



Unified CCX Introduction

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Unified CCX Components

This section describes the following components of the Unified CCX system:

- **Unified Gateway**—Connects the Cisco Unified Communications family of products to the Public Switched Telephone Network (PSTN) and to other private telephone systems such as PBX.
- **Unified CM Server**—The Cisco Unified Communications Manager (Unified CM) provides the features required to implement IP phones, manage gateways, provide failover and redundancy service for the telephony system, and direct Voice over IP (VoIP) traffic to the Unified CCX system.



Note Cisco Unified Communications Manager was previously known as Unified Call Manager. This guide uses Cisco Unified Communications Manager at the first occurrence and Unified CM for later occurrences.

- **Unified CCX Server**—Contains the Unified CCXEngine that runs applications, including Cisco script applications, Busy applications, Ring No Answer applications, and Voice Extensible Markup Language (VXML) 2.0 applications.

You can position your Unified CCX application server anywhere on the IP network and administer your applications from a web browser on any computer on the IP network. Because Unified CCX uses an open architecture that supports industry standards, you can integrate your applications with a wide variety of technologies and products, such as Enterprise databases. The Unified CCX Server has the following components:

- **Unified CCX Configuration Datastore (CDS)**—Manages configuration, component, and application information within the Unified CCX cluster and communicates with Unified CM.

- **Historical Reports Database Server**—Dedicated server that stores Unified CCX database for the following datastores: Configuration Datastore (CDS), Historical Datastore (HDS), and Repository Datastore (RDS).
- **Cisco Customer Collaboration Platform**—Acts as the endpoint that hosts the widgets that end users and agents use during chat and email sessions. Customer Collaboration Platform accepts chat request, communicates with Unified CCX to allocate an agent for the chat and then establishes the chat session between agent and end user.

Customer Collaboration Platform fetches email messages from the email server, communicates with Unified CCX to allocate an agent, and provides the email management user interface components via the Finesse desktop.

- **Unified CCXEditor**—Allows application developers to use a simple Graphical User Interface (GUI) to create, modify, and debug Unified CCX scripts for automating customer interactions. Each script consists of a series of steps, implemented as Java Beans.
- **Unified CCX Administration and Unified CCX Serviceability web interfaces**—Provides access through a web browser for administrators to configure and manage Unified CCX datastores, servers, and applications.
- **Cisco Finesse Agent and Supervisor Desktops**—Desktop programs that allow Unified CCX agents and supervisors to log in to the system, change agent states, and monitor status.
- **Media Resource Control Protocol (MRCP) Automatic Speech Recognition (ASR) server**—(optional) Dedicated server that performs real-time speech recognition.
- **MRCP Text-to-Speech (TTS) server**—(optional) Dedicated server that converts text into speech and plays it back to the caller.



Note Support for high availability and remote servers is available only in multiple-server deployments.

- **Cisco Unified Intelligence Center**—A web-based reporting solution for historical reports that provides detailed Call Contact Call Detail Records (CCDRs), application performance, and traffic analysis information.

Unified CCX Product Family

The Unified CCX product family provides contact-processing functions for your Cisco Unified Communications solution.

The software package that you choose determines which steps, components, and subsystems you receive. Each Unified CCX product includes Unified CCXEngine and Unified CCXEditor.

Unified IP IVR

The Unified IP IVR is a multimedia (voice, data, web) IP-enabled interactive voice response solution that offers an open and feature-rich foundation for the creation and delivery of Unified IP IVR applications through Internet technology.

Unified IP IVR automates call handling by autonomously interacting with contacts. Using Unified IP IVR, you can create applications that answer calls, provide menu choices for callers, obtain caller data such as passwords or account identification, and transfer calls to caller-selected extensions. You can also create Unified IP IVR applications that respond to HTTP requests, perform outbound calling, send e-mail, and process VXML 2.0 commands.

The Unified IP IVR package provides the following features:

- Java Database Connectivity (JDBC) support—Unified IP IVR applications can access Oracle, Sybase, and IBM DB2 databases.
- Real-time reporting client—Unified IP IVR applications can generate a variety of reports that provide detailed information about the real-time status of your system.
- Cisco Unified Intelligence Center—A web-based reporting solution for historical reports that provides detailed Call Contact Call Detail Records (CCDRs), application performance, and traffic analysis information.
- Automatic Speech Recognition (ASR)—Unified IP IVR applications can take advantage of ASR to provide callers with the option to use speech to navigate through menu options.
- Text-to-Speech (TTS)—Unified IP IVR applications can use TTS to read back documents and prescribed prompts to callers.

Unified Contact Center Express

Cisco Unified Contact Center Express (Unified CCX) is an IP-based Automated Call Distribution (ACD) system that queues and distributes incoming calls to Unified CCX agents, who can be groups of Unified CM users for Unified CM integration.

You can use Unified CCX applications to route calls to specific agents. You can also integrate Unified CCX with Unified IP IVR to gather caller data and classify incoming calls.

Unified CCX includes a web-based real-time and historical reporting system that you can use to monitor system, Contact Service Queue (CSQ), and resource performance.

The Unified CCX system consists of the following major components:

- Resource Manager—Application program that monitors Unified CCX agent phones and allows you to organize agents into resource groups or skills-based partitions according to the types of calls each group can handle.
- CSQ—Application program that places incoming calls in a queue and distributes them to the appropriate set of agents as the agents become available.

The following licensing options are available for the Unified CCX system:

- Unified CCX Premium—Adds full Unified IP IVR support (except for Unified ICM integration) including database integration, Voice eXtensible Markup Language (VoiceXML), HTML web integration, custom Java extensions, and e-Notification services. The outbound feature is now bundled with the Premium

package. You will receive one outbound seat free with each premium seat. The maximum number of outbound seats supported will be based on the hardware type.

- **Unified CCX Outbound**—You need to have a Unified CCX Outbound license in addition to a Unified CCX Premium license to enable the IVR and agent outbound feature. You can increase the number of ports and agents for an existing Outbound license. For all the IVR and agent based outbound campaigns that are running currently in your Unified CCX, the Display License submenu option displays these IVR ports and agent seats:
 - The licensed IVR ports for outbound.
 - The licensed agent seats for outbound.
 - The sum of the dedicated IVR ports configured for IVR-based outbound campaigns.
 - The agent seats that currently in use for agent-based outbound campaigns.



Note The dedicated outbound IVR ports for a campaign is the number of IVR ports that you want to reserve for a campaign from the total number of CTI ports available in the outbound call control group.



Note The Unified CCX Enhanced package and the Unified CCX Premium package are provisioned in the same way.

Unified CCX Cluster Architecture



Note Support for high availability and remote servers is available only in multiple-server deployments.

The Unified CCX cluster consists of one or more servers (nodes) that are running Unified CCX components in your Unified CCX deployment.

If you deploy Unified CCX components on a single server, the Unified CCX cluster (often referred to as *cluster* in this manual) consists of that server. If you deploy Unified CCX on multiple servers, the cluster includes the Unified CCX server and standby server on which you installed Unified CCX. The Unified CCX cluster can support up to two Unified CCX Servers, one designated as the *active Unified CCX Server* and the other designated as the *standby Unified CCX Server* for high availability purposes.

When you install or upgrade Unified CCX on a server, you designate the cluster to which the server will belong by designating the cluster profile for that cluster.

Cluster architecture accommodates high availability and failover because if a component fails, a secondary server will take over the functionality lost by that failed component.

All Unified CCX servers within the cluster are configured identically and installed with the same features. One server is designated the *active server*.

Unified CCX Active Server



Note Support for high availability and remote servers is available only in multiple-server deployments.

The Unified CCX active server makes global decisions for the cluster and keeps track of calls in the CSQs, agent states (if Unified CCX is installed) and generating historical detail records.



Note Only one server in the cluster can be the active server at any given time.

If the active server fails, the Unified CCX provides automatic failover to the standby server. If the active server fails (for example, in the event a hardware failure occurs or the Unified CCX Engine process terminates), some calls being handled by the server are lost. The lost calls are restricted to those being handled by the system (those in the IVR stage or in queue). Calls answered by agents continue to remain live even though related data on the agent desktop is lost. When the standby server takes over as the new active server, call processing continues.

A Unified CCX cluster consists of the one or more servers (nodes) that run Unified CCX components in your Unified CCX deployment.

Cluster management consists of two main elements:

Cluster Manager

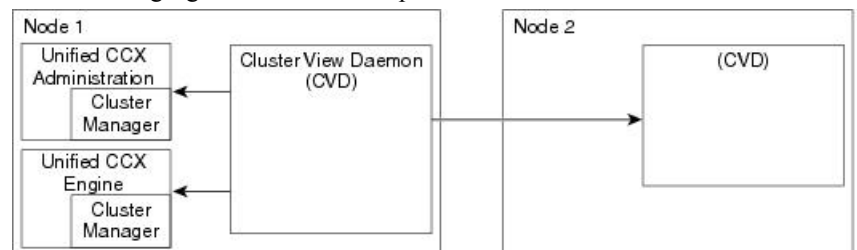
Receives updates about cluster status and subsystem states.

Cluster View Daemon (CVD)

Java code that interacts with Platform Service Manager and implements internode communication on behalf of the cluster. It detects availability of the other nodes, components and services, provides consistent cluster view, and dynamically elects a master service.

Figure 1: Components of the CVD Interaction with Nodes

The following figure shows the components of the CVD interaction with nodes.



The CVD has two interfaces:

- One that monitors *inside* the node, using:
 - Node Manager to monitor and control local processes
 - Cluster Manager publisher or subscriber to communicate with local applications, such as Engine and Application Administration

- One that monitors *outside* the node and communicates with other nodes in the cluster

Unified CCX Engine

The Unified CCXEngine enables you to run multiple applications to handle Unified CM Telephony calls or HTTP requests.

The Unified CCXEngine uses the Unified CM Telephony subsystem to request and receive services from the Computer Telephony Interface (CTI) manager that controls Unified CM clusters. The Unified CCXEngine is implemented as a service that supports multiple applications.

You can use a web browser to administer the Unified CCXEngine and your Unified CCX applications from any computer on the network. Unified CCX provides you the following two web interfaces:

- Unified CCX Administration web interface— Used to configure system parameters, subsystems, view real-time reports that include total system activity and application statistics, and so on
- Unified CCXServiceability web interface— Used to view alarm and trace definitions for Unified CCX services, start and stop the Unified CCX Engine, monitor Unified CCX Engine activity, and so on



Note Ensure that the popup blocker is disabled on your browser.

Depending on the Unified CCX products that you are using, the Unified CCX server may employ as many as 14 subsystems for communicating with other services:

Applications

Manages the applications in the Unified CCXEngine and other features such as session management.

Cisco Media

Configures CiscoMediaTermination (CMT) dialog control groups, which can be used to handle simple Dual Tone Multifrequency (DTMF)-based dialog interactions with customers.

Core Reporting

Provides information for Unified IP IVR real-time reports.

Database

Handles the connections between the Unified CCX server and the enterprise database.

eMail

Adds components to the Unified CCX Engine that allows the engine to send email messages.

HTTP

Adds components to the Unified CCX Engine that allow the engine to respond to HTTP requests.

ICM Subsystem

Manages the connection between the Unified CCX server and ICM.

Unified CM Telephony

Manages the connection between Unified CM CTI Manager and the Unified CCXEngine.

MRCP ASR

Allows a script to respond to voice input in addition to DTMF using the MRCP protocol.

MRCP TTS

Composes voice prompts that are generated real-time from text, such as speaking the words in the text of an email message using the MRCP protocol.

Resource Manager-Contact Manager (RmCm)

Allows Unified CCX to monitor agent phones, control agent states, route and queue calls, and manage the historical reporting feature.

NonVoice Subsystem

Allows Unified CCX to configure and manage Chat and Email.

Voice Browser

Manages Voice Browser functionality.

Set Up Unified CCX

After you install the Unified CCX system and perform the initial setup as described in *Cisco Unified Contact Center Express Installation Guide*, you can start provisioning and configuring the system:

- *Provisioning* is the process of allocating resources and devising strategies for using the resources to support the needs of your business.
- *Configuring* is the process of making applications available to the Unified CCX system.

Provision Telephony and Media Subsystems

The Unified CCX telephony and media subsystems manage telephony and media resources and communicate with supporting telephony and media systems.

Depending on the Unified CCX applications you plan to use, you need to provision some or all of the following subsystems:

- **Unified CM Telephony**—The Unified CM Telephony subsystem controls the Unified CM Telephony resources for the Unified CCX system.

**Caution**

While Unified CM supports Unicode characters in first and last names, those characters become corrupted in Unified CCX Administration web pages for Real-Time Reporting.

- **Cisco Media**—The Cisco Media subsystem controls the CMT media resources for the Unified CCX system.
- **MRCP ASR**—The MRCP ASR subsystem controls the ASR media resources for the Unified CCX system.
- **MRCP TTS**—The MRCP TTS subsystem controls the TTS media resources for the Unified CCX system.

Configure Unified CCX Subsystems

You need to provision your Unified CCX subsystems to enable the Unified CCX Engine to run multiple applications to handle Unified Communications calls or HTTP requests.



Note You need to configure a particular subsystem only if you are using Unified CCX applications that require it and which are installed and activated using the appropriate license.

To continue the Unified CCX system configuration process, connect to the Unified CCX Administration web interface and perform the task in the links listed in the Related Topics section.

Provision Unified CCX Subsystem

If you have purchased any of the three versions of Unified CCX, you must provision the Unified CCX subsystem.

Provision the following settings on the Unified CCX subsystem:

- **RmCm Provider**

The Resource Manager (RM) of the Unified CCX system uses a Unified CM user (called a Unified CM Telephony provider) for monitoring agent phones, controlling agent states, and routing and queuing calls.

- **Resources**

Agents that answer calls are also called *resources*. After you create a resource group, you must assign agents (resources) to that group.

- **Resource Groups**

Collections of agents that your CSQ uses to handle incoming calls. To use resource group-based CSQs, you must specify a resource group.

- **Skills**

Customer-definable labels that are assigned to agents. You can route incoming calls to agents who have the necessary skills or set of skills to handle the call.

- **CSQs**

After you assign an agent to a resource group or assign skills to an agent, you need to configure the agent for the CSQ to which the agent will be assigned.

- **Agent-Based Routing Settings**

You can configure Automatic Work and Wrapup Time settings for the agent-based routing feature from the Agent-Based Routing Settings page.

- **Teams**

If you want to create or associate teams with various agents, CSQs, and supervisors, you need to configure team settings.

Provision Additional Unified CCX Subsystems

The additional Unified CCX subsystems provide HTTP, Database, and email features.

Provision the following subsystems:

- **HTTP**—The HTTP subsystem enables Unified CCX applications to respond to requests from a variety of web clients.
- **Database**—The Database subsystem enables Unified CCX applications to communicate with enterprise database servers.
- **eMail**—The eMail subsystem enables Unified CCX applications to create and send email.

View License Information

The initial license configuration is part of the Setup Wizard procedure (during installation). The uploaded licenses define the feature set for a Unified CCX system. See *Cisco Unified Contact Center Express Install and Upgrade Guide* for more information on obtaining and installing licenses for Cisco Unified CCX.

You can add additional licenses using the **Add Licenses** submenu option.



Note

- If two licenses with the same feature name are uploaded, the Unified CCX Administration Display Licenses web page will display the earlier date as the expiry date. Although the expiry date refers to the earlier date, it does not mean that the license expires on the date displayed in the “Display Licenses” page if you upload a permanent license.
- If a permanent license is uploaded over an already existing temporary license, a license expiry message is displayed for the temporary license for the feature. This license expiry message is displayed both in License Information and Appadmin home page. The Appadmin home page displays a popup message.

For Unified CCX, if you have a premium license with an outbound license, the Unified CCX Administration Display Licenses web page displays:

- The number of licensed IVR ports and dedicated IVR ports for IVR outbound.
- The number of licensed agent seats and In Use agent seats for progressive and predictive agent outbound.



Note

The number of In Use IVR ports and In Use agent seats are displayed only for the master node.



Caution

Deleting or reducing the number of IVR ports for outbound in the license is not a supported scenario in Unified CCX. Doing this might lead to inaccurate data in Dedicated Licensed Ports, which in turn might lead to more abandoned calls.

To view license details, perform the following procedure:

Choose **System > License Information > Display License(s)** from the Unified CCX Administration menu bar.

The License Information web page opens, displaying the details of the configured licenses, including the expiry date in the case of time-bound licenses.

Upload Licenses

Software for all of the Unified CCX feature components are loaded on the system during installation. However, no feature is available for use unless a license for that feature is added and activated.

You can upload and display licenses using the License Information page. To upload a license, complete the following steps.

Step 1 From the Unified CCX Administration menu bar, choose **System > License Information > Add License(s)**.

The License Information web page opens.

Step 2 Specify a License file or click **Browse** to locate a file.

You can either specify a single file with a .lic extension or a .zip file containing multiple .lic files.

Note While you are upgrading from a previous release, if there are multiple licenses, zip all the .lic files into a single .zip file and then upload the zip file. If specifying a .zip file, ensure that all .lic files that need to be added are in the root of the .zip file and are not in subfolders in the .zip file.

Step 3 Click **Upload**.

On successful upload of the license, you will see the following confirmation message in the status bar at the top of this web page: License has been uploaded successfully

If you upload an Add-on license to increase the existing licensed Outbound IVR ports, the following message will be displayed :

As the number of licensed Outbound IVR Ports have increased, please increase the number of ports in the Outbound Call Control Group to utilize all the licensed ports.

Enable Smart Licensing

License Type

Use this page to select and enable the appropriate **Smart License Type**. Select one of the following license types:

- **Flex**
- **Perpetual Enhanced**
- **Perpetual Premium**

If you select **Perpetual Enhanced** or **Perpetual Premium**, you have to select the **Named Licenses** and enter the **No. of Seats** for each of the selected named license.

Click **Enable**, a confirmation message is displayed.

Click Yes to enable the Smart license.

On the Unified CCX menu bar, choose **System** and click **License Information**. Select **Smart License** and click **Next**.

Before the **Smart License** page, the **License Selection** window appears.



Note The **License Selection** appears only once when you configure Smart License for the first time for your deployment.

The **License Selection** window displays the following types of licenses:

- Flex license
- Perpetual license

Select the appropriate license type as applicable.

Smart License

Smart License page displays the following:

- **Transport Settings** button—Click this button to configure the transport to Cisco Smart Software Manager (CSSM).

For more information about transport settings configuration, see [Configure Transport Settings for Smart Licensing, on page 12](#).

- **Register** button—Click this button to **Register** the licenses.

For more information about registration, see [Register with Cisco Smart Software Manager](#).

- The **Smart Software Licensing Status** section which displays the following details:

- The license **Registration Status**.
- The **License Authorization Status**, such as `Evaluation mode`,

- The **Smart License Usage** drop-down menu—Select the license type for which you want to see the license usage details.

The **Smart License Usage** table displays the license usage details for the specific license type you select in the drop-down box.

The following details of the license usage displayed in the table are as follows:

- License (Version/Type)—The type or version of the license.
- Count—The number of concurrent licenses in use.
- Status—The status of the licenses such as `Evaluation`.
- Description—Describes the function of the license, for example, *Enables base features*.

Configure Transport Settings for Smart Licensing

Configure the connection mode between Unified CCX and Cisco SSM.

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- Step 1** From Unified CCX Administration, navigate to **System > License Management**.
- Step 2** Click **Transport Settings** to set the connection method.
- Step 3** Select the connection method to Cisco SSM:
- **Direct**—Unified CCX connects directly to Cisco SSM on cisco.com. This is the default option.
 - **Transport Gateway**—Unified CCX connects to Cisco SSM On-Prem for smart licensing. Enter the Cisco SSM On-Prem URL.
 - **HTTP/HTTPS Proxy**—Unified CCX connects to a proxy server, which connects to Cisco SSM. Enter the Fully Qualified Domain Name (FQDN) of the proxy server along with the port.
- Step 4** Click **Save** to save the settings.
-

Available Applications

There are several types of applications you can configure for Unified CCX:

- Script applications perform such functions as receiving calls, playing back prompts, receiving caller input, transferring calls, and queuing calls.
- The Busy application simulates a busy signal.
- The Ring-No-Answer application simulates a ringtone.

After adding a Unified CCX application, you need to define a *trigger* so that this application can respond to telephone calls and HTTP requests. Triggers are specified signals that invoke application scripts in response to incoming contacts.

Manage Scripts Prompts, Grammars, and Documents

The process of configuring Ciscoscript applications includes uploading Unified CCX scripts and prerecorded prompts, installing grammars and customized languages, and adding triggers to applications.

Depending on your particular Unified CCX implementation, you may need to perform most or all of the following tasks to configure a Ciscoscript application:

- **Manage scripts**—Ciscoscript applications are based on scripts that you must upload to the repository and make available to the Unified CCX system.
- **Manage prompts**—Many applications make use of prerecorded prompts, stored as .wav files, which are played back to callers to provide information and elicit caller response. You must upload these .wav files to the repository and make them available to the Unified CCX system.
- **Install grammars**—A *grammar* is a specific set of all possible spoken phrases and Dual Tone Multi-Frequency (DTMF) digits to be recognized by Unified CCX applications and acted upon during run time. The Unified CCX system uses specific grammars when recognizing and responding to caller

responses to prompts. You must store these grammars in a directory to make them available to the Unified CCX system.

- Install customized Unified CCX languages—Language packs, such as American English and Canadian French, are installed with Unified CCX.

Configure Unified CCX Historical Reporting

When you install the Unified CCX system, the installation process creates a database named `db_cra`. This database contains:

- Information for historical reports, including Unified CCX configuration information, stored procedures, and some call statistics
- The `ContactCallDetail` table, which is the main table for call statistics

To conclude the Unified CCX system configuration process, connect to the Unified CCX Administration web interface and perform the following Historical Reporting Configuration tasks:

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- Step 1** Define the maximum number of database connections for report client sessions.
 - Step 2** Assign historical reporting capability to users.
 - Step 3** Configure the Daily Purge Schedule and specify notification parameters.
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Manage Unified CCX

To manage your Unified CCX, you must first provision and configure it. The day-to-day administration of the Unified CCX system and datastores consist of many tasks, such as:

- Starting and stopping the Unified CCX Engine and processes.
- Managing and monitoring the status of Unified CCX servers and components across the cluster.



Note Support for high availability and remote servers is available only in multiple-server deployments.
