Cisco Unified Contact Center Enterprise Test Bed for Collaboration Systems Release 11.0(1)

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Overview

This Cisco Unified Contact Center Enterprise (Unified CCE) with Cisco Unified Customer Voice Portal (Unified CVP), local and remote agents test bed is used to test Cisco Collaborative Systems Release 11.0(1). The test bed simulates a medium-sized inbound and outbound contact center with local and remote agents. It uses 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:

- Cisco Collaboration System 11.x Solution Reference Network Designs (SRND)

- Cisco Unified Contact Center Enterprise Design Guide, Release 11.0(1)

- Design Guide for Cisco Unified Customer Voice Portal, Release 11.0(1)

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 11.0(1).

More configuration information for contact center components is available at: Configuration Examples and TechNotes.

Unified CCE with Unified CVP Test Bed and Deployment Architecture

This Unified CCE with Unified CVP test bed is replicates a 4000 agent inbound and outbound contact center in multiple sites with local and remote agents. It is combined with a general collaboration office deployment on a Unified Communications Manager cluster. A SIP-based Unified CVP deployment is used for prompting, collecting, and queuing. Agents use SCCP and SIP phones such as Cisco IP Phone 7800 and 8800 Series and Cisco Unified IP Phone 6900, 7900, 8900, 9900 Series, and video endpoints such as Cisco DX Series and Cisco TelePresence System EX Series.

Agents also use Cisco Finesse and Cisco Computer Telephony Integration Option (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 deployment is a Clustering over WAN model. In this deployment, the agents are local and connected through LAN/MAN infrastructure to the Unified CCE deployment. The Unified CCE components and Unified Communications Manager components in the secondary data center provide redundancy if 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 communication.

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The links are 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 Cisco MediaSense (MediaSense) primary and MediaSense secondary nodes installed. It is used to record audio calls using Unified Communications Manager-based forking and Cisco Unified Border Element (Unified Border Element)-based forking methods.

For a Visio version of the test bed topology diagram, see Network Topology Diagrams for Contact Center.

Figure 1: Collaboration Systems Release 11.0(1): Unified Contact Center Test Architecture
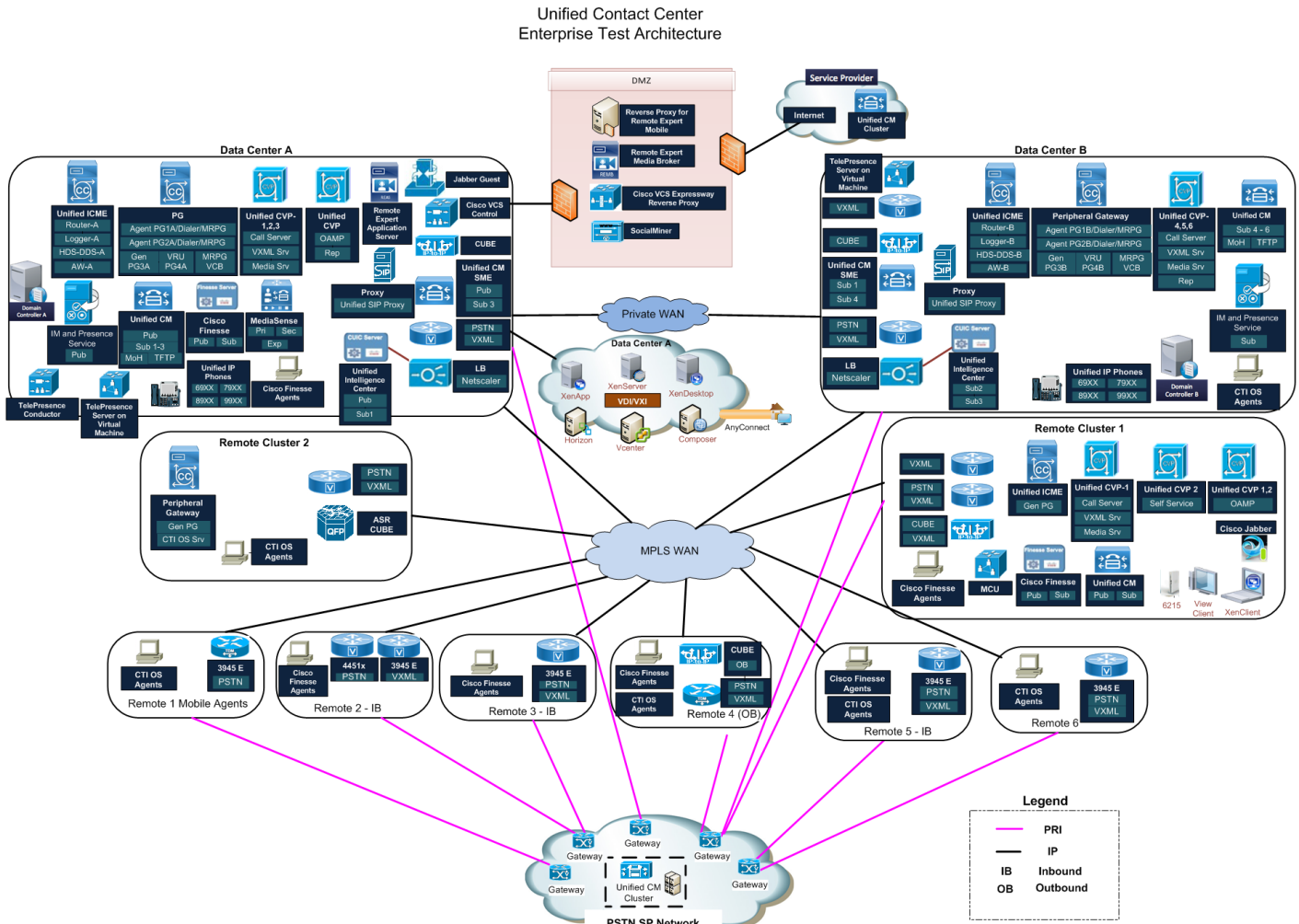
General Deployment Options

The test bed addresses Contact Center functionalities that provide value to customers.

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

Cisco Unified Contact Center Enterprise (Unified CCE) and Cisco Unified Intelligent Contact Management Enterprise (Unified ICME) provide intelligent routing and call treatment with transparent blending of multiple communication channels. These components also ease the transition from a traditional automatic call distributor (ACD) to an IP-based ACD.

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

Unified CCE and Unified ICME software is deployed at the test sites in the contact center environment. With Unified CCE and Unified ICME, the contact 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.

For the latest configuration options for Unified CCE, go to http://www.cisco.com/en/US/partner/products/sw/custcosw/ps1844/products_installation_and_configuration_guides_list.html.

Cisco Unified Customer Voice Portal

Cisco Unified Customer Voice 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 is implemented in this test environment in self-service mode, and the comprehensive mode. Comprehensive mode includes support for agent queuing, multisite call switching, and speech-enabled and touch tone applications. Customers can use touch tone signals or their own voice to request self-service information. Its components work together enabling you to create and deploy IVR applications that include voice interaction and traditional numeric inputs 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.

Through an operations console, Unified CVP also allows you to monitor, manage, and configure all Unified CVP solution components from a central, single operations console.

For additional information about Unified CVP, see http://www.cisco.com/c/en/us/support/customer-collaboration/unified-customer-voice-portal/tsd-products-support-series-home.html.

Cisco Outbound 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 customers to agents or IVRs. The Outbound Option Dialer component, resides on the peripheral gateway server. It dials customers using Unified Communications Manager and voice gateways, reserves agents through the Media Routing (MR) interface, and transfers answered customer calls to reserved agents.

In an Outbound Option deployment that uses the SIP Dialer, the voice gateway (not Unified Communications Manager) handles outbound campaign functions such as dialing, call control, and Call Progress Analysis. This deployment increases the number of outbound agents that a deployment can service on a peripheral gateway. Also, it reduces the number of peripheral gateways and dialers customers must deploy for larger enterprise systems. The Outbound Option was tested with Integrated Services Router (ISR)-G3 routers.

For additional information about Cisco Outbound Option, see http://www.cisco.com/en/US/products/sw/custcosw/ps524/tsd_products_support_series_home.html.

Cisco Mobile Agent

The Cisco Mobile Agent feature enables Unified CCE or Unified ICME to support agents using phones not directly controlled by Unified Communications Manager, such as an agent:

- Outside the call center, using an analog phone at home or a mobile phone

- Inside the call center, using an IP phone connection not controlled by Unified CCE or an associated Unified Communications Manager

Use the Cisco Mobile Agent option if you plan to configure a mobile agent to use an analog phone or a Unified IP Phone without the Cisco Business Ready Teleworker setup.

For all support information for Cisco Mobile Agent, see
http://www.cisco.com/en/US/prod/collateral/voicesw/custcosw/ps5693/ps6223/product_data_sheet0900aecd80425476.html.

Cisco MediaSense

Cisco MediaSense (MediaSense) is a SIP-based service. MediaSense allows other network devices to monitor customer conversations, including recording, playback, and streaming in real time. It also supports storage of audio and video data, including Video on Hold (VoH) and Video in Queue (ViQ). MediaSense automatically captures and stores every Voice over IP (VoIP) conversation which crosses configured Unified Communications Manager IP phones or Cisco Unified Border Element 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. MediaSense enables contact center supervisors to perform live monitoring of conversations and assists agents in resolving caller issues. MediaSense provides open, standardized hooks for real-time speech analytics, to help customer service representatives assist callers faster and more effectively.

For all Cisco MediaSense support information, see
http://www.cisco.com/en/US/products/ps11389/tsd_products_support_series_home.html.

Cisco Finesse

Cisco Finesse is a next-generation agent and supervisor desktop designed to provide a collaborative experience for the communities that interact with your customer service organization. In this deployment, Cisco Finesse is installed on a virtual machine as a primary and secondary node.

Cisco Finesse with Cisco Virtualization Experience Media Engine (VXME) 9.7 was tested with both Citrix Desktop 7.0 and with VMware View. Cisco Finesse is installed on the Linux-based Cisco Unified Communication Voice Operating System. Primary and secondary Cisco Finesse servers are installed on the same site as Unified CCE components. Currently Cisco Finesse does not support primary and secondary nodes separated over WAN. Agents can sign on to the Cisco Finesse Server from Microsoft Internet Explorer 9.0 or Mozilla Firefox version later than 24, using a laptop or a desktop. The laptop or desktop can be connected directly to the data center or remotely using Cisco VXC 62xx clients such as VPN using VMware or Citrix View.

Agents sign on to the Cisco Finesse server from Microsoft Internet Explorer 9.0 using a laptop or a desktop connected directly to the data center or remotely using Virtual Desktop Infrastructure (VDI) devices.

For all support information on Cisco Finesse, see
http://www.cisco.com/en/US/products/ps11324/tsd_products_support_series_home.html.

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 tandem to process the Agent Request (Voice CallBack) from its inception through the receipt of the callback.

The role of SocialMiner in the Agent Request feature:

- Provide a notification mechanism (the Connection to Unified CCE notification type) used to forward callback requests to Unified CCE through a Media Routing (MR) connection.

- Provide the API used by custom applications to start a callback.

- Forward the callback details to Unified CCE.

- Provide an API used by custom applications to retrieve the state of the callback. This API includes a field in the GET call that can communicate to the user the estimated wait time until an agent becomes available.

- Provide an API used by custom applications to cancel a requested callback.

For more information about SocialMiner, see http://www.cisco.com/en/US/products/ps11349/index.html.

Cisco Jabber for Windows

Cisco Jabber for Windows (Jabber for Windows) streamlines communication and enhances productivity through IM and Presence Service, 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 for Windows 11.0 Unified IP Phones are installed in Data Center A, Data Center B, and remote sites.

For all support information for Jabber for Windows, see http://www.cisco.com/c/en/us/support/unified-communications/jabber-windows/tsd-products-support-series-home.html.

Cisco Virtual Office and Cisco AnyConnect VPN Client

CTI OS and Cisco Finesse Agent or phones are connected to the data center through a VPN tunnel.

For Cisco Virtual Office, the VPN tunnel is established from the headend VPN Hub router, which is connected to Data Center Side A. The VPN tunnel is terminated at a Cisco Virtual Office spoke Router (881 and 891 routers), where Agent desktops and phones are connected.

For Cisco AnyConnect Secure Mobility Client, the VPN tunnel is established from the Cisco Adaptive Security Appliance (ASA) connected to Data Center Side A. The VPN tunnel is terminated at Unified IP Phone models that support the VPN services.

For additional information about Cisco Virtual Office, see http://www.cisco.com/en/US/netsol/ns855/.

For additional information about Cisco AnyConnect VPN Client, see http://www.cisco.com/en/US/products/ps8411/tsd_products_support_series_home.html.

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. Cisco Finesse Agent Desktop testing includes handling of inbound calls, transfer, and conference.

For all support information for Unified CCCE Desktop, see http://www.cisco.com/en/US/partner/products/sw/custcosw/ps1844/tsd_products_support_series_home.html.

For all support information for CTI OS, see http://www.cisco.com/en/US/partner/products/sw/custcosw/ps14/tsd_products_support_series_home.html.

Cisco Unified Border Element

SIP trunking is used for the Unified CVP deployment with Cisco IOS gateways and Cisco Unified Border Element (Unified Border Element). Stand-alone Unified Border Element is placed in Data Center A and Data Center B respectively. From each

Unified Border Element, there is a SIP trunk on Transmission Control Protocol (TCP) (using VoIP dial-peer) to Unified CVP in Data Center A and Data Center B respectively.

From Unified CVP, there is a SIP trunk on TCP to Unified Border Element. In addition, from each Unified Border Element (in Data Center A and B), there is another SIP trunk on User Datagram Protocol (using VoIP Dial-peers) to accept the IP calls from IP PSTN Service Provider network.

For further information about Unified Border Element, see
http://www.cisco.com/en/US/products/sw/voicesw/ps5640/tsd_products_support_series_home.html.

Unified CM SME Support for Contact Center

Cisco Unified Communications Manager Session Management Edition (Unified CM SME) interoperability with a virtualized Cisco Unified SIP Proxy (Unified SIP Proxy) and Unified CVP was deployed and qualified in the contact center test bed. All basic contact center call flows and failover were tested over Unified CM SME. Unified SIP Proxy was deployed as a VM on a Cisco UCS B-Series Blade Server.

The callers to the contact center can be routed through a Unified Border Element or PSTN Gateway. There would also be callers coming in from an ICT trunk to Unified CM SME and then routed to the contact center.

For additional information about Unified CM SME, see http://www.cisco.com/c/en/us/products/unified-communications/unified-communications-manager-session-management-edition/index.html.

Cisco Unified Intelligence Center

Cisco Unified Intelligence Center (Unified Intelligence Center) is a web-based reporting application that provides real-time and historical reporting. It provides precise and comprehensive contact center reports.

In contact center environments, supervisors can view reports to see agents' current or past performance. Reports can be displayed in different views such as Grid, Gauge, Pie, or Line charts. First step is to design the views (how and what data to be presented on screen) of report in Unified Intelligence Center. This step is a one-time activity. Once it is done, the user can sign in anytime to Unified Intelligence Center and run the report to see data in a particular view. While running a report, the user has to specify the filter such as, show data between dates or show data for agents having agent id in a particular range. Unified Intelligence Center provides permalink to each view of the report using which user can directly see the report by specifying the link in web browser.

For additional information about Unified Intelligence Center, see http://www.cisco.com/c/en/us/products/customer-collaboration/unified-intelligence-center/index.html.

Cisco Remote Expert Mobile

Cisco Remote Expert Mobile (Remote Expert Mobile) is a software solution that enables personal and actionable customer interactions within mobile and web applications. These interactions range from simple click-to call to a complete voice, video, and Expert Assist customer engagement session interconnected to a full contact center environment.

By leveraging WebRTC, it can deliver voice, video, and Expert Assist cobrowse and application sharing in mobile or web applications. Remote Expert Mobile is designed specifically for remote collaboration services provided through Unified Communications Manager, Unified CCE, or Cisco Unified Contact Center Express (Unified CCX).

Voice, video, and Expert Assist sessions in Remote Expert Mobile are created from mobile and web applications that embed the Remote Expert Mobile Client SDK (CSDK). These communications traverse securely over the top of the Internet into the enterprise network to experts that utilize a Cisco Unified Communications and Contact Center infrastructure. Session signaling travels into a DMZ through a firewall and Reverse Proxy to the Remote Expert Mobile server component know as the Remote Expert Mobile Application Server (REAS). Voice and video media traverse through the DMZ to the Remote Expert Mobile server component known as the Remote Expert Media Broker (REMB). Once an application is authorized to instantiate a session in the CSDK, calls are initiated over secure web sockets into REAS. Remote Expert Mobile effectively appears as a SIP trunk coming into the Cisco Unified Border Element (CUBE). From here, a SIP INVITE is sent to the CUBE or Unified

Communications Manager cluster. All SIP requests, both initial and subsequent, are routed to the configured CUBE or Unified Communications Manager cluster.

For additional information about Remote Expert Mobile, see http://www.cisco.com/c/en/us/products/customer-collaboration/remote-expert-mobile/index.html.

Cisco 4451-X Integrated Services Router

Cisco 4451-X Integrated Services Router (Cisco 4451-X ISR), a G3 gateway, was qualified in load for both Inbound and Outbound Call Flows through PSTN gateway and CUBE (IPIP GW). Outbound Call Flows had CPA enabled. Cisco 4451-X ISR runs on Cisco IOS-XE Software which is designed to provide modular packaging, feature velocity, and powerful resiliency.

Cisco 4451-X ISR doesn't support any VXML functionality, therefore it acted as only ingress and egress Gateways. The test bed includes a dedicated VXML gateway to cater the VXML functionality for calls coming from Cisco 4451-X ISR.

For additional information about Cisco 4451-X ISR, see http://www.cisco.com/c/en/us/support/routers/4451-x-integrated-services-router-isr/model.html.

TelePresence Conductor, TelePresence Server on Virtual Machine, MCU

Cisco TelePresence Conductor (TelePresence Conductor) helps ensure simple, reliable, and efficient multiparty telepresence and collaborative conferencing. TelePresence Conductor simplifies multiparty video communications. It lies within a video communications network, working with one or more conference bridges and one or more call control devices (either Cisco TelePresence Video Communication Server (Cisco VCS) or Unified Communications Manager). It allows the video network to be configured such that ad hoc or rendezvous conferences may be easily provisioned, initiated, accessed, and managed.

Conference bridge pools can now be made up of either Cisco TelePresence Servers or Cisco TelePresence MCUs (MCU). The Cisco TelePresence Server is an innovative software solution enabling high quality standards-based conferencing for the mobile or desktop user and the immersive room meeting participant. 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 Communications Manager. MCU 4501 was part of the MRGL configured on all phones so that an initiated conference can allocate a video conference bridge.

TelePresence Conductor now supports direct connection to Unified Communications Manager for ad hoc and rendezvous calls. Endpoints can be registered with either Unified Communications Manager or Cisco VCS and call the same conference.

A conference bridge is used for hosting the participants of a multipoint conference. This version of TelePresence Conductor supports the conference bridges Cisco TelePresence MCU (version 4.2 or later) and Cisco TelePresence Server (version 3.0 or later). All conference bridges managed by a TelePresence Conductor must be added to a conference bridge pool that contains conference bridges of one type and with the same configuration. TelePresence Conductor treats a pool of conference bridges as a single conference bridge resource, increasing the available capacity and providing redundancy. When TelePresence Conductor receives a request for conference resources, it determines the conference bridges to host the conference on.

For additional information about TelePresence Conductor, see http://www.cisco.com/c/en/us/products/conferencing/telepresence-conductor/index.html.

For additional information about Cisco VCS, see http://www.cisco.com/c/en/us/support/unified-communications/telepresence-video-communication-server-vcs/tsd-products-support-series-home.html.

For additional information about Cisco TelePresence Servers, see http://www.cisco.com/c/en/us/products/conferencing/telepresence-server/index.html.

For additional information about MCUs, see http://www.cisco.com/c/en/us/products/conferencing/video-conferencing/index.html#~products.

Virtualization Support

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

For further information about Virtualization Support, see http://www.cisco.com/en/US/products/ps10265/.

Desktop Virtualization

Cisco Virtualization Experience Media Engine (VXME) 9.7 is deployed in the data center. Some of the remote clients were over VPN. Both CTI OS Agent Desktop and Cisco Finesse were tested with these virtualized clients.

As part of the 10.6 Release, Cisco Virtualization Experience Media Engine for Windows was tested in both VMware and Citrix environments. VXME4Win is a windows plugin for VDI/VXI Cisco Jabber setup. In 10.6 Release, both VXME for SUSE Linux (6215) and VXME for Windows were tested.

For further information about VXME, see http://www.cisco.com/c/en/us/products/collaboration-endpoints/virtualization-experience-media-engine/index.html.

For further information about Cisco VXC 6000 Series, see http://www.cisco.com/c/en/us/products/collaboration-endpoints/virtualization-experience-client-6000-series/index.html.

Security

Security components include firewall, antivirus software. Security is implemented at the various sites. McAfee Antivirus Third-party antivirus agents are installed on Windows-based servers like Unified ICME and others, but not on non-Windows appliances such as Unified Communications Manager.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, using the Cisco Bug Search Tool (BST), submitting a service request, and gathering additional information, see *What's New in Cisco Product Documentation* at: http://www.cisco.com/c/en/us/td/docs/general/whatsnew/whatsnew.html.

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