
Implementing Cisco IOS Telephony and Unified Communications Express (IITUCX)

Course Objectives

- Explain the benefits and components of a Cisco Unified Communications system
- Describe how traditional telephony systems operate
- Describe the basic operation, protocols, and components that are involved in a VoIP call, and you will be able to configure a gateway to support these calls
- Implement Cisco Unified CME to support a single site
- Install and configure Cisco Unity Express, including Cisco Unity Express AutoAttendant

Prerequisites

The knowledge and skills you must have before attending this course are as follows:

- Working knowledge of fundamental terms and concepts of computer networking to include LANs, WANs, and IP switching and routing
- Interconnecting Cisco Network Devices Part 1, Version 2.0 (ICND1)
- Ability to configure and operate Cisco routers and switches
- Cisco CCENT certification recommended prerequisite

Course Outline

Module 1: Cisco Unified Communications System Introduction

Lesson 1: Introducing the Cisco Unified Communications System

- Describe the benefits of implementing a Cisco Unified Communications system
- Describe the components of the Cisco Unified Communications system
- Describe the function of the infrastructure in a Cisco Unified Communications system
- Describe the function of the call processing agent in a Cisco Unified Communications system
- Describe the function of endpoints in a Cisco Unified Communications system
- Describe the applications in a Cisco Unified Communications system

Lesson 2: Understanding Cisco Unified Communications Applications

- Describe the messaging choices available in a Cisco Unified Communications system
- Describe the auto-attendant functions that you can implement in Cisco Unified Communications
- Describe Cisco Unified IVR applications
- Describe Cisco Unified Contact Center Express
- Describe the Cisco Unified Communications Mobile solutions
- Describe Cisco Unified Presence

- Describe Cisco TelePresence

Module 2: Traditional Telephony Operations

Lesson 1: Understanding Traditional Telephony

- Describe the components and operation of the PSTN
- Describe PBXs and key systems
- Describe the three types of signaling required in a telephony network
- Describe how telephone calls are established in the PSTN
- Describe numbering plans
- Describe the E.164 standard for defining numbering plans

Lesson 2: Introducing Digital Circuits

- Describe the process of converting analog signals to digital signals
- Describe TDM
- Describe the characteristics of T1 circuits
- Describe the characteristics of E1 circuits
- Describe how CAS circuits accomplish supervisory, address, and informational signaling
- Describe how CCS circuits accomplish supervisory, address, and informational signaling

The lesson includes this activity:

- Lab 2-1: Demonstrate Voice Theory

Module 3: VoIP Fundamentals

Lesson 1: Understanding Packetization

- Describe the function of a DSP
- Describe how voice is transmitted in RTP packets
- Describe how a DSP packetizes voice streams
- Describe the various codecs that a Cisco Unified Communications system uses
- Describe additional functions performed by DSPs

Lesson 2: Introducing VoIP Signaling Protocols

- Describe the signaling protocols that are required in a Cisco Unified Communications system
- Describe SCCP signaling
- Describe H.323 signaling
- Describe MGCP signaling
- Describe SIP signaling

Lesson 3: Preparing the Network to Support Cisco Unified Communications

- Describe voice VLANs
- Configure voice VLANs on a Cisco Catalyst switch

- Identify DHCP service options
- Define a DHCP relay server
- Configure NTP
- Describe Cisco IP phone firmware files and XML configuration files
- Describe IEEE 802.3af and Cisco PoE
- Describe how Cisco IP phones obtain XML configuration files and IP addresses

Lesson 4: Connecting a VoIP System to a Service Provider Network

- Describe the function of a gateway in a Cisco Unified Communications system
- Describe how voice ports are used in a voice gateway
- Describe the function of a call leg
- Describe the purpose of a dial peer
- Describe SIP trunks
- Describe how to connect to an ITSP

The lesson includes this activity:

- Lab 3-1: Prepare the Infrastructure to Support Cisco Unified Communications

Lesson 5: Understanding Call Setup and Digit Manipulation

- Describe how the router and attached telephony equipment collect and consume digits and how to apply digit consumption to the dial peer
- Describe digit manipulation and the commands that you use to connect to a specified destination
- Verify dial plans

The lesson includes these activities:

- Lab 3-2: Configure POTS Dial Peers
- Lab 3-3: Configure VoIP Dial Peers

Module 4: Cisco Unified Communications Manager Express Implementation

Lesson 1: Introducing Cisco Unified Communications Manager Express

- Identify the key benefits and features of Cisco Unified CME
- Describe the supported platforms and the required memory, licensing, and software that is needed to deploy Cisco Unified CME
- Describe the Cisco Unified CME endpoints

Lesson 2: Defining Ephone-dn and Ephone

- Describe the purpose of an ephone and an ephone-dn
- Define an ephone-dn and give examples
- Define an ephone and give examples
- Describe different types of ephone-dns

Lesson 3: Configuring Cisco Unified Communications Manager Express to Support Endpoints

- Use the CLI to configure the telephony service on a Cisco Unified CME system to support endpoints
- Identify location-specific parameters that can be configured
- Reboot IP phones using two different methods
- Describe endpoint troubleshooting

The lesson includes this activity:

- Lab 4-1: Configure Cisco Unified Communications Manager Express to Support Endpoints

Lesson 4: Configuring SIP IP Phones

- Describe the configuration differences between SIP phones and SCCP phones
- Use the tftp-server and voice register global commands to support Cisco Unified IP Phones by using SIP
- Verify and troubleshoot SIP-controlled Cisco Unified IP Phone registration

Lesson 5: Implementing Basic Voice Features

- Configure MOH
- Configure call forward
- Configure call transfer
- Configure call park
- Configure intercoms
- Configure paging
- Configure call pickup
- Configure call blocking
- Configure directory services features
- Enter an account number to support billing and reporting

The lesson includes this activity:

- Lab 4-2: Implement Basic Voice Features

Lesson 6: Introducing Cisco Configuration Professional

- Download and install Cisco Configuration Professional
- Connect to Cisco Unified CME and Cisco Unity Express using Cisco Configuration Professional
- Describe the basic navigation of Cisco Configuration Professional
- Describe how to start configuring the device

Lesson 7: Implementing Cisco Unified Communications Manager Express by Using Cisco Configuration Professional

- Configure the basic configuration parameters of a router running Cisco Unified CME by using Cisco Configuration Professional
- Configure extensions and phones by using Cisco Configuration Professional
- Configure common features by using Cisco Configuration Professional
- Configure Cisco Unified CME to connect to either an IP or traditional PSTN by using Cisco Configuration Professional

Lesson 8: Understanding Call Setup Flows and Configuring Digit Manipulation

- Describe call setup flows and digit manipulation priorities
- Describe basic digit manipulation solutions
- Describe digit collection and consumption
- Describe digit stripping
- Describe digit forwarding
- Describe digit prefixing
- Describe number expansion
- Describe CLID manipulation
- Describe, configure, and test voice translation rules and profiles
- Contrast voice translation profiles and the telephony-service dialplan-pattern command

The lesson includes this activity:

- Lab 4-3: Configure Digit Manipulation and Path Selection

Lesson 9: Configuring Class of Restriction

- Describe the concept of COR and define the operation rules
- Describe how to use COR to implement calling privileges for Cisco Unified CME ephones and dial peers
- Implement COR in a Cisco Unified CME environment
- Configure COR for a Cisco Unified CME deployment

The lesson includes this activity:

- Lab 4-4: Configure COR and Toll Restriction

Lesson 10: Understanding Call Center Features

- Describe and configure ephone hunt groups
- Describe and configure agent control of ready and not-ready status
- Describe and configure automatic logout of an agent from an ephone hunt group
- Describe and configure dynamic control of hunt group members
- Describe and configure Cisco Unified Communications Manager Express AutoAttendant functionality through the use of the B-ACD service

Lesson 11: Describing Network Management for Cisco Unified Communications Manager Express

- Describe and configure syslog

- Describe CDRs
- Configure SNMPv3 for management purposes on a Cisco Unified CME system

Module 5: Cisco Unity Express Implementation

Lesson 1: Introducing Cisco Unity Express

- Identify the positioning of Cisco Unity Express
- Identify Cisco Unity Express modules and capabilities
- Describe Cisco Unity Express voice-mail features
- Describe the AutoAttendant features of Cisco Unity Express
- Describe the management features of Cisco Unity Express
- Describe system functionality features of Cisco Unity Express

Lesson 2: Implementing Cisco Unity Express

- Describe Cisco Unity Express software files and how to install or upgrade the Cisco Unity Express module software
- Configure the required prerequisite configuration on the Cisco Unified CME router to support voice-mail and auto-attendant services
- Configure Cisco Unity Express with an initial setup
- Configure voice mail, auto-attendant, and system settings on the Cisco Unity Express system using the Initialization Wizard
- Troubleshoot common voice-mail issues such as incorrect greeting and MWI failure

The lesson includes this activity:

- Lab 5-1: Implement Cisco Unity Express

Lesson 3: Configuring Cisco Unity Express Users, Groups, and Voice Mailboxes

- Configure Cisco Unified CME to activate the message button on Cisco Unified IP Phones
- Configure and verify systemwide voice-mail parameters for all voice mailboxes using the Cisco Unity Express GUI
- Describe the user voice-mail interface
- Configure Cisco Unity Express users and user mailboxes using the Cisco Unity Express GUI
- Configure Cisco Unity Express groups and GDMs
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Lesson 4: Configuring Cisco Unity Express Extended Functionality

- Describe and configure Integrated Messaging
- Describe and configure Cisco Unity Express VoiceView Express
- Configure the Message Notification feature
- Configure public and private distribution lists
- Describe and configure broadcast messaging
- Describe and configure Live Record

Lesson 5: Configuring Cisco Unity Express AutoAttendant

- Describe the workflow of Cisco Unity Express AutoAttendant
- Prepare to create a Cisco Unity Express AutoAttendant or IVR application
- Create a simple Cisco Unity Express AutoAttendant

The lesson includes these activities:

- Lab 5-2: Configure a Simple AutoAttendant by Using the GUI
- Lab 5-3: Configure a Complex AutoAttendant by Using Cisco Unified Communications Editor
- Lab 5-4: Super Lab (Optional, Time Permitting)