Cisco Remote Expert Smart Solution Release 1.8 Configuration Guide

March 1, 2013

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Goal

This document reports the tested configuration for the Cisco Remote Expert Smart Solution Release 1.8. It includes specific device configurations and diagrams showing interconnections.

Audience

This document is intended to assist solution architects, sales engineers, field engineers and consultants in planning, design and deployment of the Cisco Remote Expert System Solution. This document assumes the reader has an architectural understanding of the Cisco Remote Expert Smart Solution and has reviewed the Cisco Remote Expert Smart Solution Release 1.8 CVD.

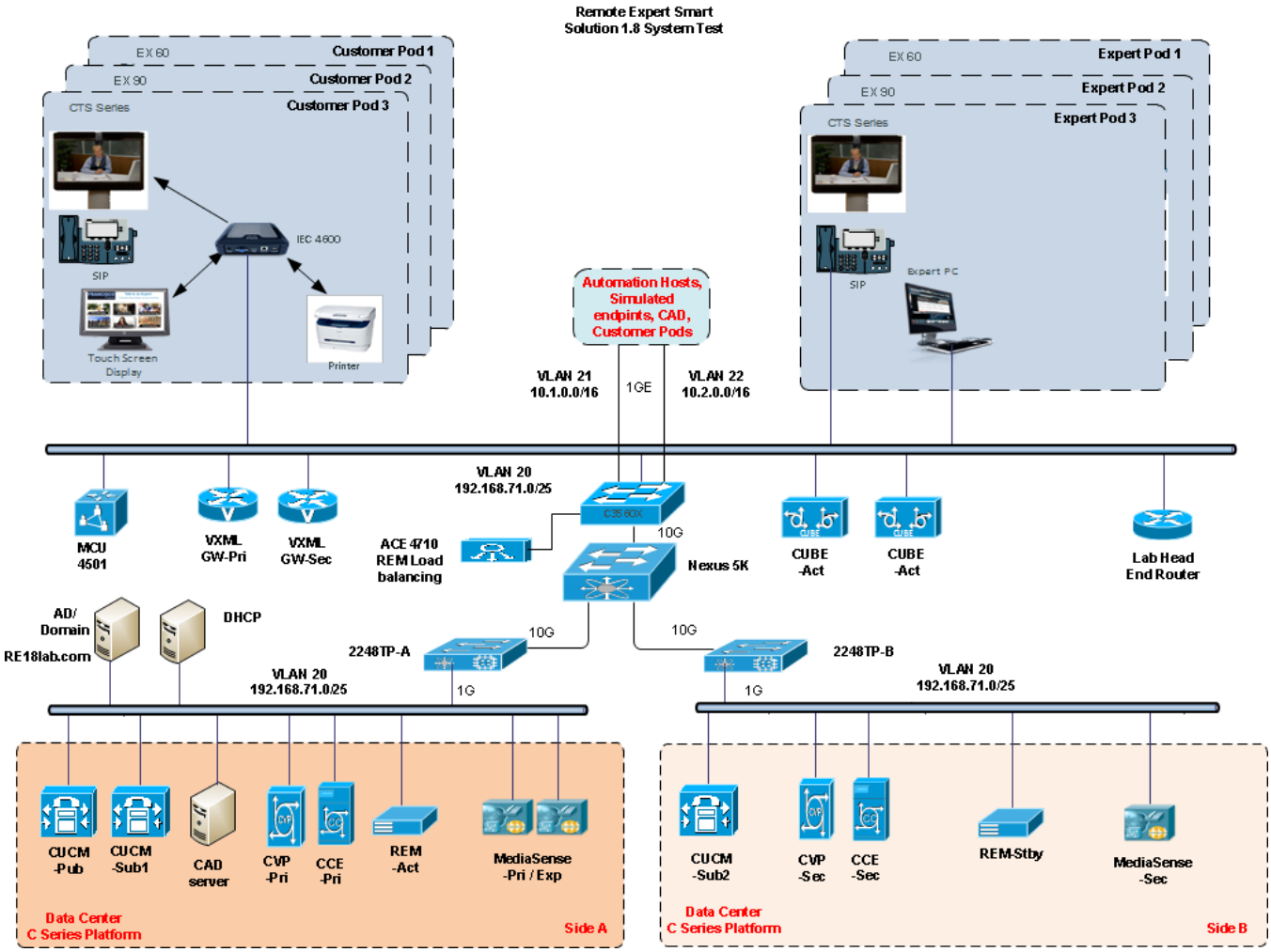
Objectives

This document is intended to articulate the overall design and specific configurations of the tested architecture called out in the Cisco Remote Expert Smart Solution Release 1.8 CVD. The actual configuration files are provided in this document as hyperlink references.

Design Overview

The Cisco® Remote Expert Smart Solution Release 1.8 connects customers with experts in an immersive, virtual face-to-face interaction regardless of their physical location. A customer in the bank branch or in the retail store can easily locate a suitable expert using skills-based routing and availability monitoring, then seamlessly connect the expert using TelePresence, desktop video, voice, and content sharing technologies. The Cisco Remote Expert Smart Solution design implemented in the Cisco Remote Expert Smart Solution CVD replicates a customer's network, end-to-end, from the datacenter to the endpoints installed. Figure 1 shows the complete system test setup.

Figure 1: Remote Expert Smart Solution Release 1.8 System Test Configuration



Due to the number of devices in the Remote Expert Smart Solution Release 1.8 CVD test setup, the configuration files for each device are included as hyperlink references throughout the document.

Figure 2: Data Center UCS C series servers Connectivity

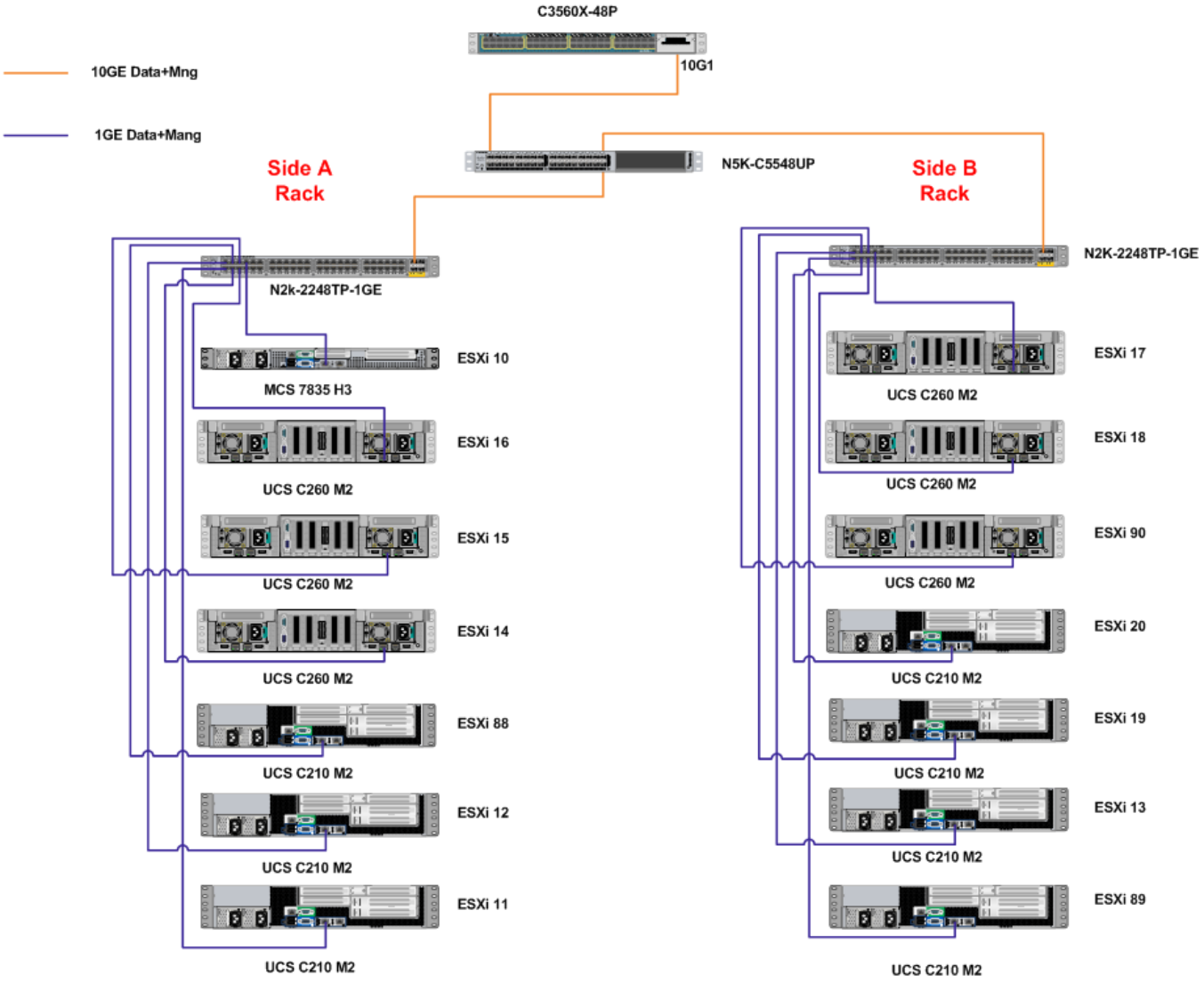
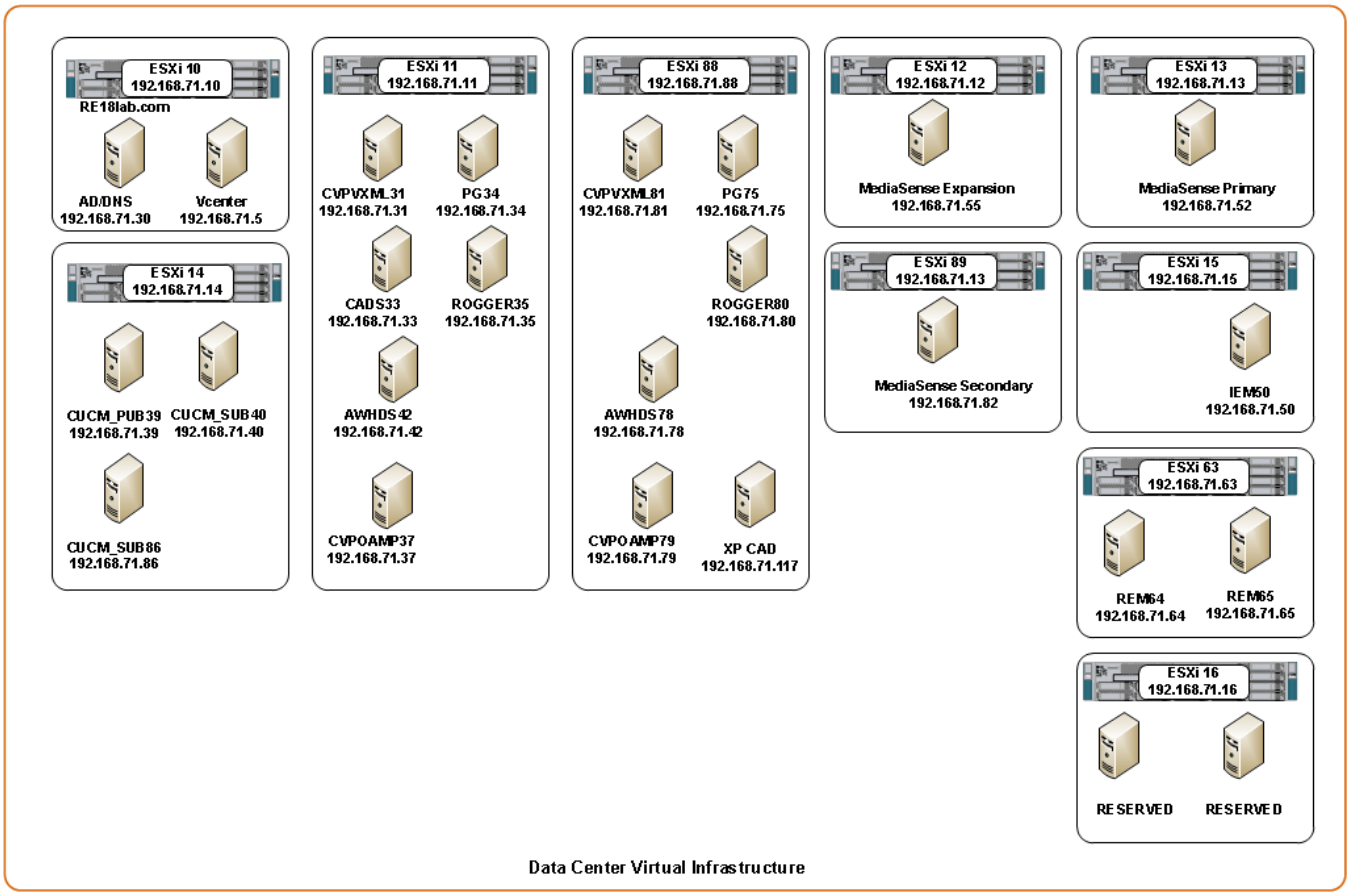


Figure 3: Data Center Virtual Infrastructure



Solution Components

Several systems are needed to create the Remote Expert Smart Solution. The Remote Expert Smart Solution is conceptually broken down into several functional groups based on the capabilities they bring to the solution. Each component of the solution and its function is briefly described below.

1. Data Center Solution Components
2. Data Center Networking Infrastructure
3. Branch/Retail office side Solution Components
4. Contact Center Remote Expert side Solution Components.

Software Compatibility Matrix

Table 1: Data Center Solution Components

Component	Software Release
REM	1.8.0
Cisco Unified Communication Manager	9.0(1)
Cisco Unified Contact Center Enterprise	9.0(1)
Cisco Unified Customer Voice Portal	9.0(1)
Cisco Unified Intelligence Suite and Intelligence Center	
Peripheral Gateway	9.0(1)
CTI OS Server	9.0(1)
CAD Server	9.0(1)
Microsoft Active Directory Domain Controllers	Win 2008 R2 (64 bit)
DNS	Win 2008 R2 (64 bit)
DHCP	Win 2008 R2 (64 bit)
Cisco MediaSense	9.0
Cisco ISR 3945 G2 running CUBE	15.3(1.17)T0.1
Cisco ISR 3945 G2 VXML Gateway	15.2(2)T1
Codian Media Control Unit (MCU)	4.3(2.30)
IEM	1.0.3

Table 2: Data Center Networking Components

Component	Software Release
Cisco Catalyst 3560X	12.2(55)SE3
Cisco Nexus 5548 UP	5.1(3)N2(1)
N2K-C2248 TP-1GE Fabric Extender	5.1(3)N2(1)
Cisco Application Control Engine (ACE) 4710	5 (1.0)
Cisco ACE Device Manager	5.1 (0)
VMware ESXi /ESX	5.0
VMware vSphere/vCenter	5.0
vCenter	SQL 2008 R2 standard (64 bit)

Table 3: Branch/Retail Office Solution Components

Component	Software Release
Printer	
Cisco 99xx, 79xx IP Phones	**99xx.9-3-1-33, 79xx.9-3-1-1S**
IEC4600	**4.154.393**
Cisco TelePresence Endpoint CTS-500	**CTS_1.9.2(5)_P2**
Tandberg Endpoint EX 60/90	**TE6.0.1.47c1258**

Table 4: Contact Center Remote Expert Solution Components

Component	Software Release
Cisco Agent Desktop Software	**9.0(1)**
Cisco TelePresence Endpoint CTS-500	**CTS_1.9.2(5)_P2**
Tandberg Endpoint EX 60/90	**TE6.0.1.47c1258**
Cisco 99xx, 79xx IP Phones	**99xx.9-3-1-33, 79xx.9-3-1-1S**
DirectConnect	**1.8.0.41672**

Data Center Solution Components

This section describes the Data Center components used in the Remote Expert Smart Solution release 1.8 System Test configuration. This includes mostly server side components which are the following:

- Remote Expert Manager (REM) Platform
- Cisco Unified Communication Manager Cluster
- Cisco Unified Contact Center Solution
  - UCCE/CVP based Contact Center Solution
- VXML Gateway
- Cisco MediaSense for recording
- Cisco Unified Border Element (CUBE) for forking the calls to MediaSense
- Media Control Unit (MCU) for Conferencing

Remote Expert Manager (REM)

REM is the platform that provides interactive experience for the Remote Expert Smart Solution during an immersive video call between a customer & a remote expert. REM uses different call events and state information to run its intelligent logic for providing the interactive experience. This solution encompasses following components:

- Interactive Experience Platform (IEP)
  - Interactive Experience Client (IEC)
  - Interactive Experience Manager (IEM)
- Remote Expert Agent Desktop (READ)
- Remote Expert Admin Console (REAC)
- Remote Expert Collaboration Panel (RECP) App
- Remote Expert Session Controller (RESC)
  - Tomcat/Apache based Web services

- MySQL based Data-Store
- JTAPI Adapter for Cisco UCM Integration

The Cisco REM configuration used during validation can be found here: REM 1.8 Configuration.
The Cisco IEM configuration used during validation can be found here: IEM 1.8 Configuration.
The Cisco READ configuration used during validation can be found here: READ 1.8 Configuration.

Cisco Unified Communication Manager (UCM)

The Cisco Unified Communications System securely integrates voice, video, and other collaborative data applications into intelligent network communications solutions. This system, which includes IP telephony, voice messaging, rich-media conferencing, IP video broadcasting, and customer contact solutions, takes full advantage of all of the power, resiliency, and flexibility of an IP network.
For information about other aspects of the Cisco Unified Communications System, refer to the documentation available at the following locations:
http://www.cisco.com/go/ucsrnd
http://www.cisco.com/go/unified-techinfo

The Cisco UCM configuration used during validation can be found here: CUCM 9.0 Configuration.

Cisco Unified Contact Center Enterprise (UCCE)

Cisco Unified Contact Center Enterprise (Unified CCE) is a solution that delivers intelligent call routing, network-to-desktop Computer Telephony Integration (CTI), and multi-channel contact management to contact center agents over an IP network. It combines software IP automatic call distribution (ACD) functionality with Cisco Unified Communications in a unified solution that enables companies to rapidly deploy an advanced, distributed contact center infrastructure.
For more information on UCCE design, refer to the Cisco UCCE Solution Reference Network Design documentation available online at:
http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_implementation_design_guides_list.html

The Cisco Unified CCE configuration used during validation can be found here: UCCE 9.0 Configuration.

Cisco Unified Customer Voice Portal (CVP)

Cisco Unified Customer Voice Portal (CVP) enables customers to efficiently and enjoyably retrieve the information they need from the contact center. Unified CVP can place a call in queue until an appropriate agent is available and then transfer information given by the customer directly to the agent along with the call itself to provide a seamless customer service experience. In addition, Unified CVP can support video interactions, including self-service, queuing, and agent across mobile devices and kiosks.
For more information on CVP design, refer to the Cisco UCCE Solution Reference Network Design documentation available online at:
http://www.cisco.com/en/US/solutions/ns340/ns414/ns742/ns818/landing_voice_portal.html

The Cisco Unified CVP configuration used during validation can be found here: CVP 9.0 Configuration

Cisco Integrated Service Router (ISR3945) VXML Gateway

The Cisco ISR3945 was used to provide the VXML Gateway functionality for the UCCE solution. The Voice XML Gateway hosts the IOS voice browser, the component which interprets Voice XML pages from either the Unified CVP IVR service or the VXML Server, plays .wavfiles and Text-to-Speech (TTS), inputs voice and DTMF, and sends results back to the VoiceXMLrequestor. It also mediates between Media Servers, VXML Servers, ASR and TTS Servers, and the IVR service.

The Cisco ISR3945 configuration used during validation for the VXML gateway can be found here: 3945 VXML Gateway Configuration.

Cisco MediaSense

MediaSense is a SIP based media server that provides the recording service to various entities in the network. The audio media from the call can be "forked" either from the IP phones or CUBE. In this context, forking refers to a process where a copy of the media flow is taken and directed towards the recording server (MediaSense). In a two-way call, two audio sessions are forked from the forking device towards MediaSense. In Remote Expert Smart Solution, CUBE is used as a media-forking device.
For more information on Cisco MediaSense design, refer to the Cisco MediaSense Solution Reference Network Design documentation available online at:
http://www.cisco.com/en/US/products/ps11389/products_implementation_design_guides_list.html

The Cisco MediaSense configuration used during validation can be found here: MediaSense Configuration.

Cisco UBE (CUBE)

Cisco UBE is a B2BUA (Back-to-back User Agent), which means that CUBE negotiates two call-legs, each of which is independently negotiated between the RE endpoints and CUBE. Therefore, CUBE sinks and re-originates the media towards the other endpoint. CUBE does do a cursory examination of the RTP payload while it sinks and sources the stream and this means that the CUBE support of the codecs or the functionalities is necessary to enable the same between the two endpoints.
CUBE is configured as a media forking point by using "dial-peer" configurations. For these configurations, the endpoints must have a Directory Number (DN) number since dial-peers are based on these numbers. When CUBE encounters a call for which recording is required, it generates one SIP invite towards MediaSense with two "m" lines, one for each audio track stored separately.

The Cisco UBE configuration used during validation can be found here: CUBE Configuration.

Media Control Unit (MCU 4500)

The MCU 4500 is an entry-level, high-definition (HD) video conferencing bridge. It offers organizations a low risk, cost effective solution for 1080p HD multipoint video conferencing. The MCU 4500 is selectable between six HD or 12 SD video ports, over 50 custom layouts and an easy to use management interface. It is compatible with all major video conferencing vendors' SD and HD endpoints. Multipoint conferencing enables multiple participants to join a single video call and participate fully in the conversation.

Cisco Unified Communication Manager can use MCU 4500 series as a video conferencing resource (bridge) and possible to establish ad-hoc conferencing multi-party video end-points.
For more information on Cisco MCU 4500, please visit
http://www.tandberg.com/video-conferencing-multipoint-control/tandberg-codian-mcu4500.jsp

The MCU 4501 configuration used during validation can be found here: MCU 4501 Configuration.

Branch Solution Components

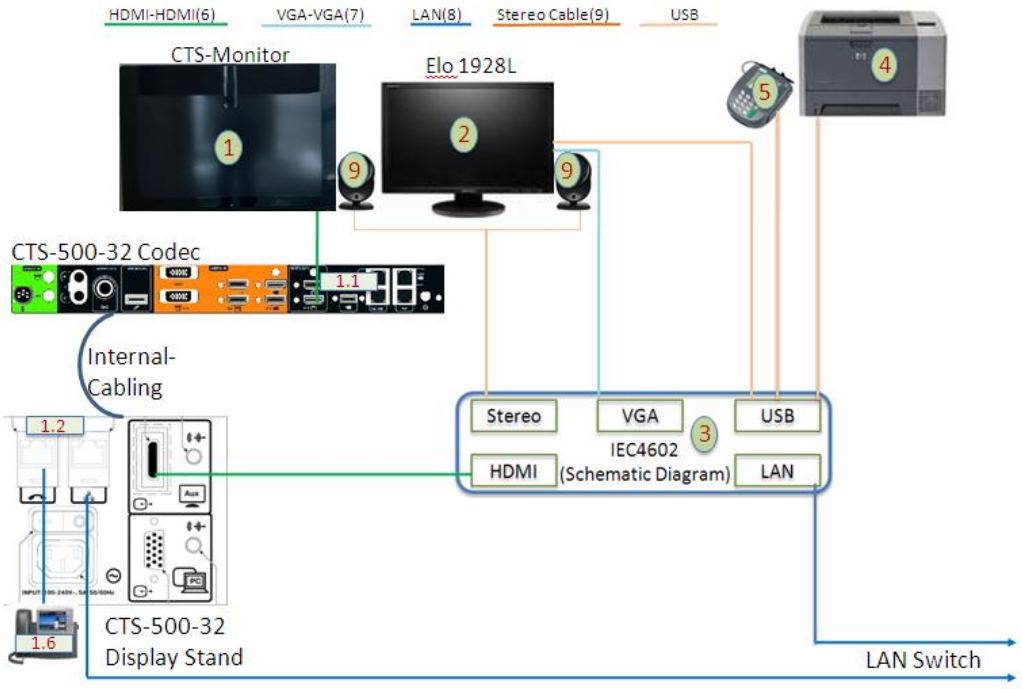
The Remote Expert Smart Solution offers various alternatives for delivering a virtualized experience to end users, including Cisco TelePresence CTS 500 and Cisco EX 60/90 series endpoints. This section describes the Branch Components used in the Remote Expert Smart Solution release 1.8 System Test configuration. This includes mostly customer side components which are the following:

- Interactive Experience Client (IEC) 4600
- Remote Expert Collaboration panel (RECP) touch-screen monitor
- Cisco TelePresence CTS-500 or Cisco EX 60/90 series endpoints
- Cisco IP phone 7975G
- Printer

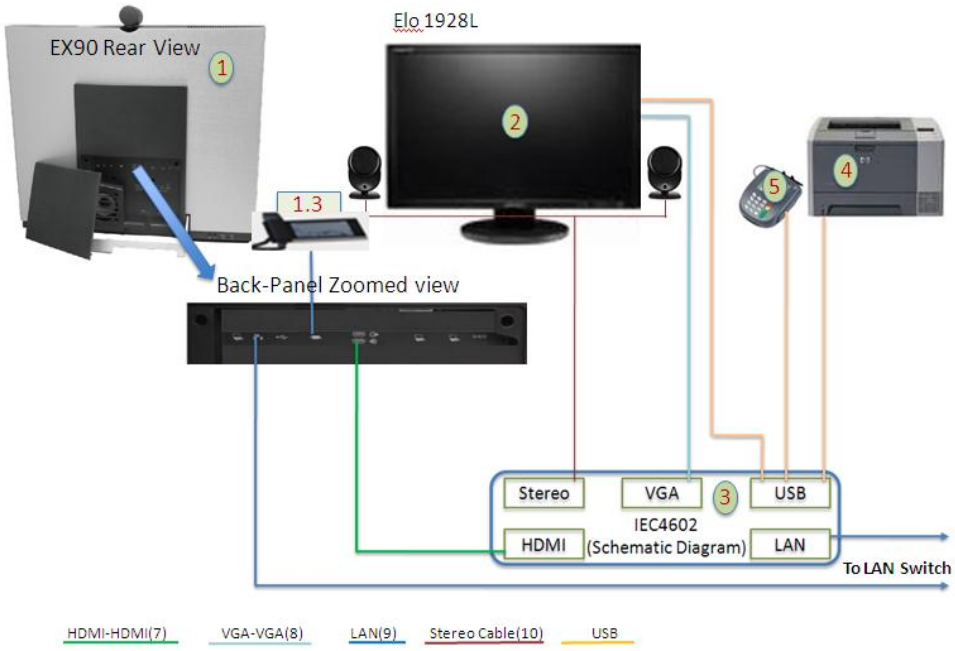
Interactive Experience Client (IEC) 4600

The IEC4600 is a small, low power, silent mini-computer. It has many interfaces. The following diagrams shows peripherals attached to the IEC 4602:

CTS-500 Cabling Diagram



EX60/90 Cabling Diagram



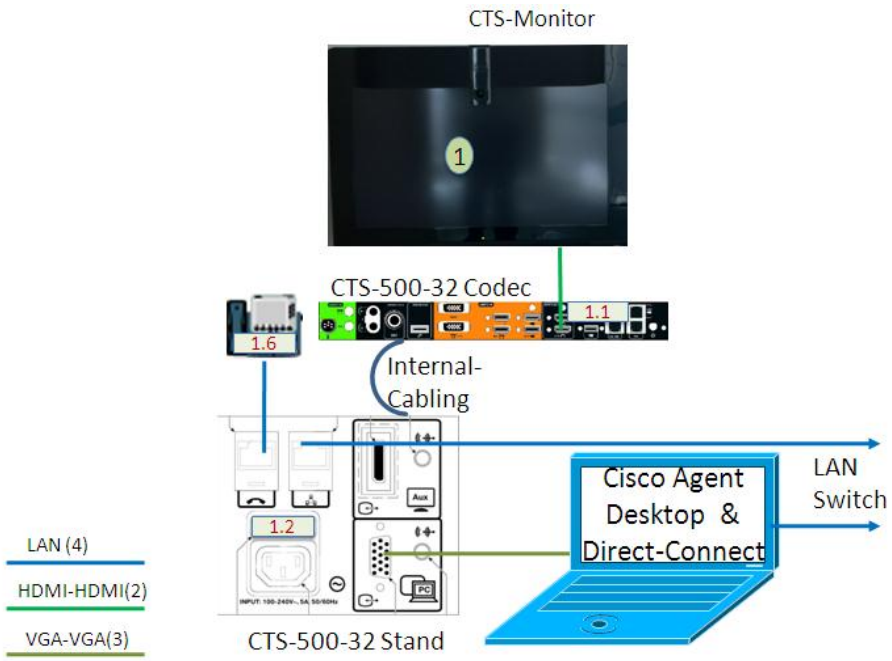
The IEC 4610 configuration used during validation can be found here: IEC 4610 Configuration.

Contact Center Remote Expert's Smart Solution Components

Following are the components used in the Remote Expert Smart Solution release 1.8 System Test configuration for the expert /agent at the contact center.

- Cisco TelePresence CTS-500 or Cisco EX 60/90 series endpoints
- Cisco IP Phone 7975G
- Cisco Agent Desktop (Premium package)
- Direct-Connect Application.

CTS-500 Cabling diagram



Cisco Agent Desktop:

Cisco Agent Desktop (CAD) is computer telephony integration (CTI) solution for IP-based contact centers that allows contact center agents to use powerful tools that help increase agent and supervisor productivity, improve customer satisfaction, and reduce costs. All the interaction with the customer & the customer Pod at the branch are done using an application that runs in the browser window of the CAD application.

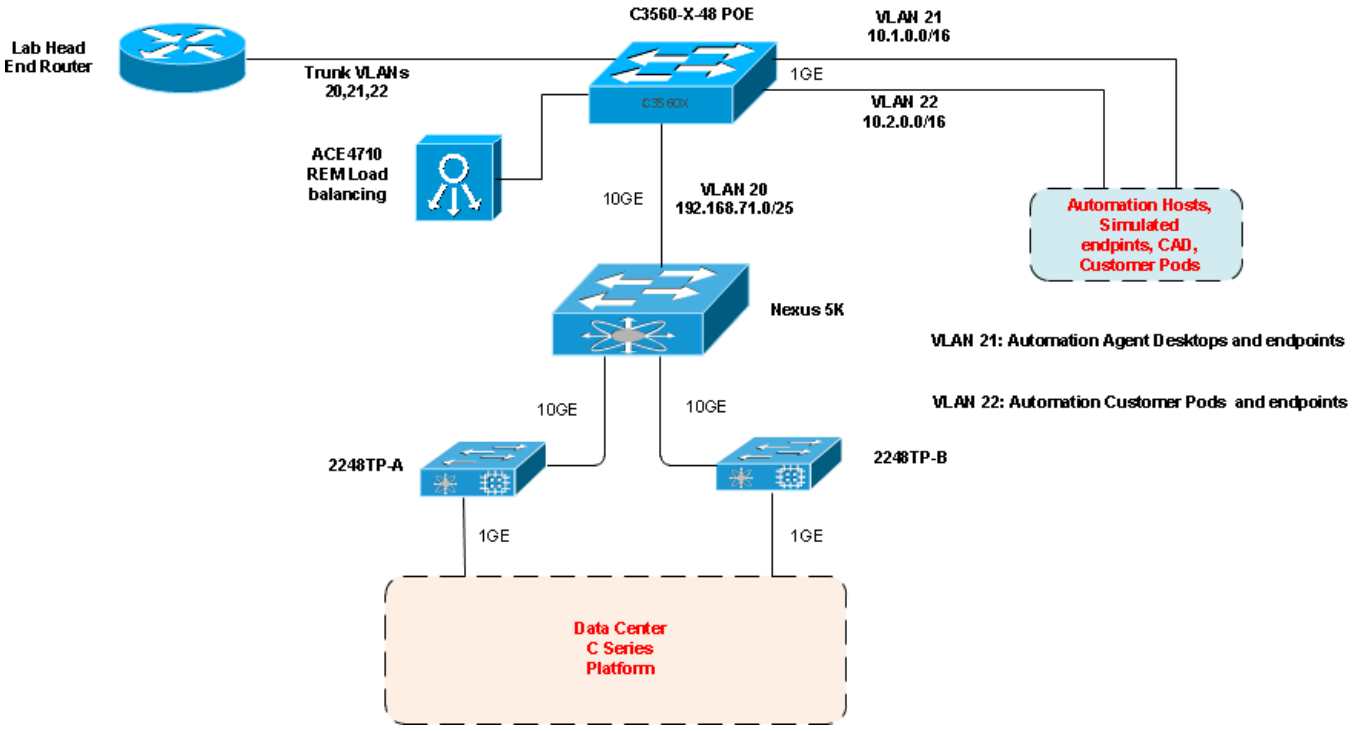
The Cisco CAD configuration can be found here: CAD 9.0 Configuration.

DirectConnect- Application

DirectConnect-Application capabilities allow experts in the contact center, to share and collaborate with customer's Pod using high performance applications in real-time. The administrator can configure the solution so that the Direct Connect dialog box appears automatically when the remote expert clicks the Answer button in the Cisco Agent Desktop.

Data Center Networking Infrastructure

Figure 4: Data Center Network Components



Cisco 3560X-48 POE

The Cisco 3560X-48 POE Switch is used for the Data Center Aggregation layers. The complete Cisco 3560X-48 POE configuration used during validation can be found here: Cisco 3560X Configuration

Cisco Nexus 5548UP Access Layer Switch

The Cisco Nexus 5548UP Switch is a 1 Rack unit (RU), 10 Gigabit Ethernet/FC/FCoE access-layer switch with 32 fixed 10 Gigabit Ethernet/FC/FCoE ports that accept modules and cables meeting the Small Form-Factor Pluggable Plus (SFP+) form factor. One expansion module slot can be configured to support up to16 additional 10 Gigabit Ethernet/FCoE ports, up to 16 Fibre Channel ports, or a combination of both.

In the Remote Expert Smart Solution System Test, the Cisco Nexus 5548UP, in combination with the Cisco 3560X, provides the functions for the Data Center Aggregation Layer. The test configuration consists of a single Cisco Nexus 5548UP. The upstream interface is connected to uplink port on the Cisco 3560X.

Interfaces

All interfaces on the Cisco Nexus 5548UP were configured as Layer 2 Ethernet interfaces. These interfaces can be configured as access ports, trunk ports, private VLANs, or Fiber Channel ports.

The complete Nexus 5548UP configuration used during validation can be found here: Nexus 5548 Configuration.

Cisco UCS 2200 Series Fabric Extender

The Cisco UCS 2248TP Fabric Extender (FEX) has forty eight 1 Gigabit Ethernet ports that provide connectivity from the Cisco C series to the Cisco Nexus 5548UP switch.

Cisco Application Control Engine (ACE4710)

The Cisco Application Control Engine (ACE4710) is used in the RE environment to provide load balancing functions for the REM servers.
The complete Cisco ACE4710 configuration used during validation can be found here: ACE 4710 Configuration.

Cisco UCS Configuration

The Cisco C210 M2 and C260 M2 general-purpose rack-mount servers were used in Standalone Mode. In this mode the Cisco Integrated Management Controller (CIMC) is used for management service. The UCS C series server is shipped with a default NIC mode called *shared* LOM, which enables the two 1-Gigabit Ethernet ports to access the CIMC.

Cisco Integrated Management Controller (CIMC)
The CIMC is the management service for the C-Series servers. The CIMC management service is used only when the server is operating in Standalone Mode. Use a web browser to login to CMIC. When logging in for the first time to an unconfigured system, use **admin** as the username and **password** as the password. The Cisco UCS C-Series Servers Integrated Management Controller GUI Configuration Guide, Release 1.4 can be found here:
http://www.cisco.com/en/US/docs/unified_computing/ucs/c/sw/gui/config/guide/1.4.1/b_Cisco_UCS_C-Series_GUI_Configuration_Guide_141_chapter_01.html#task_3F8535D6A9574BCD806B25FEBF44615D

The Cisco UCS configuration used during validation can be found here: UCS Configuration.

Local Storage

Cisco Remote Expert Smart Solution release 1.8 System Test has validated the use of Cisco UCS C Series rack-mount servers equipped with local disk storage. The UCS C Series local storage was used to store both boot images and user data. VMware vSphere 5.0 was installed on the UCS Server, which was configured to boot from the local hard disk.

Hypervisor Installation and Configuration

VMware ESXi

The VMware ESXi hypervisor was installed on the servers. Version 5.0 was tested. The vSphere/vCenter management suite was used to manage the hypervisor.

The ESXi and vCenter configuration screenshots can be found here : vCenter configuration.