. To view Phone System Associations page, on the Phone System Basics page, click **Phone System Associations** on the Edit menu.

It is not necessary to delete the port groups or ports that belong to a phone system before deleting the phone system integration. The member port groups and ports will be automatically deleted with the phone system.



Note

Port groups and ports that do not belong to the phone system will not be affected when the phone system integration is deleted.

Do the following procedure.

To Delete an Existing Phone System Integration

- Step 1** Log on to Cisco Unity Connection Administration.
- Step 2** In Cisco Unity Connection Administration, expand **Telephony Integrations**, then click **Phone System**.
- Step 3** On the Search Phone Systems page, check the check box to the left of the phone system that you want to delete.
- Step 4** Click **Delete Selected**.
- Step 5** When prompted to confirm that you want to delete the phone system, click **OK**.
- Step 6** If prompted to restart Cisco Unity Connection, in the Windows task bar, right-click the **Cisco Unity Connection** icon and click **Restart > Voice Processing Server Role**.

- Step 7** When prompted to confirm stopping the Voice Processing server role, click **Yes**.
- Step 8** Log off Cisco Unity Connection Administration.

Adding a Cisco CallManager Express Server to a Cisco CallManager Phone System Integration

Cisco Unity Connection can integrate a Cisco CallManager phone system integration that has a port group of Cisco CallManager servers and a port group of a Cisco CallManager Express server. This configuration is typically used to ensure call processing functionality at a branch office when the WAN link is down.

There are, however, the following considerations:

- The version of Cisco CallManager Express and the version of the Cisco Unity-CM TSP must be a supported combination in the *Compatibility Matrix: Cisco Unity Connection, the Cisco Unity-CM TSP, Cisco CallManager, and Cisco CallManager Express* at http://www.cisco.com/univercd/cc/td/doc/product/voice/c_unity/cmptblty/tspmtrx.htm.
- The Cisco CallManager phone system integration is typically already created before adding the Cisco CallManager Express server.
- The Cisco CallManager Express server is in its own port group, which is separate from the port group for the Cisco CallManager servers.
- The Cisco CallManager Express port group has its own voice messaging ports that connect only to the Cisco CallManager Express server.

To add a Cisco CallManager Express server to a Cisco CallManager phone system integration, do the following procedure.

To Add a Cisco CallManager Express Server to a Cisco CallManager Phone System Integration

- Step 1** Log on to Cisco Unity Connection Administration.
- Step 2** In Cisco Unity Connection Administration, expand **Telephony Integrations**, then click **Port Group**.
- Step 3** On the Search Port Groups page, under Port Group Search Results, click **Add New**.
- Step 4** On the New Port Group page, enter the following settings.

Table 16 Settings for the Cisco CallManager Express Server

Field	Setting
Display Name	Enter the display name for the port group. Accept the default name, which is composed of the phone system display name followed by an incrementing number, or enter another descriptive name.
Phone System	Click the name of the Cisco CallManager phone system.
Create From	Click Port Group Template and, in the drop-down box, click SCCP - Skinny Client Control Protocol .

Table 16 Settings for the Cisco CallManager Express Server (continued)

Field	Setting
Device Name Prefix	Enter the prefix that was added in Cisco CallManager Express to the device name for voice messaging ports; this prefix must match the prefix used by Cisco CallManager Express.
MWI On Extension	Enter the extension that you specified in Cisco CallManager Express for turning MWIs on.
MWI Off Extension	Enter the extension that you specified in Cisco CallManager Express for turning MWIs off.
IP Address or Host Name	Enter the IP address (or host name) of the Cisco CallManager Express server that you are adding to the Cisco CallManager phone system integration.
Port	Enter the TCP port of the Cisco CallManager Express server that you are adding to the Cisco CallManager phone system integration. We recommend that you use the default setting.
TLS Port	Enter the TLS port of the Cisco CallManager Express server that you are adding to the Cisco CallManager phone system integration. We recommend that you use the default setting.

Step 5 Click **Save**.

Step 6 On the Port Group Basics page, on the Edit menu, click **Servers**.

Step 7 On the Edit Servers page, in the Server Type field, click **Cisco CallManager Express**.



Note You can click **Ping** to verify the IP address of the Cisco CallManager Express server.

Step 8 Click **Save**.

Step 9 On the Edit menu, click **Advanced Settings**.

Step 10 On the Edit Advanced Settings page, in the Delay Before Opening Greeting field, enter **1000** and click **Save**.

Step 11 In Cisco Unity Connection Administration, expand **Telephony Integrations**, then click **Port**.

Step 12 On the Search Ports page, under Port Search Results, click **Add New**.

Step 13 On the New Port page, enter the following settings.

Table 17 Settings for the New Port Page

Field	Setting
Number of Ports	Enter the number of voice messaging ports that you want to create on Cisco Unity Connection for connecting to the Cisco CallManager Express server.
Phone System	Click the display name of the Cisco CallManager phone system integration.
Port Group	Click the display name of the port group that you created for the Cisco CallManager Express server in Step 5 .

Step 14 Click **Save**.

- Step 15** On the Search Ports page, click the display name of the first voice messaging port that you created for the Cisco CallManager Express port group.



Note By default, the display names for the voice messaging ports are composed of the port group display name followed by incrementing numbers.

- Step 16** On the Port Basics page, set the voice messaging port settings as applicable. The fields in the following table are the ones that you can change.

Table 18 *Settings for the Voice Messaging Ports*

Field	Considerations
Enabled	Check this check box to enable the port. The port is enabled during normal operation. Uncheck this check box to disable the port. When the port is disabled, calls to the port get a ringing tone but are not answered. Typically, the port is disabled only by the installer during testing.
Extension	Enter the extension for the port as assigned on the phone system.
Answer Calls	Check this check box to designate the port for answering calls. These calls can be incoming calls from unidentified callers or from users.
Perform Message Notification	Check this check box to designate the port for notifying users of messages. Assign Perform Message Notification to the least busy ports.
Send MWI Requests	Check this check box to designate the port for turning MWIs on and off. Assign Send MWI Requests to the least busy ports.
Allow TRAP Connections	Check this check box so that users can use the phone as a recording and playback device in Cisco Unity Connection web applications and e-mail clients. Assign Allow TRAP Connections to the least busy ports.
Outgoing Hunt Order	Enter the priority order in which Cisco Unity Connection will use the ports when dialing out (for example, if the Perform Message Notification, Send MWI Requests, or Allow TRAP Connections check box is checked). The highest numbers are used first. However, when multiple ports have the same Outgoing Hunt Order number, Cisco Unity Connection will use the port that has been idle the longest.
Security Mode	Click Non-secure . (Cisco CallManager authentication and encryption are not available.)

- Step 17** Click **Save**.
- Step 18** Click **Next**.
- Step 19** Repeat [Step 16](#) through [Step 18](#) for all remaining voice messaging ports in the Cisco CallManager Express port group.
- Step 20** In the Windows task bar, right-click the **Cisco Unity Connection** icon and click **Restart > Voice Processing Server Role**.
- Step 21** When prompted to confirm stopping the Voice Processing server role, click **Yes**.
- Step 22** In Cisco Unity Connection Administration, in the Related Links drop-down list, click **Test Port Group** and click **Go** to confirm the Cisco CallManager port group settings.
- Step 23** When prompted that the test will terminate call in progress, click **OK**.

If the test is not successful, the Task Execution Results displays one or more messages with troubleshooting steps. After correcting the problems, test the connection again.

Step 24 In the Task Execution Results window, click **Close**.

Step 25 Log off Cisco Unity Connection Administration.

Appendix: Using Alternate Extensions and MWIs

Alternate Extensions

On the New Phone Number page for a user, you can assign up to nine alternate extensions for the user. (The primary extension is the one that you assign to each user when the user is added to Cisco Unity Connection.)

Reasons to Use Alternate Extensions

There are several reasons that you may want to specify alternate extensions for users. For example, if you have more than one Cisco Unity Connection server that accesses a single, corporate-wide directory, you may want to use alternate extensions to simplify addressing messages to users at the different locations. With alternate extensions, the number that a user enters when addressing a message to someone at another location can be the same number that the user dials when calling. You may also want to use alternate extensions to:

- Handle multiple line appearances on user phones.
- Offer easy message access on direct calls from a cell phone, home phone, or phone at an alternate work site (assuming that the phone number is passed along to Cisco Unity Connection from these other phone systems). In addition, when such phones are used as alternate extensions, and are set to forward to Cisco Unity Connection, callers can listen to the user greeting and leave messages for the user just as they would when dialing the primary extension for the user.
- Enable URL-based extensions in Cisco Unity Connection for an integration with a SIP phone system.

How Alternate Extensions Work

Before you set up alternate extensions, review the following list for information on how alternate extensions work:

- Alternate extensions cannot exceed 30 characters in length. By default, each administrator-defined alternate extension must be at least 3 characters in length, while user-defined alternate extensions must be at least 10 characters.
- Cisco Unity Connection Administration will not accept an extension that is already assigned to another user (either as a primary or alternate extension), or to a public distribution list, call handler, directory handler, or interview handler. Cisco Unity Connection verifies that each alternate extension is unique—up to the dialing domain level, if applicable—before allowing either an administrator or a user to create it.
- All alternate extensions use the same transfer settings as the primary extension.

- In many cases, Cisco Unity Connection can activate a message waiting indicator (MWI) for an alternate extension. However, depending on the phones and phone systems involved, some additional phone system programming may be required to set this up.

Setting Up Alternate Extensions

Do the applicable procedure to add, modify, or delete alternate extensions:

- [To Add Administrator-Defined Alternate Extensions, page 31](#)
- [To Modify Alternate Extensions, page 31](#)
- [To Delete Alternate Extensions, page 32](#)

To Add Administrator-Defined Alternate Extensions

-
- Step 1** In Cisco Unity Connection Administration, click **User**.
- Step 2** On the Search Users page, click the user for whom you want to add an alternate extension.
- Step 3** On the Edit menu, click **Phone Numbers**.
- Step 4** On the Phone Numbers page, click **Add New**.
- Step 5** On the New Phone Number page, enter the following settings.

Table 19 *Settings for the New Phone Number Page*

Field	Setting
Phone Type	Click the type of phone that will use the extension.
Display Name	Enter a description of the extension.
Phone Number	Enter the extension. When entering characters, consider the following: <ul style="list-style-type: none"> • You can enter an extension up to 30 characters in length. (SIP integrations can use up to 30 alphanumeric characters.) • Each extension must be unique—up to the dialing domain level, if applicable. • Enter digits 0 through 9. Do not use spaces, dashes, or parentheses.

- Step 6** Click **Save**.
- Step 7** Repeat [Step 3](#) through [Step 6](#) as necessary.
-

To Modify Alternate Extensions

-
- Step 1** In Cisco Unity Connection Administration, click **User**.
- Step 2** On the Search Users page, click the user for whom you want to modify an alternate extension.
- Step 3** On the Edit menu, click **Phone Numbers**.
- Step 4** On the Phone Numbers page, click the alternate extension that you want to change.
- Step 5** On the Phone Number page, in the Phone Number field, change the extension and click **Save**.

Step 6 Repeat [Step 3](#) through [Step 5](#) as necessary.

To Delete Alternate Extensions

Step 1 In Cisco Unity Connection Administration, click **User**.

Step 2 On the Search Users page, click the user for whom you want to delete an alternate extension.

Step 3 On the Edit menu, click **Phone Numbers**.

Step 4 On the Phone Numbers page, check the check box next to the extensions that you want to delete.

Step 5 Click **Delete Selected**.

Alternate MWIs

You can set up Cisco Unity Connection to activate alternate MWIs when you want a new message for a user to activate the MWIs at up to 10 extensions. For example, a message left at extension 1001 can activate the MWIs on extensions 1001 and 1002.

Cisco Unity Connection uses MWIs to alert the user to new voice messages. MWIs are not used to indicate new e-mail, fax, or return receipt messages.

Setting Up Alternate MWIs

Cisco Unity Connection can activate alternate MWIs. Note that depending on the phones and phone systems, some additional phone system programming may be necessary. Refer to the installation guide for the phone system.

Do the applicable procedure to add, modify, or delete alternate MWIs:

- [To Add Alternate MWIs for Extensions, page 32](#)
- [To Modify Alternate MWIs, page 33](#)
- [To Delete Alternate MWIs, page 34](#)

To Add Alternate MWIs for Extensions

Step 1 In Cisco Unity Connection Administration, click **User**.

Step 2 On the Search Users page, click the user for whom you want to add an alternate MWI.

Step 3 On the Edit menu, click **Message Waiting Indicators**.

Step 4 On the Message Waiting Indicators page, click **Add New**.

Step 5 Enter the following settings.

Table 20 Settings for the New Message Waiting Indicator Page

Field	Setting
Enabled	Check the check box.
Display Name	Enter a description of the MWI.
Extension	Enter the extension for the MWI. When entering characters, consider the following: <ul style="list-style-type: none"> • Enter digits 0 through 9. Do not use spaces, dashes, or parentheses. • Enter , (comma) to insert a one-second pause. • Enter # and * to correspond to the # and * keys on the phone.
Phone System	Click the name of the phone system that the extension is assigned to.
Current Status	<i>(Display only)</i> The indication whether the MWI is currently on or off.

Step 6 Click **Save**.

Step 7 Repeat [Step 3](#) through [Step 6](#) as necessary.

To Modify Alternate MWIs

Step 1 In Cisco Unity Connection Administration, click **User**.

Step 2 On the Search Users page, click the user for whom you want to change an alternate MWI.

Step 3 On the Edit menu, click **Message Waiting Indicators**.

Step 4 On the Message Waiting Indicators page, click the MWI that you want to change.

Step 5 On the Edit Message Waiting Indicator page, change the applicable settings.

Table 21 Settings for the New Message Waiting Indicator Page

Field	Setting
Enabled	Check or uncheck the check box as applicable.
Display Name	Revise the description of the MWI.
Extension	Revise the extension for the MWI. When entering characters, consider the following: <ul style="list-style-type: none"> • Enter digits 0 through 9. Do not use spaces, dashes, or parentheses. • Enter , (comma) to insert a one-second pause. • Enter # and * to correspond to the # and * keys on the phone.
Phone System	Click the name of the phone system that the extension is assigned to.
Current Status	<i>(Display only)</i> The indication whether the MWI is currently on or off.

Step 6 Click **Save**.

Step 7 Repeat [Step 3](#) through [Step 6](#) as necessary.

To Delete Alternate MWIs

-
- Step 1** In Cisco Unity Connection Administration, click **User**.
- Step 2** On the Search Users page, click the user for whom you want to delete an alternate MWI.
- Step 3** On the Edit menu, click **Message Waiting Indicators**.
- Step 4** On the Message Waiting Indicators page, check the check boxes next to the MWIs that you want to delete.
- Step 5** Click **Delete Selected**.
-

Appendix: Documentation and Technical Assistance

Conventions

The *Cisco CallManager 3.3 Integration Guide for Cisco Unity Connection 1.1* uses the following conventions.

Table 22 *Cisco CallManager 3.3 Integration Guide for Cisco Unity Connection 1.1 Conventions*

Convention	Description
boldfaced text	Boldfaced text is used for: <ul style="list-style-type: none"> Key and button names. (Example: Click OK.) Information that you enter. (Example: Enter Administrator in the User Name box.)
< > (angle brackets)	Angle brackets are used around parameters for which you supply a value. (Example: In the Command Prompt window, enter ping <IP address> .)
- (hyphen)	Hyphens separate keys that must be pressed simultaneously. (Example: Press Ctrl-Alt-Delete .)
> (right angle bracket)	A right angle bracket is used to separate selections that you make: <ul style="list-style-type: none"> On menus. (Example: On the Windows Start menu, click Settings > Control Panel > Phone and Modem Options.) In the navigation bar of Cisco Unity Connection Administration. (Example: In Cisco Unity Connection Administration, expand System Settings > Advanced.)
[x] (square brackets)	Square brackets enclose an optional element (keyword or argument). (Example: [reg-e164])

Table 22 Cisco CallManager 3.3 Integration Guide for Cisco Unity Connection 1.1 Conventions

Convention	Description
[x y] (vertical line)	Square brackets enclosing keywords or arguments separated by a vertical line indicate an optional choice. (Example: [transport tcp transport udp])
{x y} (braces)	Braces enclosing keywords or arguments separated by a vertical line indicate a required choice. (Example: {tcp udp})

The *Cisco CallManager 3.3 Integration Guide for Cisco Unity Connection 1.1* also uses the following conventions:

**Note**

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the document.

**Caution**

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

For descriptions and URLs of Cisco Unity Connection documentation on Cisco.com, see the *About Cisco Unity Connection Documentation*. The document is shipped with Cisco Unity Connection and is available at

http://www.cisco.com/en/US/products/ps6509/products_documentation_roadmaps_list.html.

Obtaining Documentation

Cisco documentation and additional literature are available on Cisco.com. Cisco also provides several ways to obtain technical assistance and other technical resources. These sections explain how to obtain technical information from Cisco Systems.

Cisco.com

You can access the most current Cisco documentation at this URL:

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

You can access the Cisco website at this URL:

<http://www.cisco.com>

You can access international Cisco websites at this URL:

http://www.cisco.com/public/countries_languages.shtml

Product Documentation DVD

Cisco documentation and additional literature are available in the Product Documentation DVD package, which may have shipped with your product. The Product Documentation DVD is updated regularly and may be more current than printed documentation.

The Product Documentation DVD is a comprehensive library of technical product documentation on portable media. The DVD enables you to access multiple versions of hardware and software installation, configuration, and command guides for Cisco products and to view technical documentation in HTML. With the DVD, you have access to the same documentation that is found on the Cisco website without being connected to the Internet. Certain products also have .pdf versions of the documentation available.

The Product Documentation DVD is available as a single unit or as a subscription. Registered Cisco.com users (Cisco direct customers) can order a Product Documentation DVD (product number DOC-DOCDVD=) from Cisco Marketplace at this URL:

<http://www.cisco.com/go/marketplace/>

Ordering Documentation

Beginning June 30, 2005, registered Cisco.com users may order Cisco documentation at the Product Documentation Store in the Cisco Marketplace at this URL:

<http://www.cisco.com/go/marketplace/>

Nonregistered Cisco.com users can order technical documentation from 8:00 a.m. to 5:00 p.m. (0800 to 1700) PDT by calling 1 866 463-3487 in the United States and Canada, or elsewhere by calling 011 408 519-5055. You can also order documentation by e-mail at tech-doc-store-mkpl@external.cisco.com or by fax at 1 408 519-5001 in the United States and Canada, or elsewhere at 011 408 519-5001.

Documentation Feedback

You can rate and provide feedback about Cisco technical documents by completing the online feedback form that appears with the technical documents on Cisco.com.

You can send comments about Cisco documentation to bug-doc@cisco.com.

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

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

We appreciate your comments.

Cisco Product Security Overview

Cisco provides a free online Security Vulnerability Policy portal at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

From this site, you can perform these tasks:

- Report security vulnerabilities in Cisco products.
- Obtain assistance with security incidents that involve Cisco products.
- Register to receive security information from Cisco.

A current list of security advisories and notices for Cisco products is available at this URL:

<http://www.cisco.com/go/psirt>

If you prefer to see advisories and notices as they are updated in real time, you can access a Product Security Incident Response Team Really Simple Syndication (PSIRT RSS) feed from this URL:

http://www.cisco.com/en/US/products/products_psirt_rss_feed.html

Reporting Security Problems in Cisco Products

Cisco is committed to delivering secure products. We test our products internally before we release them, and we strive to correct all vulnerabilities quickly. If you think that you might have identified a vulnerability in a Cisco product, contact PSIRT:

- Emergencies—security-alert@cisco.com

An emergency is either a condition in which a system is under active attack or a condition for which a severe and urgent security vulnerability should be reported. All other conditions are considered nonemergencies.

- Nonemergencies—psirt@cisco.com

In an emergency, you can also reach PSIRT by telephone:

- 1 877 228-7302
- 1 408 525-6532



We encourage you to use Pretty Good Privacy (PGP) or a compatible product to encrypt any sensitive information that you send to Cisco. PSIRT can work from encrypted information that is compatible with PGP versions 2.x through 8.x.

Never use a revoked or an expired encryption key. The correct public key to use in your correspondence with PSIRT is the one linked in the Contact Summary section of the Security Vulnerability Policy page at this URL:

http://www.cisco.com/en/US/products/products_security_vulnerability_policy.html

The link on this page has the current PGP key ID in use.

Obtaining Technical Assistance

Cisco Technical Support provides 24-hour-a-day award-winning technical assistance. The Cisco Technical Support & Documentation website on Cisco.com features extensive online support resources. In addition, if you have a valid Cisco service contract, Cisco Technical Assistance Center (TAC) engineers provide telephone support. If you do not have a valid Cisco service contract, contact your reseller.

Cisco Technical Support & Documentation Website

The Cisco Technical Support & Documentation website provides online documents and tools for troubleshooting and resolving technical issues with Cisco products and technologies. The website is available 24 hours a day, at this URL:

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

Access to all tools on the Cisco Technical Support & Documentation website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register at this URL:

<http://tools.cisco.com/RPF/register/register.do>

**Note**

Use the Cisco Product Identification (CPI) tool to locate your product serial number before submitting a web or phone request for service. You can access the CPI tool from the Cisco Technical Support & Documentation website by clicking the **Tools & Resources** link under Documentation & Tools. Choose **Cisco Product Identification Tool** from the Alphabetical Index drop-down list, or click the **Cisco Product Identification Tool** link under Alerts & RMAs. The CPI tool offers three search options: by product ID or model name; by tree view; or for certain products, by copying and pasting **show** command output. Search results show an illustration of your product with the serial number label location highlighted. Locate the serial number label on your product and record the information before placing a service call.

Submitting a Service Request

Using the online TAC Service Request Tool is the fastest way to open S3 and S4 service requests. (S3 and S4 service requests are those in which your network is minimally impaired or for which you require product information.) After you describe your situation, the TAC Service Request Tool provides recommended solutions. If your issue is not resolved using the recommended resources, your service request is assigned to a Cisco engineer. The TAC Service Request Tool is located at this URL:

<http://www.cisco.com/techsupport/servicerequest>

For S1 or S2 service requests or if you do not have Internet access, contact the Cisco TAC by telephone. (S1 or S2 service requests are those in which your production network is down or severely degraded.) Cisco engineers are assigned immediately to S1 and S2 service requests to help keep your business operations running smoothly.

To open a service request by telephone, use one of the following numbers:

Asia-Pacific: +61 2 8446 7411 (Australia: 1 800 805 227)

EMEA: +32 2 704 55 55

USA: 1 800 553-2447

For a complete list of Cisco TAC contacts, go to this URL:

<http://www.cisco.com/techsupport/contacts>

Definitions of Service Request Severity

To ensure that all service requests are reported in a standard format, Cisco has established severity definitions.

Severity 1 (S1)—Your network is “down,” or there is a critical impact to your business operations. You and Cisco will commit all necessary resources around the clock to resolve the situation.

Severity 2 (S2)—Operation of an existing network is severely degraded, or significant aspects of your business operation are negatively affected by inadequate performance of Cisco products. You and Cisco will commit full-time resources during normal business hours to resolve the situation.

Severity 3 (S3)—Operational performance of your network is impaired, but most business operations remain functional. You and Cisco will commit resources during normal business hours to restore service to satisfactory levels.

Severity 4 (S4)—You require information or assistance with Cisco product capabilities, installation, or configuration. There is little or no effect on your business operations.

Obtaining Additional Publications and Information

Information about Cisco products, technologies, and network solutions is available from various online and printed sources.

- Cisco Marketplace provides a variety of Cisco books, reference guides, documentation, and logo merchandise. Visit Cisco Marketplace, the company store, at this URL:

<http://www.cisco.com/go/marketplace/>

- *Cisco Press* publishes a wide range of general networking, training and certification titles. Both new and experienced users will benefit from these publications. For current Cisco Press titles and other information, go to Cisco Press at this URL:

<http://www.ciscopress.com>

- *Packet* magazine is the Cisco Systems technical user magazine for maximizing Internet and networking investments. Each quarter, Packet delivers coverage of the latest industry trends, technology breakthroughs, and Cisco products and solutions, as well as network deployment and troubleshooting tips, configuration examples, customer case studies, certification and training information, and links to scores of in-depth online resources. You can access Packet magazine at this URL:

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

- *iQ Magazine* is the quarterly publication from Cisco Systems designed to help growing companies learn how they can use technology to increase revenue, streamline their business, and expand services. The publication identifies the challenges facing these companies and the technologies to help solve them, using real-world case studies and business strategies to help readers make sound technology investment decisions. You can access iQ Magazine at this URL:

<http://www.cisco.com/go/iqmagazine>

or view the digital edition at this URL:

<http://cisoiq.texterity.com/cisoiq/sample/>

- *Internet Protocol Journal* is a quarterly journal published by Cisco Systems for engineering professionals involved in designing, developing, and operating public and private internets and intranets. You can access the Internet Protocol Journal at this URL:

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

- Networking products offered by Cisco Systems, as well as customer support services, can be obtained at this URL:

<http://www.cisco.com/en/US/products/index.html>

- Networking Professionals Connection is an interactive website for networking professionals to share questions, suggestions, and information about networking products and technologies with Cisco experts and other networking professionals. Join a discussion at this URL:

<http://www.cisco.com/discuss/networking>

- World-class networking training is available from Cisco. You can view current offerings at this URL:

<http://www.cisco.com/en/US/learning/index.html>

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