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

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Change History

This table lists changes made to this guide, and gives the dates those changes were made. Earliest changes appear in the bottom rows.

Change	Date	Link
Initial release of document	**August, 2015**	
Software compatibility information has been moved to the *Cisco Packaged CCE Software Compatibility Matrix DocWiki*.		http://docwiki.cisco.com/wiki/ Compatibility_Matrix_for_Packaged_ CCE
Hardware and virtualization information has been moved to the *Virtualization for Cisco Packaged CCE DocWiki*.		http://docwiki.cisco.com/wiki/ Virtualization_for_Cisco_Packaged_ CCE

Change	Date	Link
Capacity improvements: • You can configure a maximum of 9000 agents, with up to 900 of them as supervisors. • Packaged CCE supports 1500 concurrent agents, with up to 150 of them as supervisors, for deployments with an External AW-HDS-DDS. Packaged CCE continues to support 1000 concurrent agents, with up to 100 of them as supervisors, for deployments without an External AW-HDS-DDS. • Packaged CCE supports up to 2700 Unified CVP ports for deployments with between 1000 and 1500 agents. Packaged CCE continues to support up to 1800 Unified CVP ports for deployments with up to 1000 agents.		Packaged CCE Component Capacity, on page 19 Load Capacity, on page 23
Packaged CCE supports IPv6 connections for agent and supervisor desktops and phones.		IPv6 Support, on page 28
Packaged CCE supports Call Progress Analysis (CPA) for Outbound Option deployments configured with Cisco Unified Border Element (Cisco UBE).		Cisco Unified Border Element with Outbound Option SIP Dialer, on page 38
Packaged CCE supports VMware vNetwork Distributed Switch and Cisco Nexus 1000V.		Software Licenses, on page 14 Virtualization for Packaged CCE, on page 42
Load balancing information added to the guide.		Load Balancing , on page 33
Video Contact Center: • Added support for the Remote Expert Mobile deployment of Video Contact Center. • Added support for Remote Expert Branch deployments of Video Contact Center, including Kiosk/Immersive		Optional Features That Can Be Installed on Separate Servers, on page 6 Features Supported with Restrictions, on page 7

Change	Date	Link
Packaged CCE supports Finesse IP Phone Agent.		Integrated Options and Features Available on Host Servers, on page 5 Packaged CCE Component Capacity, on page 19
Packaged CCE supports Extension Mobility.		Integrated Options and Features Available on Host Servers, on page 5
Packaged CCE supports Exony VIM for reporting.		Cisco SolutionsPlus, on page 7
Live Data information has been added.		Live Data, on page 36

About This Guide

This guide lists the configuration and capacity boundaries of Cisco Packaged Contact Center Enterprise (Packaged CCE)—a solution deployment for delivering Cisco Unified Contact Center Enterprise in a virtualized environment. Packaged CCE requires strict adherence to configuration and capacity rules. It is mandatory to follow all requirements stated in this document.

This guide specifies all configuration limits for the current release of Cisco Packaged Unified Center Enterprise. The information in this guide supersedes information about configuration limits in any other Packaged CCE documentation.

Attention   These specifications are for the most current Maintenance Release of Packaged CCE. This document assumes that you are installing—or upgrading to—the latest Maintenance Release.

Audience

This document is prepared for system engineers and partners.

Related Documents

Subject	Link
Cisco Packaged Contact Center Enterprise (Packaged CCE)	http://www.cisco.com/c/en/us/support/customer-collaboration/packaged-contact-center-enterprise/tsd-products-support-series-home.html

Subject	Link
Cisco Unified Contact Center Enterprise (Unified CCE)	http://www.cisco.com/c/en/us/support/customer-collaboration/unified-contact-center-enterprise/tsd-products-support-series-home.html
Cisco Unified Communications Manager	http://www.cisco.com/c/en/us/support/unified-communications/unified-communications-manager-callmanager/tsd-products-support-series-home.html
Cisco Unified Intelligence Center	http://www.cisco.com/c/en/us/support/customer-collaboration/unified-intelligence-center/tsd-products-support-series-home.html
Cisco Finesse	http://www.cisco.com/c/en/us/support/customer-collaboration/finesse/tsd-products-support-series-home.html
Cisco Unified Customer Voice Portal (Unified CVP)	http://www.cisco.com/c/en/us/support/customer-collaboration/unified-customer-voice-portal/tsd-products-support-series-home.html
Cisco Remote Expert Mobile	http://www.cisco.com/c/en/us/support/customer-collaboration/remote-expert-mobile/tsd-products-support-series-home.html
Cisco MediaSense	http://www.cisco.com/c/en/us/support/customer-collaboration/mediasense/tsd-products-support-series-home.html
Cisco SocialMiner	http://www.cisco.com/c/en/us/support/customer-collaboration/socialminer/tsd-products-support-series-home.html
Cisco Unified Web and E-Mail Interaction Manager	http://www.cisco.com/c/en/us/support/customer-collaboration/unified-email-interaction-manager/tsd-products-support-series-home.html

For additional information related to the Packaged CCE deployment, see the design guides for Unified CCE and for Unified CVP available at the links in the table above. While the Packaged CCE documentation takes precedence over—and overrides—these two guides, some elements are common.

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.

To receive new and revised Cisco technical content directly to your desktop, you can subscribe to the What's New in Cisco Product Documentation RSS feed. RSS feeds are a free service.

Field Alerts and Field Notices

Cisco products may be modified or key processes may be determined to be important. These are announced through use of the Cisco Field Alerts and Cisco Field Notices. You can register to receive Field Alerts and Field Notices through the Product Alert Tool on Cisco.com. This tool enables you to create a profile to receive announcements by selecting all products of interest.

Log into www.cisco.com and then access the tool at http://www.cisco.com/cisco/support/notifications.html.

Documentation Feedback

To provide comments about this document, send an email message to the following address: contactcenterproducts_docfeedback@cisco.com

We appreciate your comments.

Conventions

This document uses the following conventions:

Convention	Description
boldface font	Boldface font is used to indicate commands, such as user entries, keys, buttons, and folder and submenu names. For example: • Choose **Edit** > **Find**. • Click **Finish**.
italic font	Italic font is used to indicate the following: • To introduce a new term. Example: A *skill group* is a collection of agents who share similar skills. • A syntax value that the user must replace. Example: IF (*condition, true-value, false-value*) • A book title. Example: See the *Cisco Unified Contact Center Enterprise Installation and Upgrade Guide*.
`window font`	Window font, such as Courier, is used for the following: • Text as it appears in code or that the window displays. Example: `<html><title>Cisco Systems, Inc. </title></html>`

Convention	Description
< >	Angle brackets are used to indicate the following: • For arguments where the context does not allow italic, such as ASCII output. • A character string that the user enters but that does not appear on the window such as a password.

Introduction

Overview of Packaged CCE (CCE PAC M1)

Packaged CCE delivers Cisco Systems contact center components on a single pair of duplexed Unified Computing System (UCS) servers, referred to as the *Side A Host* and the *Side B Host*.

These components are deployed as on-box Virtual Machines (VMs) that are described by OVA files downloaded from Cisco Systems, Inc.

The Packaged CCE VMs provide the essential set of contact center functionality—call processing, prompts and rich VXML scripting, voice response collection, agent selection, queuing, and reporting. With its controlled environment and well-defined configuration and deployment boundaries, CCE PAC M1 is a robust solution with high availability and solution serviceability. Additional benefits are simplified ordering and deployment rollout, easier operation and maintenance, and *Unified CCE Administration*—a streamlined, browser-based administration interface for configuring the system and monitoring its health.

The CCE PAC M1 deployment supports on-box virtual machines (VMs) for the following products. Nothing can be installed other than what is in this table.

VM	Required?	Notes
Cisco Unified Contact Center Enterprise (Unified CCE)	Yes	Installed as two CCE Call Server VMs (one on the Side A Host and one on the Side B Host) and two CCE Data Server VMs (one on Side A and one on Side B).
Cisco Unified Customer Voice Portal (Unified CVP)	Yes	Installed as two CVP Servers on Side A, two on Side B, and one CVP OAMP Server on Side A.
Cisco Unified CVP Reporting Server	No	Used for the Courtesy Callback feature and VXML reporting. You have the option to install the CVP Reporting Server as an on-box VM on Side B or to connect to an external CVP Reporting Server.

VM	Required?	Notes
Cisco Unified Intelligence Center	Yes	Installed as a Publisher node on Side A and one Subscriber node on Side B.
Cisco Finesse	Yes	Installed as a Primary node on Side A and one Secondary node on Side B. **Important** You must install Finesse as on-box VMs, even if you do not intend to use the Finesse desktop.
Cisco Unified Communications Manager	Yes	Unified CM is required as either three on-box VMs or as a networked external Unified CM Publisher that connects with Subscribers. On-box Unified CM is installed as a Publisher and a Subscriber node on Side A and a second Subscriber node on Side B.

External Machine	Notes
Cisco Unified Communications Manager or Cisco Business Edition 7000	Optionally, Packaged CCE may connect to an existing external cluster instead of using the on-box cluster. Use the 7500-User VM Configuration or larger for Subscriber nodes on an external/existing cluster.
Cisco Unified Email Interaction Manager/Web Interaction Manager	Required for email and web collaboration management. Download the OVA that is appropriate for your EIM/WIM deployment size. Go here to download the OVA.
External AW-HDS-DDS	You can install the Administration Server, Real-Time and Historical Data Server, Detail Data Server (AW-HDS-DDS) on a maximum of two separate servers. External AW-HDS-DDS is required if • You plan to support 1000 to 1500 agents. • You need a longer retention period or additional reporting users. • You need to connect to a third-party reporting application. • You need to connect to a third-party Workforce Management application. Go here and navigate to download the OVA. Select the AW-HDS-DDS template.

External Machine	Notes
Cisco MediaSense	Provides recording, playback, live streaming, and storage of media, including audio and video, to improve customer care.
Cisco Unified CVP Reporting Server	Required for VXML reporting for the Side A Unified CVP Servers if Packaged CCE is split over a WAN. Courtesy Callback only uses the Side B Unified CVP Reporting Server, even when deployed over a WAN from the A side.
Cisco SocialMiner	Required for the Agent Request feature and for social media management.

Related Topics

Solution Topology

This figure shows the location of the virtual machines on Side A and on Side B in a deployment in which the Unified Communications Manager publisher and subscribers are installed as "on-box" virtual machines on the Side A and Side B hosts.

If you configure an external Unified Communications Manager, Side A will not have the Unified CM Publisher or Unified Communications Manager Subscriber 1. Side B will not have the Unified Communications Manager Subscriber 2.
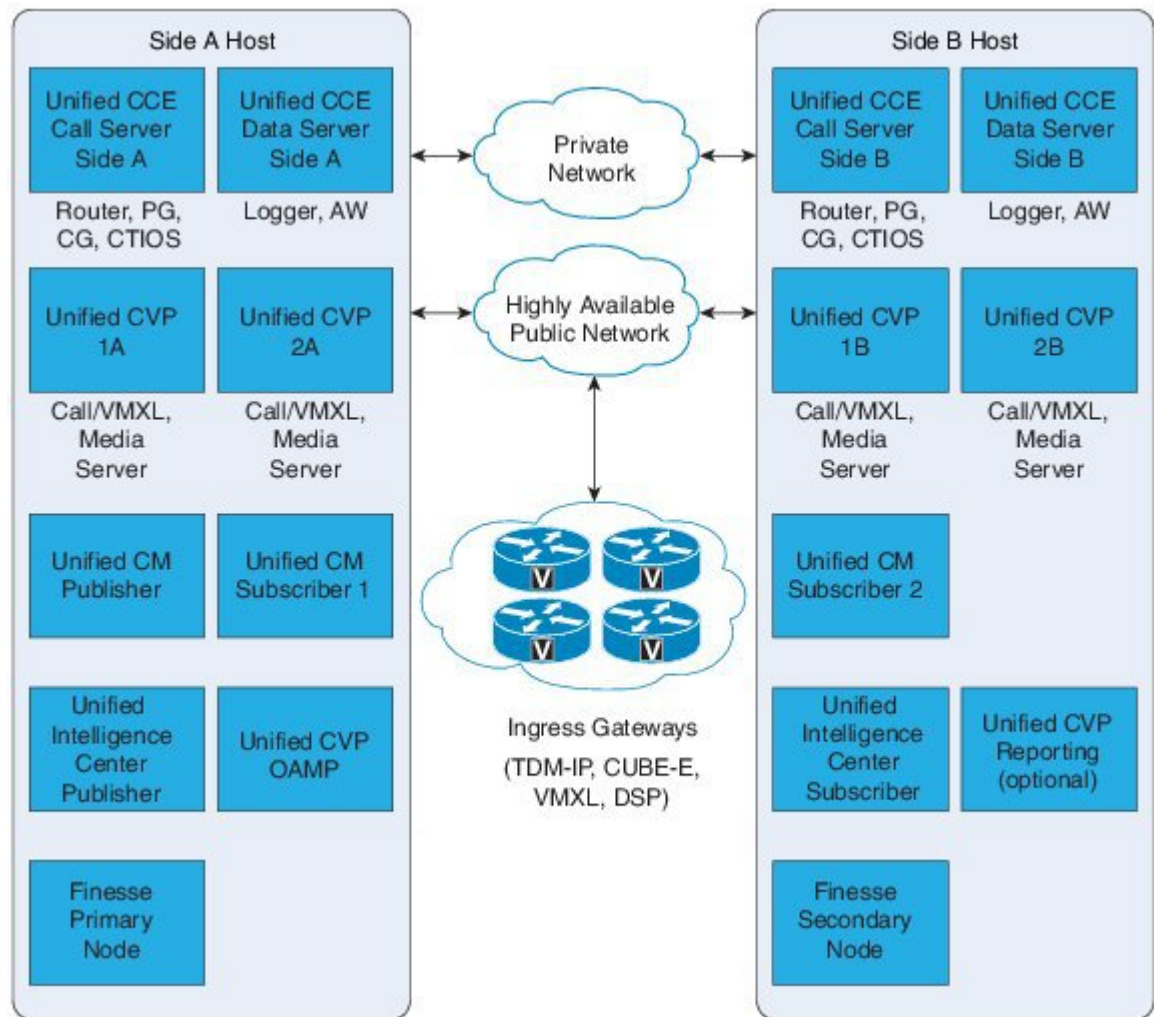
Peripheral Gateways

Two Peripheral Gateways (PGs) are required in the CCE PAC M1 deployment.

- One generic PG with these five Peripheral Interface Managers (PIMs):

  ◦ One Unified Communications Manager PIM

  ◦ Four Voice Response Unit (VRU) PIMs. Two of these connect to the two Unified CVP VMs on Side A. Two connect to the two Unified CVP VMs on Side B.

  The generic PG and its PIMs are configured automatically when you initialize a fresh Packaged CCE installation.

- One Media Routing (MR) PG that can accommodate from zero to four PIMs:

  ◦ One Outbound PIM

◦ A Multichannel PIM for SocialMiner

◦ A Multichannel PIM for E-Mail Interaction Manager / Web Interaction Manager

◦ A Multichannel PIM for a third-party multichannel application through Solutions Plus program

The MR PG is configured automatically when you initialize a fresh Packaged CCE installation. Manually configure MR PIMs for only the applications that require them.

No additional PGs or PIMs may be configured or installed.

Note Packaged CCE does not support off-box PGs.

CCE PAC M1 Option and Feature Support

This section lists the options and features that are supported in the CCE PAC M1 deployment of Packaged CCE, the features that are supported with restrictions, and the features that are not currently supported.

Features that have been fully qualified for Packaged CCE are documented in the *Cisco Packaged Contact Center Enterprise Features Guide* at http://www.cisco.com/en/US/products/ps12586/prod_maintenance_guides_list.html.

Deprecated Features and Options

The following features and options were deprecated in Packaged CCE release 11.0(1):

- Cisco UCS C260 M2 TRC#1 server

- CTI OS, the CTI OS Toolkit, and the CTI OS Toolkit Desktop

Do not include these features and options in new deployments. Support for them will be removed in a future release. For a full list of deprecated features, see the *Release Notes for Cisco Packaged Contact Center Enterprise Solution* at http://www.cisco.com/c/en/us/support/customer-collaboration/packaged-contact-center-enterprise/products-release-notes-list.html.

Integrated Options and Features Available on Host Servers

The VMs that are installed on the Side A and Side B servers enable these options and features:

- Agent Greeting

- Congestion Control

- Courtesy Callback

- Database integration through Unified CVP

- Extension Mobility

- Finesse IP Phone Agent

- Live Data

- Location-based Call Admission Control (CAC)

- Mobile Agent

- Post call survey

- Precision Routing

- Outbound Option

- Support for back-office phones

- Unified Communications Manager-based Silent Monitoring

- Unified CVP reporting

- Whisper Announcement

Optional Features That Can Be Installed on Separate Servers

These features are available on separate servers on the same network:

- Agent Request (requires SocialMiner)

- All Events clients (Recording, Wallboards, Workforce Management)

- Automatic Speech Recognition and Text-To-Speech (ASR/TTS)

- Customer Relationship Management (CRM)

- External AW-HDS-DDS for extended data retention period or 3rd party access, such as Workforce Management application

- Integration with existing Unified Communications Manager

- Cisco MediaSense

- Multichannel (Cisco Unified E-Mail Interaction Manager, Cisco Unified Web Interaction Manager, and eGain Solution Plus or Bucher + Suter Solutions Plus)

- CTI OS-based Silent Monitor (required for SPAN-based silent monitoring only)

> **Note** CTI OS was deprecated in Packaged CCE Release 11.0(1). See Deprecated Features and Options, on page 5 for more information.

- Video Contact Center (requires MediaSense and Cisco Telepresence MCU video conference bridge.)

  Video Contact Center with Jabber Guest also requires Cisco Expressway Edge, Cisco Expressway Core, and Cisco Jabber Guest Server.

  The Remote Expert Mobile deployment of Video Contact Center also requires Remote Expert Media Broker, Remote Expert Application Server, and Reverse Proxy.

- Remote Expert Branch, including Kiosk/Immersive (for more information, see http://www.cisco.com/c/en/us/solutions/enterprise/design-zone/remote_expert.html)

Cisco SolutionsPlus

Packaged CCE supports the following applications:

- ALI OnQ Campaign Management Solution

- Bucher +Suter CRM Connectors: Siebel, Salesforce, SAP, or MS Dynamics

- eGain Solutions Plus

- Nuance for CVP

- Nice Interaction Management Solution for Cisco MediaSense

- Calabrio Recording Applications for Cisco MediaSense

- Exony VIM (Reporting only)

Note Exony VIM Reporting requires an External AW-HDS-DDS.

Packaged CCE does not support Exony VIM Provisioning features.

Features Supported with Restrictions

These features and functions are supported with some restrictions, as noted.

Feature	Supported	Not supported
CTI OS	Security off	Security on
Mobile Agent	Nailed up	Call-by-call

Feature	Supported	Not supported
Video Contact Center	• Caller to agent video • Video on Hold (agent-initiated) • Video in Queue Video in Queue is a feature in Cisco Unified Customer Voice Portal that can play videos before and while a caller is in queue. Video in Queue also allows the caller use DTMF keys to interact with the Unified CVP through high-definition video prompts, and to navigate a video menu. • Recording video calls • Video Contact Center with Jabber Guest deployment • Remote Expert Mobile deployment • Remote Expert Branch deployments, including Kiosk/Immersive	The following features are not supported for video calls: • Agent Greeting • Whisper Announcement • Mobile Agent • Silent Monitor • Courtesy Callback • Outbound Dialer • Video on Hold (caller-initiated) • Supervisor Barge-In • Intercept

Voice and Video Infrastructure	Supported	Not supported
Codecs	For VRU: G.711 mu-law and G.711 A-law For voice agents: G.711 mu-law, G.711 A-law, G.729, and G.729a For video: • Audio: For video upload, MediaSense requires AAC-LD MP4A-LATM. The audio is converted to AAC-LD MP4A-LATM, G.711 mu-Law, and G.722 for streaming playback. • Video: H.264	iSAC iLBC Mixed codecs for Mobile Agent. Remote and Local ports must use the same codec. Mixed codecs for CVP prompts. CVP prompts must all use the same codec. For video playback, MediaSense does not support G.711 A-Law.
Back-office and agent devices on external Unified Communications Manager	All voice requirements.	When there is contact-center interaction, use of different codec as external agent devices. Unified Communications Manager Cross Cluster Mobility feature.

Voice and Video Infrastructure	Supported	Not supported
Media Resources	These gateway-based media resources are supported: • Conference bridges • Transcoders and Universal Transcoders • Hardware and IOS Software MTPs	These Unified Communications Manager-based (Cisco IP Voice Media Streaming Application) media resources are not supported: • Conference bridges • MTPs
Music on hold	Unicast—Unified Communications Manager Subscriber source only This sizing applies to agent node only, for both agent and back-office devices, with all agent devices on the same node pair.	Multicast
Protocol	Session Initiation Protocol (SIP) over Transmission Control Protocol (TCP) Session Initiation Protocol (SIP) over User Datagram Protocol (UDP) for Outbound Option SIP Dialer to egress voice gateway. All subsequent transfers to end points must use SIP TCP. Secure SIP to SIP signaling Secure RTP (SRTP)	SIP over User Datagram Protocol (UDP), H323, Media Gateway Control Protocol (MGCP) SIP over Transmission Control Protocol (TCP) for Outbound Option SIP Dialer to egress gateway For SRTP, consider the following points before you enable it: • The Unified CVP VXML Browser does not support SRTP. • Deployments that use span-based silent monitoring do not support SRTP. • Mobile Agents cannot use SRTP. • The Cisco Outbound Option Dialers do not support SRTP. While calls are connected to the Dialer, the calls cannot use SRTP. But, calls can negotiate SRTP once the call is no longer connected to the Dialer.

Voice and Video Infrastructure	Supported	Not supported
High Availability	High Availability (HA) and load balancing are achieved using these solution components: • Time-Division Multiplexing (TDM) Gateway and Unified Communications Manager, which use the SIP Options heartbeat mechanism to provide High Availability. • Unified CVP servers, which use the SIP server group and SIP Options heartbeat mechanism to perform High Availability and load balancing. Cisco Unified SIP Proxy is supported for Outbound Option only - specifically for the Dialer.	Cisco Unified SIP Proxy is not supported for any call flow, except for Outbound Option Dialer.

Related Topics

Options and Features Not Currently Supported

At this time, the following Unified CCE solution options and features are not supported in the Packaged CCE (CCE PAC M1) deployment.

Note This is not an exhaustive list. As a rule, if an option or feature is not mentioned in this document, it is not supported in this deployment. Non-Contact Center Cisco Unified Communication applications—such as Unity Connection or third-party applications such as CRM and recording—may be deployed on external servers. The hardware, co-residency, and support requirements must be met for each application residing on that server. Refer to the documentation for each external application for that guidance.

• Legacy ACD Peripheral Gateway integration

• Cisco Agent Desktop

• Cisco Agent Desktop Browser Edition

• Cisco Business Edition 6000

• Cisco Unified Contact Center Management Portal (Unified CCMP)

- Unified CVP Call Director

- Cisco Intelligent Contact Management (ICM) to ICM Gateway

- CTI OS Security

- Dialed Number Plan (DNP)

- ICM Application Gateway

- ICM DB Lookup

- Parent Child

- Remote Silent Monitoring (RSM)

- RTMT Analysis Manager Analyze Call Path

- Time-Division Multiplexing (TDM) (third-party legacy Automatic Call Distribution integration)

- Translation Route

- Cisco Unified IP IVR; third-party Voice Response Unit (VRU) applications

System Requirements and Server Configuration

Open Virtualization Files

Open Virtualization Format files, packaged as OVAs, define the basic structure of the VMs that are created. This includes the CPU, RAM, disk space, reservation for CPU, and reservation for memory.

OVA files for Packaged CCE are contained in the **CCE-PAC-M1-OVA** zip file at Cisco.com.

VMware Hosting and Hardware Support

See the *Virtualization for Cisco Packaged CCE DocWiki* at http://docwiki.cisco.com/wiki/Virtualization_for_Cisco_Packaged_CCE for the supported Cisco UCS C-Series and B-Series servers for Packaged CCE fresh installs and upgrades, and supported VMware vSphere ESXi versions.

Software Compatibility

See the *Cisco Packaged CCE Software Compatibility Matrix DocWiki* at http://docwiki.cisco.com/wiki/Compatibility_Matrix_for_Packaged_CCE for version compatibility information for following products:

- Cisco Systems Contact Center required and optional components

- Endpoints for agents and callers

- Cisco gateway hardware and software

- Third-party software

Software Licenses

Software License or PAK	Quantity	Included with Packaged CCE license SKU?	Required?	Details
Unified CVP	4 PAKs	Yes	Yes	1 PAK for each of the four required Unified CVP Servers.
Unified Intelligence Center	1 PAK	Yes	Yes	1 PAK to be applied to the Unified Intelligence Center Publisher on Side A.
Unified Call Studio	2 PAKs	Yes	Yes	1 PAK for each Unified Call Studio workstation.
Unified CVP Reporting Server	1 or 2 PAKs	No	No	Maximum of 2 additional Unified CVP PAKs; 1 PAK for each optional Unified CVP Reporting Server.
Microsoft Windows Server 2012 R2	9 - 13	No	Yes	1 Virtual OS license for each of the required Unified CCE Call and Data Servers = 4 licenses. 1 Virtual OS license for each of the 4 required Unified CVP Servers = 4 licenses. 1 Virtual OS license for the Unified CVP OAMP Server = 1 license. 1 additional Windows Server Virtual OS licenses each of the optional Unified CVP Reporting Servers (one on-box and one external) = up to 2 licenses. 1 additional Windows Server Virtual OS license for each optional External AW-HDS-DDS = up to 2 licenses. **Note** For more information on Microsoft Windows Server Licensing options, please contact Microsoft or your authorized Microsoft reseller.
Microsoft SQL Server 2014	2 - 4 licenses	No	Yes	1 license for each Data Server = 2 licenses. 1 additional licenses for each optional External AW-HDS-DDS = up to 2 licenses.
VMware vSphere Standard or Enterprise ESXi	1 license per CPU	No	Yes	For more information, see the *Virtualization for Cisco Packaged CCE DocWiki* at http://docwiki.cisco.com/wiki/Virtualization_for_Cisco_Packaged_CCE. VMware vSphere Enterprise Plus is required for vNetwork Distributed Switch or Cisco Nexus 1000V support.

Software License or PAK	Quantity	Included with Packaged CCE license SKU?	Required?	Details
VMware vCenter	1 license	No	No	Required for customer deployments using VMware vNetwork Distributed Switch or the Cisco Nexus 1000V. VMware vCenter version must be equal or greater than the vSphere ESXi host versions managed.

Local and Wide Area Network Communications

Due to the use of VMware virtual switch (vSwitch) and the nature of the fault and recovery mechanism, Cisco Systems requires VMware NIC Teaming to connect to redundant physical switches for the Packaged CCE public and private networks. See the *Cisco Packaged Contact Center Enterprise Installation and Upgrade Guide* for more on this design.

Network uplink designs other than those detailed in the *Virtualization for Cisco Packaged CCE DocWiki* at http://docwiki.cisco.com/wiki/Virtualization_for_Cisco_Packaged_CCE and in the *Cisco Packaged Contact Center Enterprise Installation and Upgrade Guide* may expose the applications to unexpected fault scenarios that impact the recovery and/or operation of the Contact Center.

This fault tolerant design specifies use of two VMware vSwitches, one each for the Packaged CCE public and private network VLANs. Each vSwitch has one Active and one Standby vmnic. Each Active/Standby pair should be split across physical NIC adapters (for example, Active onboard/Standby on add-in card) and alternate Active paths to two data center switches. These two data center switches must be configured for both public and private network communications. The intention of the uplinks is to ensure that no single failure (physical NIC card, cable, physical switch) causes the loss of both the public and private network communications at the same time, or the loss of both the Active and Standby for the same vSwitch at the same time.

Note VMware and server management vSwitch should also be configured separately for enterprise management separate from either the public or private network communications paths, following VMware best practices.

Campus LAN, Metro Area Network (MAN) and Wide Area Network (WAN) (all considered WAN from here) split Packaged CCE deployments require a highly available Visible network communications between those data centers. These data centers must also have dedicated or shared Packaged CCE Private network communications path in a topology such that no single point of failure within that data center and WAN infrastructure results in the loss of both the Packaged CCE visible and private network communications for more than 500ms.

Latency Requirements

Network	Maximum Round Trip Time Supported
Visible	400 ms
Private	100 ms

Quality of Service and Bandwidth Provisioning

Your Wide Area Network must support QoS. For details, refer to the "Bandwidth Provisioning and QoS considerations" section in the *Cisco Unified Contact Center Enterprise Design Guide*, at http://www.cisco.com/en/US/partner/products/sw/custcosw/ps1844/products_implementation_design_guides_list.html.

For video calls, QoS must be enabled for video RTP communication and the data channel. Your network must have sufficient bandwidth to accommodate the following:

- Video communication between endpoints.
- Communication to VXML/Cisco UBE gateway and Cisco MediaSense server for video playback.
- Video recording by Cisco MediaSense.

For more information about video call bandwidth considerations, refer to the "Cisco Collaboration Solutions Design and Deployment Sizing Considerations" chapter of the *Cisco Collaboration System Solution Reference Network Designs*, at http://www.cisco.com/c/en/us/support/unified-communications/unified-communications-manager-callmanager/tsd-products-support-series-home.html

For bandwidth provisioning information for Cisco MediaSense video playback, refer to the "Scalability and Sizing" chapter of the *Cisco MediaSense Design Guide*, at http://www.cisco.com/c/en/us/support/customer-collaboration/mediasense/tsd-products-support-series-home.html.

Fault Tolerance

Packaged Contact Center Enterprise uses two servers to run the core applications components in duplex (synchronized) operation. This gives the contact center site survivability and recovery in most failure scenarios. Packaged CCE does not support simplex (single-server) deployments, outside of lab mode.

Router and PG co-location on a single physical server (one per side) requires a high level of network fault tolerance to avoid a double failure. A double failure is the loss of both the Visible and Private network connectivity to the host server, causing a potentially serious degradation in call routing. Recovery from double failure requires manual intervention.

For details on WAN fault handling of Packaged CCE split between two data centers, please refer to the "Unified CCE Failures During Network Failures" in the *Cisco Unified Contact Center Enterprise Design Guide*, at http://www.cisco.com/c/en/us/support/customer-collaboration/unified-contact-center-enterprise/tsd-products-support-series-home.html. Failures between data centers in clustering over WAN apply to Packaged CCE.

Data Backup

Data backup tools must be run during a scheduled maintenance window. If you use local SQL backups, make sure that the local machine has sufficient capacity. If not, back up to remote storage on the network.

NTP and Time Synchronization

Packaged CCE requires that all parts of the solution have the same time. While time drift occurs naturally, it is critical to configure NTP to keep solution components synchronized. To prevent time drifts on Live Data

reports, the NTP settings on the Data Server VMs, the Call Server VMs, and on the Cisco Unified Intelligence Center Publisher and Subscriber VMs must be synchronized.

Refer to the *Cisco Packaged Contact Center Enterprise Installation and Upgrade Guide* for details: http://www.cisco.com/en/US/products/ps12586/prod_installation_guides_list.html.

Configuration Limits

- Packaged CCE Component Capacity, page 19
- Load Capacity, page 23
- Outbound Option Capacity, page 24

Packaged CCE Component Capacity

For components used by both Unified CCE and by Packaged CCE, this table shows the Packaged CCE capacity. The Active column is relevant only for components that are constrained by routing limits.

Feature/Component	Active	Maximum configured / Notes
Administrators		100
Agents	1000 (without External AW-HDS-DDS) 1500 (with External AW-HDS-DDS)	9000

Feature/Component		Active	Maximum configured / Notes
	Web Interaction Manager / E-Mail Interaction Manager or 3rd party multichannel integration	A maximum of 700 out of the active agents	The number of agents that can be kept busy depends on the following factors: • The number of Web Interaction Manager/E-mail Interaction Manager web/application server pairs • The email and chat request rates
	Mobile Agents	A maximum of 250 out of the active agents	The CTI ports on Unified Communications Manager cannot exceed 500. (250 LCP ports and 250 RCP ports.)
	Agents available for Agent Callback Requests via SocialMiner	Any of the active agents	The number of agents that can be kept busy depends on the total number of agent requests per hour.
	Outbound Agents	Any of the active agents	The number of agents that can be kept busy depends on the following factors: • Lines per agent • Dialing mode • Hit rate • Talk time
	Finesse IP Phone Agents	A maximum of 500 out of the active agents	
	Supervisors	Included in maximum concurrent agents. 100 (without External AW-HDS-DDS) 150 (with External AW-HDS-DDS)	900 (included in maximum 9000 agents)
	Agent Trace		100 (maximum number of agents for whom agent trace can be enabled)
	Agents per Team		50
	Supervisors per Team		10
Attributes per System			10,000

Feature/Component		Active	Maximum configured / Notes
	Attributes per Agent		50
Bucket Intervals			1000
Bulk Jobs			200
Call Types			2000
	Call Type skill groups per interval	2000	
Departments			50
	Departments per Administrator		10
Desk Settings			1000
Dialed Numbers			
	External Voice		1000
	Internal Voice		1000
	Multichannel for SocialMiner		500
	Multichannel for E-Mail and Web Interaction Manager		500
	Multichannel for Third Party		500
	Outbound Voice		500
Expanded Call Variables (persistent)		20	You can create any number of Expanded Call Variables within the 2000-Byte system capacity. Packaged CCE does not support persistent array variables.
Media Classes			15
Media Routing Domains			20
Monitored devices associated with pguser			2,500 monitored CTI-controlled devices associated with the pguser in Unified Communications Manager. Examples of monitored CTI-controlled devices include phones, CTI route points, device profiles, and LCP ports.

Feature/Component	Active	Maximum configured / Notes
Network VRU Scripts		1000
Precision Queues		
PQs per System		2000
Steps per System		5000
Steps per Precision Queue		10
Unique Attributes per Precision Queue		10
Precision Queues and Skill Groups combined		
Queues per Agent		15
Unique Queues for all Agents in a Supervisor's Teams		50
Reason Codes		100
Reporting Users		
Unified Intelligence Center	100 (without External AW-HDS-DDS) 200 (with External AW-HDS-DDS)	All logged-in Unified Intelligence Center users can use Live Data reports.
Finesse	1000 (without External AW-HDS-DDS) 1500 (with External AW-HDS-DDS)	All logged-in Finesse agents can use Live Data reports. Supervisors cannot use Live Data reports for Finesse. They must use Unified Intelligence Center for Live Data reports.
Routing Scripts	500	1000
Number of Script Versions		100
Skill Groups		3000
Skill Group statistics refresh rate		10 seconds (default)
Roles		30
Teams		600

Feature/Component		Active	Maximum configured / Notes
	Teams per Agent		1
	Teams per Supervisor		20

Related Topics

Load Capacity

Feature/Component	Maximum configured / Notes
Conferences	75 simultaneous active conferences or 2250 Busy Hour Call Attempts. This limit applies to Unified CM Subscribers connected to the Unified CCE Call Servers, including agent and back-office devices. When this state of the call ends, the call is counted as a normal call.
Maximum call load for per second (including multichannel)	8 calls per second
Maximum load for Agent Callback Requests via SocialMiner	1000 agent requests per hour
Maximum load for email and chat requests	12 email requests per hour per agent with a maximum of 6000 email requests per hour 10 chat requests per hour per agent with a maximum of 5000 chat requests per hour
Music on Hold (Hold/Resume)	225 active calls on hold or 6750 Busy Hour Call Attempts When this state of the call ends, the call is counted as a normal call.
Report load per user	Each reporting user can run four concurrent real-time reports and two historical reports. • Real-time reports contain 100 rows. • Historical reports contain 2000 rows.

Feature/Component	Maximum configured / Notes
Transfers	150 simultaneous active transfers or 4500 Busy Hour Call Attempts This limit applies to Unified CM Subscribers connected to the Unified CCE Call Servers, including agent and back-office devices. When this state of the call ends, the call is counted as a normal call.
Unified CVP	For Packaged CCE with up to 1000 agents: • The maximum number of Unified CVP ports supported by the CCE PAC M1 deployment is 1800, based on gateway profile. • The sum of calls at agent and calls queued (VRU ports) cannot exceed 1800. • Each Unified CVP is configured to share the load and handle up to 450 ports. • During a failover scenario, the operational Unified CVPs double their load-sharing to handle up to 900 ports. For Packaged CCE with 1000 to 1500 agents: • The maximum number of Unified CVP ports supported by the CCE PAC M1 deployment is 2700, based on gateway profile. • The sum of calls at agent and calls queued (VRU ports) cannot exceed 2700. • Each Unified CVP is configured to share the load and handle up to 675 ports. • During a failover scenario, the operational Unified CVPs double their load-sharing to handle up to 1350 ports.

Outbound Option Capacity

Feature/Component	Maximum configured / Notes
Dialer per system	1 on each side, with only one 1 active Dialer type: only SIP Dialer supported

Feature/Component	Maximum configured / Notes
Gateways and SIP Outbound Dialer Ports	In a Packaged CCE deployment, you can be connected to only one gateway OR you can use SIP Proxy to connect to multiple gateways. In either case, the maximum number of configured dialer ports is 500.
Gateway Redundancy	Each dialer can connect to one gateway. Gateway redundancy is as follows: • If the Voice Gateway on Side A is down, Dialer B will take over and use Voice Gateway B. • If the Voice Gateway on Side B is down, Dialer A will take over and use Voice Gateway A.
Number of Agent and VRU Campaigns	100
Port Throttle	10
Proxy/Cisco Unified SIP Proxy (CUSP)	CUSP is supported with Outbound Option Dialer for managing multiple egress gateways.

Features and Functions

Agent and Supervisor

Call Flows

Packaged CCE supports calls that originate at Cisco Unified Customer Voice Portal.

Packaged CCE supports SIP REFER transfer to send calls back to the public switched telephone network (PSTN) or to other SIP destinations—but not to transfer calls within Packaged CCE and to other agents. After a SIP REFER, Packaged CCE determines that the call has ended and retains no further control over the call.

Note Translation routes are not supported in Packaged CCE.

Related Topics

CRM Integration

Customer Relationship Management (CRM) integration with Packaged CCE is allowed with a Finesse API or the CTI OS Toolkit.

You can integrate with CRM using the following methods:

- CRM iFrame in the Finesse container. This method is simple and easy but does not provide deep CRM integration.

- Third-party gadget in the Finesse container. This method achieves full CRM integration but requires custom development using third-party and Finesse APIs.

- Finesse gadgets in a CRM browser-based desktop. This method provides lightweight integration into the CRM application.

- Finesse Web API or CTI OS APIs or the CTI Server protocol to integrate into a CRM application. This method provides deep CRM integration but requires custom development.

- CRM connectors that are sold through the Cisco Solution Plus program.

> **Important** The CTI OS Toolkit was deprecated in Packaged CCE Release 11.0(1). See Deprecated Features and Options, on page 5 for more information.

Desktop and Desktop Customization

Supported are:

- Finesse, which can be customized by Finesse APIs

- CTI OS desktop, which can be customized by:

  - .NET
  - Java CIL
  - Win32

> **Note** The CTI OS desktop was deprecated in Packaged CCE Release 11.0(1). See Deprecated Features and Options, on page 5 for more information.

IPv6 Support

Unified Contact Center solutions can support IPv6 connections for agent and supervisor Finesse desktops and phones. This support means that most of the endpoints in your deployment can use IPv6 addresses.

Your IPv6-enabled deployment can use either IPv6-only or a mix of IPv4 and IPv6 endpoints. Servers that communicate with those endpoints can now accept IPv6 connections, in addition to IPv4 connections. Communication between servers continues to use IPv4 connections.

This diagram shows a logical view of a deployment with only IPv6 desktops and phones:

Figure 1: Deployment with Only IPv6 Agents
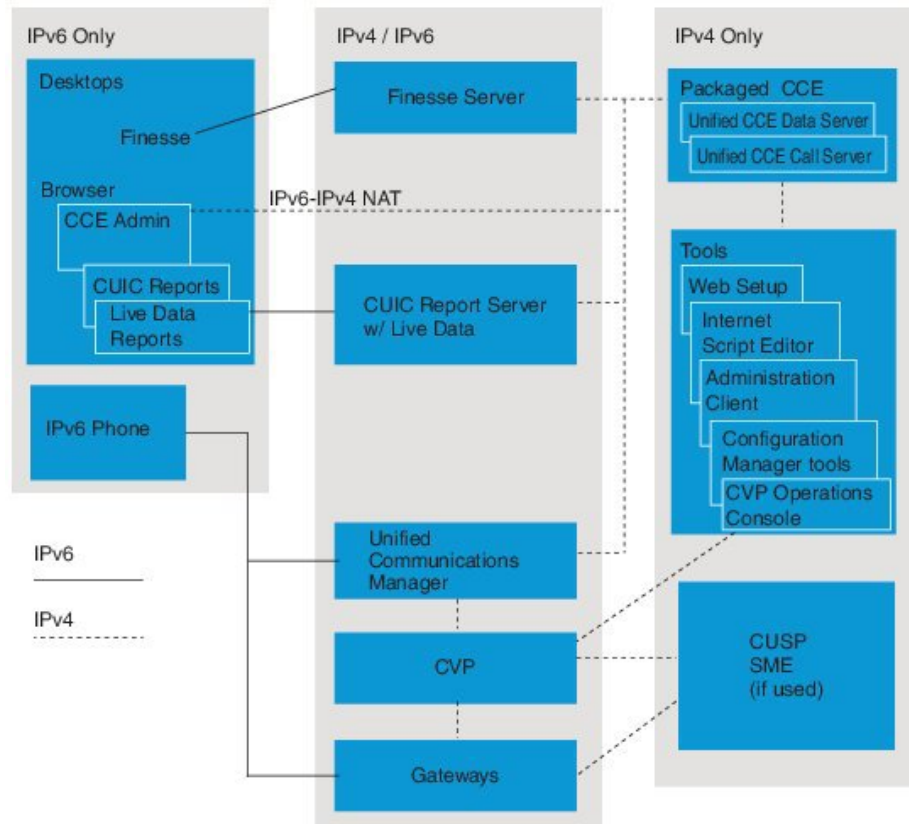
In these IPv6-only deployments, agents and supervisors use Finesse and browser-based tools that connect to dual-stack interfaces on the servers. The ingress gateways and Unified Communications Manager also use dual-stack interfaces to handle the voice traffic. These deployments require IPv4-based Administration Workstations to run the configuration tools that you do not access through a browser.

This diagram shows a logical view of a mixed deployment with both IPv6 and IPv4 endpoints:

Figure 2: Deployment with Both IPv4 and IPv6 Agents
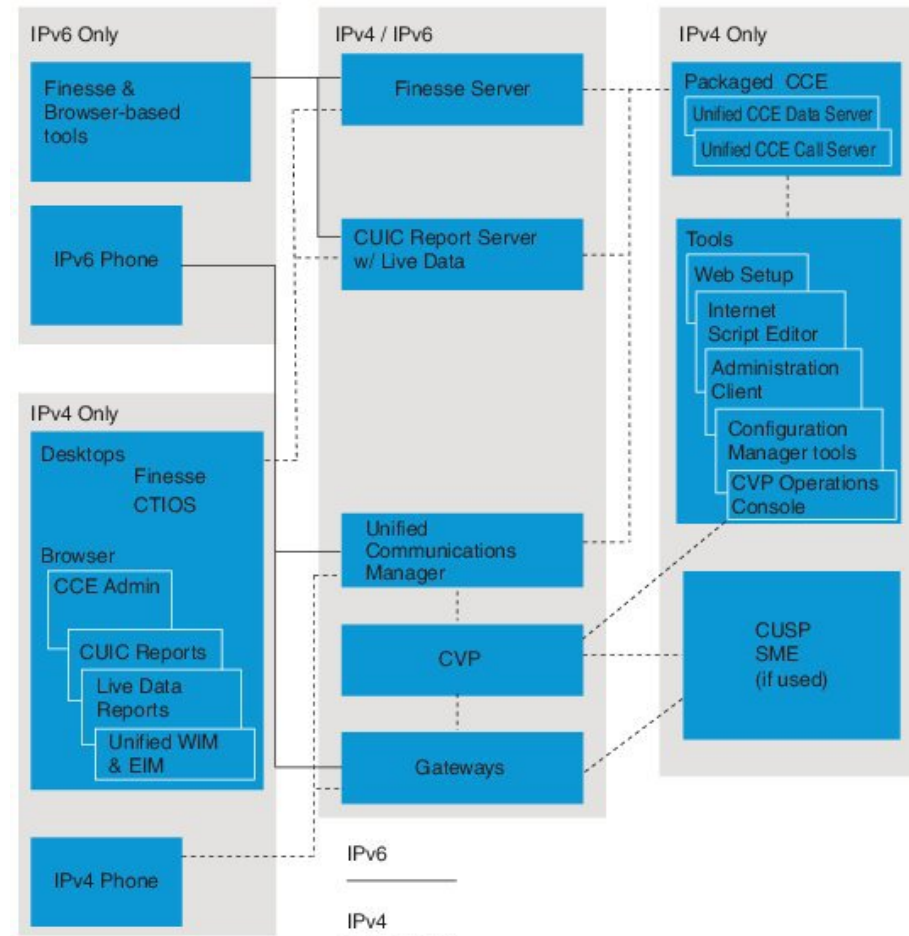
The Finesse desktop can support either IPv4 or IPv6 connections. Agents and supervisors who use the CTI OS desktops must use IPv4 connections. Unified WIM & EIM agents must use IPv4 connections.

Note   The CTI OS Desktops are deprecated as of Release 11.0(1). You can upgrade existing deployments that use these desktops, but do not include these desktops in new deployments. Support for these desktops will be removed in a future release.

For a list of endpoints that support IPv6, see the *Cisco Packaged CCE Software Compatibility Matrix DocWiki* at http://docwiki.cisco.com/wiki/Compatibility_Matrix_for_Packaged_CCE.

For information on enabling IPv6 in the Cisco Unified Communications Manager, see *Deploying IPv6 in Unified Communications Networks with Cisco Unified Communications Manager* at http://www.cisco.com/c/en/us/support/unified-communications/unified-communications-manager-callmanager/products-implementation-design-guides-list.html.

General IPv6 Design Considerations

IPv6 cannot be enabled on all the component servers in your contact center. For example, your deployment might use IPv6 phones, but only use IPv4 desktops. In that deployment, you enable IPv6 on the component servers that connect to the desktops.

When an IPv4 endpoint communicates with an IPv6 endpoint, Unified Communication Manager invokes Media Termination Points (MTPs) to negotiate the mismatch. As a result, IPv4-only endpoints like the VXML browser require extra MTP devices. Most uses of CVP features require MTPs for the IPv4-to-IPv6 negotiation.

You do not have to set up IPv6 at installation. You can enable IPv6 at any time. You can also revert to IPv4 from IPv6 if necessary.

You assign IPv6 addresses to hosts that have a dual IP stack. You use the Fully Qualified Domain Name (FQDN), rather than the IPv6 address, in the solution's user interface.

Desktop and Tool Support

This table lists which desktops support each connection type:

Desktop	IPv6 Connections	IPv4 Connections
Finesse	Yes	Yes
CTI OS	No	Yes

A supervisor's team can include a mix of agents using Finesse desktops with either IPv4 or IPv6 connections and CTI OS desktops with IPv4 connections.

You cannot use IPv6 to connect to a Finesse desktop through Citrix XenApp.

Desktops with either IPv4 or IPv6 connections can access the following tools:

- Unified CCE Administration web tool (using NAT64).
- Finesse configuration tools
- Cisco Unified Intelligence Center (Cisco Unified IC) configuration tools
- Unified IC reports

You require an IPv4 connection to access the following tools:

- Web Setup
- Script Editor
- Internet Script Editor
- Diagnostic Portico
- Unified CVP Operations Console
- Configuration Manager and its associated tools

Other Component and Feature Support

This table lists the connection type that each component or feature supports in an IPv6-enabled environment:

Component or Feature	Supported Connections in IPv6-enabled Environment		Notes
	IPv6	**IPv4**	
Mobile Agent	No	Yes	The CTI ports for Mobile Agent can only have an **IP Addressing Mode** of **IPv4 Only**.
Outbound Option	No	Yes	The Outbound Option Dialer uses IPv4 to place calls. A voice gateway that supports both IPv4 and IPv6 renegotiates call signaling and media to IPv6 during referral to an IPv6 agent. You cannot use an IPv6-only voice gateway with Outbound Option. An IPv6 client cannot import to Outbound Option.
Video Contact Center	No	Yes	
Unified Communications Manager Silent Monitoring	Yes	Yes	
Unified WIM and EIM	No	Yes	
MediaSense	No	Yes	
SocialMiner	No	Yes	

For more information on enabling IPv6, see the *Cisco Packaged Contact Center Enterprise Installation and Upgrade Guide* at http://www.cisco.com/c/en/us/support/customer-collaboration/packaged-contact-center-enterprise/products-installation-guides-list.html.

Recording

Cisco Packaged CCE supports MediaSense for audio recording. However video recording and playback is not supported.

Packaged CCE supports both of the following:

- Unified Communications Manager-based (Built In Bridge)—preferred. This requires a third-party Recording Server.
- SPAN (Silent Monitoring Server) for Mobile Agent.

Note   For any third-party vendor application ERSPAN support on UCS B Series, please consult vendor's application requirements.

Silent Monitoring

Packaged CCE supports either, but not both, of the following:

- Unified Communications Manager-based (Built In Bridge)

- SPAN for Mobile Agent

Note   If Unified Communications Manager-based silent monitoring is configured, mobile agents cannot be monitored.

A separate Silent Monitoring Server is required for SPAN-based silent monitoring to monitor mobile agents.

Cisco UCS B-Series deployments that require Cisco CTI OS Silent Monitor Server must use a UCS C-Series server for that application. UCS B-Series requires ERSPAN, which is not supported by the CTI OS Silent Monitor Server.

Load Balancing

For information about hardware, software, and third-party load balancer requirements for Packaged CCE components, see the *Cisco Packaged CCE Software Compatibility Matrix DocWiki* at http://docwiki.cisco.com/wiki/Compatibility_Matrix_for_Packaged_CCE.

See the load balancer sections in the component Design Guides for specific interfaces where the load balancers can be used.

Load Balancing for the Unified CCE Administration Tool

You can use a load balancer with the Unified CCE Administration tool in the following two scenarios.

When Users Navigate to the Unified CCE Administration Sign-In Page

If administrators or supervisors attempt to navigate to the Unified CCE Administration tool on a server that is down or not reachable, they cannot access the sign-in page. They receive an error and must manually sign in to Unified CCE Administration on the other server. To avoid this manual step, customers can use a load balancer using URL redirect mode to direct users to a server that is operational.

Usage scenario:

1   Users sign in to Unified CCE Administration, pointing their browsers to the load balancer.

2   The load balancer redirects the users' browsers to an appropriate Unified CCE Administration server.

3 The users sign in to the Unified CCE Administration server directly.

✎

Note You cannot use a load balancer as part of the fresh install process. The user must sign in to Unified CCE Administration on the Side A Unified CCE Data Server to initialize the Packaged CCE deployment type.

When Customers Use the Unified CCE Administration API Directly

If a customer uses the Unified CCE Administration REST API directly, they can opt to use a load balancer to manage high availability. This load balancer is considered part of a custom application which, like all custom applications, Cisco does not support. The customer or partner must provide the required support for the load balancer.

Load Balancing for Finesse

After agents sign in to the Finesse desktop, the Finesse desktop client manages failover. For example, if a Finesse server goes out of service, the Finesse client automatically redirects and signs the agent in to the other Finesse server. The client can manage various network and server failure use cases. Given this client-side logic, the use of a load balancer after sign-in is not required nor supported.

However, the following are two scenarios in which you can use a load balancer with Finesse.

✎

Note These scenarios only apply to the Finesse desktop and not to Finesse IP Phone Agents.

When Agents Navigate to the Finesse Sign-In Page

If an agent attempts to navigate to a Finesse server that is down or not reachable, they cannot access the sign-in page. The agent receives an error and must manually sign in to the other Finesse server. To avoid this manual step, customers can use a load balancer using URL redirect mode to direct the agent to a Finesse server that is operational. One option is to use the Finesse SystemInfo REST API, which provides the status of the Finesse server. For details about this API, see the *Cisco Finesse Web Services Developer Guide*.

When you configure a load balancer to determine the status of the Finesse servers, the call flow is as follows:

1 When agents sign in to Finesse, they point their browsers to the load balancer.

2 The load balancer redirects the agent browser to an appropriate Finesse server.

3 The agent signs in to the Finesse server directly. At this stage, the load balancer is no longer part of the call flow.

When Customers Use the Finesse API Directly

If a customer uses the Finesse REST API directly, the Finesse client-side failover logic is not in the call flow. In this case, customers can opt to use a load balancer to manage high availability. This load balancer is considered part of a custom application which, like all custom applications, Cisco does not support. The customer or partner must provide the required support for the load balancer.

Before you configure the load balancer, remember that there are two connections between Finesse clients and the Finesse server:

• A REST channel for request and response

• An XMPP channel that the server uses to send notifications to the client

Both channels for a given client must connect to the same Finesse server.

You cannot connect the load balancer to the REST connection for one Finesse server and to the XMPP channel connection for the other Finesse server. This setup provides unpredictable results and is not supported.

Reporting

Unified Intelligence Center Reporting

Reporting Data sources

The default deployment pulls Unified Intelligence Center data from the Logger database on the CCE Data Server, where real-time, historical and call detail data are stored. Retention is 400 days for historical data and 40 days for call detail data.

You have the option to generate historical summary reports at 15-minute intervals or at 30-minute intervals.

Your Unified Intelligence Center deployment can have only one historical data source, named "UCCE Historical". Your deployment can only have one real-time data source, named "UCCE Realtime".

Note   To adhere to Packaged CCE specifications, the logger database is pre-sized at 665GB / 400 days when the logger is configured during installation.

Reporting Data Source	Supported Applications	Retention Period on Historical Data Server
Logger on CCE Data Server	Cisco Unified Intelligence Center is the only supported reporting application.	N/A: No HDS is installed.

External AW-HDS-DDS	• Cisco Unified Intelligence Center
	• External applications. These include:
	  ◦ Third-party reporting applications
	  ◦ Third-party Workforce Management applications
		The standard Unified CCE retention period for the HDS is 1095 days.

Live Data

Live Data continuously processes agent and call events from the peripheral gateway and the router, and publishes changed data directly to Unified Intelligence Center reporting clients. Live Data pushes this data to the reporting clients without the delay of writing to, and reading from the database. Individual state values, such as agent states, refresh as they happen. Other values, such as calls in queue, refresh approximately every 3 seconds. Live Data reports can also be embedded in Finesse agent desktops.

Live Data installs with Unified Intelligence Center, and shares a VM with Unified Intelligence Center on Side A and Side B.

Unified CVP Reporting

You can set up a virtual machine (VM) for the CVP Reporting Server on Side B. You can also add one external CVP Reporting Server on the same network as Side A.

The number and location of Unified CVP Reporting Servers you deploy are based on how you intend to use the Courtesy Callback feature and VXML Reporting.

	LAN	WAN	Requires CVP Reporting Server on Side B	Requires External CVP Reporting Server on Side A
Courtesy Callback feature only	yes	yes	yes	no
VXML reporting only (LAN)	yes	—	yes	no
VXML reporting only (WAN)	—	yes	yes	yes
Callback feature and VXML reporting (LAN)	yes	—	yes	no
Callback feature and VXML reporting (WAN)	—	yes	yes	yes

Remote Office Options

This figure illustrates remote office options that are supported in Packaged CCE.

Figure 3: Remote Office Options
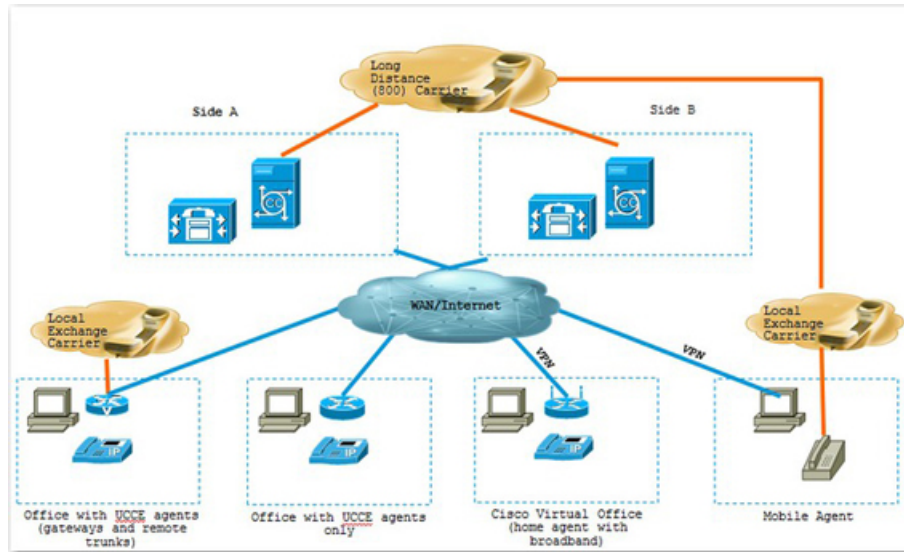
Voice and Video Infrastructure Requirements

Audio Codec Support

Packaged CCE negotiates the audio codec when a call first connects between two points. For example, the codec is negotiated when:

- A call arrives in the system and media is established between the ingress gateway and a VXML browser.

- A call in the queue connects to an agent and media is established between the ingress gateway and the agent phone.

- An agent conferences a call and media is established between all the parties and a conference resource.

Codec selection can change on each leg of the call, depending on what codecs each component supports.

For a list of supported audio codecs, see Features Supported with Restrictions, on page 7.

Cisco Unified Border Element

Packaged CCE supports SIP Service Provider trunking by means of an ISR G2-based Cisco Unified Border Element (Unified Border Element) connected to Cisco Unified Customer Voice Portal/Cisco Unified Communications Manager.

Packaged CCE supports Cisco UBE in flow-through mode only, to ensure the optimal performance of DTMF interworking, transcoding, and other key functions such as telephone and media capabilities.

Cisco UBE performs the role of session border controller (SBC) for SIP normalization and interoperability from the SIP Service Provider to Unified CVP for delivery of call to the agent: **SP CLOUD <--> Unified Border Element <--> CVP**.

If you have configured the Video in Queue feature in a Video Contact Center deployment, Cisco UBE connects video calls to Cisco MediaSense to queue the calls or play video prompts.

Note the following:

- A software license is required to run Unified Border Element. See the ordering guide at http://www.cisco.com/en/US/prod/collateral/voicesw/ps6790/gatecont/ps5640/order_guide_c07_462222.html.

- Because Packaged CCE supports G.711 for VRU but both G.711 and G.729 for agents, it is important to pay close attention to mid-call codec changes when agents are using G.729.

- Renegotiate the codec mid-call if the SIP carrier provider can support it. If not, Unified Border Element will need to transcode calls. This will affect Unified Border Element capacity.

- The default prompts shipped with Cisco Voice Portal are in u-law. They must be replaced with A-law prompts if the deployment requires A-law codec use.

Related Topics

Cisco Unified Border Element with Outbound Option SIP Dialer

Although the SIP Dialer does not advertise the A-law codec, SIP Dialers with Cisco UBE support A-law with specific design considerations. This deployment uses DSP resources on Cisco UBE during the initial negotiation (no media) between the SIP Dialer and the SIP service provider. During a REFER from the Dialer to the agent, Cisco UBE renegotiates the codec with the agent's endpoint to use A-law. Cisco UBE then releases the DSP resource (Transcoder).

Conferences and Transfers

See .

Endpoints for Agents and Callers

For the full list of endpoints supported for voice and video, see the *Cisco Packaged CCE Software Compatibility Matrix DocWiki* at http://docwiki.cisco.com/wiki/Compatibility_Matrix_for_Packaged_CCE.

Gateways

Packaged Contact Center Enterprise supports gateways with combined or separate TDM gateways and Voice gateways for Ingress, VXML, and SIP Outbound dialer.

Packaged CCE does not support coresidency for the VoiceXML Gateway and Cisco UBE if the Cisco UBE is configured with any of the following settings:

- Survivability TCL script and incoming translation rules are configured under the same incoming dial-peer.

- Cisco UBE is configured for transcoding between G.711 and G.729.

- Header-passing between the call legs is enabled.

When dedicated VoiceXML Gateways are used, the Cisco UBE Gateways have a higher port capacity than when coresident VoiceXML and Cisco UBE Gateways are used.

Consider gateway capacity when designing the deployment model.

For the full list of supported gateway hardware and software, see the *Cisco Packaged CCE Software Compatibility Matrix DocWiki* at http://docwiki.cisco.com/wiki/Compatibility_Matrix_for_Packaged_CCE.

Gateway Sizing

Individual Cisco gateways can handle various call capacities depending on whether they are doing ingress only, VoiceXML only, or a combination of the two. Gateways doing VoiceXML activities also have different call capacities depending on whether or not they are supporting ASR or TTS activities and on the type of VoiceXML application being executed. For instance, an intensive JavaScript application reduces call capacity.

In general, gateways that perform ingress only can be sized according to the number of TDM cables that can be connected to them.

Before sizing the voice gateways, use the Unified CCE Resource Calculator to determine the maximum number of trunks (DS0s) and VoiceXML IVR ports needed to support the entire solution.

The following table provides sizing information for different versions of Cisco IOS. The sizing information is based on these factors:

- The overall CPU usage is not to exceed 75 percent.

- Sizing represents the maximum number of concurrent VoiceXML sessions and VoIP calls on the gateway.

- Sizing is based on Unified CVP VoiceXML documents.

- Sizing includes active conferences and active transfers.

- For the VXML Only columns, sizing includes only basic routing and IP connectivity running on the gateway. If you intend to run additional applications such as fax or other non-contact center traffic, account for that traffic in your deployment's capacity. For the VXML + PTSN columns, the indicated number of VoiceXML sessions and voice calls are supported simultaneously on the same gateway.

- Sizing is based on using either the Cisco Call Server or Cisco Unified CVP VXML Server.

- Each gateway is configured to share the load with its redundant pair during normal operations. Under normal operations, each gateway handles the load close to half of its capacity. During a failover scenario, each gateway operates with its maximum supported load.

- Each port provides TDM and VXML functionality including ASR/TTS.

Table 1: Maximum Number of VoiceXML Sessions Supported by Cisco Voice Gateways (Cisco IOS Release 15.1.4.M7 and Later)

VoiceXML Gateway CPU Capacity for Cisco IOS Release 15.1.4.M7 or Later					
Platform	VXML Only		VXML + PSTN		Memory
	DTMF	ASR	DTMF	ASR	Recommended
2901	12	8	9	6	2 GB
2911	60	40	47	31	2 GB
2921	90	60	71	48	2 GB
2951	120	80	95	64	2 GB
3925	240	160	190	127	2 GB
3945	340	228	270	180	2 GB
3925E	700	470	570	375	2 GB
3945E	850	570	680	450	2 GB
Based on ISO 15.1.4.M7, G.711, basic calls, Ethernet egress, CPU NTE 75%					

Note A single combination gateway cannot exceed the number of concurrent VoiceXML sessions and VoIP calls.

See the "Gateway Sizing for Contact Center Traffic" topic in *Cisco Collaboration System Solution Reference Network Designs* to ensure that the call arrival rates do not exceed the listed capacities (http://www.cisco.com/c/en/us/support/unified-communications/unified-communications-manager-callmanager/products-implementation-design-guides-list.html).

CPU Usage

For all gateways, ensure that the overall CPU usage is less than 75 percent on average. The following factors affect CPU usage:

- Calls per second (cps)

- Maximum concurrent calls

- Maximum concurrent VoiceXML sessions

- Intensive JavaScript applications

Licence Requirements

If you run VoiceXML on one of the Cisco 2900 and 3900 Series gateways, additional licenses (FL-VXML-1 or FL-VXML-12) are required.

Memory Considerations

Consider how much DRAM and flash memory to order. The capacity that comes with the machine by default is usually sufficient for most purposes. However, if your application requires large numbers of distinct .wav files (as with complex self-service applications) or if your application has unusually large .wav files (as with extended voice messages or music files), consider increasing the amount of DRAM in order to expand your flash memory.

Note HTTP cache can only be extended to100 MB in the current Cisco IOS releases.

Third-Party VoiceXML Application Consideration

If you are using a non-Cisco VoiceXML application, your deployment must adhere to the CPU usage requirements. Ensure that adequate memory is available on Cisco gateways at full load when running external VoiceXML applications.

Contact the provider of that application for performance and availability information. Be aware that third-party VoiceXML applications are not provided by Cisco, and Cisco makes no claims or warranties regarding the performance, stability, or feature capabilities of the application when inter-operating in a Cisco environment.

Unified Communications Manager

You can install a Unified CM publisher and two subscribers as virtual machines on the Packaged CCE servers. This configuration supports a combination of up to 1500 active Agent and Back Office devices at a time. The devices are subject to the Voice and Video Infrastructure Requirements, on page 37. All devices must be SIP.

Alternatively, you can integrate with one external Unified CM cluster on separate servers. With this configuration, two of the subscribers must be dedicated to Packaged CCE. The devices on the dedicated subscribers must follow the Voice and Video Infrastructure Requirements, on page 37. All devices on these subscribers must be SIP.

Note If SRTP is enabled, active devices are limited to 900.

Note Cisco Unified Communications Manager is supported on-box and off-box. Cisco Business Edition is supported off-box only.

Note The Unified Communications Manager Cross Cluster Extension Mobility feature is not supported in this deployment.

Related Topics

Virtualization for Packaged CCE

VMware Feature Support

The list below designates which VMware features can be supported by Packaged CCE while in production under load due to the known or unpredictable behavior they may have on the applications. Many of the VMware features that cannot be supported in production can be used within a customer's planned maintenance downtime, where any interruption will not impact business operations. Some unsupported features will by their function cause violation of the Packaged CCE validation rules.

For more information about virtualization, see the Virtualization for Cisco Packaged CCE DocWiki at http://docwiki.cisco.com/wiki/Virtualization_for_Cisco_Packaged_CCE.

VMwareFeature	Packaged CCE Support in Production?
VM Templates (OVAs)	Yes
Copy Virtual Machine	No
Restart Virtual Machine on Different ESXi Host	No
Resize Virtual Machine	No
VMware Hot Add	No
Multiple Physical NICs and vNICs	Yes
VMware High Availability (HA)	No
VMware Site Recovery Manager (SRM)	No
VMware vNetwork Distributed Switch	Yes Packaged CCE supports Cisco Nexus 1000V.
VMware vMotion	No
VMware Dynamic Resource Scheduler (DRS)	No
VMware Dynamic Power Management	No
Long Distance vMotion	No
VMware Storage vMotion	No
VMware Update Manager (VUM)	No

VMwareFeature	Packaged CCE Support in Production?
VMware Consolidated Backup (VCB)	No
VMware Data Recovery (DR, VDR)	No
VMware Snapshots	No
VMware Fault Tolerance (FT)	No
VMware vCenter Converter	No
VMsafe	No
VMware vShield	No
Virtual Appliance Packaging of UC apps	No
3rd-Party VM-based Backup Tools	No
3rd-Party VM-based Deployment Tools	No
3rd-Party Physical To Virtual (P2V) Migration Tools	No
VMware Boot from SAN	No for C240. Yes for UCS B-Series.
All VMware Features Not Listed	No

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