Test Bed: 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 Cisco Collaborative Systems Release 10.0(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 CM) 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 10.x SRND, the Cisco Unified Contact Center Enterprise Release 10.x Solution Reference Network Design (SRND), and the Cisco Unified Customer Voice Portal Release 10.0(1) SRND.

For information about how to install and configure these and other Contact Center components, see Components Installation and Configuration Guides at: Cisco Collaboration Systems for Contact Center Release 10.0(1)

Additional configuration information for contact center call flows and components is available at: Unified Communications System Implementation

This topic contains the following sections:

- Unified CCE with Unified CVP Deployment Model
- General Deployment Options
- Deployment solution components

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 CM cluster. A SIP-based Unified CVP deployment is used for prompting, collecting and queuing. Agents use SCCP phones, SIP Phones, Cisco Unified IP Phones (69xx, 79xx, 89xx, 894x, 99xx), and video endpoints TelePresence EX 60, and EX 90. 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 through a high speed WAN for redundancy. All solution components are designed for high availability (HA) 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 for this Unified CCE with Unified CVP test bed.

Deployment Model

The deployment is a Clustering over WAN model. In this deployment, the agents are local and connected through LAN/MAN infrastructure to one side of the Unified CCE deployment. The Unified CCE components and Unified CM components are in a secondary data center, which provides redundancy in case disaster recovery is needed. The two data centers are separated by a WAN.

The Clustering over WAN model has the following setup:

- Unified CCE clustering with two links, one for Unified CCE public and Intra-Cluster Communication Signaling (ICCS) traffic and one for Unified CCE private traffic.
- To ensure path diversity, there are separate, dedicated links for Unified CCE private communications between the Unified CCE Central Controllers on Side A and Side B, and between the peripheral gateways on Side A and Side B. Path diversity is required due to the architecture of Unified CCE.

Remote Gateway 2 (3925) ISR G2 has two Services Modules (SM) with Services Ready Engine (SM-SRE-910-K9) loaded with Cisco SRE-V Software 2.0.1.0, with MediaSense primary and secondary nodes installed, which are used to record audio calls using CUCM-based forking and CUBE-based forking methods.

Cisco Unified Contact Center Enterprise and Cisco Unified Intelligent Contact Management Enterprise

Unified CCE and Unified ICME, integral components of the Cisco Unified Communications System, provide intelligent routing and call treatment with transparent blending of multiple communication channels, while easing the transition from a traditional automatic call distributor (ACD) to an IP-based ACD.

Unified CCE/Unified ICME are part of a strategic platform that helps customers move into the next phase of customer contact, beyond today’s contact center to a Customer Interaction Network. The Customer Interaction Network is a distributed, IP-based customer service infrastructure that comprises a continuously evolving suite of innovative, multichannel services and customer-relationship-management (CRM) applications.

Unified CCE/Unified ICME software is deployed at the test sites in the contact center environment. With Unified CCE/Unified ICME, the call center manager can configure agents to handle inbound and outbound voice calls. The agents can switch between these media on a task-by-task basis.


Cisco Unified Customer Voice Portal

The Cisco Unified Customer Service Portal (Unified CVP) provides interactive voice response and queuing capabilities in a contact center environment and supports automated speech recognition (ASR) and text-to-speech (TTS) capabilities. Unified CVP, which is implemented at this test environment in the comprehensive mode, includes support for agent queuing, multisite call switching, and speech-enabled and touch-tone applications. Customers can use touchtone signals or their own voice to request...
self-service information. Its components work together to enable you to create and deploy IVR applications that include voice interaction as well as traditional numeric input to provide intelligent, personalized self-service over the phone.

Unified CVP Call Server consists of SIP services and plays media files to the caller and collects information in return. It also interprets messages from Unified ICME and generates VXML documents that it uses to route the call.

Unified CVP also provides the ability, via an Operations Console, to monitor, manage, and configure all Unified CVP solution components from a central, single operations console.


### Cisco Outbound Dialer Option

The Cisco Outbound Option application provides outbound dialing functionality along with the existing inbound capabilities of Unified CCE. This application enables the contact center to dial customers and direct contacted customers to agents or IVRs. The Outbound Option Dialer component, which resides on the peripheral gateway server dials customers using Cisco Unified Communications Manager (Unified CM) and voice gateways, reserves agents via the Media Routing (MR) interface and transfers answered customers calls to reserved agents.

In an Outbound Option deployment that uses the SIP Dialer, functions such as dialing, call control, and Call Progress Analysis for Outbound campaigns are handled by the voice gateway, and not by Unified CM. This increases the number of outbound agents that a deployment can service on a peripheral gateway, and reduces the number of peripheral gateways and dialers customers need to deploy for larger enterprise systems.


### Cisco Mobile Agent

The Cisco Mobile Agent feature enables Unified CCE/Unified ICME to support agents using phones not directly controlled by Unified CM. This could be an agent:

- outside the call center, using an analog phone at home or a cell phone
- inside the call center, using an IP phone connection not controlled by Unified CCE or an associated Unified CM

If you plan to configure a mobile agent to use:

- an analog phone or an Cisco Unified IP Phone (Unified IP Phone) without the Cisco Business Ready Teleworker setup, use the Mobile Agent option


### Cisco MediaSense

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 CUBE devices.
MediaSense is an IP media recording and playback system that implements the Open Recording Architecture open interfaces. MediaSense comprises of many elements to support IP based recording. It solves the topology issues and accelerates the adoption of Cisco Collaboration Systems. It captures, stores, and processes multimedia on a unified network platform, enables contact center supervisors to live monitor conversations and assist agents in resolving caller issues and provides open, standardized hooks for real-time speech analytics, to help customer service representatives assist callers faster and more effectively.


**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. In this deployment, Finesse is installed on a virtual machine as a primary and secondary node.

Finesse is installed on the Linux-based Cisco Unified Communication Voice Operating System. Primary and secondary Finesse servers are installed on the same site as Unified CCE components. Currently Finesse does not support primary and secondary nodes separated over WAN. Agents can sign on to the Finesse Server from Microsoft Internet Explorer 9.0 or Mozilla Firefox version later than 24, using a laptop or a desktop connected directly to the data center or remotely using Cisco VXC 62xx clients over VPN using VMware/Citrix View.

Agents sign on to the Finesse server from Microsoft Internet Explorer 9.0 either using a laptop or a desktop unit connected directly to the data center, or remotely using virtual desktop infrastructure (VDI) devices: Cisco Virtualization Experience Client (Cisco VXC) 62xx over VPN using VMWare/Citrix View.


**Cisco SocialMiner**

Cisco SocialMiner (SocialMiner) is a social media customer care solution. SocialMiner can help you proactively respond to customers who communicate through public networks. SocialMiner and Unified CCE work in concert to process the Agent Request (Voice CallBack) from its inception through the receipt of the call back.

The role of SocialMiner in the Agent Request feature:

- Provides a notification mechanism (the Connection to CCE notification type) used to forward callback requests to UCCE via a Media Routing (MR) connection
- Provides the API used by custom applications to initiate a callback
- Forwards the callback details to UCCE
- Provides an API used by custom applications to retrieve the state of the callback, including a field in the GET call that defines the estimated wait time until an agent becomes available that can be communicated to the end user
- Provides an API used by custom applications to cancel a requested callback

Cisco Unified Communications Manager IM and Presence Service

Cisco Unified Communications Manager IM and Presence Service (IM and Presence Service) system is a standards-based enterprise platform that brings people together in and across organizations in the most effective way. This open and extensible platform facilitates the highly secure exchange of presence and instant messaging (IM) information between Cisco Unified Communications and other applications. Cisco Unified Presence technology has been integrated with Cisco Unified Communications Manager for Release 10.0.

With this integral component of the Cisco Unified Communications system, you can:
- Facilitate fast decision making and enhance productivity using presence awareness to view the availability of your colleagues and reduce communications delays
- See the availability of partners and customers in other organizations and exchange instant messages and video/audio calls
- Simultaneously support Cisco Unified Communications and standards-based XMMP clients with this dual-protocol platform that natively supports both SIP/SIMPLE and XMMP on a single software appliance
- Speed up your business processes and improve first-call resolution and customer satisfaction by providing availability information and communication capabilities in existing web and business applications


Cisco Jabber for Windows

Cisco Jabber for Windows streamline communications and enhances productivity through unified presence, instant messaging, and audio conference into one client on your desktop. Built on open standards, Jabber for Windows integrates with commonly used desktop applications. Jabber soft phones are installed in data center A, data center B, and remote sites.

For all support information for Cisco Jabber for Windows, go to:

Cisco Virtual Office and Cisco AnyConnect VPN client

CT IOS and Finesse Agent/phones are connected to the data center through a VPN tunnel.

In the Cisco Virtual Office (CVO) case, the VPN tunnel is established from the head-end VPN Hub router, which is connected to Data Center side A and terminated at a CVO spoke Router (881 and 891 routers), where Agent desktops and phones are connected. In the Cisco AnyConnect Secure Mobility Client case, the VPN tunnel is established from the ASA that is connected to Data Center Side A and terminated at phone models like 79XX, 89XX, and 99XX series, which support the VPN services.

Cisco Unified Contact Center Enterprise Desktop

The Cisco Computer Telephony Integration Option (CTI OS) Agent Desktop and the Finesse Agent Desktop are both tested. CTI OS Agent Desktop functionality used during testing includes handling of inbound calls, outbound calls, transfer and conference. Finesse Agent Desktop testing includes handling of inbound calls, transfer and conference.


Cisco Unified Border Element

SIP trunking is used for the Unified CVP deployment with Cisco IOS gateways and Cisco Unified Border Element (CUBE). Stand-alone CUBE is placed in data center A and data center B respectively. From each CUBE a SIP trunk is running on Transmission Control Protocol (TCP) (using VoIP dial-peer) to Unified CVP in data center A and data center B respectively. From Unified CVP, a SIP trunk is running on TCP to CUBE. In addition, from each CUBE (in Data Center A and B), one more SIP trunk is running on User Datagram Protocol (UDP) (using VoIP Dial-peers) on each CUBE 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.


Desktop Virtualization

The Cisco Virtualization Experience Client (VXC) 6xxx is a thin client that unifies voice, video and virtual desktops in one device. VXC 6xxx clients were deployed both in the data center as well as remote sites. PCoIP and ICA were tested with VXC 6xxx. Some of the remote clients were over VPN. Both CTI OS Agent Desktop and Finesse were tested with these virtualized clients.

Cisco TelePresence Video Phones

The Cisco Telepresence System EX60 and EX90 (EX60, EX90) in the Data Centers and in remote sites are tested as customer video phones. These phones are not tested as agent phones in the Contact Center deployment.
Conferencing

Cisco TelePresence MCU 4500 Series (MCU 4501) is a full high-definition multimedia conferencing bridge. MCU 4501 was deployed in the data center and registered to the Unified CM. MCU 4501 was part of the MRGL configured on all phones so that conferencing initiated can allocate a video conference bridge.

Agent Greeting and Whisper Announcement

An Agent Greeting is defined as the ability of a computer telephony integration (CTI) application, such as Contact Center, to instruct Unified CM to automatically play a pre-recorded announcement to the caller immediately after a successful media connection to the agent device.

The Agent Greeting feature allows a contact center to record a greeting to play to a caller and an agent when a caller and agent are connected. This feature is enabled with the type 10 Network VRU based on Unified CVP with SIP as the Unified CVP call control protocol.

A Whisper Announcement is defined as the ability to play a pre-recorded announcement to an agent immediately before the caller is connected. The announcement is played to the agent only and is not heard by the caller. The announcement helps the agent answer the call correctly.

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


Security

Security components include firewall, antivirus software. Security is implemented at the various sites as follows:

- McAfee Antivirus—Third-party antivirus agents are installed on Windows-based servers like Unified ICME, Unified IP IVR, and others, but not on non-Windows appliances such as Unified CM.
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**

<table>
<thead>
<tr>
<th>Component</th>
<th>Hardware Platform</th>
<th>Deployment Notes</th>
</tr>
</thead>
</table>
| Unified CM | UCS-C210M2 | • Unified CM 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 (contact center) extensions |
| Cisco Voice Gateways/VXML Gateways | Cisco 39xx Series | • Standalone E1 Gateways  
• SIP |
| Agent Phones | 69xx, 79xx, 89xx, 894x, 99xx, and Jabber for Windows | • SCCP & SIP  
• Single-line  
• Agent Greeting and Whisper announcement enabled  
• Phones have ACD line only, no general office lines |
| Agent Desktops | Windows 7, Windows XP | • CTI Object Server (CTI OS)  
• Finesse |
| Cisco Jabber for Windows | Windows 7, Windows XP | Deployed in the Data Center A, Data Center B, and the Remote sites |
| Unified CVP | UCS-C210M2 | • 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 | UCS-C210M2 | Configured in the Duplex Active-Active Mode |
| Agent Peripheral Gateway | UCS-C210M2 | Unified CM Peripheral Interface Manager (PIM) |
| Administration Server and Real-time and Historical Data Server (AW-HDS) | UCS-C210M2 | Configured in the Active and Stand-by mode |
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<tr>
<th>Component</th>
<th>Hardware Platform</th>
<th>Deployment Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote VXML Gateway</td>
<td>Cisco 39xx</td>
<td>VXML Gateway and Voice Gateway are deployed on ISR</td>
</tr>
<tr>
<td>Cisco Unified SIP Proxy (Unified SIP Proxy)</td>
<td>SM-SRE-900</td>
<td>Hosted on Cisco 3945</td>
</tr>
<tr>
<td>Cisco TelePresence MCU (MCU 4501)</td>
<td>4501</td>
<td>Video Conference Bridge</td>
</tr>
<tr>
<td>Cisco Unified Border Element (CUBE)</td>
<td>Cisco 29XX</td>
<td>Configured in stand-alone mode in Data Center A and in Data Center B</td>
</tr>
<tr>
<td>Cisco Finesse</td>
<td>UCS-C210M2</td>
<td>Configured in the cluster mode in Data Center A</td>
</tr>
<tr>
<td>Cisco Media Sense</td>
<td>Services-Ready Engine(SRE) module</td>
<td>On the Integrated Service Router 3925, equipped with Service Module (SM), loaded with Services Ready Engine (SM-SRE-910-K9) Configured in the cluster mode</td>
</tr>
<tr>
<td>Cisco MediaSense</td>
<td>UCS-C210M2</td>
<td>Configured in the cluster mode in Data Center A</td>
</tr>
<tr>
<td>Cisco SocialMiner (SocialMiner)</td>
<td>UCS-C210M2</td>
<td>Configured in the cluster mode in Data Center A</td>
</tr>
<tr>
<td>TelePresence EX60 (EX60)</td>
<td></td>
<td>Deployed in Data Center A, Data Center B, and the Remote Site</td>
</tr>
<tr>
<td>TelePresence EX90 (EX90)</td>
<td></td>
<td>Deployed in Data Center A, Data Center B, and the Remote Site</td>
</tr>
<tr>
<td>Cisco Virtualization Experience Client 6xxx (Cisco VXC 6xxx)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco ASR 1000 Series Aggregation Services Routers (Cisco ASR 1000)</td>
<td>ASR 1002</td>
<td></td>
</tr>
<tr>
<td>Cisco Integrated Services Routers</td>
<td>Cisco 881</td>
<td>Cisco Virtual Office (CVO)</td>
</tr>
<tr>
<td>Cisco Integrated Services Routers</td>
<td>Cisco 891</td>
<td>Cisco Virtual Office (CVO)</td>
</tr>
<tr>
<td>Cisco Unified Communications Manager IM and Presence Service (IM and Presence Service)</td>
<td>UCS-C210M2</td>
<td>Configured in the Cluster mode, separated the nodes across WAN</td>
</tr>
<tr>
<td>VMware View</td>
<td>UCS-C210M2</td>
<td></td>
</tr>
<tr>
<td>Citrix XenDesktop</td>
<td>UCS-C210M2</td>
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