Configure Call Diagnostics and Quality Reporting for Cisco IP Phones

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Diagnostics and Reporting Overview

Cisco Unified Communications Manager offers two options for ensuring call quality on Cisco IP Phones:

- Call Diagnostics—Call diagnostics includes generating Call Management Records (CMR) and voice quality metrics.
- Quality Report Tool QRT)—QRT is a voice-quality and general problem-reporting tool for Cisco Unified IP Phones. This tool allows users to easily and accurately report audio and other general problems with their IP phone.

Call Diagnostics Overview

You can configure Cisco IP Phones that are running SCCP and SIP to collect call diagnostics. Call diagnostics comprises Call Management Records (CMR), also called diagnostic records, and voice quality metrics.

Voice quality metrics are enabled by default and supported on most of the Cisco IP Phones. Cisco IP Phones calculate voice quality metrics based on MOS (Mean Opinion Square) value. Voice quality metrics do not account for noise or distortion, only frame loss.

The CMR records store information about the quality of the streamed audio of the call. You can configure the Unified Communications Manager to generate CMRs. This information is useful for post-processing activities such as generating billing records and network analysis.

Quality Report Tool Overview

The Quality Report Tool (QRT) is a voice-quality and general problem-reporting tool for Cisco IP Phones. This tool allows users to easily and accurately report audio and other general problems with their IP phone.

As a system administrator, you can enable QRT functionality by configuring and assigning a softkey template to display the QRT softkey on a user IP phone. You can choose from two different user modes, depending on the level of user interaction that you want with QRT. You then define how the feature works in your system by configuring system parameters and setting up Cisco Unified Serviceability tools. You can create, customize, and view phone problem reports by using the QRT Viewer application.

When users experience problems with their IP phones, they can report the type of problem and other relevant statistics by pressing the QRT softkey on the Cisco IP Phones during the On Hook or Connected call states. Users can then choose the reason code that best describes the problem that is being reported for the IP phone. A customized phone problem report provides you with the specific information.

QRT attempts to collect the streaming statistics after a user selects the type of problem by pressing the QRT softkey. A call should be active for a minimum of 5 seconds for QRT to collect the streaming statistics.

Detailed Call Reporting and Billing

The Cisco CDR Analysis and Reporting (CAR) tool generates detailed reports for quality of service, traffic, user call volume, billing, and gateways. CAR uses data from Call Detail Records (CDRs), Call Management Records (CMRs), and the Unified Communications Manager database in order to generate reports. The CAR interface can be accessed under the **Tools** menu of Cisco Unified Serviceability.

CAR is not intended to replace call accounting and billing solutions that third-party companies provide. You can find the companies that provide these solutions and that are members of the Cisco Technology Developer Program by searching the home page of the Cisco Developer Community.

For details about how to configure reporting with CAR, refer to the *Call Reporting and Billing Administration Guide for Cisco Unified Communications Manager*.

Prerequisites

Call Diagnostics Prerequisites

Check if your Cisco Unified IP Phone supports Call Diagnostics.

Quality Report Tool Prerequisites

Any Cisco IP Phone that includes the following capabilities:

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

For more information, see the guide for your phone model.

Diagnostics and Reporting Configuration Task Flow

Procedure

	Command or Action	Purpose
Step 1	Configure Call Diagnostics, on page 3	Perform this task to configure Cisco Unified Communications Manager to generate CMRs. The CMR records store information about the quality of the streamed audio of the call. For more information about accessing CMRs, see the *Cisco Unified Communications Manager Call Detail Records Administration Guide* . Voice Quality Metrics are automatically enabled on the Cisco IP Phones. For more information about accessing voice quality metrics, see the Cisco Unified IP Phone Administration Guide for your phone model.
Step 2	To Configure the Quality Report Tool, on page 4, perform the following subtasks: • Configure a Softkey Template with the QRT Softkey, on page 5 • Associate a QRT Softkey Template with a Common Device Configuration, on page 6 • Add the QRT Softkey Template to a Phone, on page 8 • Configure QRT in Cisco Unified Serviceability, on page 8 • Configure the Service Parameters for the Quality Report Tool, on page 11	Configure the Quality Report Tool (QRT) so that users who experience problems with their IP phones can report the type of problem and other relevant statistics by pressing a QRT softkey.

Configure Call Diagnostics

Procedure

Step 1 From Cisco Unified CM Administration, choose **System** > **Service Parameters**.

Step 2 From the **Server** drop-down list, choose the server on which the Cisco CallManager service is running.

Step 3 From the **Service** drop-down list, choose **Cisco CallManager**.
The **Service Parameter Configuration** window appears.

Step 4 In the **Clusterwide Parameters (Device - General)** area, configure the **Call Diagnostics Enabled** service parameter. The following options are available:

- **Disabled**—CMRs are not generated.
- **Enabled Only When CDR Enabled Flag is True**—CMRs are generated only when the Call Detail Records (CDR) Enabled Flag service parameter is set to True.
- **Enabled Regardless of CDR Enabled Flag**—CMRs are generated regardless of the CDR Enabled Flag service parameter value.

Note
Generating CMRs without enabling the CDR Enabled Flag service parameter can cause uncontrolled disk space consumption. Cisco recommends that you enable CDRs when CMRs are enabled.

Step 5 Click **Save**.

Configure the Quality Report Tool

Configure the Quality Report Tool (QRT) so that users who experience problems with their IP phones can report the type of problem and other relevant statistics by pressing a QRT softkey.

Procedure

	Command or Action	Purpose
Step 1	Configure a Softkey Template with the QRT Softkey, on page 5	You must configure the On Hook and Connected call states for the QRT Softkey. The following call states are also available: • Connected Conference • Connected Transfer
Step 2	(Optional) To Associate a QRT Softkey Template with a Common Device Configuration, on page 6, perform the following subtasks: • Add a QRT Softkey Template to a Common Device Configuration, on page 6 • Associate a Common Device Configuration with a Phone, on page 7	To make the softkey template available to phones, you must complete either this step or the following step. Follow this step if your system uses a **Common Device Configuration** to apply configuration options to phones. This is the most commonly used method for making a softkey template available to phones.
Step 3	(Optional) Add the QRT Softkey Template to a Phone, on page 8	Use this procedure either as an alternative to associating the softkey template with the Common Device Configuration, or in conjunction with the Common Device Configuration. Use this procedure in conjunction with the Common Device Configuration if you need assign a softkey template that overrides the assignment in the

	Command or Action	Purpose
		Common Device Configuration or any other default softkey assignment.
Step 4	To Configure QRT in Cisco Unified Serviceability, on page 8, perform the following subtasks: • Activate the Cisco Extended Functions Service, on page 8 • Configure Alarms, on page 9 • Configure Traces, on page 10	
Step 5	(Optional) Configure the Service Parameters for the Quality Report Tool, on page 11	

Configure a Softkey Template with the QRT Softkey

You must configure the On Hook and Connected call states for the QRT Softkey. The following call states are also available:

- Connected Conference
- Connected Transfer

Procedure

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

Step 2 Perform the following steps to create a new softkey template; otherwise, proceed to the next step.

a) Click **Add New**.
b) Select a default template and click **Copy**.
c) Enter a new name for the template in the **Softkey Template Name** field.
d) Click **Save**.

Step 3 Perform the following steps to add softkeys to an existing template.

a) Click **Find** and enter the search criteria.
b) Select the required existing template.

Step 4 Check the **Default Softkey Template** check box to designate this softkey template as the default softkey template.

Note
If you designate a softkey template as the default softkey template, you cannot delete it unless you first remove the default designation.

Step 5 Choose **Configure Softkey Layout** from the **Related Links** drop-down list in the upper right corner and click **Go**.

Step 6 From the **Select a Call State to Configure** drop-down list, choose the call state for which you want the softkey to display.

Step 7 From the **Unselected Softkeys** list, choose the softkey to add and click the right arrow to move the softkey to the **Selected Softkeys** list. Use the up and down arrows to change the position of the new softkey.

Step 8 Repeat the previous step to display the softkey in additional call states.

Step 9 Click **Save**.

Step 10 Perform one of the following tasks:

- Click **Apply Config** if you modified a template that is already associated with devices to restart the devices.
- If you created a new softkey template, associate the template with the devices and then restart them. For more information, see *Add a Softkey Template to a Common Device Configuration* and *Associate a Softkey Template with a Phone* sections.

What to do next

Perform one of the following steps:

- Add a QRT Softkey Template to a Common Device Configuration, on page 6
- Add the QRT Softkey Template to a Phone, on page 8

Associate a QRT Softkey Template with a Common Device Configuration

Optional. There are two ways to associate a softkey template with a phone:

- Add the softkey template to the Phone Configuration.
- Add the softkey template to the Common Device Configuration.

The procedures in this section describe how to associate the softkey template with a Common Device Configuration. Follow these procedures if your system uses a Common Device Configuration to apply configuration options to phones. This is the most commonly used method for making a softkey template available to phones.

To use the alternative method, see Add the QRT Softkey Template to a Phone, on page 8.

Procedure

	Command or Action	Purpose
Step 1	Add a QRT Softkey Template to a Common Device Configuration, on page 6	
Step 2	Associate a Common Device Configuration with a Phone, on page 7	

Add a QRT Softkey Template to a Common Device Configuration

Before you begin

Configure a Softkey Template with the QRT Softkey, on page 5

Procedure

Step 1 From Cisco Unified CM Administration, choose **Device** > **Device Settings** > **Common Device Configuration**.

Step 2 Perform the following steps to create a new Common Device Configuration and associate the softkey template with it; otherwise, proceed to the next step.

a) Click **Add New**.
b) Enter a name for the Common Device Configuration in the **Name** field.
c) Click **Save**.

Step 3 Perform the following steps to add the softkey template to an existing Common Device Configuration.

a) Click **Find** and enter the search criteria.
b) Click an existing Common Device Configuration.

Step 4 In the **Softkey Template** drop-down list, choose the softkey template that contains the softkey that you want to make available.

Step 5 Click **Save**.

Step 6 Perform one of the following tasks:

- If you modified a Common Device Configuration that is already associated with devices, click **Apply Config** to restart the devices.
- If you created a new Common Device Configuration, associate the configuration with devices and then restart them.

What to do next

Associate a Common Device Configuration with a Phone, on page 7

Associate a Common Device Configuration with a Phone

Before you begin

Add a QRT Softkey Template to a Common Device Configuration, on page 6

Procedure

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

Step 2 Click **Find** and select the phone device to add the softkey template.

Step 3 From the **Common Device Configuration** drop-down list, choose the common device configuration that contains the new softkey template.

Step 4 Click **Save**.

Step 5 Click **Reset** to update the phone settings.

Add the QRT Softkey Template to a Phone

Before you begin

Configure a Softkey Template with the QRT Softkey, on page 5

Procedure

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

Step 2 Click **Find** to display the list of configured phones.

Step 3 Choose the phone to which you want to add the phone button template.

Step 4 In the **Phone Button Template** drop-down list, choose the phone button template that contains the new feature button.

Step 5 Click **Save**.
A dialog box is displayed with a message to press **Reset** to update the phone settings.

Configure QRT in Cisco Unified Serviceability

Procedure

	Command or Action	Purpose
Step 1	Activate the Cisco Extended Functions Service, on page 8	Activate the Cisco Extended Functions Service to provide support for voice-quality features such as the Quality Report Tool.
Step 2	Configure Alarms, on page 9	Configure alarms for the QRT to log errors in the Application Logs within SysLog Viewer. This function logs alarms, provides a description of the alarms, and recommended actions. You can access the SysLog Viewer from the Cisco Unified Real-Time Monitoring Tool.
Step 3	Configure Traces, on page 10	Configure traces for the QRT to log trace information for your voice application. After configure the information that you want to include in the trace files for the QRT, you can collect and view trace files by using the Trace and Log Central option in the Cisco Unified Real-Time Monitoring Tool.

Activate the Cisco Extended Functions Service

Activate the Cisco Extended Functions Service to provide support for voice-quality features such as the Quality Report Tool.

Procedure

Step 1 From Cisco Unified Serviceability, choose **Tools** > **Service Activation**.

Step 2 From the **Server** drop-down list, choose the node on which you want to activate the Cisco Extended Functions service.

Step 3 Check the **Cisco Extended Functions** check box.

Step 4 Click **Save**.

What to do next

Configure Alarms, on page 9

Configure Alarms

Configure alarms for the QRT to log errors in the Application Logs within SysLog Viewer. This function logs alarms, provides a description of the alarms, and recommended actions. You can access the SysLog Viewer from the Cisco Unified Real-Time Monitoring Tool.

Before you begin

Activate the Cisco Extended Functions Service, on page 8

Procedure

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

Step 2 From the **Server** drop-down list, choose the node on which you want to configure alarms.

Step 3 From the **Service Group** drop-down list, choose **CM Services**.

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

Step 5 Check the **Enable Alarm** check box for both Local Syslogs and SDI Trace.

Step 6 From the drop-down list, configure the Alarm Event Level for both Local Syslogs and SDI Trace by choosing one of the following options:

- **Emergency**—Designates the system as unusable.
- **Alert**—Indicates that immediate action is needed.
- **Critical**—The system detects a critical condition.
- **Error**—Indicates that an error condition is detected.
- **Warning**—Indicates that a warning condition is detected.
- **Notice**—Indicates that a normal but significant condition is detected.
- **Informational**—Indicates only information messages.
- **Debug**— Indicates detailed event information that Cisco Technical Assistance Center (TAC) engineers use for debugging.

The default value is **Error**.

Step 7 Click **Save**.

What to do next

Configure Traces, on page 10

Configure Traces

Configure traces for the QRT to log trace information for your voice application. After configure the information that you want to include in the trace files for the QRT, you can collect and view trace files by using the Trace and Log Central option in the Cisco Unified Real-Time Monitoring Tool.

Before you begin

Configure Alarms, on page 9

Procedure

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

Step 2 From the **Server** drop-down list, choose the node on which you want to configure traces.

Step 3 From the **Service Group** drop-down list, choose **CM Services**.

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

Step 5 Check the **Trace On** check box.

Step 6 From the **Debug Trace Level** drop-down list, choose one of the following options:

- **Error**—Traces all error conditions, as well as process and device initialization messages.
- **Special**—Traces all special conditions and subsystem state transitions that occur during normal operation. Traces call-processing events.
- **State Transition**—Traces all state transition conditions and media layer events that occur during normal operation.
- **Significant**—Traces all significant conditions, as well as entry and exit points of routines. Not all services use this trace level.
- **Entry_exit**—Traces all entry and exit conditions, plus low-level debugging information.
- **Arbitrary**—Traces all Arbitrary conditions plus detailed debugging information.
- **Detailed**— Traces alarm conditions and events. Used for all traces that are generated in abnormal path. Uses minimum number of CPU cycles.

The default value is **Error**.

Tip
We recommend that you check all the check boxes in this section for troubleshooting purposes.

Step 7 Click **Save**.

What to do next

(Optional) Configure the Service Parameters for the Quality Report Tool, on page 11

Configure the Service Parameters for the Quality Report Tool

Caution We recommend that you use the default service parameters settings unless the Cisco Technical Assistance Center (TAC) instructs otherwise.

Procedure

Step 1 From Cisco Unified Communications Manager Administration , choose **System** > **Service Parameters**.

Step 2 Choose the node where the QRT application resides.

Step 3 Choose the **Cisco Extended Functions** service.

Step 4 Configure the service parameters. See the Related Topics section for more information about the service parameters and their configuration options.

Step 5 Click **Save**.

Related Topics

Quality Report Tool Service Parameters, on page 11

Quality Report Tool Service Parameters

Table 1: Quality Report Tool Service Parameters

Parameter	Description
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 is false (silent mode).
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 is -1 (poll until the call ends).

Parameter	Description
Streaming Statistics Polling Frequency (seconds)	Enter the number of seconds to wait between each poll. The value ranges between 30 and 3600. The recommended default value is 30.
Maximum No. of Files	Enter the maximum number of files before the file count restarts and overwrites the old files. Valid values are between 1 and 10000. The recommended default value is 250.
Maximum No. of Lines per File	Enter 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.
CAPF Profile Instance Id for Secure Connection to CTI Manager	Enter 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** 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.
CTI Manager Connection Security Flag	Choose 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.