CHAPTER 18

Quality Report Tool

The Quality Report Tool (QRT), a voice-quality and general problem-reporting tool for Cisco Unified IP Phones, acts as a service that allows users to easily and accurately report audio and other general problems with their IP phone. QRT automatically loads with the Cisco Unified CallManager installation, and the Cisco Extended Functions (CEF) service supports it. (For more information about the Cisco Extended Functions service, refer to the *Cisco Unified CallManager Serviceability System Guide* and the *Cisco Unified CallManager Serviceability Administration Guide*.)

As system administrator, you can enable QRT functionality by creating, configuring, and assigning a softkey template to associate the QRT softkey on a user's IP phone. You can choose from two different user modes, depending upon the amount of user interaction with QRT that is desired.

Note The system gives users with administrator privileges the authorization to configure QRT and view the reports.

This chapter provides the following information about configuring and using the QRT feature:

Introducing Quality Report Tool

When you install Cisco Unified CallManager, the Cisco Extended Functions service installs and loads the QRT functionality on the Cisco Unified CallManager server.

Then, as system administrator, you enable the QRT feature through the use of softkey templates and define how the feature will work in your system by configuring system parameters and setting up Cisco Unified CallManager Serviceability tools. You can then create, customize, and view phone problem reports by using the QRT Viewer application. (The system includes the QRT Viewer application as part of the Cisco Unified CallManager Serviceability Real-Time Monitoring Tool. See the "Using the QRT Viewer" section on page 18-26 for more information.)

You can configure QRT availability for up to four different call states and choose from two different user modes. The user modes determine the level of user interaction that is enabled with QRT and allow either detailed voice-quality reports or more general phone problem reports and relevant statistics. (See the "Extended Menu Choices" section on page 18-9 for more information.)

When users experience problems with their IP phones, they can invoke this feature by pressing the QRT softkey on their Cisco Unified IP Phone during one of the following call states:

- Connected
- Connected Conference
- Connected Transfer
- On Hook

From a supported call state, and using the appropriate problem classification category, users can then choose the reason code that best describes the problem that they are experiencing with their IP phone. See the "Problem Classification Categories and Reason Codes" section on page 18-10 for specific information about problem categories, reason codes, and supported call states.

The Quality Report Tool comprises several key components. The following sections provide information about these components and the architecture of the QRT feature:

Additional Information

See the "Related Topics" section on page 18-32.

Components of QRT

QRT, a multitiered, web-based application, includes the following key components:

- Client Components
  - IP phone browser for end-user interface
  - Cisco Unified CallManager Administration windows for feature and tools configuration and viewer application
- Server Components
  - Cisco Extended Functions service
  - Cisco Unified CallManager for skinny messages
  - CTIManager for QBE messages

  - Database for configuration data and device data
  - Cisco RIS Data Collector for runtime device-related information
  - Alarm interface
  - System Diagnostic Interface (SDI) trace
- Service—Cisco Extended Functions service for collecting and managing user reports. It also handles the user interface on the IP phone as well as notifying Cisco RIS Data Collector for alerts and issuing SNMP traps.
- Viewer Application—The QRT Viewer application, which is included as part of the trace collection feature in the Cisco Real-Time Monitoring Tool (RTMT), allows you to filter, format, and view generated reports. Reports automatically open in the QRT Viewer when you view a trace file that includes QRT information.

Additional Information

See the "Related Topics" section on page 18-32.

Overview of QRT Architecture

The QRT feature uses the Cisco Extended Functions service, which comprises the following interfaces:

- Cisco CTIManager Interface (QBEHelper), page 18-4
- Cisco Unified CallManager Database Interface (DBL Library), page 18-4
- Screen Helper and Dictionary, page 18-4
- Redundancy Manager, page 18-4
- DB Change Notifier, page 18-5
- SDI Trace and Alarm, page 18-5

The Cisco Extended Functions service interfaces with the phone by using the XML services interface (XSI) over skinny protocol (a protocol that is used between a Cisco Unified IP Phone and Cisco Unified CallManager) and the Quick Byte Encoding protocol (a protocol that is used between the Cisco CTIManager and TSP/JTAPI).

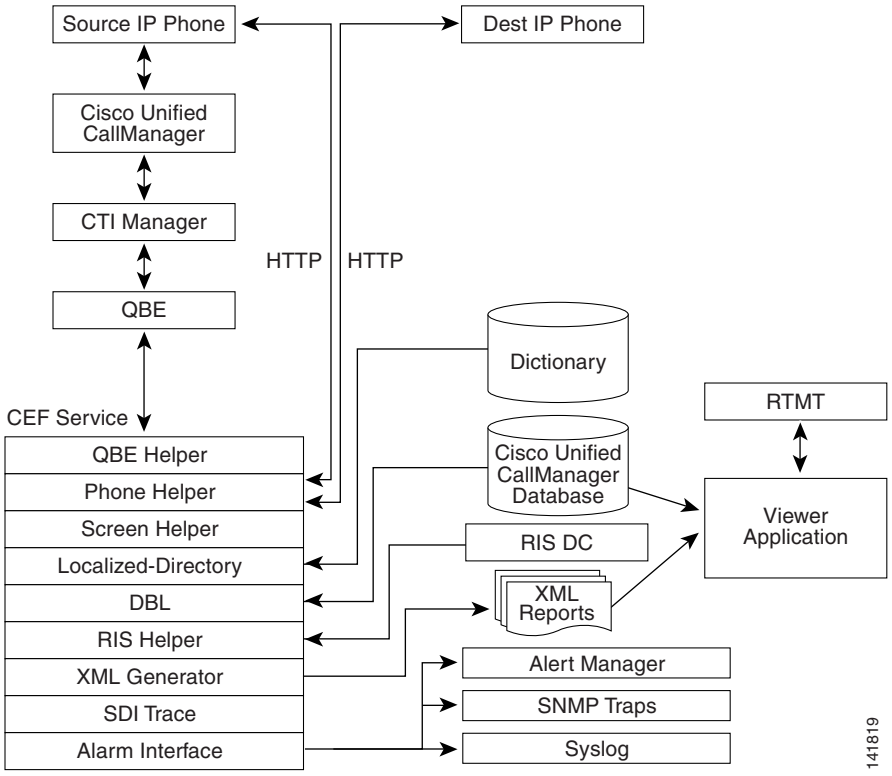
When a user presses the QRT softkey, QRT opens the device and presents up to four different screens that display problem categories and associated reason codes to obtain user feedback.

After the user chooses the option that best describes the problem, the system logs the feedback in the XML file; the system then issues alarms to notify the Cisco RIS Data Collector to generate alerts and SNMP traps. When QRT detects that user interaction is complete, it then closes the device.

Note The actual information that is logged depends upon the user selection and whether the destination device is a Cisco Unified IP Phone.

Figure 18-1 shows an illustration of the Cisco Extended Functions service architecture.

Figure 18-1 Using the Cisco Extended Functions Service Architecture



Cisco CTIManager Interface (QBEHelper)

The QBEHelper library provides the interface that allows the Cisco Extended Functions service to communicate with a configured Cisco CTIManager.

Cisco Unified CallManager Database Interface (DBL Library)

The DBL library provides the interface that allows the Cisco Extended Functions service to perform queries on various devices that are configured and registered in the Cisco Unified CallManager database.

Screen Helper and Dictionary

The screen helper of the Cisco Extended Functions service reads the XML dictionary files and creates Document Object Model (DOM) objects for all installed locales when the CEF service starts. The system uses these DOM objects for constructing XSI screens that the Cisco Unified IP Phone needs.

Redundancy Manager

When multiple Cisco Extended Functions are active within a Cisco Unified CallManager cluster, the redundancy manager uses an algorithm to determine which CEF service is active and which is the backup CEF. The Redundancy Manager uses the lowest IP address of the server that is running the CEF service as the active service. The remaining CEF services serve as backup services.

DB Change Notifier

The DB Change Notifier handles all the database change notifications, such as service parameter changes, trace parameter changes, alarm configuration changes, and status changes of other Cisco Extended Functions services in the cluster, and reports the changes to the CEF service.

SDI Trace and Alarm

The Cisco Extended Functions service uses the SDI Trace and Alarm libraries. The libraries generate traces and alarms to the Event Viewer. The alarm library publishes information about the CEF service to Syslog, SNMP, and the Cisco RIS Data Collector service. For more information about traces and alarms, refer to the *Cisco Unified CallManager Serviceability Administration Guide*.

Additional Information

See the "Related Topics" section on page 18-32.

System Requirements for QRT

To operate, the QRT feature requires the following software components:

- Cisco CallManager 3.3 or later
- Microsoft Windows 2000 or non-Windows-based OS (client application)
- Microsoft Internet Explorer or Netscape Navigator

Support for the QRT feature extends to any model IP phone that includes the following capabilities:

- Support for softkey templates
- Support for IP phone services
- Controllable by CTI
- An internal HTTP server

Note For more information, refer to the following URL for the appropriate Cisco Unified IP Phone guide for your model IP phone: http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/index.htm.

Additional Information

See the "Related Topics" section on page 18-32.

Cisco Extended Functions Service Dependency

The Cisco Extended Functions service depends on the following services:

- Cisco Unified CallManager—Ensure a minimum of one Cisco CallManager service is running in the cluster, but the service need not be on the same server as CEF.
- Cisco CTIManager—Ensure a minimum of one Cisco CTIManager service is running in the cluster, but the service need not be on the same server as CEF.

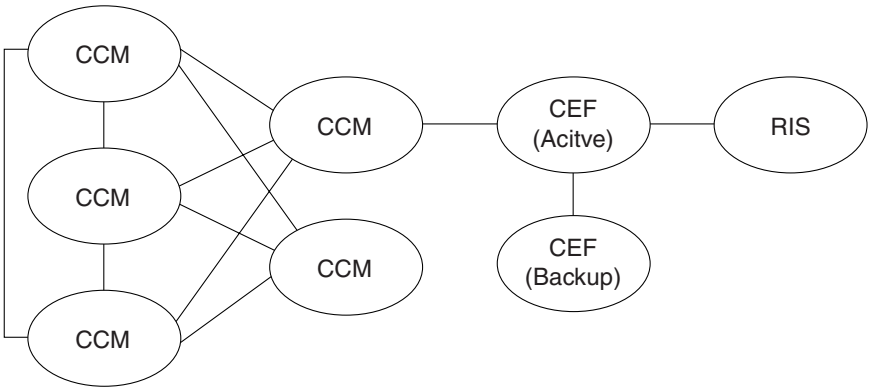
- Cisco Database Layer Monitor—Ensure one Cisco Database Layer Monitor service is running on the same server as CEF.
- Cisco RIS Data Collector—Ensure one Cisco RIS Data Collector service is running on the same server as CEF.

Note Ensure Cisco Database Layer Monitor and Cisco RIS Data Collector are running on the same server. You can include more than one CEF service in a Cisco Unified CallManager cluster.

Tip Install all the services on one server for one-server Cisco Unified CallManager systems.

Figure 18-2 shows a typical Cisco Extended Functions service configuration.

Figure 18-2 Cisco Extended Functions Service Dependency (Typical Configuration)



Additional Information

See the "Related Topics" section on page 18-32.

Multiple Cisco Extended Functions Applications in a Cluster

If multiple Cisco Extended Functions services are active within a Cisco Unified CallManager cluster, CEF uses an algorithm to determine which service should be active and to order the remaining as backups. The CEF application with the lowest IP address becomes active. The service with the next lowest IP address becomes the backup to the active service. Any remaining services act as backups to each other, beginning with the service with the next lowest IP address. If you add any new services to the cluster, CEF restarts the algorithm to determine which service will be active.

Note When a Cisco Extended Functions service gets started in a cluster, the CEF service with the lowest IP address becomes active. This process may cause service interruption for approximately 2 minutes.

To verify the directory status and Cisco Extended Functions service registration status to the Cisco CTIManager, use the Real-Time Monitoring Tool (RTMT) as described in the *Cisco Unified CallManager Serviceability Administration Guide*.

Additional Information

See the "Related Topics" section on page 18-32.

Securing a TLS Connection to CTI

QRT supports a secure Transport Layer Security (TLS) connection to CTI. Obtain the secure connection by using the "CCMQRTSecureSysUser" application user, as described in the following procedure.

Note If you enable security from the service parameters window, the QRT will open a secure connection to CTI Manager by using the Application CAPF profile. You should configure both the "CTI Manager Connection Security Flag" and the "CAPF Profile Instance Id for Secure Connection to CTI Manager" service parameters for the secure connection to succeed. See the "Setting the Cisco Extended Functions Service Parameters for QRT" section on page 18-24. For more information, refer to "Application User CAPF Profile Configuration" and "Service Parameters Configuration" in the *Cisco Unified CallManager Administration Guide*.

Note You must also configure the security service parameter "Cluster Security Mode CAPF Phone Port" to secure a TLS connection to CTI, giving it a value of 1. You can do this from **System > Enterprise Parameters** in Cisco Unified CallManager Administration. Refer to "Enterprise Parameters Configuration" in the *Cisco Unified CallManager Administration Guide*.

Perform the following procedure to configure the application user.

Procedure

Step 1 From Cisco Unified CallManager Administration, choose **User Management > Application User.**

The Find and List Application Users window displays.

Step 2 Click **Find**.

Step 3 From the Application User Configuration window, click **CCMQRTSecureSysUser** or **CCMQRTSysUser**.

Note To configure a CAPF profile, refer to "Application User CAPF Profile Configuration" in the *Cisco Unified CallManager Administration Guide*.

Additional Information

See the "Related Topics" section on page 18-32.

How to Use QRT

After you properly install and configure QRT, the QRT softkey can be configured on certain Cisco Unified IP Phone models. See the "System Requirements for QRT" section on page 18-5 for the IP phone models that are supported with QRT.

Note The Cisco Unified CallManager Standard User template does not include the QRT softkey. You must enable QRT functionality and make it available to users through the use of a QRT softkey. To do this, create, configure, and assign the QRT softkey from Cisco Unified CallManager Administration. See the "Configuring the QRT Feature" section on page 18-15 for information about setting up the softkey template.

The following sections describe the user interaction features with QRT:

For more user-related information, refer to the following URL for the appropriate Cisco Unified IP Phone guide for your phone model:
http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/index.htm.

Additional Information

See the "Related Topics" section on page 18-32.

User Interface

The QRT user interface includes several components:

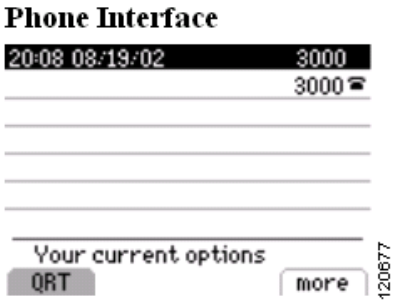
- Phone Screens—Available to all IP phones that are in the device pool where the QRT softkey is configured, the phone screen supports different locales.

  Only the Cisco Unified CallManager administrator can access the following components:

- Serviceability—See the "Configuring the Cisco Unified CallManager Serviceability Features" section on page 18-21.
- Alert Configuration—See the "Configuring Alarms and Traces for QRT" section on page 18-23.
- Service Parameters—See the "Setting the Cisco Extended Functions Service Parameters for QRT" section on page 18-24.
- Viewer Application—See the "Using the QRT Viewer" section on page 18-26.

Figure 18-3 shows an example of the QRT softkey as it displays on a Cisco Unified IP Phone.

Figure 18-3 QRT Phone Interface Display



Additional Information

See the "Related Topics" section on page 18-32.

Extended Menu Choices

Extended menu choices allow a user to interact with QRT and provide additional details regarding the phone problem that they are reporting. You can choose to enable extended menu choices or provide users with a more passive interface, depending upon the amount of information that you want users to submit.

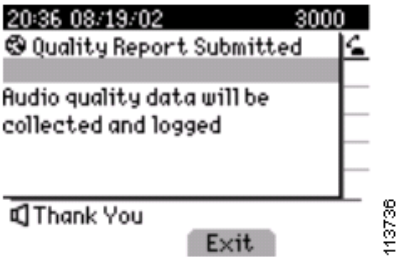
From the Cisco CallManager Service Parameters Configuration window, configure the user interface mode for QRT from the following options:

- Silent Mode—In this mode, the user does not get presented with extended menu choices. When the user presses the QRT softkey, the system collects the streaming statistics and logs the report without additional user interaction.

  The system supports silent mode only when the IP phone is in the Connected, Connected Conference, or Connected Transfer call state.

  Figure 18-4 shows an example of the QRT display as it appears in silent mode.

Figure 18-4 Submitting Voice Quality Feedback in Silent Mode

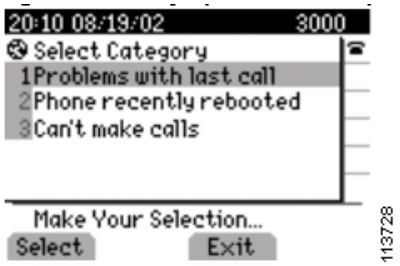


- Interview Mode—In this mode, the user gets presented with extended menu choices, which allow additional user input that is related to audio quality on the IP phone (see the "Problem Classification Categories and Reason Codes" section on page 18-10 for the applicable reason codes). This mode also allows the user to report other, non-audio-related problems such as the phone rebooting or the inability to make calls.

  The system supports interview mode only when the IP phone is in the Connected or On Hook call state.

Figure 18-5 shows an example of the QRT display as it appears when the QRT softkey is pressed while the phone is on hook and in interview mode.

Figure 18-5 QRT Phone Interface - On Hook, Interview Mode Display



Note Ensure that you configure the QRT softkey only for the supported call states.

Note Configure the "Display extended menu choices" field in the Cisco Unified CallManager Administration Service Parameters configuration window to determine whether the users can access the extended menu choices. See the "Setting the Cisco Extended Functions Service Parameters for QRT" section on page 18-24 for additional information.

Additional Information

See the "Related Topics" section on page 18-32.

Problem Classification Categories and Reason Codes

The following tables show the problem categories and corresponding reason codes that users can choose when they report problems with their IP phones.

- Additional options become available after you configure extended menu choices.
- Users can choose only one reason code per category, per problem.
- Each problem category becomes available only when the IP phone is in the supported call state.

Table 18-1 shows the supported call states and the reason codes that are available for the "Problems with current call" category.

Table 18-1 Problem Category—Problems with Current Call

Problem Category	Supported Call States	Reason Codes	Statistics
Problems with current call	• Connected • Connected Conference • Connected Transfer	• I hear echo • The remote end hears echo • Choppy audio • Robotic sound • Long delays • Low volume • The remote end experiences low volume • I can't hear the remote end • The remote end can't hear me	The system collects streaming statistics from the source and destination devices. **Note** Source device/IP phone refers to the device on which the QRT softkey gets pressed. For example, "source" and "destination" in this case do not refer to the calling party and called party in a connected call.

Figure 18-6 shows an example of the phone display as it appears after the QRT softkey is pressed on an IP phone in the connected state. This menu allows the user to provide additional details before submitting a problem with the current phone call.

Figure 18-6 Reporting Problem with the Current Call

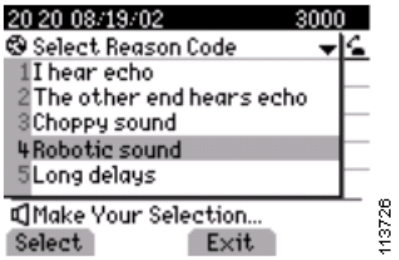


Table 18-2 shows the supported call state and the reason codes that are available for the "Problems with last call" category.

Table 18-2 Problem Category—Problems with Last Call

Problem Category	Supported Call States	Reason Codes	Statistics
Problems with last call	• On Hook	• I heard echo • The remote end heard echo • Choppy audio • Robotic sound • Long delays • Low volume on my end • Low volume on the remote end • I could not hear the remote end • The remote end could not hear me • The call dropped	The system collects streaming statistics from the source device.

Figure 18-7 shows an example of the phone display as it appears after the user selects the "Problems with last call" category. This menu allows the user to provide additional details before submitting a problem report for the last phone call.

Figure 18-7 Reporting Problem with the Last Call

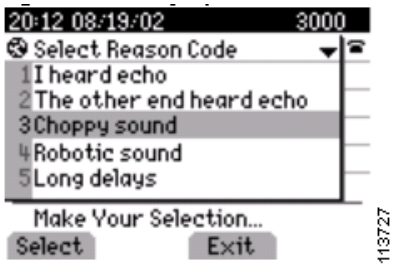


Table 18-3 shows the supported call state that is available for the "Phone recently rebooted" category. No associated reason codes exist for this category.

Table 18-3 Problem Category—Phone Recently Rebooted

Problem Category	Supported Call States	Reason Codes	Statistics
Phone recently rebooted	• On Hook	None	

Figure 18-8 shows an example of the phone display after the user chooses the "Phone recently rebooted" category. The system logs user feedback.

Figure 18-8 Reporting Problem with Phone That Recently Rebooted

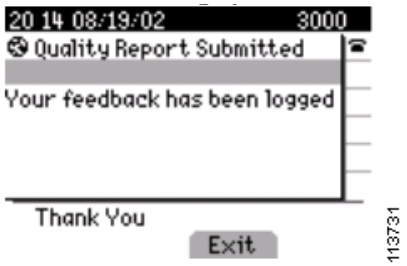


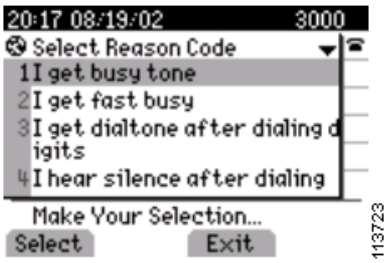
Table 18-4 shows the supported call state and the reason codes that are available for the "I can't make calls" category.

Table 18-4 Problem Category—I Can't Make Calls

Problem Category	Supported Call States	Reason Codes	Statistics
I can't make calls	• On Hook	• I get a busy tone • I get a fast busy tone • I get dialtone after dialing digits • I hear silence after dialing • I don't get dialtone	

Figure 18-9 shows an example of the phone display as it appears after the user chooses the "I can't make calls" category.

Figure 18-9 Reporting Problem with I Can't Make Calls



Note QRT collects information from various sources, such as the source IP phone, the destination IP phone, the Cisco RIS Data Collector, the Cisco Unified CallManager database, and the user. "Source" and "destination" in this case do not refer to the calling party and called party in a connected call. See the "QRT Reports" section on page 18-26 for detailed information about the fields that the phone problem report includes.

Additional Information

See the "Related Topics" section on page 18-32.

Interactions and Restrictions

The following interactions and restrictions apply when you use the QRT feature with Cisco Unified CallManager:

- Ensure that Cisco Extended Functions, Cisco CallManager, CTI Manager, and Cisco RIS Data Collector services are running and fully operational.
- As system administrator, you must create, configure, and assign softkey templates to enable the QRT softkey feature on IP phones.
- Ensure that you configure the QRT softkey only for the supported call states.
- The system makes the extended menu choices option available only when the "Display extended menu choices" service parameter is set to True; it provides support for the "Problems with current call" category.
- If another application feature (such as Cisco Call Back or Cisco Unified CallManager Assistant) or a function key (such as Settings, Directories, or Messages) is invoked while the user is interacting with QRT, or if the user does not complete the QRT selection, the system can overwrite the QRT display. In this case, the system forces the device into a wait state, which prevents QRT from completing the interaction and then closes the device.

Note Because unattended devices consume large amounts of resources and could impact CTI performance, the system configures QRT to regularly check for opened devices. You cannot modify these system settings.

- SIP phone that is configured to use UDP as the transport, instead of TCP, will not support the "device data pass-through" functionality. QRT requires the pass-through functionality, so QRT does not support these UDP-configured SIP phones.

Additional Information

See the "Related Topics" section on page 18-32.

Installing and Activating QRT Functions

As a feature within the Cisco Extended Functions service, QRT automatically installs as part of the Cisco Unified CallManager installation.

Perform the following steps after installation to enable QRT availability for users and to set up administrative reporting capabilities:

1. Properly configure the QRT feature for Cisco Unified IP Phone users. See the "Configuring the QRT Feature" section on page 18-15.
2. From Cisco Unified CallManager Serviceability, activate the Cisco Extended Functions service and configure alarms and traces for use with QRT. See the "Configuring the Cisco Unified CallManager Serviceability Features" section on page 18-21 and refer to the *Cisco Unified CallManager Serviceability Administration Guide* for additional information.
3. Define how the QRT feature will work in your system by configuring the applicable service parameters for the Cisco Extended Functions service. See the "Setting the Cisco Extended Functions Service Parameters for QRT" section on page 18-24.

4. Create, customize, and view phone problem reports by using the QRT Viewer application. See the "Using the QRT Viewer" section on page 18-26.

Note If users require the QRT feature to display (softkeys and messages on the IP phone) in any language other than English, verify that the locale installer is installed before configuring QRT. Refer to the Cisco Unified CallManager Locale Installer documentation for more information.

Additional Information

See the "Related Topics" section on page 18-32.

Configuring the QRT Feature

For successful configuration of the QRT feature, review the steps in Table 18-5, QRT Configuration Checklist, perform the configuration requirements, activate the Cisco Extended Functions service, and set the service parameters.

The following sections provide configuration information for enabling QRT:

Configuration Checklist for QRT

Table 18-5 shows the steps for configuring the QRT feature in Cisco Unified CallManager. For additional information, see the "Related Topics" section on page 18-32.

Table 18-5 QRT Configuration Checklist

Configuration Steps		Related Procedures and Topics
Step 1	Create a copy of the Standard User softkey template and add the QRT softkey for the following call states: • On Hook • Connected • Connected Conference • Connected Transfer	Creating a Softkey Template with the QRT Softkey, page 18-16 Softkey Template Configuration, *Cisco Unified CallManager Administration Guide*
Step 2	Add the new softkey template to the device pool.	Configuring the QRT Softkey Template in Device Pool, page 18-19 Device Pool Configuration, *Cisco Unified CallManager Administration Guide*
Step 3	Add the new softkey template to the user phones by using the Phone Configuration window. **Note** You can assign the device pool to the phone configuration if you are using device pool for the softkey. Alternatively, you can add the softkey individually to each phone.	Adding the QRT Softkey Template in Phone Configuration, page 18-20 Softkey Template Configuration, *Cisco Unified CallManager Administration Guide*
Step 4	Using the Cisco Unified CallManager Serviceability tool, Service Activation, activate Cisco Extended Functions service.	Activating the Cisco Extended Functions Service for QRT, page 18-22 *Cisco Unified CallManager Serviceability Administration Guide*
Step 5	From Cisco Unified CallManager Serviceability, configure alarms and traces for QRT.	Configuring Alarms and Traces for QRT, page 18-23 *Cisco Unified CallManager Serviceability Administration Guide*
Step 6	Configure the Cisco Extended Functions service parameters for QRT.	Setting the Cisco Extended Functions Service Parameters for QRT, page 18-24
Step 7	Access the QRT Viewer to create, customize, and view IP phone problem reports.	Using the QRT Viewer, page 18-26 *Cisco Unified CallManager Serviceability Administration Guide*.

Creating a Softkey Template with the QRT Softkey

Perform the following procedure to create a new softkey template with the QRT softkey.

Procedure

Step 1 From Cisco Unified CallManager Administration, choose **Device > Device Settings > Softkey Template**.

Step 2 Click **Add New**. (Alternatively, you can click the **Find** button to view a list of the available softkey templates.)

a. If you click the **Add New** button, choose the Standard User softkey template from the Softkey Template drop-down list.

b. If you click the **Find** button to view a list of the available softkey templates, choose the Standard User softkey template from the Softkey Template list.

Step 3 Click the **Copy** button.

The Softkey Template Configuration window displays with new information.

Step 4 In the Softkey Template Name field, enter a new name for the template; for example, QRT Standard User; then, add a description.

Figure 18-10 shows an example of the Cisco Unified CallManager Administration Softkey Template window where you copy a softkey template.

Figure 18-10 Softkey Template Configuration Window

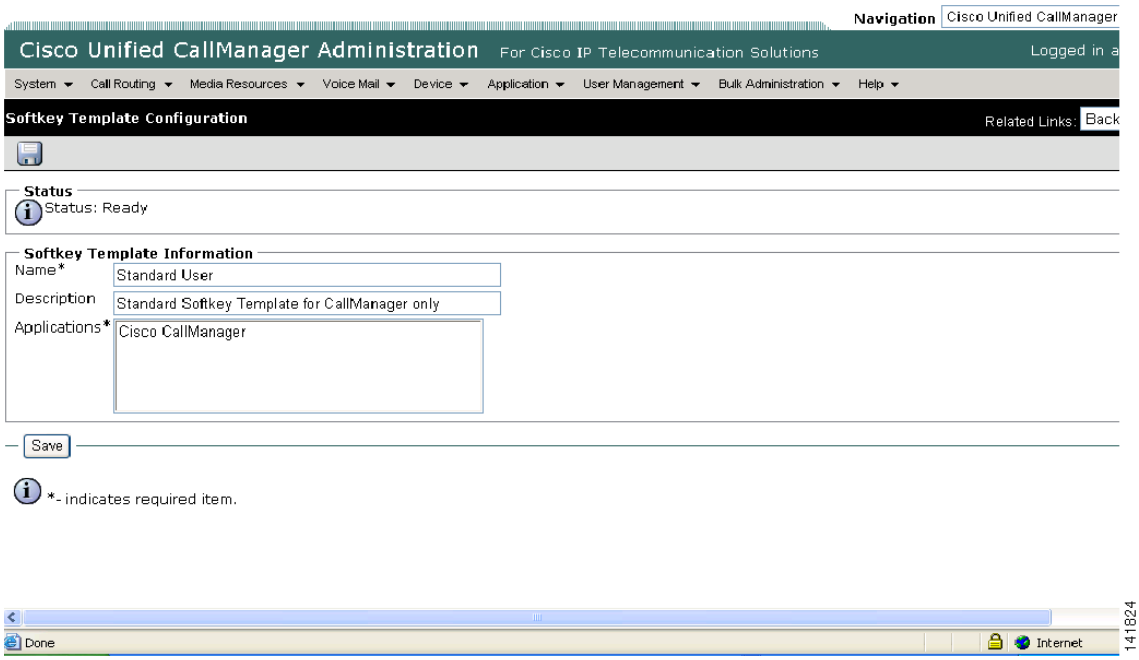
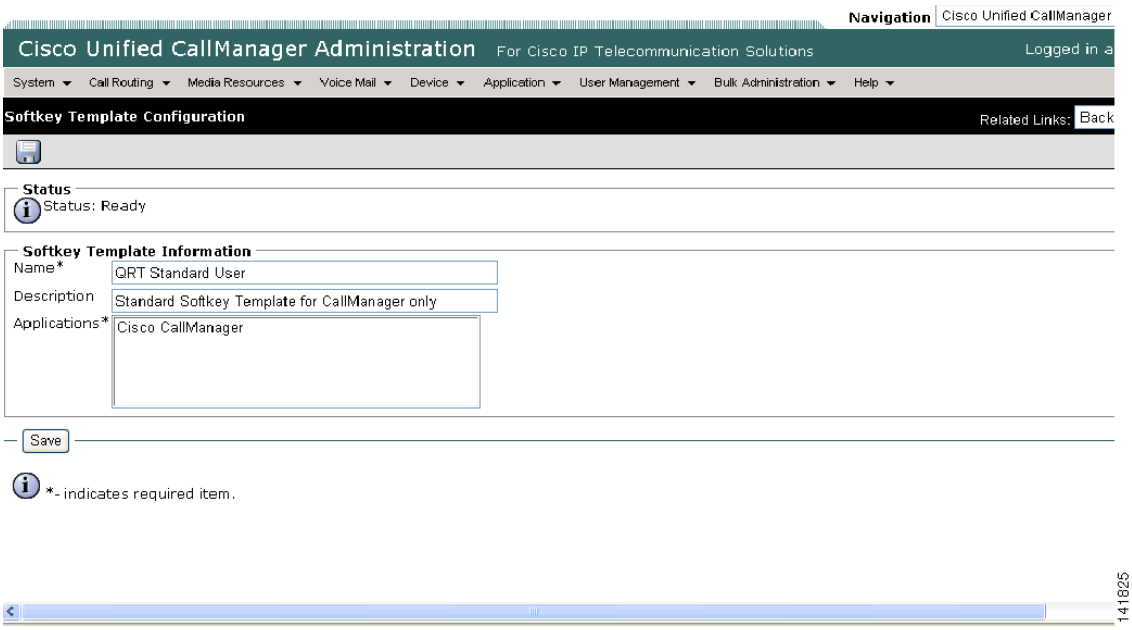


Figure 18-11 Softkey Template Configuration Window After Copy



Step 5 Click **Save**.

The Softkey Template Configuration redisplays with new information.

Step 6 To add an application, click the **Add Application** button. Refer to the "Adding Application Softkeys to Nonstandard Softkey Templates" section of the *Cisco Unified CallManager Administration Guide* for detailed instructions.

Step 7 To add the QRT softkey to the template, choose **Configure Softkey Layout** from the Related Links drop-down list box on the Softkey Template Configuration window and click **Go**.

The Softkey Layout Configuration window displays.

Note You must add the QRT softkey to the Connected, Connected Conference, Connected Transfer, and On Hook call states.

Step 8 To add the QRT softkey to the On Hook call state, choose **On Hook** from the call states drop-down list box.

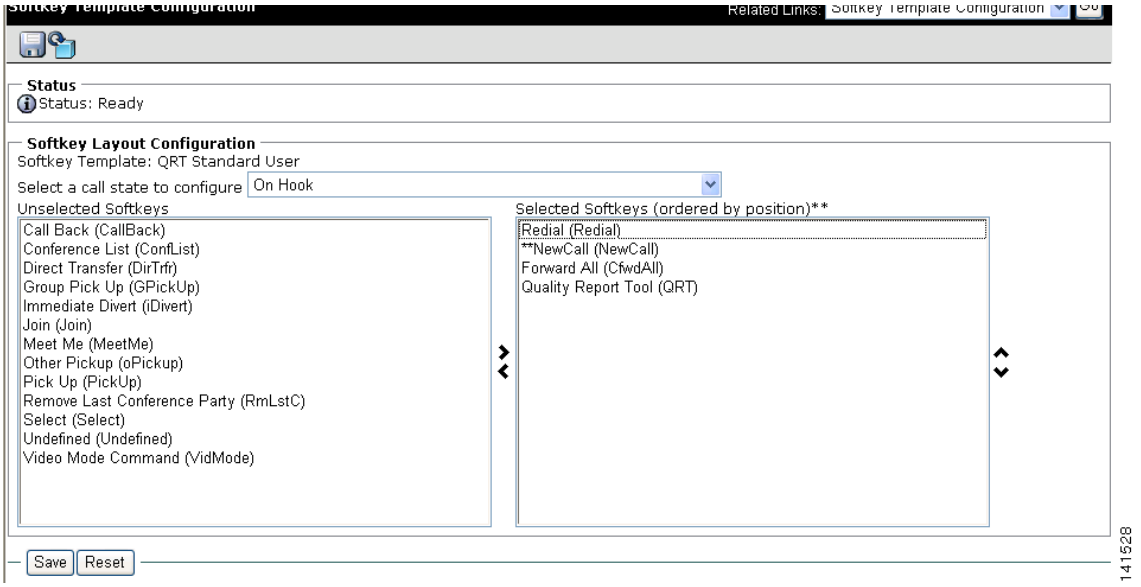
The Softkey Layout Configuration window redisplays with the Unselected Softkeys and Selected Softkeys lists.

Step 9 From the Unselected Softkeys list, choose the **Quality Report Tool (QRT)** softkey and click the right arrow to move the softkey to the Selected Softkeys list.

You can prioritize the items in the Selected Softkeys list by using the up and down arrow keys.

Figure 18-12 shows an example of the Cisco Unified CallManager Administration Softkey Layout Configuration window.

Figure 18-12 QRT Softkey Layout Configuration



Step 10 To save and continue, click **Save**.

Step 11 To add the QRT softkey to the Connected, Connected Conference, and Connected Transfer call states, repeat Step 8 through Step 10 for each individual call state.

Note Ensure that you configure the QRT softkey only for the supported call states and click the **Save** button after each entry.

Additional Information

See the "Related Topics" section on page 18-32.

Configuring the QRT Softkey Template in Device Pool

Perform the following procedure to add the QRT softkey template to the device pool.

Procedure

Step 1 From Cisco Unified CallManager Administration, choose **System > Device Pool**.

Step 2 Click **Find**.

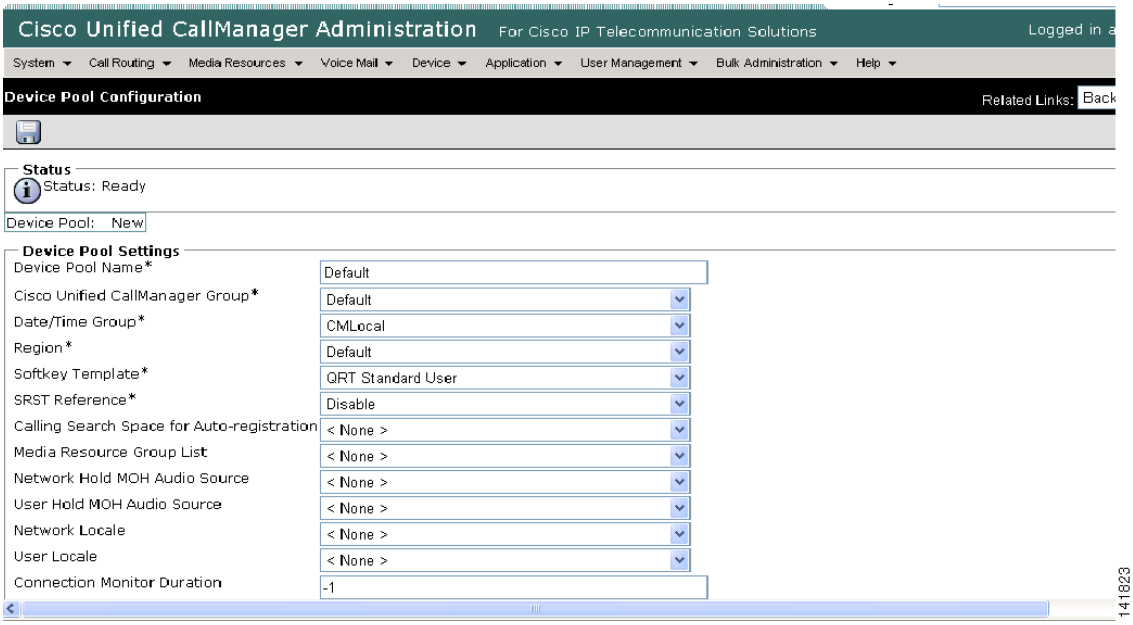
Step 3 Choose the Default device pool or any previously created device pool that displays.

You can add the template to the default device pool if you want all users to have access to the QRT softkey, or you can create a customized device pool for QRT feature users.

Step 4 In the Softkey Template field, choose the softkey template that contains the QRT softkey from the drop-down list box. (If you have not created this template, see the "Creating a Softkey Template with the QRT Softkey" section on page 18-16.)

Figure 18-13 shows an example of the Cisco Unified CallManager Administration Device Pool Configuration window.

Figure 18-13 Device Pool Configuration



Note All IP phones that are part of this device pool inherit this softkey template to provide an easy way for you to assign softkey templates to multiple phones. To associate softkey templates to individual IP phones, see the "Adding the QRT Softkey Template in Phone Configuration" section on page 18-20.

Step 5 Click **Save**.

Additional Information

See the "Related Topics" section on page 18-32.

Adding the QRT Softkey Template in Phone Configuration

Perform the following procedure to add the QRT softkey template to each user phone.

Procedure

Step 1 From Cisco Unified CallManager Administration, choose **Device > Phone**.

The Find and List Phones window displays.

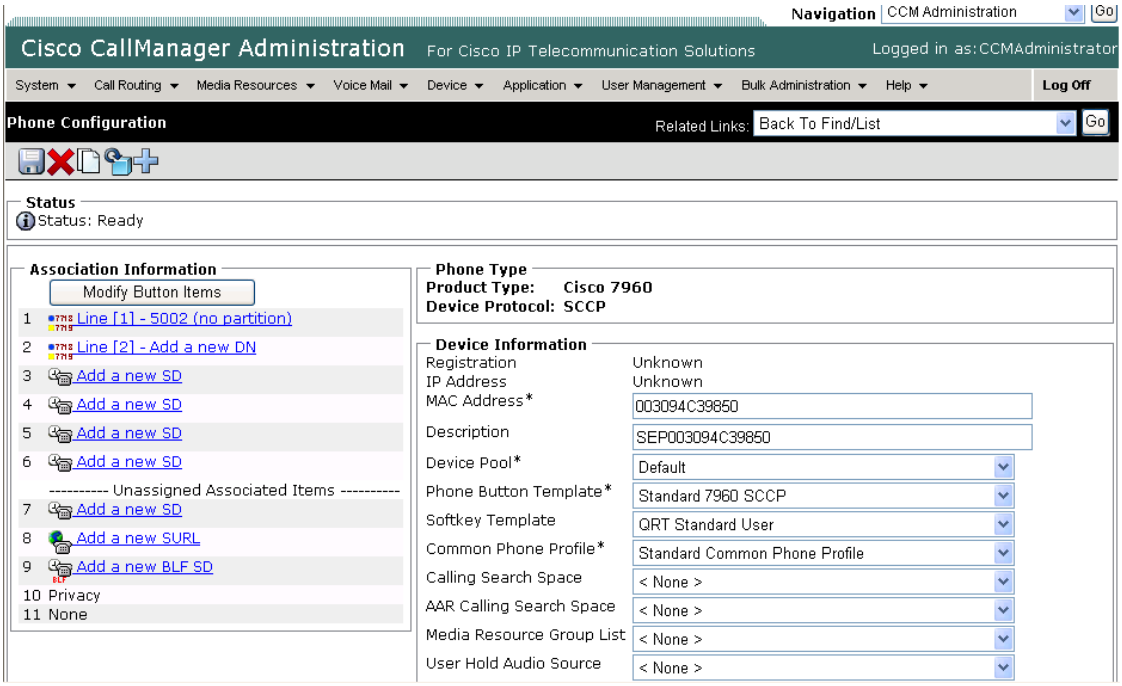
Step 2 Find the phone to which you want to add the softkey template. Refer to the "Finding a Phone" section of the Cisco Unified IP Phone Configuration chapter in the *Cisco Unified CallManager Administration Guide*.

Step 3 In the Softkey Template field, choose the softkey template that contains the QRT softkey from the drop-down list box. (If you have not created this template, see the "Creating a Softkey Template with the QRT Softkey" section on page 18-16.)

If you alternatively configured the softkey template in the device pool, from the Device Pool field, choose the device pool that contains the new softkey template.

Figure 18-14 shows an example of the Cisco Unified CallManager Administration Phone Configuration window.

Figure 18-14 Phone Configuration



Step 4 Click **Save**.

Additional Information

See the "Related Topics" section on page 18-32.

Configuring the Cisco Unified CallManager Serviceability Features

The Cisco Extended Functions service uses the following Cisco Unified CallManager Serviceability features:

- Service Activation—Configured from the Cisco Unified CallManager Serviceability Tools window.
- SDI Trace—Configured from the Cisco Unified CallManager Serviceability Trace Configuration window.

- Alarm Interface—Configured from the Cisco Unified CallManager Serviceability Alarm Configuration window.
- Real-Time Monitoring Tool (RTMT)—Used to monitor the operating status of QRT and CTIManager. For detailed information about RTMT, refer to the *Cisco Unified CallManager Serviceability Administration Guide*.

This section describes how to activate and configure the Cisco Unified CallManager Serviceability features for use with QRT and contains the following information:

- Activating the Cisco Extended Functions Service for QRT, page 18-22
- Configuring Alarms and Traces for QRT, page 18-23

For additional information about Cisco Unified CallManager Serviceability, refer to the *Cisco Unified CallManager Serviceability Administration Guide.*

Activating the Cisco Extended Functions Service for QRT

Follow this procedure to activate the Cisco Extended Functions service for use with the QRT feature.

Note A link to Cisco Unified CallManager Serviceability displays after you click the Show Navigation link on Cisco Unified CallManager Administration.

Procedure

Step 1 From the Navigation drop-down list box in Cisco Unified CallManager Administration, located in the upper, right corner of the window, choose Serviceability and click **Go**.

The Cisco Unified CallManager Serviceability window displays.

Step 2 To activate the Cisco Extended Functions service, choose **Tools > Service Activation**.

A Server drop-down list box displays.

Step 3 From the Server drop-down list box, choose the Cisco Unified CallManager server on which you want to activate the Cisco Extended Functions service.

Step 4 Check the **Cisco Extended Functions** check box.

Step 5 Click **Save**.

The CEF activation status changes from deactivated to activated.

Tip You can check the activation status of the Cisco Extended Functions service from Cisco Unified CallManager Serviceability by choosing **Tools > Control Center - Feature Services**. Look for Cisco Extended Functions; if the Cisco Extended Functions service is active, it displays as Activated.

Additional Information

See the "Related Topics" section on page 18-32.

Configuring Alarms and Traces for QRT

Follow these procedures to configure alarms and SDI traces through Cisco Unified CallManager Serviceability.

Procedure—Alarm Configuration

Step 1 From the Cisco Unified CallManager Serviceability window, choose **Alarm > Configuration**.

A Server drop-down list box displays.

Step 2 From the Server drop-down list box, choose the Cisco Unified CallManager server on which you want to configure alarms.

Step 3 From the Service drop-down list box, choose **Cisco Extended Functions**.

Step 4 Check the **Enable Alarm** check box for both Local Syslogs and SDI Trace.

Step 5 From the drop-down list box, configure the Alarm Event Level for both Local Syslogs and SDI Trace by choosing one of the following options:

- Emergency
- Alert
- Critical
- Error
- Warning
- Notice
- Informational
- Debug

The default value specifies Error.

Step 6 Click **Save**.

Procedure—Trace Configuration

Step 1 From the Cisco Unified CallManager Serviceability window, choose **Trace > Configuration**.

A Server drop-down list box displays.

Step 2 From the Server drop-down list box, choose the Cisco Unified CallManager server on which you want to configure traces.

Step 3 From the Service drop-down list box, choose **Cisco Extended Functions**.

Step 4 Check the following check boxes:

- **Trace On**
- **Cisco Extended Functions Trace Fields**

Step 5 From the drop-down list box, configure the Debug Trace Level by choosing one of the following options:

- Error
- Special

- State Transition
- Significant
- Entry_exit
- Arbitrary
- Detailed

The default value specifies Error.

Note Cisco recommends that you check all the check boxes in this section for troubleshooting purposes.

Step 6 Click **Save**.

For additional information about configuring alarms and traces, refer to the *Cisco Unified CallManager Serviceability Administration Guide*.

Setting the Cisco Extended Functions Service Parameters for QRT

Follow this procedure to set the Cisco Extended Functions service parameters by using Cisco Unified CallManager Administration.

Note Cisco recommends that you use the default service parameters settings unless the Cisco Technical Assistance Center (TAC) instructs otherwise.

Procedure

Step 1 If your display shows the Cisco Unified CallManager Serviceability window, from the Navigation drop-down list box, located in the upper, right corner of the window, choose Cisco Unified CallManager Administration and click **Go**.

The Cisco Unified CallManager Administration window displays.

Step 2 From the Cisco Unified CallManager Administration window, choose **System > Service Parameters**.

A Server drop-down list box displays.

Step 3 From the Server drop-down list box, choose the Cisco Unified CallManager server where the QRT application resides.

A Service drop-down list box displays.

Step 4 From the Service drop-down list box, choose the Cisco Extended Functions service.

Step 5 Configure the following Cisco Extended Functions service parameters for QRT.

a. **Display Extended QRT Menu Choices**—Determines whether extended menu choices are presented to the user. You can choose one of the following configuration options:

- Set this field to true to display extended menu choices (interview mode).
- Set this field to false to not display extended menu choices (silent mode).
- The recommended default value specifies false (silent mode).

b. **Streaming Statistics Polling Duration**—Determines the duration that is to be used for polling streaming statistics. You can choose one of the following configuration options:

- Set this field to -1 to poll until the call ends.
- Set this field to 0 to not poll at all.
- Set it to any positive value to poll for that many seconds. Polling stops when the call ends.
- The recommended default value specifies -1 (poll until the call ends).

c. **Streaming Statistics Polling Frequency (seconds)**— Designates the number of seconds to wait between each poll:

- The value ranges between 30 and 3600.
- The recommended default value specifies 30.

d. **Maximum No. of Files**—Specifies the maximum number of files before the file count restarts and overwrites the old files:

- The value ranges between 1 and 10000.
- The recommended default value specifies 250.

e. **Maximum No. of Lines per File**—Specifies the maximum number of lines in each file before starting the next file:

- The value ranges between 100 and 2000.
- The recommended default value specifies 2000.

Step 6 To configure a secure TLS connection to CTI, configure the following service parameters.

a. **CAPF Profile Instance ID for Secure Connection to CTI Manager—**Specifies the Instance ID of the Application CAPF Profile for application user CCMQRTSysUser that the Cisco Extended Function service will use to open a secure connection to CTI Manager. You must configure this parameter if CTI Manager Connection Security Flag is enabled.

Note Remember to turn on security by enabling the CTI Manager Connection Security Flag service parameter. You must restart the Cisco Extended Functions service for the changes to take effect.

See the "Securing a TLS Connection to CTI" section on page 18-7 for information on configuring the Application CAPF Profile.

b. **CTI Manager Connection Security Flag—**Indicates whether security for Cisco Extended Functions service CTI Manager connection is enabled or disabled. If enabled, Cisco Extended Functions will open a secure connection to CTI Manager using the Application CAPF Profile configured for the Instance ID for application user CCMQRTSysUser.

- The value choices are True and False.
- You must choose True to enable a secure connection to CTI.

Step 7 Click **Save**.

Additional Information

See the "Related Topics" section on page 18-32.

Using the QRT Viewer

You can use the QRT Viewer to view the IP phone problem reports that the Quality Report Tool generates. The QRT Viewer allows you to filter, format, and view the tool-generated phone problem reports, so they provide you with the specific information that you need.

- To view the QRT Viewer application, you need to install the Cisco Real-Time Monitoring Tool (RTMT) plug-in, which includes the trace collection feature.
- The trace collection feature enables collection and viewing of log files; the QRT Viewer is included with the trace collection feature.
- You can use the client application on Windows- or non-Windows-based operating systems.

Note For detailed information about installing and configuring the RTMT and trace collection feature, and for detailed information about accessing, configuring, using, and customizing the QRT Viewer for IP phone problem reports, refer to the *Cisco Unified CallManager Serviceability Administration Guide* and the *Cisco Unified CallManager Serviceability System Guide*.

Additional Information

See the "Related Topics" section on page 18-32.

QRT Reports

QRT collects information from various sources, such as the source IP phone, the destination IP phone, the Cisco RIS Data Collector, Cisco Unified CallManager, and the user. (The system does not collect information from gateways or other devices.) "Source" and "destination" in this case, do not refer to the calling party and called party in a connected call.

Note Refer to the QRT Viewer chapter in the *Cisco Unified CallManager Serviceability Administration Guide* for additional information about QRT reports.

The following list provides information, segmented by information source, about the QRT report fields:

Information Collected from the Source Device

- Directory number of source device (in the case of multiline devices, the information shows only the first primary directory number)
- Source device type (for example, CP-7960, CP-7940)
- Source stream1 port number
- Source codec (for example, G.711u)
- Source packets (for example, 2,45,78)
- Source rcvr packets (for example, 12,45,78)
- Source rcvr jitter (for example, 0 0)
- Source rcvr packet lost (for example, 0,21 0,21)
- Source sampling timestamp, implicit (for example, 12:30, 13:00, 13:30, 14:00)
- Destination device name (IP)
- Destination stream1 port number

Note The number of samples that are collected for packets, jitter, packets lost, and so on, depends on the sampling duration and polling frequency. The streaming information gets collected only one time per call. For example, if phone A called phone B and both phone A and phone B submit multiple reports for the same call, only the first report includes the streaming data. Also, for the "Problems with last call" category, these values might reflect only the last snapshot of the streaming statistics that are stored in the phone device.

Information Collected from the Destination Device

The system collects the following information if the destination device is a supported Cisco Unified IP Phone within same Cisco Unified CallManager cluster. If the destination device is not an IP phone, the information includes only IP address, device name, and device type.

- Directory number of destination device (in the case of multiline devices, the information shows only the first primary directory number)
- Destination device type (for example, CP-7960, CP-7940)
- Destination codec
- Destination packets
- Destination rcvr packets
- Destination rcvr jitter
- Destination rcvr packet lost
- Destination sampling timestamp (Implicit)

Note The number of samples that are collected for packets, jitter, packets lost, and so on, depends on the sampling duration and polling frequency. The streaming information gets collected only one time per call. For example, if phone A called phone B and both phone A and phone B submit multiple reports for the same call, only the first report includes the streaming data that is included. QRT attempts to collect the information from the destination IP phone only for the "Problems with current call" category.

Information Collected from RIS Data Collector

- Source device owner (user name that is currently logged in to the IP phone; if no explicitly logged-in user exists, this field specifies null)
- IP address for source device
- Registered Cisco Unified CallManager name for source device
- Source device type (if the device is not one of the supported IP phones; for example, RISCLASS_PHONE, RISCLASS_GATEWAY, RISCLASS_H323, RISCLASS_CTI, RISCLASS_VOICEMAIL)
- Source device model (for example, DBLTypeModel::MODEL_TELECASTER_MGR, DBLTypeModel::MODEL_TELECASTER_BUSINESS)
- Source device product (for example, DBLTypeProduct::PRODUCT_7960, DBLTypeProduct::PRODUCT_7940)
- Destination device name
- Destination device type (if the device is not one of the supported IP phones; for example, RISCLASS_PHONE, RISCLASS_GATEWAY, RISCLASS_H323, RISCLASS_CTI, RISCLASS_VOICEMAIL)
- Destination device model (for example, DBLTypeModel::MODEL_TELECASTER_MGR, DBLTypeModel::MODEL_TELECASTER_BUSINESS)
- Destination device product (for example, DBLTypeProduct::PRODUCT_7960, DBLTypeProduct::PRODUCT_7940)
- Registered Cisco Unified CallManager name for destination device
- Destination device owner (user name that is currently logged in to the IP phone; if no explicitly logged-in user exists, this field specifies null)

Information Collected from Cisco Unified CallManager/CTIManager

- Source device name (MAC address)
- CallingPartyNumber (the party who placed the call; for transferred calls, the transferred party becomes the calling party)
- OriginalCalledPartyNumber (the original-called party after any digit translations occurred)
- FinalCalledPartyNumber (for forwarded calls, this specifies the last party to receive the call; for non-forwarded calls, this field specifies the original called party)
- LastRedirectDn (for forwarded calls, this field specifies the last party to redirect the call; for non-forwarded calls, this field specifies the last party to redirect, via transfer or conference, the call)
- globalCallID_callManagerId (this field distinguishes the call for CDR Analysis and Reporting (CAR))
- globalCallID_callId (this field distinguishes the call for CAR)
- CallState (Connected, Connected Conference, Connected Transfer, On Hook)

Information Collected from the Cisco Unified CallManager Database

- Sampling duration - Service parameter (for example, 50 seconds)
- Sampling frequency - Service parameter (for example, 30 seconds)
- Cluster ID - Enterprise parameter

Information Collected from the User

- Category
- ReasonCode
- TimeStamp (Implicit)

Table 18-6 shows the available fields for each supported category.

Note The following QRT report fields will display appropriate phone model and product names (for example, SCCP Phone): Source Model, Source Product, Destination Model, Destination Product, and CallState.

Table 18-6 QRT Fields by Supported Category

Information Source	Problems with Current Call	Problems with Last Call	Phone Recently Rebooted	Can't Make Calls
Source Device Name	X	X	X	X
DN of Source Device	X	X	X	X
IP Address of Source Device	X	X	X	X
Source Device Type	X	X	X	X
Source Device Owner	X	X	X	X
Registered Cisco Unified CallManager for Source Device	X	X	X	X
Source Model	X	X	X	X
Source Product	X	X	X	X
Source Stream 1 Port Number	X	X		
Source Codec	X	X		
Source Packets	X	X		
Source Rcvr Packets	X	X		
Source Rcvr Jitter	X	X		
Source Rcvr Packet Lost	X	X		
Source Sampling Timestamp	X			
Destination Device Name	X	X		
DN of Destination Device	X	X		
IP Address of Destination Device	X	X		
Destination Device Type	X	X		
Destination Stream 1 Port Number	X			
Destination Codec	X			
Destination Packets	X			
Destination Rcvr Packets	X			
Destination Rcvr Jitter	X			
Destination Rcvr Packet Lost	X			

Table 18-6 QRT Fields by Supported Category (continued)

Information Source	Problems with Current Call	Problems with Last Call	Phone Recently Rebooted	Can't Make Calls
Destination Sampling Timestamp	X			
Destination Device Owner	X	X		
Registered Cisco Unified CallManager for Destination Device	X	X		
Destination Model	X	X		
Destination Product	X	X		
Calling Party Number	X			
Original Called Party Number	X			
Final Called Party Number	X			
Last Redirect DN	X			
globalCallID_callManagerId	X			
globalCallID_callId	X			
Sampling Duration	X	X	X	X
Sampling Frequency	X	X	X	X
Cluster ID	X	X	X	X
Category	X	X	X	X
Reason Code	X	X		X
TimeStamp When Report is Submitted	X	X	X	X
sProtocol **Note** sProtocol represents the source destination protocol for the phones. This protocol has a value of 1 for SCCP phones, 2 for SIP phones, and 0 for UNKNOWN.	X	X	X	X
dProtocol **Note** dProtocol represents the destination protocol for the phones. This protocol has a value of 1 for SCCP phones, 2 for SIP phones, and 0 for UNKNOWN.	X	X		

Additional Information

See the "Related Topics" section on page 18-32.

Providing Information to Users for the QRT Feature

The Cisco Unified IP Phone guides provide procedures for how to use the QRT feature on the Cisco Unified IP Phone. For more information, refer to the following URL for the appropriate Cisco Unified IP Phone Guide for your phone model: http://www.cisco.com/univercd/cc/td/doc/product/voice/c_ipphon/index.htm.

Additional Information

See the "Related Topics" section on page 18-32.

Troubleshooting the QRT Feature

Cisco Unified CallManager Serviceability provides web-based tools to assist in troubleshooting Cisco Unified CallManager problems. Use the Cisco Unified CallManager Serviceability Trace Configuration, Alarm Configuration, and Real-Time Monitoring Tool to help troubleshoot problems with QRT. Refer to the *Cisco Unified CallManager Serviceability Administration Guide* for more information.

The Trace and Alarm tools work together. You can configure trace and alarm settings for Cisco Unified CallManager services and direct alarms to local Syslogs or system diagnostic interface (SDI) log files. (SDI log files are viewable in text format only.)

You can set up traces for Cisco Unified CallManager services on debug levels, specific trace fields, and Cisco Unified CallManager devices such as phones or gateways. You can also perform a trace on the alarms that are sent to the SDI trace log files.

Use the trace collection feature to collect trace files and to analyze trace data for troubleshooting problems. (The trace collection feature includes the QRT Viewer.)

The trace collection feature provides three main functions:

- Configure trace parameters
- Collect trace files
- Analyze trace data for troubleshooting problems

Note Enabling Trace decreases system performance; therefore, enable Trace only for troubleshooting purposes. For assistance in using Trace, contact Cisco TAC.

Troubleshooting Tips

The following examples provide some common problems and recommended actions when troubleshooting scenarios for QRT:

Problem The QRT softkey is not available.

Solution Ensure that you have created, configured, and assigned the softkey template to enable the QRT feature.

Problem The QRT softkey is not working.

Solution Ensure that the Cisco Extended Functions service, the Cisco CallManager service, the Cisco CTIManager service, and the Cisco RIS Data Collector service are operational.

Problem The QRT report does not include data.

Solution The system collects data from various sources, such as the user, source IP phone, destination IP phone, RIS Data Collector, Cisco Unified CallManager, and Cisco Unified CallManager databases. Check to make sure that the destination device is a supported IP phone and not a gateway or other unsupported device; otherwise, the system does not collect data from the destination device.

Note For more information about Cisco Unified CallManager Serviceability tools, refer to the *Cisco Unified CallManager Serviceability Administration Guide.*

For information about troubleshooting Cisco Unified CallManager, refer to the *Troubleshooting Guide for Cisco Unified CallManager.*

Additional Information

See the "Related Topics" section on page 18-32.

Related Topics

- Softkey Template Configuration, *Cisco Unified CallManager Administration Guide*
- Device Pool Configuration, *Cisco Unified CallManager Administration Guide*
- Cisco Unified IP Phones, *Cisco Unified CallManager System Guide*
- Device Defaults Configuration, *Cisco Unified CallManager Administration Guide*
- Service Parameters Configuration, *Cisco Unified CallManager Administration Guide*
- Cisco Unified IP Phone Configuration, *Cisco Unified CallManager Administration Guide*

Additional Cisco Documentation

- *Cisco Unified CallManager Administration Guide*
- *Cisco Unified CallManager System Guide*
- *Cisco Unified CallManager Serviceability Administration Guide*
- *Cisco Unified CallManager Serviceability System Guide*
- *Cisco Unified CallManager Security Guide*
- *Troubleshooting Guide for Cisco Unified CallManager*
- *Cisco Unified IP Phone Administration Guide for Cisco Unified CallManager*
- Cisco IP Telephony Locale Installer
- Cisco Unified IP Phone Guides