

UCCXD

Deploying Cisco Unified Contact Center Express

Volume 1

Version 4.0

Student Guide

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Course Introduction

Overview

Deploying Cisco Unified Contact Center Express (UCCXD) v4.0 is an instructor-led course presented by training partners to systems engineers, Cisco Unified Communications system Partners, and customers who will be charged with deploying the Cisco Unified Contact Center Express (CCX) and Cisco Unified IP Interactive Voice Response (IVR) products.

Learner Skills and Knowledge

This subtopic lists the skills and knowledge that learners must possess to benefit fully from this course.

Learner Skills and Knowledge

- Internetworking fundamentals
- Basic IP telephony concepts
- Cisco Unified Communications Manager
- Cisco IP phones, Cisco IP Communicator
- Contact Center operations



Course Goal and Objectives

This topic describes the course goal and objectives.

Course Goal

“To provide knowledge and hands-on deployment experience for Cisco Unified Contact Center Express and Cisco Unified IP IVR. Deployment tasks include planning, installation, configuration, administration, script development, agent and supervisor deployments, and troubleshooting.”

Deploying Cisco Unified Contact Center Express (UCCXD)

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Upon completing this course, you will be able to meet these objectives:

- Design and plan a Cisco Unified CCX and a Cisco Unified IP IVR implementation
- Install or discuss all Cisco Unified CCX components, servers, and clients
- Configure all Cisco Unified CCX components
- Build workflow applications to exploit Cisco Unified IP IVR features and capabilities
- Build contact center workflows to exploit Cisco Unified CCX features and capabilities
- Deploy and use agent and supervisor desktop software
- Deploy the Cisco Desktop Work Flow Administrator and set contact center options
- Use real-time and historical reporting
- Deploy the Outbound Preview Dialer
- Deploy Agent Email
- Deploy Automatic Speech Recognition and text-to-speech applications
- Discuss maintenance activities
- Troubleshoot installations and workflows

Course Flow

This topic presents the suggested flow of the course materials.

		Day 1	Day 2	Day 3	Day 4	Day 5
A M		Course Introduction	Cisco Unified Contact Center Express Scripting	Cisco Unified Contact Center Express Scripting	Cisco Unified Contact Center Express ACD Operations	Cisco Unified Contact Center Express Premium Functions
		Cisco Unified Contact Center Express Product Overview				
Lunch						
P M		Installing and Configuring Cisco Unified Contact Center Express	Cisco Unified Contact Center Express Scripting	Cisco Unified Contact Center Express ACD Operations	Cisco Unified Contact Center Express Premium Functions	Cisco Unified Contact Center Express Maintenance

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The schedule reflects the recommended structure for this course. This structure allows enough time for the instructor to present the course information and for you to work through the lab activities. The exact timing of the subject materials and labs depends on the pace of your specific class.

Additional References

This topic presents the Cisco icons and symbols that are used in this course, as well as information on where to find additional technical references.

Additional References

- <http://www.cisco.com/go/ipccexpress>
- <http://www.oracle.com/technetwork/java/index.html>
- Cisco partner community forum
 - <https://www.myciscocommunity.com/community/partner/collaboration/contactcenter>



Your Training Curriculum

This topic presents the training curriculum for this course.



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For more information on the Cisco Qualified Specialist-focused certification, visit <http://www.cisco.com/go/certifications>.

General Administration

This topic addresses the training environment you will encounter for this class.

General Administration

Class-Related

- Sign-in sheet
- Length and times
- Participant materials
- Appendixes
- Attire

Facilities-Related

- Rest rooms
- Site emergency procedures
- Break room locations
- Restaurants, snacks
- Communications

Please Introduce Yourself

Take a few moments to introduce yourself and express any special objectives that you have for this training experience.

Please Introduce Yourself

- Your name and work location
- Your job responsibilities
- Your programming and administration background
- Your Cisco Unified Communications Manager experience
- Your Cisco Unified IP IVR or Cisco Unified CCX experience, if any
- Your other contact center experiences
- Your special objectives for this week



Cisco Unified Contact Center Express Product Overview

Overview

Cisco Unified Contact Center Express (CCX) is a complete customer interaction management solution that is available in four different packages: Cisco Unified IP Interactive Voice Response (IVR), Cisco Unified CCX Standard, Cisco Unified CCX Enhanced, and Cisco Unified CCX Premium. The different packages provide varying levels of customer interaction management channel options and capabilities within a contact channel.

Module Objectives

Upon completing this module, you will be able to identify and discuss the basic properties of Cisco Unified CCX. This ability includes being able to meet these objectives:

- List the four different product packages and identify the features that are available in Cisco Unified CCX
- Describe the environment and architecture in which Cisco Unified CCX can exist
- Identify and utilize the various tools used to aid in the design and order process

Cisco Unified Contact Center Express Product Packages

Overview

This lesson discusses the four different purchasable product packages offered in the Cisco Unified Contact Center Express (CCX) family of products. The features and functions of the following will be discussed:

- Cisco Unified IP Interactive Voice Response (IVR)
- Cisco Unified CCX Standard
- Cisco Unified CCX Enhanced
- Cisco Unified CCX Premium

This lesson also describes the compatibility options for integration and the operating systems required for deployment.

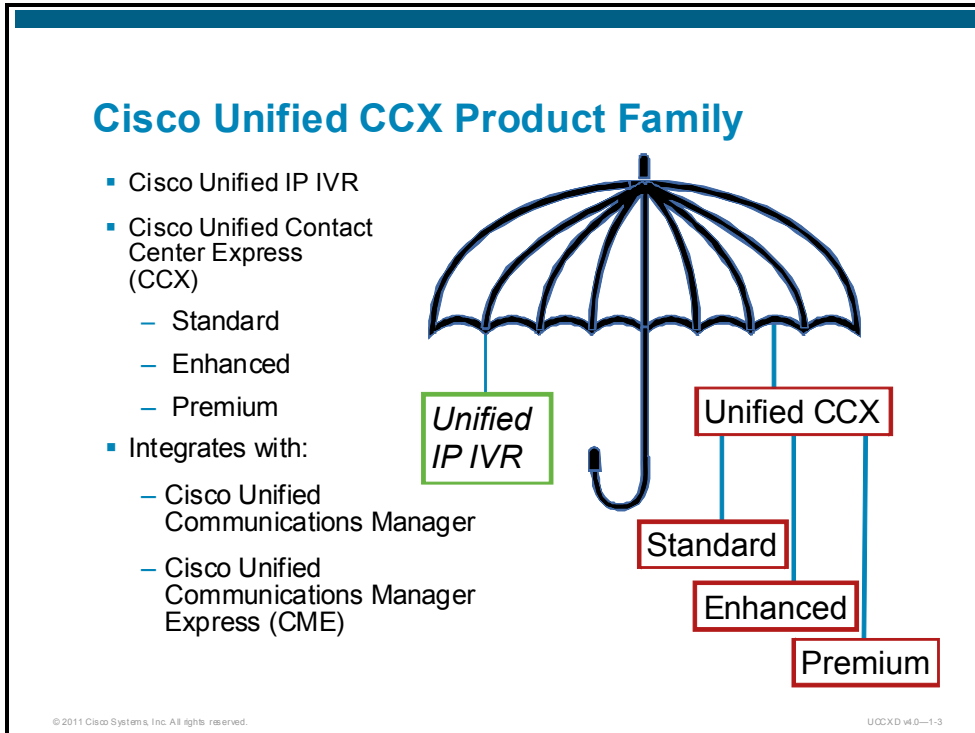
Objectives

Upon completing this lesson, you will be able to identify the different features and functions of the Cisco Unified CCX platform. This ability includes being able to meet these objectives:

- Describe the four product packages available for the Cisco Unified CCX platform
- Define the primary functions of Cisco Unified CCX
- List the features of each product package
- List and define the add-on applications available with the Cisco Unified CCX Premium package
- List Cisco Unified Communications Manager Express deployment limitations
- List compatibility options for Cisco Unified CCX Version 8.0
- List the operating system options for various Cisco Unified CCX programs
- List available hardware platforms for Cisco Unified CCX
- List maximum capacities of Cisco Unified CCX

Cisco Unified CCX Product Family

This topic describes the different packages available in the Cisco Unified CCX family of products.




Cisco Unified CCX is a complete customer interaction management solution available in three different automatic call distribution (ACD) packages and one Cisco Unified IP IVR package. Each package has varying levels of customer interaction options.

Cisco Unified CCX Primary Functions

This topic describes the basic functionality of Cisco Unified CCX.

Cisco Unified CCX Primary Functions

Cisco Unified Contact Center Express 

- **IVR: Interactive Voice Response Unit**
 - An IVR is a software application that provides self-service type of activities such as auto-attendant, bank or credit card account activation services, etc. Information is provided by the caller in the form of dual tone multifrequency (DTMF) tones or the spoken word, and response by the IVR is in the form of audio speech, whether prerecorded speech, text to speech, or generated prompts.
- **ACD: Automatic Call Distribution**
 - An ACD is a software application that provides for the routing of inbound or outbound calls to customer service representatives. Most ACD contact centers are used in the capacity of sales or technical support functions.

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Interactive Voice Response

An interactive voice response (IVR) is a software application that provides for self-service type activities for your customers. Typically, IVR is used for inbound voice contacts, where little or no interaction with customer service representatives is required.

Automatic Call Distribution

An ACD is a software application that allows for the creation, grouping, and management of customer service representatives, known as agents. These agents can then be used as targets for inbound or outbound ACD calls. A newer function of an ACD is the ability to route inbound emails as well as calls.

Cisco Unified CCX Product Package Options

This topic describes the options available for the different Cisco Unified CCX product packages.

Cisco Unified IP IVR

This subtopic summarizes the Cisco Unified IP IVR product package options.

Cisco Unified CCX Product Package Options: Cisco Unified IP IVR

- Basic and advanced IVR ports (licensed on per-port basis)
- Prompt and collect
- Call controls such as answer, terminate, transfer, and place call
- High availability (additional license required)
- Enterprise database integration via JDBC
- Inbound HTTP-triggered applications
- Generate and send outbound email
- Voice XML v2.0 support for advanced speech applications
- Record caller audio input and save or upload as prompts
- Remote Method Invocation (RMI)
- CTI integration with Cisco Unified ICM and Cisco Unified CCE
- XML document processing
- MRCP integration to support ASR and TTS services
- AutoAttendant and Spoken Name Upload provided
- Real-time and historical reports

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The Cisco Unified IP IVR is a Cisco Unified CCX product package that provides IP call queuing and IP intelligent voice response functionality for a contact center.

The options that are listed in the figure are basic and advanced IVR port options that are available for the Cisco Unified IP IVR. See *Solution Reference Network Design for Cisco Unified CCX* and *Cisco Unified IP IVR, Release 8.0* for a more comprehensive review.

Cisco Unified CCX Standard

This subtopic discusses the options available with the Cisco Unified CCX Standard product package.

Cisco Unified CCX Product Package Options: Cisco Unified CCX Standard

- Basic IVR port option:
 - No licensing for basic IVR ports
 - Number of ports available determined by server capacity
 - Prompt and collect
 - XML document processing
 - Call controls such as answer, terminate, transfer, and place call
 - Record caller audio input and save or upload as prompts
- Conditional call routing and queuing of inbound ACD calls
- Resource group and skills-based routing

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Cisco Unified CCX Product Package Options: Cisco Unified CCX Standard (Cont.)

- Cisco IP Phone Agent:
 - Agent state control
 - Call control
 - Real-time CSQ status
 - Reason code entry
 - Enterprise data display
 - Roaming agent (Cisco Unified Communications Manager Extension Mobility required)
- Cisco Agent Desktop is not available for the Standard package.

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Cisco Unified CCX Product Package Options: Cisco Unified CCX Standard (Cont.)

- Cisco Supervisor Desktop:
 - Monitor agent state in real time
 - Push agent state
 - Integrated browser
 - Reports
- One ACD line and three secondary lines supported for historical reporting purposes
- AutoAttendant and Spoken Name Upload provided
- Integration with Cisco Unified ICM as a subordinate ACD
- Integrate with Cisco Unified Presence Server
- Real-time and historical reports
- SNMP and alarm services

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Cisco Unified CCX Standard includes the editor steps necessary for creating basic Cisco Unified CCX configurations for informal call centers. It does not include a Java license.

Cisco Unified CCX Enhanced

This subtopic discusses the options available with the Unified CCX Enhanced product package.

Cisco Unified CCX Product Package Options: Cisco Unified CCX Enhanced

- All Standard product package options
- High availability (additional license required)
- Priority queuing
- Cisco Agent Desktop – Standard Desktop and Browser Edition:
 - Call control (third party)
 - Agent state control
 - Task automation buttons
 - Auto-start Windows applications
 - Event-driven CTI work flows
 - On-demand call recording
 - Work state (wrap-up)
 - Integrated team chat

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Cisco Unified CCX Product Package Options: Cisco Unified CCX Enhanced (Cont.)

- Cisco Supervisor Desktop:
 - Integrated team chat
 - Broadcast team messages
 - Silent monitor
 - Barge
 - Intercept
 - On-demand call recording and archiving of agent calls
- Agent-level routing:
 - Specific agent selection
 - No agent-level queuing
- Additional real-time and historical reporting metrics

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Cisco Unified CCX Enhanced adds significant new capability in ACD, desktop, and computer telephony integration (CTI) functions with support for agent-based routing, priority queuing, support for historical reporting on these enhanced features, additional enhanced features in both agent and supervisor desktop, and support for using and popping data to any Windows-based third-party application. It includes all functions of Cisco Unified CCX Standard, plus support for high availability. It also includes a Java license enabling custom Java extensions.

Cisco Unified CCX Premium

This subtopic discusses the options available with the Cisco Unified CCX Premium product package.

Cisco Unified CCX Product Package Options: Cisco Unified CCX Premium

- All Enhanced product package options
- Advanced IVR port option:
 - Two IVR ports per licensed agent
 - Enterprise database integration via JDBC
 - Inbound HTTP-triggered applications
 - Generate and send outbound email
 - Voice XML v2.0 support for advanced speech applications
 - Remote Java support (RMI)
- MRCP integration to support ASR and TTS services
- Remote silent monitor

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Cisco Unified CCX Product Package Options: Cisco Unified CCX Premium (Cont.)

- Cisco Agent Desktop:
 - Integrated multitabbed browser
- Agent Email:
 - Blended preview outbound dialer (no additional license required)
- Workforce Optimization:
 - Quality management, advanced quality management, and compliance recording
 - Workforce management
 - Requires separate servers
 - Requires additional purchase and license

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Cisco Unified CCX Premium includes all the functions provided by Cisco Unified CCX Enhanced and, in addition, adds full Cisco Unified IP IVR support integration, including database integration, Cisco Voice Extensible Markup Language (Cisco VoiceXML), HTML web triggers (ability to run any script from a web page), custom Java extensions, e-Notification services, and support for Automatic Speech Recognition (ASR) and text-to-speech (TTS) from Cisco certified partners (Nuance). It includes a Java license enabling custom Java extensions.

Cisco Unified Communications Manager Express Deployment Limitations

This topic discusses the Cisco Unified Communications Manager Express differences for Cisco Unified CCX.

Cisco Unified Communications Manager Express Deployment Limitations

- Only SCCP phones are supported.
- Only G.711 codec is supported.
- Call control functions in Cisco Agent Desktop are disabled.
- Supervisor cannot barge or intercept.
- Cisco Unified Communications Manager Express supports only one instance of Cisco Unified CCX.
- Deployments with Cisco Unified Communications Manager Express do not support these features:
 - High availability
 - Outbound Preview Dialer
 - Remote Monitoring
 - Unified Presence Integration
 - Workforce Optimization
 - Cisco Unified ICME integration for Cisco Unified CCE deployments
- User creation and configuration maintained by Cisco Unified CCX.
- No CTI ports—the call control group is created as part of the installation.

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Cisco Unified CCX for Cisco Unified Communications Manager Express is a solution composed of many components. These components include Cisco Unified CCX software, Cisco Unified Communications Manager Express, Cisco routers, Cisco data switches, Cisco voice gateways, and Cisco Unified IP phones. Cisco Unified CCX software is part of the Cisco Unified CCX software platform running with Cisco Unified Communications Manager Express. Cisco Unified CCX provides software capabilities for both Cisco Unified CCX and Cisco Unified IP IVR. With Cisco Unified Communications Manager Express, Cisco Unified CCX can run either Cisco Unified CCX or a Cisco Unified IP IVR package.

Cisco Unified CCX for Cisco Unified Communications Manager Express and Cisco Unified CCX for Cisco Unified Communications Manager have the same solution architecture for the following:

- Cisco Unified CCX system management
- Cisco Unified Wireless IP Phone 7920 support
- Citrix and Microsoft Terminal Services support for Cisco Agent Desktop
- Remote Agent Over Broadband
- Cisco Unified CCX ASR and TTS
- Cisco Unified CCX Agent Email

Cisco Unified CCX for Cisco Unified Communications Manager Express does not support the following solution architecture:

- Session Initiation Protocol (SIP) phone as an agent phone

- Cisco Unified CCX integration with Cisco Unified Intelligent Contact Management (ICM) software
- Cisco Unified CCX Outbound Preview Dialer
- Cisco TelePresence Virtual Agent solution
- Cisco Agent Desktop integration with Cisco Unified Presence
- Cisco Unified Workforce Optimization

In Cisco Unified Communications Manager Express, there is no concept of CTI ports. During the engine activation phase, a default call control group with the number of channels equal to the number of licensed ports is created automatically by the system. All Communications Manager Express telephony triggers will use this default call control group.

An agent is configured in Cisco Unified CCX as a user with agent capability and is stored in the Cisco Unified CCX database. An agent does not have an associated extension until the agent logs in successfully. Even though an agent has an assigned extension, the agent can log off and log in with a different extension. Thus, an agent can log in with multiple agent devices without using Cisco Unified Communications Manager Extension Mobility.

Cisco Unified CCX Compatibility

This topic discusses the compatibility options for Cisco Unified CCX Version 8.0.

Cisco Unified CCX Product Deployment and Compatibility Options

- Cisco Unified CCX installs on the Cisco Unified Communications Operating System 8.0.1.10000-38 (Linux)
- SCCP and SIP phones
- Cisco Unified Communications Manager
 - Versions 7.1(3), 7.1(4), and 8.0(1)
- Cisco Unified CME
 - Versions 7.1 and 8.0
- Cisco UC500 Series
 - Version 8.0
- Cisco Agent Desktop 8.0.1.86
- Workforce Optimization
 - Quality Management 8.0
 - Workforce Management 8.3(4)

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The figure summarizes compatibility requirements for Cisco Unified CCX Version 8.0. Refer to the *Cisco Unified Contact Center Express (Cisco Unified CCX) Software and Hardware Compatibility Guide* for a thorough listing of those items compatible with Cisco Unified CCX.

Cisco Unified CCX Operating Systems

This topic describes the supported operating systems available for Cisco Unified CCX programs.

Cisco Unified CCX Product Operating System Compatibility Options

- Script Editor:
 - Windows XP Pro, SP2, and SP3
 - Windows Vista Ultimate and Business
- Cisco Agent Desktop and Cisco Supervisor Desktop:
 - Windows XP Pro SP2 and SP3
 - Windows Vista Ultimate, Enterprise, and Business
 - Windows 7 Ultimate, Enterprise, and Professional
- Historical Reporting Client:
 - Windows XP Pro, SP2, and SP3
 - Windows Vista Ultimate and Business

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Cisco Unified CCX Product Operating System Compatibility Options (Cont.)

- Cisco Agent Desktop – Browser Edition:
 - Client OS
 - Windows XP Pro SP2
 - Windows Vista Ultimate and Business
 - Red Hat Enterprise v5
 - Windows 7 Ultimate, Enterprise, and Professional
 - All browsers require Sun JRE 6.0 with update 17
 - Browser support (Windows XP)
 - Internet Explorer 7 and 8
 - Firefox 3 and 3.5
 - Browser support (Windows Vista)
 - Internet Explorer 7 and 8
 - Firefox 3 and 3.5
 - Browser support (Red Hat)
 - Internet Explorer 7 and 8
 - Firefox 3 and 3.5

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Refer to the *Cisco Unified Contact Center Express (Cisco Unified CCX) Software and Hardware Compatibility Guide* for a thorough listing of supported operating systems.

Cisco Unified CCX Product Hardware Compatibility Options

This topic describes the supported hardware platforms available for Cisco Unified CCX.

Cisco Unified CCX Product Hardware Compatibility Options

- MCS-78xx Series Servers:
 - MCS-7815
 - MCS-7816
 - MCS-7835
 - MCS-7845
- HP DL Series Servers:
 - HP DL 320
 - HP DL 380
- IBM xSeries Servers:
 - IBM xSeries 3250
 - IBM xSeries 3650
- Support for virtualization using UCS-B Series Servers
- See *Cisco Unified CCX Software and Hardware Compatibility Guide* for more information.

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Cisco Unified CCX must be installed on a Cisco-approved server. You may purchase a Cisco 78xx Series server from Cisco or purchase an approved platform from your vendor of choice. The only approved vendors are HP and IBM; Cisco no longer OEMs servers from HP. See the *Cisco Unified CCX Software and Hardware Compatibility Guide* for more specific information.

Unified CCX 8.0(2) offers support for virtualization on UCS B-Series servers (UCS-B200M1-VCS1). The following guidelines apply to Virtual Machine provisioning for Cisco Unified Communications applications:

- Each Cisco Unified Communications application virtual machine must have physical CPU cores dedicated to the virtual machine, no oversubscribing CPU resources. Without dedicated CPU cores, call quality degrades noticeably.
- Each Cisco Unified Communications application virtual machine must be configured to execute on as many cores as vCPUs configured.
- Each Cisco Unified Communication application virtual machine must have the Memory Reservation for the full amount of memory allocated to the virtual machine. For example, if the virtual machine has 4 GB of RAM allocated, the Memory Reservation must be set to 4096 MB.
- Network design is left to your discretion, with the exception of requiring gigabit or faster network interface cards (NICs).
- When multiple virtual machines share the same VMware ESXi host physical network interface, there is the possibility of contention for inbound and outbound bandwidth. Inbound bandwidth contention can be managed with Quality of Service (QoS) in a

hardware switch. The VMware ESXi soft switch does not support the same QoS capabilities for outbound traffic, making contention more difficult to manage dynamically.

- One way to avoid outbound contention completely is to dedicate a NIC on the VMware ESXi hosts to the Cisco Unified Communications application virtual machines. This, however, is not a requirement. Deploying 10 Gigabit Ethernet and/or link aggregation with Link Aggregation Control Protocol or Cisco EtherChannel can help reduce or eliminate the possibility of outbound contention as well. In testing, the VMware ESXi software switch rate-limiting feature also proved capable, although using the feature might be impractical for most customers.
- Additional factors the architect should consider are any third-party virtual machines that will share the outbound interface with the Cisco Unified Communications applications virtual machines. A file server might not be the best candidate to share bandwidth with Cisco Unified Communications applications virtual machines, whereas a low-traffic print server might be. Examining the historical traffic patterns of co-resident virtual machines through the VMware Infrastructure client could prove helpful.
- Unfortunately, there is no simple method to detect outbound contention from within a virtual machine. In situations where inbound or outbound contention is suspected, troubleshooting will need to occur from the switch or switches to which the VMware ESXi host links.
- With storage fabric redundancy, failover is not instantaneous. During a failover event, the Cisco Unified Communications applications cannot write to disk, and it pauses—typically for 1 to 2 minutes—until the event completes. For this reason, we recommend that customers deploying Cisco Unified Communications application virtual machines do so with the Cisco Unified Communication backup or failover feature. To get the full benefits of failover, there must be careful consideration given to redundancy of the underlying server, network, and storage infrastructure.
- If a failover event happens because of a storage redundancy event, there is no information within the Cisco Unified Communications application virtual machine to determine that the failover event was caused by the storage event. You need to coordinate with the teams that manage the components of the storage infrastructure to conduct an investigation into the cause of the failover event.

Disaster recovery for Cisco Unified Communications application virtual machines supports the same in-host techniques as Cisco Unified Communications applications on physical servers: the same backup options are available with Cisco Unified Communications running on ESXi as on physical servers. Virtualization and storage networks allow for new out-of-host disaster-recovery techniques. Examples include snapshots, entire virtual machine backups, and multisite recovery scripts with products such as VMware Site Recovery Manager. You can use out-of-host disaster-recovery techniques, provided disk-performance minimums are maintained. Caution Disaster-recovery techniques that rely on snapshot or synchronous interdata-center I/O writes can have a negative impact on disk performance and snapshots are not supported by most of the Cisco Unified Communications applications.

For more information, refer to the Cisco Unified Communications VM Doc Wiki at the following URL:

http://docwiki.cisco.com/wiki/Unified_Communications_Virtualization

Cisco Unified CCX Scalability

This topic describes Cisco Unified CCX Version 8.0 maximum capacities.

Unified CCX Item	MCS-7845	MCS-7835	MCS-7825	MCS-7816	Unified CME
Agents	300	150	100	75	50
BHCC	5000	2600	2000	1800	1000
IVR ports	300	150	100	75	50
ASR ports	100	50	50	50	25
TTS ports	160	40	40	40	25
VXML ports	80	40	40	40	25
Contact Service queues	150	100	25	25	50
Skills	150	150	150	150	150
Supervisors	32	15	10	8	10
Monitor	32	15	10	8	10
Record/Playback	64	32	24	16	10
HR sessions	16	10	10	10	2

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The table in the figure shows the maximum capacities for various Cisco Unified CCX 8.0(1) items for an inbound high-availability system (two-server cluster), which has the most capacity. The supported call rate Busy Hour Call Completions (BHCC) on a given platform will depend on the number of Cisco Unified IP IVR ports and the average call duration.

Actual capacity depends on the total server points that are determined by profiling testing. In addition, the maximum BHCC rate on a server is limited by the number of configured CTI ports and the use of other features.

The Unified CME column shows maximum capacities for any Cisco Unified Communications Manager Express deployment. The actual capacity depends on the type of server on which Cisco Unified CCX is installed.

Summary

This topic summarizes the key points that were discussed in this lesson.

Summary

- There are two primary functions of the Cisco Unified CCX solution: Cisco Unified IP IVR, or self-service type activities, and ACD inbound and outbound call routing.
- There are four purchasable product packages: Cisco Unified IP IVR, Cisco Unified CCX Standard, Cisco Unified CCX Enhanced, and Cisco Unified CCX Premium.
- Additional services available with the Cisco Unified CCX Premium package:
 - Workforce Optimization: Quality Management and Workforce Management
- Outbound Direct Preview dialing is now a Cisco Unified CCX Premium feature.
- The Cisco Agent Desktop – Browser Edition supports Internet Explorer and Firefox.
- Agent Email is available with the Unified CCX Premium package.
- All Cisco Unified CCX product packages integrate with Cisco Unified Presence.

Cisco Unified Contact Center Express Architecture

Overview

Cisco Unified Contact Center Express (CCX) is installed as a package, but there are four separate components that may be installed, depending on the product package purchased. Cisco Unified CCX is not very effective in an environment by itself; therefore, this lesson investigates several other programs that are required for an installation. In addition, Cisco Unified CCX can optionally interface with other programs to provide different call routing methodologies.

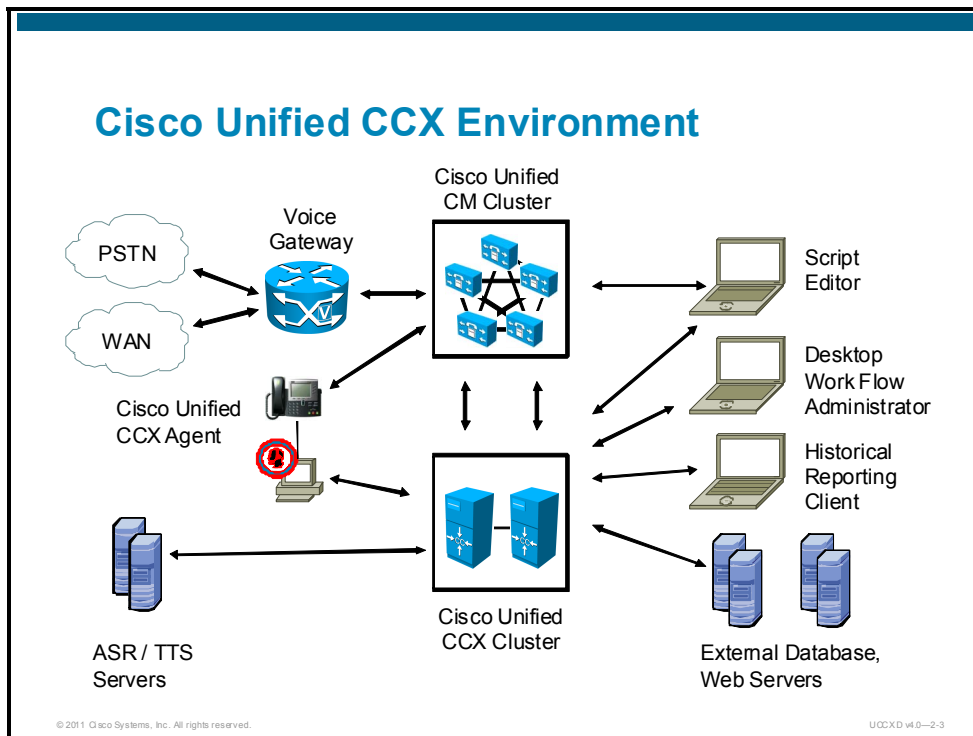
Objectives

Upon completing this lesson, you will be able to understand how Cisco Unified CCX exists in a variety of environments to produce different caller experiences. This ability includes being able to meet these objectives:

- List and describe the various applications in the Cisco Unified CCX environment
- Define the cluster components of Cisco Unified CCX
- Describe the Cisco Unified CCX datastores and the type of data they contain
- Describe the different integration models in which Cisco Unified CCX can be employed

Cisco Unified CCX Environment

This topic describes the basic environment of Cisco Unified CCX.



The diagram shows the most common utilities and programs that Cisco Unified CCX requires.

Cisco Unified CCX Environment Definitions

This subtopic defines the most common programs and utilities in the Cisco Unified CCX environment.

Cisco Unified CCX Environment Definitions

- **Gateways:** Gateways are interfaces used to convert media type. In this case, the gateway converts standard telephony media (T1, E1, ISDN, etc.) to VoIP.
- **Routers:** Routers, in this case, are used to route VoIP traffic to and from the Cisco Unified Communications Manager environment.
- **Cisco Unified Communications Manager:** An IP-based call-processing engine. It fills the role of a PBX.
- **Cisco Unified CCX:** An IP-based family of products that will perform IVR functions, ACD functions, or both, depending on the product package purchased
- **Script Editor:** A Cisco Unified CCX program used to create or modify Cisco Unified CCX scripts

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Some definitions of components of the Cisco Unified CCX environment are as follows:

- **Voice gateway:** Connects the Cisco Unified Communications network to the public switched telephone network (PSTN) and to other private telephone systems. You can purchase gateways separately. Both inbound and outbound calls to the PSTN travel through the gateway.
- **Cisco Unified Communications Manager:** Provides the features that are required to implement Cisco Unified Communications phones, manages gateways, and directs voice over Cisco Unified Communications traffic to the Cisco Unified CCX system. You must purchase Unified Communications Manager separately.
- **Cisco Unified CCX:** Contains the Cisco Unified CCX Engine and other components needed to provide interactions for customer service.
- **Cisco Unified CCX Script Editor:** A visual programming environment for creating, modifying, validating, and debugging telephony and multimedia application scripts in a Cisco Unified CCX system.

Cisco Unified CCX Environment Definitions (Cont.)

- **Cisco Desktop Work Flow Administrator:** A Cisco Unified CCX program used to define and set up these basic functions:
 - Enterprise Data
 - VoIP monitor
 - Agent desktop display attributes
 - Reason codes
 - CTI activities
 - Wrap codes
 - Agent Email
 - Cisco Unified Presence
- **Historical Reporting Client:** A Cisco Unified CCX program used to view, define, schedule, and retrieve historical reports

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Additional Cisco Unified CCX definitions are as follows:

- **Cisco Desktop Work Flow Administrator:** A client-based utility that can be downloaded and installed from Cisco Unified CCX Administration. It is no longer installed on the Cisco Unified CCX server. The Cisco Desktop Administrator allows an administrator to perform tasks such as configuring the agent interface, setting up reason codes, and defining agent work flows and keystroke macros.
- **Cisco Unified CCX Historical Reporting Client:** Designed to provide you with information about the call activities of your Cisco Unified CCX system. With Cisco Unified CCX Historical Reporting, you can perform the following functions:
 - View, print, and save reports
 - Sort and filter reports
 - Send scheduled reports to a file or printer
 - Export reports in a variety of formats, including Portable Document Format (PDF), Microsoft Excel, Rich Text Format (RTF), Extensible Markup Language (XML), and comma-separated values (CSVs)
 - Prepare custom reports using a variety of generally available third-party applications that are designed to create reports from databases

Cisco Unified CCX Environment Definitions (Cont.)

- **Cisco Unified CCX Agent:** Cisco Unified CCX Agent requires a phone and a Cisco Agent Desktop. The phone connects to Cisco Unified Communications Manager for call control. The agent desktop connects to Cisco Unified CCX for agent control.
- **External servers:** Workforce Optimization, ASR and TTS, and database servers

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An agent is a customer service representative and must be configured in Cisco Unified Communications Manager as a user. This adds a record to the Cisco Unified Communications Manager user table. The Cisco Unified Communications Manager user table can be synchronized with Lightweight Directory Access Protocol (LDAP) directories such as Microsoft Active Directory. Cisco Unified Communications Manager supports usage of one of the following LDAP directory servers: DC Directory (default), Netscape IPlanet, and Microsoft Active Directory. In Cisco Unified Communications Manager, an agent phone and directory number are associated with the Cisco Unified Communications Manager user account of the agent, and the directory number is also marked as a Cisco Unified CCX extension. This designation of the directory number allows Cisco Unified CCX to know that this Cisco Unified Communications Manager user is an agent; the user then shows up in the resource list in Cisco Unified CCX Administration.

Quality Management (QM) supports the recording and archiving of every call between agents and customers. Managers and supervisors can evaluate a customer contact by listening to the recording and filling out an electronic evaluation form. They can also monitor and analyze the performance of groups, teams, and individual agents by looking at summary and detail reports of those evaluations. Supervisors and managers can then use these results to suggest training classes for the agents to take.

The Quality Management product also supports Compliance Recording by enabling 100% audio recording of calls for selected teams of agent or knowledge workers.

Advanced QM is similar to QM except that it supports screen recording. Screen recording allows a supervisor to see what the agent was doing on the desktop at the time the agent handled a call.

Compliance Recording (CR) enables audio recording of phone calls of knowledge workers according to recording policies established within QM Administrator Desktop within an archive and/or quality work flow. Compliance Recording users can also use the QM desktop application to search and play their own recordings.

Cisco Workforce Management allows supervisors and contact center managers to develop schedules for their agents and manage key performance indicators and real-time adherence.

Managers can create and manage schedules for an unlimited number of sites, manage scheduling for offices spread out in different time zones, and schedule alternative media sources seamlessly, including chat and email.

Cisco Unified CCX allows integration with Media Resource Control Protocol (MRCP)-compliant Automatic Speech Recognition (ASR) and text-to-speech (TTS) servers. Nuance, Scansoft, and IBM are the only ASR and TTS providers that have been tested and will be supported. ASR and TTS software must be purchased from one of these vendors. These vendors can provide design and server sizing requirements for their software. Cisco no longer resells Nuance ASR and TTS as a Cisco Unified CCX option.

You can use the database subsystem to enable Cisco Unified CCX applications to interact with enterprise database servers so that this information can be used for decision making in the script or computer telephony integration (CTI) activity on the agent desktop.

Cisco Unified CCX Cluster Components

This topic describes the cluster components available in Cisco Unified CCX.

Cisco Unified CCX Cluster Components

- **Cisco Unified CCX Engine:** The main component of the Cisco Unified CCX system processes and accepts voice calls and web contacts. The engine is also responsible for:
 - Communications with Cisco Unified Communications Manager
 - Execution of scripts
 - System management and administration
 - The agent state machine for agent monitoring and selection
 - Communications with Cisco Agent Desktop for agent state control, call control, and CTI screen pops
- **Database server:** Component used to store Cisco Unified CCX data. It consists of four datastores: Agent, Configuration, Historical, and Repository.

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Every Cisco Unified CCX deployment must have a Cisco Unified CCX Engine component and a Database component. The Monitoring and Recording components are optional. With Cisco Unified CCX 8.0, there is only one active server and one standby server. Each of these servers must have the same components installed.

The Cisco Unified CCX Engine (and closely related subsystems) is the component that provides functions such as the following:

- Java Telephony Application Programming Interface (JTAPI) communications with Cisco Unified Communications Manager
- Execution of scripts
- Encoding and streaming of .wav files for all CTI ports defined
- Communications with Cisco Agent Desktop for agent state control, call control, and screen pop
- Agent monitoring and selection
- Cisco Unified CCX Administration web interface

The Cisco Unified CCX Engine component provides the core automatic call distribution (ACD), interactive voice response (IVR), and CTI services. The other components—Database, Monitoring, and Recording—are auxiliary software components.

The Database component is a required component for any Cisco Unified CCX deployment and is the component that manages access to the Cisco Unified CCX database. The Cisco Unified CCX Database contains four datastores, as follows:

- **Configuration datastore:** Contains Cisco Unified CCX configuration information such as resources (agents), skills, resource groups, teams, and Contact Service Queue (CSQ) information.
- **Repository datastore:** Contains user prompts, grammars, and documents.
- **Agent datastore:** Contains agent logs, statistics, and pointers to the recording files.
- **Historical datastore:** Contains Contact Call Detail Records (CCDRs).

Cisco Unified CCX Cluster Components (Cont.)

- **Monitor:** Component used for monitoring and recording agent calls. In SPAN port configuration, the monitor server collects and distributes voice data from the agent phone to the supervisor and/or recording server. In the agent desktop configuration, voice traffic moves directly from the agent desktop to the supervisor or recording server, or both, but the monitor component is still required to set up the connection.
- **Recording server:** Component used to accept and store agent call recording data. References to storage location are in the Agent datastore.

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Cisco Unified CCX Enhanced and Premium provide the ability for a supervisor to silently monitor agents. Cisco Unified CCX Enhanced and Premium also provide the ability for agent calls to be recorded. Agent call recording can be triggered in the following ways:

- A supervisor clicks the **Record** button on Cisco Supervisor Desktop for a specified agent call.
- An agent clicks the **Record** button on Cisco Agent Desktop or Cisco IP Phone Agent (IPPA).
- The work flow configuration automatically triggers complete call recording on certain types of calls for agents using Cisco Agent Desktop.

In order to use the silent monitoring or recording features, access to the Real-Time Protocol (RTP) packet streams is required. Silent monitoring and recording will work with either G.711 or G.729 RTP streams, or a mixture of agents using G.711 and G.729 phones is supported. However, silent monitoring and recording will not work with encrypted media streams. Cisco Unified CCX provides two mechanisms for access to the RTP packet stream: Switched Port Analyzer (SPAN) port monitoring and desktop monitoring.

Cisco Unified CCX Datastores

This topic describes the datastores present in the Cisco Unified CCX database.

Cisco Unified CCX Datastores

The Cisco Unified CCX database is divided into four datastores:

- **Agent datastore:** Stores agent logs, statistics, and information about agent recordings and their locations on the recording server
- **Configuration datastore:** Stores Cisco Unified CCX configuration data. This data includes resource (agent), supervisor, resource group, skill, contact service queue (CSQ), trigger, application, and team definitions
- **Repository datastore:** Storage location for scripts, prompts, grammars, and documents
- **Historical datastore:** Stores all Cisco Unified CCX statistics and CCDR records for reporting purposes

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Datastores are components that allow you to manage and monitor historical, repository, and configuration data in the Cisco Unified CCX cluster.

The Datastore Control Center allows you to configure and manage the following data in the cluster:

- Agent records
- Historical records
- Repository data, such as prompts, grammars, and documents
- Configuration data for historical reporting

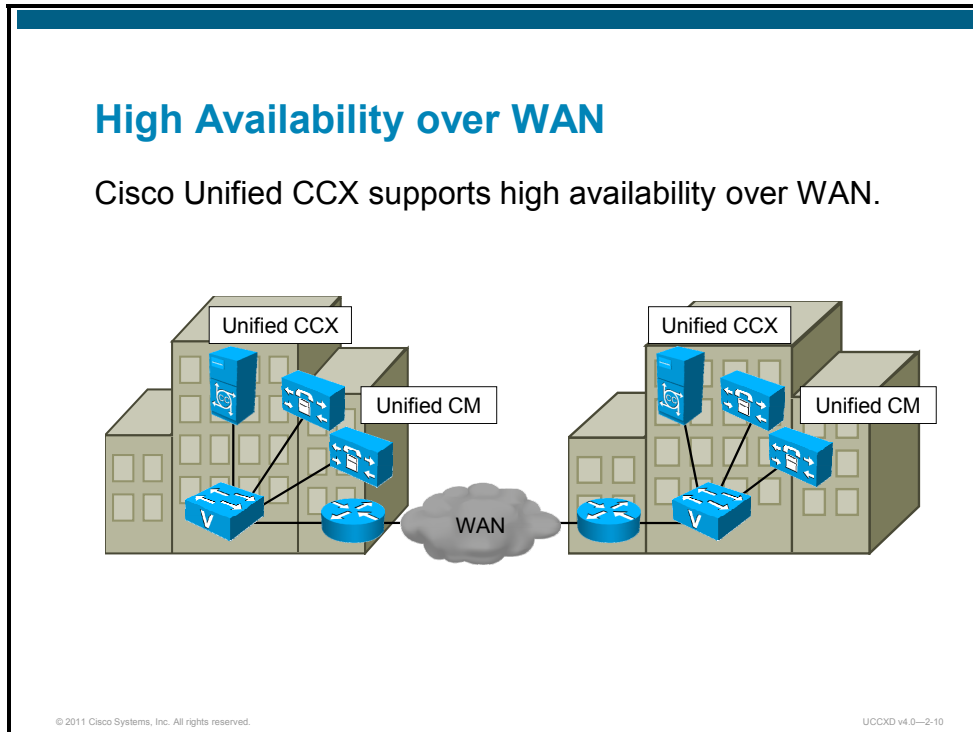
You can access the Datastore Control Center in Unified CCX Serviceability Administration by selecting **Tools > Datastore Control Center > Replication Servers**.

You can use the Datastore Control Center to obtain an overview of the datastores in the cluster and their relationships, manage the datastore read/write access, monitor and control the replication agents (only available for agent, historical, and repository datastores) and activate the publisher.

Note The Datastore Control Center is not available on a single-node deployment.

High Availability over WAN

This subtopic describes the high availability over WAN feature for Cisco Unified CCX.



Cisco Unified CCX supports high availability over WAN to provide site redundancy. In this deployment, the Cisco Unified CCX servers are located in two different sites across the WAN. Cisco recommends each site should have at least one Cisco Unified CM server that is running CTI Manager with which Cisco Unified CCX communicates. Agents and supervisors can be located in one of the sites where the Cisco Unified CCX server resides or in any other remote sites.

Sufficient bandwidth must be provisioned for Cisco Unified CCX cluster, Cisco Unified CM cluster, remote agent/supervisor desktops, and other optional components in order to deploy high availability over WAN successfully. The maximum allowed round-trip time (RTT) between Cisco Unified CCX servers is 80 ms.

Deployment Considerations

Consider the following when deploying high availability over WAN with Cisco Unified CCX:

- Deploy ASR and TTS servers locally in each Cisco Unified CCX site.
- Set up Cisco Unified CCX to use the local Cisco Unified CM servers for both primary and secondary in the following configurations. If this is not possible, at least the primary Cisco Unified CM server should be local.
 - AXL Service Provider
 - JTAPI Provider for Cisco Unified CM Telephony Subsystem
 - JTAPI Provider for Resource Manager/Contact Manager Subsystem
- Assign the two sets of CTI Ports (one for the master and the other for the standby engine) to different device pools, regions, and locations, etc., in the CTI Port Group.

- Data in Agent Datastore, Historical Datastore, and Repository Datastore of Informix IDS database start merging after the network partition is restored, and this could potentially generate heavy data traffic over the WAN. Cisco recommends restoring the WAN link after hours to minimize the performance impact.
- There is no support for VPN tunneling across the WAN.

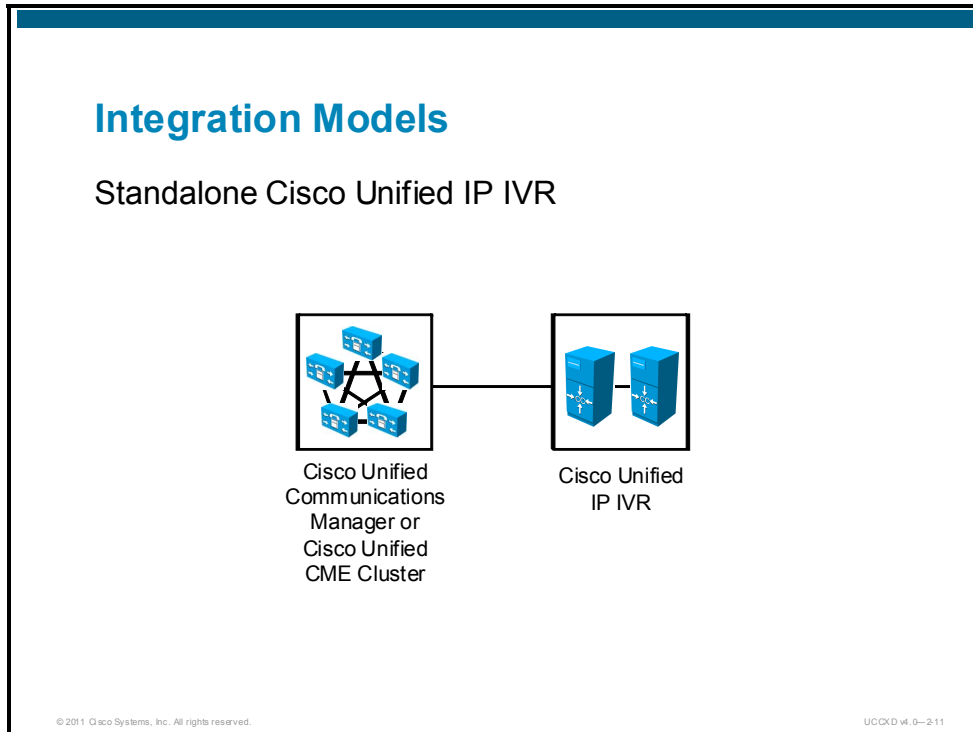
Cisco Unified CCX Integration Models

This topic describes the integration models in which Cisco Unified CCX may be employed.

Note While a Unified Communications Manager deployment can support multiple instances of Cisco Unified CCX, Cisco Unified Communications Manager Express can only support one instance.

Standalone Cisco Unified IP IVR

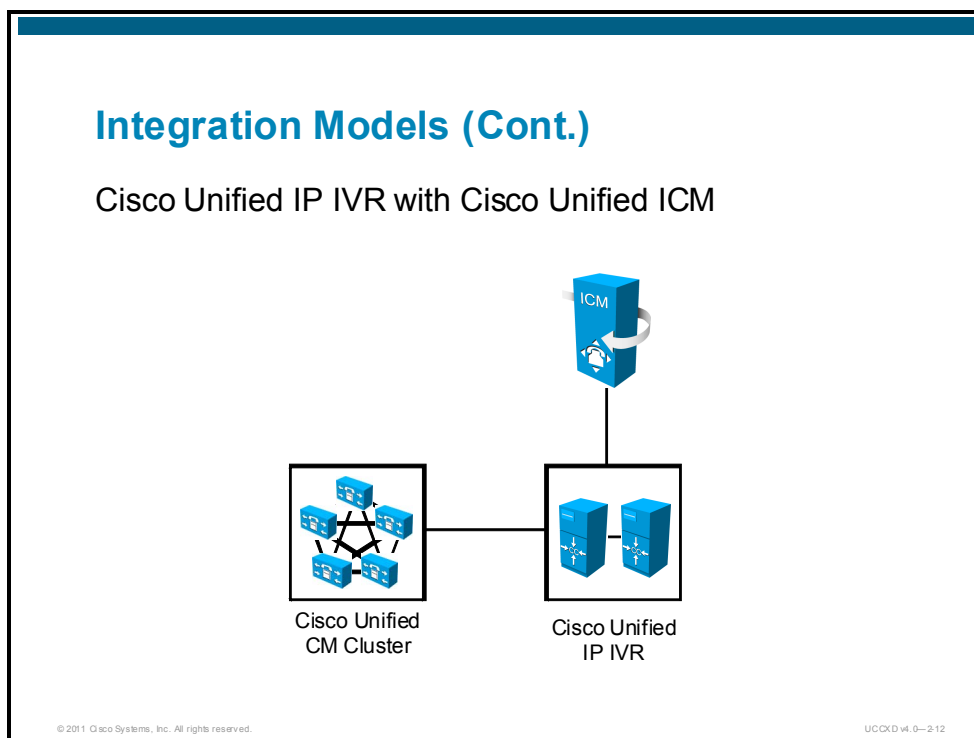
This subtopic describes a standalone Cisco Unified IP IVR deployment.



The Cisco Unified IP IVR can be installed purely as an IVR for self-service type activities and can service calls for one Cisco Unified Communications Manager.

Cisco Unified IP IVR Integrated with Cisco Unified ICM

This subtopic describes a Cisco Unified IP IVR integrated with Cisco Unified Intelligent Contact Management (ICM) deployment.

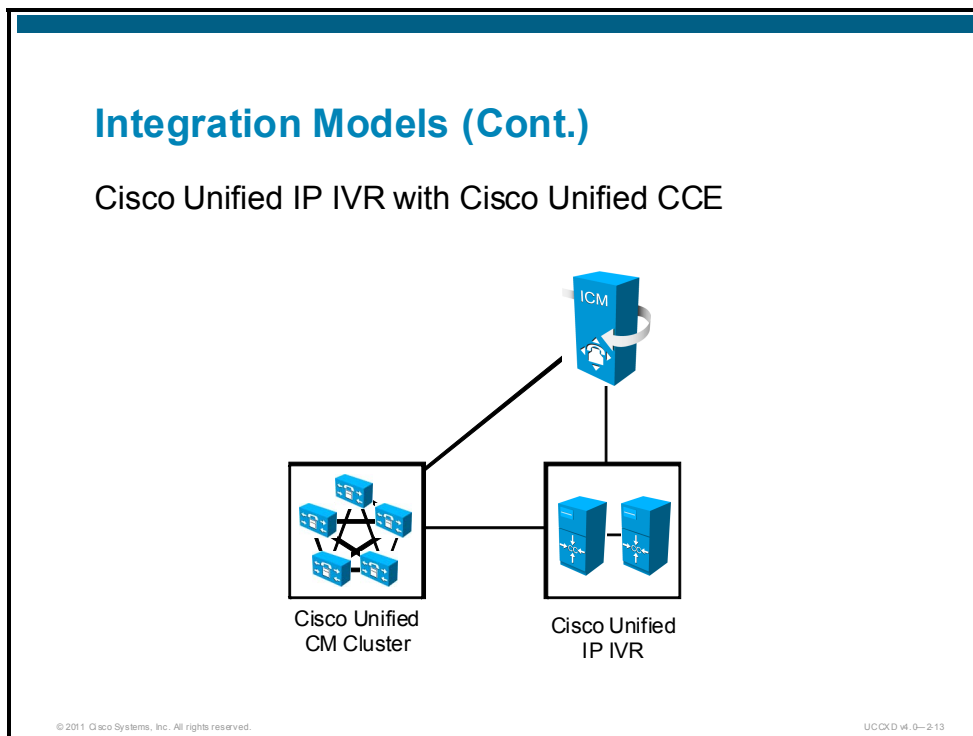


In this model, the Cisco Unified IP IVR can be used to service callers locally, as in the standalone mode. It can also service IVR calls that exist in the Cisco Unified Intelligent Contact Manager Enterprise (ICME) system.

When the Cisco Unified IP IVR is configured to service calls for Cisco Unified ICME, it can accept calls before entering the Cisco Unified ICME environment and then perform a post route (a route request to Cisco Unified ICME) or accept calls that have been moved from another peripheral (ACD, IVR, or network carrier). The latter is known as a translation route.

Cisco Unified IP IVR Integrated with Cisco Unified CCE

This subtopic describes a Cisco Unified IP IVR integrated with Cisco Unified Contact Center Enterprise (CCE) deployment.



In this model, the Cisco Unified IP IVR can be used to service callers locally, as in the standalone mode, and can also service IVR calls that exist in the Cisco Unified CCE system.

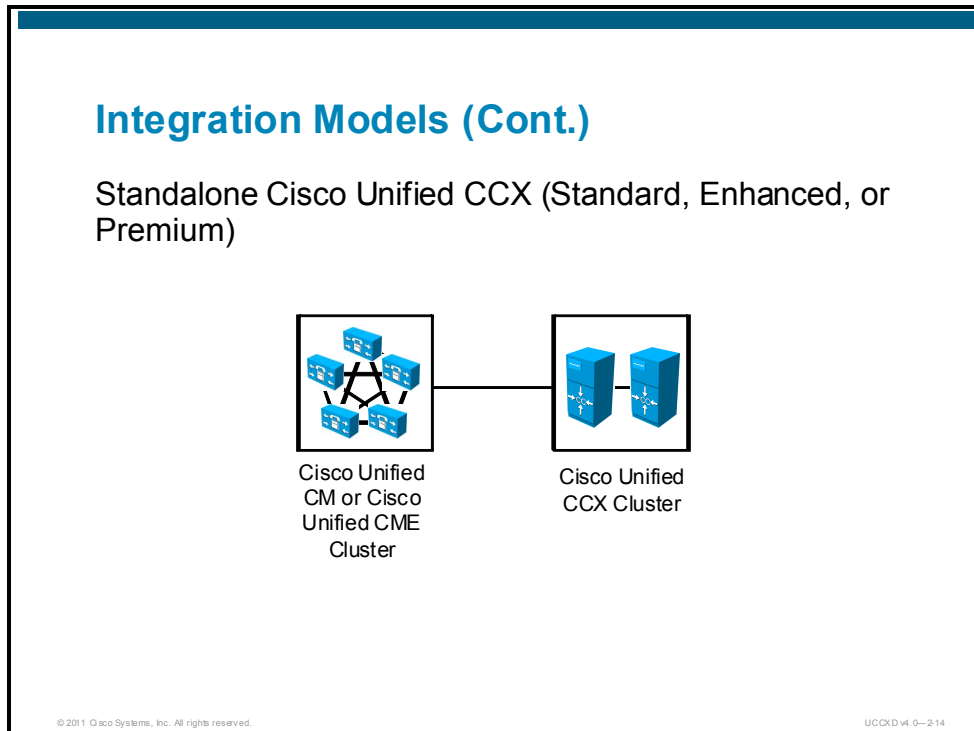
The reason that the Cisco Unified IP IVR fits in this model is to act as a queue point for Cisco Unified CCE. To define the term “queue point,” you must understand that the applications Cisco Unified Communications Manager and Cisco Unified ICM cannot terminate a phone call. The only component in this model that can accept a call is Cisco Unified IP IVR. Therefore, when a call enters the Cisco Unified CCE system and there are no agents available, the only place to put the call while it is in queue is on Cisco Unified IP IVR. Obviously, once a call has been placed on Cisco Unified IP IVR and queuing has started, Cisco Unified IP IVR can provide all the call treatment required while the call is in queue.

Concurrently, the Cisco Unified IP IVR can also do the following:

- Accept calls before entering the Cisco Unified CCE environment and then perform a post route (a route request to Cisco Unified ICME).
- Accept calls that have been moved from another peripheral (ACD, IVR, or network carrier).

Standalone Cisco Unified CCX

This subtopic describes a standalone Cisco Unified CCX deployment.



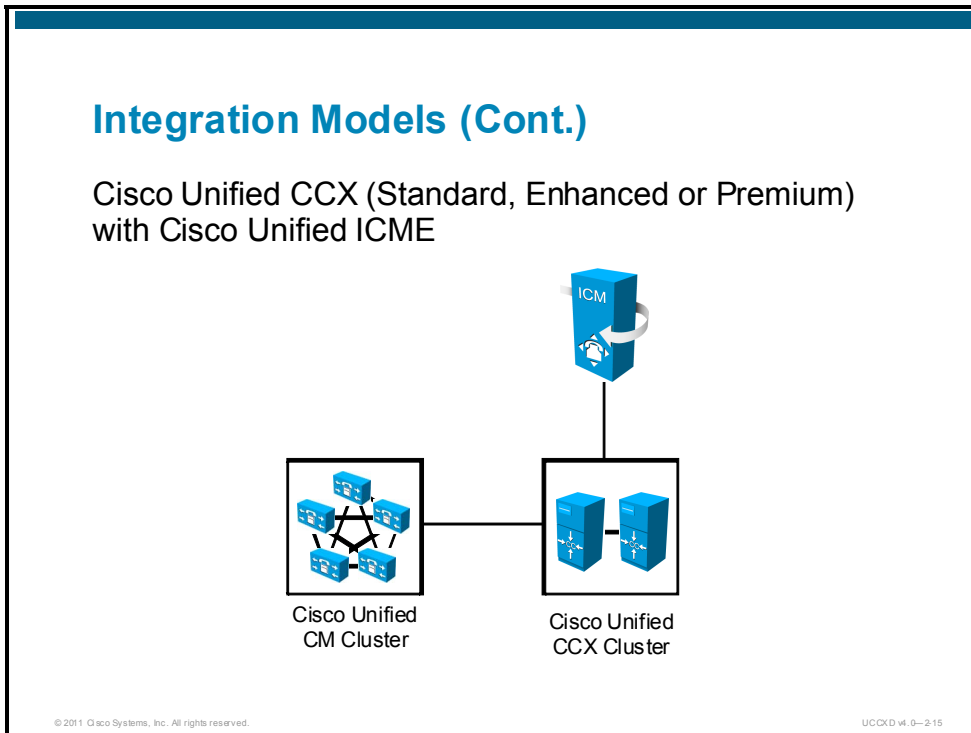
The figure shows the basic model for the ACD products of Cisco Unified CCX. The Standard and Enhanced product packages are ACD systems that differ only in feature sets available. There are no Cisco Unified IP IVR (advanced port option) functions provided.

The Premium product package offers all functions available for the Cisco Unified CCX product platform, including Cisco Unified IP IVR activities, except the capability to act as a queue point as the Cisco Unified IP IVR does in the Cisco Unified CCE model.

All product packages (Standard, Enhanced, and Premium) can exist as a subordinate ACD in the Cisco Unified ICME model.

Cisco Unified CCX Integrated with Cisco Unified ICM

This subtopic describes a Cisco Unified CCX integrated with Cisco Unified ICM deployment.



In this model, Cisco Unified CCX acts as a subordinate ACD in the Cisco Unified ICME system. Depending on the product package purchased, Cisco Unified CCX has all the features and functions available, except the capability to act as a queue point as the Cisco Unified IP IVR does in the Cisco Unified CCE model.

Summary

This topic summarizes the key points that were discussed in this lesson.

Summary

- Cisco Unified CCX is dependent on several additional applications to be a more effective system. At a minimum, Cisco Unified Communications Manager is required.
- Cisco Unified CCX has four cluster components:
 - Engine
 - Database
 - Monitor
 - Record
- Support for high availability over WAN is new in Cisco Unified CCX version 8.0(1).
- Cisco Unified CCX can be quite versatile. Depending on the product purchased and the architecture deployed, it can:
 - Act as a standalone IVR
 - Act as an IVR or in an IVR farm in the Cisco Unified ICM environment
 - Act as an IVR or a queue point in the Cisco Unified CCE environment
 - Act as a standalone ACD
 - Act as an ACD in the Cisco Unified ICM environment

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Cisco Unified Contact Center Express Design and Order Tools

Overview

This lesson discusses the processes and tools used for designing and ordering Cisco Unified Contact Center Express (CCX) products.

Sizing a Cisco Unified CCX deployment is accomplished by using a series of tools, including Erlang calculators, the IPC Resource Calculator, and the IP IVR Self-Service Calculator.

This lesson discusses these processes and tools and provides hands-on experiences in the subsequent lab.

Objectives

Upon completing this lesson, you will be able to understand and use the tools for designing and ordering Cisco Unified CCX products. This ability includes being able to meet these objectives:

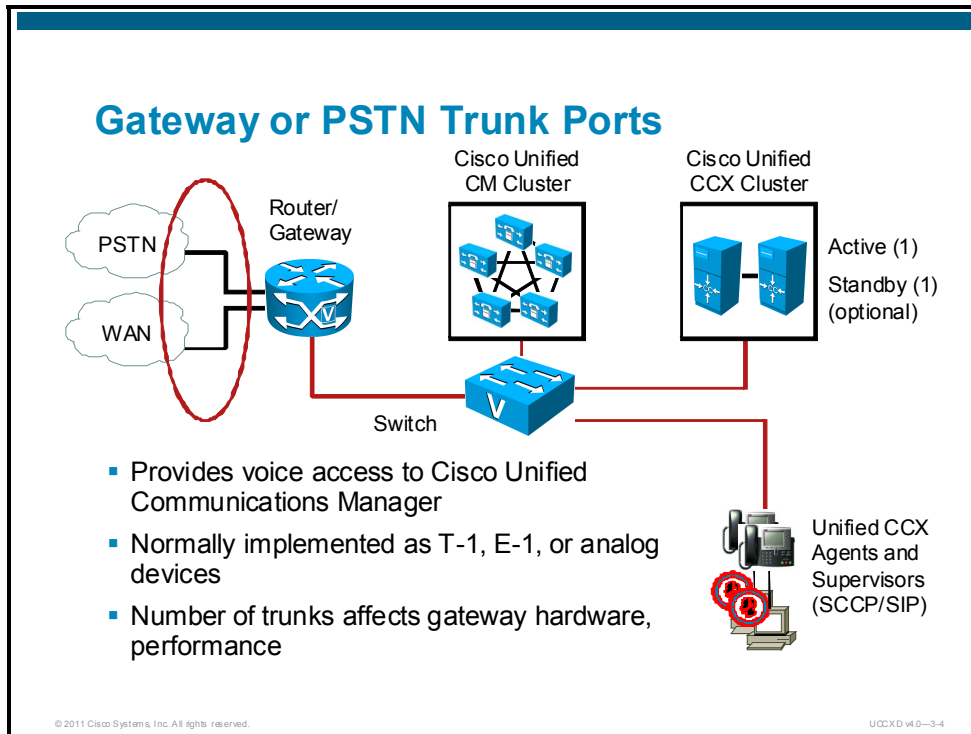
- Define basic terms associated with sizing a call center
- Describe Erlang calculators
- Use IPC Resource Calculators to determine IVR and call center requirements
- Describe the Cisco Solution Expert
- List network considerations found in the SRND

Terminology

This topic describes the terminology used to properly size the system.

Gateway or PSTN Trunk Ports

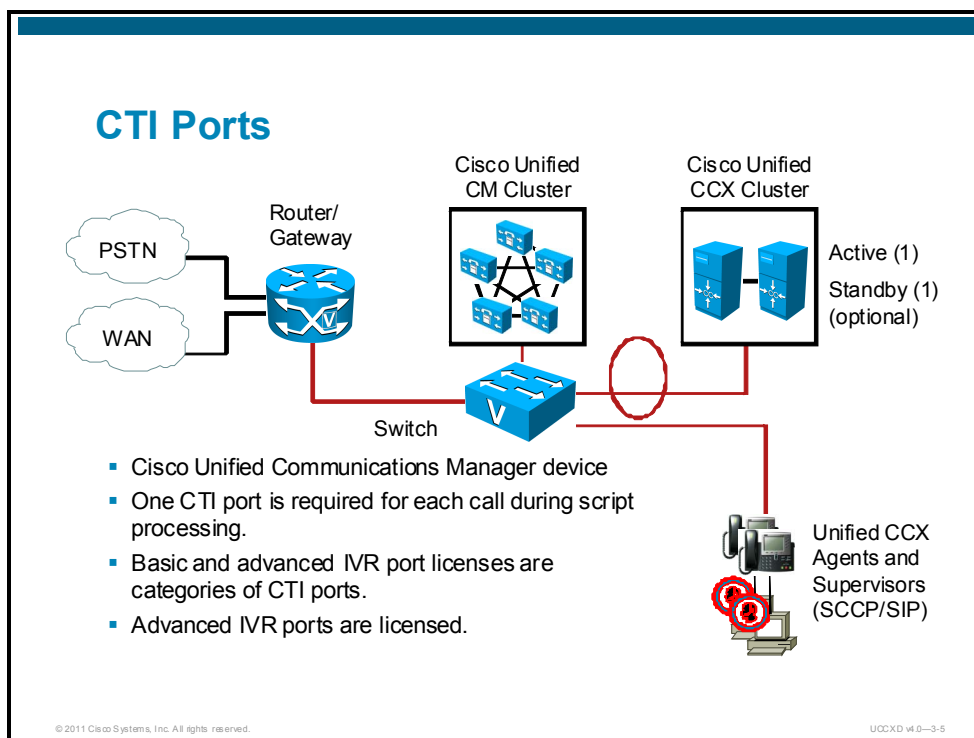
This subtopic describes the gateway and public switched telephone network (PSTN) trunk ports.



Gateway or PSTN trunk ports handle calls originating from the PSTN. They are purchased separately from Cisco Unified CCX.

CTI Ports

This subtopic describes how to determine the number of computer telephony interface (CTI) ports required for script processing.

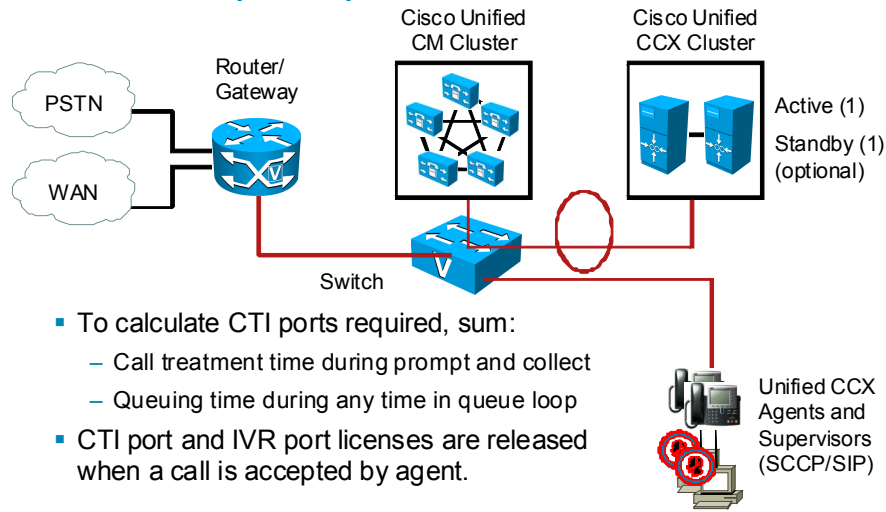


The number of CTI ports is determined as follows:

- **CTI ports in Cisco Unified Communications Manager:** CTI ports are Cisco Unified Communications Manager devices that are configured and associated with the Java Telephony Application Programming Interface (JTAPI) user account that will provide the logical connection with the Cisco Unified CCX server and the CTI services on the Cisco Unified Communications Manager. One CTI port is required for each call connection to the Cisco Unified CCX.
- **IVR ports in Cisco Unified CCX:** IVR ports are packaged as either Basic or Advanced IVR ports:
 - **Basic IVR ports licensing:** Basic IVR ports are not licensed, and a given configuration may have as many Basic IVR ports as fit, given the server on which the system is deployed and the mix of other features deployed on that server. You must use the Cisco Unified Communications Sizing Tool to determine the maximum number of Basic IVR ports that are supported on a per configuration basis. Basic IVR ports provide a queue point, custom messaging and prompting, caller input collection, and processing via dual tone multifrequency (DTMF) decoding. Decoded DTMF input may be used for both routing and screen pop purposes. Basic IVR ports (and only Basic IVR ports) are available in both the Standard and Enhanced packages.

- **Advanced IVR ports licensing:** Advanced IVR ports are licensed on a per-inbound voice seat basis and are available only with the Premium package. Each inbound voice seat provides two Advanced IVR port licenses. For example, a 100-seat inbound voice deployment provides 200 Advanced IVR port licenses. Advanced IVR port license counts are checked at run time. In this example, the 201st simultaneously active request for an Advanced IVR port to handle an incoming call would be denied. Deployments requiring more IVR ports than provided by this 1:2 seat Advanced IVR port ratio would need to purchase one additional Premium inbound voice seat for each two additional Advanced IVR ports required.

CTI Ports (Cont.)



- To calculate CTI ports required, sum:
 - Call treatment time during prompt and collect
 - Queuing time during any time in queue loop
- CTI port and IVR port licenses are released when a call is accepted by agent.

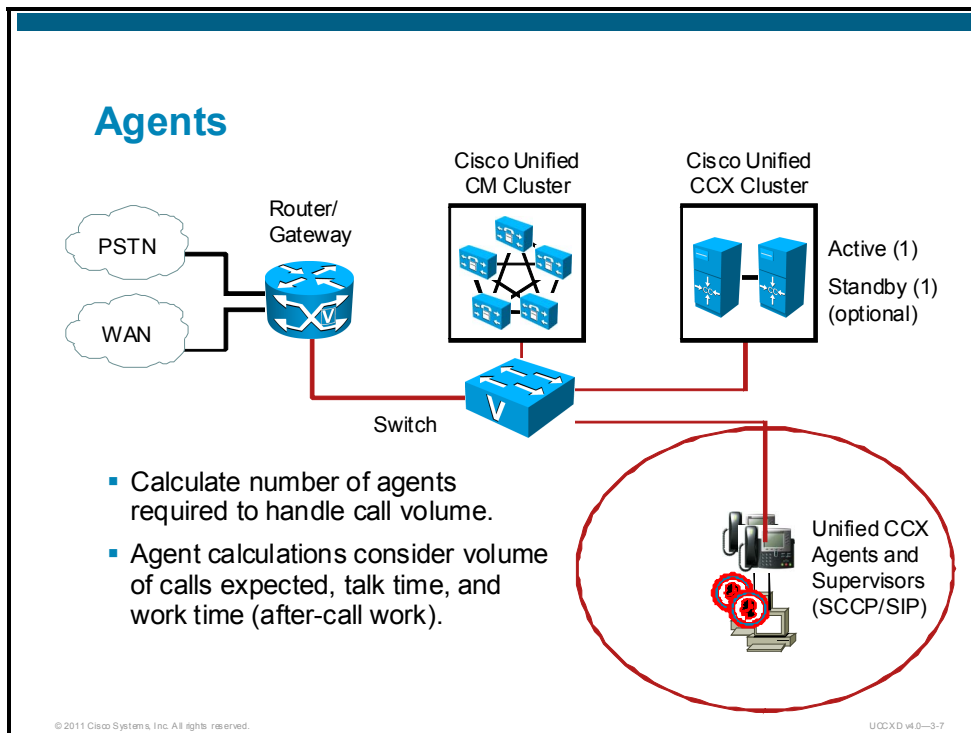
The total number of CTI ports required is calculated by considering the ports required for call treatment, plus the ports required for call queuing, plus the number of self-service ports. Obviously, the product package purchased will dictate which of these metrics need to be used. The IPC Resource Calculator will take this into consideration.

For purposes of call center sizing, the port types are differentiated as follows:

- Gateway or PSTN trunk ports handle calls originating from the PSTN. They are purchased separately from Cisco Unified CCX.
- Queue ports are IVR ports that queue calls (when no agents are available) prior to transferring the caller to an available agent. These ports are included at no additional cost with Cisco Unified CCX Standard or Enhanced, but they must be sized for proper capacity planning for the Cisco Unified CCX server. Refer to the Cisco Unified Communications Sizing Tool for more details.
- IVR ports are full-featured IVR ports with all the capabilities found in the standalone Cisco Unified IP IVR product, except that the Cisco Unified CCX IVR ports require Cisco Unified CCX Premium.

Agents

Agent calculations consider queue time, talk time, and work time.



Sizing Metrics

The following metrics are considered for sizing.

Sizing Metrics Considered

- **BHCA:** Average number of calls received in the busy hour
- **SLG:** Percentage of calls answered by agents within the specified number of seconds
- **AHT:** Average of agent talk time plus after-call work time
- **Average call talk time:** Average of agent talk time
- **Average after-call work time:** Average of agent after-call work time
- **Average call treatment time:** Average of total script time, including playing menus and queuing
- **Blockage:** Percentage of calls not allowed (or blocked) because of all trunks busy (ATB)
- **Average trunk occupancy:** The average time a trunk port is occupied for a call

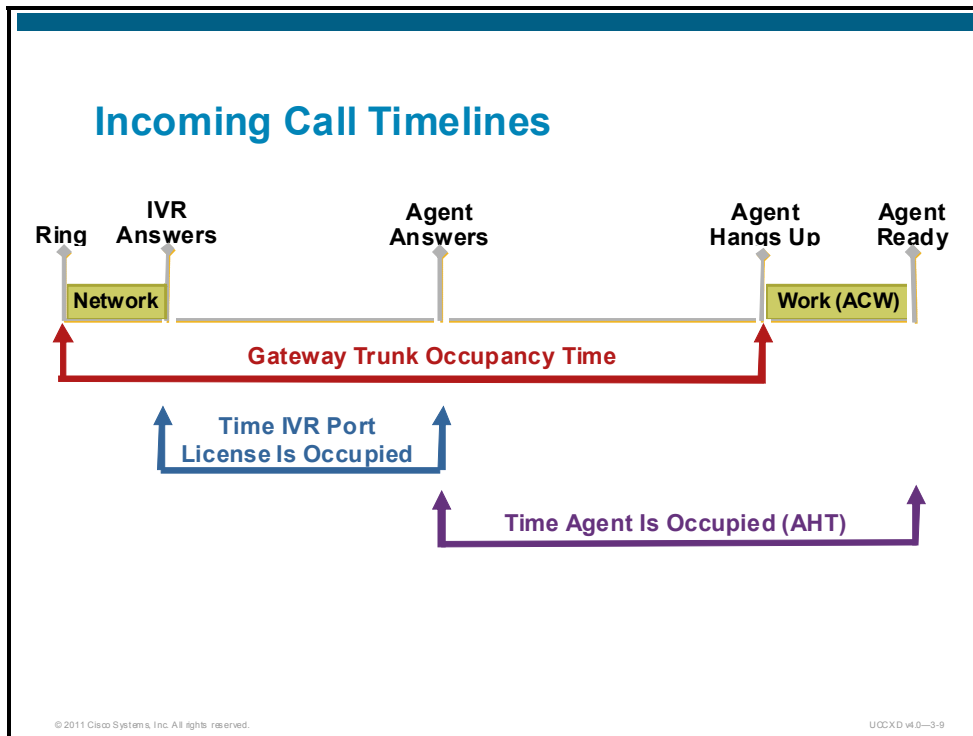
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All of these metrics are basic call-sizing metrics. After this information is obtained, the number of gateway trunk ports, IVR ports, and agents can be calculated using the appropriate IPC Resource Calculator.

- **Busy hour call attempts (BHCA):** Average number of calls received in the busy hour
- **Service level goal (SLG):** Percentage of calls answered by agents within the specified number of seconds
- **Average handle time (AHT):** Average of agent talk time plus after-call work time
- **Average call talk time:** Average of agent talk time
- **Average after-call work time:** Average of agent after-call work time
- **Average call treatment time:** Average of total script time, including playing menus and queuing (IVR)
- **Blockage:** Percentage of calls not allowed (or blocked) because of all trunks busy (ATB)
- **Average trunk occupancy:** The average time that a trunk port is occupied for a call

Incoming Call Timelines

The timeline shown in the figure provides an indication of when agents, trunks, and IVR ports are occupied during an incoming call.



The following timelines provide an insight as to when certain resources are used during an incoming call:

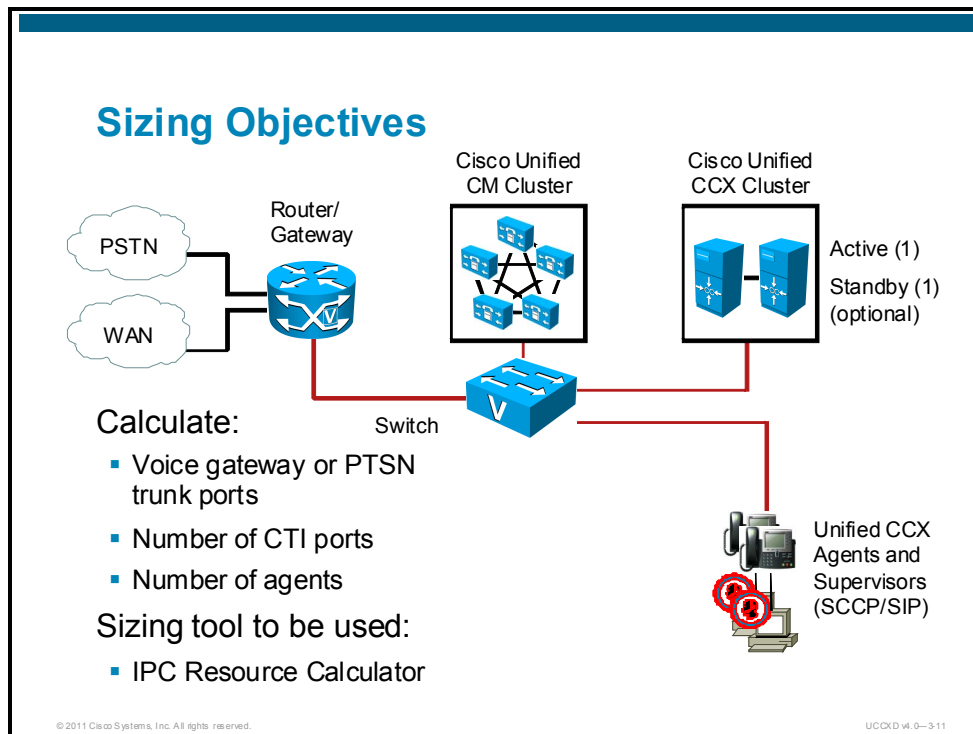
- AHT includes agent talk time + wrap-up time (after-call work [ACW]).
- Average IVR port usage time includes script time (call treatment time + queue delay time).
- Total voice trunk holding time includes network ringing + call treatment time + queue delay time + agent talk time.

Calculating Requirements

This topic describes the tools used to size a Cisco Unified CCX system.

Sizing Objectives

The objective for this discussion is to determine the number of gateway trunk ports, the number of IVR ports, and the number of agents that are required for a deployment.



You should include the following design considerations, specific to Cisco Unified CCX, in your call center sizing calculations:


- At a minimum, you should plan on enough capacity to replace your existing system. The replacement system should perform at least as well as the one it is replacing.
- After all of the Erlang (C and B) calculations are complete for the call center sizing, any changes in queue times or agents will affect the total number of trunks and IVR ports required for a Cisco Unified CCX solution.
- As you increase the size of the agent pool, very small changes in the average queue time and percentage of queued calls will affect the required number of gateway trunks and IVR ports.
- Even if you perform all of the calculations for a call center, there are still some variables that you cannot plan for but that will affect the ports needed on a Cisco Unified CCX system. For example, one or more agents could call in sick, and that would affect the port count and queue time for each call. Just two agents calling in sick could increase the port count by over 12 percent. This would affect the price of the system and, if not planned for, would affect the ability of the call center to meet caller requirements. Properly sizing call center resources is integral to designing an effective Cisco Unified CCX system.

Erlang Calculations

The key tools used to calculate the correct number of facilities or agents are the Erlang traffic theory tools.

Erlang Calculations

- Created by Agner Krarup Erlang, Copenhagen Telephone Company
- An Erlang is a unit of measurement that describes the volume of call traffic that occurs in one hour
- One Erlang = 3600 call seconds = 60 call minutes
- Number of Erlangs = Amount of traffic (time) / one hour
- Used by IPC Resource Calculator
- Used to calculate number of:
 - IVR ports and trunk ports using Erlang B (nonqueuing)
 - Agents using Erlang C (queuing)



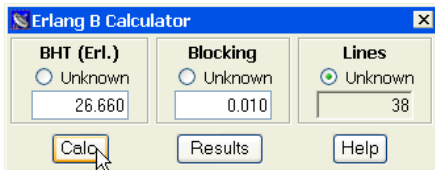
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Erlang B Example

Erlang B calculators are used to determine trunks and IVR port licenses.

Erlang B Calculation Example

- Access Erlang B tool at:
<http://www.erlang.com/calculator/erlb/>
- Given:
 - 640 calls during the busy hour
 - Each call lasts an average of 150 seconds
- 640 BH calls * 150 seconds (avg.) = 96,000 CS
- 96,000 CS / 3600 = 26.66 Erlangs
- Lines required: 38
- Use to calculate trunk ports and IVR ports (non-ACD)
- Experiment with inputs
- BHT = Busy Hour Traffic



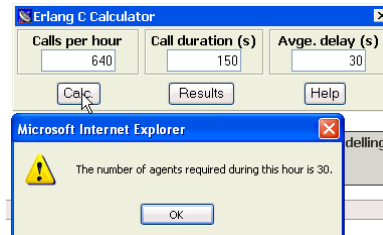
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Erlang C Example

Erlang C calculators are used to determine the number of agents in a queuing environment.

Erlang C Calculation Example

- Access Erlang C tool at:
<http://www.erlang.com/calculator/erlc/>
- Given:
 - 640 calls during the busy hour
 - Average delay (call treatment and queue time) is 30 seconds
 - Each call lasts an average of 150 seconds (agent talk time + work time, also known as average handle time (AHT))
- Agents required: 30
- Same calculations done within IPC Resource Calculation Tool for Cisco Unified CCX Agents
- Experiment with inputs



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IPC Resource Calculator

This subtopic introduces the available IPC Resource Calculators.

IPC Resource Calculators

- Resource calculators available (requires login):
<http://tools.cisco.com/partner/ipccal/index.htm>
- Advanced IPC Resource Calculator provides:
 - Number of agents
 - Number of IVR ports for call treatment and queuing
 - Number of IVR ports for self-service
 - Number of trunks required to service calls
- Standard IPC Resource Calculator provides:
 - Number of agents
 - Number of IVR ports for call treatment and queuing
 - Number of trunks required to service calls
- IP IVR Self-Service Calculator provides:
 - Number of IVR and trunk ports for self-service

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The IPC Resource Calculators use Erlang C for sizing agents and Erlang B for sizing IVR ports. The output of this sizing process will provide you with the total number of gateway trunk ports, IVR ports, and the total number of agents to size the Cisco Unified CCX system.

There are three different IPC Resource Calculators available. Use the appropriate one for the type of deployment you are considering:

- Use the Advanced IPC Resource Calculator for Cisco Unified CCX Premium deployments.
- Use the Standard IPC Resource Calculator for Cisco Unified CCX Standard or Enhanced deployments. This calculator can also be used for Cisco Unified CCX Premium if you are not using IVR ports for self-service and other premium options such as ASR and VXML are not a concern.
- Use the IP IVR Self-Service Calculator for Cisco Unified IP IVR deployments.

The IPC Resource Calculators are available at <http://tools.cisco.com/partner/ipccal/index.htm>.

Advanced IPC Resource Calculator—Inputs

The figure shows the inputs that are required for the Advanced IPC Resource Calculator.

Advanced IPC Resource Calculator

- Calls per interval, BHCA
- Service Level Goal (SLG)
- Average Call Talk Time + ACW = Average Handle Time (AHT)
- Average Call Treatment Time (IVR)
- Estimate tolerance for call abandonment
- Self-service calls per interval
- Self-service call duration
- Percent of calls per trunk group
- Estimate percentage of blockage allowance
- Calculate or enter agents

Advanced Service Technology Group
IPCC Advanced Resource Calculator

Cisco Systems

Project Identification:

Agent Busy Hour Calls (BHCA): calls

Service Level Goal (SLG): within

Avg call talk time: 2m 0s

Avg after call work time: 0m 30s

Avg handle time (Agent calls): 2m 30s

Avg Call treatment Time (IVR): 0m 30s

Wait before abandon (Tolerance): 2m 30s

Self-Service Calls (IVR-BHCA):

Self-Service Average Call Duration: 2m 55s

PSTN Trunk Groups:	TG1	TG2	TG3	TG4	TG5
% Trunk Group Allocation:	75 %	25 %	0 %	0 %	0 %
Blockage %:	1 %	1 %	1 %	1 %	1 %

Check to manually enter Agents Agents

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Advanced IPC Resource Calculator—Outputs

The figure shows the results of the inputs.

Advanced IPC Resource Calculator (Cont.)

- Values required for Configuration Calculator
- Provides recommended number of agents
- Provides number of voice gateway trunks
- Provides number of IVR ports required
 - Queuing
 - Call Treatment
 - Self-Service
 - Total
- May export to CSV file

Recommended Agents: 90

Agent calls completed (BHCC): 1980 calls	20 Blocked calls
Self-Service Calls Answered (BHCC): 296 calls	4 Blocked calls
Calls answered within SLG: 93% within	30 sec
Calls answered beyond SLG: 7% beyond	30 sec
Queued calls: 31.7%	627 Q Calls
Calls answered immediately: 68.3%	1352 calls
Avg Queue Time (AQT): 20 sec	0m 20s
Avg Speed to Answer (ASA): 6 sec	0m 6s
Avg call duration: 156 sec	2m 36s
Agents utilization: 92%	
Calls exceeding Abandon Tolerance: 0%	0 Calls

IVR ports required for queuing: 10 IVR Ports					
IVR ports required for call treatment:	21	10	0	0	0
IVR ports required for self service:	19	9	0	0	0
Sum of IVR Ports and Utilization:	69 IVR Ports				50% Utilization
Voice Trunks Required (TG1 - TG5):	92	36	0	0	0
Sum of Trunks and Utilization:	128 Trunks				79% Utilization

Confidence Factor (50% - 100%):

Growth Factor (0% - 100%):

Confidence/Growth factors: 100%

Recommended Agents: 90

Sum of IVR Ports: 69 (uses Recommended Agents)

Total Trunks: 128

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Standard IPC Resource Calculator—Inputs

The figure shows the inputs that are required for the Standard IPC Resource Calculator.

Standard IPC Resource Calculator

- Calls per interval, BHCA
- Service Level Goal (SLG)
- Average Call Talk Time + ACW = Average Handle Time (AHT)
- Average Call Treatment Time (IVR)
- Estimate tolerance for call abandonment
- Estimate percentage of blockage allowance
- Calculate or enter agents

Advanced Service Technology Group
IPCC Standard Resource Calculator

Project Identification: <input type="text" value="Project Title"/>	
Calls per interval (BHCA):	60 min 640 calls
Service Level Goal (SLG):	90 % within 30 sec 0m 30s
Avg call talk time:	120 sec 2m 0s
Avg after call work time:	30 sec 0m 30s
Avg handle time (Agent calls):	150 sec 2m 30s
Avg Call treatment Time (IVR):	30 sec 0m 30s
Wait before abandon (Tolerance):	150 sec 2m 30s
Blockage % (PSTN Trunks):	1 % of calls lost (Busy)
Check to manually enter Agents <input type="checkbox"/> Agents	

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Standard IPC Resource Calculator—Outputs

The figure shows the results of the inputs.

Standard IPC Resource Calculator (Cont.)

- Values required for Configuration Calculator
- Provides recommended number of agents
- Provides number of voice gateway trunks
- Provides number of IVR ports required
 - Queuing
 - Call Treatment
 - Total
- May export to CSV file

Advanced Service Technology Group
IPCC Standard Resource Calculator


Recommended Agents: 32	
Calls completed (BHCC):	634 calls 6 Blocked calls
Calls answered within SLG:	93% within 30 sec
Calls answered beyond SLG:	7% beyond 30 sec
Queued calls:	21.7% 137 Q Calls 1.1 Erlangs
Calls answered immediately:	78.3% 496 calls
Avg Queue Time (AQT):	27 sec 0m 27s
Avg Speed to Answer (ASA):	6 sec 0m 6s
Avg call duration:	156 sec 2m 36s
Agents utilization:	83%
Calls exceeding Abandon Tolerance:	0%
PSTN Trunk Utilization:	70%
Voice trunks required:	39 Trunks T1/PRI 1.8 T1/PRI
IVR ports required for queuing:	5 IVR Ports
IVR ports required for call treatment:	12 IVR Ports
Sum of Required IVR Ports:	17
<input type="button" value="Submit"/> <input type="button" value="Export"/>	

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IP IVR Self-Service Calculator

The figure shows the input and output of this calculator.

IP IVR Self-Service Calculator

Advanced Service Technology Group 
IP/IVR Stand-Alone Calculator

Trunk/Port Group	Project Title1	Project Title2	Project Title3	Project Title4	Project Title5
Calls Per Interval (BHCA)	60 min 200 calls	60 min 335 calls	60 min 434 calls	60 min 2000 calls	60 min 2000 calls
Avg Call Duration	90 sec 1m 30s	129 sec 2m 9s	200 sec 3m 20s	200 sec 3m 20s	200 sec 3m 20s
Blockage % (PSTN Trunks)	1 %	1 %	1 %	1 %	1 %
Voice Trunks/ IVR Ports Required:	11 Ports	20 Ports	35 Ports	129 Ports	129 Ports

- Calls per Interval
- Average call duration
- Blockage
- Provides: Gateway voice trunks; IVR ports required

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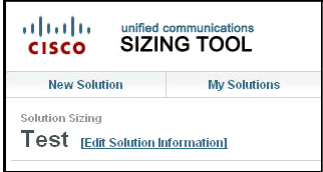
This calculator is used to calculate the number of IVR ports across multiple trunk groups, which is required for self-service applications that do not require agent participation.

Cisco Unified Communications Sizing Tool

This topic describes the use of the Cisco Unified Communications Sizing Tool.

Cisco Unified Communications Sizing Tool

- The Cisco Unified Communications Sizing Tool is a web-based solution sizing tool.
<http://tools.cisco.com/cucst>
- Helps design and model Cisco Unified Communications solutions for existing and prospective customers
- Assists users with hardware sizing of large or complex unified communications solutions by calculating the call-processing requirements for Cisco Unified Communications products that have a major impact on performance and scalability



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The Cisco Unified Communications Sizing Tool is a web-based tool for Cisco Partners and can be found at this location: <http://tools.cisco.com/cucst>. It requires partner login.

Cisco Unified Communications Sizing Tool (Cont.)

- Input variable summary:
 - Software release and package type
 - Numbers of agents and supervisors
 - Add-on products such as WFM or QM
 - Monitoring and recording requirements
 - VXML port count
 - ASR and TTS requirements
- Provides recommended server types

Output		Defaults	Help
Unified CCX Servers			
Selected Unified CCX Package Type	Premium		?
Primary Platform Recommendation	MCS-7845-H2-CCX1	MCS-7825-H3-CCX1	?
Standby Server Recommendation	MCS-7845-H2-CCX1	None	?
Unified CCX Server Available Capacity	MCS-7845-H2-CCX2 MCS-7845-H2-CCX1 MCS-7845-H2-CCX2 MCS-7845-I3-CCX1 MCS-7845-I3-CCX1 VM - 2vCPU 4GB RAM 2 x 146 GB vDisk		?

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The Cisco Unified Communications Sizing Tool for Cisco Unified CCX must be used to size Cisco Unified CCX systems. In addition, the Cisco Unified CM Capacity Tool (CMCT) and Cisco Unified Communications Sizing Tool are the only approved tools and must be used to properly size the Cisco Unified Communications Manager server or servers.

The Cisco Unified Communications Sizing Tool is designed for use by Cisco and Partner Systems Engineers with unified communications solution experience, or individuals with equivalent abilities. It may help design and model Cisco Unified Communications solutions for existing and prospective customers and can help the account team in presales or postsales activities.

The Cisco Unified Communications Sizing Tool assists users with hardware sizing of large or complex Unified Communications solutions by calculating the call-processing requirements for Unified Communications products that have a major impact on performance and scalability.

Cisco Solution Expert

This topic describes the Cisco Solution Expert.

Cisco Solution Expert

- For Cisco Unified IP IVR and Cisco Unified CCX products
- Use the Cisco Solution Expert for:
 - Bill of Materials with part numbers and list prices
 - Visio network diagram
 - Design notes and infrastructure/security checklists
 - Recommended services
 - Configuration set number for Cisco Online Ordering Tool
- Cisco Solution Expert available (requires login):
<http://www.cisco.com/go/sx>
- Based on output from IPC Resource Calculator
- Provides high-level sizing guidance
- Based on input, only allows selection of supported servers

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Use the Cisco Solution Expert for new deployments, upgrades, and add-ons.

Network Considerations from the SRND

The SRND document provides detailed network design considerations for various solutions.

Network Considerations from SRND

- Estimating bandwidth consumption:
 - Remote agents
 - Silent monitoring
 - IP call bandwidth
 - CAD/CSD usage bandwidth
- Serviceability and security:
 - Corporate data access
 - Port utilization (UDP, TCP)
- Quality of service (QoS) and Call Admission Control:
 - Classifying Cisco Unified CCX and application traffic
 - QoS considerations for CAD/CSD software
- Outbound considerations
- SPAN sessions allowed per switch

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Summary

This section summarizes the key points you learned in this lesson.

Summary

- Understanding terms associated with call centers is essential when trying to properly calculate sizing requirements.
- An Erlang is a unit of measurement often used in call center calculations. Use Erlang calculators to determine the number of trunks, CTI ports, and agents.
- Use Cisco authored IPC Resource Calculators to size your IVRs or call centers.
- Use the Cisco Unified Communications Sizing Tool and the Cisco Solution Expert to properly configure an order before a formal offer is proposed to a customer.
- Always check with the SRND for network considerations such as bandwidth utilization, QoS, and silent monitoring.

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Module Summary

This topic summarizes the key points that were discussed in this module.

Module Summary

- Cisco Unified CCX is a complete customer interaction management solution available in four different packages:
 - Cisco Unified IP IVR
 - Cisco Unified CCX Standard
 - Cisco Unified CCX Enhanced
 - Cisco Unified CCX Premium
- Cisco Unified CCX is tightly integrated with Cisco Unified Communications Manager to provide IVR or ACD functions, or both. It can also integrate into the Cisco family of enterprise contact center products.
- Customer satisfaction is improved by understanding how to size and correctly order contact center products using the appropriate Cisco approved tools.

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Cisco Unified Contact Center Express (CCX) can be deployed as a full-featured interactive voice response and an automatic call distribution system. Understanding its product packages and features, integration capabilities, and ordering tools will aid you in effectively discussing and implementing a new contact center for a prospective customer.

References

For additional information, refer to these resources:

- *Cisco Unified Contact Center Express Solution Reference Network Design*, Release 8.0, March 2010
- *Release Notes for Cisco Unified Contact Center Express 8.0(2)*, May 2010
- *Cisco Unified Contact Center Express (Cisco Unified CCX) Software and Hardware Compatibility Guide*, April 2010
- *Getting Started with Unified Contact Center Express*, Release 8.0(1), February 2010
- *Cisco Unified CCX Administration Guide*, Release 8.0(1), February 2010

Installing and Configuring Cisco Unified Contact Center Express

Overview

Cisco Unified Contact Center Express (CCX) is a full-featured platform for interactive voice response (IVR) and automatic call distribution (ACD) services. To fully realize the capabilities of this platform, the deployment engineer must have a thorough knowledge of how to install and manage the Cisco Unified CCX system.

Module Objectives

Upon completing this module, you will be able to install and set up Cisco Unified CCX. This ability includes being able to meet these objectives:

- Describe and illustrate a complete view of the installation process to include Cisco Unified CCX single server and high-availability deployments and Cisco Unified CCX with Cisco Unified Communications Manager Express. Additionally, this lesson discusses the upgrade process and virtualization.
- Find and use the most common management functions for Cisco Unified CCX, such as the Cisco Unified CCX administrative web pages, supervisor and user web pages, and Cisco Desktop Work Flow Administrator.
- Understand the call flow and requirements to establish a call on Cisco Unified CCX and perform basic configuration for a Cisco Unified CCX deployment.

Installing Cisco Unified Contact Center Express

Overview

This lesson discusses the installation processes for Cisco Unified Contact Center Express (CCX). The lesson discusses installing a single server node, the first node, and the second node in a high-availability deployment. Additionally, the lesson discusses the initial setup processes that occur after installation is completed.

Objectives

Upon completing this lesson, you will be able to install Cisco Unified CCX. This ability includes being able to meet these objectives:

- Describe the installation options available for Cisco Unified CCX
- Describe the licensing requirements for Cisco Unified CCX
- Summarize the order of installation and setup
- List the prerequisites for installation
- Describe the processes required to install a Cisco Unified CCX server
- Describe the processes required to set up and configure the first or single Cisco Unified CCX server
- Describe the processes required to install and set up the second Cisco Unified CCX server
- Describe the processes required to set up the Cisco Unified CCX server when using Cisco Unified Communications Manager Express
- Describe the contents and location of installation files
- Summarize requirements for upgrading Cisco Unified CCX
- Summarize the actions required to migrate to a virtual server

Preliminary Considerations

This topic discusses preliminary considerations for installation and setup.

Installation Options

- Basic
 - Install the Cisco Unified CCX software from the installation disk and configure it simultaneously.
- Factory
 - When ordering new servers, you may choose to have Cisco Unified CCX preinstalled.
- Answer file generator
(http://www.cisco.com/web/cuc_afg/index.html)
 - The answer file generator will ask you to enter all installation information and generate a file that may be used from a USB key for an “auto” installation. It will also generate the License MAC address.

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This figure details the primary options for installing Cisco Unified CCX.

About Licensing

- Licensing is node-locked.
- Node-locked licensing is based on the License MAC address.
- The License MAC address is based on information entered for installation—**not** the physical MAC address. Obtain your License MAC as follows:
 - Use the installation process display.
 - Access the answer file generator.
 - Use the CLI **show status** command on the platform terminal.
 - From the Cisco Unified Communications Operating System Administration window, navigate to **Show > Network**.
- Cisco Unified CCX installation media comes bundled with demo licenses good for 30 days.
- All node-locked licensing comes with a 30-day grace period.

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Licensing helps manage Unified CCX licenses and enforces the licenses for Unified CCX components and nodes. In Unified CCX 8.0(1), all the licenses are node-locked, which means the use of the license is restricted to only one particular node based on the License MAC of that node. Typically, a Unified CCX 8.0(1) license is based on the License MAC of the first node only.

The licenses are based on a string called the License MAC which is different from the physical MAC address of a system. The License MAC string is generated during installation and is based on various input fields, such as the hostname, IP address, etc. If any of these fields change after fresh installation, the License MAC will become invalid, and you must request new license(s).

The License MAC will be displayed during system install. You must make a note of this for ordering license files. To obtain License MAC after installing Unified CCX 8.0(1), complete the following steps:

- Use the command-line interface (CLI) on the platform terminal and run the “show status” command.
- Use the answer file generation web site at: http://www.cisco.com/web/cuc_afg/index.html. Complete and submit the answer file form. The result will be a file you can download and use for the installation process and will also display the License MAC.
- Access the Cisco Unified Communications Operating System Administration web pages and navigate to Show > Network. The License Mac will be displayed.

The Unified CCX 8.0(1) Warm Standby license and all other licenses are node-locked to the License MAC address of the first node (typically the database publisher node) of a Unified CCX cluster. When a second node is added, it is verified that the first node has the valid add-on Warm Standby License. Once the cluster is set up, the licenses will be valid on both nodes in a cluster.

License MAC is dependent on some system parameters. Modifying any of these parameters can change License MAC thereby invalidating current license files. Here are the parameters on which the validity of a License MAC depends:

- Time zone
- NTP server 1 (or “one”)
- NIC speed (or “auto”)
- Hostname
- IP address
- IP mask
- Gateway address
- Primary DNS
- SMTP server
- Certificate Information (organization, unit, location, state, country)

The Unified CCX 8.0(1) Installation DVD comes bundled with four demo licenses; one each for Cisco Unified IP IVR and the Cisco Unified CCX standard, enhanced, and premium package. Since ordering actual licenses may take a while, you can start using the demo licenses by uploading them to the system using the Unified CCX web administration. A demo license is valid for initial 30 days only.

In case your License MAC becomes invalid, you must request new license(s). The system, however, continues to operate for 30 days without a new license. After the 30-day grace period ends, the system will shut down until you upload a new license using the updated License MAC. After you obtain re-hosted licenses, these licenses can be uploaded through the System > License Information > Add License page of the Unified CCX administration web interface.

Obtaining License Files

- When the customer order is received, the DVD packet will have a Product Authorization Key (PAK).
- Locate the PAK.
- Access the Cisco Product License Registration website and supply the appropriate information. (<http://www.cisco.com/go/license>).
- The license file with the extension .lic will be sent by email to you.
- Save the license file for use during the cluster setup process.
- For Cisco Unified CCX 8.0(1), older license versions will work for upgrades only.

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UCCXD v1.0-2-6

License files determine the Cisco Unified CCX components that you will be able to activate for use on a server. After you install Cisco Unified CCX, you perform the cluster setup procedure. As part of that procedure, you must specify the location of your Cisco Unified CCX license file or files.

Your copy of Cisco Unified CCX software includes at least one unique Product Authorization Key (PAK), which you use to register your purchase. After you register your purchase, Cisco will send you an email message with the appropriate license file as an attachment. You will receive one such email message for each PAK that you register.

To register your PAK, use this URL: <http://www.cisco.com/go/license>

Unified CCX 8.0(1) supports only node-locked licenses. However, Unified CCX 8.0(1) continues to recognize the existing licenses used for Unified CCX versions earlier than 8.0(1) on an upgraded system.

Order of Installation and Setup Summary

- First node summary:
 - Perform preinstallation tasks for the first node.
 - Perform the basic installation for the first node.
 - Perform configuration steps for the first node.
- Second node summary (if required):
 - Ensure that the license for high availability is uploaded.
 - Add the second node in Unified CCX Administration.
 - Perform preinstallation tasks for the second node.
 - Perform the basic Installation for the second node.

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UCCXD v4.0–2-7

This figure depicts a high level view of the tasks required to install Cisco Unified CCX.

Server Installation

This topic describes the server installation processes for Cisco Unified CCX. Cisco Unified CCX can be installed as a single server node or in high availability.

Installation Prerequisites

This subtopic describes the prerequisites needed before the installation process occurs.

Installation Prerequisites

- Review Cisco documentation for deployment guidelines.
- Check the compatibility matrix to ensure the version of software is correct for your deployment.
- Ensure the server is a Cisco approved machine for Cisco Unified CCX.
- Register and obtain licenses for your Cisco Unified CCX purchase.
- Obtain any patches required.
- Ensure Cisco Unified Communications Manager or Cisco Unified Communication Manager Express is installed and that the appropriate services are activated (Call Manager, AXL Web Service, CTI Manager, etc.).
- Ensure you have end-user accounts available for activation as Cisco Unified CCX administrators (not required for Cisco Unified Communications Manager Express deployments).

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UCCXD v4.0-2-9


Before deploying Cisco Unified CCX, the installer should review all pertinent Cisco documentation. There are several documents to review, and they can all be found on the Cisco website. While many of the items listed here are not actually required for the installation process, you should have them in place because the setup process will require them.

Installation Process

This subtopic describes the beginning of the installation process.

Installation Process

- Insert the Cisco Unified CCX DVD installation media.
- Power on the machine.
- The machine will boot and prompt to perform a media check.



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Follow these steps after the operating system is installed:

- Step 1** If you have a USB key with configuration information that the Answer File Generator generated, insert it now.
- Step 2** Insert Cisco Unified CCX CD or DVD.
- Step 3** Start or restart your MCS server to boot from the DVD media.
- Step 4** Choose yes to have the media checked for file integrity, or no to skip this step.

Installation Process (Cont.)

- Verify the correct product is being installed and choose OK.



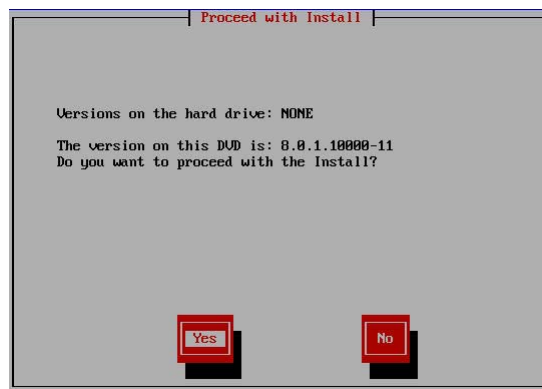
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UCCKD v4.0-2-11

In the Product Deployment window, choose OK to install the Unified Contact Center Express product suite.

Installation Process (Cont.)

- Verify the correct software is being installed and choose Yes.



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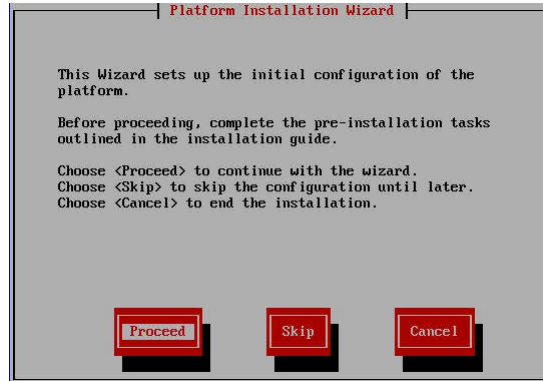
UCCKD v4.0-2-12

If an earlier version of the software is currently installed on the server, the Proceed with Install window displays the software version currently existing on your hard drive and the version available on the DVD. Choose Yes to continue with the installation, or No to cancel.

Caution If you choose Yes in the Proceed with Install window, all existing data on your hard drive gets overwritten and lost.

Installation Process (Cont.)

- Choose to proceed with the wizard.



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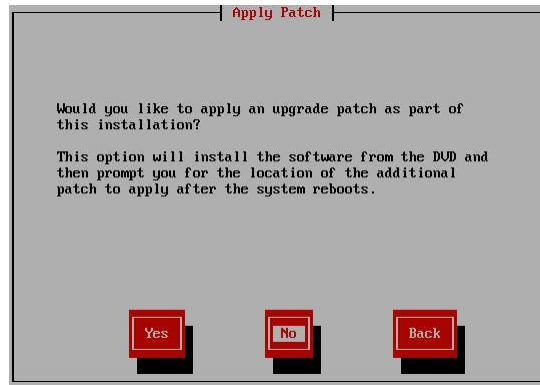
UCCXD v4.0-2.13

Choose one of the following options:

- To enter your configuration information manually and have the installation program install the configured software on the server, choose Proceed and continue with this procedure.
- To do any of the following tasks, choose Skip.
 - Manually configure the software that is preinstalled on your server. In this case, you do not need to install the software, but you must configure the preinstalled software.
 - Perform an unattended installation. In this case, you provide pre-existing configuration information on a USB key, floppy disk, or an Answer File Generator.
 - Install the software before manually configuring it. In this case, the installation program installs the software and then prompts you to configure it manually. You can choose Skip if you want to preinstall the application on all your servers first and then enter the configuration information at a later time. This method might cause you to spend more time performing the installation than the other methods.

Installation Process (Cont.)

- If you need to apply a patch, choose Yes; otherwise, choose No.



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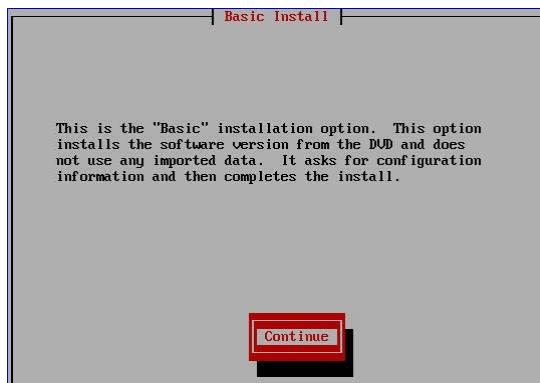
UCCXD v1.0--2-14

In the Apply Patch window, choose one of the following options:

- To apply a patch and upgrade to a later Service Release of the software during installation, choose Yes.
- To skip this step, choose No.

Installation Process (Cont.)

- Choose to continue.



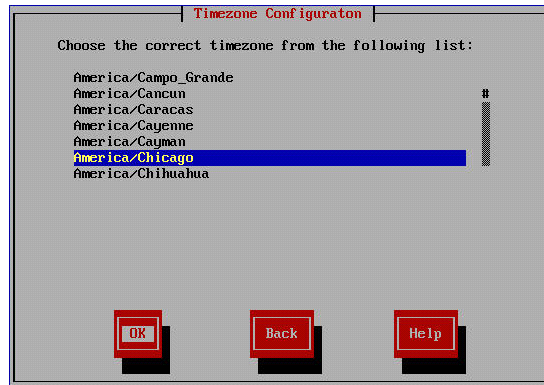
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UCCXD v1.0--2-15

Choose continue to install the software on the DVD.

Installation Process (Cont.)

- Set your time zone.



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UCCXD v4.0-2.16

Choose the appropriate time zone for your installation and choose OK.

Installation Process (Cont.)

- Choose the automatic negotiation setting for your network interface card.



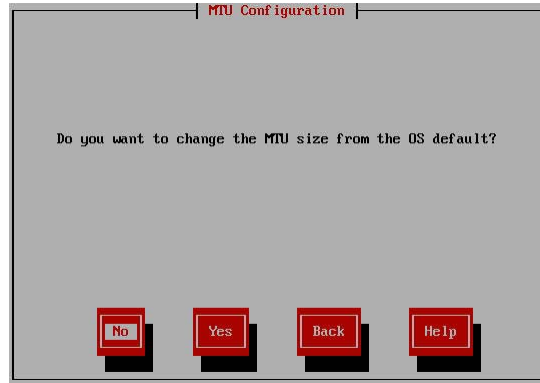
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UCCXD v4.0-2.17

The installation process allows you to automatically set the speed and duplex settings of the Ethernet network interface card (NIC) by using automatic negotiation. You can change this setting after installation.

Installation Process (Cont.)

- Decide whether to change the MTU size from the OS default value.



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UCCKD v4.0-2-18

In the MTU Configuration window, you can change the MTU size from the operating system default.

The MTU represents the largest packet, in bytes, that this host will transmit on the network. If you are unsure of the MTU setting for your network, use the default value, which is 1500 bytes.

- To accept the default value (1500 bytes), choose No.
- To change the MTU size from the operating system default, choose Yes, enter the new MTU size, and choose OK.

Caution If you configure the MTU size incorrectly, your network performance can be affected.

Installation Process (Cont.)

- Enter network IP settings.

The screenshot shows a dialog box titled "Static Network Configuration". It contains four input fields with the following values: Host Name: MCS-Train40, IP Address: 10.10.1.40, IP Mask: 255.255.255.0, and GW Address: 10.10.1.1. At the bottom of the dialog, there are three buttons: OK, Back, and Help.

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UCCXD v4.0-2.19

For the Static Network Configurations enter your network IP settings and choose OK.

Installation Process (Cont.)

- Decide whether to enable the DNS client.

The screenshot shows a dialog box titled "DNS Client Configuration". It contains a question: "Do you want to enable Domain Name System (DNS) Client on this machine?". At the bottom of the dialog, there are four buttons: Yes, No, Back, and Help.

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UCCXD v4.0-2.20

To enable DNS choose Yes.

Installation Process (Cont.)

- Enter DNS information.

DNS Client Configuration

Primary DNS 10.10.1.2

Secondary DNS (optional)

Domain cisco.class.com

OK Back Help

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UCCXD v1.0-221

Enter your DNS information.

Installation Process (Cont.)

- Enter the platform administrative username and password.
- Use to access CLI and serviceability screens.

Administrator Login Configuration

Enter the Platform administration username and password.
Choose Help for username and password guidelines.

Administrator ID administrator

Password *****

Confirm Password *****

OK Back Help

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UCCXD v1.0-221

Enter your platform administrator login credentials and choose OK.

The administrator login must start with an alphabetic character and be at least six characters long. It can contain alphanumeric characters, hyphens, and underscores. You will need the administrator login to log into Unified OS Administration, the command-line interface, and the Disaster Recovery System.

Installation Process (Cont.)

- Enter information for certificate generation.

The screenshot shows a dialog box titled "Certificate Information". The text inside reads: "Enter information about your organization. This is used to generate security certificates for this node." Below this text are several input fields: "Organization" with the value "Contact Center", "Unit" with "Training", "Location" with "Chicago", "State" with "IL", and "Country" with a list of options: "Ukraine", "United Arab Emirates", and "United States" (which is highlighted). At the bottom of the dialog are three buttons: "OK", "Back", and "Help".

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UCCXD v4.0-223

Enter your information to create your Certificate Signing Request (organization, unit, location, state, country) and choose OK.

Installation Process (Cont.)

- Indicate whether this is the first or second server.

The screenshot shows a dialog box titled "First Node Configuration". The text inside asks: "Is this server the First Node in the cluster?". At the bottom of the dialog are four buttons: "Yes", "No", "Back", and "Help".

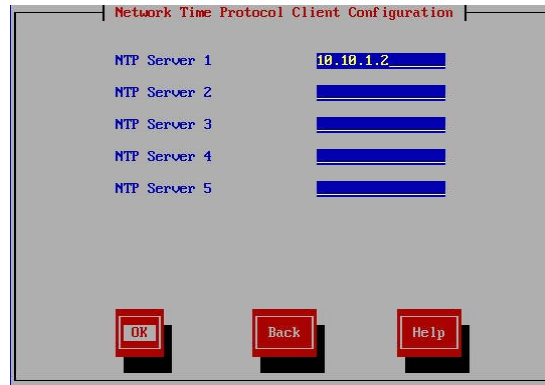
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UCCXD v4.0-224

Choose Yes if this is the first or standalone server in your cluster.

Installation Process (Cont.)

- Provide NTP server location information.



The screenshot shows a dialog box titled "Network Time Protocol Client Configuration". It contains five rows, each labeled "NTP Server 1" through "NTP Server 5". The first row has the IP address "10.10.1.2" entered in a blue text box. The other four rows have empty blue text boxes. At the bottom of the dialog box are three red buttons labeled "OK", "Back", and "Help".

Enter one or more NTP server locations.

Installation Process (Cont.)

- Enter a security password for intracluster communications.
- Use the same password for the second node installation.



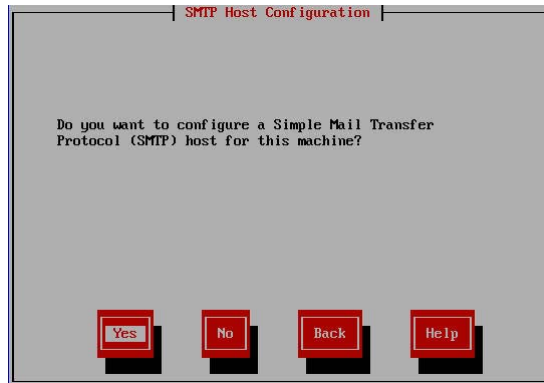
The screenshot shows a dialog box titled "Security Configuration". It contains a paragraph of text: "Enter the system security password. This password is used to secure communication between cluster nodes and will also be used by DRS for encryption of backup tar files. Choose Help for username and password guidelines." Below the text are two rows, each labeled "Security Password" and "Confirm Password", with blue text boxes containing "*****". At the bottom of the dialog box are three red buttons labeled "OK", "Back", and "Help".

Enter a security password.

The security password must start with an alphanumeric character and be at least six characters long. It can contain alphanumeric characters, hyphens, and underscores. The system uses this password to authorize communications between nodes, and you must ensure this password is identical on both the nodes in a cluster.

Installation Process (Cont.)

- Decide whether to configure SMTP.



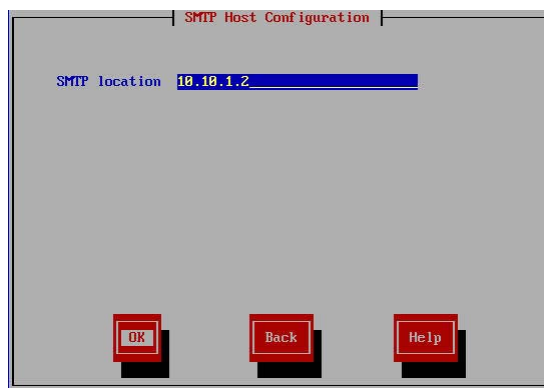
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UCCXD v4.0-227

Choose Yes to configure SMTP for this machine during installation. You may also choose to enable or modify SMTP configurations after installation.

Installation Process (Cont.)

- Enter email server IP address.



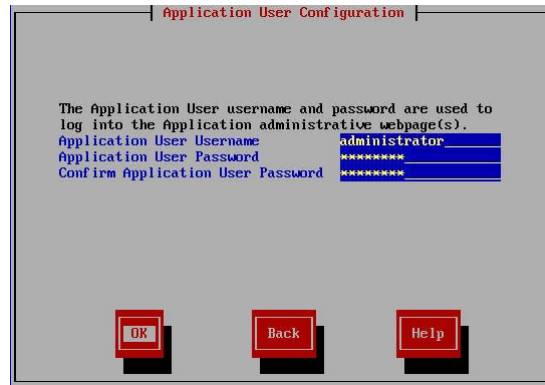
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UCCXD v4.0-228

Enter your mail server hostname or IP address.

Installation Process (Cont.)

- Enter the administrative application username and password.



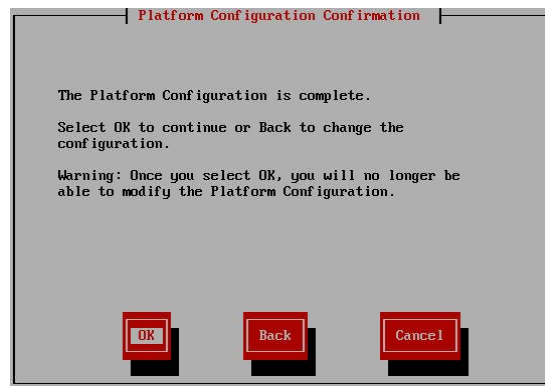
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UCCKD v4.0-229

Enter your application administrative username and password. These credentials will allow you access to the administrative web pages after the installation is complete.

Installation Process (Cont.)

- Complete platform configuration options.



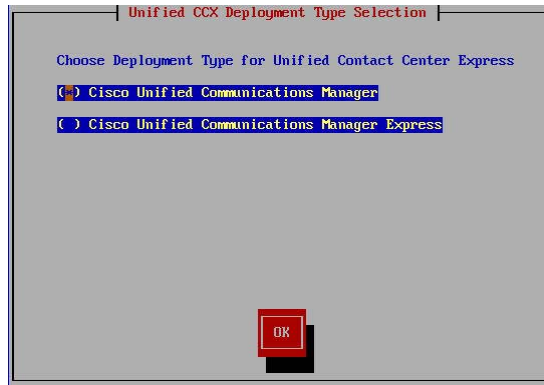
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UCCKD v4.0-230

The configuration options are complete. Choose OK to continue the installation process.

Installation Process (Cont.)

- Choose deployment type.



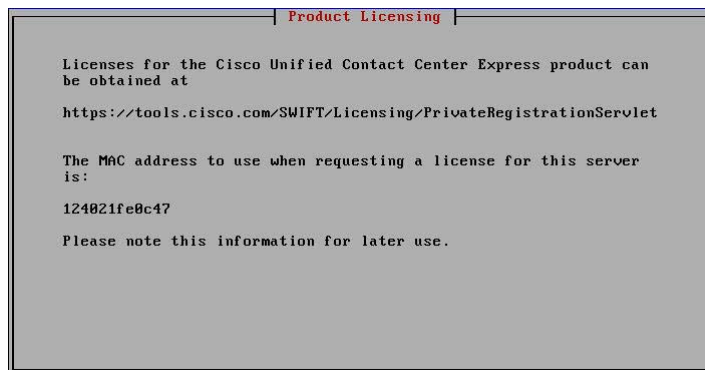
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UCCXD v4.0-231

Choose the correct Cisco Unified Communications Manager type for your installation and choose OK.

Installation Process (Cont.)

- Make note of the License MAC address.



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UCCXD v4.0-232

Before proceeding, the installer will display the License MAC. It is a brief display, so have a pen and paper ready. If you fail to get the License MAC recorded, you can access it after installation via the CLI command terminal or the Cisco Unified OS Serviceability utility mentioned earlier.

Installation Process (Cont.)

- Installation is complete.
- Additional configuration is required via the administrative web pages.

```
The installation of Cisco Unified Contact Center Express has completed successfully.
```

```
Cisco Unified Contact Center Express 8.0.1.10000-11  
MCS-Train40 login: _
```

When installation is complete, the command terminal login screen is displayed, and you are ready for postinstallation configuration.

Server Setup—Single Server or First Node

After you install Cisco Unified CCX, use the Cisco Unified CCX Administration application to perform the initial system setup.

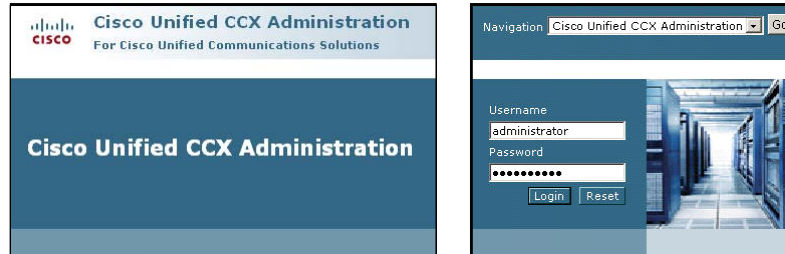
Cisco Unified CCX Administration is a web-based application that allows you to control, configure, and monitor many functions of your Cisco Unified CCX system. The setup procedure that you perform depends on the following:

- Your deployment of Cisco Unified CCX with Cisco Unified Communications Manager
- Your deployment of Cisco Unified CCX with Cisco Unified Communications Manager Express

If you need to update information later that you specify during the setup procedure, you can use Cisco Unified CCX Administration to make changes. For more information, refer to the *Cisco Unified Contact Center Express Administration Guide*.

Authentication

- On another Windows OS-based machine, log into the server after the installation.
- Open Internet Explorer and browse to:
`https://<server hostname or IP address>/appadmin`
- Enter credentials:
 - Application user ID
 - Password used during installation



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UCCKD v4.0-235

After Cisco Unified CCX has been installed, you must access a Windows OS-based machine and use Internet Explorer to access the Cisco Unified CCX administrative web pages. Use this URL: `https://<server IP address>/appadmin`

Use the administrative application user credentials you created during the installation process to access Cisco Unified CCX. The credentials are case-sensitive and are only used to access Cisco Unified CCX for the setup process. After server setup has completed, these credentials will no longer be usable.

Type of Setup

- Choose Fresh Install.
- Click Next.

Cisco Unified CCX Administration
For Cisco Unified Communications Solutions

Cisco Unified CCX Administrator Setup

Next

Please select the type of Cisco Unified CCX Setup.

Upgrade from a previous UCCX release

Fresh Install

Next

i * indicates required item

i Note: Please do not minimize your browser during setup. Just close it after the setup is completed.

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UCCXD v4.0-236

In the Cisco Unified CCX Administrator window, you can choose these options:

- Upgrade from a previous release
- Fresh install

Cisco Unified Communications Manager Configuration

- Enter:
 - Hostname or IP address of Cisco Unified Communications Manager
 - AXL admin user name
 - Password
- Click Next.

Cisco Unified CCX Administration
For Cisco Unified Communications Solutions

Cisco Unified CM Configuration - Service Provider Configuration

← Back Next →

Unified CM Server Host Name or IP address*

AXL Admin User Name*

Password*

Back Next

* indicates required item

Enter these values for the Cisco Unified CM Configuration page:

- Cisco Unified CM hostname or IP address
- AXL Admin User Name
- Password
- Click **Next**.

Add License

- Browse to license file(s).
- Upload multiple license files as a zip file.
- Click Next.

Cisco Unified CCX Administration
For Cisco Unified Communications Solutions

License Information

← Back Next →

Status
Status : Ready

Enter a license or zip file name
License File* Browse...

Back Next

* indicates required item

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UCCXD v4.0-238

Browse to and add the license files. If you need to add multiple files, you may use a zip file that contains them all, or upload them individually.

Add Additional Licenses

- Browse to additional license files if required.
- Click Next.

Cisco Unified CCX Administration
For Cisco Unified Communications Solutions

License Information

← Back Next →

Status
Status : Ready

Enter a license or zip file name
License File Browse...

Validating uploaded license file...

Validation completed.

Please click on Next to continue.

Back Next

* indicates required item

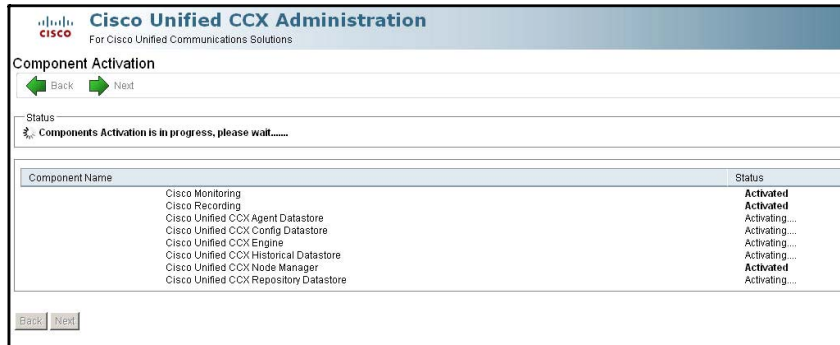
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UCCXD v4.0-239

Add additional licenses, if required.

Component Activation

- Wait for the components to activate.
- Click Next.

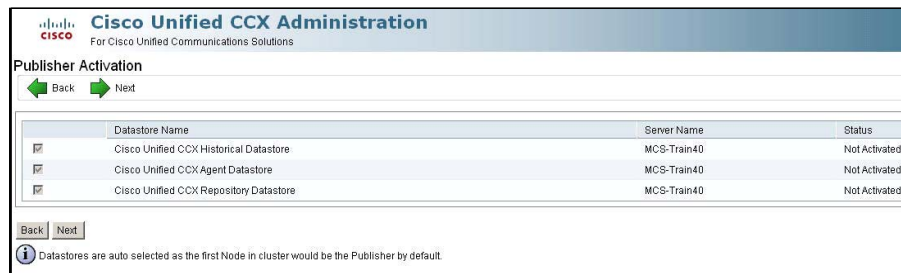


Component Name	Status
Cisco Monitoring	Activated
Cisco Recording	Activated
Cisco Unified CCX Agent Datastore	Activating...
Cisco Unified CCX Config Datastore	Activating...
Cisco Unified CCX Engine	Activating...
Cisco Unified CCX Historical Datastore	Activating...
Cisco Unified CCX Node Manager	Activated
Cisco Unified CCX Repository Datastore	Activating...

Wait until all the components are activated. Once all the components are successfully activated, click Next to continue.

Publisher Activation

- Wait for the publishers to activate.
- Click Next.



	Datastore Name	Server Name	Status
<input checked="" type="checkbox"/>	Cisco Unified CCX Historical Datastore	MCS-Train40	Not Activated
<input checked="" type="checkbox"/>	Cisco Unified CCX Agent Datastore	MCS-Train40	Not Activated
<input checked="" type="checkbox"/>	Cisco Unified CCX Repository Datastore	MCS-Train40	Not Activated

Back Next

i Datastores are auto selected as the first Node in cluster would be the Publisher by default.

Select the check boxes corresponding to each datastore to activate the publisher. If the check boxes corresponding to the listed datastores are already selected and grayed out, it means this is the first node in the cluster, which would be the publisher by default. Click Next to continue.

Service Provider Configuration

- Attach to Cisco Unified Communications Manager.
- AXL service provider will already be in place. Add additional links to Cisco Unified Communications Manager, if required.

The screenshot displays the Cisco Unified CCX Administration web interface. At the top, it says "Cisco Unified CCX Administration" and "For Cisco Unified Communications Solutions". Below this is the "Cisco Unified CM Configuration" section with "Back" and "Next" navigation buttons. The main area is titled "AXL Service Provider Configuration" and is split into two columns: "Selected AXL Service Providers" and "Available AXL Service Providers". In the "Selected" column, there is a text box containing the IP address "10.10.1.10" and two small triangle icons (up and down) for selection. The "Available" column is currently empty. Below these columns is the "Cluster Wide Parameters" section, which includes a "User Name*" field with the value "administrator" and a "Password*" field with masked characters.

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UCCXD v4.0-242

In the AXL Service Provider Configuration area, choose the Cisco Unified Communications Manager server or servers that you want to use as the Administrative XML Layer (AXL) service provider. Also note that these fields are prepopulated from the previous steps. You can change these fields.

Service Provider Configuration (Cont.)

- Choose CTI Managers for Cisco Unified CM Telephony Provider and set username and password. An application user account will be created on Cisco Unified Communications Manager.

The screenshot shows the 'Unified CM Telephony Subsystem - Unified CM Telephony Provider Configuration' window. It is divided into two main sections: 'Selected CTI Managers' and 'Available CTI Managers'. In the 'Selected CTI Managers' section, there is a list box containing the IP address '10.10.1.10'. Below this, there are 'Cluster Wide Parameters' including 'User Prefix*' (with the value 'UCCX_Jtapi'), 'Password*' (masked with asterisks), and 'Confirm Password*' (also masked with asterisks). Navigation arrows are visible between the two list boxes.

In the Cisco Unified CM Telephony Subsystem Configuration area, choose the following:

- The Cisco Unified Communications Manager servers that will act as call control service providers. You can choose up to two Cisco Unified Communications Manager servers (computer telephony interface [CTI] Managers), whether you are in a single node configuration or a high-availability configuration.
- Enter a user prefix. This will cause a Cisco Unified Communications Manager Application User account to be created. When this occurs, “_1” will be appended to the username for node 1, and “_2” will be appended for node 2. For example, the username UCCX_Jtapi, when created, will be UCCX_Jtapi_1 in a single-node and first-node environment. If you are in high availability and the appropriate licensing has been uploaded, the system will also create another Application User account for node 2. Its username will be UCCX_Jtapi_2.
- Enter the password that you want to use for this account.

Service Provider Configuration (Cont.)

- Choose CTI Managers for RmCm Provider and set username and password. An application user account will be created on Cisco Unified Communications Manager.
- Click Next.

RmCm Subsystem - RmCm Provider Configuration

Selected CTI Managers: 10.10.1.10

Available CTI Managers

Cluster Wide Parameters

User Id*: UCCX_RMJapi

Password*: [REDACTED]

Confirm Password*: [REDACTED]

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In the Resource Manager-Contact Manager (RmCm) Subsystem Configuration area, follow these steps:

- Step 1** Choose the Cisco Unified Communications Manager servers that will act as RmCm service providers. You can choose up to two Cisco Unified Communications Manager Servers (CTI Managers), whether you are in a single node configuration or high-availability configuration.
- Step 2** Enter a user ID. This will cause a Cisco Unified Communications Manager application user account to be created.
- Step 3** Enter the password that you want to use for this account.

System Parameters

- Set:
 - Number of concurrent historical reporting sessions allowed
 - Concurrent recording sessions allowed
 - Number of outbound seats
 - Codec
- Click Next.

Cisco Unified CCX Administration
For Cisco Unified Communications Solutions

System Parameters Configuration

← Back Next →

Number of HR session licenses*	<input type="text" value="8"/>	
Recording Count*	<input type="text" value="8"/>	(Limit: 25)
Number of Outbound seats*	<input type="text" value="25"/>	
Codec	<input type="text" value="G711"/>	

Back Next

*. indicates required item

For the system parameter fields, enter the following:

- The maximum number of concurrent historical reporting sessions allowed for this deployment
- The maximum number of concurrent recording sessions allowed for this deployment
- The maximum number of outbound seats allowed. Enter the lower number of the following:
 - Licensed number of premium seats
 - Maximum allowed based on server hardware:
 - 7845: 300
 - 7835: 75
 - 7825: 75
 - 7816: 50
- Choose the codec that will be used for this deployment, G.729 or G.711.

Language Configuration

- Choose country-specific languages to use.
- Set a group default for each category of language.
- Choose CAD/CSD Language.
- Click Next.

The screenshot shows the 'Languages Configuration' page in the Cisco Unified CCX Administration interface. The page title is 'Cisco Unified CCX Administration For Cisco Unified Communications Solutions'. Below the title, there are 'Back' and 'Next' navigation buttons. The status is 'Ready'. The 'IVR Language Configuration' section contains a table with the following data:

Language Group	Group Default	Country Specific
en_AU	<input type="radio"/>	<input type="checkbox"/>
en_CA	<input type="radio"/>	<input type="checkbox"/>
en_GB	<input type="radio"/>	<input type="checkbox"/>
en_US	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>

The 'CAD/CSD Language configuration' section has a dropdown menu for 'CAD/CSD Language*' set to 'English'. At the bottom, there are 'Back' and 'Next' buttons. The footer contains the text '© 2011 Cisco Systems, Inc. All rights reserved.' and 'UCCXD v4.0-246'.

All languages available with Cisco Unified CCX are installed during the installation process. You may use as many as needed without incurring any additional cost. Use the Languages Configuration page to designate languages for this deployment. To add languages, follow these steps:

- Step 1** Use the drop-down list to choose a language.
- Step 2** Choose the specific country.
- Step 3** Set the group default.
- Step 4** Repeat for additional languages, if desired.
- Step 5** Click **Next**.

User Configuration

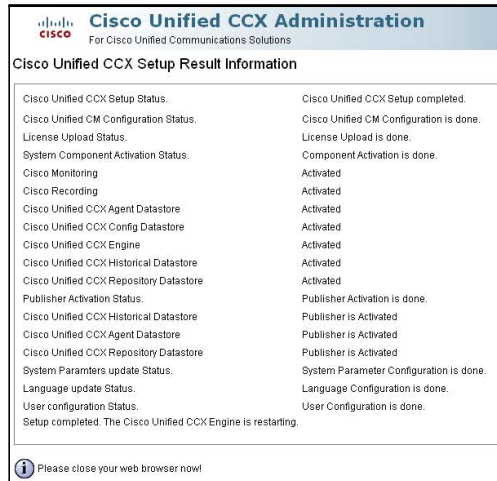
- Choose Cisco Unified Communications Manager user accounts that will be Cisco Unified CCX administrators.
- Click Finish.

The screenshot shows the 'User Configuration' page in the Cisco Unified CCX Administration interface. The page title is 'Cisco Unified CCX Administration' with the subtitle 'For Cisco Unified Communications Solutions'. Below the title, there are 'Back' and 'Finish' buttons. A 'Status' section indicates 'Search results displayed'. A search bar with a 'Search' button is present. Below the search bar, a message states: 'Please add or remove the Administrators from the following list:'. There are two columns of user accounts. The left column is titled 'Cisco Unified CCX Administrator*' and contains the following users: instructor, student01, student02, student03, student04, student05, student06, student07, student08, and student09. The right column is titled 'Cisco Unified CM Users' and contains the following users: 8800 and uccxemail. Between the two columns are two arrow buttons: a left-pointing arrow and a right-pointing arrow. At the bottom of the page, there are 'Back' and 'Finish' buttons.

You must choose at least one Cisco Unified Communications Manager user account for Cisco Unified CCX administrator access. These accounts provide credentials to access all Cisco Unified CCX administrative functions. Click Finish.

Setup Results

- View summary of server setup activities.
- Close the browser.
- To log back into application administration pages again, use credentials from Cisco Unified Communications Manager user accounts (specified in the previous slide).
- Examine log files from the CLI terminal.



The screenshot shows the 'Cisco Unified CCX Administration' interface for 'For Cisco Unified Communications Solutions'. The main heading is 'Cisco Unified CCX Setup Result Information'. Below this, there is a table with two columns listing various components and their status. At the bottom, there is a message: 'Please close your web browser now!'.

Cisco Unified CCX Setup Result Information	
Cisco Unified CCX Setup Status.	Cisco Unified CCX Setup completed.
Cisco Unified CM Configuration Status.	Cisco Unified CM Configuration is done.
License Upload Status.	License Upload is done.
System Component Activation Status.	Component Activation is done.
Cisco Monitoring	Activated
Cisco Recording	Activated
Cisco Unified CCX Agent Datastore	Activated
Cisco Unified CCX Config Datastore	Activated
Cisco Unified CCX Engine	Activated
Cisco Unified CCX Historical Datastore	Activated
Cisco Unified CCX Repository Datastore	Activated
Publisher Activation Status.	Publisher Activation is done.
Cisco Unified CCX Historical Datastore	Publisher is Activated
Cisco Unified CCX Agent Datastore	Publisher is Activated
Cisco Unified CCX Repository Datastore	Publisher is Activated
System Parameters update Status.	System Parameter Configuration is done.
Language update Status.	Language Configuration is done.
User configuration Status.	User Configuration is done.
Setup completed. The Cisco Unified CCX Engine is restarting.	

Please close your web browser now!

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A summary of actions taken appears. You must now close the browser and log in as a Cisco Unified CCX administrator to continue.

If you encounter problems with the installation, you may be able to examine the install log files by entering the following commands in the command-line interface.

To obtain a list of install log files from the command line, enter:

```
CLI > file list install *
```

To view the log file from the command line, enter:

```
CLI > file view install log_file (where log_file is the log file name)
```

You can also view logs by using Unified RTMT. For more information on using and installing the Unified RTMT, see *Cisco Unified Serviceability Administration Guide Release 8.0(1)*.

Second Server Installation and Setup

This topic describes those procedures required to install and set up a second node for Cisco Unified CCX high availability.

Second Server Installation

This subtopic provides a summary of steps for installing the second of two nodes in a high-availability deployment. Even though the installation processes for the first and second nodes are virtually identical, there are some differences. This section will discuss those differences.

Second Node Setup Preliminaries

- Ensure that the Cisco Unified CCX first node is operational.
- Ensure that you have high availability licensing: See System > License Information > Display Licenses.
- Ensure that the NTP service on the first node is active and synchronized. Use CLI command: `Utils ntp status`.
- Configure the second node in Cisco Unified CCX before starting the installation process. See System > Servers.
- Install the second node.
- Perform the initial setup for the second node.

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This figure provides a summary of activities that need to be performed in order to install the second server.

Configure the Second Node

- Configure the second node in Cisco Unified CCX administration.
- Choose System > Servers.

The screenshot displays the Cisco Unified CCX administration interface. On the left, a table titled 'Servers' shows the current configuration:

Host Name/IP Address	Node ID	Status
MCS-Train40	1	IN SERVICE

Below this table is another 'Servers' table with two entries:

Host Name/IP Address	Node ID	Status	Info	Delete
MCS-Train40	1	IN SERVICE	[Info Icon]	[Delete Icon]
10.10.1.41	2	UNKNOWN	[Info Icon]	[Delete Icon]

On the right, the 'Server Configuration' dialog box is open, showing the 'Ready' status and the following fields:

- Host Name/IP Address*: 10.10.1.41
- MAC Address: [Empty]
- Description: [Empty]

Buttons for 'Add' and 'Cancel' are visible at the bottom of the dialog box.

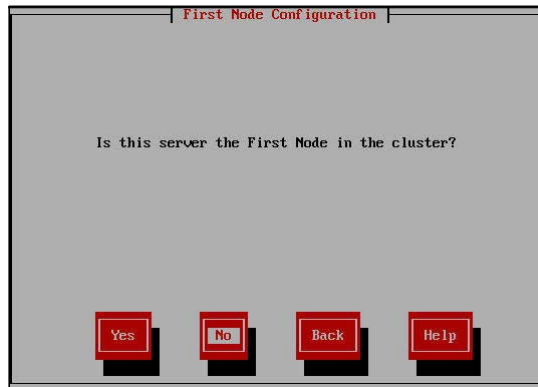
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To configure the second node, log in to the administration pages on the Cisco Unified CCX publisher. From the menu bar choose System > Servers and add your second node to the cluster.

Install the Second Node

- Install the second node using the same procedures as the first, until you reach this option.
- Choose No.



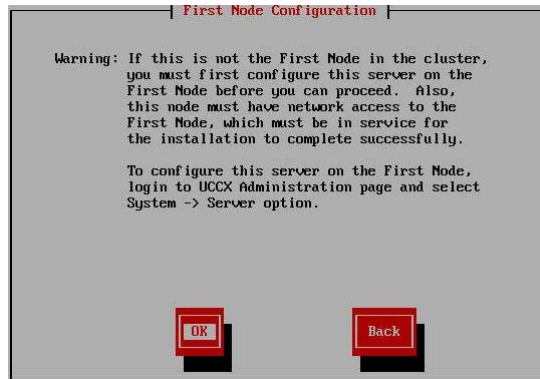
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Using the installation media, install the Cisco Unified CCX software using the same procedures you used for the first node. When you encounter the option to choose if this is the first node, you will indicate no.

Warning Note

- Note the warning, and click OK.



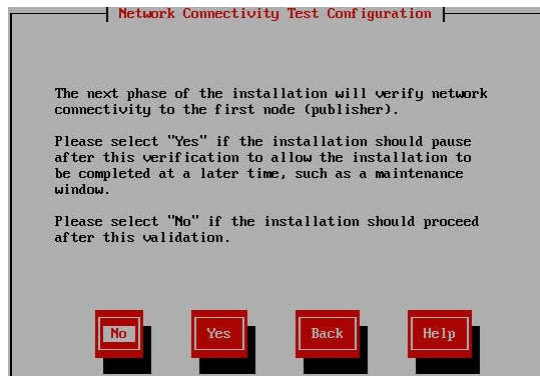
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Acknowledge the warning and continue.

Network Verification

- Choose either Yes or No to pause the installation after the network connectivity test.




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A network connectivity test will be performed. Choose whether to pause the installation process afterward.

First Node Access

- Enter hostname, IP address, and security password.



The screenshot shows a dialog box titled "First Node Access Configuration". It contains the following text and input fields:

Connectivity to First Node:

Host Name: MCS-Train40

IP Address: 10.10.1.40

Security Password: *****

Confirm Password: *****

At the bottom of the dialog box, there are three buttons: OK, Back, and Help.


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Enter the hostname, IP address, and security password used for the first node installation (publisher server).

Platform Configuration Confirmation

- Enter SMTP information (not shown).
- Confirm platform configuration and complete the media installation.



The screenshot shows a dialog box titled "Platform Configuration Confirmation". It contains the following text:

The Platform Configuration is complete.

Select OK to continue or Back to change the configuration.

Warning: Once you select OK, you will no longer be able to modify the Platform Configuration.

At the bottom of the dialog box, there are three buttons: OK, Back, and Cancel.

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UCCXD v4.0-2.55

Choose to set up SMTP if desired and then choose OK to complete the installation.

Second Server Initial Setup

This subtopic describes those activities that must occur after the second node has successfully completed the installation process.

Second Node Initial Setup

- From Internet Explorer, access administration for the second node:
`https://<second node IP address>/appadmin.`
- Enter administrative user credentials. The Replication Wizard appears.
- Enter:
 - First node IP address
 - Cisco Unified CCX administrator user ID
 - Cisco Unified CCX administrator password
 - Network deployment type

Welcome to Cisco Unified CCX Replication Wizard

Next

Cluster Server IP Address*	10.172.192.240
Cisco Unified CCX Administrator User ID*	instructor
Cisco Unified CCX Administrator Password*	••••••••
Network Deployment Type*	LAN ▾

Next

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After the Cisco Unified CCX second node has been installed, open Internet Explorer and use this URL to access the administration pages:

`https://<second node server IP address>/appadmin`

Use the credentials you created during the installation process for the administrative user.

These credentials are case-sensitive and are only used to access Cisco Unified CCX administration for the setup process. After server setup has completed, these credentials will no longer be usable to access the administrative pages.

When login is complete, you will be presented with the initial setup procedures, beginning with the Cisco Unified CCX Replication Wizard. You will need to enter the publisher node's IP address, a Cisco Unified CCX administrator user ID and password, and indicate the type of network between the two nodes. In this example, a LAN is chosen; if you choose a WAN, you are presented with additional input screens for the AXL Service Provider, Unified CM Telephony Provider, and the RmCm Provider. For a WAN deployment, these options are separate for each server. See the Cisco Unified CCX installation guide for further details on these options.

Component Activation

- When the components have activated, click Next.

Component Name	Status
Cisco Monitoring	Activated
Cisco Recording	Activated
Cisco Unified CCX Agent Datastore	Activated
Cisco Unified CCX Config Datastore	Activated
Cisco Unified CCX Engine	Activating...
Cisco Unified CCX Historical Datastore	Activating...
Cisco Unified CCX Node Manager	Activated
Cisco Unified CCX Repository Datastore	Activating...

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After successfully completing the last step, the setup will activate the relevant components.

Setup Results

A summary of actions taken appears. You must now close the browser and log in as a Cisco Unified CCX administrator to continue.

Setup Result

- View setup summary.
- Close browser.

Cisco Unified CCX Setup Result Information	
Cisco Unified CCX Setup Status.	Cisco Unified CCX Setup completed.
Cluster Configuration Status.	Cluster Configuration Completed.
System Component Activation Status.	Component Activation is done.
Cisco Monitoring	Activated
Cisco Recording	Activated
Cisco Unified CCX Agent Datastore	Activated
Cisco Unified CCX Config Datastore	Activated
Cisco Unified CCX Engine	Activated
Cisco Unified CCX Historical Datastore	Activated
Cisco Unified CCX Repository Datastore	Activated
Setup completed. The Cisco Unified CCX Engine is restarting.	
Note: You should configure the failover collector by navigating to Service Parameters within Cisco Unified CCX Serviceability	
Please close your web browser now!	

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Cisco Unified CCX Setup for Cisco Unified Communications Manager Express

Before you begin the setup procedure, ensure that Cisco Unified Communications Manager Express is operational, appropriate networking connectivity is in place, the AXL service has been started, and you have created an AXL Administrator account.

Installation and Initial Setup Summary for Cisco Unified Communications Manager Express

This subtopic summarizes the installation and initial setup for Cisco Unified Communications Manager Express.

Installation and Setup Summary for Cisco Unified Communications Manager Express

- Software installation is the same except when choosing the type of Cisco Unified Communications Manager.
- Initial setup is virtually the same as when deploying with Cisco Unified Communications Manager:
 - Log in and choose fresh install.
 - Specify AXL user configuration.
 - Upload licensing.
 - Wait for component activation.
 - Enter System Parameter information (recording count, historical reporting count, etc.).
 - Choose language settings.
 - Create Cisco Unified CCX administrator user account. (User accounts are created and maintained on Cisco Unified CCX.)
 - View the Setup Result page, which is displayed.
 - Note that initial setup is complete.

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The processes you will use to install Cisco Unified CCX for Cisco Unified Communications Manager Express are almost exactly the same as if you were installing for Cisco Unified Communications Manager. When installing the software, the only difference will be in the deployment option, where you will specify that you are deploying Cisco Unified CCX with Cisco Unified Communications Manager Express.

Likewise, the initial setup is almost exactly the same as that for a Cisco Unified Communications Manager installation. The figure here provides a summary of activities that are required. The major difference is that you do not choose a Cisco Unified Communications Manager user account as a Cisco Unified CCX administrator; you have to *create* a user account in Cisco Unified CCX. When Cisco Unified CCX is deployed with Cisco Unified Communications Manager Express, all end user accounts are created and maintained by Cisco Unified CCX.

Installation Log Files

This subtopic describes how to find installation log files and error messages.

Installation Log Files

- Installation log files can be found on the server console using the command-line interface (CLI).
- Use CLI commands:
 - File list `install*`; to create the file list
 - File view `install log_filename`; to view log files

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If you have error messages during the installation process, there is documentation that lists these messages and provides guidance. In the *Cisco Unified Contact Center Express Installation Guide*, you can find error messages and additional guidance.

Upgrading Cisco Unified CCX

This topic provides a basic summary for upgrading Cisco Unified CCX.

Upgrading to Unified CCX 8.0(1)

- Direct upgrades are supported from Cisco Unified CCX versions 5.0(2) and 7.0(1).
- Procure licensing before the upgrade. The demo licenses will not work for upgrades.
- Perform a regular backup.
- Use the Pre-Upgrade Tool (PUT) on your existing system to generate the backup/migration data used for the upgrade.
 - All nodes must be operational and in-service.
- Upgrade Cisco Unified Communications Manager.
- Upgrade the first node for Cisco Unified CCX.
- After you successfully restore the backed-up data on the first node, perform the JTAPI and Data Resync activity.
- If you have high availability, upgrade the second node.
- If you are using Cisco Tool for Auto-Registered Phone Support (TAPS), note that the program is migrated but must be deleted and reinstalled.

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Unified CCX 8.0(1) offers a direct solution for Cisco Customer Response Solutions (CRS) 5.0(2) and Unified CCX 7.0(1) to upgrade to Unified CCX 8.0(1). This figure here provides a summary of important considerations and the overall order of installation.

Unified CCX 8.0(1) Upgrade Phases

- Backup phase
 - Obtain and use the Pre-Upgrade Tool.
- Installation phase
 - Upgrade Cisco Unified Communications Manager.
 - Install Cisco Unified CCX.
- Restore phase
 - Restore data files generated from the PUT.
 - Perform the Cisco JTAPI resync.
- Post Restore phase
 - Add a second node if needed.
 - Modify or add options as required.
- See Cisco upgrade documentation in *Upgrading to Cisco Unified Contact Center Express, Release 8.0(x)* for details.

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The upgrade process is carried out in the following phases:

- Backup phase
- Installation phase
- Restore phase
- Post Restore phase

In the backup phase, back up your CRS or Unified CCX cluster with a tool offered by Cisco, called the Pre-Upgrade Tool (PUT). This tool facilitates the process of backing up data from your CRS or Unified CCX cluster.

Since CRS 5.0(2) and Unified CCX 7.0(x) only support multinode clusters with high availability, you should run PUT on the engine master node. However, before you run PUT to complete the backup operation in a high-availability setup, make sure that both of the nodes in the cluster are up and accessible. PUT retrieves the backed up data from the standby servers programmatically and moves the complete backup TAR file to the Secure FTP (SFTP) location provided by you.

In the installation phase, you upgrade your existing CallManager or Cisco Unified Communications Manager and then install Unified CCX 8.0(1).

In the restore phase, you retrieve the backed up data on the system installed with Unified CCX 8.0(1) (performed in the installation phase) and configure the initial setup.

After you complete the installation of Unified CCX 8.0(1), you must access the Cisco Unified CCX Administration Web interface through its Authentication page to restore the backed up data.

In the post restore phase, there are activities that you may need to perform on your system after you successfully upgrade to Unified CCX 8.0(1):

- Build the second node in a high-availability deployment after the upgrade is complete on the first node.

- After successful upgrade, the Preview Outbound seat count will not be carried forward in case of an upgrade from CRS 5.0(x) or Unified CCX 7.0(x) to Unified CCX 8.0(1). By default, the Preview Outbound seat count will be initialized with the maximum supported value for the given hardware type. You need to manually modify the seat count in the System Parameters Configuration page of the Unified CCX Administration according to the usage.
- After successful upgrade, the HTTP trigger will work on port 9080 in Unified CCX 8.0(1). Also applications using the HTTP port 8080 should be changed to 9080. To change this, choose System > Applications on the Unified CCX 8.0(1) Administration interface, and then change the port in the applications using them.
- Manually upgrade all third-party subsystems like ASR/TTS to versions compatible with Unified CCX 8.0(1) since these are not automatically upgraded.
- Manually add the email templates (configured on Cisco Desktop Administrator) on the Unified CCX 8.0(1) after the upgrade since these are not automatically upgraded.
- If you have set the default password in Cisco Desktop Administrator to blank in Unified CCX 7.0(1), the default password changes to “crsadmin” after your system is upgraded to Unified CCX 8.0(1).
- After you finish upgrading the second node, you must run the Cisco Unified CCX Desktop Client Configuration Tool (by logging into the web interface of the Cisco Unified CCX Administration and then choosing Tools > Plugin > Desktop Suite > Client Configuration Tool) to create correctly configured MSI files for the client applications. The Automated Update feature uses these MSI files to update the client desktops the next time users launch a CAD application.

See Cisco documentation, *Cisco Unified CCX Installation Guide* for further details.

Linux-to-Linux Upgrades

- Cisco Unified Communications Operating System (UCOS) comes with a second, inactive partition.
- You can perform upgrades on the inactive partition with no interruption in service during the upgrade process.
- You can roll back to software on the inactive partition if desired.
- Do not make configuration changes during an upgrade.
- Data migration will occur after you switch to the new version; data migration does not occur on rollback.
- See *Cisco Unified Communications Operating System Administration Guide* for further details.

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The Unified CCX 8.0(1) software upgrade process consists of successful installation of the upgrade software to the inactive partition followed by the switch version process.

You can install upgrade software on your server while the system continues to operate. Two partitions exist on your system: an active, bootable partition and an inactive, bootable partition. The system boots up and operates entirely on the partition that is marked as the active partition.

When you install upgrade software, you install the software on the inactive partition. The system continues to function normally while you are installing the software. When you are ready, you activate the inactive partition and reboot the system with the new upgrade software by running the switch version process. The current active partition will then get identified as the inactive partition when the system restarts. The current software remains in the inactive partition until the next upgrade. Your configuration information migrates automatically to the upgraded version in the active partition.

If for any reason you decide to back out of the upgrade, you can restart the system to the inactive partition that contains the older version of the software. However, any configuration changes that you made since you upgraded the software will be lost.

You can only make changes to the database on the active partition. The database on the inactive partition does not get updated. If you make changes to the database after an upgrade, you must repeat those changes after switching the partition.

You can install a patch or upgrade version from a DVD (local source) or from a network location (remote source) that the server can access. While upgrading the Operating System in a single node deployment of Unified CCX, you should upgrade the publisher node1. After the upgrade is complete, initiate switch version on the publisher node. Ensure that the publisher node comes up successfully after the switch version and shows appropriate active and inactive versions.

Additional notes on Linux-to-Linux upgrades:

In a high-availability deployment of Cisco Unified CCX, you should upgrade both the nodes, with publisher being the first and then the subscriber. After the upgrade is complete on both nodes, initiate a switch version on the publisher first. After the publisher comes up successfully, initiate a switch version on the subscriber. Ensure both the publisher and the subscriber come up successfully after the switch version and show appropriate active and inactive versions.

Data migration happens only when a switch version is done from a lower to a higher version; when the switch version is done from a higher to a lower version, the data migration does not happen.

Cisco Unified CCX Real-Time Monitoring Tool, Cisco Unified CCX Editor, and Cisco Historical Reporting Client do not support the automatic true upgrade process. You have to manually uninstall the existing version and then download and install the relevant one from the current active software.

Migrating to a Virtual Server

This topic provides a summary of the steps required to migrate from a physical to a virtual server.

Virtual Server Migration Summary

- Cisco Unified CCX 8.0(2) supports virtualization.
- Perform a complete backup and store the backup TAR file at a safe SFTP network location.
- Install VMware ESXi 4.0 on UCS B-Series (UCS-B200M1-VCS1) servers.
- Create and deploy VMs from a template.
- Perform fresh installation of Cisco Unified CCX 8.0(2) on the VM machines.
- Use the Disaster Recovery System to perform the restore using the backup TAR archived in the first task.

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Migrating to a virtual server system is a fairly straightforward operation. Note that this is not a software upgrade; it is simply creating one (or two) virtual machines, performing a fresh install, and then using a backup to re-install all the personalized configurations.

Additional documentation is available to assist in these separate tasks:

- *Disaster Recovery System Administration Guide for Cisco Unified Contact Center Express Release 8.0(2)*
- VMware documentation for ESXi 4.0
- *Installing Cisco Unified Contact Center Express Release 8.0(1)*

See this link for more information:

http://docwiki.cisco.com/wiki/Unified_Communications_Virtualization

Summary

This topic summarizes the key points that were discussed in this lesson.

Summary

- You can order a factory-installed server or perform a basic or unattended installation. Before you install Cisco Unified CCX, several items need to be in place:
 - Obtain correct software and licenses.
 - Ensure that Cisco Unified Communications Manager is operational and has appropriate services activated and end-user accounts created.
- Cisco Unified CCX uses a node-locked licensing scheme. The licensing is based on the License MAC, which is determined by options used during the installation phase.
- You must install and set up the first node and then install licensing and configure the second node for a duplex deployment.
- Before installing the first node, you must perform the preliminary steps and have Cisco Unified Communications Manager installed.
- Cisco Unified CCX now uses the Cisco Unified Operating System (UCOS), and installation is similar to installing Cisco Unified Communications Manager.

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Summary (Cont.)

- When the first node is installed, you must access a Windows machine to browse into Cisco Unified CCX to perform the setup procedures to provide licensing and basic configurations.
- Before you install the second node, it must already be configured on the first node. After installation, which is similar to installing the first node, you must browse to the second server node to perform the setup procedures.
- Installing Cisco Unified CCX with Cisco Unified Communications Manager Express is the same, except for choosing the type of Cisco Unified Communications Manager. The setup procedures have a couple of minor differences, such as user and CTI port configurations.
- Installation log files can be viewed from the CLI.
- Upgrading from Cisco Unified CCX versions 5.0(2) and 7.0(1) is supported.
- Cisco Unified CCX 8.0(2) supports virtualization.

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Cisco Unified Contact Center Express Management

Overview

Cisco Unified Contact Center Express (CCX), being a feature-rich interactive voice response (IVR) and automatic call distribution (ACD) application, has many management interfaces. To be effective in managing Cisco Unified CCX, you must be aware of what management interfaces are available, where they are, and how to use them. This lesson discusses the most common management functions required to operate Cisco Unified CCX.

Objectives

Upon completing this lesson, you will be able to locate, manage, and configure Cisco Unified CCX properties. This ability includes being able to meet these objectives:

- Define and describe Cisco Unified Communications Manager configuration requirements
- Find and use Cisco Unified CCX Management web pages
- Locate and describe Cisco Unified CCX Subsystem properties
- Locate and describe the tools available under the Tools menu option such as User Management and Plug-ins
- Access and describe the features available on the Supervisor and User web pages
- Locate and know the configurable properties of the Cisco Desktop Work Flow Administrator
- Describe the configuration properties available in the Cisco Desktop Administrator
- Summarize Cisco Unified CCX Serviceability
- Summarize the Disaster Recovery System
- Summarize Cisco Unified OS Administration
- Summarize Cisco Unified Serviceability
- Summarize the Cisco Unified CCX CLI

Cisco Unified Communications Manager Administration

This topic describes the properties required to access Cisco Unified Communications Manager.

Accessing Cisco Unified Communications Manager Administration

- To access Cisco Unified Communications Manager administration, open Internet Explorer, and in the address field, type: `https://<server IP address>/ccmadmin`, and press Enter.
- Click Yes at the security alert.
- Enter the appropriate credentials required to gain access. The username and password are both case-sensitive.

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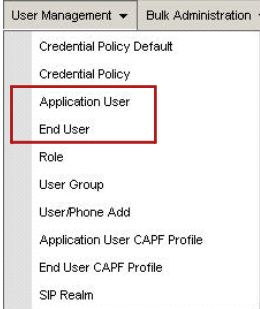
Use Internet Explorer from a Windows-based machine to access Cisco Unified Communications Manager Administration.

Cisco Unified Communications Manager User Accounts

This subtopic defines Cisco Unified Communications Manager User accounts.

User Accounts

- End User
- Application User
- When configured appropriately, Cisco Unified CCX will have an Application User account.
- The user account menus can be found in Cisco Unified Communications Manager administration under User Management on the menu bar.



The screenshot shows the 'User Management' menu in Cisco Unified Communications Manager. The menu items are: Credential Policy Default, Credential Policy, Application User, End User, Role, User Group, User/Phone Add, Application User CAPF Profile, End User CAPF Profile, and SIP Realm. The 'Application User' and 'End User' items are highlighted with a red box.

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These are the common user accounts:

- End user: Typically, Cisco Unified Communications Manager has a user account for all or most of the employees that have a phone. These accounts are referred to as “end user” accounts. An end user account is used to define any personalized attributes for a user and is associated with the phone that the user has been assigned.
- Application user: Application user accounts are similar to end user accounts but are used for applications, such as Cisco Unified CCX. Just like an end user account associates users with their phone, an application user account associates its telephony resources (computer telephony integration [CTI ports], route points, and phones) with the application.

End user accounts can be administered locally from Cisco Unified Communications Manager, but it is common for many companies to use external user directories, such as Active Directory for their user account repository. In these cases, user account manipulation is normally performed from the external directories.

Application user accounts are always administered locally, and when configured appropriately, Cisco Unified CCX will have at least one application user account.

You can find the user account menus in Cisco Unified Communications Manager administration under the User Management tab.

CTI Ports

This subtopic describes CTI ports.

CTI Ports

- In the Cisco Unified Communications Manager environment, a CTI port is known as an endpoint. In other words, a CTI port is a connection point and can accept a voice data stream. Another way to look at a CTI port is to think of a phone because, in reality, it acts just like a phone but is used for applications instead of end users. The major difference between a phone and a CTI port is the feature set that can be applied.
- Just like a phone, a CTI port is defined in Cisco Unified Communications Manager, but its physical presence is elsewhere, typically on a server.
- The Cisco Unified CCX uses CTI ports to connect calls so that we may then interact with the caller for IVR and/or ACD purposes.
- CTI ports defined for Cisco Unified CCX will be associated with the Application User account for Cisco Unified CCX. This action tells Cisco Unified Communications Manager that these resources (CTI ports) belong to, and can be controlled by, Cisco Unified CCX.
- CTI ports for Cisco Unified CCX are created from Cisco Unified CCX administration and can be viewed in Cisco Unified Communications Manager. To view CTI ports, access Cisco Unified Communications Manager administration and search under Device > Phone.

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CTI Route Points

This subtopic describes CTI route points.

CTI Route Points

- A CTI route point can be characterized as a logical device of Cisco Unified Communications Manager used for the purpose of passing call control to an external application. To further clarify this statement:
 - A route point is a logical device, which means it is defined in Cisco Unified Communications Manager as a device and is nothing more than a database entry in the Cisco Unified Communications Manager database.
 - A route point is a pointer. It points to an external application, in this case, Cisco Unified CCX.
 - Route points defined for Cisco Unified CCX will be associated with the Application User account for Cisco Unified CCX.
 - A route point can point to an application because it is associated with the application user account.
- Route points for Cisco Unified CCX are created as triggers from Cisco Unified CCX Administration and can be viewed in Cisco Unified Communications Manager. To view route points, access Cisco Unified Communications Manager Administration and search under Device > CTI Route Points.

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Cisco Unified CCX Administration

This topic describes how to access and use Cisco Unified CCX management pages.

Accessing Cisco Unified CCX Administration

- To access Cisco Unified CCX Administration, open Internet Explorer, enter in the address field: `https://<IP Address>/appadmin`, and press Enter.
- Enter Cisco Unified Communications Manager user credentials that have been designated as a Cisco Unified CCX administrator.



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To access Cisco Unified CCX Administration, follow these steps:

- Step 1** To access Cisco Unified CCX Administration, open Internet Explorer and enter in the address field: `https://<IP Address>/appadmin`, and press **Enter**.
- Step 2** Enter the appropriate credentials required to gain access. The user identification and password are both case-sensitive.

Cisco Unified Communications Manager Configuration

This subtopic discusses how to access and populate the Cisco Unified Communications Manager Configuration page.

Cisco Unified Communications Manager Configuration

- To access the Cisco Unified CM Configuration page, navigate to System > Cisco Unified CM Configuration.
- Select Server (not shown)
 - High Availability (HA) over WAN deployments only
 - Used to choose server for options on this page
- AXL Service Provider

AXL Service Provider Configuration

Selected AXL Service Providers Available AXL Service Providers

10.10.1.10

Cluster Wide Parameters

User Name* administrator

Password*

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Cisco Unified Communications Manager Configuration (Cont.)

- Cisco Unified CM telephony provider.
- Enter a username prefix and password.
- An application user account will be created on Cisco Unified Communications Manager.

Unified CM Telephony Subsystem - Unified CM Telephony Provider Configuration

Selected CTI Managers Available CTI Managers

10.10.1.10

Cluster Wide Parameters

User Prefix* UCCX_Itapi

Password*

Confirm Password*

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Cisco Unified Communications Manager Configuration (Cont.)

- RmCm Provider
- Enter a username and password.
- An application user account will be created on Cisco Unified Communications Manager.

The screenshot shows the 'RmCm Subsystem - RmCm Provider Configuration' page. It is divided into two main sections: 'Selected CTI Managers' and 'Available CTI Managers'. The 'Selected CTI Managers' section contains a text box with the IP address '10.10.1.10'. The 'Available CTI Managers' section is currently empty. Below these sections is the 'Cluster Wide Parameters' section, which includes three input fields: 'User Id*' with the value 'UCCX_RMJtapi', 'Password*' with masked characters, and 'Confirm Password*' with masked characters.

To access the Cisco Unified Communications Manager Configuration page, navigate to System > Unified CM Configuration.

The Cisco Unified Communications Manager Configuration page is used to do the following:

- Set up an integration link to Cisco Unified Communications Manager for user account access and authentication. Access to Cisco Unified CCX administration, the supervisor page, the user page, the historical reporting client, and Cisco Agent Desktop use Cisco Unified Communications Manager credentials (Cisco Unified Communications Manager user ID and password [or PIN]).
- Set up the Cisco Unified Communications Manager Telephony Provider integration link to Cisco Unified Communications Manager. When this link is set up, Cisco Unified CCX communicates with and creates an application user account on Cisco Unified Communications Manager. This account is commonly referred to as the JTAPI account. This link is used to provide for call control setup messages between Cisco Unified Communications Manager and Cisco Unified CCX. If you have more than one Cisco Unified Communications Manager server, two Cisco Unified Communications Manager CTI Managers should be selected to provide for Cisco Unified Communications Manager failover. If you are in a high-availability deployment, you will also have two application user accounts (such as UCCX_Jtapi_1 and UCCX_Jtapi_2) so that CTI ports and CTI Route Points can be allocated to each specific Cisco Unified CCX server.
- Set up the Resource Manager-Contact Manager (RmCm) Provider integration link to Cisco Unified Communications Manager. When this link is set up, Cisco Unified CCX communicates with and creates an application user account on Cisco Unified Communications Manager. This account is commonly referred to as the RMJTAPI account. This link is used to monitor status and provide for third-party call control activities for agent phones. If you have more than one Cisco Unified Communications Manager server, two Cisco Unified Communications Manager CTI Managers should be selected to provide for Cisco Unified Communications Manager failover. Only one Application user account is created for the RmCm subsystem. All agent phones must be associated with the RmCm Application user account.

High Availability over WAN Options

In a high availability over WAN deployment of Cisco Unified CCX, when you choose System > Cisco Unified CM Configuration from the Unified CCX Administration menu bar, the Select Server for UCM Configuration section displays a new field called Select Server. You can view the different Cisco Unified CCX nodes that are available in a drop-down list. Select the node for which you want to update the Unified CM configuration and click Go. The Unified CM Configuration for the selected node will be displayed.

Though the user credentials are common for all the nodes in the cluster, you can select a different AXL service provider and CTI manager for each node. Thus, you can opt to associate the selected Cisco Unified CCX node with a different AXL service provider and CTI Manager that is local rather than those over WAN. Once you configure the data for the selected node, click Update to save the configuration information. The selected Cisco Unified CCX node will communicate only with the AXL service provider or CTI Manager for which it is configured. For detailed information on high availability over WAN, refer to *Cisco Unified CCX High Availability User Guide*.

System Parameters

This subtopic discusses the System Parameters page.

System Parameters

- To access the System Parameters page, navigate to System > System Parameters.
- Default currency
- Codec
- Recording count
- Default TTS provider

Generic System Parameters		
Parameter Name	Parameter Value	Suggested Value
System Time Zone*	Central Standard Time	

Internationalization Parameters		
Parameter Name	Parameter Value	Suggested Value
Customizable Locales	<input type="text"/>	
Default Currency*	American Dollar [USD] <input type="button" value="Edit"/>	American Dollar

Media Parameters		
Parameter Name	Parameter Value	Suggested Value
Codec	G711 <input type="button" value="v"/>	G711
Recording Count*	8 <input type="text"/>	0
Default TTS Provider	< NONE > <input type="button" value="v"/>	

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To access the System Parameters page, navigate to System > System Parameters.

Most of the attributes on the System Parameters page should be left at their default values, but these settings may be of interest:

- Default Currency
- Codec
- Recording Count
- Default TTS Provider

System Parameters (Cont.)

- Supervisor access
- Default session timeout
- Agent state after Ring No Answer (RNA)
- Number of HR sessions
- Number of outbound seats

Application Parameters		
Parameter Name	Parameter Value	Suggested Value
Supervisor Access	Access to Supervisor's Teams only ▾	
Max Number of Executed Steps*	1000	1000
Additional Tasks*	0	0
Default Session Timeout*	30 minutes	30 minutes
Enterprise Call Info Parameter Separator*		
Agent State after Ring No Answer*	<input type="radio"/> Ready <input checked="" type="radio"/> Not Ready	Not Ready
Number of HR session licenses*	8 (Number of Seats : 25)	0
Number of Outbound seats*	25	
System Ports Parameters		
Parameter Name	Parameter Value	Suggested Value
RMI Port*	6999	6999
RmCm TCP Port*	12028	12028
Master Listener TCP Port*	1994	1994

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Other attributes on the System Parameters page are important:

- Supervisor Access: Allows access to RmCm configuration via the Supervisor web page. Supervisors can only modify existing entries. These categories are available:
 - Skills (Read Only)
 - Resources
 - Resource Groups (Read Only)
 - Contact Service Queues
 - Teams
- Default Session Timeout
- Agent State after Ring No Answer
- Number of HR session licenses
- Number of Outbound seats

License Management

This subtopic discusses the License Information page.

License Management

- To access the License Information page, navigate to System > License Information.
- Display licenses.
- Add licenses.

Configured Licenses:

Package: Cisco Unified CCX Premium

IVR Port(s): 50

Cisco Unified CCX Premium Seat(s): 25

High Availability: Enabled

Cisco Unified CCX Preview Outbound Dialer: Enabled

Cisco Unified CCX Quality Manager Seat(s): 25

Cisco Unified CCX Advanced Quality Manager Seat(s): 25

Cisco Unified CCX Workforce Manager Seat(s): 25

Cisco Unified CCX Compliance Recording Seat(s): 25

Cisco Unified CCX Maximum Agents: 300

Cisco Unified CCX Preview Outbound Seat count can be configured in [System Parameters Configuration page](#).

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When you navigate to System > License Information, you will have two subcategories to choose from: Add Licenses and Display Licenses. The license display page will indicate the level of licensing on your system.

License Management (Cont.)

- Add licenses.
- Consider upload as a zip file.

License Information

Upload Cancel

Status

Status : Ready

Enter a license or zip file name

License File* Browse...

Upload Cancel

*. Indicates required item

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To upload additional licenses, choose System > License Information > Add License(s). You can then browse to and upload the appropriate license files.

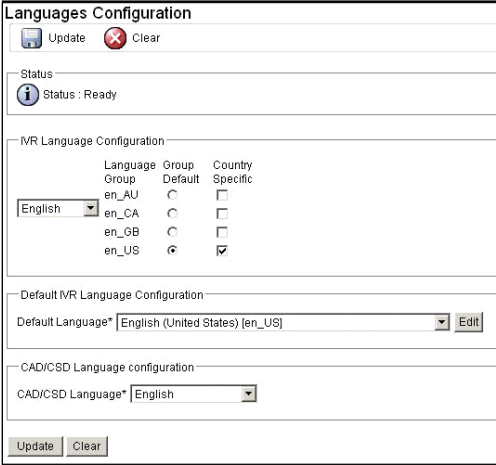
If you have several licenses, you can upload multiple licenses in a zip file format.

Language Management

This subtopic discusses the Languages Configuration page.

Language Management

- To access the Language Configurations page, navigate to System > Language Information.
- Add language sets.
- Define country-specific language.
- Specify group default language.
- Configure default IVR language.
- Configure CAD/CSD language.



Language Group	Group Default	Country Specific
en_AU	<input type="radio"/>	<input type="checkbox"/>
en_CA	<input type="radio"/>	<input type="checkbox"/>
en_GB	<input type="radio"/>	<input type="checkbox"/>
en_US	<input checked="" type="radio"/>	<input checked="" type="checkbox"/>

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Language configurations allow the system to utilize multiple languages on the same Cisco Unified CCX deployment. In effect, what it does is to provide a pointer system so that a different set of directories are used for prompts, grammars, and documents. Within the system, there is a language attribute that is set so that the system knows which set of directories to use. The language attribute, or “setting,” is first set in the trigger configuration and may be changed at any time in the script. This allows a script to have different language settings based on the number dialed. If this is not practical, you may also prompt the caller for the language desired and change the language attribute from the script.

To access the Languages Configuration page, navigate to System > Language Information.

All languages available for Cisco Unified CCX are installed during the installation process. Use this page to add or remove language sets needed for your system. There is no additional cost or penalty for the number of languages you choose.

Follow these steps to add a language:

- Step 1** Use the drop-down menu to choose a language group.
- Step 2** Each language group will generally have more than one specific language. Choose one or more languages and choose one as the group default.
- Step 3** Click **Update**.
- Step 4** Perform the reverse to remove a language.

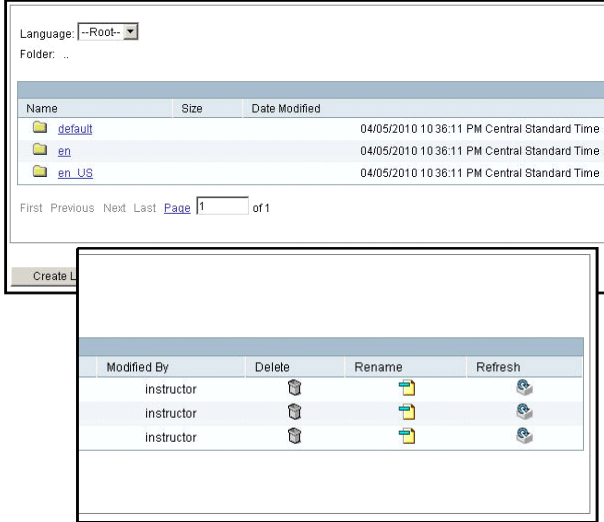
The election to enable a language does not automatically add all the requisite directories and other infrastructure needed to use multiple languages. These activities will be performed on the appropriate management pages.

Prompt Management

This subtopic discusses the Prompt Management page.

Prompt Management

- To access the Prompt Management page, navigate to Applications > Prompt Management.
- Create or delete language folders.
- Download folder.
- Rename folders.
- Refresh folder.



The screenshot shows the Prompt Management interface. At the top, there is a 'Language' dropdown menu set to '--Root--' and a 'Folder: ..' field. Below this is a table with columns for 'Name', 'Size', and 'Date Modified'. The table lists three folders: 'default', 'en', and 'en_US', all with a date of '04/05/2010 10:36:11 PM Central Standard Time'. Below the table is a pagination control showing 'Page 1 of 1'. A 'Create L' button is visible at the bottom left of the table. Below the table is another table with columns for 'Modified By', 'Delete', 'Rename', and 'Refresh'. The 'Modified By' column lists 'instructor' for three rows. The 'Delete', 'Rename', and 'Refresh' columns contain icons for each respective action.

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The Prompt Management page reflects all the user prompts and directories that have been uploaded into the Prompt repository. User prompts and directories can be defined as those prompts that you, or someone else, have created and uploaded for use by your scripts.

System prompts are those prompts that are used by the system to create generated prompts for your scripts. These prompts are used for the purposes of generating speech, such as speaking a current time or date to a caller. These files come with any installation and are installed automatically during Cisco Unified CCX installation. System prompts cannot be viewed from the Prompt Management page.

To access the Prompt Management page, navigate to Applications > Prompt Management.

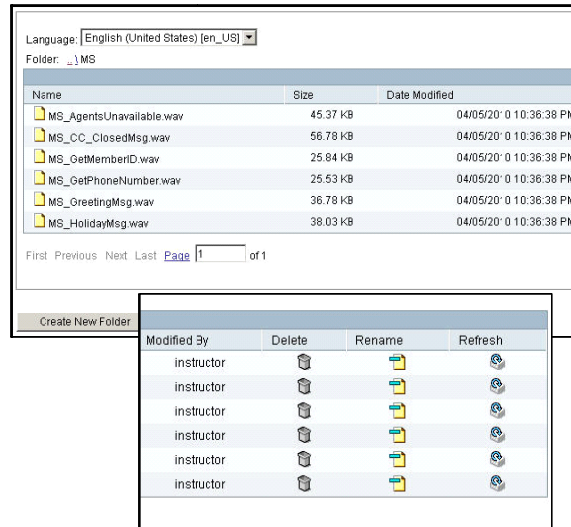
The contents of the Prompt Management page reflect the files in the repository, not what is on the disk, although they should be the same.

Almost every item on this page is a link to perform one of these actions:

- Create language folders.
- Rename language folders. 
- Delete language folders. 
- Upload individual prompts or multiple prompts as zip files or whole directories as zip files.
- Click the icon to the left of the folder or prompt name to download the file or folder. Folders download as zip files.  
- Rename files or folders. 
- Refresh a file or folder. Refresh causes the file or folder to be removed from the disk and a new copy from the repository is then written back to the disk. 

Prompt Management (Cont.)

- Create or delete folders.
- Upload prompts.
- Download file or folder.
- Rename files or folders.
- Refresh a file or folder.
- Prompt file format:
 - G.711 or G.729 codec
 - ITU-T
 - 8 bit
 - 8K sample
 - Mono
 - uLaw
 - Save as .wav



As you drill down into a language folder, you can create folders and upload prompts. The available actions are as follows:

- Create folders.
- Rename files or folders.
- Delete files or folders.
- Refresh a file or folder. Refresh causes the file or folder to be removed from the disk and a new copy from the repository is then written back to the disk.
- Upload individual prompts or multiple prompts as zip files or whole directories as zip files.
- Click the icon to the left of the folder or prompt name to download the file or folder. Folders download as zip files.
- Prompt file format:
 - G.711 or G.729 codec
 - ITU-T
 - 8-bit
 - 8-KB sample
 - Mono
 - mu-law
 - Save as .wav

Script Management

This subtopic discusses the Script Management page.

Script Management

- To access the Script Management page, navigate to Applications > Script Management.
- Create or delete folders.
- Upload scripts.
- Download scripts.
- Rename files or folders.
- Refresh a file or folder.

Name	Size	Date Modified
aa.aef	91.2 KB	04/05/2010 10:35:31 PM
icd.aef	10.31 KB	04/05/2010 10:35:31 PM
rmon.aef	94.66 KB	04/05/2010 10:35:31 PM
SNU.aef	58.81 KB	04/05/2010 10:35:31 PM
X701_03-1_End.aef	8.39 KB	04/05/2010 10:35:31 PM





Modified By	Delete	Rename	Refresh
instructor			
instructor			
instructor			
instructor			

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To access the Script Management page, navigate to Applications > Script Management.

The contents of this page reflect the files in the repository, not what is on the disk, although they should be the same.

Almost every item on this page is a link to perform one of these actions:

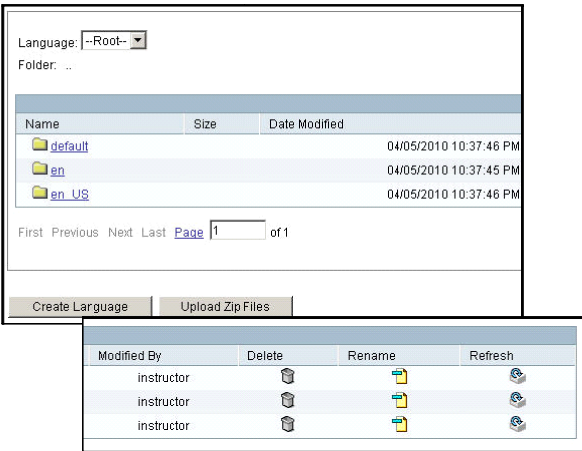
- Create or delete folders.
- Upload individual scripts or multiple scripts as zip files or whole directories as zip files.
- Click the icon to the left of the folder or script name to download the file or folder. Folders download as zip files.  
- Rename files or folders. 
- Refresh a file or folder. Refresh causes the file or folder to be removed from the disk and a new copy from the repository is then written back to the disk. 

Document Management

This subtopic discusses the Document Management page.

Document Management

- To access the Document Management page, navigate to Applications > Document Management.
- Create or delete folders.
- Upload documents.
- Download documents.
- Rename files or folders.
- Refresh a file or folder.



The screenshot shows a web interface for document management. At the top, there is a 'Language' dropdown menu set to '--Root--' and a 'Folder: ...' field. Below this is a table with columns for 'Name', 'Size', and 'Date Modified'. The table lists three folders: 'default', 'en', and 'en_US', all with a date of 04/05/2010 10:37:46 PM. Below the table are navigation links: 'First', 'Previous', 'Next', 'Last', and 'Page 1 of 1'. At the bottom of the interface are two buttons: 'Create Language' and 'Upload Zip Files'. A separate table below the main interface shows action buttons for each row: 'Modified By', 'Delete', 'Rename', and 'Refresh'. The 'Modified By' column lists 'instructor' for all three rows. The 'Delete' column has a trash can icon, 'Rename' has a folder icon, and 'Refresh' has a circular arrow icon.





Modified By	Delete	Rename	Refresh
instructor			
instructor			
instructor			

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To access the Document Management page, navigate to Applications > Document Management.

The contents of this page reflect the files in the repository, not what is on the disk, although they should be the same.

Almost every item on the Document Management page is a link to perform one of these actions:

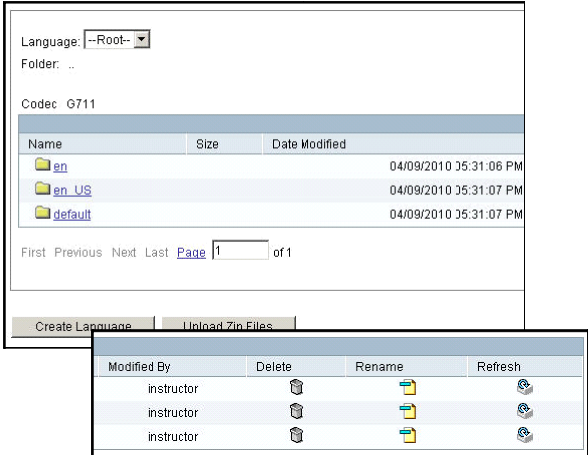
- Create or delete folders.
- Upload individual documents or multiple documents as zip files or whole directories as zip files.
- Click the icon to the left of the folder or document name to download the file or folder. Folders download as zip files.  
- Rename files or folders. 
- Refresh a file or folder. Refresh causes the file or folder to be removed from the disk and a new copy from the repository is then written back to the disk. 

Grammar Management

This subtopic discusses the Grammar Management page.

Grammar Management

- To access the Grammar Management page, navigate to Applications > Grammar Management.
- Create or delete folders.
- Upload grammars.
- Download grammars.
- Rename files or folders.
- Refresh a file or folder.







The screenshot shows the Grammar Management interface. At the top, there is a 'Language' dropdown menu set to '--Root--' and a 'Folder: ..' field. Below this is a 'Codec' field set to 'G711'. A table lists files and folders with columns for 'Name', 'Size', and 'Date Modified'. The table contains three entries: 'en', 'en_US', and 'default', all with a date of '04/09/2010 05:31:07 PM'. Below the table is a pagination control showing 'Page 1 of 1'. At the bottom of the interface, there are two buttons: 'Create Language' and 'Upload Zip Files'. A separate table shows action buttons for each file: 'Modified By' (instructor), 'Delete' (trash icon), 'Rename' (rename icon), and 'Refresh' (refresh icon).

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To access the Grammar Management page, navigate to Applications > Grammar Management.

The contents of this page reflect the files in the repository, not what is on the disk, although they should be the same.

Almost every item on this page is a link to perform one of these actions:

- Create or delete folders.
- Upload individual grammars or multiple grammars as zip files or whole directories as zip files.
- Click the icon to the left of the folder or grammar name to download the file or folder. Folders download as zip files.  
- Rename files or folders. 
- Refresh a file or folder. Refresh causes the file or folder to be removed from the disk and a new copy from the repository is then written back to the disk. 

Application Management

This subtopic discusses the Application Configuration page.

Application Management

- To access the Application Management page, navigate to Applications > Application Management.
- Add application.
- Refresh applications.
- Delete.
- Copy.
- Refresh.
- Summary.

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In Cisco Unified CCX, an application is a definition (database entry) that allows options to be specified. Ultimately, the definition points to a script. This application is used in the call setup process.

To access the Application Configuration page, navigate to Applications > Application Management.

Application Management (Cont.)

Adding an Application

- Name
- ID
- Script
- Description
- Enabled
- Default Script

Name	App00
ID*	<input type="text" value="0"/>
Maximum Number of Sessions*	<input type="text" value="4"/>
Script*	<input type="text" value="SSCRIPT[aa.aef]"/> <input type="button" value="Edit"/>
<input type="checkbox"/> welcomePrompt	<input type="text" value="AAAAWelcome.wav"/> <input type="button" value="Show Prompts"/> <input type="button" value="🔊"/>
<input type="checkbox"/> MaxRetry	<input type="text" value="3"/>
<input type="checkbox"/> operExtn	<input type="text" value=""/>
Description	<input type="text" value="App00"/>
Enabled	<input checked="" type="radio"/> Yes <input type="radio"/> No
Default Script	<input type="text" value="- System Default -"/> <input type="button" value="Edit"/>

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These fields must be defined for an application:

- Name and description
- ID: A unique numerical value
- Sessions: A numerical value indicating the number of active voice contacts to be allowed concurrently on the Cisco Unified CCX system for this application
- Enabled: Yes or No
- Script: Script to be run for this contact

The default script will be run in these events:

- The session count has been exceeded.
- The application is not enabled.
- The application (script) is invalid.
- An exception occurs in the main script during processing.

After an application has been created, you may also create a trigger for it by clicking the “Add new trigger” link on the left side of the page.

Cisco Unified CCX Subsystems

The Subsystems menu of the Cisco Unified CCX Administration web interface provides access to the subsystems that are licensed for your Cisco Unified CCX system. The Cisco Unified CCX system uses subsystems for communicating with other services.

Cisco Unified Communications Manager Telephony Subsystem

This subtopic discusses the Cisco Unified Communications Manager Telephony subsystem.

Cisco Unified Communications Manager Telephony Subsystem

- The Cisco Unified CM Telephony subsystem is used to configure all the appropriate items necessary for calls to connect to Cisco Unified CCX and has seven subcategories:
 - Provider
 - Call Control Group
 - Triggers
 - Data Check
 - Data Resync
 - Cisco JTAPI Resync
 - Advanced Settings
- The configuration process will be discussed in the next lesson.

Subsystems	Wizards	Tools	Help
Cisco Unified CM Telephony			Provider
RmCm			Call Control Group
Outbound			Triggers
Database			Data Check
HTTP			Data Resync
eMail			Cisco JTAPI Resync
Cisco Media			Advanced Settings
MRCP ASR			
MRCP TTS			

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The Cisco Unified Communications Manager Telephony Subsystem is used to configure all the appropriate items necessary for calls to connect to Cisco Unified CCX, and has seven subcategories:

- **Provider:** These fields are now read-only and can be modified on the Cisco Unified Communications Manager Configuration page. A link to the configuration page is provided for you.
- **Call Control Group:** This is where CTI ports are created. CTI ports are arranged in groups called “Call Control Groups.” After being created, the CTI ports may be viewed in Cisco Unified Communications Manager.
- **Triggers:** This is where triggers are created. Alternatively, triggers may be created from the Application page. After being created, the triggers may be viewed in Cisco Unified Communications Manager as CTI route points.
- **Data Check:** Used to verify consistency of JTAPI data between Cisco Unified Communications Manager and Cisco Unified CCX.
- **Data Resync:** Use this menu to check and resynchronize the JTAPI data between Cisco Unified Communications Manager and Cisco Unified CCX. You can select the Data Resync submenu if you find any mismatch during Data Check. If any inconsistencies exist, they should be corrected using this tool.

- Cisco JTAPI Resync: This additional check ensures that the Unified CM Telephony Client (also known as the Cisco JTAPI Client) is the same between the clients installed on the Cisco Unified CCX node and the Cisco Unified Communications Manager. If the Cisco Unified CCX detects a mismatch, the system downloads and installs the required version of Cisco JTAPI Client.
- Advanced Settings: Use this menu to configure advanced settings for the Unified CM Telephony Client.

RmCm Subsystem

This subtopic discusses the RmCm subsystem.

RmCm Subsystem

- The RmCm (Resource Manager-Contact Manager) subsystem is where you set up and configure the ACD attributes for Cisco Unified CCX and has nine categories:
 - Skills
 - Resources
 - Resource Groups
 - Contact Service Queues
 - RmCm Provider
 - Assign Skills
 - Remote Monitor
 - Agent Based Routing Settings
 - Teams
- The configuration process for these items will be discussed in a later lesson.

- Skills
- Resources
- Resource Groups
- Contact Service Queues
- RmCm Provider
- Assign Skills
- Remote Monitor
- Agent Based Routing Settings
- Teams

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The Resource Manager-Contact Manager (RmCm) subsystem is where you set up and configure the ACD attributes for Cisco Unified CCX. There are nine categories:

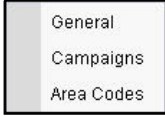
- **Skills:** In Cisco Unified CCX, a skill is an attribute to be assigned to the agent. Create one or more skills for skills-based routing.
- **Resources:** After the agent has been set up, this is where you associate skills, resource groups, and apply other attributes to the agent definition.
- **Resource Groups:** Create one or more resource groups for resource group routing.
- **Contact Service Queues:** This is a definition created in Cisco Unified CCX and used in a script to tell the system which group of agents to direct a caller to. It has two main goals: it defines a set of agents for selection and it defines how to choose an agent from among those available. The contact service queue (CSQ) is also the major reporting object for ACD reports, similar to the skill group in other ACDs.
- **RmCm Telephony Provider:** These fields are now read-only and can be modified on the Cisco Unified Communications Manager Configuration page.
- **Assign Skills:** An alternate method of assigning skills to agents.
- **Remote Monitor:** After a remote monitor supervisor has been set up, this is where you define which CSQs and agents that a supervisor can monitor.
- **Agent Based Routing Settings:** Certain settings need to be defined when using agent-based routing; define those settings here.
- **Teams:** Define teams here. Teams are groupings of agents that supervisors are allowed to monitor from the supervisor desktop. Teams are a supervisory function only and do not affect routing.

Outbound Subsystem

This subtopic discusses the Outbound subsystem.

Outbound Subsystem

- The Outbound subsystem is where you configure Outbound campaigns. It has three categories:
 - General
 - Campaigns
 - Area Codes
- The configuration process for these items will be discussed in a later lesson.



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Use the Outbound Configuration web pages to provision the Cisco Unified Preview Outbound Dialer Express (Outbound) outbound dialing functionality.

Choose Subsystems > Outbound from the Cisco Unified CCX Administration menu bar. There are three subcategories:

- **General:** Use the General area of the General Configuration pane to add or modify outbound dialing preferences.
- **Campaigns:** From the Campaigns web page, a Cisco Unified CCX administrator can create and schedule campaigns and import lists of contacts (in bulk from a text file) into the Cisco Unified CCX database for each campaign.
- **Area Codes:** Area codes are associated with time zones in Cisco Unified CCX. Cisco Unified CCX uses this information so that it knows how to schedule outbound calls. Use this page to manually add new area codes, update existing area codes, and add international area codes.

Database Subsystem

This subtopic discusses the Database subsystem.

Database Subsystem

- The Database subsystem is used to set up JDBC access to a customer's external database. Once the connection to a database has been established, the Cisco Unified CCX script will be able to read or write to this database.
- Cisco Unified CCX supports these types of databases:
 - Oracle
 - Sybase
 - IBM DB2
 - MS SQL Server 2000
 - MS SQL Server 2005
- Configuration options will be discussed in a later lesson.

DataSource
Parameters
Drivers

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The Cisco Unified CCX system uses the Database subsystem to communicate with external database servers. Information obtained from the database can be used as enterprise data or to make application decisions.

Cisco Unified CCX supports these types of databases:


- Oracle
- Sybase
- IBM DB2
- MS SQL Server 2000
- MS SQL Server 2005

Email Subsystem

This subtopic discusses the Email subsystem.

Email Subsystem

- The Email subsystem is used to define the local email server to be used for outbound email. Once the email server is established, the Cisco Unified CCX script will be able to send email.
- Configuration options will be discussed in a later lesson.



The screenshot shows a configuration menu with the following items: Cisco Unified CM Telephony, RmCm, Outbound, Database, HTTP, eMail (highlighted with a red box), Cisco Media, MRCP ASR, and MRCP TTS.

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The Cisco Unified CCX system uses the Email subsystem to communicate with your email server and enable your applications to create and send email. The email configuration identifies the default email address and server to be used for sending email (including e-pages and faxes) and for receiving acknowledgments.

Cisco Media Subsystem

This subtopic discusses the Cisco Media subsystem.

Cisco Media Subsystem

- The Cisco Media subsystem is used to create DTMF-type dialog groups.
- For any voice contact that connects to Cisco Unified CCX, it must be allowed to dialog with the system using DTMF or Automatic Speech Recognition (ASR), or both.
- Dialog groups are a method of defining, on a per-contact basis, how that contact will be allowed to dialog with Cisco Unified CCX.
- Cisco Media Dialog groups specify a number of DTMF dialog channels and are applied to the trigger.

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The Cisco Unified CCX system uses the Media subsystem of the Cisco Unified CCX Engine to configure Cisco Media Termination dialog groups that can be used to handle simple dual tone multifrequency (DTMF)-based dialog interactions with customers. A dialog group is a pool of dialog channels in which each channel is used to perform dialog interactions with a caller.

ICM Subsystem

This subtopic discusses the Cisco Unified Intelligent Contact Management (ICM) subsystem.

ICM Subsystem

- The ICM subsystem is used to define the integration with a Cisco Unified ICM VRU Peripheral Gateway (PG).
- The ICM subsystem will not be present unless you have Cisco Unified IP IVR.
- It will also be used to declare Cisco Unified ICM VRU script names and tie those definitions to Cisco Unified IP IVR scripts. This will allow Cisco Unified ICM to instruct Cisco Unified IP IVR to play (or execute) scripts when necessary.

Call Information	Expanded Call Variables
<input type="checkbox"/> Task ID	user.task.id
<input type="checkbox"/> Media ID	user.media.id
<input type="checkbox"/> Last Redirected Address	user.last.redirected.address
<input type="checkbox"/> Arrival Type	user.connect.type
<input type="checkbox"/> Session Handled	user.session.handled
<input type="checkbox"/> VRU Script Name	user.connect.script.name
<input type="checkbox"/> Config Param	user.connect.script.config

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Use the Intelligent Contact Manager (ICM) Configuration web pages to add or modify Unified ICME configuration parameters and to modify Voice Response Unit (VRU) script information.

To configure the Unified ICME subsystem, choose Subsystems > ICME > General from the Unified CCX Administration menu bar to access the Unified ICME Configuration web page.

Unified ICME uses Unified ICME VRU scripts to handle interaction with contacts. These scripts are loaded as applications on the Unified CCX Engine. Choose Subsystems > ICME > ICME VRU Scripts from the Unified CCX Administration menu bar to access the ICME VRU Scripts web page.

The ICME subsystem is only available when deploying the Cisco Unified IP IVR product package.

MRCP ASR Subsystem

This subtopic discusses the Media Resource Control Protocol (MRCP) Automatic Speech Recognition (ASR) subsystem.

MRCP ASR Subsystem

- The Media Resource Control Protocol (MRCP) Automatic Speech Recognition (ASR) subsystem is used to set up access to one or more automatic speech servers.
- MRCP ASR Providers
- MRCP ASR Servers
- MRCP ASR Dialog Groups
- Configuration options will be covered in a later lesson.

MRCP ASR Providers
MRCP ASR Servers
MRCP ASR Dialog Groups

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The MRCP ASR subsystem is used to set up access to one or more automatic speech servers:

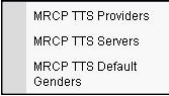
- MRCP ASR Providers: Used to define the type of provider or providers connected to Cisco Unified CCX.
- MRCP ASR Servers: Used to define the server or servers connected to Cisco Unified CCX.
- MRCP ASR Dialog Groups: Used to create ASR dialog groups. Dialog groups are used to allow or disallow the usage of ASR dialog channels on a per-call basis.

MRCP TTS Subsystem

This subtopic discusses the MRCP text-to-speech (TTS) subsystem.

TTS Subsystem

- The MRCP TTS subsystem is used to set up access to one or more text-to-speech servers.
- MRCP TTS Providers
- MRCP TTS Servers
- MRCP TTS Default Genders
- Configuration options will be covered in a later lesson.



The diagram is a rectangular box containing three lines of text: 'MRCP TTS Providers', 'MRCP TTS Servers', and 'MRCP TTS Default Genders'.

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The MRCP TTS subsystem is used to set up access to one or more TTS servers:

- MRCP TTS Providers: Used to define the type of provider or providers connected to Cisco Unified CCX.
- MRCP TTS Servers: Used to define the server or servers connected to Cisco Unified CCX.
- MRCP TTS Default Genders: Used to define the default gender, if none is specified in the script.

Administrative Tools

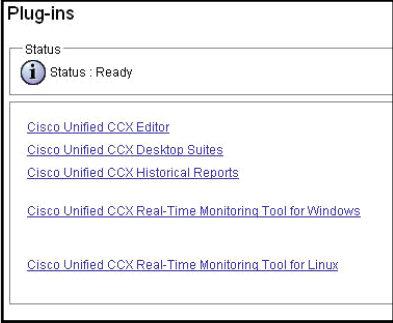
This topic describes the administrative tools available for Cisco Unified CCX.

Plug-ins

This subtopic discusses the Plug-Ins web page.

Plug-ins

- Access the Plug-ins web page from Tools > Plug-ins.
- Cisco Unified CCX Editor
- Cisco Unified CCX Desktop Suites
- Cisco Unified CCX Historical Reports
- Cisco Unified CCX Real-Time Monitoring Tool for Windows
- Cisco Unified CCX Real-Time Monitoring Tool for Linux



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Access the Plug-Ins web page by navigating to Tools > Plug-ins. Use this page to download and install these programs:

- Script Editor
- Agent Desktop
- Supervisor Desktop
- Desktop Administrator
- Historical Reporting Client
- Real-Time Monitoring Tool (RTMT)

User Management

This subtopic discusses the User Management web page.

User Management

- Access the User Configuration page from Tools > User Management.
- User View and Capability views
- Name Grammar Generation
- Spoken Name Upload

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The User Management menu option allows you to assign access levels to the Cisco Unified CCX system, known as capabilities.

- Administrator: Allows full access to the Cisco Unified CCX administration system.
- Supervisor: Allows limited access to Cisco Unified CCX for capabilities normally relegated to ACD supervisors, most notably, the supervisor desktop, real-time reporting, and RmCm configuration. This access is allowed via the Supervisor web page.
- Agent: Allows access only to agent utilities. This access is allowed via the User web page.
- Reporting: Allows a user access to view historical reports.

User Management (Cont.)

User View

- Most items in User View are set in Cisco Unified Communications Manager.
- Display and change capabilities.
- Allow historical reporting packages to be viewed.

User List				
	User ID $\Delta \nabla$	First Name $\Delta \nabla$	Last Name $\Delta \nabla$	Capability $\Delta \nabla$
	8800	8800	User	None
	instructor	instructor	User	Administrator
	student01	student01	User	Administrator
	student02	student02	User	Administrator
	student03	student03	User	Administrator
	student04	student04	User	Administrator
	student05	student05	User	Administrator
	student06	student06	User	Administrator
	student07	student07	User	Administrator
	student08	student08	User	Administrator
	uccxemail	uccxemail	User	None

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From the Unified CCX Administration menu bar, choose Tools > User Management > User View to access the User Configuration web page.

Use this page to view existing users, create new users (for deployments with Cisco Unified Communications Manager Express only), and assign administrative privileges to administrators and supervisors. You may use this view to change the capabilities of a user by clicking on the appropriate user link.

User Management (Cont.)

Capability Views

- Search for Cisco Unified Communications Manager user accounts.
- Display and change capabilities.

The screenshot displays the 'User Configuration' window. At the top, there are buttons for 'Update', 'Clear', and 'Back to User List'. Below this is a 'Status' section showing 'Ready'. A search bar with a 'Search' button is present. The main area is divided into two columns: 'Cisco Unified CCX Administrator' and 'Available Users'. The first column lists users: student07, student05, student08, student01, student04, instructor, student03, student02, and student06. The second column lists '8800' and 'uccxemail'. At the bottom, there are buttons for 'Update', 'Clear', and 'Back to User List'.

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If you click a category under the Capability view, you will be presented with this type of view. You can also use this view to change the capabilities of a user.

User Management (Cont.)

Name Grammar Generation

- Used to generate grammar for auto-attendant program
- Can run on a designated frequency
- Choose Grammar Variant
- Generate Name Grammar Now

Name Grammar Generator Configuration	
Update Clear Generate Name Grammar Now	
Status	
Ready	
Frequency*	Never
Run task on (hrs of day)*	12:00 AM Central Standard Time
Run task on (day of week)*	Monday
Last Completed on	Name Grammar has not been generated since installation.
Last Completion Result	Name Grammar has not been generated since installation.
Grammar Variant*	<input checked="" type="checkbox"/> OSR 3.1.x <input checked="" type="checkbox"/> 2003 SISR <input checked="" type="checkbox"/> Nuance
Current Status	IDLE
Update Clear Generate Name Grammar Now	

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The first thing to discuss is, “What is a grammar?” A grammar is a definition (a text-based file) used to define to an ASR program the speech audio that it is supposed to recognize. It also specifies a “tag” that is sent back to Cisco Unified CCX to indicate the word or phrase that was recognized. To further clarify this statement, you must keep in mind that ASR is a software program that runs on a separate server. Although ASR can recognize all kinds of words and phrases, it needs to be able to associate audio that is presented to it with words or phrases that are valid for that specific ASR operation. When it does recognize a valid word or phrase, there must be a method for ASR to indicate to Cisco Unified CCX what ASR heard. This is what a grammar is used for.

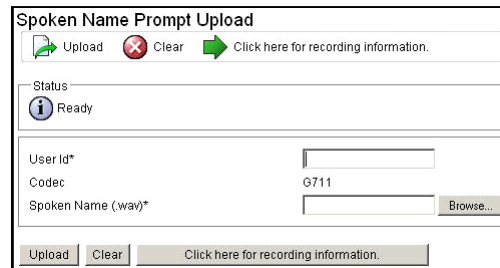
If you understand the previous statement, then it is fairly easy to understand that if you intend to use the auto-attendant program in an ASR mode, there must be a grammar generated for all the Cisco Unified Communications Manager users’ names for “dial by name”. This page is used to generate the Name Grammar.

When the Name Grammar is generated, Cisco Unified CCX pulls all the Name Dialing field values from Cisco Unified Communications Manager to create a grammar. Once that is completed, Cisco Unified CCX sends the new grammar to all associated ASR machines to be used for name dialing. You can add alternate name pronunciations via the Cisco Unified CCX User web page.

User Management (Cont.)

Spoken Name Upload

- Used to upload a spoken name to Cisco Unified CCX
- Choose
 - User ID
 - Spoken name .wav file



The screenshot shows a web interface titled "Spoken Name Prompt Upload". At the top, there are three buttons: "Upload" (with a green arrow icon), "Clear" (with a red X icon), and "Click here for recording information." (with a green arrow icon). Below this is a "Status" section showing an information icon and the text "Ready". The main form area contains three input fields: "User Id*" (empty), "Codec" (with the value "G711"), and "Spoken Name (.wav)*" (empty). A "Browse..." button is located to the right of the "Spoken Name" field. At the bottom of the form, there are three buttons: "Upload", "Clear", and "Click here for recording information.".

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A spoken name, simply put, is an audio recording of the name of a user recorded in the user's own voice. This is most commonly seen with voice mail systems. The auto-attendant program uses a spoken name if there is one available. Spoken names can also be used in other types of scripts.


Use this interface to upload spoken name .wav files to Cisco Unified CCX. If you find that you have many spoken names to upload, this method can be quite cumbersome. Another method would be to use a script for your users to dial into so that they can create a spoken name and have it automatically uploaded from the script. Cisco provides such a script, SNU.aef (seen as SSCRIPT[SNU.aef] on the application page).

Real-Time Reporting

This subtopic discusses how to access Real-Time Reporting.

Real-Time Reporting

- Choose Tools > Real Time Reporting.
- Opens another browser page to view real-time:
 - Contacts and contact summaries
 - Applications and application summaries
 - Sessions
 - Data source usage
 - CSQ and agent statistics



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Clicking Tools > Real Time Reporting will cause a new browser window to open to display the real-time reporting interface. If Real-Time Reporting has not been installed, the installation process will begin automatically. Real-Time Reporting will display all available real-time metrics. Many of these metrics are available to the script.

Supervisor and User Web Pages

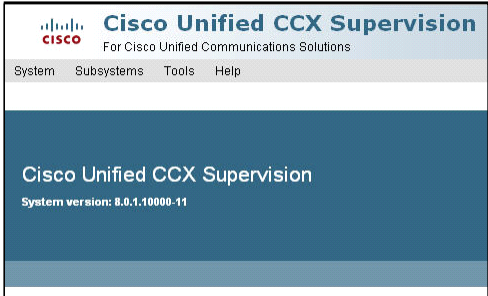
This topic discusses how to access the Supervisor and User web pages and describes their functions.

Supervisor Web Page

This subtopic describes how to access the Supervisor web page and describes the functions available.

Supervisor Web Page

- To access the Supervisor web page, navigate to `https://<Unified CCX IP Address>/AppAdmin`.
- Login is based on credentials provided. The highest capability must be Supervisor.

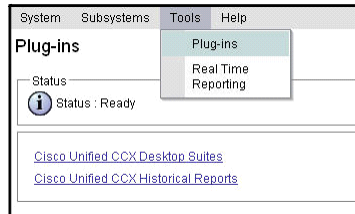


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To access the Supervisor web page, open Internet Explorer and enter this address: `https://<Unified CCX IP Address>/AppAdmin`. The Supervisor page is displayed if Supervisor is the highest capability of the login credentials. If the credentials are administrative, the Administration page appears. If administrative credentials were used previously in the same browser session, close the browser and reopen another browser session before logging in with supervisor credentials.

Supervisor Web Page (Cont.)

- Tools > Plug-ins
- Supervisor Desktop
- Real-time reports
- Historical reports client
- View remote monitor capability

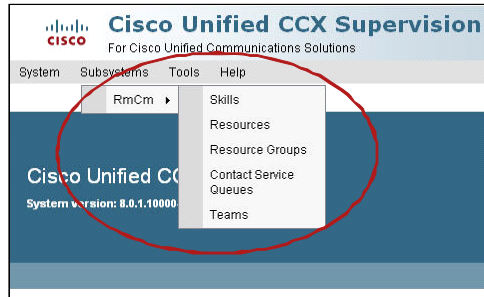


The supervisor has access to several functions from the Supervisor web page:

- Download and install Supervisor Desktop.
- Install and view Real-Time Reporting.
- Download and install the Historical Reporting Client. To produce historical reports, the supervisor must be allowed to do so. These options are found on the User Management page.
- View Agent extensions and CSQ IDs of those the supervisor is allowed to remotely monitor via the Remote Monitor feature.

Supervisor RmCm Access

- Must allow access in System Parameters
- Modify
 - Resources
 - Contact Service Queues
 - Teams
- Read-Only
 - Skills
 - Resource Groups



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Supervisors have the ability to modify resource attributes, contact service queues, and teams from the Supervisor web page. This ability is regulated by the Supervisor Access option set on the System Parameters web page.

User Web Page

This subtopic describes how to access the User web page and describes the functions available.

User Web Page

- Useful for all Cisco Unified Communications Manager and Cisco Unified CCX users
- To access the User web page, navigate to <https://<Unified CCX IP Address>/AppUser>.
- Download Agent Desktop.
- Alternate pronunciation



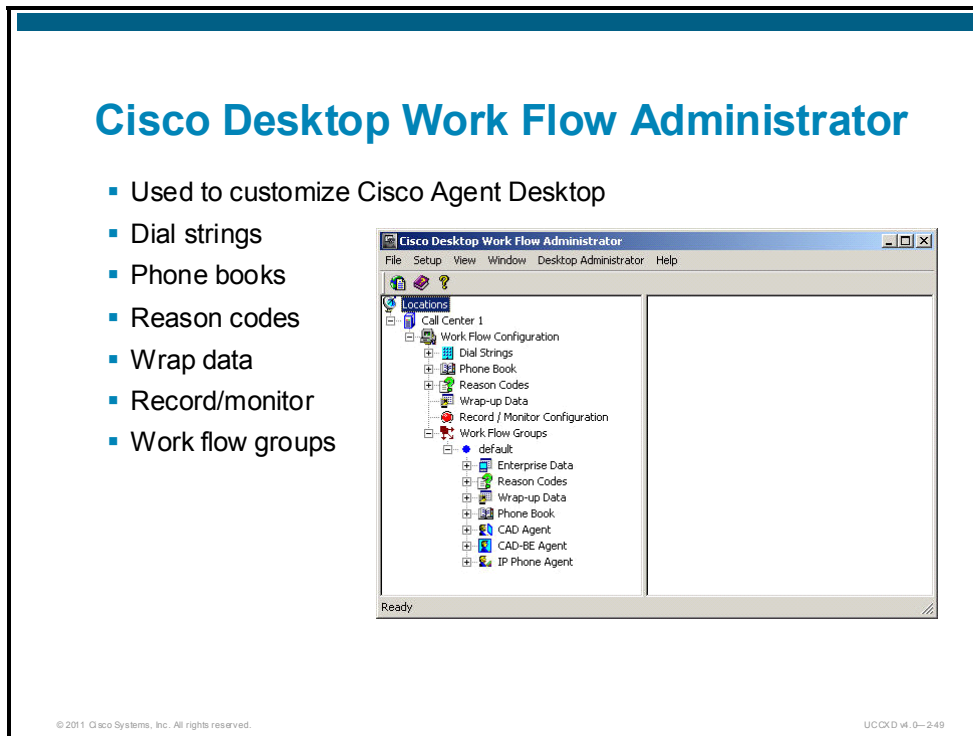
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The User web page is available to all users in Cisco Unified Communications Manager, whether they are Cisco Unified CCX administrators or are not associated with Cisco Unified CCX at all. The primary reason for this is to allow entry of alternate pronunciations for the auto-attendant. To access the User web page, open Internet Explorer and enter this address: <https://<Unified CCX IP Address>/AppUser>. From this web page you can do the following:

- Download and install the Cisco Agent Desktop
- Provide alternate pronunciations for dial by name

Cisco Desktop Work Flow Administrator

This topic summarizes the various activities that are performed in the Cisco Desktop Work Flow Administrator.



You use the Cisco Desktop Work Flow Administrator to customize the Cisco Agent Desktop. From here, you can perform many actions, such as the following:

- Define how dial strings are displayed on the user interface.
- Create phone books of commonly used numbers for quick reference by agents. You may allow or disallow an agent to have a personal phone book.
- Create Logout and Not Ready reason codes.
- Define wrap-up data.
- Specify whether to notify the agent with a dialog box in the event of a monitor or record action.
- Create Work Flow Groups that can specify automated task buttons and automated CTI activity at the Cisco Agent Desktop.

Cisco Desktop Administrator

This topic summarizes the configuration activities available in the Cisco Desktop Administrator. Further discussions on this topic will occur later in this course.

Cisco Desktop Administrator

- Access Cisco Desktop Administrator from either:
 - The Desktop Work Flow Administrator menu bar: choose Desktop Administrator
 - The Administration web pages from the Navigation menu
- Used to customize:
 - Enterprise data
 - Silent monitoring
 - Personnel
 - Cisco Unified Presence
 - Agent Email
- All options to be covered in a later lesson.

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Access the Cisco Desktop Administrator from the Cisco Desktop Work Flow Administrator or from the administrative pages using the Navigation menu. Functions performed here are as follows:

- Create Enterprise Data fields
- Set Silent Monitoring options
- Configure Cisco Unified Presence settings
- Configure Agent Email settings

Serviceability and Maintenance Summaries

Due to the change in the Cisco Unified CCX operating system, the arrangement and location of various utilities and activities have changed. Cisco Unified CCX now uses the Cisco Unified Communications Operating System (UCOS) as the base operating system platform. Some of these utilities, mostly web pages, will contain what you might consider the “generic” UCOS type activities. Others specifically prefixed with “Cisco Unified CCX” contain specific activities for Cisco Unified CCX. The summaries covered in this section are:

- Cisco Unified CCX Serviceability
- Disaster Recovery System
- Cisco Unified OS Administration
- Cisco Unified Serviceability
- Command-line interface (CLI)

Cisco Unified CCX Serviceability

This subtopic summarizes Cisco Unified CCX Serviceability.

Cisco Unified CCX Serviceability

- To access Cisco Unified CCX Serviceability from the administrative web pages, use the Navigation drop-down menu.
- Note that these items are **Cisco Unified CCX** specific options and settings.
- Use Cisco Unified CCX Serviceability to perform these types of activities:
 - Enable and configure alarm levels
 - Trace-level configuration
 - Service activation for Cisco Unified CCX reporting server
 - Control center (Cisco Unified CCX services)
 - Datastore control center
 - Service parameters
 - Performance configuration and logging

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Cisco Unified CCX Serviceability, a web-based troubleshooting tool for Cisco Unified CCX, provides the following functionality:

- Configure alarms for local and remote Syslogs
- Configure trace settings for Cisco Unified CCX components. Once enabled, you can collect and view trace information using the RTMT
- Configure the log profiles to which Cisco Unified CCX trace information will be saved and manage the log profiles for different Unified CCX components
- Manage and control network and feature services

- View replication status, synchronize data, and reset replication for Cisco Unified CCX servers in a cluster through Datastore Control Center
- Set parameters for different platform services
- Set JVM parameters for different Cisco Unified CCX services and collect thread and memory traces

Depending on the service and component involved, you may perform serviceability-related tasks in both Cisco Unified CCX Serviceability and Cisco Unified Serviceability. For example, you may need to start and stop services, configure alarms, and configure traces in both applications to troubleshoot a problem.

Control Center

- The Control Center has moved to the Cisco Unified CCX Serviceability utility.
 - Tools > Control Center – Network Services
 - Tools > Control Center – Feature Services

Tools Help

Service Activation

Control Center - Network Services

Control Center - Feature Services

Datastore Control Center

Service Parameters

Performance Configuration and Logging

DB Services

	Service Name
<input type="radio"/>	Cisco Unified CCX Database
Desktop Services	
	Service Name
<input type="radio"/>	Cisco Desktop Recording and Playback Service
<input type="radio"/>	Cisco Desktop VoIP Monitor Service
<input type="radio"/>	Cisco Desktop Administrator Service
<input type="radio"/>	Cisco Desktop LDAP Monitor Service
<input checked="" type="radio"/>	Cisco Desktop Sync Service
<input checked="" type="radio"/>	Cisco Desktop Call/Chat Service
<input checked="" type="radio"/>	Cisco Desktop Agent E-Mail Service
<input checked="" type="radio"/>	Cisco Desktop Browser and IP Phone Agent Service
<input checked="" type="radio"/>	Cisco Desktop License and Resource Manager Service
<input checked="" type="radio"/>	Cisco Desktop Enterprise Service
<input checked="" type="radio"/>	Cisco Desktop Recording and Statistics Service

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The Control Center in Cisco Unified CCX Serviceability lets you do the following tasks:

- Start, stop, and restart Cisco Unified CCX services
- View the status of Cisco Unified CCX services
- Refresh the status of Cisco Unified CCX services

Cisco Unified CCX Serviceability provides two Control Center menu options to perform the above-mentioned tasks:

- Network Services—Required for your system to function
- Feature Services—Allows you to use application features such as Unified CCX Reporting Server

Installed automatically, Network Services includes services that the system requires to function, for example, database and system services. Because these services are required for basic functionality, you cannot activate them in the Service Activation window.

After the installation of your application, Network Services starts automatically. The list of services displayed in the Control Center - Network Services web page depends on the license package of your Cisco Unified CCX. If you have a Cisco Unified CCX Premium license, Cisco Unified CCX Serviceability categorizes the network services into the following categories, which are explained in the subsequent sections:

- System Services
- Admin Services
- DB Services
- Desktop Services

The Control Center - Network Services web page displays the following information for the network services:

- Name of the network services, their dependant subsystems, managers, or components
- Status of the service (IN SERVICE, PARTIAL SERVICE, or SHUT DOWN; for individual subsystems, the status could be OUT OF SERVICE or NOT CONFIGURED).
- Start time of the service
- Up time of the service

Control Center (Cont.)

- View Engine Status

System Services		Service Name	Status
○		Cisco Unified CCX SNMP Java Adapter	
○		Cisco Unified CCX Perfmon Counter Service	
○		Cisco Unified CCX DB Perfmon Counter Service	
○	▼	Cisco Unified CCX Cluster View Data	
	▶	Manager Manager	
○	■	Cisco Unified CCX Engine	IN SERVICE
	▶	Manager Manager	IN SERVICE
	▶	Subsystem Manager	IN SERVICE
○		Cisco Unified CCX Voice Subagent	
Admin Services			
	▼	Cisco Unified CCX Serviceability	
	▶	Manager Manager	
○		Cisco Unified CCX Administration	
		MRCP AGR Subsystem	NOT CONFIGURED
		Unified CM Telephony Subsystem	IN SERVICE
		Core RTR Subsystem	IN SERVICE
		CMT Subsystem	IN SERVICE
		Enterprise Server Data Subsystem	IN SERVICE
		RmCm Subsystem	IN SERVICE
		eMail Subsystem	NOT CONFIGURED
		MRCP TTS Subsystem	NOT CONFIGURED
		HTTP Subsystem	IN SERVICE
		Voice Browser Subsystem	IN SERVICE
		VOIP Monitor Subsystem	IN SERVICE
		Outbound Subsystem	IN SERVICE
		Database Subsystem	NOT CONFIGURED

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One of the main functions of the Cisco Unified CCX Engine is to provide for the many functions and features of Cisco Unified CCX. Each of the subsystems is used to interface or control these functions. Drill down under the Engine heading to view the status of the individual subsystems.

Disaster Recovery System

This subtopic summarizes the Disaster Recovery System.

Disaster Recovery System

- To access the Disaster Recovery System from the administrative web pages, use the Navigation drop-down menu.
- Use the Disaster Recovery System to perform these activities:
 - Schedule and execute database backups
 - Database restores

Backup ▾ Restore

- Backup Device
- Scheduler
- Manual Backup
- History
- Current Status

Restore ▾ Help ▾

- Restore Wizard
- History
- Status

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The Disaster Recovery System (DRS), which can be invoked from Cisco Unified Contact Center Express Administration, provides full data backup and restore capabilities for all servers in a Cisco Unified Contact Center Express cluster. The DRS allows you to perform regularly scheduled automatic or user-invoked data backups and to restore data after a failure.

In case of high availability, the DRS performs a cluster-level backup, which means that it collects backups for all servers in a Cisco Unified Contact Center Express cluster to a central location and archives the backup data to a physical storage device.

The DRS restores its own settings (backup device settings and schedule settings) as part of the platform backup/restore. DRS backs up and restores drfDevice.xml and drfSchedule.xml files. When the server is restored with these files, you do not need to reconfigure the DRS backup device and schedule settings.

The DRS includes the following capabilities:

- A user interface for performing backup and restore tasks
- A distributed system architecture for performing backup and restore functions
- Scheduled backups
- Archive backups to a physical tape drive or remote SFTP server

The DRS contains two key components, Master Agent (MA) and Local Agent (LA). The Master Agent coordinates backup and restore activity with Local Agents.

The system automatically activates both the Master Agent and the Local Agent immediately after installation on the server, and in case of high-availability setup, it is activated on all nodes in the cluster.

Cisco Unified OS Administration

This subtopic summarizes Cisco Unified OS Administration.

Cisco Unified OS Administration

- To access Cisco Unified OS Administration from the administrative web pages, use the Navigation drop-down menu.
- Use Cisco Unified OS Administration to perform these types of activities:
 - Show hardware, software, and network settings
 - Change IP, NTP, Time, SMTP, and version settings
 - Manage security, such as certificates and IPsec
 - Manage software upgrades and TFTP files

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Cisco Unified CCX, a member of the Cisco Unified Communications family of products, manages customer voice contact centers for departments, branches, or small- to medium-size companies planning to deploy an entry-level or mid-market contact center solution.

Cisco Unified Operating System Administration web interface in Cisco Unified CCX allows you to configure and manage the Cisco Unified Communications Operating System. For Cisco Unified CCX, you can perform many common system administration functions through the Cisco Unified Communications Operating System. Administration tasks include the following examples:

- Check software and hardware status
- Check and update IP addresses
- Ping other network devices
- Manage NTP servers
- Upgrade system software and options
- Manage server security, including IPSec and certificates
- Manage remote support accounts
- Restart the system

From the Show menu, you can check the status of various operating system components, including

- Cluster and node
- Hardware
- Network

- System
- Installed software and options
- IP preferences

From the Settings menu, you can view and update the following operating system settings:

- IP—Updates the IP addresses that were entered when the application was installed
- NTP Server settings—Configures the IP addresses of an external NTP server; add or delete an NTP server
- SMTP settings—Configures the SMTP host that the operating system will use for sending email notifications

From the Settings > Version window, you can choose from the following options for restarting or shutting down the system:

- Switch Versions—Switches the active and inactive disk partitions and restarts the system. You normally choose this option after the inactive partition has been updated and you want to start running a newer software version.
- Current Version—Restarts the system without switching partitions
- Shutdown System—Stops all running software and shuts down the server

The operating system security options enable you to manage security certificates and Secure Internet Protocol (IPSec). From the Security menu, you can choose the following security options:

- Certificate Management—Manages certificates and Certificate Signing Requests (CSR). You can display, upload, download, delete, and regenerate certificates. Through Certificate Management, you can also monitor the expiration dates of the certificates on the server.
- IPSEC Management—Displays or updates existing IPSEC policies; sets up new IPSEC policies and associations

From the Install/Upgrade menu option, you can upgrade system software from either a local disc or a remote server. The upgraded software gets installed on the inactive partition, and you can then restart the system and switch partitions, so the system starts running on the newer software version.

From the Services menu the application provides the following operating system utilities:

- Ping—Checks connectivity with other network devices
- Remote Support—Sets up an account that Cisco support personnel can use to access the system. This account automatically expires after the number of days that you specify.

Cisco Unified Serviceability

This subtopic summarizes Cisco Unified Serviceability.

Cisco Unified Serviceability

- To access Cisco Unified Serviceability from the administrative web pages, use the Navigation drop-down menu.
- Note that these items are **Unified Communications Operating System (UCOS)** specific options and settings.
- Use Cisco Unified Serviceability to perform these types of activities:
 - Enable and configure alarm levels
 - Trace-level configuration
 - Service activation (UCOS services)
 - Control center (UCOS services)
 - Audit log configuration
 - SNMP configuration

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Cisco Unified Serviceability, a web-based troubleshooting tool, provides the following functionality:

- Saves alarms and events for troubleshooting and provides alarm message definitions for both Cisco Unified CCX and the Cisco Unified Communications platform
- Saves trace information to various log files for troubleshooting
- Monitors real-time behavior of components through the Cisco Unified RTMT
- Provides audit capability by logging any configuration changes by a user or as a result of the user action
- Provides feature services that you can activate, deactivate, and view through the Service Activation window
- Provides an interface for starting and stopping feature and network services
- Generates and archives daily reports, for example, alert summary or server statistic reports
- Allows Cisco Unified CCX to work as a managed device for SNMP remote management and troubleshooting for both Unified CCX and the platform
- Monitors the disk usage of the log partition on a server
- Monitors the number of threads and processes in the system; uses cache to enhance the performance

Cisco Unified Serviceability provides the following reporting tools:

- Cisco Unified Real-Time Monitoring Tool (RTMT)—Monitors real-time behavior of components through RTMT; creates daily reports that you can access through the Serviceability Reports Archive. For more information, refer to the *Cisco Unified CCX Real-Time Monitoring Tool Administration Guide*.

- Serviceability Reports Archive—Archives reports that the Cisco Serviceability Reporter service generates

Command-Line Interface

This subtopic summarizes the CLI.

Cisco Unified CCX Command Line Interface

- The Command Line Interface (CLI) is the Linux interface of the Cisco Unified CCX machine.
- Access the CLI from a Telnet session or from the main console.
- Requires the platform user ID and password

```
Cisco Unified Contact Center Express 8.0.1.10000-11
MCS-Train40 login:
Cisco Unified Contact Center Express 8.0.1.10000-11
MCS-Train40 login: administrator
Password:
Last login: Sat May 15 02:17:36 on tty1
Command Line Interface is starting up, please wait ...

Welcome to the Platform Command Line Interface

VMware Installation:
 4 vCPU@2670Hz
 Disk 1: 80GB
 2048 Mbytes RAM

admin:_
```

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Cisco Unified CCX Command Line Interface (Cont.)

- Command help
 - Help command or use “?”
 - Use tab key or “?” to complete commands
- Type “quit” to end session.
- Categories of commands
 - Show
 - Provider information
 - Trace levels
 - Database information
 - Set
 - Trace and provider information
 - Run
 - SQL queries and stored procedures against the Cisco Unified CCX database

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UCCXD v. 8--260

Cisco Unified CCX Command Line Interface (Cont.)

- Categories of commands (Cont.)
 - Utils
 - Access and manipulate services and JTAPI client updates
 - Also used for system upgrade and shutdown commands
 - `Utils system shutdown <cr>`
 - File
 - Access and view files
 - High availability
 - Access database replication information
- See Cisco documentation for:
 - Cisco Unified CCX CLI commands, Command Line Interface Reference Guide for Cisco Unified Contact Center Express
 - All other CLI commands, Command Line Interface Reference Guide for Cisco Unified Communications Solutions

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The CLI contains all the command-line capabilities that can be executed from the main console. There are a large variety of commands that may be issued from the console that may be summarized as:

- File management
- Set commands, such as network, domain, passwords, and time zones, among others
- Show commands, such as status, database information, registry, SMTP, traces, and others
- Utilities (Utils) commands, such as database replication, disaster recovery, network utilities, system upgrade, and system shutdown

Summary

This topic summarizes the key points that were discussed in this lesson.

Summary

- CTI ports and CTI route points are devices in Cisco Unified Communications Manager. These devices are created and modified from Cisco Unified CCX Administration.
- Most of the management functions are performed from Cisco Unified CCX Administration. The most fundamental are the Script, Prompt, and User Management pages.
- Subsystems are used to communicate with other services. They provide a means to apply a database and interact with other devices to affect Cisco Unified CCX operations.
- There are various tools available to help operate and maintain Cisco Unified CCX. These include Agent Desktop and Supervisor Desktop, Real-Time Reporting, Historical Reporting Client, and Desktop Work Flow Administrator.
- Use the Supervisor and User web pages to perform functions specific to those roles.
- Cisco Desktop Work Flow Administrator is used to set up many basic and advanced contact center functions. These include defining or setting up Reason Codes, Wrap Data, and CTI activities.

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Summary (Cont.)

- The Cisco Desktop Administrator is used to set up additional basic and advanced contact center functions. These include defining or setting up Enterprise Data, Silent Monitor options, Cisco Unified Presence for chat, and Agent Email.
- Use Cisco Unified CCX Serviceability to access the Control Center and Datastore Control Center, and to set alarm and trace levels.
- Use the Disaster Recovery System for backup and restore operations.
- Use Cisco Unified OS Administration to access hardware, software, network, and security settings. Also use this page for upgrade functions.
- Use Cisco Unified Serviceability to access the UCOS Control Center and Datastore Control Center, and to set alarm and trace levels.
- Use the Cisco Unified CCX Command Line Interface to perform a variety of command-line activities.

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Call Process and Basic Cisco Unified Contact Center Express Configuration

Overview

Cisco Unified Contact Center Express (CCX) has certain requirements to accept and handle calls, whether it is deployed as Cisco Unified IP Interactive Voice Response (IVR) or some version of Cisco Unified CCX. This lesson covers those basic terms, concepts, and configuration requirements needed to establish and service a call.

Objectives

Upon completing this lesson, you will be able to understand the call flow process and set up configuration properties to accept a call. This ability includes being able to meet these objectives:

- Define terms associated with the call flow process
- Describe the call flow process
- Describe the basic configurations required to accept a call
- Describe Configuration Wizards

Terms Defined

This topic describes terms used in the call flow process.

Terms Defined

- **Java Telephony Application Programming Interface (JTAPI):** Cisco Unified Communications Manager uses JTAPI as an interface for communicating with external applications for call control purposes.
- **Cisco Unified Communications Manager Telephony Provider:** A reference to those Cisco Unified Communications Manager machines that provide call control activities for Cisco Unified CCX.
- **Call Control Group:** A grouping of CTI ports on Cisco Unified CCX.
- **Dialog Groups:** A grouping of dialog channels used to allow DTMF and/or ASR type of dialogs to Cisco Unified CCX.
- **Script:** The program, or set of instructions, that provides the call logic used to determine the caller's experience in Cisco Unified CCX.
- **Default Script:** Used to gracefully remove a caller from the Cisco Unified CCX system.
- **Application:** A database entry that contains various attributes that ultimately calls a script to run.
- **Trigger:** The first Cisco Unified CCX point of contact for a call. The trigger sets certain attributes and ensures appropriate physical resources are available and allocated to answer a call.

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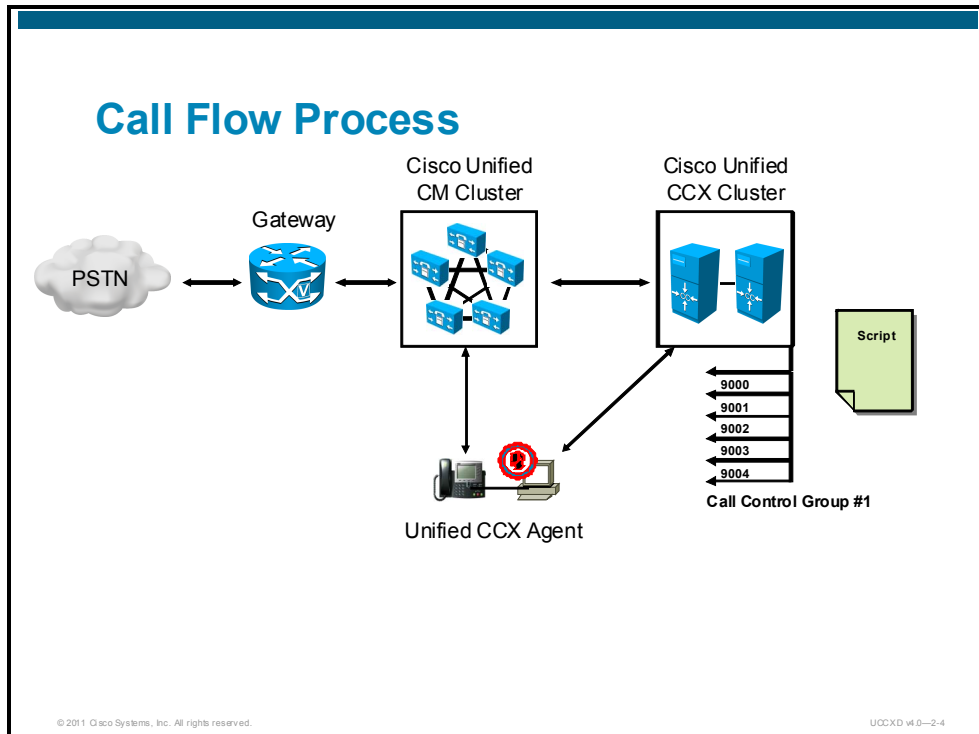
UCCXD v4.0-2.3

Some terms used in the call flow process are defined as follows:

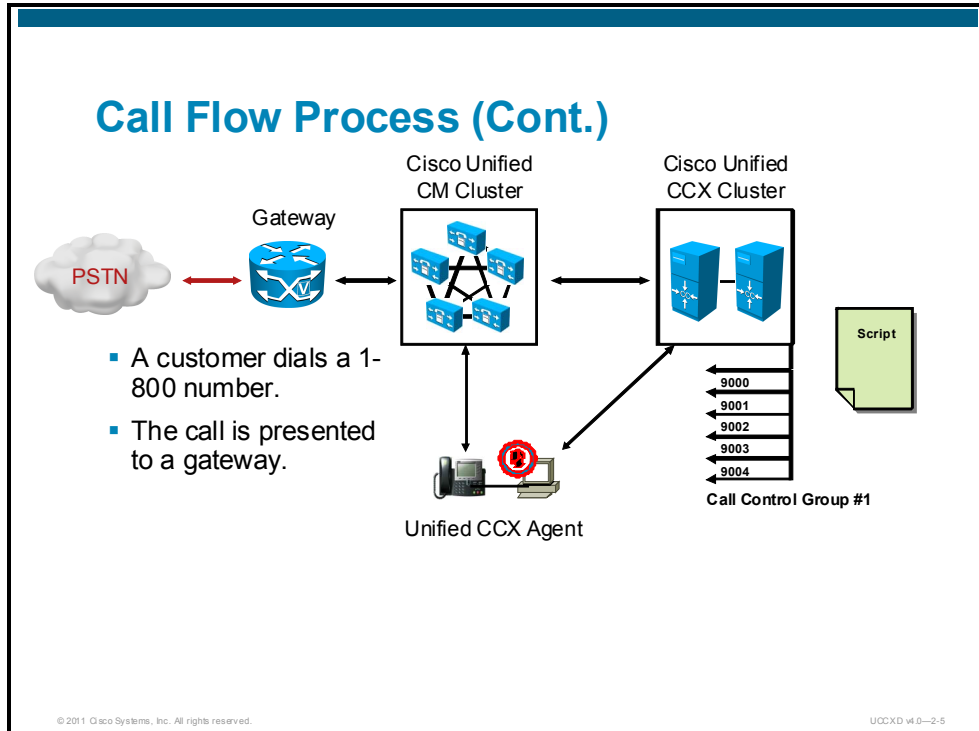
- **Java Telephony Application Programming Interface (JTAPI):** Cisco Unified Communications Manager uses JTAPI as an interface for communicating with external applications for call control purposes.
- **Cisco Unified Communications Manager Telephony Provider:** A reference to those Cisco Unified Communications Manager machines that provide call control activities for Cisco Unified CCX.
- **Call Control Group:** A grouping of computer telephony integration (CTI) ports on Cisco Unified CCX.
- **Dialog Groups:** A grouping of dialog channels used to allow dual tone multifrequency (DTMF) and Automatic Speech Recognition (ASR)-types of dialogs to Cisco Unified CCX.
- **Script:** The program, or set of instructions, that provides the call logic used to determine the caller experience in Cisco Unified CCX.
- **Default Script:** Used to gracefully remove a caller from the Cisco Unified CCX system.
- **Application:** A database entry that contains various attributes and ultimately calls a script to run.
- **Trigger:** The first Cisco Unified CCX point of contact for a call. The trigger sets certain attributes and ensures that appropriate physical resources are available and allocated to answer a call.

Call Flow Process

This topic describes the call flow process.

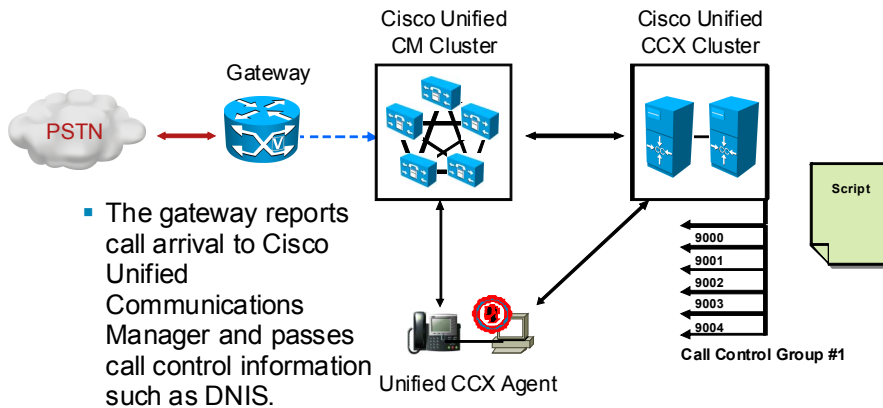


These components are involved in the call flow process.



A caller dials a 1-800 number and is passed to a gateway.

Call Flow Process (Cont.)

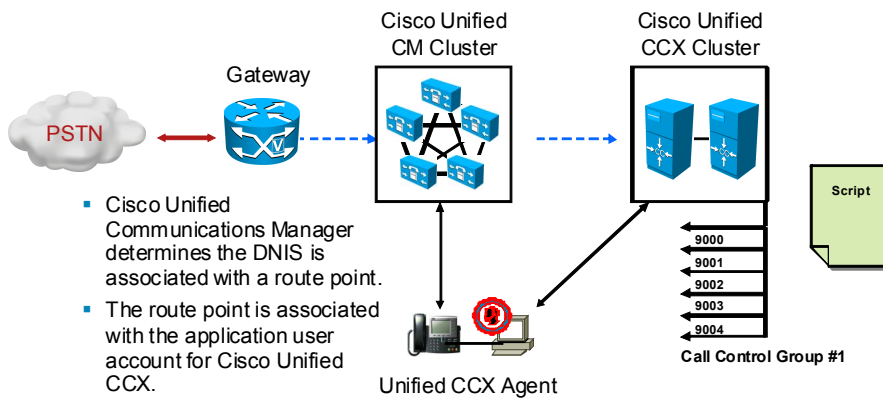


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Call control information is passed to Cisco Unified Communications Manager.

Call Flow Process (Cont.)

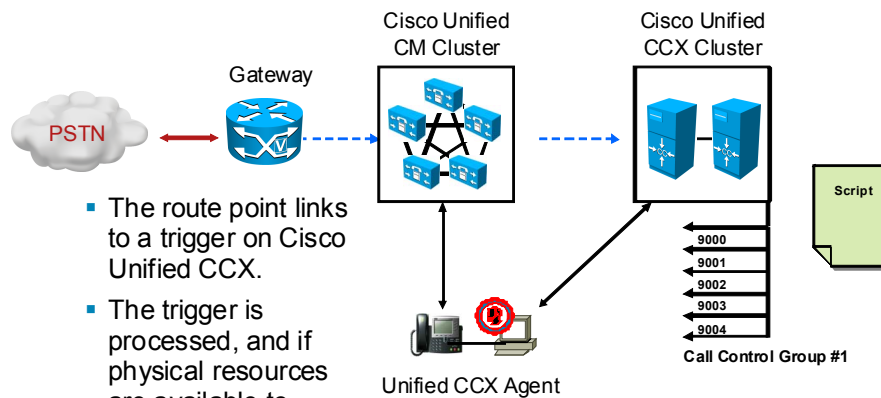


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Based on the incoming Dialed Number Identification Service (DNIS), Cisco Unified Communications Manager sees that the number is a directory number on a route point. Because the route point is associated with the Application User account for Cisco Unified CCX, Cisco Unified Communications Manager will pass call control to Cisco Unified CCX.

Call Flow Process (Cont.)



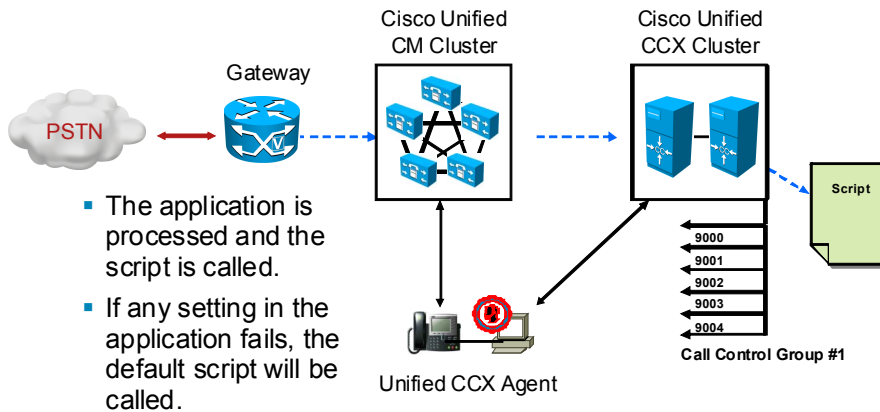
- The route point links to a trigger on Cisco Unified CCX.
- The trigger is processed, and if physical resources are available to answer the call, logic will pass to the application. If not, the call is rejected.

On Cisco Unified CCX, the route point links to a trigger. During trigger processing, certain attributes are set for the call. Some of these attributes directly relate to physical resources required to service a call. If these resources are not available, the call must be rejected. For a call to be answered you must have the following:

- A session available
- A CTI port available
- A dialog channel
- The trigger enabled

If call logic succeeds the trigger, Cisco Unified CCX *will* answer the call. Call logic now proceeds to the application.

Call Flow Process (Cont.)

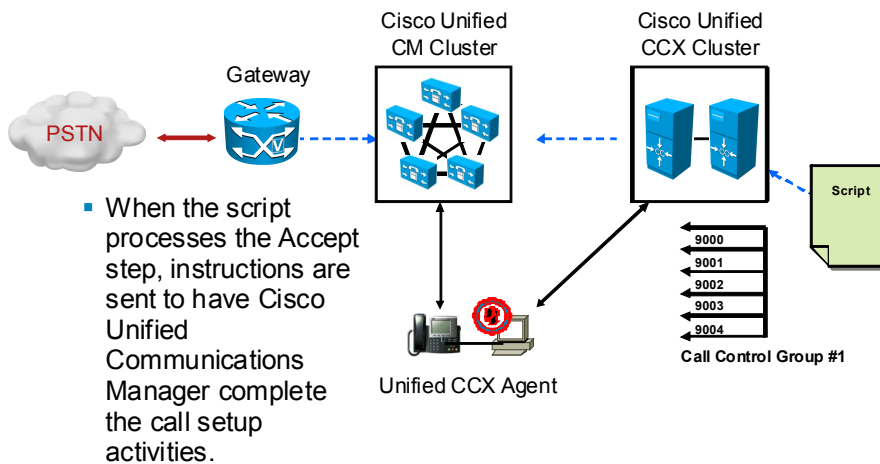


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At the application, if the application is enabled and a session is available, the script is called to run. If the application is not enabled, or a session is not available, or the script is invalid, the default script is called to run. In the event that the default script is invalid, the system default script will run, announcing a system error, and will then hang up.

Call Flow Process (Cont.)

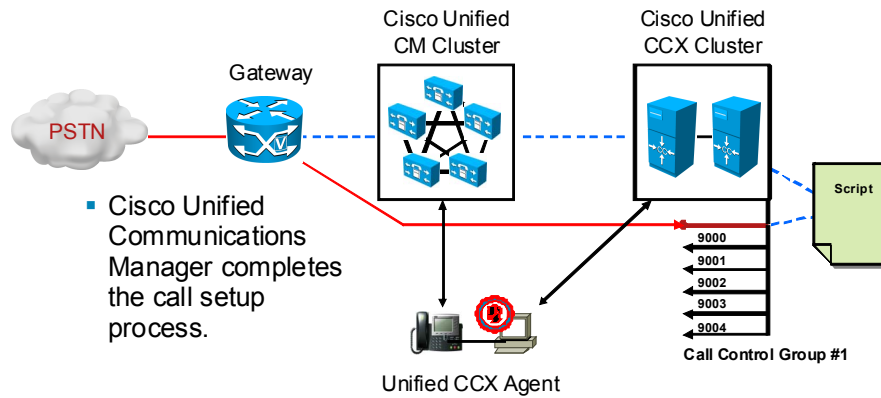


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UCCXD v4.0-2.10

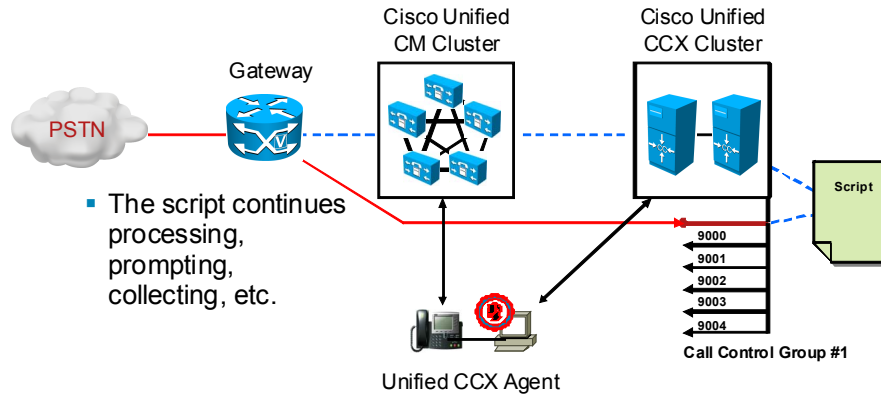
When the script is executed, an Accept step in the script signals Cisco Unified CCX to complete the call setup process with Cisco Unified Communications Manager.

Call Flow Process (Cont.)



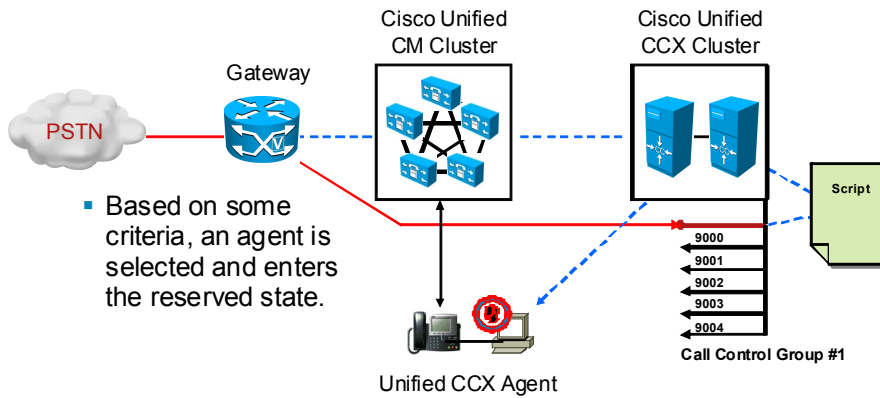
The call is connected to Cisco Unified CCX.

Call Flow Process (Cont.)



Normal script processing occurs.

Call Flow Process (Cont.)

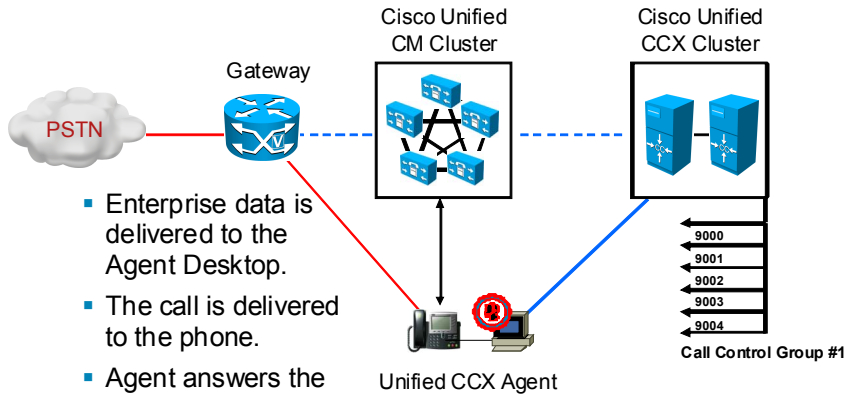


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When the decision process has completed, an agent is reserved.

Call Flow Process (Cont.)



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UCCXD v4.0-2-14

The call is delivered to an agent.

Basic Cisco Unified CCX Configuration

This topic describes those configuration items that must be in place for a call contact to occur.

Order of Basic Configuration

- **Telephony provider:** You must have a valid connection to Cisco Unified Communications Manager. Cisco Unified CCX connects to a CTI Manager on Cisco Unified Communications Manager.
- **CTI ports:** Groups of CTI ports are created on Cisco Unified Communications Manager from Cisco Unified CCX Administration.
- **Dialog groups:** A Dialog Group must be in place to allocate the appropriate DTMF or ASR resources for caller input.
- **Prompts:** Prompts must be uploaded to the repository for use by a script.
- **Script:** A valid script must be uploaded into the repository.
- **Application:** Create an application that calls a script.
- **Trigger:** Create a trigger that points to an application.

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UCCKD v4.0-2.16

These configuration items must be in place for a call contact to occur:

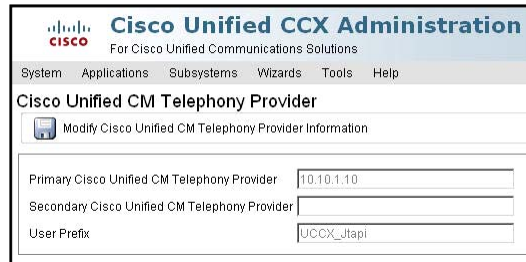
- **Telephony provider:** You must have a valid connection to Cisco Unified Communications Manager. Cisco Unified CCX connects to a CTI Manager on Cisco Unified Communications Manager.
- **CTI ports:** Groups of CTI ports are created on Cisco Unified Communications Manager from Cisco Unified CCX Administration. CTI ports must be in place for any call contact to occur.
- **Dialog groups:** A dialog group must be in place to allocate the appropriate DTMF or ASR resources for caller input.
- **Prompts:** Prompts must be uploaded to the repository for use by a script.
- **Script:** A valid script must be uploaded into the repository. An application will call a script to run.
- **Application:** Create an application that calls a script.
- **Trigger:** Create a trigger that points to an application. When a trigger is created, a route point is also created on Cisco Unified Communications Manager that is associated with the Cisco Unified CCX Application user account. This provides a pointer on Cisco Unified Communications Manager, indicating that the call is destined for Cisco Unified CCX.

Cisco Unified Communications Manager Telephony Provider

This subtopic discusses the Cisco Unified Communications Manager telephony provider.

Cisco Unified CM Telephony Provider

- Fields are prefilled from the server setup process.
- To modify fields, choose System > Cisco Unified CM Configuration.



The screenshot shows the Cisco Unified CM Telephony Provider configuration page. The page title is "Cisco Unified CM Telephony Provider" and it is part of the "Cisco Unified CCX Administration" interface. The page contains a navigation menu with "System", "Applications", "Subsystems", "Wizards", "Tools", and "Help". Below the navigation menu, there is a section titled "Cisco Unified CM Telephony Provider" with a sub-section "Modify Cisco Unified CM Telephony Provider Information". The form contains three input fields: "Primary Cisco Unified CM Telephony Provider" with the value "10.10.1.10", "Secondary Cisco Unified CM Telephony Provider" (empty), and "User Prefix" with the value "UCCX_utapi".

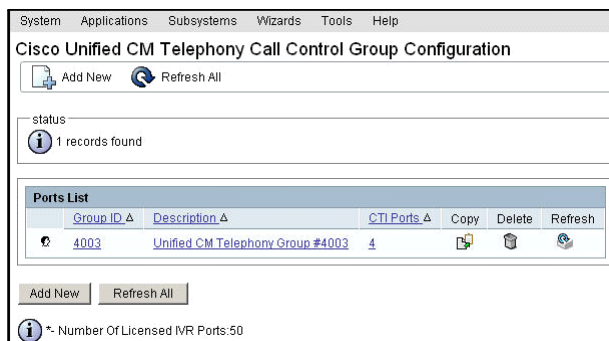
The Cisco Unified CM Telephony Configuration page displays the configured Unified Communications Manager CTI Managers and the user prefix for the associated application user accounts. Fields on this page can be modified on the System > Cisco Unified CM Configuration page.

Create Cisco Unified Communications Manager Telephony Call Control Groups

This subtopic discusses the Cisco Unified Communications Manager telephony call control groups.

Create Cisco Unified CM Telephony Call Control Groups

- Choose Subsystems > Cisco Unified CM Telephony > Call Control Group.
- Click Add New to add a new call control group.



Navigate to **Subsystems > Cisco Unified CM Telephony > Call Control Group**. Click **Add New** to create a new group.

Create Cisco Unified CM Telephony Call Control Groups (Cont.)

Enter:

- Group ID
- Number of CTI ports
- Media termination support
- Device name prefix
- Select server (not shown? used for HA over WAN deployments only)
- Starting directory number

Group Information	
Group ID*	<input type="text" value="4003"/>
Description	<input type="text" value="Unified CM Telephony Group #2"/>
Number Of CTI Ports*	<input type="text" value="4"/>
Media Termination Support*	<input type="radio"/> Yes <input checked="" type="radio"/> No

Directory Number Information	
Device Name Prefix*	<input type="text" value="CTIP"/>
Starting Directory Number*	<input type="text" value="4003"/>
Device Pool	<input type="text" value="Default"/> <input type="button" value="Add Device Pools"/>
DN Calling Search Space	<input type="text" value="None"/>
Location	<input type="text" value="Hub_None"/>
Partition	<input type="text" value="None"/>

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UCCXD v4.0-2.19

Enter these values:

- **Group ID:** Enter a unique numerical value. This value often corresponds to the starting directory number for ease of management, but this is not a requirement.
- **Number of CTI Ports:** Enter the number of CTI ports (per Cisco Unified CCX server) to create for this group. For example, if you have high availability and you enter 4, 8 ports will be created on Cisco Unified Communications Manager (four for each Cisco Unified CCX server).
- **Media Termination Support:** Choose **Yes** to allow auto creation of a Media Termination Dialog Group.
- **Device Name Prefix:** Provide a name for the CTI ports.
- **Starting Directory Number:** Enter the starting directory number that Cisco Unified CCX will use when creating these ports on Cisco Unified Communications Manager. Ports are created in a contiguous fashion. For example, if you specified four ports beginning with 4013 and had high availability, the ports created would be: 4013 – 4016 for the active Cisco Unified CCX server, and 4017 – 4020 for the standby server.

Create Cisco Unified CM Telephony Call Control Groups (Cont.)

- Enter additional Cisco Unified Communications Manager attributes, such as Calling Search Spaces and Partitions.

The screenshot displays the configuration page for a Cisco Unified CM Telephony Call Control Group. It is divided into three main sections:

- Advanced Directory Number Information:** Includes fields for 'Alerting Name ASCII' (set to CTIP), 'Redirect Calling Search Space' (set to Redirect Party), and 'Media Resource Group List' (set to None).
- Directory Number Setting:** Includes fields for 'Voice Mail Profile' (None), 'Presence Group' (Standard Presence group), 'Require DTMF Reception' (radio buttons for Yes and No, with Yes selected), 'AAR Group' (None), 'User Hold Audio Source' (None), and 'Network Hold Audio Source' (None).
- Call Forward and Pickup Settings:** Includes 'Call Pickup Group' (None), 'Display' (empty text field), and 'External Phone Number Mask' (empty text field).

Ensure that you enter additional Cisco Unified Communications Manager attributes, such as Device Pools, Locations, Partitions, and Calling Search Spaces.

High Availability over WAN Options

In high availability over WAN deployments, CTI ports often will have different Cisco Unified Communications Manager attributes, such as Device Pools and Regions. If you have a high availability over WAN deployment, there will be an additional field that occurs after the “Device Name Prefix” field.

- **Select Server for Telephony Port Group Configuration:** In the high availability over WAN setup, you need to configure directory information along with Cisco Unified Communications Manager-specific information for the ports in each node. Once you select a node, all configuration details displayed below this field will be specific to the selected node only. So, if you update any node-specific parameters (below the Select Server field), they will be applicable only to the ports specific to the selected node. But, if you update any configuration data above the Select Server field, it will be applicable to the ports in both the nodes, except for the Number of CTI Ports field.

Note You need to ensure that the values in the Number of CTI Ports field for both the nodes are the same. If you modify this field, the number of ports is modified for the selected node only as the device pool selection for both nodes could be different in a high availability over WAN deployment. If you click Add before updating this value for either of the nodes, then the port group for that node will be marked with a red cross in the main Cisco Unified CM Telephony Call Control Group Configuration web page to signify that the number of ports between the two nodes is different and the other node should also be updated. In such a scenario, click the hyperlink for the node that is tagged in red, and from the Cisco Unified CM Telephony Call Control Group Configuration page for the selected node, update the value in the Number of CTI Ports field and click Update to ensure the number of CTI ports for both the nodes is the same.

Create Cisco Media Termination Dialog Groups

This subtopic discusses the Cisco Media Termination Dialog Groups.

Create Cisco Media Termination Dialog Groups

- A default CMT Dialog Group is created as part of Cisco Unified CCX setup.
- Choose Subsystems > Cisco Media. Add a new Dialog Group.
- Groups are used to allow or disallow allocation of DTMF resources.

Cisco Media Termination Dialog Group Configuration

Add New Refresh All

Status
2 records found

Group ID	Description	Channels	Copy	Delete	Refresh
0	Default	50			
4008	Cisco Media Group #4008	4			

Add New Refresh All

*- Number Of Licensed IVR Ports :50

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Navigate to **Subsystems > Cisco Media**. Click **Add New** to add a new group.

Create Cisco Media Termination Dialog Groups (Cont.)

- Group ID
- Description
- Number of licensed IVR ports
- Maximum number of channels

Status
Status : Ready

Group ID : 4008
Description : Cisco Media Group #4008
Number Of Licensed IVR Ports : 50
Maximum Number Of Channels* : 4

Update Delete Cancel

*- Indicates required item

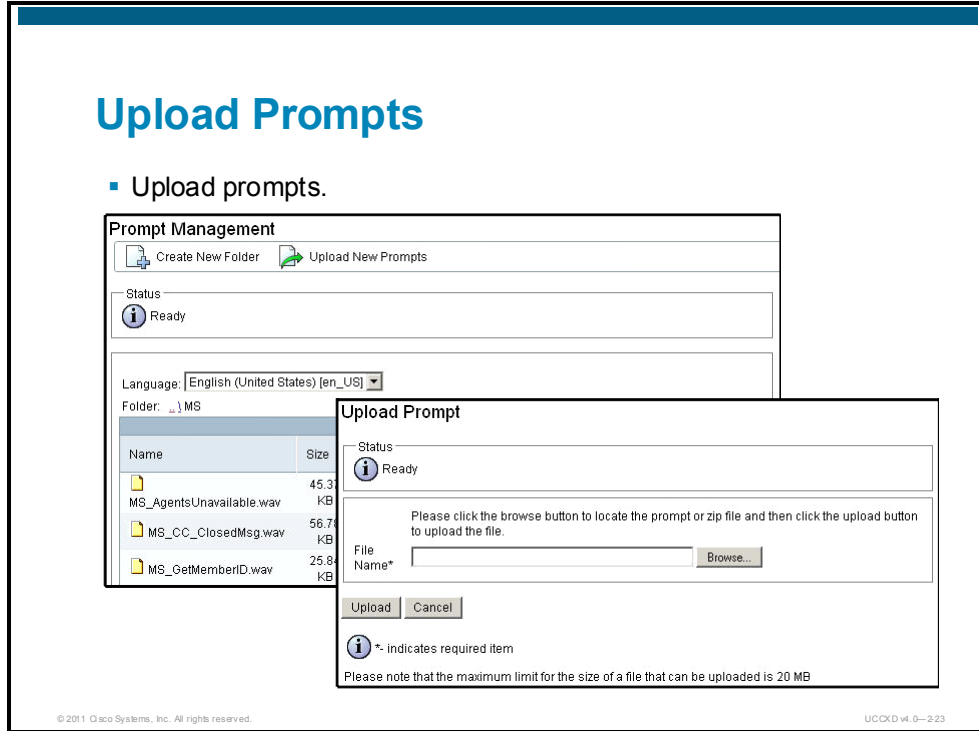
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UCCXD v4.0-222

Enter a unique group ID, a description, and the maximum number of channels that you want for this group.

Upload Prompts

This subtopic discusses how to upload prompts.



Navigate to **Applications > Prompt Management**. Click **Upload New Prompts**, browse to your file (.wav or .zip), and click **Upload**.

Upload Script

This subtopic discusses how to upload a script.

The screenshot displays the 'Script Management' interface with an 'Upload Script' dialog box open. The dialog box contains the following elements:

- Status:** Ready
- Instructions:** Please click the browse button to locate the script or zip file and then click the upload button to upload the file.
- File Name*:** A text input field with a 'Browse...' button next to it.
- Buttons:** 'Upload' and 'Cancel' buttons.
- Legend:** An information icon followed by the text '*- indicates required item'.
- Footer:** A note stating 'Please note that the maximum limit for the size of a file that can be uploaded is 20 MB'.

The background interface shows a table with the following data:

Name	Size	Date Modified	Modified By	Delete	Rename	Refresh
aa.aef	91.2	04/05/2010 10:35:31 PM				
lcd.aef						
rmon.aef						
SNU.aef						

Navigate to Applications > Script Management. Click **Upload New Scripts**, browse to script file (.aef or .zip), and click **Upload**.

Create Application

This topic discusses how to create an application.

Create Application

- Click Add New.
- Application type is Cisco Script Application.

The screenshot displays the 'Application Management' interface. At the top, there are 'Add New' and 'Refresh All' buttons. Below this is a 'Status' section indicating '1 records found'. The main area is an 'Application List' table with columns for Name, ID, Sessions, Enabled, Delete, Copy, Refresh, and Summary. A single application named 'App00' is listed with ID '0' and '4' sessions. Below the table are 'Add New' and 'Refresh All' buttons. An 'Add A New Application' dialog box is open, showing a 'Next' button with a green arrow and a 'Cancel' button with a red X. The dialog prompts the user to 'Select the type of application you would like to create:' and shows 'Application Type*' as 'Cisco Script Application' in a dropdown menu. At the bottom of the dialog are 'Next' and 'Cancel' buttons, and a note: '* indicates required item'.

Navigate to **Applications > Application Management**. Click **Add New** to add a new application. Choose **Cisco Script Application** for application type and click **Next**.

Create Application (Cont.)

Enter:

- Name
- ID
- Maximum number of sessions
- Script
- Enabled
- Default script
- Click add.

The screenshot shows the 'Cisco Script Application' configuration window. At the top, there are buttons for 'Add', 'Cancel', and 'Back to Application List'. Below this is a 'Status' section showing 'Status: Ready'. A message box states 'Triggers can be added after application is created.' The main form fields are: 'Name *' (text input), 'ID*' (text input with '1' entered), 'Maximum Number of Sessions*' (text input), 'Script*' (dropdown menu with '- No Selection -' and an 'Edit' button), 'Description' (text input), 'Enabled' (radio buttons for 'Yes' and 'No'), and 'Default Script' (dropdown menu with '- System Default -' and an 'Edit' button'). At the bottom, there are buttons for 'Add', 'Cancel', and 'Back to Application List', along with an information icon and the text '* indicates required item'.

Enter these values:

- **Name:** A unique name
- **ID:** A unique ID number
- **Maximum Number of Sessions:** Enter a number indicating the number of active calls you are willing to allow on Cisco Unified CCX for this application, concurrently. If the number of active calls already present on Cisco Unified CCX for this application equals this value, the default script will be called to run.
- **Script:** Use the drop-down list to choose a script to run.

Note User scripts, scripts that you create, are designated as: SCRIPT[FileName.aef]. System scripts that come with the system are designated as SSCRIPT[FileName.aef].

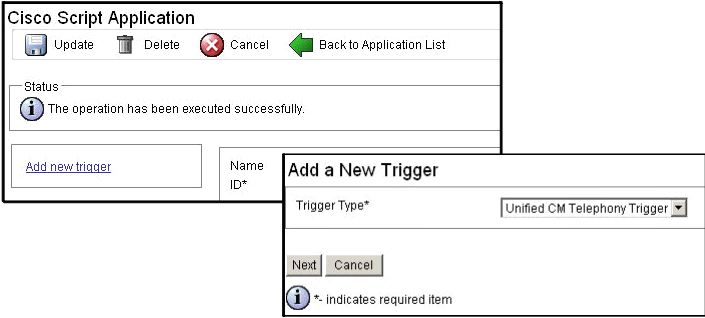
- **Description:** Enter a description for this application.
- **Enabled:** Yes or No. If no, the default script will be called to run.

Create Unified Communications Manager Telephony Triggers

This subtopic discusses how to create Cisco Unified Communications Manager triggers.

Create Cisco Unified CM Telephony Triggers

- From the Application page, click Add New Trigger.
- Choose trigger type: Unified CM Telephony Trigger.
- Click Next.



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From the Application page just created, click **Add new Trigger**.

Note An alternate method of adding a trigger would be to go to the Cisco Unified Communications Manager Telephony subsystem. Adding triggers there has an advantage when you are adding multiple triggers because of a copy function. This is especially helpful if multiple triggers are to be created for the same application.

Choose Cisco Unified Communications Manager Telephony Trigger for the Trigger Type, and click **Next**.

Create Cisco Unified CM Telephony Triggers (Cont.)

- Directory number
- Language
- Application name and description
- Call control group
- Enabled
- Maximum number of sessions
- Media termination

Directory Information	
Directory Number*	<input type="text" value="1002"/>
Trigger Information	
Language*	<input type="text" value="- System Default -"/> <input type="button" value="Edit"/>
Application Name*	<input type="text" value="App01"/>
Device Name*	<input type="text" value="00"/>
Description*	<input type="text" value="For App 00"/>
Call Control Group*	<input type="text" value="None"/>
Advanced Trigger Information	
Enabled	<input checked="" type="radio"/> Yes <input type="radio"/> No
Maximum Number Of Sessions	<input type="text" value="Default"/> <small>Unchecked: Default value is same as Number of Sessions set on the Application</small>
Idle Timeout (in ms)	<input type="text" value="5000"/>
Override Media Termination	<input type="radio"/> Yes <input checked="" type="radio"/> No

Create Cisco Unified CM Telephony Triggers (Cont.)

- Configure other attributes as required.
- Click Add.

CTI Route Point Information			
Alerting Name ASCII	<input type="text" value="1002"/>		
Device Pool	<input type="text" value="Default"/>		
Location	<input type="text" value="Hub_None"/>		
Directory Number Settings			
Partition	<input type="text" value="None"/>		
Voice Mail Profile	<input type="text" value="None"/>		
Calling Search Space	<input type="text" value="None"/>		
Calling Search Space for Redirect	<input type="text" value="Address Search Space"/>		
Presence Group	<input type="text" value="Standard Presence group"/>		
Call Forward and Pickup Settings			
	Voice Mail	Destination	Calling Search Space
Forward Busy	<input type="checkbox"/>	<input type="text"/>	<input type="text" value="None"/>
Line Settings			
Display	<input type="text"/>		
External Phone Number Mask	<input type="text"/>		

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UCCKD v4.0-229

Enter these values:


- **Directory Number:** Enter a directory number that this trigger will be associated with. When this trigger is created, a route point will be created on Cisco Unified Communications Manager with this directory number. The route point will also be associated to the application user account associated to Cisco Unified CCX.
- **Language:** Choose the language to be used for this call. It may be relevant to have multiple triggers associated to an application so that different sets of callers can automatically use a different set of language prompts. If this is not possible or practical, the language setting can be modified in the script based on caller input.
- **Application Name:** Because you got here from the Application page, this value will already be in place. If you are creating a trigger from the Subsystems menu, you will need to choose the Application Name for this trigger.
- **Call Control Group:** Choose a call control group with an appropriate number of CTI ports for this trigger. If these ports all become busy, the next call will be rejected.
- **Enabled:** Yes or No. If no, the call will be rejected.
- **Maximum Number of Sessions:** Enter a number indicating the number of active calls that you are willing to allow on Cisco Unified CCX for this trigger, concurrently. If the number of active calls already present on Cisco Unified CCX for this trigger equals this value, the call will be rejected. Choosing Default means to accept the same number that is defined on the application to which this trigger is associated.

Configuration Wizards

This topic describes configuration wizards available in Cisco Unified CCX.

Configuration Wizards

- Configuration wizards provide an ordered list of procedures to complete a configuration process.
 - Application Wizard
 - RmCm Wizard



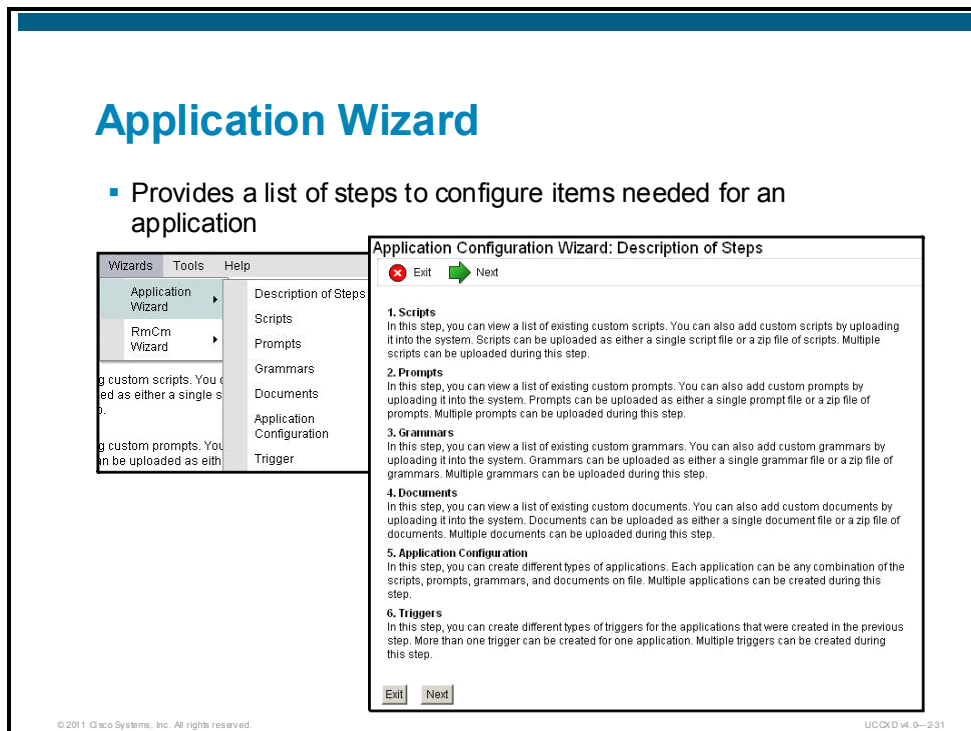
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Effective with Cisco Unified CCX Release 5.0, the Wizards menu of the Cisco Unified CCX Administration web interface provides access to the wizards available for your Cisco Unified CCX system.

In each Wizard web page, you are provided with a list of procedures in the left pane and a description of each procedure in the main pane. At the top of the page, you have the option to exit the wizard at any time or to go to the next step, as required. You can also jump to any other step by clicking on the required procedure in the left pane.

Application Wizard

This subtopic discusses the Application Wizard.



Application configuration is one of the very basic requirements in Cisco Unified CCX Administration. You need to complete several steps in the suggested order to successfully complete application configuration. The Application Configuration Wizard leads you through the suggested steps.

Select **Wizards > Application Wizard** from the Cisco Unified CCX Administration menu bar to access the Application Wizard.

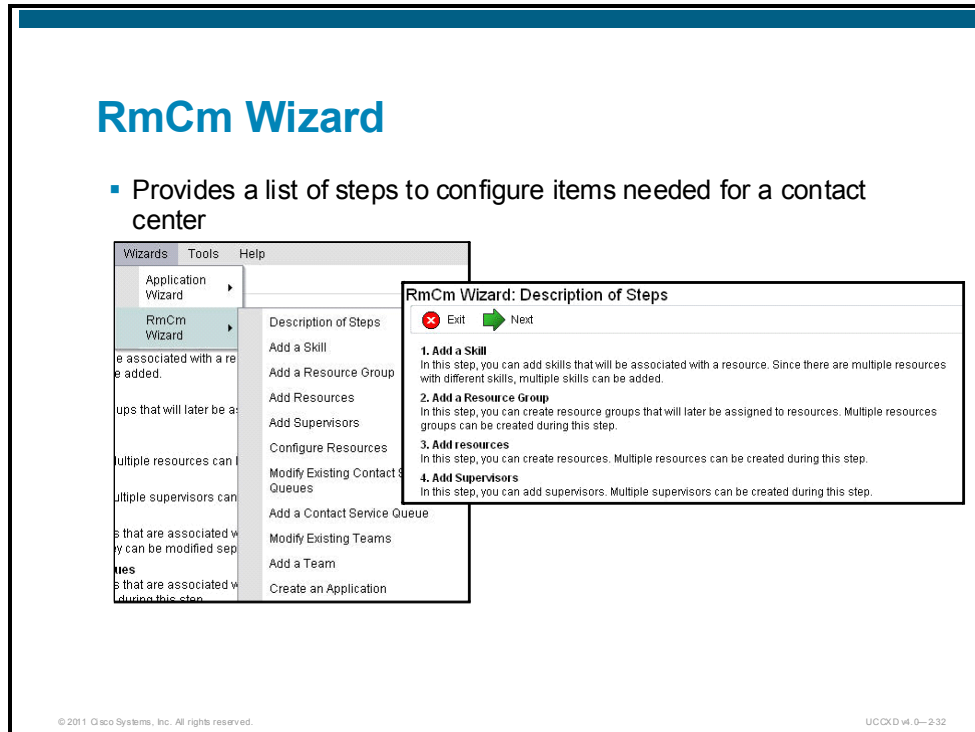
The Application Wizard web page contains the following hyperlinks:

- **Description of Steps:** Choose this option to review the order in which to perform the configuration and for a description of each stage in the process. You can jump to any step directly, or click **Next** to proceed to the next step.
- **Scripts:** Choose this option to upload multiple custom scripts. In this step, you are transferred to the Script Management web page, which lists the available scripts and provides links to create a folder and upload scripts.
- **Prompts:** Choose this option to upload multiple prompt files. In this step, you are transferred to the Prompt Management web page, which lists the available prompts and provides links to create new folders and upload prompts.
- **Grammars:** Choose this option to upload multiple grammar files. In this step, you are transferred to the Grammar Management web page, which lists specific grammar files to recognize and respond to caller prompts.
- **Documents:** Choose this option to upload multiple document files. In this step, you are transferred to the Document Management web page, which lists the available .txt, .doc, .xml, .jsp, or .html custom classes, and Java Archive (JAR) files that allow you to customize the performance of your Cisco Unified CCX system.

- **Application Configuration:** Choose this option to select the type of application to be configured. In this step, you are transferred to the Application Configuration page (to select the name and maximum number of sessions), after selecting the type of application to be configured.
- **Trigger:** Choose this option to complete the trigger configuration. In this step, you are transferred to the Trigger Configuration page. By default, the application configured in the previous step is automatically selected. On providing the directory number, device name, and language, the trigger configuration is complete.

RmCm Wizard

This subtopic discusses the RmCm Wizard.



RmCm configuration is a commonly performed procedure in the contact center environment. You need to complete several steps in the suggested order to successfully complete RmCm configuration. The RmCm Configuration wizard leads you through the suggested steps.

Select **Wizards > RmCm Wizard** from the Cisco Unified CCX Administration menu bar to access the RmCm Wizard.

The RmCm Wizard web page contains the following hyperlinks:

- **Description of Steps:** Choose this option to review the order in which to perform the configuration and for a description of each stage in the process. You can jump to any step directly or click **Next** to proceed to the next step.
- **Add a Skill:** Choose this option to configure the skills to be associated with the user. In this step, you are transferred to the RmCm Configuration Skills web page to add a new skill. Click **OK** to repeat this step to create multiple skills, or click **Cancel** to continue.
- **Add a Resource Group:** Choose this option to configure a resource group to be associated with the user. In this step, you are transferred to the RmCm Configuration Resource Groups web page to add a new resource group. Click **OK** to repeat this step to create multiple groups, or click **Cancel** to continue.
- **Add Resources:** Choose this option to add new resources in Cisco Unified Communications Manager. In this step, you are transferred to the RmCm Configuration web page with a hyperlink to add resources in Cisco Unified Communications Manager. This link invokes Cisco Unified Communications Manager automatically.
- **Add Supervisors:** Choose this option to assign supervisor privileges to a user. In this step, you are transferred to the User Management web page, which allows you to search for and modify a specific user.

- **Configure Resources:** Choose this option to add or remove skills that are associated with resources. In this step, you are transferred to the RmCm Configuration Resources web page, which lists the configured resources. Resources can be modified together to obtain the same skills, or they can be modified separately to be assigned different skills.
- **Contact Service Queues:** In this optional step, you can either create a new CSQ or modify an existing CSQ by adding more skills.
 - **Modify Existing Contact Service Queues:** Choose this option for skills that are associated with a contact service queue. In this step, you are transferred to the RmCm Configuration Contact Service Queue web page, which lists the configured CSQs.
 - **Add a Contact Service Queue:** Choose this option to add contact service queues. Skills or resource groups are associated to these contact service queues in order to filter out the resources. In this step, you are transferred to the RmCm Configuration Contact Service Queue Configuration web page, which allows you to add CSQs.
- **Teams:** In this optional step, you can either create a new team or modify an existing team. Supervisors, resources, and contact service queues are associated to these teams.
 - **Modify Existing Teams:** Choose this option to modify agents in existing teams. In this step, you are transferred to the RmCm Configuration Contact Teams web page, which lists the configured teams.
 - **Add a Team:** Choose this option to create new teams and associate those teams with new agents. In this step, you are transferred to the RmCm Configuration Team Configuration web page, which allows you to create new teams.
- **Create an Application:** On completing the RmCm configuration, you can optionally proceed to the Application Wizard configuration.

Summary

This topic summarizes the key points that were discussed in this lesson.

Summary

- There are many terms that are unique to Cisco Unified CCX. Understanding these terms is essential to understanding the call flow process.
- Understanding the call flow process is key to understanding how Cisco Unified CCX operates and provides a solid basis for troubleshooting. Regardless of the deployment model used, all calls must follow these basic steps to connect to Cisco Unified CCX.
- There are certain fundamental requirements before calls can be processed. You must have:
 - A valid script with associated prompts
 - An application to call a script
 - A trigger pointing to an application
- Use configuration wizards, Application and RmCm, if you want a step-by-step presentation of configuration requirements.

Module Summary

This topic summarizes the key points that were discussed in this module.

Module Summary

- Cisco Unified CCX now uses the Cisco UCOS installer, and with the exception of some Cisco Unified CCX-specific options, installs much like Cisco Unified Communications Manager. Cisco Unified CCX 8.0(x) supports upgrades from versions 5.0(2) and 7.0(1).
- Most of the common management pages are in the same locations as in previous versions. There are many new management pages that come with UCOS: Command Line Interface, Cisco Unified OS Administration, Cisco Unified CCX Serviceability, Cisco Unified Serviceability, and Disaster Recovery System.
- The call flow process is fairly straightforward and provides good knowledge of how Cisco Unified CCX operates and provides a strong basis for troubleshooting. Basic configuration properties follow the same flow as the call flow, but in reverse. Create and upload a script, create an application that calls a script, and create a trigger that points to an application.

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Cisco Unified Contact Center Express Scripting

Overview

This lesson describes Cisco Unified Contact Center Express (CCX) Script Editor and how it is used to create application scripts. In this module, you will install and use the script editor to create and troubleshoot your own basic IVR scripts.

Module Objectives

Upon completing this module, you will be able to install and use Cisco Unified CCX Script Editor. This ability includes being able to meet these objectives:

- Describe how to install and use the script editor and perform many of the tasks needed to create or modify a script. This includes creating variables, placing script steps, validating a script, and debugging a script.
- Describe how to create a basic IVR script that will accept a call and play a prompt.
- Describe how to prompt for and collect information from a caller by using the appropriate script steps, such as the Get Digit String and the Menu step.
- Describe the processes used to set up and access an external database. This includes setting up JDBC and the Database subsystem, and using database script steps.
- Describe how to create loops and counters and to make decisions using the appropriate script steps found in the script editor.
- Describe how to confirm caller inputs and use other prompt generation steps.

Cisco Unified Contact Center Express Script Editor

Overview

The Cisco Unified Contact Center Express (CCX) Script Editor is a fundamental component of Cisco Unified CCX. No customer interactions can happen without a valid script.

Understanding Cisco Unified CCX scripting is an essential part of understanding what Cisco Unified CCX can do, and often has a direct effect on customer satisfaction.

Objectives

Upon completing this lesson, you will be able to describe the major functions of the script editor and how to use them. This ability includes being able to meet these objectives:

- Describe how to install the script editor
- Describe how to access and use the script editor
- Describe the Palette, Design, Variable, and Message windows
- Describe variables, what they are used for, and how to create, edit, and delete them
- Describe the expression editor and its fundamental properties
- Illustrate the four steps of script management: Validate, Save, Upload, and Refresh
- Describe the basic properties of debugging
- Contrast reactive vs. nonreactive debugging
- Define debugging tools on the toolbar
- Describe how to start and view a debug session

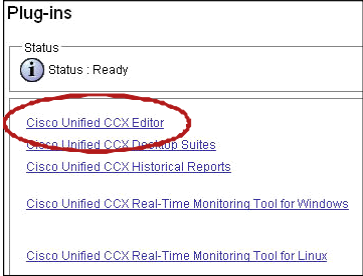
Installing the Cisco Unified CCX Script Editor

The Cisco Unified CCX Script Editor is the tool used by application designers to create scripts using the steps authorized with the product licenses.

This topic discusses the installation process for the Cisco Unified CCX Script Editor.

Installing the Cisco Unified CCX Script Editor

- The Cisco Unified CCX Script Editor permits the designer to create scripts using logic steps organized in a logical sequential manner.
- The script editor may be installed on your workstation.
 - Windows XP Pro, SP2, and SP3
 - Windows Vista Ultimate and Business
- Install on your workstation from Cisco Unified CCX Administration:
 - **Tools > Plug-ins > Cisco Unified CCX Editor**

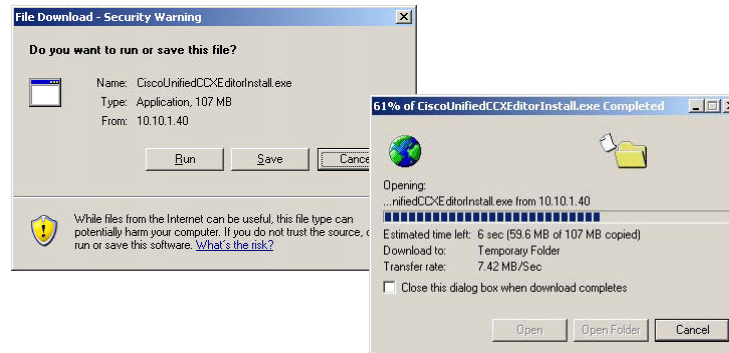


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The Cisco Unified CCX Script Editor is a visual scripting tool that allows the user to drag and drop steps from the Palette window to the appropriate logical location in the Design window. Steps are the smallest building blocks in a script. This is the only tool that Cisco Unified CCX uses to build scripts, and thus it is important to utilize the tool effectively.

Installing the Cisco Unified CCX Script Editor (Cont.)

- Navigate to **Tools > Plug-ins > Cisco Unified CCX Editor**.
- Click **Run** to download the Cisco Unified CCX Editor Installer.
- Open.



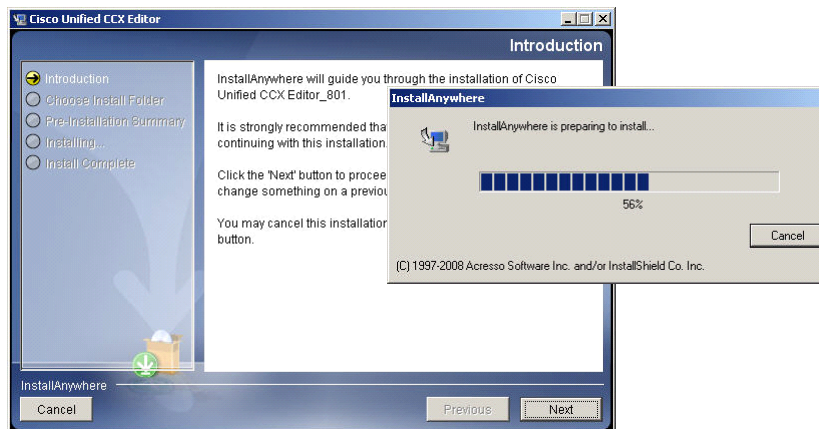
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Click the appropriate link in Cisco Unified CCX Administration to start the installation process. You may run the file, which automatically starts the installation, or you may save the executable file, which should be run after the download finishes.

Installing the Cisco Unified CCX Script Editor (Cont.)

- Preparing to install.
- Click Next.



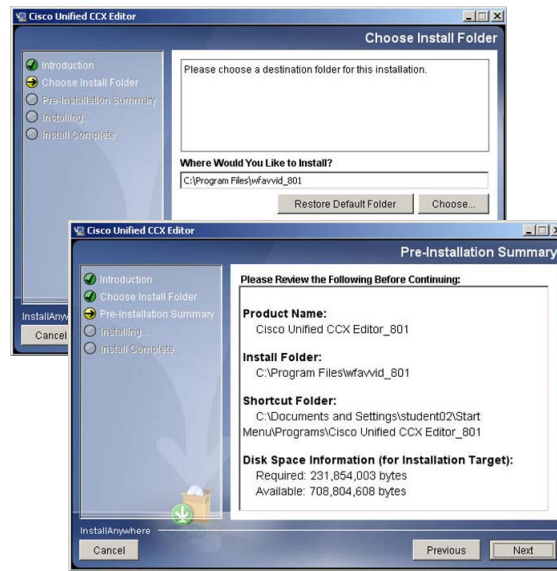
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Click Next at the introduction dialog box.

Installing the Cisco Unified CCX Script Editor (Cont.)

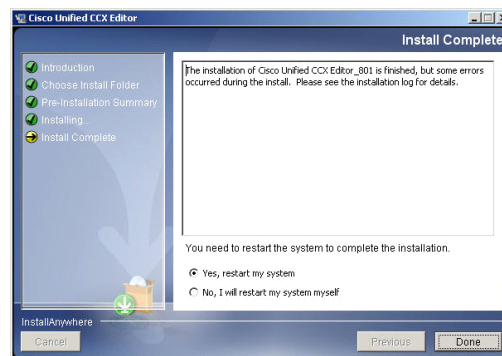
- Choose Install folder.
- Click Next.



Choose the install folder. Accepting the default folder is best. In the summary window, click Next.

Installing the Cisco Unified CCX Script Editor (Cont.)

- Click Done.
- Reboot if required.



Click Done when finished. Reboot the system if required. You are now ready to start the editor.

Knowing Your Script Editor

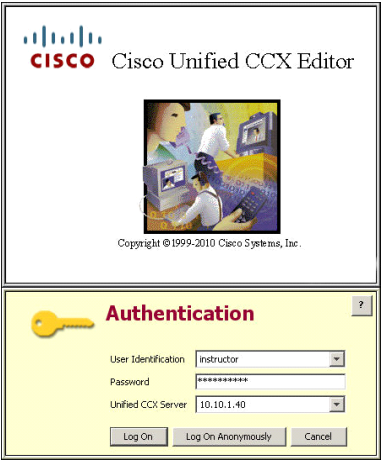
This topic covers the basic properties of using the script editor.

Starting the Script Editor

This subtopic discusses logging in to the script editor.

Starting the Script Editor

- Start the script editor from **Start > Programs > Cisco Unified CCX Editor_801 > Cisco Unified CCX Editor**.
- Log into any Cisco Unified CCX server of the same version.
- If you log in anonymously:
 - Cannot upload directly to script repository
 - Cannot test script



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When you open the script editor, you will be presented with the Login dialog box. You should enter these values:

- User Identification: A Cisco Unified Communications Manager user ID (Unified CCX Administrator)
- Password: Cisco Unified Communications Manager user password
- Unified CCX Server: IP address of Cisco Unified CCX server

It is possible to log in anonymously, which means you can open the editor, but not be attached to a Cisco Unified CCX system. This method of logging in has an advantage in that you can open a script at any time, but it also has serious disadvantages in that you cannot do much with it. You can view a script, change it, and save it. But you cannot test the script or upload it to the repository. To log in anonymously, remove all field entries and press Log On Anonymously.

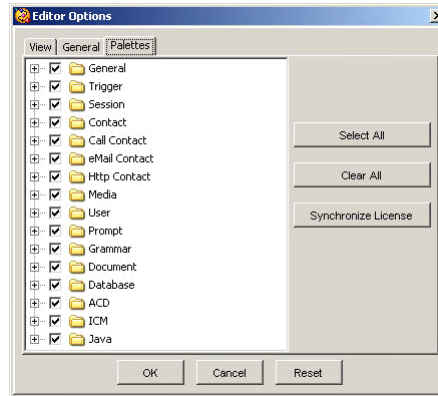
Note The first time you log into your script editor, you must attach to a Cisco Unified CCX server. After that you may log in anonymously.

Synchronize License with Cisco Unified CCX Engine

This subtopic describes the license synchronization between the Cisco Unified CCX server and the script editor.

Synchronize License with Engine

- If unlicensed steps are included in a script, the script causes license violation.
- Synchronize License button hides unlicensed steps.
- Cisco Unified CCX script editor must be logged into Cisco Unified CCX server.
- **Settings > Options > Palettes.**
- Example: Enhanced.

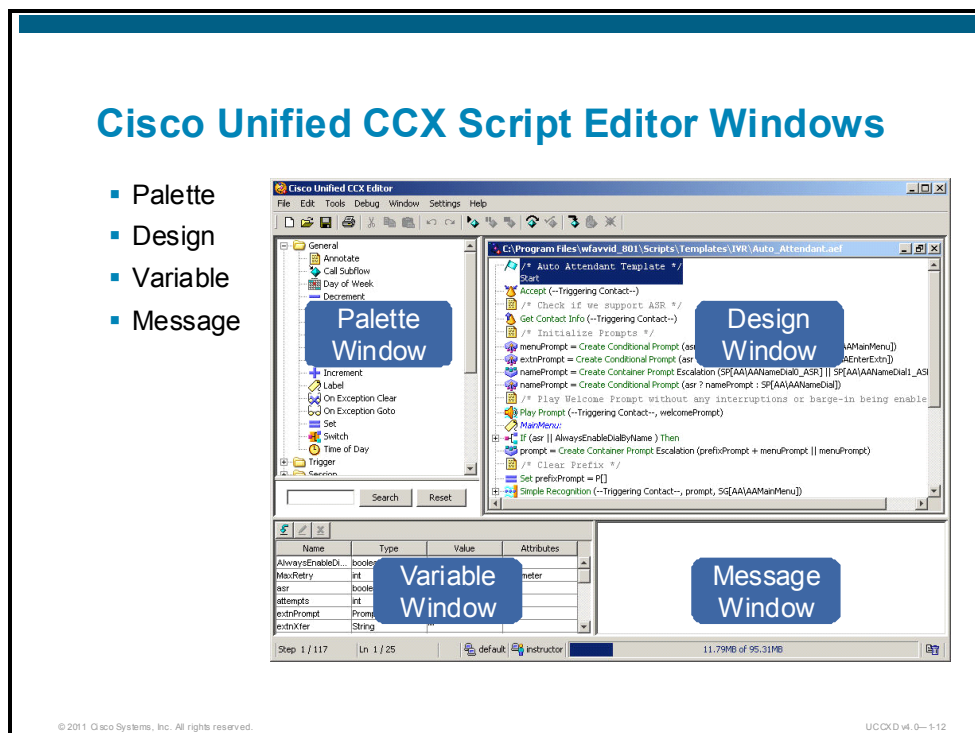


Feature availability and script step availability are dependent on licensing. Even when you log into the script editor, it has no awareness of the licensing available on the Cisco Unified CCX system you are connected to. Therefore, unless you synchronize the licenses, the script editor will allow you to use any script editor step—even if you are not allowed to. Everything will work fine, and there will be no outward appearance of problems. The problems will begin when you upload the script. When you upload the script, the Cisco Unified CCX system also validates the script and will note any license violations. If there is a license violation, any application that points to that script will be placed out of service.

The Synchronize License button lets you display steps that are licensed. The Synchronize License button is available to communicate with the cluster and will automatically show or hide Palette steps according to the currently installed licenses.

Cisco Unified CCX Script Editor Windows

There are four window areas on the Cisco Unified CCX Script Editor interface.



The script editor is the development environment for creating, modifying, testing, and debugging scripts. It is a visual scripting tool that allows you to drag and drop steps from the Palette window to the Design window. These steps are the building blocks of a script.

The Cisco Unified CCX Script Editor is divided into four windows:

- Palette window
- Design window
- Variable window
- Message window

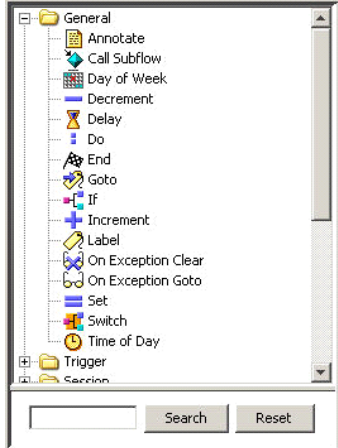
You can resize the editor windows to allow for better observation of the variables and their values. Most of the resizing will be saved.

Palette Window: Folders and Steps

The Palette window provides a list of the steps available for script development.

Palette Window: Folders and Steps

- Steps are Java beans.
- Customizable logic is used.
- Folders contain steps.
- Steps can be dragged and dropped” into adjacent design window.
- Use Search to find steps.
- Reset closes all folders.



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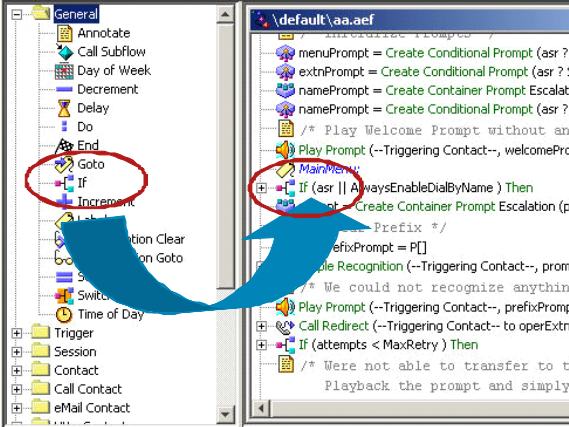
The steps are organized in folders that contain sets of related steps. Steps are available as a function of the licensing. If you do not know where a step is but you know the name or part of the name, you can use the Search function to display the steps that match the search criteria. Reset closes all the folders.

Design Window: Drag and Drop

Steps can be dragged and dropped into the Design window to create the logic for a call.

Design Window: Drag and Drop

- Logic flow of script, top to bottom.
- Drag and drop steps:
 - Highlight step and drag.
 - Point to the step that the new step will follow.
 - Release and drop.



The screenshot shows the Design Window interface. On the left is a palette of script steps under the 'General' category, including Annotate, Call Subflow, Day of Week, Decrement, Delay, Do, End, Goto, If, Increment, List, List Clear, List Goto, Switch, and Time of Day. On the right is the script editor for a file named '\default\aa.aef'. The script contains several steps, including 'Create Conditional Prompt', 'Create Container Prompt Escalate', 'Play Welcome Prompt without an', 'Play Prompt (--Triggering Contact--, welcomePrc', 'Main Menu', 'If (asr || AlwaysEnableDialByName) Then', 'Create Container Prompt Escalation (p', 'Prefix */', 'PrefixPrompt = P[]', 'able Recognition (--Triggering Contact--, prom', '/* We could not recognize anythin', 'Play Prompt (--Triggering Contact--, prefixPromp', 'Call Redirect (--Triggering Contact-- to operExtn', 'If (attempts < MaxRetry) Then', and '/* Were not able to transfer to t Playback the prompt and simply'. A red circle highlights the 'If' step in the palette, and another red circle highlights the 'If' step in the script editor. A blue arrow points from the palette 'If' step to the script editor 'If' step.

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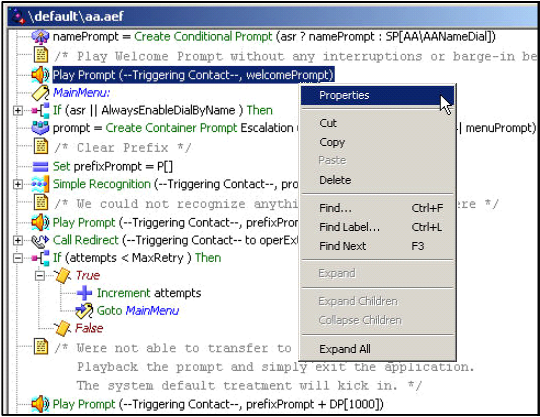
The Design window provides a workspace for script step assembly. Drag the step icon from the Palette window and drop it onto the step it follows. To change the order of the steps, you can drag the icons from the old location to the new location. To delete a step, select the icon and press Delete.

Design Window: Step Properties

Most steps have properties to define and specify the desired step functionality.

Design Window: Step Properties

- Right-click on step for Properties option.
- There is an optional setting in script editor to allow double-click to open customizer.
- Accesses the customizer for that step.
- Each type of step has different properties.



The screenshot shows a script editor window titled 'default\aaa.aef'. The script contains several steps, including 'namePrompt = Create Conditional Prompt', 'Play Prompt', 'MainMenu', 'If (asr || AlwaysEnableDialByName) Then', 'prompt = Create Container Prompt Escalation', '/* Clear Prefix */', 'Set prefixPrompt = P[]', 'Simple Recognition', '/* We could not recognize anything */', 'Play Prompt', 'Call Redirect', 'If (attempts < MaxRetry) Then', 'True', 'Increment attempts', 'Goto MainMenu', 'False', '/* Were not able to transfer to', 'Playback the prompt and simply exit the application.', 'The system default treatment will kick in. */', and 'Play Prompt'. A context menu is open over the 'MainMenu' step, showing options: Cut, Copy, Paste, Delete, Find... (Ctrl+F), Find Label... (Ctrl+L), Find Next (F3), Expand, Expand Children, Collapse Children, and Expand All.

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To display the step properties, right-click the icon to display a menu, and choose Properties.

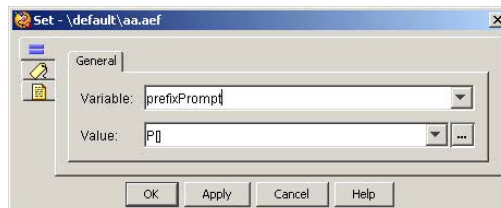
To enable the Double-click to Open Customizers setting, check the option on the General tab under Settings > Options in the script editor.

Design Window: Customizer

The customizer allows you to define the step properties.

Design Window: Customizer

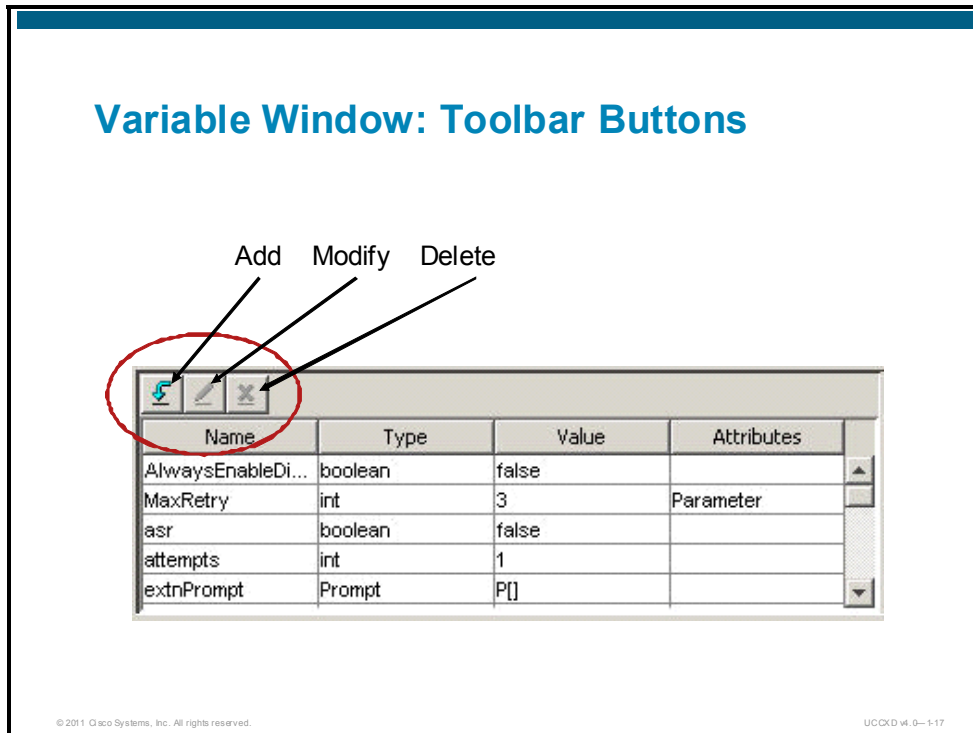
- Customizer defines step properties.
- Example: Specifies what value to set for a variable
- Other examples: Specifies what prompt to play or what database to access
- Each step has a different customizer.



Select the Properties option to display the customizer. The customizer allows you to define the properties for each step.

Variable Window: Toolbar Buttons

The Variable window allows you to create, modify, and view the local script variables.



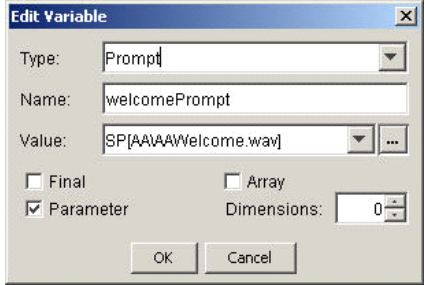
Use the Variable window toolbar buttons to add, delete, and modify variables.

Variable Window: Edit

To create a variable, click the New Variable button at the top of the Variable window. This displays the Edit Variable window. Define a name, type, and value (optional) for the new variable.

Variable Window: Edit

- To create or modify variables
- Many variable data types
 - Integer
 - String
 - Boolean
 - Many more
- See “Expression Language Reference Guide”



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A fundamental concept to programming is the concept of a variable. But before addressing that concept, you must consider what a program is and what it does. A program (or script) is all about accepting some input, doing some work based on that input, and producing an output. When input, or data, is provided, the script must be able to do some work on that data to provide some output. Now we can address, “What is a variable, and what does it do for me?” Simply put, a variable is a storage container a program uses to store data. Once a program has appropriate variable information, it can use these variables for making decisions and for output purposes.

For example, consider the auto-attendant program. When you dial the number for the auto-attendant, it asks you if you want to dial by number or dial by name. You are asked to press 1 for one option or 2 for the other. When you make this choice, what happens to your input? Your input must be placed into a variable. This variable can then be used by another step to determine what you indicated so it can branch off to the appropriate logic you requested. Additionally, since you pressed 1, the program branched to logic that now asks you what number you want to be transferred to. When you input a directory number, where does this value go? It goes into another variable. Another step will use this variable to determine where to transfer the call.

You must also know that a program (or script), is inherently ignorant. It is only as smart or knowledgeable as you allow it to be. For this reason, you must be meticulous about providing information to the script that it requires to perform its tasks. This also extends to variables. When you declare a variable, you must provide some basic information about this variable:

- **Type:** There are many different data types. The script must know what kind of data it has to deal with. Different data types define to the script what kind of data it is, and thus, the set of rules it can follow to use or manipulate that data.

- **Name:** This is a reference the script will use to indicate where the data is stored.
- **Value:** When a script starts, it initializes all the variables and provides a starting value. Depending on the data type, you may be disallowed from entering an initialized value, allowed to enter a value, or required to enter a value. Note that you can enter a specific value or you can enter an *expression* providing a dynamic result. For example, you could have a string data type variable you have designated as a date. You could enter a static value of “5/12/2009”, or you could enter an expression that results in today’s current date being the initialized value.

The following is a list of variable types available in the Cisco Unified CCX Script Editor.

- **Byte:** A Byte type variable represents an integer value with a value range from -128 to +127. Examples:
 - 23
 - -45
- **Contact:** A Contact type variable represents an internal contact. All media type steps (Play Prompt, Menus, Get Digit String, and so forth) have a contact field that is used to define which contact to act upon. For example, an incoming call that triggers an application that calls a script is the triggering contact for that script. To play a prompt to that caller, you are playing a prompt to that triggering contact. To continue the example, if during processing of the same script, you wanted to initiate a phone call to another person (or contact), you would have to create another contact type variable and then place a call to that new contact. You can then play prompts to your new contact by specifying that contact in the Contact field. Contacts are also used to specify email and http type contacts.
- **Short:** A Short type variable represents an integer value with a value range of -32768 to +32767. Examples:
 - 3456
 - -3456
- **User:** A User type variable represents a configured Cisco Unified Communications Manager user. A user variable can be returned by steps such as Name To User, Get User, or the Select Resource step, and is used in other steps to extract information from the variable.
- **Session:** A Session type variable is used to reference a session. When a voice contact (phone call) triggers an application to call a script, a session is created by the system and is used to maintain information about the contact activities. As the contact moves within the Cisco Unified CCX system, information can be tagged and stored in the session to be retrieved at a later time by another script. A Session variable can be thought of as a shopping cart in a web application. You cannot manually give a Session variable a value. Session variables can only be returned from the Get Contact Info step (Contact palette) or the Get Session step (Session palette).
- **Prompt:** A Prompt type variable contains information about what to play to a caller when a call is passed to a Media step. It can reference audio files in the prompt repository or on disk, concatenation of multiple prompts, or more complicated types of prompts. Examples:
 - **P[]:** Indicates a prompt to be found in the user prompts area on disk. Enter a string value in between the brackets as a path and a .wav filename.
 - **SP[]:** Indicates a prompt to be found in the system prompts area on disk. Enter a string value in between the brackets as a path and a .wav filename.
 - **P[AA\AAWelcome.wav]:** An example of a user-defined prompt located in the User Prompts directory. The directory path (AA\) is subordinate to the language directory.

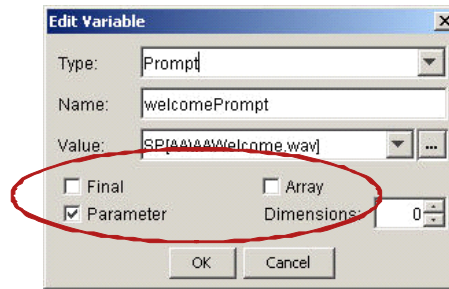
- **Grammar:** The Grammar type variable represents different options to an automatic speech recognition (ASR) application that can be selected by a caller using a Media input step (such as the Menu step). A Grammar variable can represent grammars uploaded to the grammar repository or created using some of the existing steps. Examples:
 - **G[], SG[]:** An empty grammar (No value gets recognized.)
 - **G[grammar.grxml]:** A user-defined grammar located in the User Grammars directory
- **Language:** A language attribute is used to point to particular sets of directories so that a script knows which set of resources (prompts, grammars, and so forth) to use. A Language type variable is used to determine which directories are being used and, if necessary, change the language setting. Examples:
 - L[en_US]
 - L[fr_CA]
- **Currency:** The Currency type variable is used to identify a given currency, such as the American Dollar (USD), and is useful when creating generated currency prompts that need to be tailored based on a given currency. Examples:
 - C[USD]
 - C[CAD]
- **Iterator:** The Iterator variable corresponds to the Java java.util.Iterator class.
- **Boolean:** A Boolean type variable only has two states: true or false. It is used to indicate whether something is true or false, on or off, or 0 or 1. For example, when considering an ASR operation, an ASR resource is allocated (or not) based on an ASR dialog channel being specified and available at the trigger when call setup logic processes the trigger. It seems evident that, for any call, ASR may or may not be supported. Therefore, it may seem reasonable that there is a system attribute called “ASRSupported.” This is indeed true, that there is a system attribute called “ASRSupported,” and it must have a value of true or false. You would use a Boolean data type variable to obtain this value from the system. You could then customize your script to handle a caller differently based on whether ASR is available or not.
- **Character:** A Character type variable can contain a character, such as the letters in an alphabet. Examples:
 - ‘a’, ‘1’, ‘Z’
 - Any escape sequence: ‘\t’, ‘\r’, ‘\0’, ‘\n’, ‘\f’, ‘\’, ‘\’
- **Document:** A Document type variable can be any type of document, such as a file, a URL, or a recording. Examples:
 - FILE[C:\Documents\mydoc.txt]
 - URL[http://evbuweb/mydoc.asp?number=23]
 - TEXT[Some text to be stored in document]
- **Float:** A Float variable consists of decimal numbers. Examples:
 - 3.14159
 - 2E-12
 - -100

- **Integer:** An Integer variable consists of whole numbers, ranging from -2147483648 to 2147483647 inclusive. Examples:
 - 234556789
 - 0
 - -23
- **String:** A String variable consists of a set of Unicode characters, from “\u0000” to “\uffff” inclusive. They can be viewed as a string of characters. Strings are set within quotes (“Some string value”). Examples:
 - “Hello”, “C:\WINNT\win.ini”: Supports any escape characters or Unicode characters.
 - u“\”This is a quoted string\”, u“\tHello,” u“\u2222\u0065,” u“C:\\WINNT\\win.ini”: Supports the same escape sequences or Unicode characters described for the Character type.
- **Date:** The Date variable contains date information. Examples:
 - D[now]
 - D[12/13/52]
 - D[Dec 13, 1952]
- **Time:** The Time variable contains time information. Examples:
 - T[now]
 - T[3:39 AM]
 - T[11:59:58 PM EST]
- **BigDecimal:** The BigDecimal variable consists of an arbitrary-precision integer along with a scale, where the scale is the number of digits to the right of the decimal point. Examples (same as Float variable):
 - 3.14159 DB
 - 2E-12 DB
 - -100 DB
- **BigInteger:** The BigInteger variable represents arbitrary-precision integers. Examples (same as Integer variable):
 - 234556789 IB
 - 0 IB
 - -23 IB
- **Double:** The Double variable represents an expanded Float variable. Examples (same as Float variable):
 - 3.14159 D
 - 2E-12 D
 - -100 D

- **Long:** The Long variable is an expanded Integer variable. Examples (same as Integer variable):
 - 234556789 L
 - 0 L
 - -23 L

Variable Window: Edit (Cont.)

- Final
- Parameter
- Array
- Dimensions



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Cisco Unified CCX variables offer additional attributes to a variable. They are Final, Parameter, and Array.

The script editor evaluates initial values for variables before the first step in the script is executed. For example, an expression such as <new Date()> would be evaluated at the time the script executes, and results in a data object representing the current date.

- **Final:** If checked, marks the variable as one that cannot have its value changed after it has been initialized. Such a variable is known as a constant and can be used to define other nonfinal variable initial values.
- **Parameter:** If checked, allows the initialized value to be modified from the Application Management web interface.
- **Array:** If checked, defines the variable as an array, seen by the ending square brackets([]) on the variable type.
- **Dimensions:** If the variable is set as an array, you must indicate the number of dimensions for this array:
 - If set at 0, then the variable cannot be an array.
 - If set to 1, the variable is a one-dimensional array. To use an analogy, a one-dimensional array is like declaring (or using) a single row in an Excel spreadsheet.
 - If set to 2, the variable is a two-dimensional array. To continue the analogy, a two-dimensional array is like declaring (or using) multiple rows in an Excel spreadsheet (rows and columns).
 - If set to 3, the variable is a three-dimensional array. To continue the analogy, a three-dimensional array is like declaring (or using) multiple sheets in an Excel spreadsheet (rows, columns, and sheets).

Expression Editor Panel

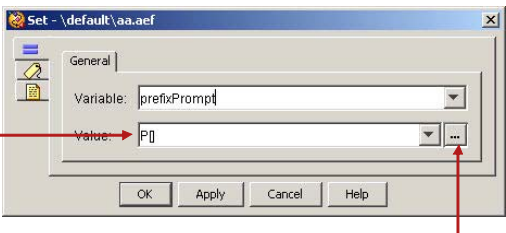
Expressions are useful if you do not know the exact value at design time and instead enter a formula that can be evaluated at run time. The expression editor helps write expressions as well as enables the use of Java objects in a convenient manner.

Example of Expression Panel

All drop-downs now offer variables of the correct type and well-known choices.

Expression Editor Panel

- Drop-down list allows you to choose variables.
- Almost all fields allow or require text input.
- For example, you can type in expression here.
- Access expression editor for more advanced help with expressions.



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For almost any field you encounter, you can enter some value or expression.

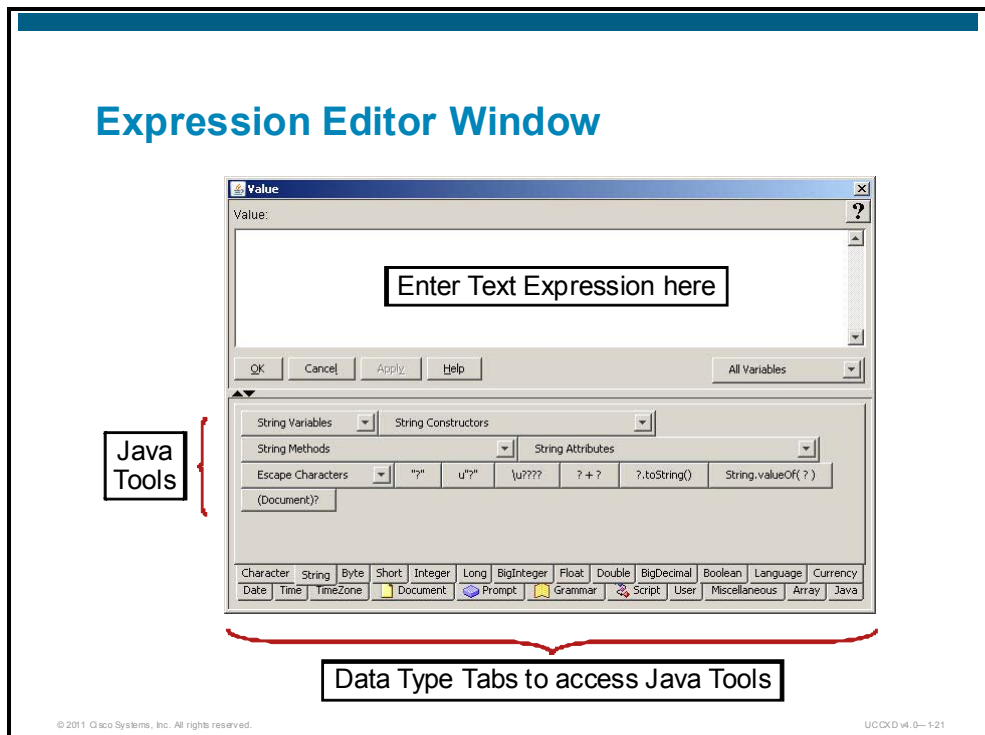
The Cisco Unified CCX Expression Language syntax is backward-compatible with the previous releases of Expression Language and is enhanced to support the following:

- All numerical operators
- All Boolean operators (?:, |, ||, &, &&, ...)
- Variables manipulation operators (=, +=, -=, ^=, ...)
- All primitive Java data types (void, byte, short, float, double, int, ...)
- All numerical literals (3I, 5L, 6.3E4F, 5.54D, ...)
- All BigInteger and BigDecimal literals (23IB, 45.5ID)
- Hexadecimal numbers (0x2A4, 0x2F44FL, ...)
- Additional prompt operators (substitute prompt, random prompt, day of week prompt, time of day prompt)
- Additional document operators (day of week document, time of day document, ...)
- Additional grammar operators (compound grammars, indexing of compound grammars)
- User and system document representation
- Customizing some prompt generation (\$[23.33, C[FRF]], ...)

- Typecasting ((int)23.33, ...)
- Block comments and line comments within the expression similar to C++ and Java
- Creating user-specified objects using the new operator (new java.util.Vector(), ...)
- Full array creation and indexing support (new int[] {3, 4}, intVar[2], intVar.length, ...)
- Complex block expression with return statement ({return 5 * 1000L;})
- Full Java-like statement support in complex block expression (if, while, do-while, for, switch, try-catch-finally, throw, break, continue, default, ...)
- Full Java-like supports for labels inside complex block expression ({loop: while(true) {while (true) {break loop;}}}, ...)
- Local variable definition inside complex block expression ({int j = 5; return j + 2;}, ...)

Expression Editor Window

This is an example of the new Expression Editor window.



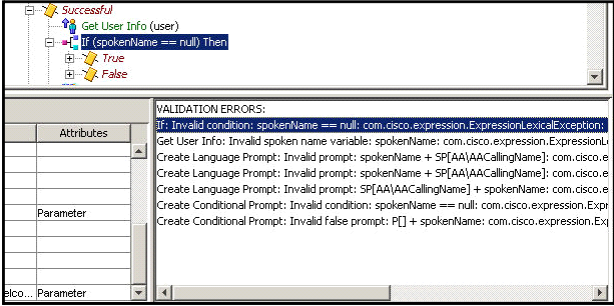
In the Expression Editor window, you can enter an expression in the text field, or you can use the Variable Expression Dialog Box drop-down list to get quick access to variables that you have previously defined in the script. When you choose a variable from the Variable drop-down list, the variable name appears in the input text field. After you enter the expression, click OK. The Expression Editor window closes.

Message Window

The Message window is used to provide information about script validation errors and debug status.

Message Window

- Displays validation errors during validation.
- Click Error to find step.
- Displays debug status during debug.



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Scripts are validated in the editor by navigating to Tools > Validate. The validation process ensures that you have addressed the property issues for each step. When you are validating your script, validation errors appear in the Message window. Double-click a message to highlight the associated step in the Design window.

Names and Conventions

It is important to establish and use naming conventions when you create scripts.

Names and Conventions

- Establish variable names and naming conventions early.
- Example for Variable: `zipCode`.
 - At least two words.
 - Lowercase, and then uppercase words.
- Example for Label: `CALLER_TROUBLE`.
 - At least two words.
 - All uppercase for visibility.
- Example for filenames: `PA_WelcomePrompt.wav`.
 - “PA” indicates **P**hysician **A**ssistant application.

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Using a common set of conventions allows you to easily determine what kind of object you are looking at, such as:

- **Variable Names:** All programmers use a common convention when naming their variables. Variable names always contain at least two (descriptive) words. The first word is not capitalized; the rest are, for example, `zipCodePrompt`.
- **Label Names:** Label names use all capital letters separated with underscores, for example, `CALLER_TROUBLE`.
- **Filenames:** Filenames should be descriptive as to what they contain. In the example shown (`PA_WelcomePrompt.wav`), there are three parts to the filename. The PA indicates the Physician Assistant directory, the `WelcomePrompt` is descriptive of what is in the file, and the `.wav` is the extension indicating the type of file.

Script Management: Four Steps

Scripts must be uploaded so that the applications can use them, or script developers can debug and test the scripts. Prompts must be uploaded so that the .wav files can be heard by the caller when the script runs.

There are four steps required for managing scripts and making them available to the Cisco Unified CCX applications.

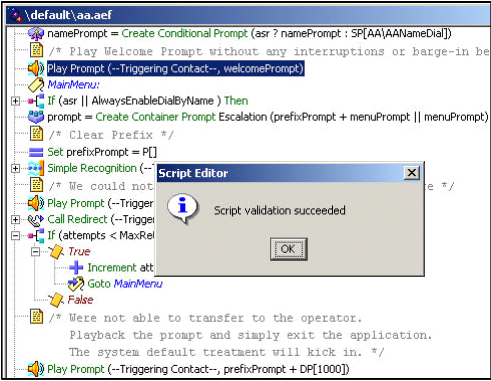
Script Management: Four Steps

From the script editor:

1. **Validate** the script.
2. **Save** (using Save As) the script to your hard drive or Script Repository.

From Administration > Script Management:

3. **Upload** script to the repository.
4. **Refresh** the application.



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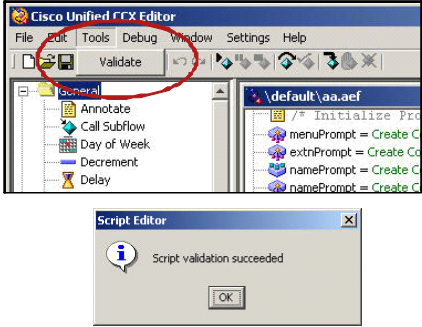
- Validate
- Save
- Upload
- Refresh

Step One: Validate

Validate the script.

Step 1: Validate

- **Tools > Validate.**
- Validation should be successful.
- If not successful, click on error in Message window to locate step that needs attention.



The screenshot shows the Cisco Unified CCX Editor interface. The 'Tools' menu is open, and the 'Validate' option is highlighted with a red circle. Below the main editor window, a 'Script Editor' dialog box is displayed, indicating that the script validation was successful.

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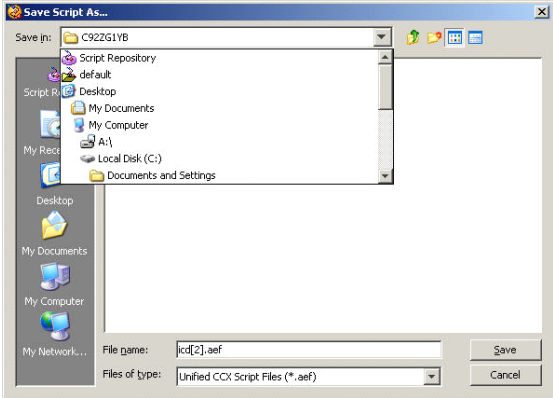
In the script editor, navigate to Tools > Validate. This process ensures that all of the step properties have been properly configured, at least concerning syntax and other requirements. Attempting to upload an invalid script will not cause any outward error, and the upload will complete. But the result of uploading an invalid script will cause the application that this script is using to go out of service and the application subsystem to go into partial service (assuming there is more than one application).

Step Two: Save As

Save your script.

Step 2: Save As

- **File > Save As.**
- Saves .aef file to:
 - Hard drive
 - Script Repository
- Save As allows developer to see where file is saved, **avoiding misplaced scripts.**



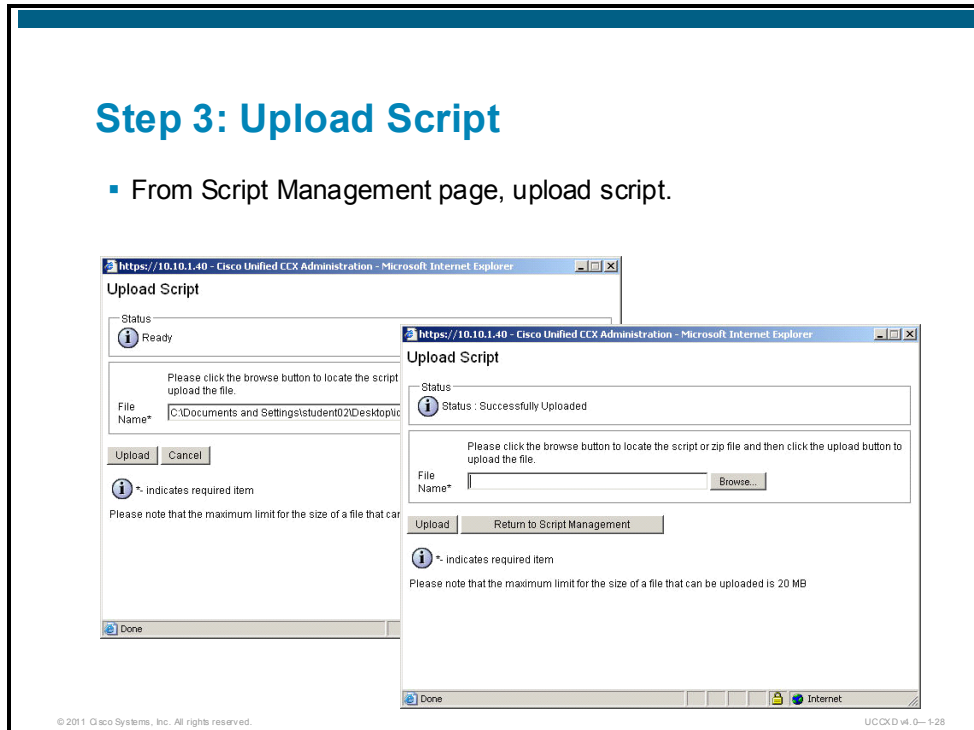
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In the script editor, click File > Save As to save your script (.aef) to the hard drive on the developer PC. Usually, this is saved in a folder designated for a specific project. Using the Save As option allows you to review where the file will be saved to avoid writing over other files.

Note When saving a script file, you must be aware of the source of the file. For example, if you access a local script file, change, and save it, it saves back to the source: your local file system. If the source of the file is from the Script Management page, the save action will cause the script to be saved to the Temporary Internet files folder.

Step Three: Upload

The last two steps are conducted in the Cisco Unified CCX Application Administration pages.



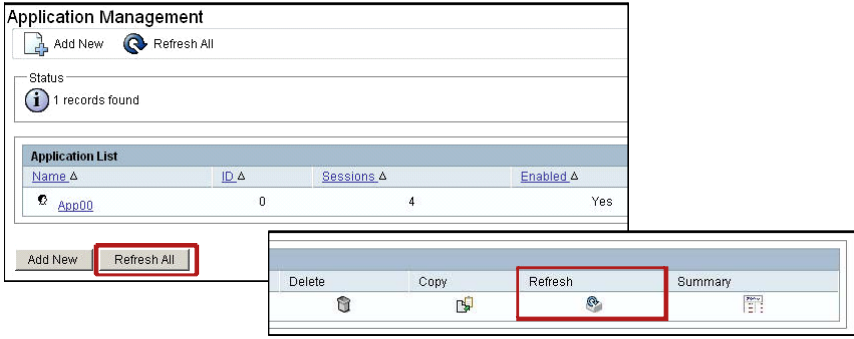
On the Cisco Unified CCX Script Management page, a developer may add a new script or upload a new version to the repository. This process loads the script into the repository database and makes it available for configured applications.

Step Four: Refresh the Application

If you are uploading a modified or a replacement script, you must manually refresh the application before the new script becomes active.

Step 4: Refresh the Application

- From Application Management page, refresh the application.



The screenshot displays the 'Application Management' interface. At the top, there are 'Add New' and 'Refresh All' buttons. Below this is a 'Status' section indicating '1 records found'. The main area contains an 'Application List' table with columns for Name, ID, Sessions, and Enabled. A single application 'App00' is listed with 0 IDs and 4 sessions. Below the table, there are 'Add New' and 'Refresh All' buttons. A separate window shows a toolbar with 'Delete', 'Copy', 'Refresh', and 'Summary' buttons, with the 'Refresh' button highlighted.

Name	ID	Sessions	Enabled
App00	0	4	Yes

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If you are uploading a new script, then a refresh operation is not required (but is still viewed as a good idea anyway).

Debugging a Script

This topic describes what a debug is used for and describes what you can do during a debug session.

Debugging a Script

- Use the debug process to test and troubleshoot your script.
- The debug process allows, via the script editor, a scripter to view, and to some extent, exert control over the execution of a script.
- You can only debug one script at a time. “Stepping into” a subflow from a parent script is not allowed.
- Once a debug session has been started:
 - You can play (Start, Run or Continue), pause (Break), step over (Single Step), or stop (End) the debug process at any time.
 - You can view the flow of the script logic.
 - You can view the contents of variables to see how they change as the script progresses.
 - You cannot move or change the definition of any step.
 - You can modify the contents of a variable at any time.

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Reactive or Nonreactive Debugging

This subtopic describes the two types of debugging and how they are different.

Reactive or Nonreactive Debugging

The actual properties of debugging are the same for any instance of a debug. But how you start a debug process depends on the properties of the script to be debugged. Thus, we refer to two different types of debugging, not because they are different, but because of how they are initiated.

- **Reactive debugging:** Requires you to specify the script name to be debugged in the Cisco Unified CCX Script Editor. You must then “trigger” the script to run by making a phone call (JTAPI) or by using a browser to initiate a web contact (http).
- **Nonreactive debugging:** Requires you to open the script to be debugged in the script editor. You then press **Start** on the toolbar or select **Debug > Start** from the menu.

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Reactive or Nonreactive Debugging (Cont.)

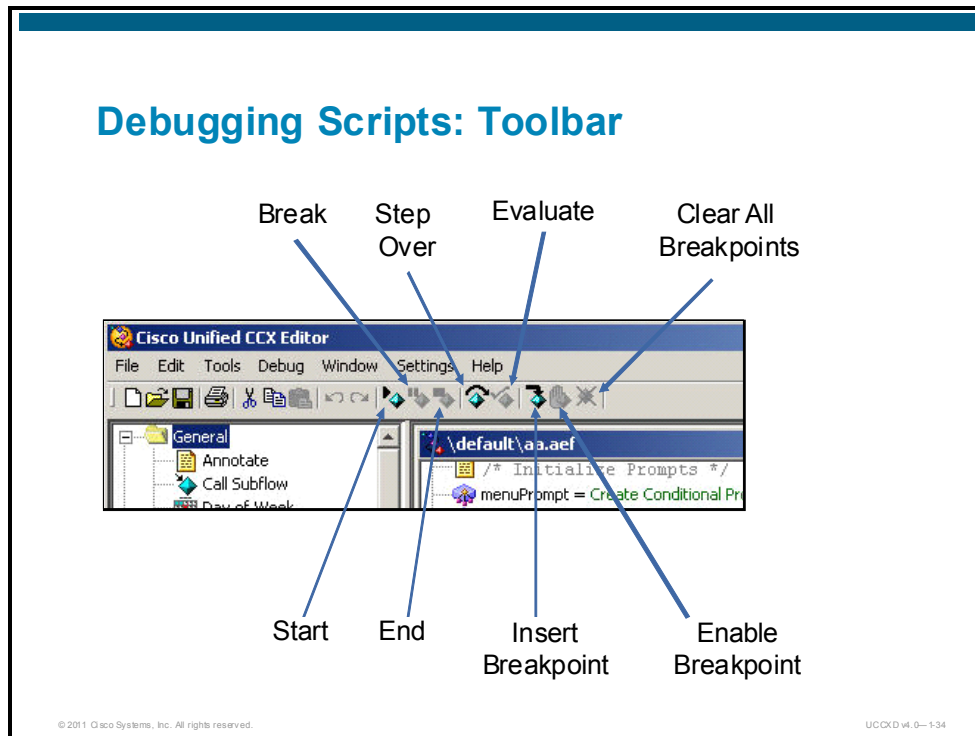
- Scripts that accept and use Media steps from or to a Triggering Contact must use reactive debugging.
- Scripts that are HTTP-triggered must use reactive debugging.
- Subflows that use Media steps must use reactive debugging and be debugged as a Triggered (Parent) Script (exceptions possible – script manipulation required).
- Subflows that do not use Media steps will be initiated as a nonreactive debug.

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Debugging Scripts: Toolbar

Having a clear understanding of the Debug tools will greatly enhance your ability to troubleshoot your scripts.



Understanding most of the tools for debugging is actually easy, that is, if you know how to use a CD player. The ability to use the buttons is available after a debug session has been initiated. The debug buttons are:

- **Start:** Press Start to cause the script to run. It will continue to run until you pause it or until the script ends.
- **Break:** The programmer's term for *pause*. Press this button to pause the script processing at any time. Press the Play button to continue running the script.
- **End:** Pressing this button causes the debug session to end. This button may be pressed at any time.
- **Step Over:** This button does not really “step over” anything. During a debug process, there is no stepping over, skipping, or otherwise changing any step or logical order of processing. Press this button to “single step” through the script. Each button press causes the script to run one step and pause.
- **Evaluate:** The Evaluate button allows you, during a debug session, to evaluate an expression. When you pause a script on a step that uses an expression and you press the Evaluate button, the Expression Editor dialog window will open so that you can evaluate the expression and get a result based on current script values.
- **Insert Breakpoint:** During a debug session that has been paused, highlight a step and press this button to insert a breakpoint. After script debugging has continued, this action will cause an automatic break to occur when script logic encounters this step. The Insert Breakpoint function allows you to start a debug session, pause it, insert a breakpoint, and then run the script at normal speed until the step that has a breakpoint is encountered. The script then pauses so that you may scrutinize your script at that time.

- **Disable Breakpoint:** If you have a breakpoint already placed on a step and you highlight that step, the Enable Breakpoint button changes to Disable Breakpoint. Disabling a breakpoint does not remove it, but prevents it from breaking.
- **Enable Breakpoint:** Enables a previously disabled breakpoint.
- **Clear All Breakpoints:** Causes all breakpoints in the script to be removed.

Summary

This topic summarizes the key points that were discussed in this lesson.

Summary

- To install the Cisco Unified CCX Script Editor, access the **Tools > Plug-ins** page and click **Cisco Unified CCX Editor**.
- To access the Cisco Unified CCX Script Editor, you should open the program and log into the Cisco Unified CCX Server. Scripts are built by dragging and dropping steps in a logical sequential order.
- The script editor is divided into four sections called the Palette, Design, Variable, and Message windows.
- Variables are temporary storage locations for program data. Programs use variables to store and manipulate information and are key in a program's ability to do "work." If a script had no variables, there would be no flexibility in the script.
- Use the expression editor to aid in the development of script expressions.

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Summary (Cont.)

- Any good developer knows to validate, save, upload, and then refresh any script intended for production.
- The only true way to test or troubleshoot any script is to perform a debug action. Debugging a script allows the developer to view the logical progression of a script and to view or change the contents of variables during the debug process.
- Use reactive debugging when a phone call or any other triggering contact is required for the script.
- Use the script editor toolbar to find debugging tools.
- Start the debug process from the script editor. If it is a reactive debug where a phone call is required, you must call the route point to activate the debug process.

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Creating a Basic IVR Script

Overview

This lesson discusses the basic Cisco Unified Contact Center Express (CCX) Script Editor steps and procedures. To support this discussion, you will use the script editor to start a simple workflow script that will answer a call, respond with an announcement, speak the calling number, and disconnect the call.

Objectives

Upon completing this lesson, you will be able to create a simple interactive voice response (IVR)-type script used to answer a call, play a prompt, and disconnect the call. This ability includes being able to meet these objectives:

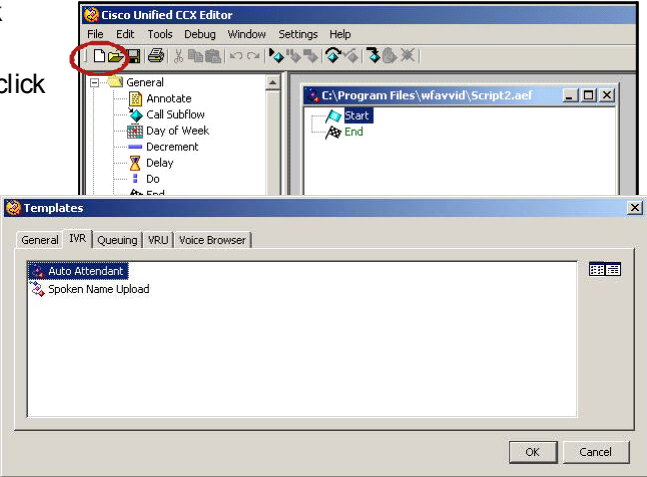
- Describe how to start a blank script or a script from a template
- Describe the Start and End steps
- Describe the Accept and Terminate steps
- Describe the Annotate step
- Describe the Play Prompt step
- Describe the Get Call Contact Info step
- Describe the Delay step

Start a New Script

This topic describes how to start a new script.

Start a New Script

- From the menu bar, click New Blank Script.
- For templates, click **File > New**.



The screenshot shows the Cisco Unified CCX Editor application. The 'File' menu is open, and the 'New' option is highlighted with a red circle. Below the main editor window, the 'Templates' dialog box is open, showing a list of templates including 'Auto Attendant' and 'Spoken Name Upload'. The 'General' tab is selected in the dialog box. The main editor window shows a script with 'Start' and 'End' actions.

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There are two primary methods for beginning a new script:

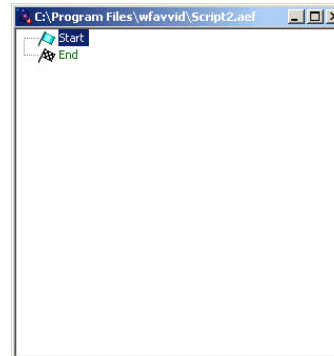
- From the menu bar, choose **File > New**. This provides you with a dialog box that allows you to choose a new blank script or one of several template scripts supplied with Cisco Unified Contact Center Express (Cisco Unified CCX).
- From the toolbar, choose New Blank Script to start a new script.

Start and End Steps

This topic discusses the Start and End steps.

Start and End Steps

- When a new script is started, script comes with the Start and End steps.
- The Start step is not on a palette.
- Each script must have one Start step, but can have many End steps.



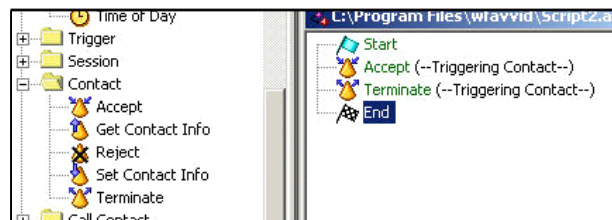
Use the Start step to start the execution of the script, and use the End step to end the execution of the script. The Start and End steps do not affect the status of a call.

Accept and Terminate Steps

This topic describes the Accept and Terminate steps.

Accept and Terminate Steps

- The Accept step causes the call setup process to complete.
- The Terminate step ends the call.



The Accept and Terminate steps are used to accept a voice call (Triggering Contact) and disconnect a call. To accept anything other than a Triggering Contact is an invalid concept because a Triggering Contact is the only type of call that can be “accepted.” But when disconnecting a call, you must be sure to disconnect or terminate the correct contact because you could have more than one. For example, if you have a script running that has a caller connected (the Triggering Contact), you use a Place Call step to call another caller (another contact). When the time comes to disconnect one of the callers, you must choose the correct contact to terminate.

Annotate Step

This topic describes the Annotate step.

Annotate Step

- The Annotate step is used to document a script.
 - Purpose
 - Author
 - Contact info
- The Annotate function is also available within most steps.
- Does not affect script processing, but does count as an executed step and can use breakpoint for debug.

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The Annotate step is used to document your script. In most programming languages, this step would be considered a comment step. Any good developer will document scripts appropriately. Unless a script is overly simple, you should document areas of the script to indicate methods and purpose of steps.

Play Prompt Step

This topic describes the Play Prompt step.

Play Prompt Step

- Used to play audio to a caller.
- Variables must point to a .wav file.
- Prompts can be results of:
 - Concatenated Prompt step
 - Container Prompt step
 - Conditional Prompt
 - TTS Prompt step
- Can play a list of prompts.

```
default\aaa.aef
namePrompt = Create Conditional Prompt (asr ? namePrompt : SP[AA]AANameDial)
/* Play Welcome Prompt without any interruptions or barge-in be
Play Prompt (--Triggering Contact--, welcomePrompt)
MainMenu:
If (asr || AlwaysEnableDialByName) Then
prompt = Create Container Prompt Escalation (prefixPrompt + menuPrompt || menuPrompt)
/* Clear Prefix */
Set prefixPrompt = P[]
Simple Recognition (--Triggering Contact--, prompt, SG[AA]AAMainMenu)
/* We could not recognize anything or transfer anywhere */
Play Prompt (--Triggering Contact--, prefixPrompt + SP[AA]AASorry)
Call Redirect (--Triggering Contact-- to operator)
If (attempts < MaxRetry) Then
True
+ Increment attempts
Goto MainMenu
False
/* were not able to transfer to the operator.
Playback the prompt and simply exit the application.
The system default treatment will kick in. */
Play Prompt (--Triggering Contact--, prefixPrompt + DP[1000])
```

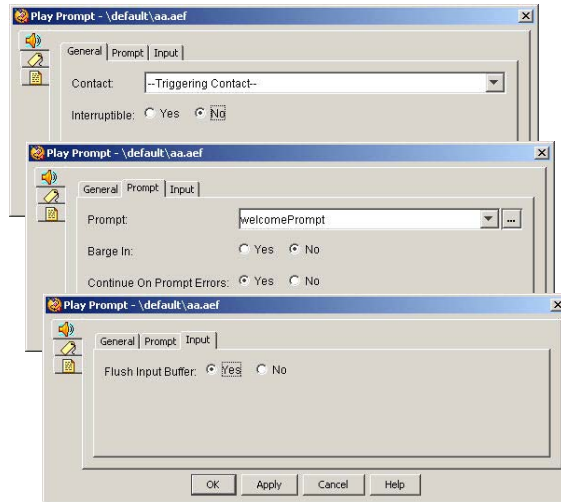
Use this step to play a prompt or a list of prompts. The prompt to be played may be:

- A .wav file located on the Cisco Unified CCX server
- A prompt created by one of the following steps:
 - Create Generated Prompt
 - Create Conditional Prompt
 - Create Container Prompt
- A prompt created by the Create TTS Prompt step

Note You may play a list of prompts which is similar to concatenating strings. To do this, you must declare prompts using *prompt data type variables*.

Play Prompt Step (Cont.)

- Contact option
- Interruptible by system option
- Prompt, either a variable or filename
- Barge In option by caller
- Continue on Prompt Errors option
- Flush Input Buffer option clears any previous input before accepting input



The components of the Play Prompt step:

- **Contact:** Defines which contact this step will act on.
- **Interruptible:** Define whether this step will be interruptible by processes of the script or not.
- **Prompt:** Use this field to indicate which prompt or prompts to play. You may use hard coded values, variables, or a combination of both to declare which prompts to play.
- **Barge In:** Allow or disallow the caller to interrupt the prompt.
- **Continue on Prompt Errors:** If the step encounters an error with the prompt, choose Yes to ignore the error and continue processing the step, or choose No to throw an exception. If you choose No, you must have already defined an exception handling steps for these exceptions; otherwise the script will abort and then call the Default script.
- **Flush Input Buffer:** Choose to flush the input buffer before the step accepts an input or to allow usage of the buffer contents for this step.

Note The input buffer is a buffer in memory that stores inputs from the caller. In an optimal case, the input buffer remains clear because the caller responds to the prompts correctly, causing each input to be used at the time of entry. But, it is possible that a caller will make a mistake or, for whatever reason, enter more digits than are needed for a particular step. These extra digits that do not get used are stored in the input buffer to be used on the next step that requires an entry. This aspect of input buffers, generally, is viewed as undesirable, but may be used for experienced callers for “type ahead.”

Get Call Contact Info Step

This topic describes the Get Call Contact Info step.

Get Call Contact Info Step

- Used to pull system call contact information into the script
- Values put into variables for use in the script

Names	Variables
Calling Number:	
Called Number:	
Arrival Type:	
Last Redirected Number:	
Original Called Number:	
Original Dialed Number:	
Dialed Number:	

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The Cisco Unified CCX system can provide information to the script using several different steps. The Get Call Contact step is used to access call-specific information and to store values in selected variables in the script.

This is a summary of the properties to be configured in the Get Call Contact Info step customizer:

- **Call Contact:** Default is Triggering Contact unless another contact is defined.
- **Calling Number:** The number of the originator of the call. If the call is an outbound call, this would be the number dialed out (ANI).
- **Called Number:** The number called from the perspective of the calling party (DNIS).
- **Arrival Type:**
 - **UNKNOWN:** The system is unable to determine how the call arrived.
 - **DIRECT:** An incoming call that comes directly from the originator.
 - **REDIRECT:** An incoming call that was redirected to this script.
 - **FORWARD_ALL:** An incoming call that was forwarded from the destination of the original call.
 - **FORWARD_BUSY:** Call that was forwarded to the current script because the original extension was busy.
 - **FORWARD_NO_ANSWER:** A call that was forwarded to the current script because the original extension exceeded the maximum number of rings.
 - **TRANSFER:** An incoming call that originated locally as part of the Transfer feature.


- **Last Redirected Number:** The number from which the last call diversion or transfer was invoked. This number is the number at which the call was placed immediately before the current number.
- **Original Called Number:** The number called from the perspective of the called party.

Delay Step

This topic describes the Delay step.

Delay Step

- Used to delay the execution of the script
- Most often used in the queue loop of an ACD script
- Uses decimal numbers as input, such as:
 - 2
 - 1.25
- Can also use the format: DP[xxxx], where xxxx is an integer in milliseconds



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The Delay step is used to pause script processing for a specified amount of time (in seconds). To customize the Delay step, enter the time to delay in seconds or any valid expression. You can use the expression editor to help you build and validate your expression.

Summary

This topic summarizes the key points that were discussed in this lesson.

Summary

- To start a new script, use the menu or toolbar button. Using the menu allows for quick access to template scripts.
- The Start step starts the execution of the script, and the End step ends the execution of the script.
- The Accept step is used to answer the call, and the Terminate step disconnects the call.
- Use the Annotate step to document your script. You should document your script for ease of maintenance in the future.
- Use the Play Prompt step to play existing prompts. The Play Prompt step may also be used to play a list of prompts.
- Use the Get Call Contact Info step to retrieve call control information, such as the ANI from the system for use in the script.
- Use the Delay step to delay execution of the script.

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UCCKD v4.0-2.11

Prompting and Collecting Information

Overview

This lesson discusses the Cisco Unified Contact Center Express (CCX) Script Editor steps and procedures for accepting dual tone multifrequency (DTMF) input from a caller. Procedures for accepting speech from a caller are covered in a later lesson. To support the discussion, you will be asked to use the script editor to enhance the Locator work flow script to accept caller input that includes:

- A Get Digit String step to collect zip code digits from the caller
- A Menu step so the caller can select the type of physician to be located from a list

Now that you have learned to accept a call and play a message, the next step is to accept input from the caller. What the caller inputs is placed into variables and used by the script. Proper collection and storage of the caller inputs allow the script to assemble a database query to locate the physicians.

If callers are to perceive work flows as valuable, scripts must be designed for easy use. Menu choices should be limited (best practice maximum is five), presented in the most likely order, and consistent. For example, you should use the same key for “repeat information” in all situations.

In setting up prompts, a key decision is whether to allow callers to “barge in” or interrupt the prompt. To allow experienced users to interact efficiently with the script, Barge In is typically enabled for prompts that route calls and/or collect information. Barge In is turned off to ensure that callers hear the complete prompt.

Additionally, several script steps provide input from the system to provide system information, such as called number, Automatic Speech Recognition (ASR) status, and language. The information may be inserted into variables, and the script can evaluate the variables to alter the logical flow of the call through the script. For example, the sales message is played if the called number is the sales number.

Objectives

Upon completing this lesson, you will be able to add functionality to the script using the steps to collect information from the caller to determine the caller's objectives. This ability includes being able to meet these objectives:


- Describe how to collect digits from a caller
- Describe how to present a menu to callers and branch script logic accordingly
- Describe how to obtain a recording from a caller
- Describe how to obtain a user object for dialing by name
- Describe how to set variable information
- Describe how to get contact information from the system
- Describe how to set contact information from the system
- Describe how to transfer a call

Get Digit String Step

This topic describes the Get Digit String step.

Get Digit String Step

- Used to:
 - Prompt the caller to provide input
 - Collect input
 - Insert input into a variable
- Includes three output branches:
 - Successful: A successful collection of digits
 - Timeout: Timeout exceeded before collection finished
 - Unsuccessful: Caller tried to enter invalid input



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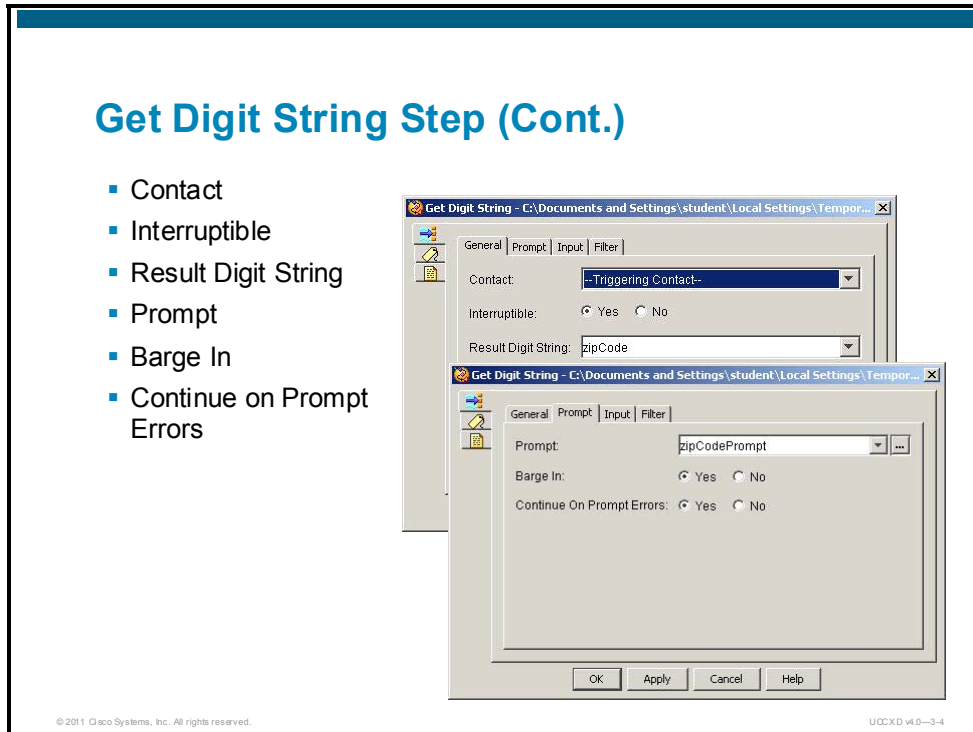
The Get Digit String step is designed to collect digits input from a caller. But more specifically, it prompts the caller for an input, collects that input, and then places the collected digits into a variable. There are several options in this step that can drastically affect how it operates, and can affect the caller's ability to provide a successful input. These will be discussed in the next couple of pages.

The Get Digit String step provides three output branches:

- **Successful:** To exit this output branch, the step has collected the appropriate number of digits based on its settings.
- **Timeout:** Based on the settings of this step, to exit this output branch, the caller, after exceeding the maximum number of retries, has exceeded the maximum amount of time to input the appropriate digits.
- **Unsuccessful:** Based on the settings of this step, to exit this output branch, the caller, after exceeding the maximum number of retries, has tried to enter an invalid input.

Get Digit String Options

This subtopic discusses the Get Digit String options.



Get Digit String Step (Cont.)

- Contact
- Interruptible
- Result Digit String
- Prompt
- Barge In
- Continue on Prompt Errors

The following parameters are configured on the Get Digit String General tab:

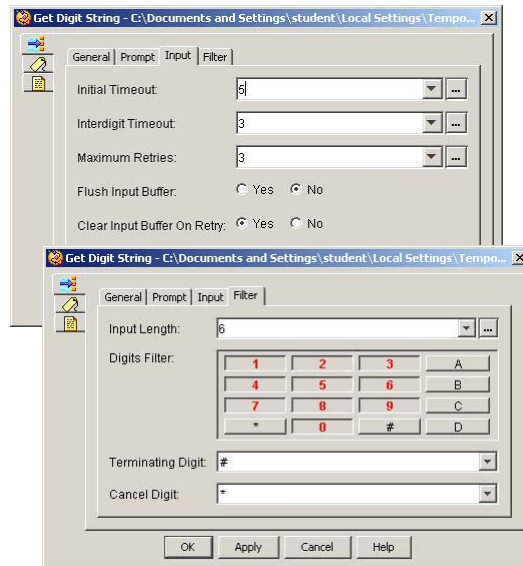
- **Contact:** Specify the contact that this step will collect digits from. The triggering contact is default.
- **Interruptible:** Specify whether this step will be interruptible by processes of the script or not.
- **Result Digit String:** This is the output of the step. Collected digits will be placed into this variable.

The following parameters are configured on the Get Digit String Prompt tab:

- **Prompt:** Use this field to indicate which prompt, or prompts, to play. You may use hard-coded values, variables, or a combination of both to declare which prompts to play.
- **Barge In:** Specify whether the caller will be allowed to barge in on the prompt. If you choose No, the caller will be required to hear the complete prompt before collection can occur.
- **Continue on Prompt Errors:** If the step encounters an error with the prompt, choose Yes to ignore the error and continue processing the step, or choose No to throw an exception. If you choose No, you must have already defined exception-handling steps for these exceptions; otherwise, the script will abort and then call the Default script.

Get Digit String Step (Cont.)

- Initial Timeout
- Interdigit Timeout
- Maximum Retries
- Flush Input Buffer
- Clear Input Buffer on Retry
- Input Length
- Digits Filter
- Terminating Digit
- Cancel Digit



The following parameters are configured on the Get Digit String Input tab:

- **Initial Timeout:** The length of time after the prompt completes that the step will wait for an input from the caller. If the maximum number of retries has not been exhausted, the step will reprompt the caller; otherwise, a timeout will be declared and script logic will go to the Timeout output branch.
- **Interdigit Timeout:** The length of time between digit presses. If the maximum number of retries has not been exhausted, the step will reprompt the caller; otherwise, a timeout will be declared, and script logic will go to the Timeout output branch.
- **Maximum Retries:** The maximum number of times the step will reprompt the caller for an input before exiting the step to the Timeout branch.
- **Flush Input Buffer:** Choose to flush the input buffer before the step accepts an input or to allow usage of the buffer contents for this step.

Note The input buffer is a buffer in memory that stores inputs from the caller. In an optimal case, the input buffer remains clear because the caller responds to the prompts correctly, causing each input to be used at the time of entry. But, it is possible that a caller will make a mistake, or for whatever reason, enter more digits than are needed for a particular step. The extra digits that do not get used are stored in the input buffer to be used on the next step that requires an entry. This aspect of input buffers is generally viewed as undesirable, but may be used for experienced callers for "type ahead".

- **Clear Input Buffer on Retry:** Choose to flush the input buffer before the step accepts an input when a retry option occurs or to allow usage of the buffer contents for this step.

The following parameters are configured on the Get Digit String Filter tab:

- **Input Length:** The input length determines the length of the collection loop. Specify the number of digits the step is expected to interpret (or “hear”). If a Terminating Digit will be used for this step, you must increase this value by one so that this step will be able to interpret it. The Terminating Digit is not included in the output result.
- **Digits Filter:** Press the digits in this area to indicate which digits are valid as an output. If you press the pound key (#), then you will not be able to use this key as a terminating digit. Keys 0-9 are set by default.
- **Terminating Digit:** The Terminating Digit, if declared, is used to stop the collection loop, and the step will accept any valid input as a result.
- **Cancel Digit:** If this is defined and the caller presses this key, a retry occurs.

Some of the options in this step can stand a little more scrutiny to gain a real understanding about how to use them. You must understand how some of the options interact with each other to provide a different caller experience. The most common problems occur when the Input Length and Terminating Digit are configured incorrectly.

Remember that the Input Length specifies the length of the collection loop, meaning that when this number of digits has been heard, the collection loop completes and a result is provided. Also, remember that the Terminating Digit is used to stop the collection loop and the step accepts whatever input is provided as an output. These concepts seem to contradict themselves, when, in fact, they do not. This step was designed this way on purpose to allow you to configure it appropriately, based on your requirements.

For example, suppose you are prompting a caller for a zip code. You know that a zip code is five digits (or you have decided five digits is what you want), but the Get Digit String step does not know this, nor does it care. If you use a terminating digit, you are risking a caller providing fewer than five digits and allowing this input to be seen by the script as successful, and you know that fewer than five digits is not correct. To avoid this, set your input length to five and do not allow a terminating digit to be used. This guarantees that for logic to pass through the successful branch that five digits were indeed collected. This obviously does not guarantee that the digits received actually correlate to a zip code, but that is another subject.

To cite another example, suppose you have a banking application that allows a caller to transfer money from their savings account to their checking account. It seems reasonable to see that one customer might want to transfer 10 dollars, but another customer would want to transfer 250 dollars. In this case, the input length can be different, but still be valid. This is a situation where you would use a terminating digit. In this case, you might specify the input length to be 10, and you would prompt for and accept the terminating digit to stop the collection loop.

This discussion provides you with two rules to use:


- If you want to guarantee a certain number of digits collected (to be successful), you must not use a terminating digit. The input length is the number of digits to collect.
- If the number of digits to be collected is variable, then you must use the terminating digit. Increase the Input Length field to include all possibilities, plus one for the terminating digit, and declare a terminating digit.

Menu Step

This topic describes the Menu step.

Menu Step

- Menu step is used to:
 - Prompt the caller to make a choice
 - Collect input
 - Take output branch of choice
- Menu step has multiple output branches:
 - Menu Choice
 - Timeout: Timeout exceeded before input
 - Unsuccessful: Caller tried to enter invalid input



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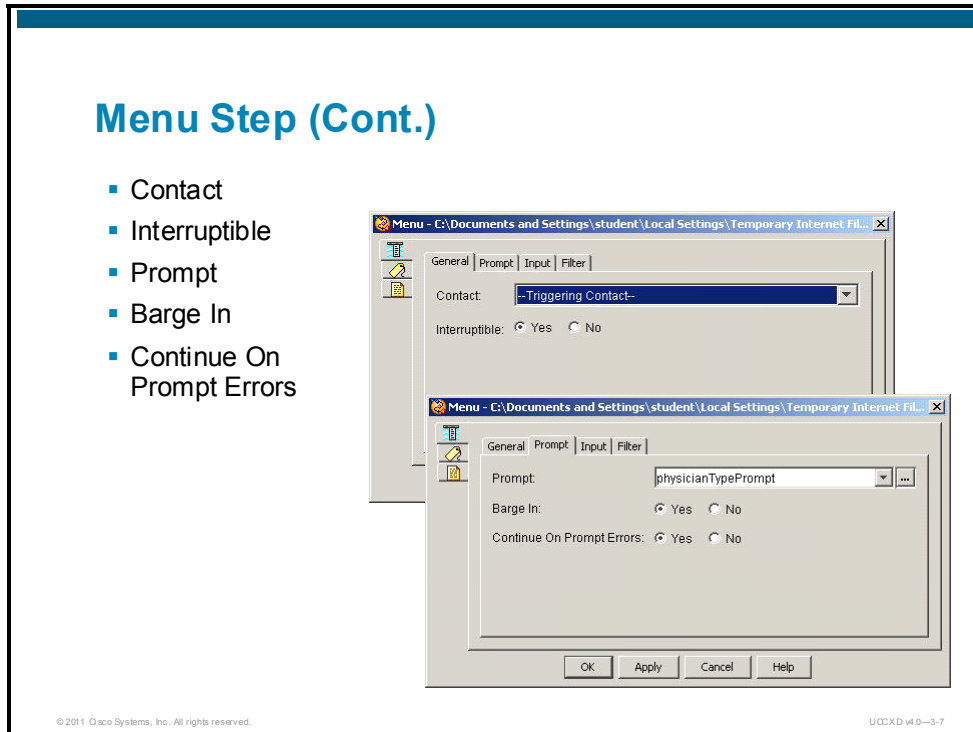
The Menu step is designed to allow a caller to make a choice and branch logic based on that choice. But more specifically, it prompts the caller to make a choice, collects the input, and then branches logic based on the input.

The Menu step provides multiple output branches:

- **Menu Choices:** To exit these branches, the step has interpreted the applicable digit press.
- **Timeout:** Based on the settings of this step, to exit this output branch, the caller, after exceeding the maximum number of retries, has exceeded the maximum amount of time to input the appropriate choice.
- **Unsuccessful:** Based on the settings of this step, to exit this output branch, the caller, after exceeding the maximum number of retries, has tried to input an invalid choice.

Menu Step Options

This subtopic discusses the Menu step options.



Menu Step (Cont.)

- Contact
- Interruptible
- Prompt
- Barge In
- Continue On Prompt Errors

The following parameters are configured on the Menu step General tab:

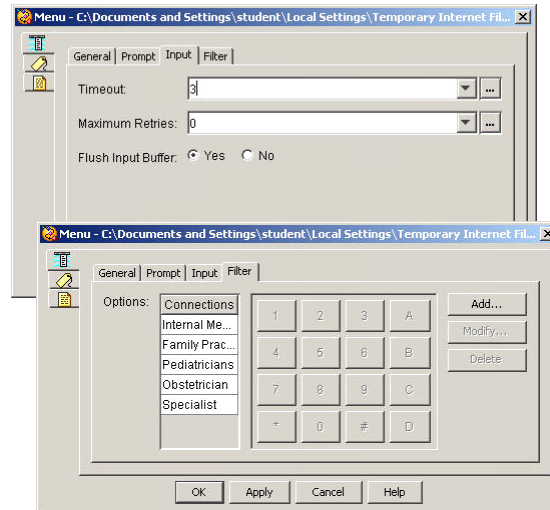
- **Contact:** Specify the contact that this step will collect digits from. The triggering contact is default.
- **Interruptible:** Specify whether this step will be interruptible by processes of the script or not.

The following parameters are configured on the Menu step Prompt tab:

- **Prompt:** Use this field to indicate which prompt, or prompts, to play. You may use hard-coded values, variables, or a combination of both to declare which prompts to play.
- **Barge In:** Specify whether the caller will be allowed to barge in on the prompt. If you choose No, the caller will be required to hear the complete prompt before collection can occur.
- **Continue on Prompt Errors:** If the step encounters an error with the prompt, choose Yes to ignore the error and continue processing the step, or choose No to throw an exception. If you choose No, you must have already defined exception-handling steps for these exceptions; otherwise, the script will abort and then call the Default script.

Menu Step (Cont.)

- Timeout
- Maximum Retries
- Flush Input Buffer
- Options
- Associate output connections with number pressed



The following parameters are configured on the Menu step Input tab:

- **Timeout:** The length of time, after the prompt completes, that the step will wait for an input from the caller. If the maximum number of retries has not been exhausted, the step will reprompt the caller; otherwise, a timeout will be declared, and script logic will go to the Timeout output branch.
- **Maximum Retries:** The maximum number of times the step will reprompt the caller for an input before exiting the step to the Timeout branch.
- **Flush Input Buffer:** Choose to flush the input buffer before the step accepts an input or to allow usage of the buffer contents for this step.

The following parameters are configured on the Menu step Filter tab:

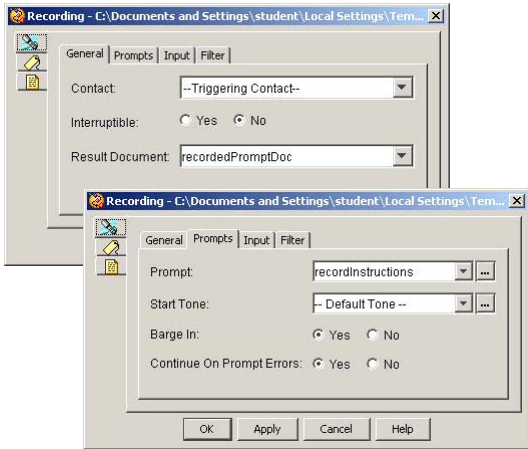
- **Options:** Configure your choices (output branches) here. Click Add to enter a choice name (which becomes the name of the output branch) and then associate it with a digit by pressing the digit number while the choice is highlighted. Be careful here; you can associate a menu choice with more than one (or no) digits.

Recording Step

Use the Recording step to prompt a caller for a recording. Once obtained, the recording can be used as a prompt in the existing script, saved as a .wav file, and/or uploaded into the repository as a user prompt.

Recording Step

- Used to accept inbound audio to save as a recording
- Contact
- Interruptible
- Result Document
- Prompt
- Start Tone
- Barge In
- Continue On Prompt Errors



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The following parameters are configured on the Recording step General tab:

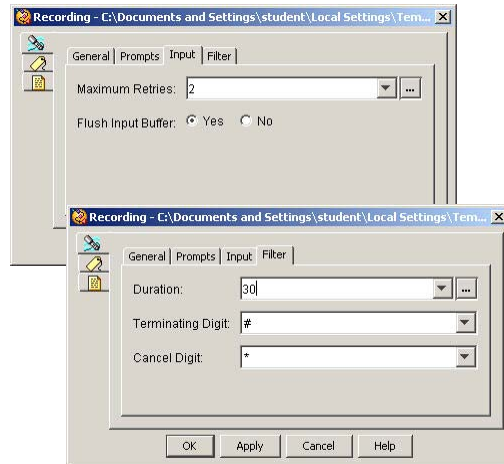
- **Contact:** Specify the contact that this step will collect audio and digits from. The triggering contact is default.
- **Interruptible:** Specify whether this step will be interruptible by processes of the script or not.
- **Result Document:** This is the output of the step. The audio received is placed into a Document data type variable. While, in fact, this audio is housed in a file on disk, it is a temporary file that will not be saved unless you actively do so in the script.

The following parameters are configured on the Recording step Prompt tab:

- **Prompt:** Use this field to indicate which prompt, or prompts, to play. You may use hard-coded values, variables, or a combination of both to declare which prompts to play.
- **Start Tone:** A tone to be heard by the caller indicating when to start speaking. You can define your own customized start tone or use the default.
- **Barge In:** Specify whether the caller will be allowed to barge in on the prompt. If you choose No, the caller will be required to hear the complete prompt before collection can occur.
- **Continue on Prompt Errors:** If the step encounters an error with the prompt, choose Yes to ignore the error and continue processing the step, or choose No to throw an exception. If you choose No, you must have already defined exception-handling steps for these exceptions; otherwise, the script will abort and then call the default script.

Recording Step (Cont.)

- Maximum Retries
- Flush Input Buffer
- Duration
- Terminating Digit
- Cancel Digit



The following parameters are configured on the Recording step Input tab:

- **Maximum Retries:** The maximum number of times the step will reprompt the caller for an input before exiting the step to the Timeout branch.
- **Flush Input Buffer:** Choose to flush the input buffer before the step accepts an input or to allow usage of the buffer contents for this step.

The following parameters are configured on the Recording step Filter tab:

- **Duration:** Specify the amount of time allotted for the recording, in seconds.
- **Terminating Digit:** The Terminating Digit, if declared, is used to stop the input loop.
- **Cancel Digit:** If this value is defined and the caller presses this key, a retry occurs.

Name to User Step

The Name to User step is used to prompt a caller to enter a Cisco Unified Communications Manager user name via the keypad on the phone. It will then correlate a caller's input to a Cisco Unified Communications Manager user account. This provides the script with that user account information and is commonly used in these functions:

- Auto-attendant activity
- Uploading of prompts, documents, and grammars
- Uploading of spoken names

Name to User Step

- Used to correlate to a Cisco Unified Communications Manager user account
- Contact
- Interruptible
- Operator
- Result User
- Prompt
- Match Threshold
- Barge In
- Continue On Prompt Errors

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The following parameters are configured on the Name to User step General tab:

- **Contact:** Specify the contact that this step will collect digits from. The triggering contact is default.
- **Interruptible:** Specify whether this step will be interruptible by processes of the script or not.
- **Operator:** Specify if Operator or a DTMF 0 is valid input. If so, another output branch called Operator will be present and available for the script logic.
- **Result User:** This is the output of the step. The result of this step will be a reference to a Cisco Unified Communications Manager user account. It will not contain any user account information, but the reference allows you to access user account information via other script steps. The variable is a User data type variable.

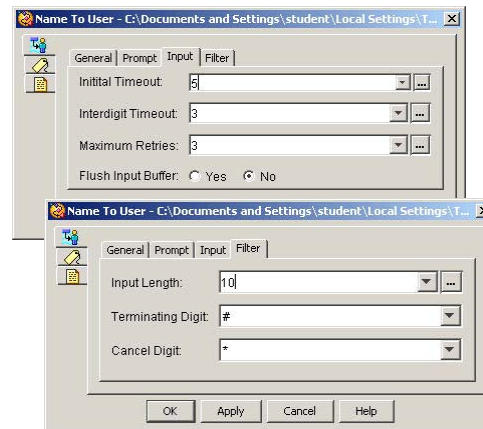
The following parameters are configured on the Name to User step Prompt tab:

- **Prompt:** Use this field to indicate which prompt, or prompts, to play. You may use hard-coded values, variables, or a combination of both to declare which prompts to play.

- **Match Threshold:** Specify an integer. Based on the current input, if the possible number of Cisco Unified Communications Manager accounts is this number or less, the step will provide a choice to the caller as to which one is desired. If not, the step prompts the caller to enter more digits.
- **Barge In:** Specify whether the caller will be allowed to barge in on the prompt. If you choose No, the caller will be required to hear the complete prompt before collection can occur.
- **Continue on Prompt Errors:** If the step encounters an error with the prompt, choose Yes to ignore the error and continue processing the step, or choose No to throw an exception. If you choose No, you must have already defined exception-handling steps for these exceptions; otherwise, the script will abort and then call the default script.

Name to User Step (Cont.)

- Initial Timeout
- Interdigit Timeout
- Maximum Retries
- Flush Input Buffer
- Input Length
- Terminating Digit
- Cancel Digit



The following parameters are configured on the Name to User Input tab:

- **Initial Timeout:** The length of time, after the prompt completes, that the step will wait for input from the caller. If the maximum number of retries has not been exhausted, the step will reprompt the caller; otherwise, a timeout will be declared, and script logic will go to the Timeout output branch.
- **Interdigit Timeout:** The length of time between digit presses. If the maximum number of retries has not been exhausted, the step will reprompt the caller; otherwise, a timeout will be declared, and script logic will go to the Timeout output branch.
- **Maximum Retries:** The maximum number of times the step will reprompt the caller for input before exiting the step to the Timeout branch.
- **Flush Input Buffer:** Choose to flush the input buffer before the step accepts an input or to allow usage of the buffer contents for this step.

The following parameters are configured on the Name to User Filter tab:

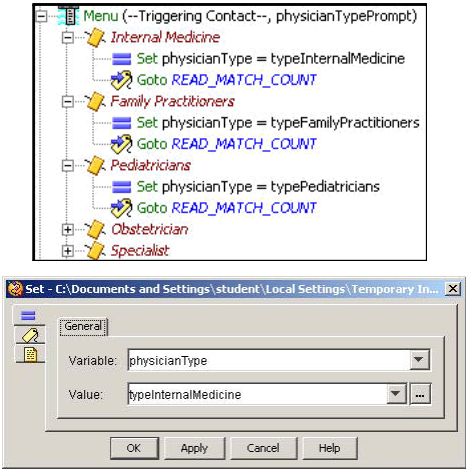
- **Input Length:** The input length determines the length of the collection loop. Specify the number of digits the step is expected to interpret (or “hear”). Since this is a variable length type of operation, you should always use a terminating digit.
- **Terminating Digit:** The Terminating Digit, if declared, is used to stop the collection loop, and the step will accept any valid input as a result.
- **Cancel Digit:** If this value is defined and the caller presses this key, a retry occurs.

Set Step

This topic describes the Set step.

Set Step

- Used to assign the contents of a variable with some value.
- Data type assigned must be consistent with variable data type—with one exception.
- Will convert string to integer and integer to string.



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Use the Set step to set the contents of a variable to some value. This step can be used to manipulate data and change data types of variable data. This step can be used for a variety of purposes. It should be easy to see that if you had an integer type variable called “counter,” and you used it to count something, it would contain some integer value greater than zero. Suppose you wanted to reuse this counter for another counting operation. You would use a Set step to set the counter back to zero. Your entries would look like this: Variable: counter Value: 0. Realize, of course, that you can also use a complete mathematical expression that evaluates to an integer.

Another type of operation that is commonly performed with a Set step is to concatenate strings. Suppose you have your prompts arranged in an organized directory structure. The main directory for your Physician Locator script is called PhysicianLocator. You also have a subdirectory for your physician names (as prompts), called PhysicianNames. Several prompts reside in this directory. Instead of trying to hard-code everything, use variables to contain the values. These values are all String data type variables, named promptDir, subDir, and the individual prompt names will be in a variable named physicianName. Now suppose the value in physicianName was MartyGriffin (assume there is a prompt in the subdirectory called MartyGriffin.wav). Now you can use the Set step to do this: Set (Variable): physicianName, to (Value): promptDir + subDir + physicianName. What would be the result? It would look like this: PhysicianLocatorPhysicianNamesMartyGriffin. For a filename, this will not work, will it? So make a change to the Set step to look like this: Set (Variable): physicianName, to (Value): promptDir + “\” + subDir + “\” + physicianName + “.wav”. This now concatenates to: “PhysicianLocator\PhysicianNames\MartyGriffin.wav” – a proper and complete pathname to a prompt.

The script editor accepts the following operators, which are listed in order of execution priority:

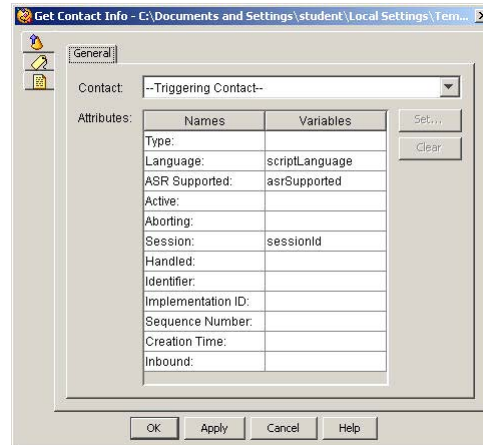
- **Parentheses ()**: Works with any expression and allows you to give priority to the expression contained in the parentheses.
- **Multiplication (*), Division (/)**: Works with any number expression (integer, long, float, decimal, BigInteger, BigDecimal).
- **Addition (+), Subtraction (-)**: Works with any number expression (integer, long, float, decimal, BigInteger, BigDecimal).
- **Less Than (<), Greater Than (>), Less Than or Equal To (<=), Greater Than or Equal To (>=), Equal To (==), Not Equal To (!=)**: Comparison operands work only on String, Character, and Number operands. Testing for the <null> constant is supported by the two equality operators.
- **And (&&), Or (||)**: Works only with Boolean expressions.
- **Concatenation (+)**: If the operands are Characters, then they are concatenated together, resulting in a new String.

Contact Info Steps

This topic describes the Get and Set Contact Info steps.

Get Contact Info Step

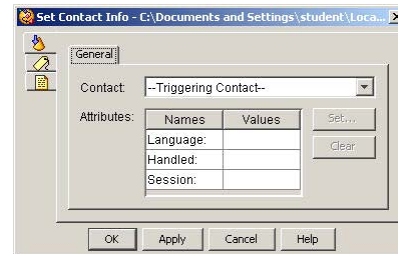
- Used to pull information from Cisco Unified CCX system.
- Attribute is assigned to variables.
- Most notable:
 - Language
 - ASR supported
 - Session



Use the Get Contact Info step to pull information from the Cisco Unified CCX system.

Set Contact Info Step

- Used to push information to Cisco Unified CCX system.
- Attribute assigned is from variables.
- Change Language attribute for this contact.
- Mark the call as Handled—This is not an ACD attribute.
- Associate contact with a different session object.





Use the Set Contact Info step to change the language setting for the script, mark a call as handled, and associate this call with another session.

Call Redirect Step

Use the Call Redirect step to redirect or transfer a call.

Call Redirect Step

- Used to redirect or transfer a caller.
- Call Contact
- Destination
- Called Address



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The following parameters are configured on the Name to User step General tab:

- **Call Contact:** Specify the contact that this step will redirect, or transfer. The triggering contact is default.
- **Destination:** Enter a string value that indicates the extension where the call is to be redirected. This can be a variable.
- **Called Address:** Select one of the following options:
 - Reset To radio button and drop-down list (default): The script resets the original destination of the call to the redirected destination.
 - Preserve radio button: The script preserves the original call destination even after the Call Redirect step executes, and the information associated with the call gives no indication that the route point or CTI port was ever involved with the call.

Summary

This topic summarizes the key points that were discussed in this lesson.

Summary

- Use the Get Digit String step to collect digit information from a caller. If you are collecting a variable number of digits, you must use a terminating digit.
- Use the Menu step to prompt callers to choose from a list of options.
- Use the Recording step to prompt a caller to provide audio input. Once obtained, you may save the input as a .wav file or upload to the Prompt repository.
- Set up the Name to User step to prompt a caller to provide a digit sequence that can be used to correlate to a Cisco Unified Communications Manager user account. Once obtained, you can then pull information about the user from Cisco Unified Communications Manager.

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Summary (Cont.)

- Use the Set step to assign variable information. The data types must be consistent except for strings and integers.
- Use the Get Contact Info step to retrieve information from the system.
- Use the Set Contact Info step to set contact attributes like language settings or a handled flag.
- Use the Call Redirect step to transfer a call.

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UCCKD v4.0-3-18

Accessing an External Database

Overview

This lesson discusses the deployment processes required to access and query a Java Database Connectivity (JDBC)-compliant SQL database.

To automate basic transactions, the Cisco Unified Contact Center Express (CCX) scripts use the enterprise databases of the customer for information about callers, available services, and/or business guidelines.

Continuing with your Locator script, you will access a database that will return the names, phone numbers, and addresses of health care providers by type within the zip code of the caller.

Locator applications are frequently used by Health Management Organizations (HMOs), Dental Management Organizations (DMOs), department stores, banks (ATM locations), and parcel services (drop-off boxes).

Objectives

Upon completing this lesson, you will be able to add functionality to a script using steps to acquire information from a supported SQL database. This ability includes being able to meet these objectives:

- Describe the architecture and supported databases for external database access
- Illustrate the processes for uploading the JDBC driver to access an external SQL Server database
- Describe how to set up the Database subsystem
- Describe the DB Read step
- Describe the DB Get step
- Describe the DB Write step
- Describe the DB Release step

Database Overview

This topic describes general aspects of accessing an external database.

Database Overview

- Cisco Unified CCX uses JDBC to access external databases.
- Supported databases:
 - MS SQL Server 2000
 - MS SQL Server 2005
 - MS SQL Server 2008
 - Sybase Adaptive Server 12
 - IBM DB2 8.2
 - Oracle 10g R2
 - Oracle 10g XE

The diagram illustrates the connection between a Cisco Unified CCX Cluster and external databases. On the left, a box labeled 'Cisco Unified CCX Cluster' contains two blue server icons. An arrow points from this cluster to a group of four blue server icons on the right, labeled 'External Database / Web Servers'.

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Supported SQL Databases

Scripts may query enterprise databases for user information. All databases must be JDBC-compliant. The Cisco Unified CCX server must be administered to locate the JDBC database used for the Cisco Unified CCX scripts.

Currently supported databases include:

- Microsoft SQL Server (2008, 2005, and 2000)
- Sybase Adaptive Server 12
- Oracle (10g R2 and 10g XE)
- IBM DB2 8.2

Structured Query Language

Cisco Unified CCX scripts allow you to access the supported JDBC database using steps that embed Structured Query Language (SQL) commands. SQL is the standard communication language between scripts and database systems. The database is organized into a series of tables that can be accessed and updated using the following steps.

It is recommended that you familiarize yourself with SQL commands to fully utilize the potential of these steps.

The following SQL commands are not supported in the database steps:

- Join queries that retrieve columns with the same name from different tables
- Aliases of column names
- SELECT count (*)
- SELECT min (*)

Note In the event that a more complex query must be utilized, a stored procedure can be used. The stored procedure must be designed such that when you pass variable information to it, it runs and then populates a table or view from which the results can be retrieved. You run the stored procedure from the DB Read step by specifying the stored procedure name and variables to be passed. For example, a DB Read step would look like this:
StoredProcedureName \$variable1 \$variable2. Use the DB Get step to retrieve the data just like in any other case.

Database Steps

The Cisco Unified CCX script database steps allow you to:

- Connect to a database server (DB Read)
- Get database field values (DB Get)
- Disconnect from a database server (DB Release)
- Write database field values (DB Write)

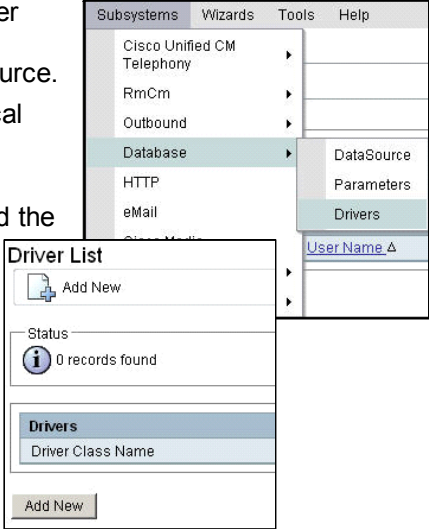
To get field values from the database, you will use the DB Read, DB Get, and DB Release steps. To update/insert field values in the database, you will use the DB Write and DB Release steps.

Installing a JDBC Driver

This topic discusses the steps required to install a JDBC driver.

Installing a JDBC Driver

- You must obtain a JDBC driver that is compliant with your database from an external source.
- Place the .jar files on your local system for upload.
- Navigate to **Subsystems > Database > Drivers** to upload the driver.
- Click **Add New**.



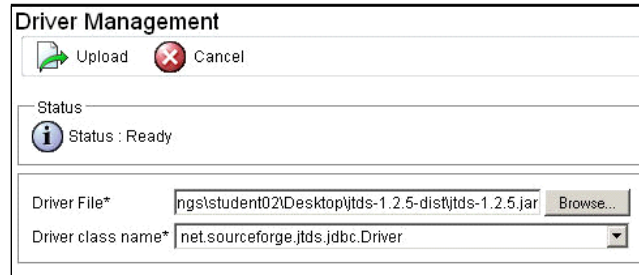
The screenshot shows the Cisco Unified CCX administration interface. The top navigation bar includes 'Subsystems', 'Wizards', 'Tools', and 'Help'. The 'Subsystems' menu is expanded, showing 'Cisco Unified CM Telephony', 'RmCm', 'Outbound', 'Database', 'HTTP', 'eMail', and 'Cisco Mail'. The 'Database' menu is further expanded to show 'DataSource', 'Parameters', and 'Drivers'. Below this, the 'Driver List' page is visible, featuring an 'Add New' button, a status indicator showing '0 records found', a table with a header 'Driver Class Name', and another 'Add New' button at the bottom.

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Cisco Unified CCX does not come pre-packaged with JDBC drivers, so the first step is to obtain one. Once you have a driver, navigate to **Subsystem > Database > Drivers** to upload it.

Installing a JDBC Driver (Cont.)

- Browse to the location of the .jar file.
- Choose the supported class name for the new driver from the Driver class name drop-down list.



Driver Management

Upload Cancel

Status

Status : Ready

Driver File* ngs\student02\Desktop\jtds-1.2.5-dist\jtds-1.2.5.jar Browse...

Driver class name* net.sourceforge.jtds.jdbc.Driver

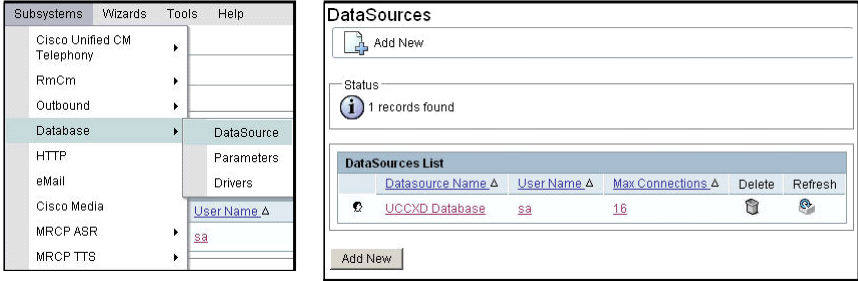
After placing the .jar file on your local system, browse to the location of the file to be uploaded. Choose the appropriate driver class name from the drop-down list and click **Upload**.

Database Subsystem Setup

This topic describes the Database subsystem setup.

Database Subsystem Setup

- Navigate to **Subsystems > Database > DataSources**.
- Click **Add New**.



The screenshot displays the Cisco Unified Contact Center Express (UCCX) administration console. On the left, the 'Subsystems' menu is expanded to 'Database', and the 'DataSources' option is selected. The right pane shows the 'DataSources' configuration page, which includes an 'Add New' button, a status indicator showing '1 records found', and a table listing existing data sources.

DataSource Name	User Name	Max Connections	Delete	Refresh
UCCXD Database	sa	16		

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After installing the JDBC driver, you can complete the database access setup process. Navigate to **Subsystems > Database > DataSource**. Click **Add New** to add a new data source.

Database Subsystem Setup (Cont.)

- Specify a Datasource Name.
- User Name and Password
- Maximum Number of Connections
- Driver
- JDBC URL

Datasource Name*	<input type="text" value="UCCXD Database"/>
User Name*	<input type="text" value="sa"/>
Password	<input type="password" value="....."/>
Confirm Password	<input type="password" value="....."/>
Maximum Number of Connections*	<input type="text" value="16"/>
Driver*	<input type="text" value="net.sourceforge.jtds.jdbc.Driver"/>
JDBC URL*	<input type="text" value="jdbc:jtds:sqlserver://10.10.1.2/UCCXD Database"/>

jdbc:jtds:sqlserver://{hostname}[/{port}]{dbname}[/{property}=(value)[,...]]
jdbc:jtds:sybase://{hostname}[/{port}]{dbname}

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UCCXD v1.0-4.7

Provide a data source name, username, and password for access, and the number of connections to this database. Additionally, you will need to use the drop-down list to select the driver you uploaded for this database. Next, you will need to enter a string URL that points to the database location. The exact syntax for the URL will depend on the type of driver being used.

Note The username and password must be SQL Server credentials.

Database Steps


This topic describes the Cisco Unified CCX database steps.

DB Read Step

The DB Read step is the first of two steps used to acquire data from an SQL database.

DB Read Step

- Initial step for database access when retrieving data
- Obtains the database resource
- Points to the database to retrieve records from
- Executes a simple SQL SELECT command for retrieval of data from database
- Must use DB Get step after the DB Read to retrieve records



The screenshot shows a script configuration for a DB Read step. The main step is 'DB Read : resource: GetPhysicians, database: UCCXD Database'. It is expanded to show sub-steps: 'DB Get : resource: GetPhysicians' (Successful), 'Set physicianName = promptDir + plSpeechName + physicianName', 'Set physicianPhone = promptDir + plSpeechPhone + physicianPhone', 'Set physicianAddress = promptDir + plSpeechAddress + physicianAddress', and 'DB Release : resource: GetPhysicians'. Below these are 'No Data', 'SQL Error', and three 'Play Prompt' steps for physicianName, physicianPhone, and physicianAddress. At the bottom, there are 'Connection Not Available' and 'SQL Error' messages.

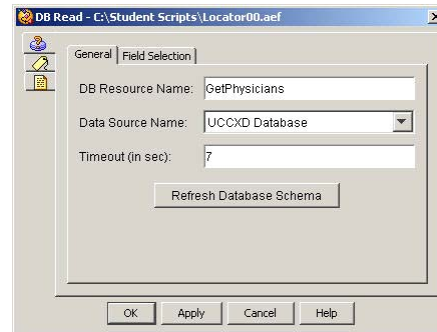
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The DB Read step is used to choose a database and to enter required SQL statements to obtain the data required for a script. Use the DB Get step after a DB Read step to assign the results of your query to specific variables. When you are finished with a database, use the DB Release step to free the connection to the database server.

- DB Read is the initial step to retrieve information from a corporate database.
- Each DB Read command is a separate access point to the database for extracting different or unique data.
- There can be more than one DB Read session open at any particular time, but each one will have its own resource name.
- Within the DB Read step is an SQL SELECT command that defines what data the DB Read will retrieve. DB Read does not actually retrieve the data, but only sets up an access point (much like an SQL cursor).
- DB Read works in conjunction with DB Get to retrieve the physical data.

DB Read Step (Cont.)

- DB Resource Name
- Data Source Name
- Timeout (in sec)
- Refresh Database Schema
- Three Output Branches:
 - Successful
 - Connection Not Available
 - SQL Error

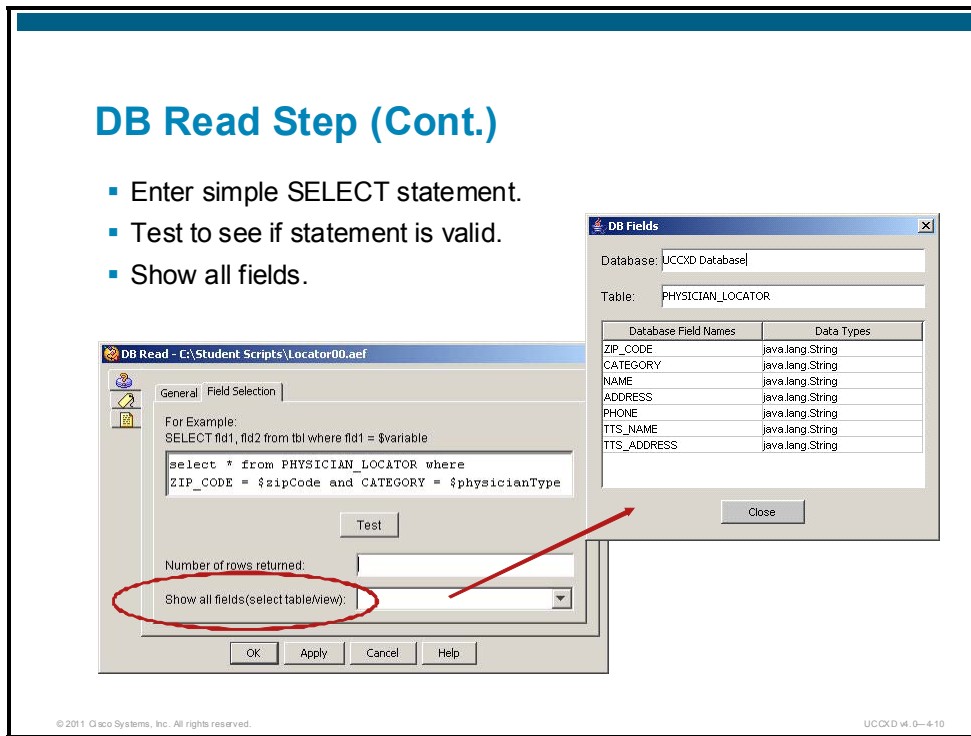


Fields to be addressed include:

- **DB Resource Name:** The DB Resource Name is a reference to this database query.
- **Data Source Name:** The Data Source Name drop-down list contains the data source names specified on the database subsystem. Choosing a data source name is equivalent to choosing a database. Choose the database you want to access.
- **Timeout (in seconds):** The timeout interval keeps your script from hanging while it waits for a database that may not be available. Specify the number of seconds for the timeout interval.
- **Refresh Database Schema:** The Refresh Database Schema button allows you to update the script editor with any database schema changes.

DB Read Step (Cont.)

- Enter simple SELECT statement.
- Test to see if statement is valid.
- Show all fields.



Fields to be addressed include:

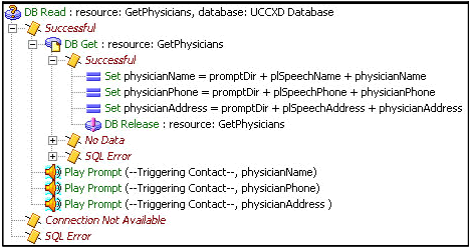
- **SQL Command:** Enter the SQL SELECT statement to be executed in the SQL Command field.
- **Test:** Clicking on the Test button tests the database connection and the SQL SELECT statement. It then shows the number of rows that would be returned.
 - If your script editor does not have connectivity to the database, a “0” is returned.
 - Also, if you are using an SQL SELECT statement that uses a variable that does not have a value until run time, a “0” is returned. Either an integer or a zero indicates that the syntax is correct according to the script editor. To test and receive a positive integer, replace the variables in the SQL statement with known values (within single quotes) to get a count of rows returned.
 - If the SQL SELECT statement is invalid, the Number of Rows Returned box will display “?”.
- **Show All Fields:** To display table fields, select the database table from the Show All Fields drop-down list. The database fields automatically appear in a separate window. This is useful if you are creating the SQL command and need to know the field names and their data types.

DB Get Step

The DB Get step is the second step in a database retrieval operation.

DB Get Step

- Must follow DB Read step in script.
- Retrieves one record (row) from the SELECT command defined in DB Read.
- Stores data into assigned variables.
- To get additional records, step must be repeated until “No Data” is shown.
- Looping logic must be built into script to get additional records.



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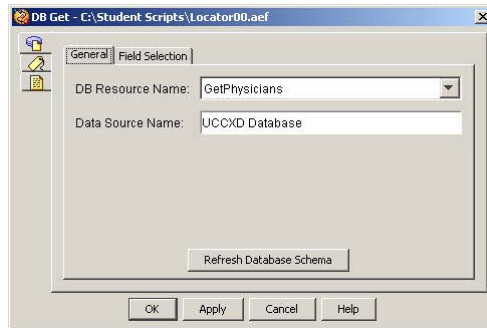
The DB Get step is used to assign the results of the SQL query to specific variables in your script. Before you can use a DB Get step, you must use a DB Read step to define the SQL statements and identify the target database.

Each time the script executes the DB Get step, a single row of the results returned by the DB Read step is retrieved and placed in the variables you assign. If your select statement in the DB Read step yields multiple rows of data, and you want to retain or use this data, you will need to execute the DB Get step multiple times to get these values.

In the event you require multiple rows of data, you will need to implement a looping logic around the DB Get step. This topic will be discussed in the next lesson, but you will need to loop from the successful output branch of the DB Get step to the beginning of the DB Get step. You will continue to do this until all rows have been retrieved. Once all rows have been retrieved, the next DB Get execution will result in “No Data.” Thus, the logic will now take the DB Get “No Data” output branch. This is the exit to your loop.

DB Get Step (Cont.)

- DB Resource Name
- Data Source Name
- Refresh Database Schema
- Three output branches:
 - Successful
 - No Data
 - SQL Error



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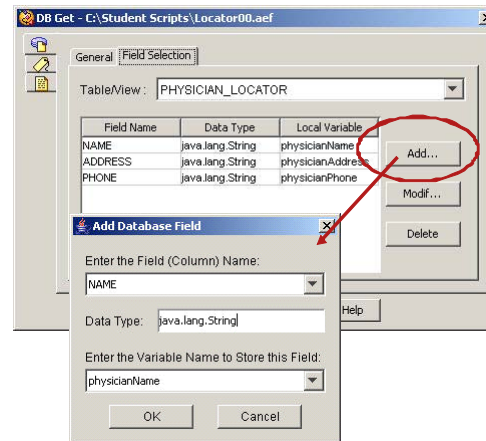
UCCXD v4.0-4.12

Fields to be addressed include:

- **DB Resource Name:** Choose the reference to your DB Read step.
- **Data Source Name:** This field will automatically populate when you select the Data Resource Name.
- **Refresh Database Schema:** The Refresh Database Schema button allows you to update the script editor with any database subsystem schema changes.

DB Get Step (Cont.)

- Assigns database field values to local variables
- Table/View name
- Add, Delete, Modify buttons



The Field Selection tab allows you to assign database fields to variables. Variables must be already defined in the script editor and must also be the correct type to match the database field value you want to store. The fields are as follows:

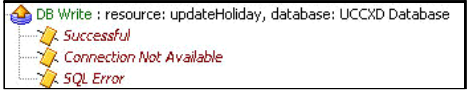
- **Table/View:** Choose a table or view from the selected database using the drop-down list.
- **Add:** Click the **Add** button to assign data from a field to a variable. You must add at least one field assignment in order for this step to validate.
- **Delete:** To delete an assignment from the Field Selection window, select the assignment you want to delete and click the **Delete** button.
- **Modify:** Use the Modify button to make changes to an assignment that appears in the Field Selection window. Modify the current assignment properties and click **OK**. The field, data type, and variable reflect the modification in the Field Selection window.

DB Write Step

This subtopic describes the DB Write step.

DB Write Step

- Only step needed for database access when writing data
- Obtains the database resource
- Points to the database to write records to
- Connects to database to insert, update, or delete a record



DB Write : resource: updateHoliday, database: UCCXD Database

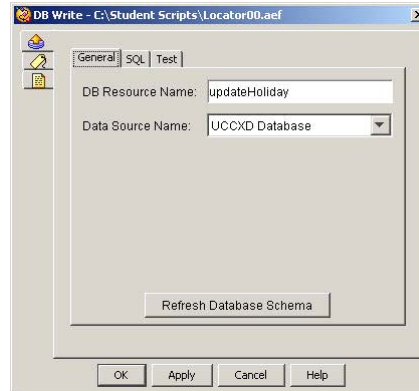
- Successful
- Connection Not Available
- SQL Error

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Use the DB Write step to choose a database and enter SQL INSERT, UPDATE, or DELETE statements. You can use this step to update an enterprise database. When you are finished with a database write operation, use the DB Release step to free the connection to the database server.

DB Write Step (Cont.)

- DB Resource Name
- Data Source Name
- Refresh Database Schema
- Three branches:
 - Successful
 - Connection Not Available
 - SQL Error

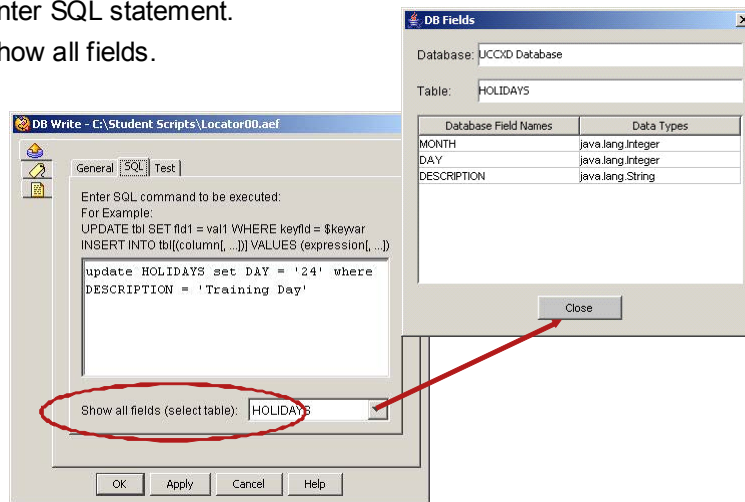


Fields to be addressed include:

- **DB Resource Name:** The DB Resource Name is a reference to this database activity.
- **Data Source Name:** The Data Source Name drop-down list contains the data source names specified on the database subsystem. Choosing a data source name is equivalent to choosing a database. Choose the database you want to access.
- **Refresh Database Schema:** The Refresh Database Schema button allows you to update the script editor with any database subsystem schema changes.

DB Write Step (Cont.)

- Enter SQL statement.
- Show all fields.

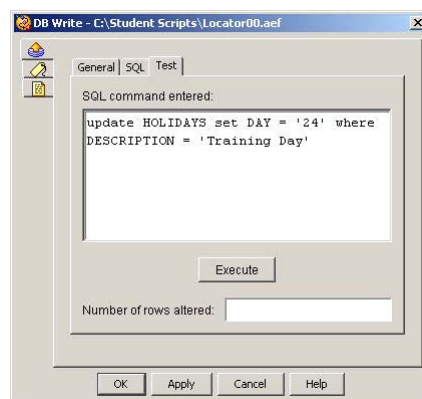


The SQL tab permits the user to write an SQL command to cause a record to be inserted or updated in the database.

- **SQL Command:** The SQL Command field is where you enter the SQL command to be executed.
- **Show All Fields:** To display table fields, select the database table from the Show All Fields drop-down list. The database fields appear in a separate window.

DB Write Step (Cont.)

- Enter statement for testing.
- Will not alter database in test mode.



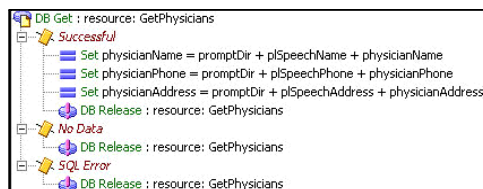
The Test tab allows you to write statements and test them. Executing a test will not alter any database records.

DB Release Step

This subtopic describes the DB Release step.

DB Release Step

- Final database access step
- Closes the SQL command and releases database resource obtained by the DB Read or DB Write steps
- Releases resource for use by another script



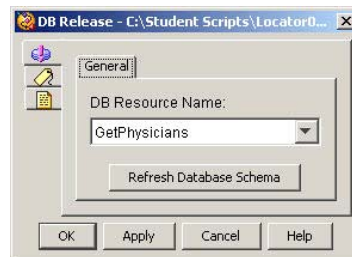
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DB Release is the final database access step. It works in conjunction with either a DB Read or a DB Write step. The DB Release step closes the SQL command defined in the DB Read or DB Write steps and releases the resource (JDBC connection) back to the Cisco Unified CCX system.

DB Release Step (Cont.)

- DB Resource Name to be released.
- Releases the resource name created in either the DB Read or DB Write step.
- Refresh database schema.



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Fields to be addressed include:

- **DB Resource Name:** The DB Resource Name of the resource to be released.
- **Refresh Database Schema:** The Refresh Database Schema button allows you to update the script editor with any database subsystem schema changes.

Summary

This topic summarizes the key points that were discussed in this lesson.

Summary

- Cisco Unified CCX can access multiple databases on different servers.
- Connecting to an external database requires you to obtain a JDBC driver from an external source. Once you have the driver, you will have to upload it to the Cisco Unified CCX system.
- In Cisco Unified CCX Administration, use the Database subsystem to set up a JDBC driver to point to a database. Here, you will also specify access credentials and the number of concurrent connections.
- Use the DB Read step to connect to a database and set up the database retrieval operation.
- After the DB Read step, use a DB Get step to obtain the actual record.
- Use a DB Write step to connect to a database and perform a write operation.
- Always use a DB Release step after any database access to release the database resource back to the Cisco Unified CCX system.

Loops, Counters, and Decision Making

Overview

To create effective scripts, you will need to implement some type of looping logic. This lesson discusses the principles behind loops, counting loops, and exiting loops.

Objectives

Upon completing this lesson, you will be able to understand and implement looping logic in a script. This ability includes being able to meet these objectives:

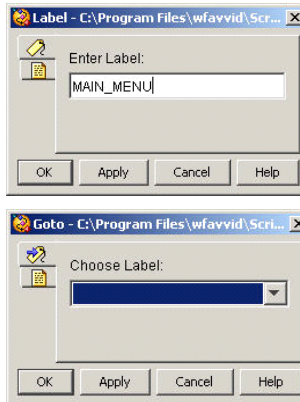
- Describe the Label step
- Describe the Goto step
- Describe the Increment step
- Describe the Decrement step
- Describe the If step
- Describe the Switch step

Label and Goto Steps

This topic describes the Label and Goto steps.

Label and Goto Steps

- Use the Label step to mark a unique place in the script.
- By convention, use uppercase letters for the labels.
- Use the Goto step to “go to” a label.
- Labels are used in conjunction with the Goto step to transfer logic from one point in the script to another.



Use the Label step to identify a specific location in a script. Right-click the Label step and select Properties. This action displays the customizer, where you enter the label name. Labels are usually defined as the target for a Goto step within the same script.

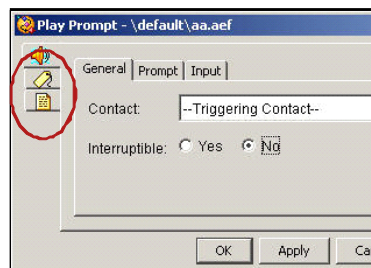
Use the Goto step to cause the script logic to branch to a specified Label step within the same script. In the customizer, select the Label from the drop-down list. An example of a Goto step would be to allow a caller to go back to the main menu.

Label and Annotate Tabs

All steps have Label and Annotate tabs. Use these tabs to specify labels and make comments. These tabs will work the same as if you had used the Label or Annotate steps.

Label and Annotate Tabs

- All steps have tabs to include the Label and Annotate functions.
- Labels and annotates function the same way as if you had used the steps.
- Using these tabs reduces the number of executable steps.

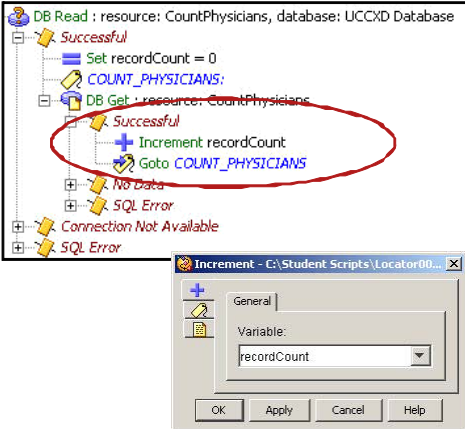


Increment Step

Use the Increment step to increase the value of a selected integer variable by one.

Increment Step

- Increments variable value by 1
- Integer values only
- To increment twice, add another step.



The screenshot displays a workflow editor interface. The main window shows a sequence of steps: 'DB Read : resource: CountPhysicians, database: UCCXD Database', 'Successful', 'Set recordCount = 0', 'COUNT_PHYSICIANS:', 'DB Get : resource: CountPhysicians', 'Successful', 'Increment recordCount' (circled in red), 'Goto COUNT_PHYSICIANS', 'No Data', 'SQL Error', 'Connection Not Available', and 'SQL Error'. A dialog box titled 'Increment - C:\Student Scripts\Locator00...' is open, showing the 'General' tab with a dropdown menu for 'Variable:' set to 'recordCount'. The dialog has 'OK', 'Apply', 'Cancel', and 'Help' buttons.

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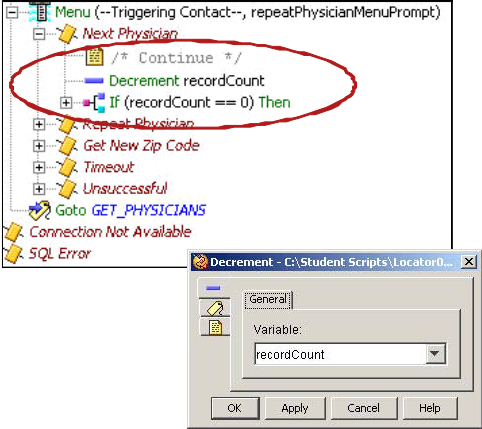
In the customizer for this step, simply select the integer type variable to increment from the drop-down list. For example, the figure here shows how you can increment a variable used to keep track of the number of records obtained from a database.

Decrement Step

Use the Decrement step to decrease the value of a selected integer variable by one.

Decrement Step

- Decrements variable value by 1
- Integer values only
- Caution when approaching 0 or -1



The screenshot shows a script editor window with a tree view of steps. The 'Decrement recordCount' step is highlighted with a red oval. Below it, an 'If (recordCount == 0) Then' step is visible. A dialog box titled 'Decrement - C:\Student Scripts\Locator0...' is open, showing the 'Variable' dropdown menu set to 'recordCount'. The dialog has 'OK', 'Apply', 'Cancel', and 'Help' buttons.

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Select the integer type variable to decrement from the drop-down list. In this example, the variable is used to help you keep track of when you have cycled back through a list of records.

Boolean Operators

This topic describes Boolean operators.

Boolean Operators

- Boolean operators

Operator	Description
==	Equals
!=	Not equal to
	Logical OR
&&	Logical AND
<=	Less than or equal to
>=	Greater than or equal to
<	Less than
>	Greater than

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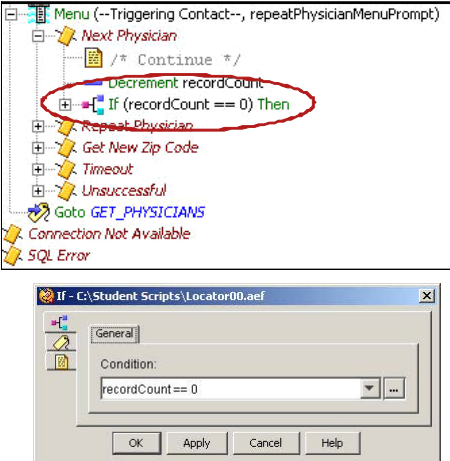
When building expressions, you should know the common operators used. Use parentheses to indicate the order of evaluation, just the same as you would for a mathematical expression.

If Step

This topic describes the If step.

If Step

- Conditional expression
- Output branches: true or false
- Uses a comparative expression



The screenshot shows a script editor window titled 'Menu (--Triggering Contact--, repeatPhysicianMenuPrompt)'. The script contains several steps: 'Next Physician', '/* Continue */', 'Decrement recordCount', 'If (recordCount == 0) Then', 'Repeat Physician', 'Get New Zip Code', 'Timeout', 'Unsuccessful', 'Goto GET_PHYSICIANS', 'Connection Not Available', and 'SQL Error'. The 'If (recordCount == 0) Then' step is highlighted with a red circle. Below the script editor is a dialog box titled 'If - C:\Student Scripts\Locator00.aef'. The dialog has a 'General' tab and a 'Condition:' field containing 'recordCount == 0'. The dialog has 'OK', 'Apply', 'Cancel', and 'Help' buttons.

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The If step is used to evaluate a comparative expression that results in a true or false conclusion. You can use any Boolean or mathematical expression that evaluates to a true or false answer. For example, to evaluate the expression `If callerRetries == 3`, the `callerRetries` variable would be an integer data type variable. This is a comparative expression that must evaluate to a true or false conclusion.

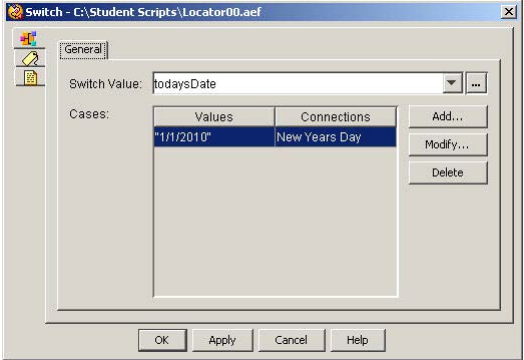
You can also use Boolean type variables as well. To add to the last example, look at this expression: `((If callerRetries == 3) && asrSupported)`. This expression also evaluates to a true or false conclusion. Note the use of parentheses indicating the order of execution.

Switch Step

Use the Switch step to cause the program logic to branch to one of a number of cases, based on the evaluation of a specified expression.

Switch Step

- Switch Value is a variable with a value to be evaluated.
- Cases can be string, integer, or language.
- Connections are output branches.
- You can add, delete, or modify.



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A case is a method for providing script logic based on the value of a variable at a point in time. You can assign one case for each value. The Switch step lets you define any number of case output branches, with each branch available for you to create its own script logic. There is no practical limit to the number of connections.

Steps, which you add following a specific case output branch, execute if the integer or string expression you specify for that case is equal to the switch value.

The default branch of the step allows you to handle those cases where none of the branches match the expression.

- **Switch Value:** This value is the input to the Switch step and will normally be a variable or expression that will evaluate to a specific value. Use the Expression Editor to help you build and validate your expression.
- **Cases:** Each entry has a specific value. In the “case” that the input (Switch Value) equals the value specified in the Values column, the script logic will take the associated output branch.
 - **Values:** Enter a specific “case” value. The value data type must match the data type of the evaluated Switch Value.
 - **Connections:** Enter a name for the output branch as seen in the script editor. The name of the output branch can be anything and does not have any associations to anything else in the script.

Summary

This topic summarizes the key points that were discussed in this lesson.

Summary

- Use the Label step to mark a unique place in a script.
- Use the Goto step to redirect script logic to a Label step. This can be used to create a loop or skip logic in a script.
- Use the Increment step to increment an integer variable by one. This step is normally used to count upward.
- Use the Decrement step to decrease an integer variable by one. This step is normally used to count downward.
- Use the If step to evaluate an expression to a true or false conclusion.
- Use the Switch step to redirect logic based on a variable input.

Confirming Caller Input

Overview

Confirming the input of a caller can sometimes greatly enhance the caller experience. This lesson discusses the steps you can use to confirm which callers think they have input and redirect logic based on this query.

Objectives

Upon completing this lesson, you will be able to confirm the input of a caller using a variety of editor steps. This ability includes being able to meet these objectives:

- Describe how to use the Create Generated Prompt step
- Describe how to use the Implicit Confirmation step
- Describe how to use the Explicit Confirmation step
- Describe the Create Conditional Prompt step
- Describe how to use the Create Container Prompt step

Create Generated Prompt Step

This topic describes the Create Generated Prompt step.

Create Generated Prompt Step

- Creates a prompt from .wav files in the system prompt window.
- Generates prompts to speak in a natural manner.
 - Telephone numbers, “303 (pause) 447 (pause) 2837”
 - Dates
 - Credit card numbers
- Language override available.
- Multiple generation types available.
- Number
- Character
- Spelling
- Date
- Time
- Ordinal
- Currency
- Country
- Language
- CC number, CC expiry date
- Telephone number

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The Create Generated Prompt step is used to create prompt phrases from intermediate variables whose values are dynamically determined based on runtime script information. Additionally, the spoken information can be formatted into currency, telephone numbers, spelled, or many other formats. After the prompt is generated, it can be played by any step that plays a prompt.

When you choose a generator type from the Generator Type drop-down list, the corresponding constructor types become available in the Constructor Type drop-down list. These constructor types provide information on what form to use for creating a specific prompt generator.

For example, in the Create Generated Prompt customizer window, the generator type “character” is chosen. The two constructor types for character now appear in the Constructor Type drop-down list. When the second constructor “character, play_all” is chosen, both the “character” and “play_all” arguments appear in the Argument Information list box.

To define items in the Argument Information list box, highlight and double-click the item. For example, by highlighting and double-clicking the “character” argument, the Define character box appears, in which the variable expression can be entered. The following describes the various Generator Types:

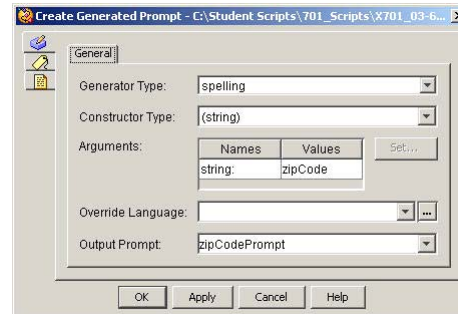
- **Number:** Generated object that has a number or a string. Object Constructors are combinations of three parameters:
 - **Number:** Any number or string object defining the number to be played back.
 - **Gender:** When the number has to be played back in a specific gender context, use this parameter to specify the context. Valid values are 0 for neutral, 1 for male, and 2 for female.
 - **Play.full:** Plays the number in full format (709 will be played as “Seven Hundred and Nine”) if this optional Boolean argument is true or omitted. Otherwise, the number plays in brief format (709 will be played as “Seven O Nine”).

- **Character:** Object Constructors are combinations of two parameters:
 - **Character:** The character object to be played back.
 - **Play_all:** Optional Boolean flag indicating whether to play spaces, punctuation marks, and other special characters normally, instead of playing them as silence (ranging from 250 ms to 500 ms).
- **Spelling:** Object Constructors are combinations of three parameters:
 - **String:** A string object to be played back.
 - **Object:** An object for which the string representation returned by the `String.valueOf()` method should be spelled out.
 - **Punctuation:** An optional Boolean flag indicating whether to play spaces, punctuation marks, and special characters normally or as silences.
- **Date:** Object Constructors are combinations of five parameters:
 - **Date:** Any date or time object from which to extract the date to be played back.
 - **skip.current.year:** If set to true, the year does not play out if it is the same as the current year.
 - **Year:** The year of the date to be played out. This year must be specified in full (for example, 2002).
 - **Month:** The month of the date to be played back. Valid values range from 1 to 12, where 1 represents January and 12 represents December.
 - **Day:** The day of the date to be played back. Valid values range from 1 to 31 and are validated at run time, and based on the specified month and year.
- **Time:** Object Constructors are combinations of two parameters:
 - **Time:** Any date or time object representing the time to be played back. It can also be defined as a number (integer, float, long and so forth) object that specifies the time to be played [from 0 to 2359]; if the value is greater than 2359, then it is considered to be the number of milliseconds since the standard base time known as the epoch, or January 1, 1970, 00:00:00 GMT. Otherwise, a number like 1234 will be played as “12 34 PM.”
 - **Hours:** Number object that specifies the hour to be played.
 - **Minutes:** Number object that specifies the minutes to be played.
- **Ordinal:** Object Constructors are combinations of two parameters:
 - **Number:** Any number or string object defining the ordinal number to be played back. The supported range is from 1 to 999999.
 - **Gender:** When the ordinal number has to be played back in a specific gender context, this parameter can be used to specify this context. Valid values are 0 for neutral, 1 for male, and 2 for female.

- **Currency:** Object Constructors are combinations of the following parameters:
 - **Designator:** Specifies the designator of a currency to play back (for example, USD is played back as “U.S. Dollar”).
 - **Amount:** The currency amount to be played back in the system-configured default currency or in the specified currency.
 - **Dollar:** A number object representing the amount of currency unit to be played. Only the integer part of the number is played. The fractional part, if any, is ignored.
 - **Cent:** A number object representing the currency subdivision to be played. Only the integer part of the number is played. The fractional part, if any, is ignored.
 - **Colloquial:** An optional Boolean flag, which specifies whether to use colloquial currency representations (for example, “Dollars” instead of “U.S. Dollars”). If omitted, the currency amount is played in colloquial format.
 - **Currency:** The currency in which the amount should be played back. If not specified, the system default configured default currency is played back.
- **Country:** The Country generator type supports only one constructor: (Language language). The parameter “language” is a Language object from which to get the language to be played back. (For example, en_US is played back as “United States English”.)
- **Language:** The Language generator type supports only one constructor: (Language language). The parameter “language” is a Language object from which to get the country to be played back. (For example, en_US is played back as “United States English”.)
- **Telephone Number:** The Telephone Number generator type supports only one constructor: (String number). The parameter “number” is a string object specifying the telephone number to be played out as a sequence of digits. The character is replaced with 250 ms of silence if the string contains any of the following characters:
 - “ - (). Otherwise, the string is automatically formatted. Automatic formatting of the string inserts 250 ms of silence between sections of digits. These sections follow the following rule: “XXX-XXX-XXX-XXXX” unless there are exactly five digits in the string, in which case, the string is considered to be a single section of five digits. An “X” character is played back as “Extension”. Dual tone multifrequency (DTMF) digits, for example, ABCD0123456789#*, are played back normally. A string of the form “*xx,” where x is a DTMF digit (“0123456789”), is played back as “star xx” (for example, “*69” is played back as “star sixty-nine”).
- **Credit Card Number:** The Credit Card Number generator type supports only one constructor: (String number). The parameter “number” is a string object specifying the credit card number to be played out as a sequence of digits. If the specified credit card number includes “-”, then it is played as is, replacing the “-” character with 250 ms of silence; otherwise, the number is automatically separated into sections of four digits and played back with 250 ms of silence inserted between sections.
- **Credit Card Expiration Date:** The parameters are identical to those of the Generated Date constructors:
 - If day is 0 or omitted: GeneratedDate (year, month, true)
 - All other cases: GeneratedDate (year, month, day, true)

Create Generated Prompt Step (Cont.)

- Generator Type
- Constructor Type
- Arguments
- Override Language
- Output Prompt



These fields are defined:

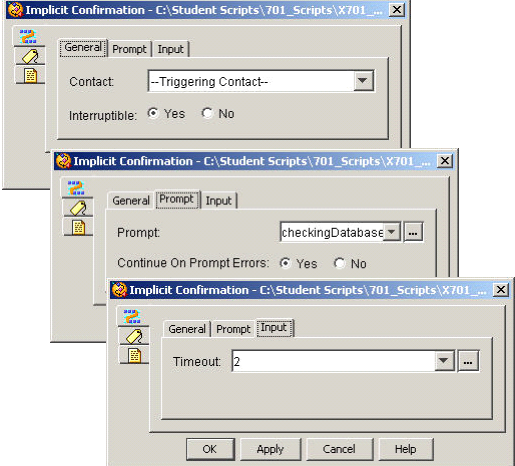
- **Generator Type:** Specifies what type of information is generated.
- **Constructor Type:** Indicates the constructor type that corresponds to the generator type.
- **Arguments:** Information list box that lists the arguments and their value.
- **Override Language (optional):** Specifies a language other than the script language for generation.
- **Output Prompt:** Specifies which prompt from the drop-down list is the output prompt. This must be a Prompt data type variable.

Confirmation Steps

This topic discusses the two Confirmation steps available.

Implicit Confirmation Step

- Implies an input by making a statement.
- Contact
- Interruptible
- Prompt
- Continue On Prompt Errors
- Timeout



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The Implicit Confirmation step confirms caller input by making a statement. A spoken or DTMF interruption before the timeout will cause the confirmation to fail.

The following parameters are configured on the Implicit Confirmation General tab:

- **Contact:** Specify the contact that this step will collect digits from. The triggering contact is default.
- **Interruptible:** Specify whether this step will be interruptible by processes of the script or not.

The following parameters are configured in the Implicit Confirmation Prompt tab:

- **Prompt:** Use this field to indicate which prompt, or prompts, to play. You may use hard-coded values, variables, or a combination of both to declare which prompts to play.
- **Continue On Prompt Errors:** If the step encounters an error with the prompt, choose Yes to ignore the error and continue processing the step, or choose No to throw an exception. If you choose No, you must have already defined exception-handling steps for these exceptions; otherwise, the script will abort and then call the default script.

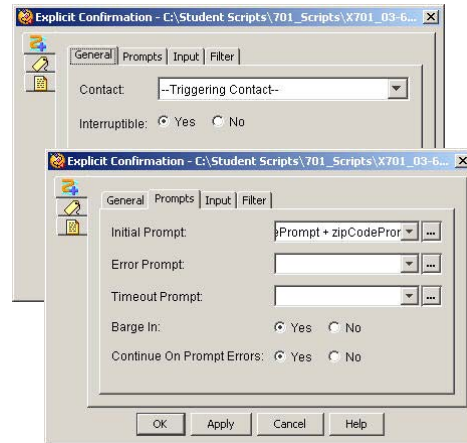
The following parameters are configured on the Implicit Confirmation Input tab:

- **Timeout:** Enter the timeout value, in seconds. If this step “hears” any audio during this timeout, the implicit confirmation fails.

Note In a non-ASR mode, the only audio that can be “heard” is a DTMF tone.

Explicit Confirmation Step

- Explicitly confirms input by asking a question.
- If no input from caller, assumes input correct after retries exhausted.
- Contact
- Interruptible
- Initial Prompt
- Error Prompt
- Timeout Prompt
- Barge In
- Continue On Prompt Errors



The Explicit Confirmation step requests a Yes or No response from the caller. This step usually is placed in the No branch of the Implicit Confirmation step.

The following parameters are configured on the Explicit Confirmation General tab:

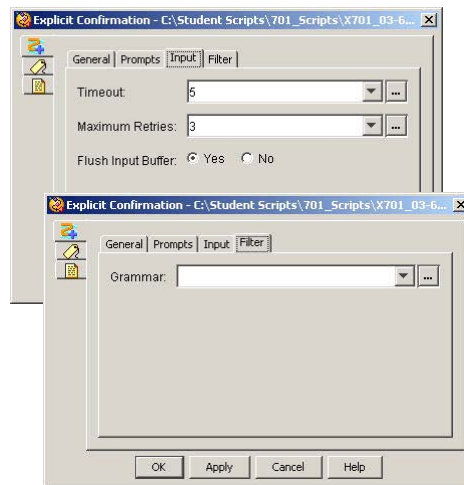
- **Contact:** Specify the contact this step will collect digits from. The triggering contact is default.
- **Interruptible:** Specify whether this step will be interruptible by processes of the script or not.

The following parameters are configured on the Explicit Confirmation Prompt tab:

- **Initial Prompt:** Use this field to indicate which prompt, or prompts, to play first. You may use hard-coded values, variables, or a combination of both to declare which prompts to play.
- **Error Prompt:** (Optional) Indicate prompt to be played in the event of an error. Leave blank to use system default.
- **Timeout Prompt:** (Optional) Indicate prompt to be played in the event of a timeout. Leave blank to use system default.
- **Barge In:** Specify whether the caller will be allowed to “barge in” on the prompt. If you choose No, the caller will be required to hear the complete prompt before collection can occur.
- **Continue On Prompt Errors:** If the step encounters an error with the prompt, choose Yes to ignore the error and continue processing the step, or choose No to throw an exception. If you choose No, you must have already defined exception-handling steps for these exceptions; otherwise, the script will abort and then call the default script.

Explicit Confirmation Step (Cont.)

- Timeout
- Maximum Retries
- Flush Input Buffer
- Grammar



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The following parameters are configured on the Explicit Confirmation Input tab:

- **Timeout:** The length of time after the prompt completes that the step will wait for an input from the caller. If the maximum number of retries has not been exhausted, the step will reprompt the caller; otherwise, a timeout will be declared and the script logic will assume the confirmation has succeeded.
- **Maximum Retries:** The maximum number of times the step will reprompt the caller for an input before exiting the step to the Timeout branch.
- **Flush Input Buffer:** Choose to flush the input buffer before the step accepts an input or to allow usage of the buffer contents for this step.

Note The input buffer is a buffer in memory that stores inputs from the caller. In an optimal case, the input buffer remains clear because the caller responds to the prompts correctly, causing each input to be used at the time of entry. But, it is possible that a caller will make a mistake, or for whatever reason, enter more digits than are needed for a particular step. These extra digits that do not get used are stored in the input buffer to be used on the next step that requires an entry. This aspect of input buffers, generally, is viewed as undesirable, but may be used for experienced callers for “type ahead.”

The following parameter is configured on the Explicit Confirmation Filter tab:

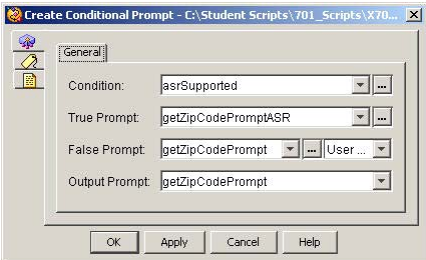
- **Grammar:** If you are in the ASR mode, specify a grammar to recognize a Yes or No.

Create Conditional Prompt Step

This topic describes the Create Conditional Prompt step.

Create Conditional Prompt Step

- Used to choose between two prompts based on a condition
- Condition
- True Prompt
- False Prompt
- Output Prompt



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Use the Create Conditional Prompt step to create a prompt based on the result of evaluating a specified Boolean expression.

In reality, this step does not create any prompts. It simply allows the script to choose between two existing prompts (True Prompt and False Prompt) using a conditional expression—the Condition. The expression must evaluate to a true or false conclusion, and based on that result, will choose the appropriate prompt as the output prompt.

The following properties apply:

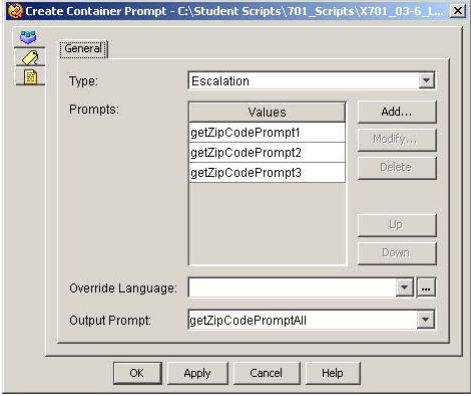
- **Output Prompt:** Variable that stores the prompt that results from the Create Conditional Prompt step. This must be a Prompt data type variable.
- **Condition Expression:** A Boolean variable or an expression resolving to a Boolean variable indicating which one of the two prompts to play back to the caller.
- **Prompt If True:** Variable or expression indicating the prompt to be played if the expression is True.
- **Prompt If False:** Variable or expression indicating the prompt to be played if the expression is False.

Create Container Prompt Step

This topic describes the Create Container Prompt step.

Create Container Prompt Step

- Used to arrange and speak a list of prompts in different ways
 - Concatenate
 - Escalate
 - Random
- Type
- Prompts
- Override Language
- Output Prompt



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Use the Container Prompt step to combine multiple prompts into one larger prompt. The prompts used in this step must be defined with prompt data type variables. You can create three types of container prompts:

- **Concatenated Prompt:** Contains a list of prompt phrases that are played back in a specific sequence. For example, for a prompt of “Your checking account balance is one hundred and sixty-eight dollars,” you can create a concatenated prompt that (1) begins with the user prompt “Your checking account balance is” and (2) continues with the result of a Generated prompt that says, “one hundred and sixty-eight dollars.”
- **Escalating Prompt:** Provides an initial question prompt with a minimal amount of information at first and then allows you to play additional prompt phrases if no response is given. For example, for a prompt that provides the caller with more information as needed, you can create an escalating prompt that, when passed to a media step such as the Get Digit String step, begins by playing the first concise prompt inside the escalating prompt, such as, “What is your account number?” If the step fails to collect the account number because of the failure of the caller to provide it, a second prompt plays, such as, “Please provide your account number by either pressing the account number using your touch tone phone followed by the pound key or simply speaking out the account number digits.”
- **Random Prompt:** Plays back a series of promotional or informational messages in a random order while a caller is waiting for an available agent. Each time logic passes this step, it randomly chooses one prompt from the list of prompts to play.

Summary

This topic summarizes the key points that were discussed in this lesson.

Summary

- Use Create Generated Prompt to create a prompt to speak information to the caller, using .wav files from the system. Formats include spelling, numbers, dates, times, and more options.
- Use the Implicit Confirmation step to confirm caller input by making a statement. This step works better in an ASR mode because in DTMF mode, only DTMF tones can interrupt the step.
- Use the Explicit Confirmation step to confirm caller input by asking a question and receiving input from the caller.
- The Create Conditional Prompt step allows a choice between two prompts based on a conditional expression.
- The Create Container Prompt step allows you to speak a list of prompts in different ways. Random Container Prompt is used most often for treatment while a caller is waiting in queue for an agent.

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Module Summary

This topic summarizes the key points that were discussed in this module.

Module Summary

- Knowing how to debug a script is essential for testing and troubleshooting.
- When you create a new script, you can open a blank script or open an existing system template.
- There are several steps you can use to collect information. Some pull information from the system, and others collect information from the caller. Knowing these options can greatly enhance the caller's experience.
- Use the Database steps to perform a read or write operation to an external database. When you have completed your database activities, always release the database connection.
- Create and use loops to reuse the same code in your script. Always have an exit strategy for any loop created.
- Use Implicit and Explicit Confirmation steps to confirm a caller's input.

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