



Test Bed 1: Unified CCE with Unified CVP, Local and Remote Agents

This Cisco Unified Contact Center Enterprise (Unified CCE) with Cisco Unified Customer Voice Portal (Unified CVP), Local and Remote Agents test bed, used to complete testing for the Unified Communication System Release 9.0(1), is designed to simulate a medium sized inbound and outbound contact center with local and remote agents using Unified CCE with Unified CVP for call treatment and queuing and Cisco Unified Communications Manager (Unified Communications Manager) for call control.

This test bed is designed to implement and test some of the design considerations and guidelines of the [Cisco Unified Communications System Release 9.x SRND](#), the [Cisco Unified Contact Center Enterprise Release 9.x Solution Reference Network Design \(SRND\)](#) and the [Cisco Unified Customer Voice Portal Release 9.0\(1\) SRND](#).

This topic contains the following sections:

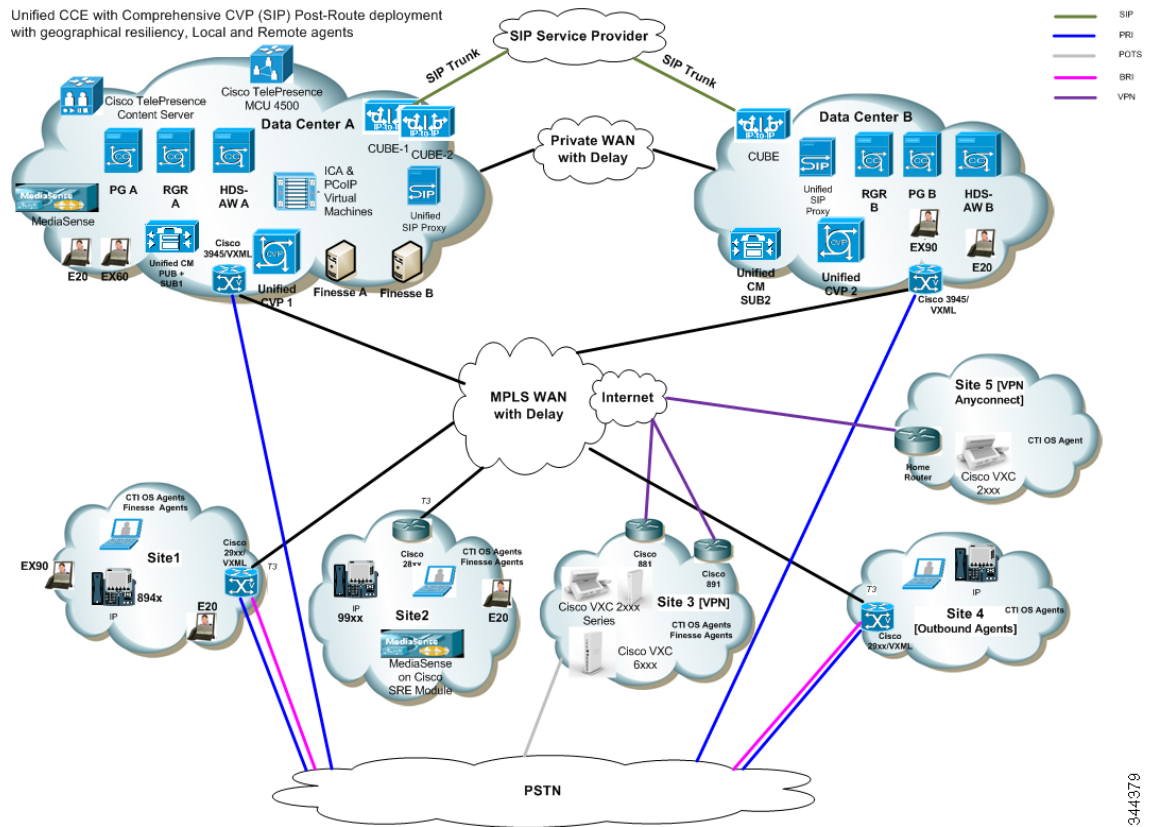
- [Unified CVP Test Site](#)

Unified CVP Test Site

Unified CCE with Unified CVP Deployment Model

This Unified CCE with Unified CVP test bed is designed to replicate a 4000 agent inbound and outbound contact center in multiple sites where agents are located locally, as well as in remote sites. It is combined with a general IP Telephony (IPT) office deployment on a Unified Communications Manager cluster. A SIP based Unified CVP deployment is used for prompting, collecting and queuing. Agents use SCCP phones, SIP Phones, and IP Video Phones. Agents also use Cisco Finesse (Finesse) and CTI OS desktops. Some local and remote agents also use virtualized clients. The entire deployment uses two data centers connected via a high speed WAN for redundancy. All solution components are designed for high availability wherever possible. The topology and relationships of the Unified CCE with Unified CVP deployment is shown in [Figure 1](#).

Figure 1 Unified CCE with Unified CVP Test Bed Topology



General Deployment Options

The following deployment options were used on this Unified CCE with Unified CVP test bed.

IPT Deployment

The IPT deployment is a Clustering over the WAN model. In this deployment, the agents are local (connected via LAN/MAN infrastructure) to one side of the Unified CCE deployment, while the Unified CCE components and Unified Communications Manager components have redundancy in a secondary data center for disaster recovery. The two data centers are separated by a WAN.

The clustering over the WAN has the following setup:

- Unified CCE clustering over the WAN with two links, one for Unified CCE public + ICCS traffic and one for Unified CCE private traffic.
- Separate dedicated link(s) for Unified CCE private communications between Unified CCE Central Controllers Side A and Side B and between Peripheral Gateways Side A and Side B to ensure path diversity. Path diversity is required due to the architecture of Unified CCE.

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Unified Contact Center Enterprise Desktop

Both CTI OS agent desktops and Finesse agent desktops are used. CTI OS agent desktop functionality used during testing includes handling of inbound calls, outbound calls, transfer and conference. Finesse agents desktop testing includes handling of inbound calls, transfer and conference.

Security for Cisco Unified Contact Center Enterprise

- Virus Protection is used on all Windows based servers.

Agent Peripheral Options

Enterprise Unified CCE Peripheral option is used for agent peripherals where the Unified CCE software treats the VRU and Unified Communications Manager as separate peripherals. The Unified Communications Manager peripheral gateway and VRU peripheral gateway are deployed independently.

Unified CCE Administration & Historical Data Server

An Administration & Data Server is used for historical and real-time data as an AW-HDS.

Cisco Unified Border Element Interoperability

SIP trunking is used for the Unified CVP deployment with Cisco IOS gateways and Cisco Unified Border Element (Unified Border Element). Active and Stand-by Unified Border Elements are placed in data center side A and data center Side B respectively. The Unified Border Element provides high availability (HA) via box-to-box redundancy configurations implemented on a Cisco Integrated Services Router Generation 2 router (Cisco ISR G2) platform. Unified Border Element box-to-box redundancy leverages available router-based Hot Standby Routing Protocol (HSRP) router technology. Unified Border Element Bidirectional Redundancy is achieved towards Unified CCE/Unified CVP and Service Provider Sides. From each Unified Border Element (i.e Active and Stand-by) a SIP trunk is running on Transmission Control Protocol (TCP) (using VoIP dial-peer) to Unified CVP. From Unified CVP, a SIP trunk is running on TCP to Floating IP of Unified Border Element in HA mode. In addition, from each

Unified Border Element (i.e Active and Stand-by), one more SIP trunk is running on User Datagram Protocol (UDP) (using VoIP Dial-peers) on each Unified Border Element to accept the IP calls from IP PSTN Service Provider network.

Virtualization Support

Many components of the solution are running on virtual machines on Cisco Unified Computing System UCS hardware.

Whisper Announcement Support

All calls to agents are enabled for Whisper Announcement feature to play a pre-recorded announcement to an agent right before the caller is connected. This feature operates with the type 10 Network VRU based on Unified CVP with SIP as the Unified CVP call control protocol.

Agent Greeting Support

The Agent Greeting feature is enabled and used for all agents for all calls. This feature and allows a contact center agent to record a greeting and that automatically plays it to for the caller and agent at the same time when an agent receives a new call is received at the agent. The agent greeting playback is immediately followed by a caller and agent connected in a call. This feature is enabled with the type 10 Network VRU based on Unified CVP with SIP as the Unified CVP call control protocol.

Desktop Virtualization

The Cisco Virtualization Experience Client (VXC) 6xxx is a thin client that unifies voice, video and virtual desktops in one device. The Cisco VXC 2xxx zero client virtual desktops can be used with Cisco IP phones to deliver high-quality virtual desktop, video and voice capabilities. VXC 6xxx and 2xxx clients were deployed both in the data center as well as remote sites. PCoIP and ICA were tested with VXC 6xxx and 2xxx. Some of the remote clients were over VPN. Both CTI OS agent desktop and Finesse were tested with these virtualized clients.

Cisco Finesse

Finesse is a next-generation agent and supervisor desktop designed to provide a collaborative experience for the various communities that interact with your customer service organization. Finesse is installed on a virtual machine as a primary and secondary node. Finesse is installed on the Linux-based Unified Communications Operating System (OS). The Primary and Secondary Finesse Server are installed on the same site as Unified CCE components. Currently Finesse doesn't support primary and secondary nodes separated over WAN. Agents can login to the Finesse Server from Internet Explorer 8.0 either using laptop or desktop connected directly to the data center or remotely using Cisco VXC 62xx or 22xx clients over VPN using VMware/Citrix View.

Video Phones

The Cisco IP Video Phone E20 (E20) has basic IP telephony capabilities plus fully integrated video. The Cisco TelePresence System EX90 (EX90) and EX60 with touch-screen interface can be used as PC monitors and telepresence systems allowing agents to easily call and share content. Cisco Unified IP Phones 99xx and 89xx Series were also tested as contact center video agents. All video phones were deployed both at the central data center and the remote branch offices. Video phones in the branch

offices register to the Unified Communications Manager on the data center over WAN. Further Media Transfer Protocols (MTP) were also configured as part of the phones' Media Resource Group Lists (MRGL) to take care of any Dual-tone multi-frequency (DTMF) capability mismatch.

Video Queueing

Video in Queue is a feature which enables streaming a video advertisement or a video prompt to a customer with a video phone who is in queue waiting for a video contact center agent to become available. Video in Queue was tested in this Unified CVP post-routed test environment with customer IP video phones such as: 89xx, 99xx, EX60, EX90 and E20. The components in this deployment included Unified CVP, VXML gateway, Unified Communications Manager, Unified CCE and Cisco TelePresence Content Server (Content Server).

Conferencing

Cisco TelePresence MCU (MCU) is a full high-definition multimedia conferencing bridge. MCU was deployed in the data center and registered to the Unified Communications Manager. MCU was part of the MRGL configured on all phones so that conferencing initiated can allocate a video conference bridge. Cisco TelePresence Content Servers (Content Server) allow for recording of and sharing of Cisco TelePresence and third-party videoconferencing meetings.

Monitoring and Recording

Cisco MediaSense (MediaSense) is a SIP based service that allows other network devices in real-time to monitor customer conversations, including recording, playback, streaming and storing audio and video data. MediaSense automatically captures and stores every Voice over IP (VoIP) conversation which cross configured Unified Communications Manager IP phones or Unified Border Element devices.

Deployment Solution Components

Table 1 lists the equipment, hardware platform, quantity and some general deployment notes for the Unified CCE with Unified CVP test bed. Use the reference information in the table to access corresponding software versions and model numbers.

Table 1 Unified CCE with Unified CVP Test Bed Equipment List

Component	Hardware Platform	Quantity	Deployment Notes
Cisco Unified Communications Manager (Unified Communications Manager)	UCS-C210M1-K9-VCD1 UCS-C210M2-VCD2	2	<ul style="list-style-type: none"> Unified Communications Manager is deployed as a 3 node cluster Clustering -over -the -WAN in two data centers with 1:1 redundancy Combines Cisco Unified IP phones with both normal IP Telephony (office) extensions and Unified CCE (call center) extensions
Cisco Voice Gateways	Cisco 39xx Series	2	<ul style="list-style-type: none"> Standalone E1 Gateways SIP

Table 1 Unified CCE with Unified CVP Test Bed Equipment List

Component	Hardware Platform	Quantity	Deployment Notes
Agent Phones	79xx, 89xx, 99xx, EX90, EX60 and E20	50	<ul style="list-style-type: none"> • SCCP & SIP (simulated Cisco Unified IP Phones 7900 Series) • Single-line • Agent Greeting and Whisper announcement enabled • Phones have ACD line only, no general office lines
Agent Desktops	n/a	20	<ul style="list-style-type: none"> • CTI Object Server (CTI OS) • Finesse
Cisco Unified Customer Voice Portal (Unified CVP)	MCS-7845-H2-CCE1 (MCS-40-005-Class)	2	<ul style="list-style-type: none"> • Prompting, collecting, queuing • Unified CVP Comprehensive, type 10 • SIP • Load balancing with Cisco Unified SIP Proxy Servers • Whisper Announcement enabled • IIS based Media Server and VXML server in call server
Rogger		2	
Agent Peripheral Gateway	MCS-7845-H2-CCE1 (MCS-40-005-Class)	1	<ul style="list-style-type: none"> • Unified Communications Manager Peripheral Interface Manager (PIM) • CTI OS
Administration Server and Real-time and Historical Data Server (AW-HDS)	MCS-7845-H2-CCE1 (MCS-40-005-Class)	2	
VXML Gateway	Cisco 3945	2	
Remote VXML Gateway	Cisco 29xx	2	
Cisco Unified SIP Proxy (Unified SIP Proxy)	SM-SRE-900	2	<ul style="list-style-type: none"> • Hosted on Cisco 3945
Cisco TelePresence Content Server (Content Server)		1	
Cisco TelePresence MCU (MCU)		1	
Cisco Unified Border Element (Unified Border Element-CUBE)		3	
Cisco Finesse (Finesse)		2	
Cisco MediaSense (MediaSense)		2	<ul style="list-style-type: none"> • 1 on Cisco Services-Ready Engine (SRE) Module
Cisco TelePresence System EX90 (EX90)		4	

Table 1 *Unified CCE with Unified CVP Test Bed Equipment List*

Component	Hardware Platform	Quantity	Deployment Notes
Cisco IP Video Phone E20 (E20)		6	
Cisco Virtualization Experience Client 2xxx Series (Cisco VXC 2xxx Series)		4	
Cisco Virtualization Experience Client 6xxx (Cisco VXC 6xxx)		4	
Cisco Integrated Services Routers Generation 2 (Cisco ISR G2)	Cisco 29xx & 39xx	1	
Cisco Integrated Services Routers	Cisco 881	1	
Cisco Integrated Services Routers	Cisco 891	1	