Troubleshooting Tools

This section addresses the tools and utilities that you use to configure, monitor, and troubleshoot Cisco CallManager 5.0(1) and provides general guidelines for collecting information to avoid repetitive testing and recollection of identical data.

Note To access some of the URL sites listed this document, you must be a registered user and you must be logged in.

This section contains the following topics:

Sniffer Traces

Typically, you collect sniffer traces by connecting a laptop or other sniffer-equipped device on a Catalyst port that is configured to span the VLAN or port(s) (CatOS, Cat6K-IOS, XL-IOS) that contains the trouble information. If no free port is available, connect the sniffer-equipped device on a hub that is inserted between the switch and the device.

Tip To help facilitate reading and interpreting of the traces by the TAC engineer, Cisco recommends using Sniffer Pro software because it is widely used within the TAC.

Have available the IP/MAC addresses of all equipment that is involved, such as IP phones, gateways, Cisco CallManagers, and so on.

Collecting Traces

The video described below will show you how to gather basic Call Connection Manager (CCM) and Signal Distribution Layer (SDL) traces from your CallManager cluster. You can then use this information in your TAC Service Request.

After watching this video, you will be able to:

- Document the problem
- Reproduce the problem and gather the necessary information
- Get this information to your TAC Engineer

You can view this informative Flash video at:

www.cisco.com/warp/public/788/video_64826/callmanager-tool.html
(available to non-registered users)

www.cisco.com/warp/customer/788/video_64826/callmanager-tool.html
(available to registered users)

Debugs

The output from **debug** privileged EXEC commands provides diagnostic information about a variety of internetworking events relating to protocol status and network activity in general.

Set up your terminal emulator software (such as HyperTerminal), so it can capture the debug output to a file. In HyperTerminal, click **Transfer**; then, click **Capture Text** and choose the appropriate options.

Before running any IOS voice gateway debugs, make sure that `service timestamps debug datetime msec` is globally configured on the gateway.

Note Avoid collecting debugs in a live environment during operation hours.

Preferably, collect debugs during non-working hours. If debugs must be collected in a live environment, configure `no logging console` and `logging buffered`. To collect the debugs, use **`show log`**.

Some debugs can be lengthy, so collect them directly on the console port (default **`logging console`**) or on the buffer (**`logging buffer`**). Collecting debugs over a Telnet session may have an impact on the device performance, and the result could be incomplete debugs, which requires that you re-collect them.

To stop a debug, use the **`no debug all`** or **`undebug all`** commands. Verify that the debugs have been turned off by using the command **`show debug`**.

Packet Capture

This section contains information on the following topics:

Packet Capturing Overview

Because third-party troubleshooting tools that sniff media and TCP packets do not work after you enable encryption, you must use Cisco CallManager Administration to perform the following tasks if a problem occurs:

- Analyze packets for messages that are exchanged between Cisco CallManager and the device (Cisco IP Phone, Cisco SIP IP Phone, Cisco IOS MGCP gateway, H.323 gateway, H.323/H.245/H.225 trunk, or SIP trunk).
- Capture the Secure RealTime Protocol (SRTP) packets between the devices.
- Extract the media encryption key material from messages and decrypt the media between the devices.

Tip Performing this task for several devices at the same time may cause high CPU usage and call-processing interruptions. Cisco strongly recommends that you perform this task when you can minimize call-processing interruptions.

For more information, see the *Cisco CallManager Security Guide*.

Configuration Checklist for Packet Capturing

Extracting and analyzing pertinent data includes performing the following tasks in Table 2-1:

Table 2-1 Configuration Checklist for Packet Capturing

Configuration Steps		Procedures and Topics
Step 1	Add end users to the Standard Packet Sniffer Users group.	Adding an End User to the Standard Packet Sniffer Users Group, page 2-4
Step 2	Configure packet capturing service parameters in the Service Parameter Configuration window in Cisco CallManager Administration; for example, configure the Packet Capture Enable service parameter.	Configuring Packet-Capturing Service Parameters, page 2-4
Step 3	Configure packet capturing settings on a per-device basis in the Phone or Gateway or Trunk Configuration window. **Note** Cisco strongly recommends that you do not enable packet capturing for many devices at the same time because this task may cause high CPU usage in your network.	• Configuring Packet Capturing in the Phone Configuration Window, page 2-5 • Configuring Packet Capturing in Gateway and Trunk Configuration Windows, page 2-6 • Packet Capturing Configuration Settings, page 2-7
Step 4	Capture SRTP packets by using a sniffer trace between the affected devices.	Refer to the documentation that supports your sniffer trace tool.

Table 2-1 Configuration Checklist for Packet Capturing (continued)

Configuration Steps		Procedures and Topics
Step 5	After you capture the packets, set the Packet Capture Enable service parameter to False.	• Configuring Packet-Capturing Service Parameters, page 2-4 • Packet Capturing Configuration Settings, page 2-7
Step 6	Gather the files that you need to analyze the packets.	Analyzing Captured Packets, page 2-8
Step 7	Cisco Technical Assistance Center (TAC) analyzes the packets. Contact TAC directly to perform this task.	Analyzing Captured Packets, page 2-8

Adding an End User to the Standard Packet Sniffer Users Group

End users that belong to the Standard Packet Sniffer Users group can configure the Packet Capture Mode and Packet Capture Duration settings for devices that support packet capturing. If the user does not exist in the Standard Packet Sniffer Users group, the user cannot initiate packet capturing.

The following procedure, which describes how to add an end user to the Standard Packet Sniffer Users group, assumes that you configured the end user in Cisco CallManager Administration, as described in the *Cisco CallManager Administration Guide*.

Procedure

Step 1 Find the user group, as described in the *Cisco CallManager Administration Guide*.

Step 2 After the Find/List window displays, click the **Standard Packet Sniffer Users** link.

Step 3 Click the **Add Users to Group** button.

Step 4 Add the end user, as described in the *Cisco CallManager Administration Guide*.

Step 5 After you add the user, click **Save**.

Configuring Packet-Capturing Service Parameters

To configure parameters for packet capturing, perform the following procedure:

Procedure

Step 1 In Cisco CallManager Administration, choose **System > Service Parameters**.

Step 2 From the Server drop-down list box, choose an Active server where you activated the Cisco CallManager service.

Step 3 From the Service drop-down list box, choose the **Cisco CallManager (Active)** service.

Step 4 Scroll to the TLS Packet Capturing Configuration pane and configure the packet capturing settings.

Tip For information on the service parameters, click the name of the parameter or the question mark that displays in the window.

Note For packet capturing to occur, you must set the Packet Capture Enable service parameter to True.

Step 5 For the changes to take effect, click **Save**.

Step 6 To continue packet-capturing configuration, see one of the following sections:

- Configuring Packet Capturing in the Phone Configuration Window, page 2-5
- Configuring Packet Capturing in Gateway and Trunk Configuration Windows, page 2-6

Configuring Packet Capturing in the Phone Configuration Window

After you enable packet capturing in the Service Parameter window, you can configure packet capturing on a per-device basis in the Phone Configuration window of Cisco CallManager Administration.

You enable or disable packet capturing on a per-phone basis. The default setting for packet capturing equals None.

Tip Cisco strongly recommends that you do not enable packet capturing for many phones at the same time because this task may cause high CPU usage in your network.

If you do not want to capture packets or if you completed the task, set the Packet Capture Enable service parameter to False.

To configure packet capturing for phones, perform the following procedure:

Procedure

Step 1 Before you configure the packet-capturing settings, see the "Configuration Checklist for Packet Capturing" section on page 2-3.

Step 2 Find the SIP or SCCP phone, as described in the *Cisco CallManager Administration Guide*.

Step 3 After the Phone Configuration window displays, configure the troubleshooting settings, as described in Table 2-2.

Step 4 After you complete the configuration, click **Save**.

Step 5 In the Reset dialog box, click **OK**.

Tip Although Cisco CallManager Administration prompts you to reset the device, you do not need to reset the device to capture packets.

Additional Steps

Capture SRTP packets by using a sniffer trace between the affected devices.

After you capture the packets, set the Packet Capture Enable service parameter to False.

See the "Analyzing Captured Packets" section on page 2-8.

Configuring Packet Capturing in Gateway and Trunk Configuration Windows

The following gateways and trunks support packet capturing in Cisco CallManager Administration:

- Cisco IOS MGCP gateways
- H.323 gateways
- H.323/H.245/H.225 trunks
- SIP trunks

Tip Cisco strongly recommends that you do not enable packet capturing for many devices at the same time because this task may cause high CPU usage in your network.

If you do not want to capture packets or if you completed the task, set the Packet Capture Enable service parameter to False.

To configure packet capturing settings in the Gateway or Trunk Configuration window, perform the following procedure:

Procedure

Step 1 Before you configure the packet capturing settings, see the "Configuration Checklist for Packet Capturing" section on page 2-3.

Step 2 Perform one of the following tasks:

- Find the Cisco IOS MGCP gateway, as described in the *Cisco CallManager Administration Guide.*
- Find the H.323 gateway, as described in the *Cisco CallManager Administration Guide.*
- Find the H.323/H.245/H.225 trunk, as described in the *Cisco CallManager Administration Guide.*
- Find the SIP trunk, as described in the *Cisco CallManager Administration Guide.*

Step 3 After the configuration window displays, locate the Packet Capture Mode and Packet Capture Duration settings.

Tip If you located a Cisco IOS MGCP gateway, ensure that you configured the ports for the Cisco IOS MGCP gateway, as described in the *Cisco CallManager Administration Guide*. The packet-capturing settings for the Cisco IOS MGCP gateway display in the Gateway Configuration window for endpoint identifiers. To access this window, click the endpoint identifier for the voice interface card.

Step 4 Configure the troubleshooting settings, as described in Table 2-2.

Step 5 After you configure the packet-capturing settings, click **Save**.

Step 6 In the Reset dialog box, click **OK**.

Tip Although Cisco CallManager Administration prompts you to reset the device, you do not need to reset the device to capture packets.

Additional Steps

Capture SRTP packets by using a sniffer trace between the affected devices.

After you capture the packets, set the Packet Capture Enable service parameter to False.

See the "Analyzing Captured Packets" section on page 2-8.

Packet Capturing Configuration Settings

Use Table 2-2, which describes the Packet Capture Mode and Packet Capture Duration settings, with the following sections:

- Configuring Packet Capturing in the Phone Configuration Window, page 2-5
- Configuring Packet Capturing in Gateway and Trunk Configuration Windows, page 2-6

Table 2-2 Packet Capturing Configuration Settings

Setting	Description
Packet Capture Mode	This setting exists for troubleshooting encryption only; packet capturing may cause high CPU usage or call-processing interruptions. Choose one of the following options from the drop-down list box: • **None**—This option, which serves as the default setting, indicates that no packet capturing is occurring. After you complete packet capturing, Cisco CallManager sets the Packet Capture Mode to None. • **Batch Processing Mode**—Cisco CallManager writes the decrypted or nonencrypted messages to file, and the system encrypts each file. On a daily basis, the system creates a new file with a new encryption key. Cisco CallManager, which stores the file for seven days, also stores the keys that encrypt the file in a secure location. Cisco CallManager stores the file in /var/pktCap. A single file contains the time stamp, source IP address, source IP port, destination IP address, packet protocol, message length, and the message. The TAC debugging tool uses HTTPS, administrator username and password, and the specified day to request a single encrypted file that contains the captured packets. Likewise, the tool requests the key information to decrypt the encrypted file. **Tip** Before you contact TAC, you must capture the SRTP packets by using a sniffer trace between the affected devices.
Packet Capture Duration	This setting exists for troubleshooting encryption only; packet capturing may cause high CPU usage or call-processing interruptions. This field specifies the maximum number of minutes that is allotted for one session of packet capturing. The default setting equals 0, although the range exists from 0 to 300 minutes. To initiate packet capturing, enter a value other than 0 in the field. After packet capturing completes, the value, 0, displays.

Analyzing Captured Packets

Cisco Technical Assistance Center (TAC) analyzes the packets by using a debugging tool. Before you contact TAC, capture SRTP packets by using a sniffer trace between the affected devices. Contact TAC directly after you gather the following information:

- Packet Capture File—**https://<IP address or server name>/pktCap/pktCap.jsp?file=mm-dd-yyyy.pkt**, where you browse into the server and locate the packet-capture file by month, date, and year (mm-dd-yyyy)
- Key for the file—**https://<IP address or server name>/pktCap/pktCap.jsp?key=mm-dd-yyyy.pkt**, where you browse into the server and locate the key by month, date, and year (mm-dd-yyyy)
- User name and password of end user that belongs to the Standard Packet Sniffer Users group

For more information, see the *Cisco CallManager Security Guide*.

Cisco CallManager Troubleshooting Tools

Refer to the *Cisco CallManager Serviceability Administration Guide* and the *Cisco CallManager Serviceability System Guide* for detailed information of the following different types of tools that Cisco CallManager Serviceability provides to monitor and analyze the various Cisco CallManager systems.

Table 2-3 Serviceability Tools

Term	Definition
Real-Time Monitoring Tool (RTMT)	This term identifies a program in Serviceability that provides real-time information about Cisco CallManager devices and performance counters.
Alarms	Administrators use alarms to obtain run-time status and state of the Cisco CallManager system. Alarms contain information about system problems such as explanation and recommended action.
Alarm Catalog	This term refers to a file containing all the Alarm definitions for Cisco CallManager services. Serviceability supports multiple alarm catalogs that are specific to the alarm type.
Alarm Definition	Administrators search the alarm definitions database for alarm information. The alarm definition contains a description of the alarm and recommended actions.
Alarm Event Levels	Administrators determine the level of information that an alarm will contain. Levels range from general information about the system to information for debugging purposes only.
Alarm Filters	Administrators determine the level of information an alarm contains and where the alarm information gets saved.
Alarm Monitors	Cisco CallManager Serviceability allows alarms to be sent to different destinations called monitors: local syslog, remote syslog, SDI trace and SDL trace.

Table 2-3 Serviceability Tools (continued)

Term	Definition
Alert Notify	Administrators configure alert notifications for performance counters and gateway ports/channels by using the Real-Time Monitoring Tool. Real-time monitoring sends alerts to the administrator by e-mail or in a system notification (popup) window.
Category Tabs	Administrators configure specific monitoring windows in real-time monitoring for troubleshooting purposes. The administrator creates these specific windows by using Category tabs.
Chart View	The Performance Monitoring Window displays performance counters in chart view by default. Chart view graphically shows the counter information.
Cisco CallManager service	Cisco CallManager supports many services in the form of software that performs a specific function, such as TFTP, CTI, or music on hold (MOH).
Control Center	Control Center tool in Serviceability allows administrators to view the status of and to start and stop Cisco CallManager services.
Debug Trace Levels	Administrators determine the level of information that a trace will contain. Levels range from general errors to detailed errors for debugging purposes.
Device Monitoring	Real-time monitoring displays real-time information about Cisco CallManager devices such as phones and gateways.
Device Monitoring Window	The right side of the Real-Time Monitoring Tool window displays device performance information when the tool is monitoring device performance.
Device Name Based Trace Monitoring	Administrators obtain trace information about selected devices by configuring trace parameters for Cisco CallManager and Cisco CTIManager services.
Monitoring Objects Window	The left side of the Real-Time Monitoring Tool window displays Cisco CallManager-related objects and counters or devices for a cluster. The information that displays depends on which tab is active in the window.
Objects and counters	The system provides performance data that contains information about various objects and counters. Objects are the logical groupings of like counters for a specific device or feature, such as Cisco IP Phones or Cisco CallManager System Performance. Counters measure various aspects of system performance. Counters measure statistics such as the number of registered phones, calls attempted, and calls in progress. The Real-Time Monitoring Tool monitors the real-time statistics generated by these counters.
Performance Monitoring	The Real-Time Monitoring Tool displays real-time information about a performance counter. Performance counters can be system specific or Cisco CallManager specific.
Performance Monitoring Window	The right side of the Real-Time Monitoring Tool window displays counter statistics when the tool is monitoring counters.
CCM Trace log file (formerly SDI Trace)	Every Cisco CallManager service includes a default trace log file. The system traces system diagnostic interface (SDI) information from the services and logs run-time events and traces to a log file.
Quality Report Tool	This term designates voice quality and general problem-reporting utility in Cisco CallManager Serviceability.

Table 2-3 Serviceability Tools (continued)

Term	Definition
SDL Trace log file	This file contains call-processing information from services such as Cisco CallManager and Cisco CTIManager. The system traces the signal distribution layer (SDL) of the call and logs state transitions into a log file. **Note** In most cases, you will only gather SDL traces when Cisco Technical Assistance Center (TAC) requests it of you.
Service status	Control Center displays the status of a service on a server.
Trace	Administrators and Cisco engineers use trace files to obtain specific information about Cisco CallManager service problems.
Trace log file	Cisco CallManager Serviceability sends configured trace information to this file. Two types of trace log files exist: CCM and SDL.
Window Status Bar	The bottom, right corner of the Real-Time Monitoring Tool window displays the window status bar. The status bar displays five icons: Preferences, Cluster Information, Resource Usage, About, and Help.

Cisco Secure Telnet

Cisco Secure Telnet allows Cisco Service Engineers (CSE) transparent firewall access to the Cisco CallManager node on your site. Using strong encryption, Cisco Secure Telnet enables a special Telnet client from Cisco Systems to connect to a Telnet daemon behind your firewall. This secure connection allows remote monitoring and troubleshooting of your Cisco CallManager nodes, without requiring firewall modifications.

Note Cisco provides this service only with your permission. You must ensure that a network administrator is available at your site to help initiate the process.

Command Line Interface

The command line interface (CLI) is used to access the Cisco CallManager system for basic maintenance and failure recovery. Access to the system can be obtained by either a hard-wired terminal (a system monitor and keyboard) or by performing a SSH session.

The account name and password are created at install time. The password can be changed after install, but the account name can never be changed.

A command is a text instruction that caused the system to perform some function. Commands may be stand alone or they can have mandatory or optional arguments or options.

A level is a collection of commands; for example, ***show*** is a level, whereas ***show status*** is a command. Each level and command also has an associated privilege level. You will be allowed to execute a command only if you have a sufficient privilege level.

For complete information on the Cisco CallManager CLI command set, see Appendix A in the *Cisco IP Telephony Platform Administration Guide, Release 5.0(1)*.

Troubleshooting Perfmon Data Logging

Caution Enabling the troubleshooting perfmon data logging feature impacts system performance on the selected node. Do not enable this parameter unless Cisco Technical Assistance Center (TAC) directs you to do so.

The troubleshooting perfmon data logging feature assists Cisco TAC in identifying system problems. When you enable troubleshooting perfmon data logging, you initiate the collection of a set of Cisco CallManager and operating system performance statistics on the selected node. The statistics that are collected include comprehensive information that can be used for system diagnosis and information from a set of counters that is not a part of the current set of preconfigured counters.

Because an extensive amount of information is collected in a short time, Cisco recommends that you do not enable the enable troubleshooting perfmon data logging for any extended time and that you enable the Log Partitioning Monitor to monitor disk usage while troubleshooting perfmon data logging is enabled.

When you enable the troubleshooting perfmon data feature on a system with no active phone calls and you use the default setting for the troubleshooting perfmon data logging parameters, Cisco estimates that the system experiences a less than 5 percent increase in CPU utilization, and an insignificant increase in the amount of memory being used, and it write approximately 50 MB of information to the log files daily.

You can perform the following administrative tasks with the troubleshooting perfmon data logging feature:

- Enable and disable the trace filter for Troubleshooting perfmon data logging.
- Monitor a set of predefined System and Cisco CallManager performance objects and counters on each server.
- Logs the monitored performance data in CSV file format on the local server in the active log partition and the cm/log/ris/csv directory. The log file uses the following naming convention: PerfMon_<node>_<month>_<day>_<year>_<hour>_<minute>.csv; for example PerfMon_172.19.240.80_06_15_2005_11_25.csv.
- Specify the polling rate. This rate specifies the rate at which performance data is gathered and logged. You can configure the polling rate down to 5 seconds. Default polling rate equals 15 seconds.
- Specifiy the maximum number of log files that will be stored on disk. Log files exceeding this limit are purged automatically by removing the oldest log file.
- Specify the rollover criteria of the log file based on the maximum size of the file in Megabytes. The default value specifies 2 MB.
- Collect the log file by using TCT/SOAP TCT (trace collection tool) or Command Line Interface.
- View the log file in graphical format by using the Microsoft Windows performance tool.

The troubleshooting perfmon data logging feature collects information from the following counters within the following perfmon objects. Refer to the “Performance Objects and Counters” chapter in *Cisco CallManager Serviceability System Guide* for a description on the counters:

- Cisco CallManager Object:
  - CallManagerHeartBeat
  - CallsActive
  - CallsAttempted
  - CallsCompleted

  - InitializationState
  - RegisteredHardwarePhones
  - RegisteredMGCPGateway
- Cisco CallManager System Performance Object:
  - QueueSignalsPresent 1-High
  - QueueSignalsPresent 2-Normal
  - QueueSignalsPresent 3-Low
  - QueueSignalsPresent 4-Lowest
  - QueueSignalsProcessed 1-High
  - QueueSignalsProcessed 2-Normal
  - QueueSignalsProcessed 3-Low
  - QueueSignalsProcessed 4-Lowest
  - QueueSignalsProcessed Total
- Cisco TFTP
  - BuildAbortCount
  - BuildCount
  - BuildDeviceCount
  - BuildDialruleCount
  - BuildDuration
  - BuildSignCount
  - BuildSoftkeyCount
  - BuildUnitCount
  - ChangeNotifications
  - DeviceChangeNotifications
  - DialruleChangeNotifications
  - EncryptCount
  - GKFoundCount
  - GKNotFoundCount
  - HeartBeat
  - HttpConnectRequests
  - HttpRequests
  - HttpRequestsAborted
  - HttpRequestsNotFound
  - HttpRequestsOverflow
  - HttpRequestsProcessed
  - HttpServedFromDisk
  - LDFoundCount
  - LDNotFoundCount
  - MaxServingCount
  - Requests

  - RequestsAborted
  - RequestsInProgress
  - RequestsNotFound
  - RequestsOverflow
  - RequestsProcessed
  - SegmentsAcknowledged
  - SegmentsFromDisk
  - SegmentsSent
  - SEPFoundCount
  - SEPNotFoundCount
  - SIPFoundCount
  - SIPNotFoundCount
  - SoftkeyChangeNotifications
  - UnitChangeNotifications
- Process Object:
  - PID
  - STime
  - % CPU Time
  - Page Fault Count
  - VmData
  - VmSize
  - Thread Count
- Memory Object:
  - Used Kbytes
  - Free Kbytes
  - Total Kbytes
  - Shared Kbytes
  - Buffers Kbytes
  - Cached Kbytes
  - Free Swap Kbytes
  - Total Swap Kbytes
  - Used Swap Kbytes
  - Pages Input
  - Pages Output
  - Pages
  - % Page Usage
  - % VM Used
  - % Mem Used
- Processor Object:
  - Irq Percentage

  - Softirq Percentage
  - IOwait Percentage
  - User Percentage
  - Nice Percentage
  - System Percentage
  - Idle Percentage
  - %CPU Time
- Thread Object—Troubleshooting Perfmon Data Logger only logs CCM threads:
  - PID
  - %CPU Time
- Partition Object:
  - Used Mbytes
  - Total Mbytes
  - %Used
  - % Wait in Read Time
  - % Wait in Write Time
  - % CPU Time
  - Read Bytes Per Sec
  - Write Bytes Per Sec
  - Queue Length
- IP Object:
  - In Receives
  - InHdr Errors
  - In Unknown Protos
  - In Discards
  - In Delivers
  - Out Requests
  - Out Discards
  - Reasm Reqds
  - Reasm Oks
  - Reasm Fails
  - Frag OKs
  - Frag Fails
  - Frag Creates
  - InOut Requests
- TCP Object:
  - Active Opens
  - Passive Opens
  - Attempt Fails
  - Estab Resets

  - Curr Estab
  - In Segs
  - Out Segs
  - Retrans Segs
  - InOut Segs
- Network Interface Object:
  - Rx Bytes
  - Rx Packets
  - Rx Errors
  - Rx Dropped
  - Rx Multicast
  - Tx Bytes
  - Tx Packets
  - Tx Errors
  - Tx Dropped
  - Total Bytes
  - Total Packets
  - Tx QueueLen
- System Object:
  - Allocated FDs
  - Freed FDs
  - Being Used FDs
  - Max FDs
  - Total Processes
  - Total Threads
  - Total CPU Time

The procedure below provides the steps for using the troubleshooting perfmon data logging feature.

Procedure

Step 1 Configure the Troubleshooting Perfmon Data Logging parameters in the Cisco RIS Data Collector service.

See the"Configuring Troubleshooting Perfmon Data Logging" section on page 2-16

Step 2 Verify that log partition monitoring is enabled.

See the *Cisco CallManager Administration Guide.*

Step 3 Collect the log files for the Cisco RIS Data Collector service on the server that has troubleshooting perfmon data logging enabled

- If you want to download the log files by using RTMT, refer to *Cisco CallManager CallManager Administration Guide*.
- If you want to download the log files by using the CLI, refer to *Cisco IP Telephony Platform Administration Guide.*

Step 4 View the log files by using Microsoft Windows Performance tool.

See the "Viewing the Perfmon Log Files with the Microsoft Performance Tool" section on page 2-17

Step 5 When you have collected all the necessary files, disable troubleshooting perfmon data logging by setting the Enable Logging parameter to False.

Configuring Troubleshooting Perfmon Data Logging

The following procedure describes how to configure the troubleshooting perfmon data logging feature.

Procedure

Step 1 In Cisco CallManager Administration, choose **System > Service Parameters**.

The Service Parameter Configuration window displays.

Step 2 From the Server drop-down list box, choose the server.

Step 3 From the Service drop-down list box, choose Cisco RIS Data Collector.

Step 4 Enter the appropriate settings as described in Table 2-4.

Step 5 Click **Save.**

Table 2-4 Troubleshooting Perfmon Data Logging Parameters

Field	Description
Enable Logging	From the drop-down box, choose **True** to enable or **False** to disable troubleshooting perfmon data logging.
Polling Rate	Enter the polling rate interval (in seconds). You can enter a value from 5 (minimum) to 300 (maximum). The default values specifies 15.
Maximum No. of Files	Enter the maximum number of Troubleshooting Perfmon Data Logging files that you want to store on disk. You can enter a value from 1 (minimum) up to 100 (maximum). The default value specifies 50. Consider your storage capacity in configuring the Maximum No. of Files and Maximum File Size Parameters. Cisco recommends that you do not exceed a value of 100 MB when you multiply the Maximum Number of Files value by the Maximum File Size value. When the number of files exceeds the maximum number of files that you specified in this field, Cisco CallManager will delete log files with the oldest timestamp. **Caution** If you do not save the log files on another machine before you change this parameter, you risk losing the log files.

Table 2-4 Troubleshooting Perfmon Data Logging Parameters

Field	Description
Maximum File Size	Enter the maximum file size (in megabytes) that you want to store in a perfmon log file before a new file is started. You can enter a value from 1 (minimum) to 500 (maximum). The default values specifies 2. Consider your storage capacity in configuring the Maximum No. of Files and Maximum File Size Parameters. Cisco recommends that you do not exceed a value of 100 MB when you multiply the Maximum Number of Files value by the Maximum File Size value.

Viewing the Perfmon Log Files with the Microsoft Performance Tool

To view the log files by using the Microsoft Performance tool, follow these steps:

Procedure

Step 1 Choose **Start > Settings > Control Panel > Administrative Tools > Performance.**

Step 2 In the application window, click the right mouse button and choose **Properties**.

Step 3 Click the Source tab in the System Monitor Properties dialog box.

Step 4 Browse to the directory where you downloaded the perfmon log file and choose the perfmon csv file. The log file has the following naming convention: PerfMon_<node>_<month>_<day>_<year>_<hour>_<minute>.csv; for example, PerfMon_172.19.240.80_06_15_2005_11_25.csv.

Step 5 Click **Apply.**

Step 6 Click the **Time Range** button. To specify the time range in the perfmon log file that you want to view, drag the bar to the appropriate starting and ending times.

Step 7 To open the Add Counters dialog box, click the Data tab and click **Add** t.

Step 8 From the Performance Object drop-down box, choose the perfmon object. If an object has multiple instances, you may choose **All instances** or select only the instances that you are interested in viewing.

Step 9 You can choose **All Counters** or select only the counters that you are interested in viewing.

Step 10 To add the selected counters, click **Add**

Step 11 When you finish selecting counters, click **Close.**

CiscoWorks2000

CiscoWorks2000 serves as the network management system of choice for all Cisco devices including Cisco CallManager. Because CiscoWorks2000 is not bundled with Cisco CallManager, you must purchase it separately. Use the following tools with CiscoWorks2000 for remote serviceability:

- System Log Management
- Cisco Discovery Protocol Support
- Simple Network Management Protocol Support

Refer to the *Cisco CallManager Serviceability Administration Guide* and the CiscoWorks2000 documentation for more information on CiscoWorks2000 at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/cw2000/index.htm

System Log Management

Although it can be adapted to other network management systems, Cisco Syslog Analysis, which is packaged with CiscoWorks2000 Resource Manager Essentials, provides the best method to manage Syslog messages from Cisco devices.

Cisco Syslog Analyzer serves as the component of Cisco Syslog Analysis that provides a common storage and analysis of the system log for multiple applications. The other major component, Syslog Analyzer Collector, gathers log messages from Cisco CallManager servers.

These two Cisco applications work together to provide a centralized system logging service for Cisco IP Telephony Solutions.

Refer to the *Cisco CallManager Serviceability Administration Guide* for more information.

Cisco Discovery Protocol Support

The Cisco Discovery Protocol Support enables discovery of Cisco CallManager servers and management of those servers by CiscoWorks2000.

Refer to the *Cisco CallManager Serviceability Administration Guide* and the CiscoWorks2000 documentation for more information on CiscoWorks2000 at the following URL:

http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/cw2000/index.htm

Simple Network Management Protocol Support

Network management systems (NMS) use SNMP, an industry-standard interface, to exchange management information between network devices. A part of the TCP/IP protocol suite, SNMP enables administrators to remotely manage network performance, find and solve network problems, and plan for network growth.

An SNMP-managed network comprises three key components: managed devices, agents, and network management systems.

- A managed device designates a network node that contains an SNMP agent and resides on a managed network. Managed devices collect and store management information and make it available by using SNMP.
- An agent, as network management software, resides on a managed device. An agent contains local knowledge of management information and translates it into a form that is compatible with SNMP.
- A network management system comprises an SNMP management application together with the computer on which it runs. An NMS executes applications that monitor and control managed devices. An NMS provides the bulk of the processing and memory resources that are required for network management. The following NMSs share compatibility with Cisco CallManager:
  - CiscoWorks2000
  - HP OpenView
  - Third-party applications that support SNMP and Cisco CallManager SNMP interfaces

For detailed information, refer to the *Cisco CallManager Serviceability Administration Guide* and the *Cisco CallManager Serviceability System Guide*.

Troubleshooting the Server Without Root Access

This section is a quick reference for commands and utilities to help you troubleshoot a Cisco CallManager server with root access disabled. It includes the following topics:

- Serviceability GUI and CLI Commands for Commonly-used Linux Commands
- Common Troubleshooting Tasks
  - How to Collect Logs and Trace Files
  - How to Schedule Collection of Logs and Trace Files
  - How to Access the Database
  - How to Free Up Space on the Hard Disk
  - How to Look at Core Files
  - How to Reboot the Cisco CallManager Server
  - How to Change Debug Levels for Traces
  - How to Look at Netstats

Serviceability GUI and CLI Commands for Commonly-used Linux Commands

Real Time Monitoring Tool (RTMT) is a client application you can install on your PC by downloading the RTMT client from your server at this URL:

https://<server_ipaddress>:8443/ccmadmin/pluginsFindList.do

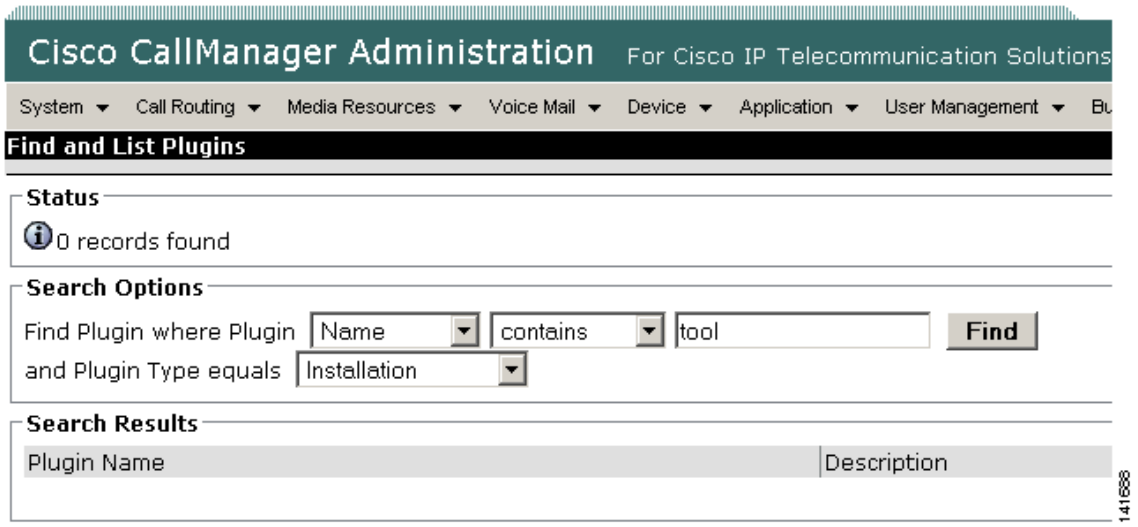
Procedure

Step 1 Log in to Cisco CallManager.

Step 2 Choose **Applications > Plugins**.

The Find and List Plugins screen screen is displayed as shown in Figure 2-1

Figure 2-1 Cisco CallManager Find and List Plugins Screen



Step 3 Set the selection boxes to **Name contains** and enter **tool**.

Step 4 Set the **Plugin Type** selection box to **Installation**.

Step 5 Click **Find.**

The Search Results box will display links to both the Windows and Linux versions of the Cisco CallManager Real-Time Monitoring Tool.

Step 6 Download the appropriate RTMT installation plugin (Windows or Linux version).

Step 7 Install the RMT client application on your PC or workstation.

Table 2-5 provides a summary of the CLI commands and GUI selections detailed in following sections.

Table 2-5 Summary of CLI Commands and GUI Selections

Information	Linux Command	Serviceability GUI Tool	CLI commands
CPU usage	top	RTMT Goto View > Server CPU and Memory	Processor CPU usage: show perf query class Processor Process CPU Usage for all processes: show perf query counter Process "% CPU Time" Individual process counter details (including CPU usage): show perf query instance <Process task_name>
Process state	ps	RTMT Goto View > Server Process	show perf query counter Process "Process Status"
Disk usage	df/du	RTMT Goto View > Server Disk Usage	show perf query counter Partition "% Used" or show perf query class Partition

Table 2-5 Summary of CLI Commands and GUI Selections (continued)

Information	Linux Command	Serviceability GUI Tool	CLI commands
Memory	free	RTMT Goto View > Server CPU and Memory	show perf query class Memory
Network status	netstats		show network status
Reboot server	reboot	login to Platform Web page on the server Goto Restart > Current Version	utils system restart
Collect Traces/logs	Sftp, ftp	RTMT Goto Tools > Trace > Trace & Log Central > Collect Files	List file: file list Download files: file get View a file: file view

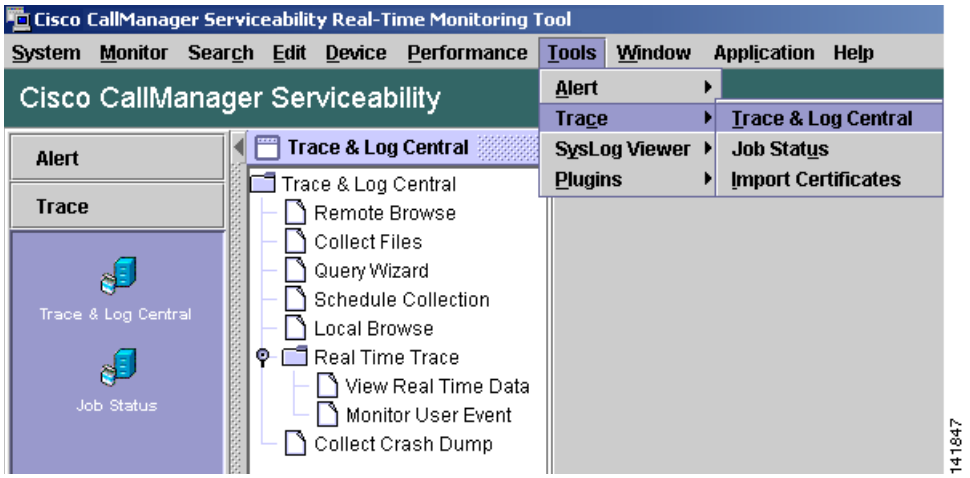
Common Troubleshooting Tasks

How to Collect Logs and Trace Files

GUI

Using the RTMT client application, go to the **Tools** menu and select **Trace > Trace & Log Central** to see the different trace utilities.

Figure 2-2 Cisco CallManager RTMT Trace & Log Central



CLI

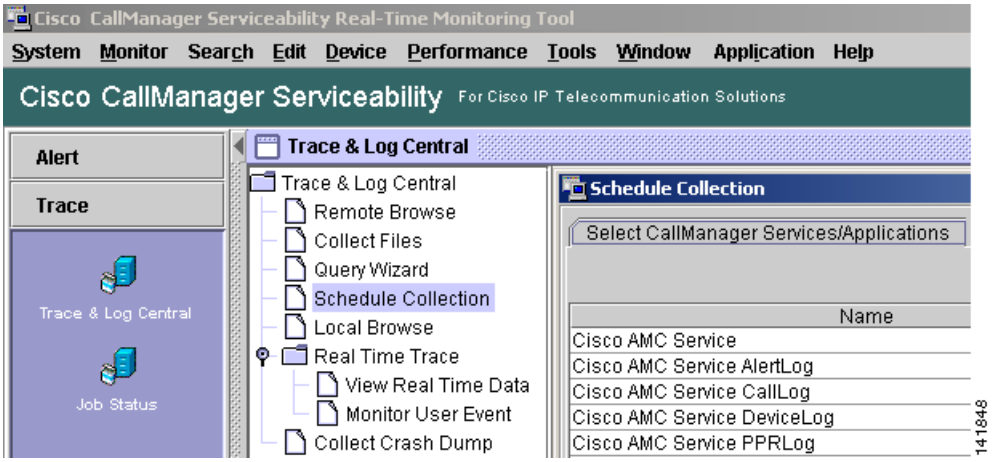
- file list
- file get
- file view

How to Schedule Collection of Logs and Trace Files

GUI

Using the RTMT client application go to the **Tools** menu and select **Trace & Log Central > Schedule Collection**.

Figure 2-3 Cisco CallManager RTMT Schedule Collection



How to Access the Database

CLI

Log in as admin and use any of the following **show** commands:

- show tech database
- show tech dbinuse
- show tech dbschema
- show tech devdefaults
- show tech gateway
- show tech locales
- show tech notify
- show tech procedures
- show tech routepatterns
- show tech routeplan
- show tech systables
- show tech table
- show tech triggers
- show tech version
- show tech params*

To run a SQL command use the **run** command:

- run <sql command>

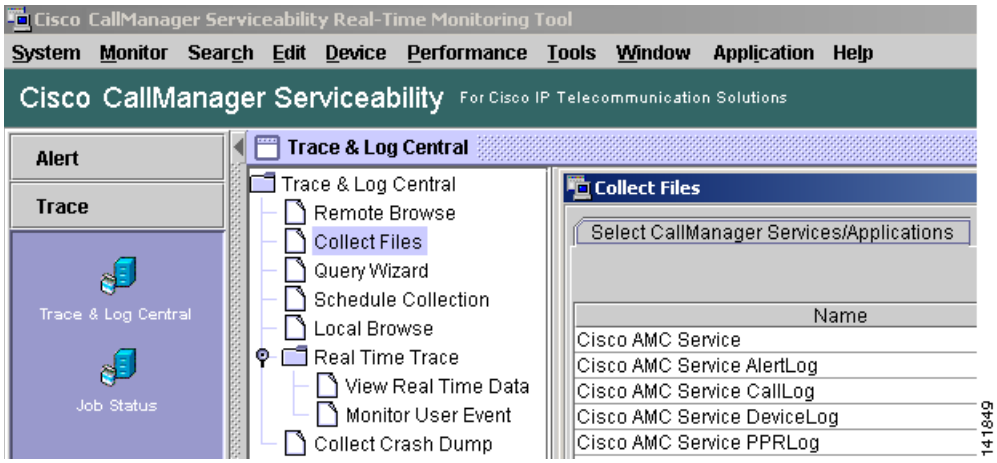
How to Free Up Space on the Hard Disk

You can only delete files from the Log partition.

GUI

Using the RTMT client, go to the **Tools** menu and select **Trace & Log Central > Collect Files**.

Figure 2-4 Cisco CallManager RTMT Collect Files



Choose the criteria to select the files you want to collect, then check the option **Delete Files**. This will delete the files on the Cisco CallManager server after downloading the files to your PC.

CLI:

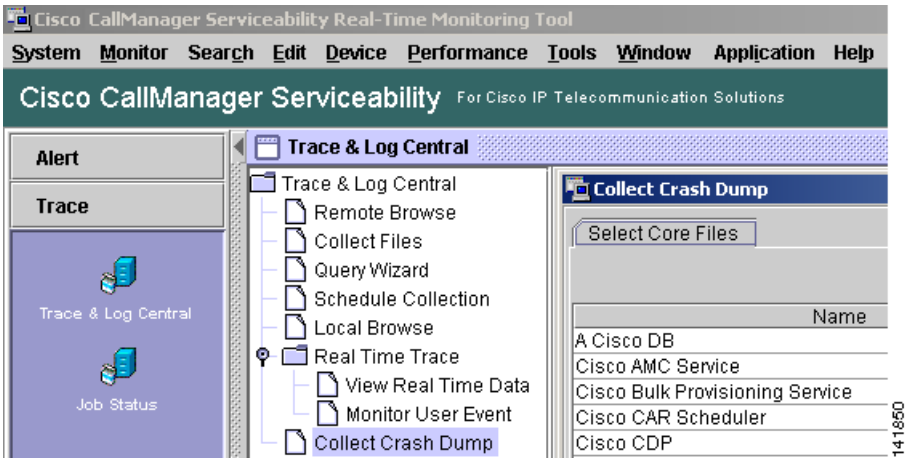
- file delete

How to Look at Core Files

GUI

It is not possible to view the core files; however, you can download the Core files by using the RTMT application and selecting **Tools > Trace & Log Central > Collect Crash Dump.**

Figure 2-5 Cisco CallManager RTMT Collect Crash Dump



CLI

- Core [options..]

How to Reboot the Cisco CallManager Server

GUI

Login to the Platform Web page on the server and go to **Restart > Current Version**.

CLI

- utils system restart

How to Change Debug Levels for Traces

GUI

Login to the Serviceability web page at https://<server_ipaddress>:8443/ccmservice/ and go to **Trace > Configuration**

CLI

- set trace enable [Detailed, Significant, Error, Arbitrary, Entry_exit, State_Transition, Special] [syslogmib, cdpmib, dbl, dbnotify]

How to Look at Netstats

GUI

none

CLI

- show network status

Troubleshooting Tips

The following tips may help you when troubleshooting the Cisco CallManager.

Tip Check the release notes for Cisco CallManager for known problems. The release notes provide descriptions and workaround solutions for known problems.

Tip Know where your devices are registered.

Each Cisco CallManager log traces files locally. If a phone or gateway is registered to a particular Cisco CallManager, then the call processing gets done on that Cisco CallManager if the call is initiated there. You will need to capture traces on that Cisco CallManager to debug a problem.

A common mistake involves having devices registered on a subscriber server, but capturing traces on the publisher server. These trace files will be nearly empty (and definitely will not have the call in them).

Another common problem involves having Device 1 registered to CM1 and Device 2 registered to CM2. If Device 1 calls Device 2, the call trace occurs in CM1 and if Device 2 calls Device 1 the trace occurs in CM2. If you are troubleshooting a two-way calling issue, you need both traces from both Cisco CallManagers to obtain all the information needed to troubleshoot.

Tip Know the approximate time of the problem.

Multiple calls may have been made, so knowing the approximate time of the call helps TAC quickly locate the trouble.

You can obtain statistics on a Cisco IP Phone 79xx by pressing the **i** button twice during an active call.

When you are running a test to reproduce the issue and produce information, know the following data that is crucial to understanding the issue:

- Calling number/called number
- Any other number that is involved in the specific scenario
- Time of the call

Note Remember that time synchronization of all equipment is important for troubleshooting.

If you are reproducing a problem, make sure to choose the file for the timeframe by looking at the modification date and the timestamps in the file. The best way to collect the right trace is to reproduce a problem and then quickly locate the most recent file and copy it from the Cisco CallManager server.

Tip Save the log files to prevent them from being overwritten.

Files will get overwritten after some time. The only way to know which file is being logged to is to choose **View >Refresh** on the menu bar and look at the dates and times on the files.

Verify Cisco CallManager Services Are Running

Use the following procedure to verify which Cisco CallManager services are active on a server.

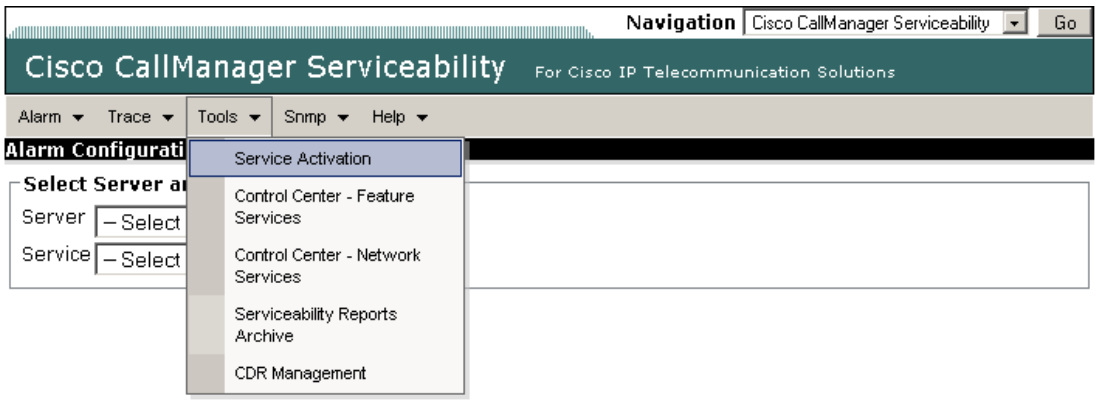
Procedure

Step 1 From Cisco CallManager Administration, choose **Navigation > Cisco CallManager Serviceability**.

The Cisco CallManager Serviceability window displays.

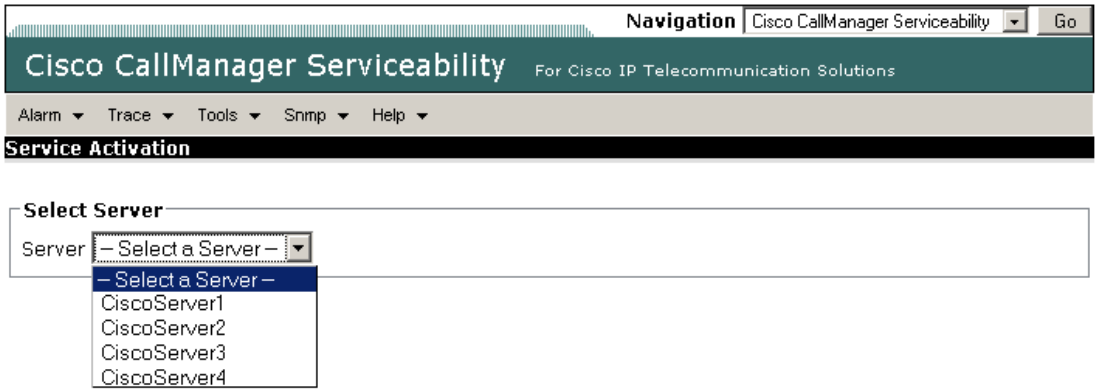
Step 2 Choose **Tools > Service Activation** as shown in **Figure 2-6.**

Figure 2-6 Cisco CallManager Serviceability Window Tools Menu



Step 3 From the Servers column, choose the desired server as shown in Figure 2-7.

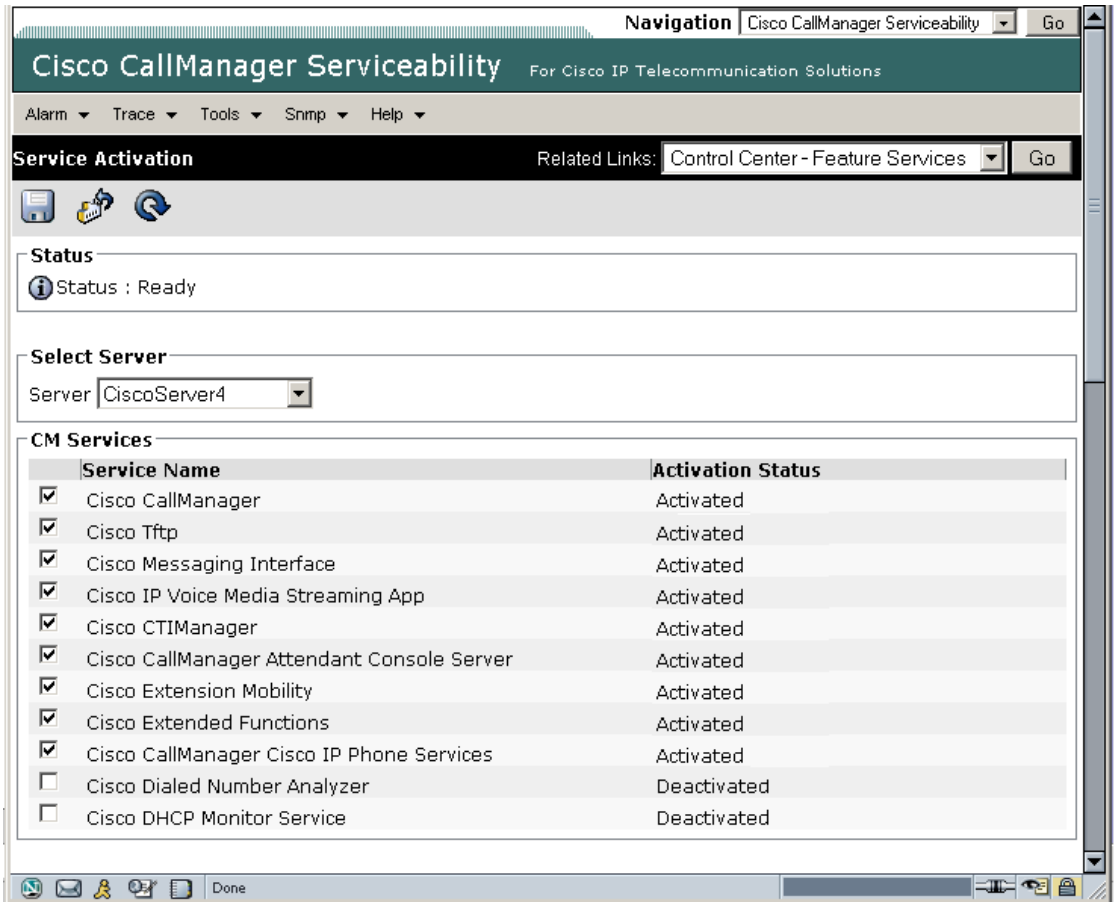
Figure 2-7 Cisco CallManager Serviceability Window Service Activation



The server that you choose displays next to the Current Server title, and a series of boxes with configured services displays.

Activation Status column displays either Activated or Deactivated in the Cisco CallManager line as shown in Figure 2-8.

Figure 2-8 Service Activation Window



If the **Activated** status displays, the specified Cisco CallManager service is active on the chosen server.

If the **Deactivated** status displays, continue with the following steps.

Step 4 Check the check box for thedesired Cisco CallManager service.

Step 5 Click the **Update** button.

The Activation Status column displays **Activated** in the specifed Cisco CallManager service line.

The sepcified Cisco CallManager service is now active for the chosen server.

Perform the following procedure if the Cisco CallManager has been in service and you want to verify if it is currently running.

Procedure

Step 1 From Cisco CallManager Administration, choose **Navigation > Cisco CallManager Serviceability**.

The Cisco CallManager Serviceability window displays.

Step 2 Choose **Tools > Control Center – Feature Services.**

Step 3 From the Servers column, choose the server.

The server that you chose displays next to the Current Server title, and a box with configured services displays.

The Status column displays which services are running for the chosen server.

Where to Find More Information

Additional Cisco Documentation

- *Cisco CallManager Serviceability Administration Guide*
- *Cisco CallManager Serviceability System Guide*
- *Cisco CallManager Administration Guide*
- *Cisco CallManager Security Guide*
- *Installation Guide for Cisco CallManager*