



## Overview

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The Cisco CDR Analysis and Reporting (CAR) tool generates 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.



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**Note** CAR does not handle iDivert calls (a feature that diverts calls to a voice-messaging system) and treats them as normal calls. The part of the call after the iDivert feature gets activated may not get charged to the correct party.

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## CDR Analysis and Reporting Overview

As its primary function, CAR generates reports about the users of Unified Communications Manager and generates reports on the system status about call processing. CAR also performs CAR database management activities. You can perform these tasks in one of the following ways:

- Automatically configure the required tasks to take place.
- Manually perform the tasks by using the web interface.

You access CAR from the Tools menu of Cisco Unified Serviceability after you activate the appropriate services as described in the [Activate CAR](#).

All CAR reports use CDR data. CAR processes the CDRs from flat files that the CDR Repository service places in the CDR repository folder structure. CAR processes CDRs at a scheduled time and frequency. By default, CDR data loads continuously 24 hours per day and seven days per week; however, you can set the loading time, interval, and duration as needed. In addition, the default setting loads only CDR records. CMR records do not get loaded by default.



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**Note** An option allows you to uncheck the “Load CDR Only” check box in the CAR System Scheduler window to allow CMR records to load. See [Set Up CDR Load Schedule](#) for additional information.

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CAR retrieves information that requires for various reports from CDRs, CMRs, and the Unified Communications Manager database.

### Scheduling Reports

After CAR is activated on your system, you can schedule CAR reports to generate automatically at a regular time. Each report that can be scheduled has its own report generation interval. You can make the report generation interval be daily, weekly, or monthly. Scheduling Daily reports schedules all the reports that have report generation intervals of daily. Similarly, scheduling Weekly or Monthly reports would schedule the reports that have report generation intervals of weekly or monthly. You can also specify the time to keep a report before it gets automatically deleted.

By default, CAR uses the following report generation and deletion schedule:

- Daily reports run at 1 a.m. every day. These reports get purged after two days.
- Weekly reports run at 4 a.m. every Sunday. These reports get purged after four weeks.
- Monthly bill reports run at 3 a.m. on the first day of every month. These reports get purged after two months.
- Other monthly reports run at 2 a.m. on the first day of every month. These reports get purged after two months.



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**Note** If you upgrade your system to a new version of Unified Communications Manager, you must disable the CAR reports that generate automatically, so you conserve system resources during the upgrade process.

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For a list of reports and the default generation schedule, see the [Enable Automatic Generation Reports](#).

For system monitoring, automatically generate various reports, such as QoS reports, and review them at regular intervals, perhaps every day if you have a large system, or every week or every two weeks for smaller systems. QoS reports helping you determine the quality of calls that run on your network and judge whether you need additional hardware to improve performance. You can use utilization reports for gateways, voice messaging, conference bridge, route groups, route lists, and route patterns to provide a picture of the usage to help with system handling.

You can also customize the report parameters and enable a mailing option, so reports get emailed when they are created. The Customize Parameters option allows you to customize the report parameters for particular reports in the Customize Parameters window. For each individual report, you can customize the parameters for that report.

### Setting Up Alerts

CAR provides email alerts for various events, including the following events:

- Charge Limit Notification indicates when the daily charge limit for a user exceeds the specified maximum. You can set the maximum in the **Report Config > Notification Limits** window.

- QoS Notification indicates when the percentage of good calls drops below a specified range or the percentage of poor calls exceeds a specified limit. You can set the range in the **Report Config > Notification Limits** window.

Enabling the system for email alerts comprises a two-step process. First, you must specify the mail server configuration information (**System > System Parameters > Mail Parameters**). CAR uses the configuration information to successfully connect to the email server. Next, you must enable the email alerts on the Automatic Report Generation/Alert window (**Report Config > Automatic Generation/Alert**). By default, CAR enables email alerts for some, but not all, reports.

Be sure to disable the automatic email alerts to conserve system resources while you upgrade your system to a later version of Unified Communications Manager.



**Note** The system does not provide email alerts to application users because no mail ID exists for an application user.

### Purging CAR Data

This section contains information on the following topics:

- Automatic purging
- Manual purging
- Event log purging

CAR provides automatic and manual purging of the CAR database. By default, the system enables automatic purging. Before and after loading CDRs/CMRs, CAR checks the size of the CAR database and invokes automatic purging, if necessary, to control the CAR database size.

With automatic purging, CAR continuously monitors the number of days that the CDRs are kept in the CAR database; when the CDR age exceeds the maximum number of days as configured in the maximum age setting in the Configure Automatic Database Purge window, CAR deletes all CDRs that are older than the number of days that you configured.

In the Configure Automatic Database Purge window, you specify the percentages of the CAR database that you want to allot for CAR data; the system maintains the CAR database size between the high water mark and low water mark that you specify. When the CAR database size exceeds the low water mark, CAR sends an email to CAR administrators. When the CAR database size exceeds the high water mark, CAR begins to delete the partitions from billing data and billing error tables, starting from the oldest date partitions until under the specified limit, allowing the system to continue loading the latest records. In cases where there are many CDRs present in the CAR database and deleting the partitions does not lower the limit, CAR keeps at least two days worth of data and send an email to CAR administrators.

**Table 1: Maximum Size of CDR Database**

Version	Maximum Number of CDR Records	Maximum Size of Database	Maximum Aggregated Busy Hour Call Attempts (BHCA)
Unified Communications Manager	2 million records	6 GB	10,000

Version	Maximum Number of CDR Records	Maximum Size of Database	Maximum Aggregate Busy Hour Call Attention (BHCA)
Cisco Unified Communications Manager Business Edition 5000	1 million records	3 GB	5,000

Configure a manual database purge when you want to delete records that are older than a particular date or that fall in a specific date range, but you do not want to change the automatic purging schedule. You can also reload the CAR database with CDR records by clicking the Reload button in the Manual Purge window. You may want to reload the database to reclassify calls after dial-plan updates, user-device association changes, call rate changes, and so on. After the system loads the new records, the system loads the records according to the schedule in the configured CDR load schedule. By default, CDR data loads 24 hours per day, 7 days per week.

Event log purging, which is a daily scheduled job that monitors the `tbl_event_log` table, automatically deletes the `tbl_event_log` records to keep the latest 3 days of daily jobs, the latest 3 weeks of weekly jobs, and the latest 3 months of monthly jobs; that is, if more than 1500 rows exist in the `tbl_event_log` table, CAR automatically enables event log purging and does not send an email when event log purging occurs.

### Call Costs

You can use CAR to set a base monetary rate for the cost of calls on the basis of a time increment. Then, you can further qualify the cost by applying the time-of-day and voice-quality factors. Service providers who must account for service to subscribers use this feature. Some organizations also use this information to establish billing costs for users and departments in the organization for accounting or budgeting purposes.

Reports that use these rating parameters include Individual Bill, Department Bill, Top N by Charge, Top N by Number, and Top N by Duration.




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**Note** If you do not change the default value for charge base/block, the cost will always remain zero because the default base charge per block equals zero.

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**Note** If you do not want to increase, call cost by voice quality, you can use the default values. The default multiplication factor specifies 1.00, so no increase in call cost for voice quality occurs.

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For more information on setting call rates, see [CAR Rating Engine](#).

### Tracking Activity

CAR provides logs that can track the status of the various activities. The event log tracks events that the CAR Scheduler triggers, such as automatically generated reports, loading of CDRs, notifications, report deletions, database purging, and monitoring, and event tracking.

## CDR Management

The CDR Management window can be accessed from Cisco Unified Serviceability by choosing **Tools > CDR Management**. CDR Management services manage CDR and CMR storage within the cluster, as well as file

transfers to an application billing server. From Release 14 onwards, CDR/CMR files sends upto eight customer billing servers via FTP/SFTP.

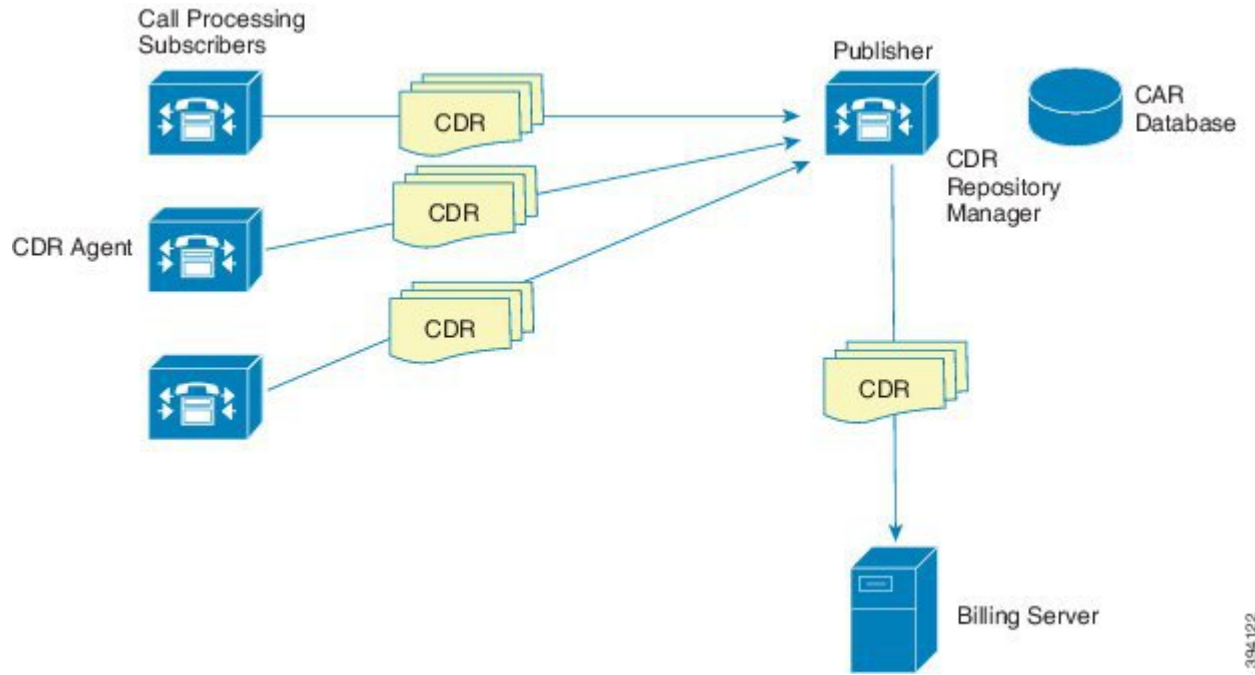
CDR Management uses the following services:

- **CDR Agent**—This network service transfers the CDR files that the call processing nodes generate from the call processing nodes to the CDR Repository node via SFTP. After the file transfer is completed, the CDR Agent deletes the local CDR file from the call processing node. This service is enabled by default.
- **CDR Repository Manager**—This service must be running on at least one node in the cluster (typically, the publisher node). The CDR Repository Manager maintains copies of the generated CDR and CMR files on the repository node and purges the files after a specified expiration passes, or when the disk usage exceeds the high water mark. If an application billing server is deployed, the CDR Repository Manger initiates an SFTP transfer of the CDR and CMR files to the billing servers. This network service is on by default.
- **CDR onDemand Server**—This feature service must be activagted on the CDR Repository node if you are using an application billing server. This service uses a SOAP/HTTPS-based service, which receives SOAP requests for a particular CDR filename based on a user-specified time interval and returns all files via SFTP that fit the parameters.

### SFTP File Transfers

The CDR Agent checks at 6-second intervals for CDR and CMR files to transfer from call processing nodes to the CDR Repository server via SFTP. After a successful transfer, the local file is deleted from the call processing node. Each delivery failure results in the immediate change of the sleep interval to 1 minute, then stays at 1-minute intervals until successful delivery. After the first successful delivery of files, the 6-second interval resumes. If any files remain on call processing nodes without being transferred, they may be deleted by the Cisco Log Partition Monitoring Tool if the disk usage exceeds a configured threshold. For information on the Log Partition Monitoring Tool, see the *Cisco Unified Real-Time Monitoring Tool Administration Guide*.

The CDR Repository Manager checks at 6-second intervals for CDR and CMR files to send to any deployed billing servers. If the billing server does not respond, the system doubles the interval before making another attempt. Each delivery failure results in double the sleep time until 2 minutes, then stays at 2 minutes until successful delivery is reached. After a successful delivery, the 6-second interval resumes. This process continues unless you delete the billing server, or if the files fall outside the preservation window and are deleted.



**Supported SFTP Servers**

For internal testing, Cisco uses the SFTP Server on Cisco Prime Collaboration Deployment (PCD) which is provided by Cisco, and which is supported by Cisco TAC. Refer to the following table for a summary of SFTP server options:

Use the information in the following table to determine which SFTP server solution to use in your system.

*Table 2: SFTP Server Information*

SFTP Server	Information
SFTP Server on Cisco Prime Collaboration Deployment	This server is the only SFTP server that is provided and tested by Cisco, and fully supported by Cisco TAC.  Version compatibility depends on your version of Unified Communications Manager and Cisco Prime Collaboration Deployment. See the <a href="#">Cisco Prime Collaboration Deployment Administration Guide</a> before you upgrade its version (SFTP) or Unified Communications Manager to ensure that the versions are compatible.
SFTP Server from a Technology Partner	These servers are third party provided and third party tested. Version compatibility depends on the third party test. See the Technology Partner page if you upgrade their SFTP product and/or upgrade Unified Communications Manager for which versions are compatible:  <a href="https://marketplace.cisco.com">https://marketplace.cisco.com</a>

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SFTP Server	Information
SFTP Server from another Third Party	<p>These servers are third party provided and are not officially supported by Cisco TAC.</p> <p>Version compatibility is on a best effort basis to establish compatible SFTP versions and Unified Communications Manager versions.</p> <p><b>Note</b> These products have not been tested by Cisco and we cannot guarantee functionality. Cisco TAC does not support these products. For a fully tested and supported SFTP solution, use Cisco Prime Collaboration Deployment or a Technology Partner.</p>

## Roles

CAR provides reporting capabilities for three levels of users:

- Administrators use all the features of CDR Analysis and Reporting; for example, they can generate system reports to help with load balancing, system performance, and troubleshooting.
- Managers can generate reports for users, departments, and QoS to help with call monitoring for budgeting or security purposes and for determining the voice quality of the calls.
- Individual users can generate a billing report for calls.

Any user can act as a CAR administrator. Users who have been identified as CAR administrators have full control over the CAR system. The administrator can modify all the parameters that relate to the system and the reports.

CAR requires a minimum of one administrator.

You set up administrators, managers, and users in Cisco Unified CM Administration. For more information, see the [Generate CAR Users](#).

## Reports

From CAR, you can generate reports on demand, or if you are an administrator, you can schedule reports for an automatic generation. You can view reports in Comma Separated Values (CSV) format or Portable Document Format (PDF). If you choose PDF, you must have Adobe Acrobat Reader that installed on your PC.

## Report Information

For all CAR reports that show the pattern for Hour of Day, Day of Week, and Day of Month, the charts and tables get shown according to the following conditions:

- When no records match the time range that is specified (hour of the day, day of the week, or day of the month) in the search criteria, the report displays a value of 0.00 for all the days/hours.
- If all records that are returned have a value of 0.00, CAR does not display the charts. CAR displays the charts if any record contains a non-zero value.
- When records get generated (for at least one day in the chosen date range) and the number of days that is chosen is more than the number of days that the report can show (more than seven for weekly and more than 31 for monthly), the chart displays all the days (with 0 value for the days that do not generate

records). A table displays for all the days with relevant value and 0.00 for the days that do not contain data.

- When records generate (for at least one day in the chosen date range) and the number of days that is chosen is less than the number of days that the report can show (less than 7 for weekly and less than 31 for monthly), the chart displays all the days (with 0 value for the days that do not generate records). A table displays all the days with relevant value and 0.00 for the days that do not contain data.

In all the CAR reports that display the username, userid displays if CAR cannot retrieve the username. This situation can occur when the report gets generated for prior data where the user that was involved in a call then no longer exists in the system (Unified Communications Manager database).

## Generated Report Schedule

Automatically generating reports comprises a two-step process. First, you must enable the reports that you want to have generated. Second, you must schedule the reports for the day and time that you want them to generate. CAR provides a default schedule, so if the default schedule is acceptable, you need only enable the reports that you want to automatically generate.

Reports and email alerts do not automatically get enabled on a new installation. You must enable the reports that you want to automatically generate. To enable or disable a report generation, see the [Enable Automatic Generation Reports](#) for instructions on how to generate reports and emails automatically.

To change the specific time each day, week, or month that reports get generated and get purged from the system, see [Set Up CDR Load Schedule](#).

## Audit Logging

With audit logging, any configuration change to the Unified Communications Manager system gets logged in separate log files for auditing. An audit event is any event that is required to be logged. Cisco Unified CDR Analysis and Reporting create audit logs for these events:

- Scheduling the CDR Loader.
- Scheduling the daily, weekly, and monthly user reports, system reports, and device reports.
- Mail parameters configurations.
- Dial plan configurations.
- Gateway configurations.
- System preferences configurations.
- Autopurge configurations.
- Rating engine configurations for the duration, time of day, and voice quality.
- QoS configurations.
- Automatic generation/alert of pre-generated reports configurations.
- Notification limits configurations.



## Log-On Message

You can upload a text file that contains a customized log-on message that appears on the initial Cisco Unified Communications Manager CDR Analysis and Reporting window.

For more information and the procedure for uploading your customized log-on message, see the *Administration Guide for Cisco Unified Communications Manager*.

## Internationalization

CAR, designed to be internationalized to handle any locale (or language), includes a database that can also handle any locale.



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**Note** CAR supports all Latin-1 language and Unicode language locales as Unified Communications Manager the help specifies. Latin-1 languages include English and Western European languages. Unicode languages include Japanese and Chinese.

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Two types of locale exist: user and network. Each locale comprises a set of locale files. The following definitions describe the two types of files:

- User - Files that relate to user-related functions, such as phone display text, user applications, and user web pages.
- Network - Files that relate to network-related functions, such as phone and gateway tones. Country names designate network locales.

CAR supports the locales only if the Locale Installer has installed locales.



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**Note** For Unified Communications Manager, make sure that you have first installed the Unified Communications Manager Locale Installer on every server in the cluster. Installing the Locale Installer ensures that you have the latest translated text available for CAR.

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For more information about the Unified Communications Manager Locale Installer, see the *Administration Guide for Cisco Unified Communications Manager*.

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Only User and Manager windows support multiple locales. Administrator windows display in English.

In the Cisco Unified CM Administration, set the user-preferred locale in the Unified Communications Manager database. You do this when you create a user from the End User Configuration window. Specify the preferred locale along with the username, user ID, and so on. The Unified Communications Manager database stores this information.

For more detailed information, see the *Cisco Unified Communications Manager Online Help*.

These sections describe the elements that make up the internationalization of CAR.

### Logon Page

When the client (browser) requests the logon information, the logon window header includes the most preferred locale of the client. The CAR system checks whether the CAR UI supports this locale. If the CAR UI does

not support the locale, or if the locale is not installed in the system, the logon window displays in the Unified Communications Manager system default locale that is set in the CiscoCommunications Manager Enterprise parameter. If CAR does not also support this locale, or the locale is not installed in the system, the locale gets set to English\_United\_States.

### **Authenticate and Show CAR Pages for Post Logon Windows**

User credentials (in any language) get authenticated through the Unified Communications Manager database, and then CAR windows for non-administrative users (users or managers) display the user preferred locale. If the CAR UI does not support this locale, or if the locale is not installed in the system, the Unified Communications Manager system default locale gets used. If this locale is not supported by CAR or is not installed in the system, windows display in the most preferred locale of the browser. When the browser-preferred locale is also not supported or not installed, the locale gets set to English\_United\_States. All information on the UI windows, including labels, number formats, and so on, displays based on the locale. The administrator windows always display in English.

### **Reports**

Reports, which are generated in both CSV and PDF formats, display in the user preferred locale for non-administrative users (users or managers). However, the dynamic data (like the Company Name shown in the report header) displays in the same language as was used to enter it in the database. The locale provides the basis for the header, footers, number formats, and some static data (like call classification). Reports for administrators display in English.

## **Online Help**

To access CAR documentation online help, choose **Help > Contents and Index** (for a list of contents) or **Help > For this page** (for information that is specific to the page that displays.)

## **Backup Database**

The CAR and CDR Disaster Recovery Service (DRS) now integrates into the Unified Communications Manager DRS. The DRS includes the backup of the CAR database, pre-generated reports, and the CDR preserved flat files.

The CAR Web Service and CAR Scheduler automatically stop before the backup and restore process begin, and automatically restart after the backup and restore process is complete.

The table displays the features and components that the Disaster Recovery System can back up and restore. For each feature that you choose, the system backs up all its components automatically.

Table 3: Cisco Unified CM Features and Components

Feature	Components
CCM - Unified Communications Manager	Unified Communications Manager database
	Platform
	Serviceability
	Music On Hold (MOH)
	Cisco Emergency Responder
	Bulk Tool (BAT)
	Preference
	Phone device files (TFTP)
	syslogagt (SNMP syslog agent)
	cdpagent (SNMP cdp agent)
	tct (trace collection tool)
	Call Detail Records (CDRs)
	CDR Reporting and Analysis (CAR)

For more detailed information, see the *Administration Guide for Cisco Unified Communications Manager*.

## CPU Utilization

Cisco has performed basic testing to measure CPU utilization when CDRs and/or CMRs are enabled. The CPU utilization testing was measured on subscribers and was not measured on the publishers. Your actual results can vary because of the CDR Loader settings and the CDR Management settings for external billing servers. The following table displays the results of these tests.



**Note** These tests are performed with the Unified Communications Manager Release 8.0(1).

Table 4: CDR and CMR CPU Utilization

CDRs and CMRs Enabled/Disabled	Average % Increase in Cisco Unified CM CPU Utilization	Average % Increase in Total CPU Utilization	% Increase in Cisco Unified CM CPU	% Increase in Total CPU
CDRs disabled, CMRs disabled	6.17	11.15	-	-
CDRs enabled, CMRs disabled	6.99	12.10	13.18	8.57
CDRs disabled, CMRs enabled	6.38	11.24	3.43	0.86

<b>CDRs and CMRs Enabled/Disabled</b>	<b>Average % Increase in Cisco Unified CM CPU Utilization</b>	<b>Average % Increase in Total CPU Utilization</b>	<b>% Increase in Cisco Unified CM CPU</b>	<b>% Increase in Total CPU</b>
CDRs enabled, CMRs enabled	7.71	13.04	24.92	17.02