



Database Administration

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Unified CCE Database Administration

When you install a new Logger, you create its central database. Create an HDS database on a real-time Administration & Data Server. When you create a database, you specify the size of its data or log files. The data files must be sufficient for all the data that you expect the database to hold. The size of the central and HDS databases depend on your call center traffic and your data retention requirements.



Note

For more information on how to perform a manual configuration for integrating AWDB with ECE, see the section *Integrating ECE with Unified CCE* in the [Enterprise Chat and Email Installation and Configuration Guide](#).

The local database (awdb) contains configuration and real-time data, if the Administration & Data Server role includes a real-time server. Because the real-time data in the local database (awdb) are constantly overwritten by new data, the database size remains fairly constant.

Over time, the size of your enterprise or your call volumes can change significantly. Therefore, you might need to resize the central and HDS databases to meet new requirements. You do not need to resize the local database (awdb). To resize the local database (awdb), use the ICM Database Administration (ICMDBA) tool.

The data in the central database and HDS database grow as they accumulate historical data and call detail records. The growth is directly related to the following factors:

- Size of the Unified ICM configuration; for example, how many services, skill groups, routes, and trunk groups are configured.
- Call rate; that is, how many calls per day the system software is handling.
- How long historical data is kept in the database.

The amount of configuration data directly affects the amount of historical data generated. The system software generates a new historical record every half hour for each service, skill group, route, trunk group, and so on, that is configured in the Unified ICM system.

You size and create the central and HDS databases after installing the system software. Use the Database Sizing Estimator applet for estimating the size of these databases, based on the expected usage.

If your configuration expands significantly or if you change the retention times for historical data, you might have to increase the size of the database. This increase might involve adding more disks to the system.

Historical Data

The system software initiates a purge process on the Logger once every day. By default, the purge process runs each night at 12:30 A.M. The purge process deletes records that are older than a specified number of retain days. When you set up the Logger using the Web Setup tool, you can modify the default retention time and purge schedule.

This table lists the *default* settings for retaining historical data.

Historical tables	Default retention time
Logger_Admin, Import_Rule_History, Persistent	30 days
Recovery	3650 days
All other historical tables	14 days

The following large historical tables are not purged by the system software but as a scheduled SQL Server Agent Job:

- Agent_Event_Detail
- Call_Type_SG_Interval
- Dialer_Detail
- Network_Event_Detail

- Route_Call_Detail
- Route_Call_Variable
- Termination_Call_Detail
- Termination_Call_Variable

**Caution**

SQL Server Agent Jobs are installed and enabled during the Unified CCE install and upgrade procedure. Do not stop these jobs while the system software is active. If you plan to stop the Logger and Administration & Data Server-hds component services for maintenance for more than a day, manually disable the Microsoft SQL Server jobs using the SQL Server enterprise management tool. Later, after the services are started, re-enable the jobs.

Database Statistics

Maintaining accurate, up-to-date statistical details is essential to a well-run database environment and contributes to the optimizer's efficient handling of work load. In some SQL Server-based environments, it is not unusual to see users rely on the database itself to maintain statistics by using the Auto Create Statistics and Auto Update Statistics options. Setting these options in an AW environment (with its rapid data turnover) results in a considerable effort being expended in updating statistics. For that reason, users often schedule these options to run during off-peak hours. Because the database in the AW environment is nearly empty during off-peak times, however, statistics gathered then might not be as helpful as they would be when collected at other, busier times.

Another option to consider for gathering statistics is the creation of a SQL Server Agent job that periodically runs the Microsoft stored procedure `sp_updatestats`. The `sp_updatestats` procedure updates statistics as required for all user-defined and internal tables in the current database and can be run on an hourly basis if workload and environment permit.

Database Administration Tool

Unified CCE includes the ICMDDBA tool (`icmdba.exe`) in the `\icm\bin` folder. This tool provides a central utility to administer the Unified ICM databases. Use this tool to:

- Create, edit, and delete central databases, local databases, and historical databases
- Resize database files
- Recreate databases
- Import and export Unified ICM configuration data to and from databases
- View database properties

In addition to these tasks, you can start or stop a server and do some limited SQL Server configuration.



Note Before using the ICMDBA tool, install the Unified CCE software. See the Cisco Unified Contact Center Enterprise Installation and Upgrade Guide, for information on the Unified CCE installation.



Note The ICMDBA Import /Export feature works on Unified ICM configuration data only. To import or export Unified ICM historical data, use Microsoft's SQL Server Database Backup and Database Restore utilities.

You start the ICMDBA either by double-clicking **ICMDBA** in the Unified CCE Tools folder or by selecting **Start > Run > ICMDBA**.

The main window is a tree hierarchy displaying the Unified ICM database servers in the current domain.



Note If you cannot find the server you want in the main window, you can select any computer on your local network by choosing **File > Add Computer**.

Expanding the server name displays the Unified ICM instances that have databases on the server. Expanding the Unified ICM instance displays a specific Unified ICM node or nodes (Administration & Data Server and Logger) on machines that have databases for that instance. Expanding the node displays the databases associated with the node. Expanding the node database displays a list of the individual tables in the node database. Under databases are the table groups, and the final level lists the tables in the group.

You can create databases for instances with or without configured components. When an instance does not have configured components, database creation occurs under the instance within a component placeholder on the ICMDBA tree view.

To view the properties of a table, right-click the desired table in the list and select Properties from the context menu, or double-click the table in the list.

There are two ways to access the ICMDBA tool functions:

- From the main window, select a node or database from the tree and then select a function from the menu bar menu.
- Right-click a node or database to display a context menu.

Create Database with Configured Components

Use the Create function to create a database for an Administration & Data Server or Logger. You can only create one Logger database per side.

Procedure

- Step 1** With the Unified CCE running, for the server and instance, select the node (Administration & Data Server or Logger) where you want to create the database.
- Step 2** Select **Database > Create** from the menu bar (or click the right mouse button and select **Create**). The **Create Database** window is displayed.

- Step 3** Enter the following information for the database:
- **DB Type**—Specify the type of database: **Outbound Option** for an outbound dialer, **Administration & Database Server** for a local database (awdb), or **Historical Data Server/Detail Data Server (HDS/DDS)** for Administration & Data Server machines. For a **Logger** device, the default database type is displayed (Logger side must be selected).
 - **ICM Type**—Specify whether this system is a Unified ICM or Unified CCE, Unified ICMH, or CICM (Customer ICM) system.
 - **Region**—Specify regional information where applicable.
- Step 4** Select **Add**. This button invokes the **Add Device** window.
- Use this window to create a new data file and a new log file for the selected database. Specify the disk drive letter and size in megabytes for each new file.
- Note** Move the database log file to a separate virtual drive. By default, both the log file and database data file are installed in \MSSQL\DATA on the virtual drive where you create the database. You can move the log file with SQL Server Management Studio.
- Note** By default, the newly created data file is set to “Automatically Grow,” if it exceeds the initially specified size. You can modify this setting, and the maximum file size, with SQL Server Enterprise Manager. Verify on the **Files** page in SQL Server Enterprise Manager that the **Autogrowth** column shows:
- Data files automatically grow in 100-MB increments.
 - Log files automatically grow in 10% increments.
- Step 5** After you complete entering information in the **Create Database** window, select **Create** to close the window and create the database.

Create Database Without Configured Components

Use the Create function to create a database for an Administration & Data Server or Logger. You can only create one Logger database per side.



Note When an instance does not have any configured components, database creation occurs under the instance within a component placeholder.

Procedure

- Step 1** With Unified CCE running, for the server and instance, select the instance where you want to create the database.
- Step 2** Select **Database > Create** from the menu bar (or click the right mouse button and select **Create**). The **Select Component** dialog appears.
- Step 3** Select the **Administration & Data Server**, **LoggerA**, or **LoggerB** component and select **OK**.

- Step 4** If you select LoggerA or LoggerB, the **Select Logger type** dialog appears, allowing you to select **Enterprise**, **CICM**, or **NAM**. Select the logger type and select **OK**. The **Create Database** window appears.
- Step 5** Enter the following information for the database:
- **DB Type**—Specify the type of database: **Outbound Option** for an outbound dialer, **Administration & Database Server** for a local database (awdb), or **Historical Data Server/Detail Data Server (HDS/DDS)** for Administration & Data Server machines. For a **Logger** device, the default database type is displayed (Logger side must be selected).
 - **ICM Type**—Specify whether this system is a Unified ICM or Unified CCE, Unified ICMH, or CICM (Customer ICM) system.
 - **Region**—Specify regional information where applicable.
- Step 6** Select **Add**. This button invokes the **Add Device** window.
- Use this window to create a new data file and a new log file for the selected database. Specify the disk drive letter and size in megabytes for each new file.
- Note** Move the database log file to a separate virtual drive. By default, both the log file and database data file are installed in \MSSQL\DATA on the virtual drive where you create the database. You can move the log file with SQL Server Management Studio.
- Note** By default, the newly created data file is set to “Automatically Grow,” if it exceeds the initially specified size. You can modify this setting, and the maximum file size, with SQL Server Enterprise Manager. Verify on the **Files** page in SQL Server Enterprise Manager that the **Autogrowth** column shows:
- Data files automatically grow in 100-MB increments.
 - Log files automatically grow in 10% increments.
- Step 7** After you have completed entering information in the Create Database window, select **Create** to close the window and create the database.

Delete a Database

Use the Delete function to delete an Administration & Data Server or Logger database.



Note When an instance does not have any configured components, component placeholders appear under that instance on the application tree view. If you delete the database, the component placeholders no longer appear.

Procedure

- Step 1** With Unified CCE running, for the server, instance, and node (Administration & Data Server or Logger), select the database that you want to delete.
- Step 2** Select **Database > Delete** from the menu bar.
- Step 3** The **Delete Database** prompt appears. Select **Yes** to delete the database.

- Step 4** Verify that you want to delete the database in the message box.
- Step 5** Select **Close** to exit. Check the main window to verify that the database was deleted.

Expand a Database

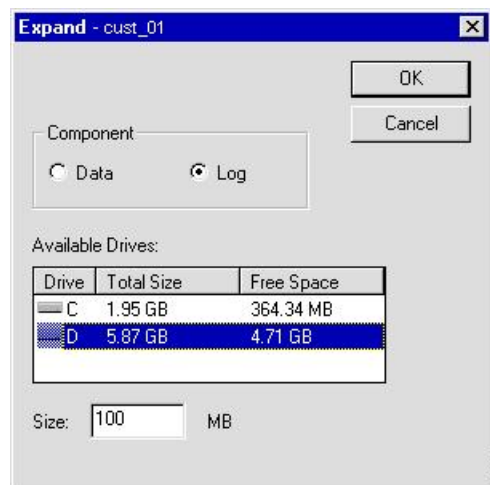
Use this function to add a new storage file.



Note ICMDDBA allows a database to be expanded a maximum of 49 times (resulting in 50 segments). In the event that you reach this limit, you must either recreate the database or use SQL Enterprise Manager to modify the database.

Procedure

- Step 1** For the server, instance, and node (Administration & Data Server or Logger), select the database that you want to expand.
- Step 2** Select **Database > Expand** from the menu bar (or click the right mouse button and select **Expand**). The **Expand** window appears:



- Step 3** Use the window to adjust the size allocation on the database storage device, by completing the following fields:
- **Component**—Specifies whether the file is a data file or log file. Each database must have a file for each type of service.
 - **Available Drives**—Specify the drive on which to create the database.
 - **Size**—Specifies the size (in MB) of the storage. The field displays a default size, adjust the value as necessary.
- Step 4** Select **OK** to expand the file and exit the screen.

Recreate a Database

Use the Recreate function to recreate a database. The procedure for recreating a database is similar to the procedure for creating a database.



Caution When you recreate a database, the information currently stored in the database is deleted.



Note When an instance does not have any configured components, database creation occurs under a component placeholder on the application tree view.

Procedure

- Step 1** For the server, instance, and node (Administration & Data Server or Logger), select the database that you want to recreate.
- Step 2** Select **Database > Recreate** from the menu bar. The **Recreate** window appears.
- Step 3** Enter the database information. See the online help for a description of the fields.
- Step 4** Select **Create** to continue. A message is displayed asking if you are sure you want to recreate the database. Select **Yes** to continue the operation.
- Step 5** The next **Recreate Database** window appears. Select **Start** to recreate the database. After the process completes, a message appears indicating the action was successful. Select **OK** and then select **Close** to exit.

View Database Properties

The ICMDBA tool allows you to view the properties of specified databases.

Procedure

- Step 1** For the server, instance, and node (Administration & Data Server or Logger), select the database that you want to view.
- Step 2** Select **Database > Properties** from the menu bar (or click the right mouse button and select **Properties**). The **Properties** window appears.
The screen display includes the following information:
 - Instance name
 - The database configuration
 - The size and percentage used of the files
 - Where the data and log files are stored
- Step 3** After you finish viewing the database properties, select **Close** to exit the window.

View Table Properties

ICMDBA also allows you to view the properties of each table in the database.

Procedure

-
- Step 1** Select and expand the database to display the tables of a database.
 - Step 2** Double-click the table you want to view. The **Table Properties** window appears.
 - Step 3** After you finish viewing the table properties, select **Close** to exit the window.
-

Import and Export Data

You can use Import/Export functions to move Unified ICM configuration data from one database to another.



Note The ICMDBA Import/Export feature handles Unified ICM configuration data only. To import or export Unified ICM historical data, use Microsoft's SQL Server Database Backup and Database Restore utilities.

Procedure

-
- Step 1** For the server, instance, and node (Administration & Data Server or Logger), select the database from which you want to import or export data.
 - Step 2** Select **Data > Import** (or Export) from the menu bar. The **Import data to** (or Export) window appears.
 - Step 3** Check **Lockout Changes**, if you want to prevent changes to the database during the import or export operation.
 - Step 4** Check **Truncate Config Message Log**, if you want to truncate the Config_Message_Log table in the Logger database.
- Note** Truncating deletes the data and does not export the Config_Message_Log table.
- Step 5** Set the **Data type** for the imported data.
 - Step 6** Indicate the path for the source/destination of the data.
 - Step 7** Select **Import** (or Export) to display the **Import** (or Export) dialog.
 - Step 8** Select **Start** to import (or export) the data. After the process completes, a message appears indicating that the action was successful. Select **OK** and then select **Close** to exit. You can select **Cancel** at any time to end the process.
-

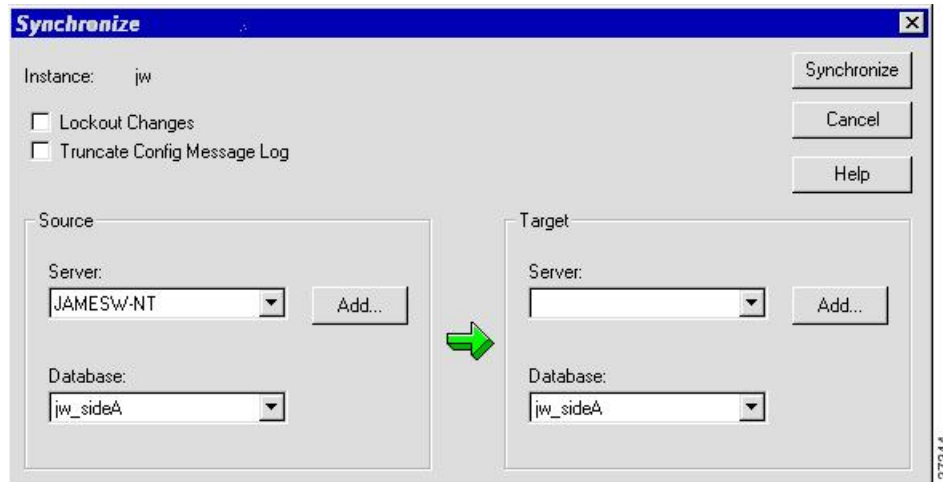
Synchronize Database Data

Use the Synchronize function to synchronize the configuration data of two Logger databases. This function does not synchronize the historical data.

Procedure

Step 1 For the server and instance, select the Logger database to synchronize.

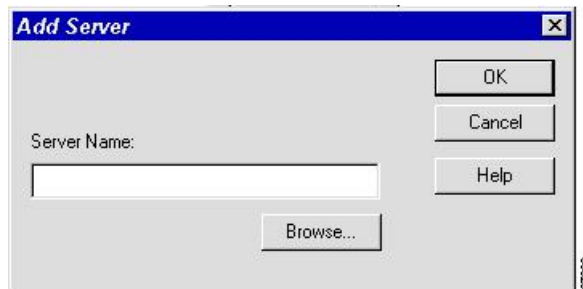
Step 2 Select **Data > Synchronize** from the menu bar. The **Synchronize** window appears:



Step 3 Check **Lockout Changes**, if you want to prevent changes to the database during the synchronize operation.

Step 4 Check **Truncate Config Message Log**, if you want to truncate the Config_Message_Log table in the Logger database.

Step 5 Select the server name and database for both source and target from the drop down lists. To select a server that is not on the drop down list, select **Add** and enter the server name in the **Add Server** box:



Step 6 Select **Synchronize**.

Step 7 A message box appears asking for confirmation. Select **OK** to continue.

Step 8 The next **Synchronize** window appears. Select **Start** to synchronize the data. After the process completes, a message appears indicating that the action was successful. Select **OK** and then select **Close** to exit. You can select **Cancel** at any time to end the process.

Configure a Database Server

ICMDBA allows you to start or stop a server and to do some limited server configuration.

To start or stop a server, select the node from the list and select **Server > Start/Stop** from the menu bar.



Note When you use the Configure option, the SQL Server, Administration & Data Server, and Logger restart automatically. However, when you use the Stop option from the Server menu, manually restart the Logger and Administration & Data Server from ICM Service Control.

Procedure

- Step 1** Select the server and select **Server > Configure** from the menu bar. The **Configure** window appears.
- Step 2** Use this window to modify the following SQL Server parameters:
- **User Connections**—Indicates the maximum number of users that can connect to SQL Server at one time.
 - **Locks**—Indicates the maximum number of available locks.
 - **Open Objects**—Indicates the maximum number of available open objects.
- Note** User Connections, Locks, and Open Objects are “dynamically allocated” by SQL Server. Unified ICM does not allow you to change these options, so they are dimmed.
- **Open Databases**—Indicates the maximum number of available open databases.
 - **Memory**—Indicates the amount of memory (in megabytes) allocated to SQL Server processing.
- Note** You can configure a specific amount of memory instead of the SQL Server default of “Dynamic.” Specifying a value of 0 sets the Memory setting to “Dynamic.”
- **Recovery Interval**—This setting controls checkpoint frequency.
 - **Max Async ID**—Indicates the maximum number of outstanding asynchronous disk input/output (I/O) requests that the entire server can issue against a file.
- Step 3** After you are finished configuring the server, select **OK** to complete the operation or select **Cancel** to end the operation without making any changes.

Increase the size of the disk space for an existing virtual machine

For deployments of 4000 agents or more, you can increase the size of the virtual machine's (VM) disk space on your Windows server. To increase the size of the VM's disk space for 2000 agents deployment, follow these steps:

Before you begin

Plan for a maintenance window to increase the size of the disk space.

Procedure

- Step 1** Power off the VM.
 - Step 2** Clone the VM or take a snapshot of the powered off VM.
 - Step 3** Change the size of the disk space, as required. Ensure that the disk format is set to Thick Provision Lazy Zeroed.
 - Step 4** Power on the VM.
 - Step 5** On the Windows server, go to **Server Manager > File and Storage Services > Volumes > Disks**.
 - Step 6** Modify the disk size and verify the changes.
 - Step 7** Delete the clone or snapshot of the old VM.
-

Database Sizing Estimator Tool

The Database Sizing Estimator tool enables you to perform database sizing tasks.

The Database Sizing Estimator estimates the storage requirements for a Cisco Unified ICM/CCE logger or HDS database. The tool bases the estimate on information about the configuration of the environment (for example, the number of agents, skill groups, call types, and so on) and database retention days. You can supply initial values by loading values from your local Unified ICM database.

When values are updated in the Database Sizing Estimator, the application recalculates its totals. This update enables you to immediately see the affects of each change as it is made, with the values displayed in a spreadsheet. The tool enables you to engage in what-if scenarios to see the effects that various changes have on the database sizing requirements.

The Database Sizing Estimator allows you to save the values as an XML file on your local machine. At any time, you can load the saved XML file back into the Database Sizing Estimator, so you can continue revising your estimates.

Cisco Unified ICM/CCE Database Retriever Dialog

The Cisco Unified ICM/CCE Database Retriever dialog, which you access from the Database Sizing Estimator tool, queries the existing database and registry configuration. The Database Sizing Estimator tool then uses this data to provide starting values, which you can modify.

To access the **Database Retriever** dialog, select **Load from DB** in the Database Sizing Estimator tool on your local machine.



Note Cisco Unified ICM/CCE Database Retriever can retrieve the configuration and retention information from any Unified ICM/CCE system containing a Logger or Historical Data Server (HDS) database. The Database Sizing Estimator can calculate a database size for a newer schema other than the deployment to which the Database Sizing Estimator is connected.

Start Database Sizing Estimator

The following steps describe how to start the Database Sizing Estimator.



Note For Database Sizing Estimator field-level descriptions, see the online help.

Procedure

- Step 1** Open the Database Sizing Estimator tool by selecting **Database > Estimate** in the ICMDDBA tool.
- Step 2** The Cisco Unified ICM/CCE Database Sizing Estimator window appears:

The screenshot shows the 'Database Sizing Estimator' window. It has a 'Configuration' tab selected, with fields for Agents (10), Routing Clients (10), Translation Routes (10), Application Gateways (10), Scripts (10), Trunk Groups (10), Call Types (10), Services (10), Precision Queue (10), Network Trunk Groups (10), Skill Groups (10), Precision Queue per Agent (10), Peripherals (10), Skills per Agent (10), Routes (10), and Skills per Call Type (10). On the right are buttons: Load from File, Save to File, Load from DB, About..., and Help.

Below the configuration is a 'Call and Event Data' section with tabs: Call and Event Data, Interval Data, Five Minute Data, Outbound, and Advanced. The 'Call and Event Data' tab is active, showing a table of data requirements:

	Records Per Day	Days	MB
<input checked="" type="checkbox"/> Route Call Detail	1000	14	11.8
<input checked="" type="checkbox"/> Termination Call Detail	400	14	8.5
<input checked="" type="checkbox"/> ECC Variables Stored	# of Variables Per Call Detail: 0	Total ECC Bytes Per Call Detail: 0	Days: 14, MB: 0.0
<input checked="" type="checkbox"/> Events	10000	14	244.2

At the bottom, the 'Database Size' section shows 'Required: 741.5 MB'. The 'Database Version' section shows 'Schema Version: 10.0(x)' and 'Copyright © 1994-2012 Cisco Systems, Inc.'

- Step 3** The window displays initial default values for all fields. As you change the field values, the database size requirements update automatically. You can load values from a previous version or from the **Cisco Unified ICM/CCE Database Retriever** dialog by selecting **Load from File** to load an external XML data file.

Estimate Database Size



Note Steps 1–3 in this procedure only apply when using existing databases.

Procedure

-
- Step 1** Use your existing database as the starting point. Select **Load from DB** in the **Database Sizing Estimator** main window. The **Cisco Unified ICM/CCE Database Retriever** dialog appears.
 - Step 2** Select the database you want to use as the starting point for your sizing estimates.
 - Step 3** Select **Retrieve**.
The fields in the **Database Sizing Estimator** main window auto-populate with the information from the selected database.
 - Step 4** Modify the database information depending on your scenario. As changes are made, the **Database Size Required** value changes.
 - Step 5** Save your work in progress by selecting **Save to File**.
-

Administration and Data Server with Historical Data Server Setup

There are two ways to set up a Historical Data Server (HDS) VM:

- The instance is created in the domain, but not already added.
- The instance is created in the domain and is already added.

Set Up HDS and Add Instance

Procedure

-
- Step 1** Run the Cisco Unified ICM/Contact Center Enterprise (if you have not run it already) on the local machine.
 - Step 2** Run the Web Setup tool for that machine (in a browser, from anywhere). Under **Instance Management**, select **Add** and add the instance.
 - Step 3** Run the ICMDBA tool on the local machine. Create the Historical Data Server/Detail Data Server database.
 - Step 4** Return to the Web Setup tool. Under **Component Management**, select **Add** on the Administration & Data Server list page, then follow the instructions in the Cisco Unified Contact Center Enterprise Installation and Upgrade Guide. If you did not perform step 3, the Administration & Data Server **Add** wizard does not allow you to finish this procedure until you create an HDS database.
-

What to do next

Use the Database Sizing Estimator tool to determine the size of the database and then use the ICMDDBA tool to create the database.

Set Up HDS from Added Instance

Procedure

-
- Step 1** Run the Cisco Unified ICM/Contact Center Enterprise Installer (if you have not run it already) on the local machine.
- Step 2** In the Web Setup tool, under **Component Management**, select **Add** on the Administration & Data Server list page, then follow the instructions in the Cisco Unified Contact Center Enterprise Installation and Upgrade Guide. If you did not perform step 1, the Administration & Data Server **Add** wizard does not allow you to finish this procedure until you create an HDS database.
-

What to do next

Use the Database Sizing Estimator tool to determine the size of the database and then use the ICMDDBA tool to create the database.

Database Size Monitoring

Regularly monitor the space used by the central database and transaction logs. You can monitor database size by viewing the Logger's per-process log files. The per-process log files contain information on Logger and database activity, as this example log file illustrates:

```

C:\icr\bin\DUMPLLOG.exe
Events from February 25, 1997:
00:38:13 Trace: 81% of the available free space is used in cus01_sideA database.
01:08:13 Trace: 76% of the available free space is used in cus01_sideA database.
02:08:15 Trace: 77% of the available free space is used in cus01_sideA database.
07:08:21 Trace: 78% of the available free space is used in cus01_sideA database.
12:08:27 Trace: 79% of the available free space is used in cus01_sideA database.
17:07:32 Trace: 80% of the available free space is used in cus01_sideA database.
22:07:38 Trace: 81% of the available free space is used in cus01_sideA database.

Events from February 26, 1997:
00:37:41 Trace: 79% of the available free space is used in cus01_sideA database.
01:07:42 Trace: 70% of the available free space is used in cus01_sideA database.
05:07:47 Trace: 71% of the available free space is used in cus01_sideA database.
09:37:52 Trace: 72% of the available free space is used in cus01_sideA database.
10:37:54 Trace: 73% of the available free space is used in cus01_sideA database.
11:07:54 Trace: 74% of the available free space is used in cus01_sideA database.
12:07:56 Trace: 75% of the available free space is used in cus01_sideA database.
13:07:57 Trace: 76% of the available free space is used in cus01_sideA database.
13:37:57 Trace: 77% of the available free space is used in cus01_sideA database.
14:37:59 Trace: 78% of the available free space is used in cus01_sideA database.
15:38:00 Trace: 79% of the available free space is used in cus01_sideA database.
  
```

The Logger logs events and trace messages that show the percentage of space used in the database. These files are stored in a \logfiles subdirectory in the Logger's folder (la or lb). You can view the Logger's per-process log files by using the Unified ICM dumplog utility.

When the database becomes 80 percent full, the Logger logs an EMS warning message to the central database. The “80 percent full” warning message might also immediately be sent to your Unified ICM network management station through SNMP or SYSLOG.



Note See the [Serviceability Best Practices Guide for Cisco Unified ICM/Contact Center Enterprise](#) for more information on using the dumplog utility.

If you decide that you need more database space, contact your Unified ICM support provider.

System Response When Database Nears Capacity

The system software has automatic checks to prevent the central database from becoming full:

- **Warning message**—When the central database begins to approach its capacity, the system software issues a warning message. By default, this warning occurs when the database is 80% full, but you can configure this value. Warning messages trigger an event that is registered in AlarmTracker, which the console window displays in an EMS trace message.
- **Purge Adjustment**—Purge Adjustment automatically deletes the oldest historical data when the database usage exceeds 80% threshold or when the central or HDS database nears its capacity. However, purge adjustment does not happen immediately. It happens at the default scheduled purge time (00:30 AM), or at the time that you have specified for the scheduled purge to happen.

By default, purge adjustment occurs when the database is 80% full, but you can specify the percentage when you set up the Logger.

If the historical databases for the Logger, AW-HDS-DDS, AW-HDS, and HDS-DDS are not adequately sized, the purge adjustment feature is activated when the database usage exceeds the threshold. Use the **Database Sizing Estimator** tool to size your database requirements.



Note The purge adjustment feature affects performance of the Unified CCE system. The high CPU and disk usage due to purge adjustment could affect component performance including failures.

See the Cisco Unified Contact Center Enterprise Installation and Upgrade Guide for more on purging information from databases.

- **Emergency/Automatic Purge**—By default, the system automatically deletes the oldest historical data from all historical tables when the database exceeds 90% usage capacity.

The automatic purge ensures that the database can never become full. But, the purge means that you can lose older historical data.

Allocation of More Database Space

If the central database is growing too large, you can allocate more space. If you require more space in the central database, back up the primary database before you add more space. Your Unified CCE support provider might have options for allocating more space.

Initialize Local Database (AWDB)

Usually, you do not need to initialize the local database (awdb), because initialization happens automatically during its creation. If you ever need to initialize the local database after its creation, you can do so.

Procedure

-
- | | |
|---------------|---|
| Step 1 | Double-click Initialize Local Database within the Administration Tools folder. The Initialize Local Database main window appears. |
| Step 2 | Select Start to transfer the data. As data is copied, the screen displays the number of rows processed for each table. |
| Step 3 | After the transfer is complete, select Close to exit. |
-

General Database Administration

Because Unified ICM is a mission-critical application that runs 24 hours a day, the system software takes care of many routine administration tasks automatically. In general, the system software retains control of most of the database administration functions in order to keep external interference to a minimum.

The Unified ICM administrator might perform several optional Unified ICM administration tasks:

- Setting networking options
- Monitoring Logger activity
- Backing up the central database
- Restoring the central database from a backup
- Comparing databases
- Resynchronizing databases



Note To conserve system resources, minimize all Unified ICM process windows before configuring your system.

Built-In Administration

The system software maintains a database on each side of the Central Controller and the local database (awdb). Each database consists of a group of interrelated tables. As you add or update data in the database, ensure that

logical relationships are maintained. For example, if you delete a trunk group, do not leave trunks in the database that reference that trunk group. If you do, the integrity of the database is broken.

Configuration Manager prevents you from making certain changes that disrupt the integrity of the data in the database. However, it cannot prevent all such changes. Usually, if data integrity in the local database (awdb) is temporarily disrupted, no major problems occur. However, integrity problems in the central Unified CCE database could cause errors in system processing.



Note To protect the integrity of the Unified CCE databases, do not use third-party tools to modify them. These tools do not protect against disruptions of database integrity. (You can use third-party tools to view Unified ICM data.)

When your Unified CCE support provider installs the Unified CCE system, they perform integrity checks to make sure that the database is configured correctly. After that, the system software maintains the integrity of the central database. You do not need to manually check the integrity of the Unified CCE central database. If you ever have a problem with data integrity in the central database, the problem is most likely a software problem that your Unified CCE support provider needs to address.



Caution Manual integrity checks of the central database must involve your Unified CCE support provider. Do not run the DBCC CHECKDB procedure on the central database with the Unified CCE system running. This procedure stops the Logger.

Check AWDB Data Integrity

You can manually check the integrity of data in the local database (AWDB). Configuration Manager provides a Check Integrity option under the Administer menu. Configuration Manager allows you to select the checks that you need to run.

The specific data integrity check procedures are listed in the following table:

Table 1: Local Database Data Integrity Check Procedures

Procedure	Description
Null	Checks the database for the value NULL in fields that must not have the value NULL. Checks if the value of the RoutingClient.PeripheralID is NULL for the routing clients associated with the NIC.
Targets	Checks for appropriate relationships among peripherals, targets at peripherals (services, skill groups, agents, and translation routes), trunk groups, network targets, announcements, and peripheral targets.
Routes and Numbers	Checks if the ID fields cross-referenced from several tables correspond to the existing records.
Scripts	Checks for valid cross-references among scripts, call types, and dialed numbers.

Procedure	Description
Enterprise	Checks for valid cross-references among enterprise services and services, and between enterprise skill groups and skill groups. Also performs several other checks on skill groups, trunks, and so on.
Domain Adherence	Checks for valid relationships between agents and skill groups, between skill groups and services, between labels and routing clients, between dialed numbers and routes, and between peripherals and routing clients.
Names	Checks for invalid characters in enterprise names (EnterpriseName field) in various database tables. Enterprise names provide unique character-string names for objects in the Unified ICM configuration.
Miscellaneous	Checks rules for Outbound Option Configuration.

For more information on the specific fields checked by these procedures, see the online help for the Configuration Manager tool.

Procedure

-
- Step 1** Invoke Configuration Manager by double-clicking its icon in the Administration Tools folder.
 - Step 2** Select **Configure ICM > Administration > Integrity Check** from the menu bar. The **Integrity Check** dialog box appears.
 - Step 3** Select specific checks to run, or select All to perform all the checks.
 - Step 4** Select **Start** to perform the checks. If any integrity problems are found, the Configuration Manager displays a message describing the problems.
 - Step 5** After you perform all the checks you want, select **Done** to dismiss the **Integrity Check** dialog box.
-

Logger Events

You can view recent Logger activity by viewing the Logger's per-process log files. Per-process log files document events for the specific processes running on a computer. These files are useful in diagnosing problems with processes on the Logger (and on other nodes in the Unified ICM system).

You can also view Logger event data in the central database. The Event Management System (EMS) logs events to the central database. Be especially aware of Error and Warning events generated by the Logger. For example, the system software logs a Warning event when the central database becomes 80% full.

See the [Serviceability Best Practices Guide for Cisco Unified ICM/Contact Center Enterprise](#) for more information on viewing the per-process log files and central database event data.

Database Networking Support

You can use the SQL Server Setup program to specify which network protocols the database manager supports.

The correct order and states are:

1. **Shared Memory**—Enabled
2. **Named Pipes**—Enabled
3. **TCP/IP**—Enabled
4. **VIA**—Disabled

See the *Staging Guide for Cisco Unified ICM/Contact Center Enterprise* http://www.cisco.com/en/US/products/sw/custcosw/ps1844/prod_installation_guides_list.html for detailed information about installing SQL Server. For more information about database networking, see the Microsoft documentation for Microsoft SQL Server.

Database Backup and Restore

A database can be lost or corrupted for several reasons. Because you cannot protect against all these reasons, you must have a backup strategy in place. This backup strategy is especially important if you have a nonredundant central database configuration. However, even for a redundant system, you still need to perform backups to protect against software problems that corrupt both sides of the system.

The commonly used database backup strategies are:

- Regularly scheduled database backups
- Mirrored disk configurations
- Redundant Array of Inexpensive Disks (RAID) configurations

Although the last two strategies might decrease system performance, they have the advantage of not requiring manual intervention. However, while these configurations protect against disk drive failure and bad media, they might not protect against some software errors.

In a single database configuration, ensure protection against all types of errors. To protect your data, regularly back up the central database with the SQL Administrator tool provided with SQL Server.

When you restore a database, you can only restore up to the last backup. Any transactions after that backup are lost. In single database configurations, daily backups are required to ensure maximum data protection.



Note You must back up the entire database at each backup interval. The system software does not support the use of transaction log dumps as incremental backups.

For general information about developing a backup strategy, including the use of mirrored disks, see *Microsoft's SQL Server System Administrator's Guide*. For specific information about backing up a database using SQL Administrator, see *Microsoft's SQL Administrator User's Guide*.

Database Recovery Models

When you install a Logger, HDS, or AWDB database, the ICMDBA tool automatically sets the database recovery model to Simple. The Simple model is required for the Unified CCE data recovery mechanism.

For more information, see the Microsoft documentation.

Database Comparison

For diagnostic purposes, you can check that two databases have the same data in a specific table. For example, you can check that the ICM_Locks table contains the same data on both sides of a Central Controller. The tool `dbdiff.exe` performs this type of check. Its syntax is as follows:

```
dbdiff database1.table@host1 database2.table@host2
```

For example:

```
dbdiff cust1_sideA.ICM_Locks@geoxyzlgra cust1_sideB.ICM_Locks@geoxyzlgrb
```

The batch script `diffconfig.bat` invokes **dbdiff** for various tables to automatically compare two Unified ICM databases. Its syntax is as follows:

```
diffconfig database1 host1 database2 host2
```

For example:

```
diffconfig cust1_sideA geoxyzlgra cust1_sideB geoxyzlgrb
```

Database Resynchronization

You might occasionally need to repair corrupt configuration data on the Logger database on one side of a redundant Unified ICM by copying the configuration data on Logger database from the other side. You can synchronize the configuration data on the databases using either the DOS Command window or the ICM Database Administration (ICMDBA) tool.

The ICMDBA synchronize process involves dropping the targeted side data and copying the data from the source. For example, if you are synchronizing side B data to side A data, the side B data is replaced with the data stored in side A. For more information, see [Synchronize Database Data, on page 9](#).



Note Perform these procedures in a maintenance window.

Synchronize Configuration Data between Loggers from Command Window

Procedure

-
- Step 1** Stop the Logger for the target database, if that Logger is running.
 - Step 2** In a DOS Command window on the VM for that Logger, change to the `\icm` directory.
 - Step 3** Run the following command: `install\syncloggers <Source_logger_server> <Source_logger_database> <Target_logger_server> <Target_logger_database>`.
 - Step 4** When prompted, Type **Y** to continue, upon which configuration of target database will be deleted and synced with source database.
-

What to do next

When the command is complete, restart the Logger on the target server.