Cisco HealthPresence Solution Design Guide

Cisco HealthPresence Version 2.0 for AMD Telemedicine Medical Devices
November 16, 2011

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Cisco HealthPresence Solution Design Guide

CONTENTS

Cisco HealthPresence Solution Design Guide

CHAPTER 1

Overview

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Objectives and Audience

The Cisco HealthPresence™ Solution Design Guide provides an overview of the options and best practices for designing a Cisco HealthPresence V 2.0 solution, including:

- selecting a deployment model
- choosing the features you want to use
- designing the video conferencing portion of the solution
- determining bandwidth requirements and implementing quality of service
- determining security requirements and defining your security policy
- designing a Cisco HealthPresence room
- selecting Cisco service options

The target audience is Cisco HealthPresence solution planners and designers.

Cisco HealthPresence Intended Uses

The Cisco HealthPresence Solution consists of Attendant and Provider endpoints running the Cisco HealthPresence-Connect software.

The Cisco HealthPresence Enterprise Server at a data center provides a communications link between HealthPresence endpoints over private or virtual private network connections. Utilizing the network connections with encryption, the Cisco HealthPresence-Connect software transmits data acquired from third-party medical devices at an Attendant endpoint to Provider endpoints located within remote facilities.

Compatible third party devices include the following medical devices from AMD Telemedicine[1]:

- Digital stethoscope (AMD-3700)

1. This guide specifically covers Cisco HealthPresence when using medical devices supported in the United States. Most of the solution design is the same regardless of the device aggregators and medical devices. The Cisco HealthPresence Solution Design Guide Addendum for Neurosynaptic Devices addresses the solution guidelines (in particular, bandwidth requirements) that are unique to medical devices not supported in the United States.

- Camera and illumination system (AMD-400) and supported scopes:
  - Digital ear, nose, and throat video scope (AMD-2015)
  - Digital direct ophthalmoscope (AMD-2020)
  - Digital dermascope (AMD-2030)
- Digital examination camera (AMD-2500)
- Vital sign capture and measurement device (AMD-8221, also known as the Welch Allyn Spot Vital Signs LXi)

Additional network connections with encryption, separate from those used to transmit the data from medical devices, provide video conferencing capabilities between an Attendant and a Provider endpoint.

The Cisco HealthPresence Connect software transmits data from a Cisco HealthPresence Attendant Appliance to a Cisco HealthPresence Provider Appliance, according to the intended uses of the third party medical devices.

Note The Cisco HealthPresence-Connect software is not intended to perform real-time, active, or online patient monitoring, and does not transmit or display any real-time data that is intended to alert a physician of alarms or other conditions that require a physician's immediate action or response.

The user's infrastructure must meet the basic minimum specified requirements for Cisco HealthPresence to perform as intended. This includes, but is not limited to:

- adequate bandwidth
- appropriate latency, jitter and error rate
- appropriate video call control and routing equipment
- appropriate capacity routing and switching equipment
- proper software levels
- correct room design
- adequate physical security
- adequate network security

Cisco HealthPresence Capabilities

The Cisco HealthPresence solution is a network platform that combines high-definition video, advanced audio, and patient medical data to create a live, "face-to-face visit" experience over the network for clinicians and patients, even though they might be miles apart. The visit is enhanced by the availability of physical and diagnostic information (such as vital signs) generated from a variety of medical devices integrated with Cisco HealthPresence.

The Cisco HealthPresence solution provides effective health services from health care professionals to multiple patient sites, optimizing the capacity and the reach of regional, health care organizations. It enables delivery of health services to a variety of settings such as community centers, office buildings, hotels, and educational campuses.

The Cisco HealthPresence solution integrates specialized Cisco HealthPresence software, video endpoints and several networking elements to provide a seamless, easy-to-use solution. Specialized software enables health professionals to start telehealth appointments and share medical data with a single click.

New Features in Cisco HealthPresence V2.0

Cisco HealthPresence V2.0 provides many new features and capabilities, providing enhancements in usability, scalability, availability and serviceability.

Simplified Workflow and Ease of Use for Providers and Attendants

A number of features enhance the usability and workflow for Providers and Attendants. These include:

- An appointment queuing model that allows Providers to select from a list of ready appointments and allows Attendants to select from a drop down menu of Providers. This model:
  - Enables Attendants to quickly find the best medical Provider to address the patient's needs (based on specialty and availability), as shown in Figure 1-1.

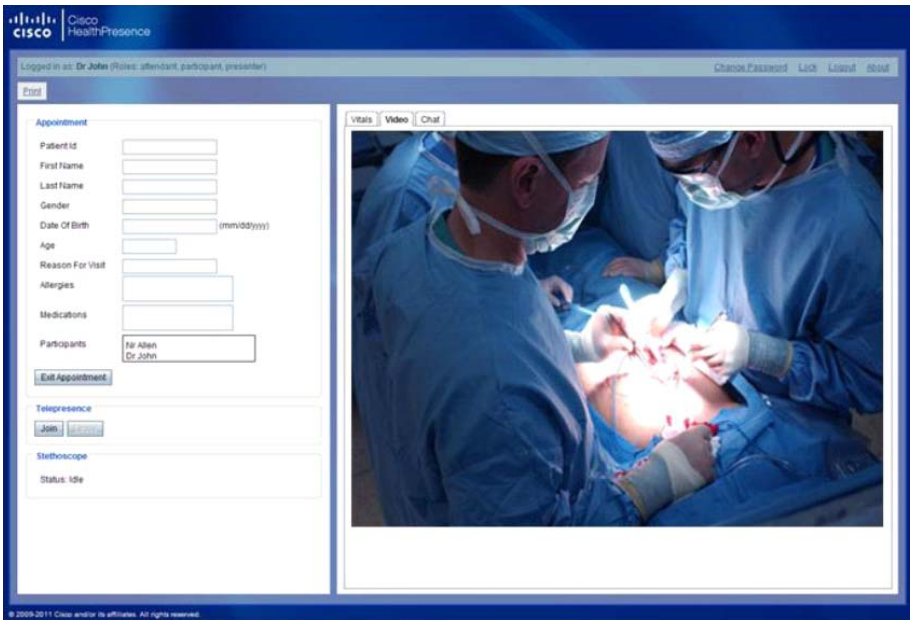
Figure 1-1 List of Providers

  - Allows Providers to maximize their consultation time by accepting appointments in remote sites with a simple click of a button. These can be regularly scheduled telehealth appointments or appointments they assist with in spare time (for example, if they have a cancellation.) They can triage the list of waiting appointments, as shown in Figure 1-2, and select an appointment based on the reason for visit or time in queue.

Figure 1-2 List of Ready Appointments

- An enhanced user interface that simplifies collaboration between Providers and Attendants and enables the Attendant to collect and share more detailed appointment data (such as reason for visit, allergies and medications) before the video conference component starts.
- A pause/print capability that captures (still) images from any of the supported scopes or the exam camera, as well as all other appointment data.
- A chat window that provides another means of communication between appointment or conference attendees.
- A conferencing capability that allows numerous parties to join in educational video conferences and allows one location to stream video to two other locations as part of a conference. This can be used for educational purposes, enabling remote viewing of a medical procedure using the exam camera (as shown in Figure 1-3) or a medical ailment using one of the scopes (for example, sharing images of a lesions using the dermascope).

Figure 1-3 Educational Use Case for Conferencing Capability



- The ability for a single username to be associated with multiple roles: Provider, Attendant, Participant, Presenter and Site Administrator.
- Support for an ePen that can be used to write prescriptions in one location and print them in another. (These are not electronic prescriptions.)

The next two capabilities also simplify the workflow for Attendants and Providers, and as well allow enterprises to leverage their existing resources.

- An interface to integration engines that facilitates integration of Electronic Medical Records (EMR). This interface, coupled with the integration engines and any required back end work, enables appointment data gathered during Cisco HealthPresence appointments to be stored in existing medical records data bases with a simple click of a button.
- Light-weight Directory Access Protocol (LDAP) support that allows medical facilities to leverage their existing directory services to authenticate users of the Cisco HealthPresence system. This simplifies password maintenance for the end user as well as site administrator.

Business to Business (B2B) Capability

The Business-to-Business (B2B) feature enables different medical business entities to collaborate with each other, either for B2B conferences or B2B medical consultations[2], with a simple click of a button. This collaboration provides several benefits:

- It allows enterprises to offer more complete medical services while retaining only the most commonly required experts on their staff.
- It facilitates medical collaboration across research facilities, as conferences no longer require travel.
- If facilitates offering specialist consultations during a patient's regular general practitioner appointment. The patient has a single appointment and no travel or waiting. In addition, having the primary care physician and specialist participate in the same patient appointment can improve the patient care.
  - The specialist learns first hand the medical care the patient is currently getting.
  - The general practitioner hears, first hand, the required follow-on care.

Infrastructure Enhancements

- Multi-tenancy, that allows multiple instances of Cisco HealthPresence to reside in the same physical server, providing a cost-effective solution for hosting services.
- Higher availability, with support for a redundant server and an external Network File System (NFS) database, enabling one server to automatically take over for another after a failure.
- A scalable solution that supports:
  - up to 120 Provider or Attendant stations managed by a single Cisco HealthPresence Connect Server
  - up to 60 endpoints concurrently in appointments or conferences
  - sharing of streaming medical content among 3 conference or appointment participants (one sending and two receiving)
- Enhanced Security with the capability to easily configure the security policy for the system.

Versatility and Cost Effectiveness

- Support for a variety of video endpoints to address both the high-end immersive requirements, and lower-cost desktop or personal video requirements.
- Support for additional medical devices, to address needs in locales where those devices are prevalent.
- Support for a variety of data center components to support video call management and switching, facilitating implementation in establishments with an install base of those components, as well as providing a lower-cost entry point.
- Support for interoperability between video endpoints in both point-to-point or multi-point configurations.
- Support for the Cisco TelePresence System Clinical Presence mobile cart, which enables the solution to be easily transported to non-ambulatory patients.

2. B2B appointments or conferences are always multi-point.

Smaller, More Secure Form Factor

The Cisco HealthPresence Attendant Appliance replaces both the medical device aggregator and the PC required by Cisco HealthPresence V1.0, providing a small, secure platform that takes up less space, generates less heat, and simplifies maintenance. Both the Cisco HealthPresence Attendant Appliance and the Cisco HealthPresence Provider Appliance are streamlined and "hardened" to contain only the required software and services.

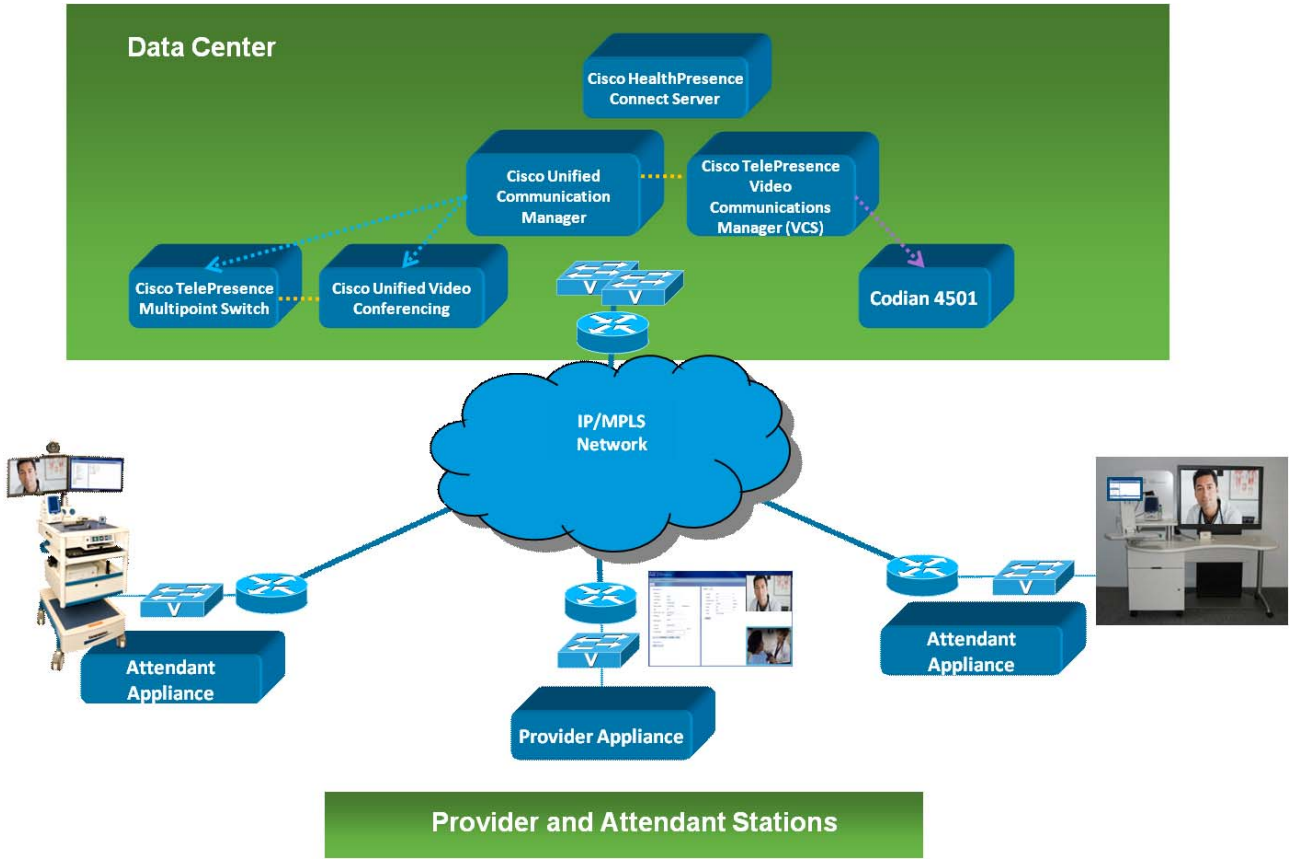
Simplified Installation and Support

- A streamlined software installation process (both in the Data Center and at the endpoints.)
- An enhanced graphical user interface for configuring and servicing Cisco HealthPresence.

Cisco HealthPresence Architecture

Figure 1-4 illustrates an overview of the components in a Cisco HealthPresence solution.

Figure 1-4 Cisco HealthPresence Solution Architecture



Cisco HealthPresence Components

In addition to the video components described earlier, the Cisco HealthPresence Solution includes data center software, Cisco HealthPresence endpoint software (running on a specifically configured PC), and medical devices. These components are described in the next few sections.

Cisco HealthPresence Software Components

The Cisco HealthPresence solution combines several different software and hardware components, including, but not limited to, the following:

- **Cisco HealthPresence Connect Server**, the data center software that manages all of the connectivity. It is comprised of the following internal components:
  - **Cisco HealthPresence Application Server (CHPAS) –** ties together all the components of Cisco HealthPresence. Specifically, the Cisco HealthPresence Application Server:

    - maintains the master information about resources

    - manages conferences, sessions and appointments

    - interfaces with CHP Connect Endpoint software, CHP Admin, CHP Portal, and Unified Communications (UC) servers

    – interfaces with the EMR integration engine (either IBM Message Broker or Mirth)

    - manages the flow of medical devices data through the network
  - **Cisco HealthPresence Portal Server –** maintains the portal login sessions, provides the UI to the providers and attendants and interfaces to the CHPAS to validate sessions.
  - **Cisco HealthPresence Administration** - is the management server used by the installation team to configure, administer and manage the CHPAS and the CHPPS.
- **Cisco HealthPresence B2B Server –** which manages conferences, sessions and appointments between endpoints managed by different Cisco HealthPresence Application Servers.
- **Cisco HealthPresence Attendant Appliance -** a platform that resides at an Attendant Station and includes the following components:
  - Cisco HealthPresence Connect Client software
  - AMD device aggregation software
- **Cisco HealthPresence Provider Appliance -** a platform that resides at a Provider Station and includes the Cisco HealthPresence Connect Client software.

Video Conferencing Support

Cisco HealthPresence supports a variety of video endpoints, call control and management systems and multipoint bridges to address requirements ranging from low-cost desktop to high-end and immersive and to enable a rapid deployment (in environments that have an install base of video equipment).

Video Endpoints

Cisco HealthPresence supports a number of video endpoints, giving enterprises a choice in video quality, size/form factors, bandwidth required and cost. These video endpoints are illustrated in Figure 1-5.

Figure 1-5 Video Endpoints[3]

These video endpoints are described in detail in Chapter 3, "Video Endpoint Considerations".

Call Control

Cisco HealthPresence solution supports both the Cisco Unified Communication Manager (CUCM) and Cisco TelePresence Video Communications Manager (VCS). In conjunction with the appropriate Multi-point Control Unit (MCU), the solution can support interoperability between video endpoints managed by CUCM and video endpoints managed by VCS. For more detail on Call Control options and interoperability, see Chapter 3, "Video Endpoint Considerations".

Multi-point Bridges

In addition, the Cisco HealthPresence Solution supports the following multipoint bridges:

Cisco TelePresence™ Multipoint Switch (CTMS) – Solutions using Cisco TelePresence-only endpoints can use the CTMS.

Cisco Unified Videoconferencing (CUVC) Multipoint Control Unit (MCU) – For solutions using both the CTS-500 and other video endpoints, use the CUVC MCU to support video endpoints other than CTS-500 and to provide interoperability.

3. The Cisco TelePresence System Edge 95 MXP is supported at provider endpoints only. The Cisco Unified Communications 7985G IP Phone is now EOL.

4501 MCU – solutions using only non-CTS-500 video endpoints can use the 4501 MCU multipoint bridge.

For more detail on video endpoint interoperability, see Chapter 3, "Video Endpoint Considerations".

Cisco HealthPresence-Supported Medical Devices

Cisco supports various integrated medical devices from 3rd-party vendors, including AMD Telemedicine and Welch Allyn (as sold by AMD)[4]. The AMD and Welch Allyn Telemedicine devices, shown in Figure 1-6, include:

- AMD-2500 General Exam Camera
- AMD -400 Image and Illumination System and its associated scopes:
  - AMD-2015 ENT Scope
  - AMD-2020 Direct Ophthalmoscope
  - AMD-2030 Dermascope
- AMD-3700 Telephonic Stethoscope
- Welch Allyn Spot Vital Signs LXi (also known as the AMD-8221 vital signs monitor)

Figure 1-6 AMD and Welch Allyn Medical Devices

Cisco HealthPresence also supports the Hi-Tech E-Pen (not a medical device) to enable a prescription, hand written at the provider end, to be displayed and printed at the attendant end. The Hi-Tech E-Pen is shown in Figure 1-7.

Figure 1-7 Hi-Tech's E-Pen

4. Neurosynaptics devices, which are also supported by Cisco HealthPresence, are covered in an addendum to this manual, as they are not supported in the United States.

Furniture Options

Cisco offers two furniture options for the medical equipment, video conferencing system and Cisco HealthPresence Connect Appliance:

- Cisco HealthPresence Patient Pod
- Cisco TelePresence System Clinical Presence

Cisco HealthPresence Patient Pod

The Cisco HealthPresence Pod is designed to maximize work space while minimizing the footprint of the furniture. The furniture has compartments tailored for the Cisco HealthPresence medical equipment, computer, monitor/keyboard, device aggregator and cabling. The Cisco HealthPresence Pod enables you to keep the work space clear yet provides convenient access to all necessary equipment. Cabling from medical devices drops back into troughs specifically designed to maximize portability of the medical devices, avoid tangles, and keep the work space clean. The Cisco HealthPresence Pod is shown in Figure 1-8. The Cisco HealthPresence Patient Pod can work any of the video endpoints, but it will look the best with a video endpoint that has a 32-inch or 37-inch display. The Cisco TelePresence System 500 (CTS 500) comes with a 37-in display and the Cisco TelePresence Codecs C20/C40 work with a 32 inch display.

Figure 1-8 Cisco HealthPresence Patient Pod

Cisco HealthPresence Clinical Presence Cart

The Cisco HealthPresence Clinical Presence Cart enables the solution to travel to patients. Utilizing the Cisco TelePresence System Codec C40, the Cart provides both video conferencing and Cisco HealthPresence screens and medical equipment in a single mobile device. This is especially useful in environments where the patient cannot easily travel to a Cisco HealthPresence Attendant Station, such as a neonatal ICU or burn care centers.

The Cisco TelePresence System Clinical Presence is illustrated in Figure 1-9.

Figure 1-9 Cisco TelePresence Systems Clinical Presence

Data Center Requirements

Cisco HealthPresence Connect Server runs on the following platforms:

- Cisco UCS C200 M2 Server
- A partition of the Cisco UCS C250 M2 Server[5]
- Cisco MCS 7845-I3 Server (Enterprise license only)

Additional components required for Multi-tenancy (supported only on a UCS C250 Server):

- VMware vSphere Hypervisor (ESXi) 4.1. This runs on a UCS C250 Server.
- Vsphere Client 4.1. This runs on a Windows platform.

Additional components required if implementing the high availability design option[6]:

- All the software components required for Multi-tenancy, plus:
  - NetApp FAS2020 Network File System
  - vCenter Server 4.1. This runs on a 64 bit Windows platform.

5. This server is required if multi-tenancy or the hosting option is selected.
6. The high availability design option is not supported on the MCS platform but is supported on either UCS platform.

For Use with Specific Software and Hardware

Cisco HealthPresence customers run the Cisco HealthPresence Connect V2.0 software on the Cisco HealthPresence Provider or Attendant Appliance. The Cisco HealthPresence Attendant Appliance enables an Attendant to participate in appointments with Providers using the Cisco HealthPresence Provider Appliance. The Cisco HealthPresence Connect software aggregates video, audio and vitals from attached medical devices.

Note Neither the Cisco HealthPresence Provider Appliance or the Cisco HealthPresence Attendant Appliance can be changed in any way, as this can impact the performance of the solution. No software packages may be added and existing software packages must not be modified (either by configuration changes or service level changes, except for required service upgrades to Windows and anti-virus software.)

Key Considerations

When designing a HealthPresence solution, consider the following:

Deployment Models and Feature Sets: There are several options for how you deploy your solution (both in the data center and in the network). As well, there are several feature sets to choose from.

Video Endpoints and Unified Communications (UC) Architecture: If you have an install base of video endpoints and those endpoints meet the specific requirements of the Cisco HealthPresence solution, you may want to leverage those endpoints in your design. Alternatively, if purchasing new video endpoints, you have a number to select from. In either case, you need to determine how you will configure these devices to support video conferencing, interoperability and if applicable, what multi-point switches you will use.

Quality of Service (QoS) and Bandwidth: QoS provisions are required to help assure that critical data gets priority and that real-time video[7] is handled without degradation of the images.

In addition, while a well-designed QoS strategy can minimize bandwidth requirements, a minimum amount of bandwidth is required for each of the three site types:

- data center
- Attendant endpoints
- Provider endpoints

Your choice of video endpoints may influence how much bandwidth you need to provision. In addition, having point to point or multipoint conferences can also impact bandwidth.

Security: The solution has a number of features to enhance security. In addition, it offers the capability for enterprises to define a security policy for user authentication. As part of that security policy, you need to determine if you want an existing LDAP server to authenticate end users or if you want that authentication done by Cisco HealthPresence.

In addition, if you are using EMR to securely store electronic medical data, you need to decide if you want to take advantage of the integration engine interface provided in the Cisco HealthPresence Connect Server. You can use this interface to connect to either the IBM Message Broker or Mirth. These integration engines, when properly configured, enable to Cisco HealthPresence to access your existing EMR system.

7. Real-time, in this instance, refers to the traffic classification of Cisco TelePresence. The Cisco HealthPresence-Connect software is not intended to perform real-time, active, or online patient monitoring, and does not transmit or display any real-time data that is intended to alert a physician of alarms or other conditions that require a physician's immediate action or response.

Room Design: For an optimal experience using the Cisco HealthPresence solution and in particular, the Cisco TelePresence component of the solution, several factors need to be considered, including room size, location, lighting, colors, cooling and windows. Requirements may vary dependent on the video endpoints selected.

Cisco Services: There are several options for how the solution can be serviced. This decision needs to be made up front as it may affect the network design.

Each of these topics is covered in this document.

Network and QoS design are touched upon briefly in this document. For more information on network and QoS design, refer to one of the following:

- ***Medianet Campus QoS Design 4.0***
- ***Enterprise Medianet Quality of Service Design 4.0 - Overview***
- ***Enterprise QoS Solution Reference Network Design Guide***

CHAPTER 3

Video Endpoint Considerations

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You selection of video endpoints must take a number of other factors into consideration. These include:

- Unified Communication Models
- Multipoint Bridges
- Furniture
- Bandwidth

This chapter touches on each of these topics and describes where to find additional information.

Video Endpoints Supported

- **Cisco TelePresence System 500 (CTS 500) –** consists of an integrated display, camera, microphone, speakers, one Cisco Unified 7975G IP phone, and the Cisco TelePresence codec. The CTS-500 supports video at 30 frames per second (fps) and 720p or 1080p resolution. The Cisco TelePresence codec is the engine that drives the entire CTS-500 solution. All displays, cameras, microphones, and speakers connect to the codec and it communicates with the network and handles all audio and video processing.
- **Cisco TelePresence Edge 95 MXP –** includes a Tandberg PrecisionHD camera, an integrated codec, a microphone and cables. A separate video display is required. This system is supported at the Provider endpoint only.
- **Cisco TelePresence Codec C20/C40 –** The C-series codecs must be used in conjunction with the LCD 100L Pro 32N monitor. The C40 codec is the video endpoint used in the Cisco TelePresence System Clinical Presence mobile system.
- **Cisco TelePresence System EX60/EX90 –** The Cisco TelePresence System EX Series are personal video conferencing endpoints designed for an office. The EX series are fully integrated units with a codec, display, camera, microphone and loudspeakers.
- **Cisco Unified VideoAdvantage –** This solution comprises Unified Video Advantage software and Cisco VT Camera III, a high-definition two megapixel video telephony USB camera with a high-quality fixed-focus glass lens for improved performance and better image quality. The video codec and bandwidth selection in Cisco Unified Video Advantage is completely controlled by Cisco Unified Communications Manager. At the provider end, Cisco Unified Video Advantage enables your Cisco HealthPresence Appliance with an attached video display to provide both video conferencing and access to the Cisco HealthPresence appointment screens.

- **Cisco Unified IP Phone 7985G –** a personal desktop video phone for the Cisco Unified Communications solution. The phone includes a camera, LCD screen, speaker, keypad, an integrated codec and a handset. While this device is no longer available for purchase, it is supported by Cisco HealthPresence to address the large install base.

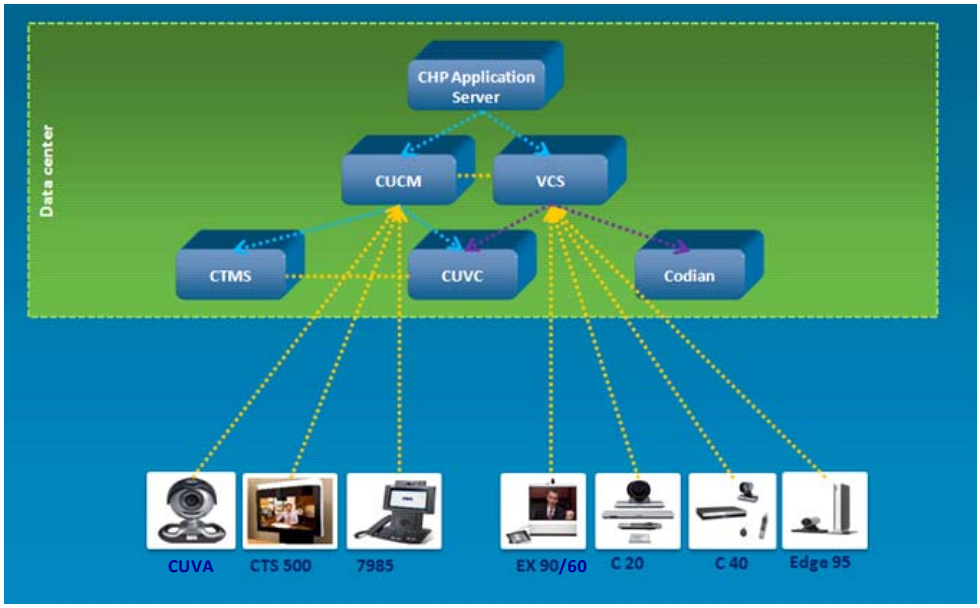
Unified Communication Models

To support a wide variety of video endpoints and to enable interoperability between them, Cisco HealthPresence supports the following Unified Communication models:

- CUCM only mode
- VCS only mode
- CUCM and VCS mixed mode

The architecture diagram shown in Figure 3-1 lists the preferred registration mode for the video endpoints supported by the Cisco HealthPresence Solution.

Figure 3-1 Preferred Endpoint Registration Mode



To understand how to enable calls between endpoints registered on the Cisco VCS Control to endpoints registered on CUCM, see the Cisco Unified Communications Manager v6.1, 7 and 8 Cisco TelePresence Deployment Guide[1].

Multipoint Bridge Options

As described in Chapter 1, the Cisco HealthPresence Solution supports three bridge types:

- CTMS

1. http://www.cisco.com/en/US/docs/telepresence/infrastructure/vcs/config_guide/Cisco_VCS_Cisco_Unified_Communications_Manager_Deployment_Guide_CUCM_6-1_7_8_and_X5-1.pdf

- CUVC
- 4501 MCU

The correct bridge type for your enterprise depends on your selection of signaling mode and the video endpoints that you use. Table 3-1 illustrates which bridges are supported in which configurations.

Table 3-1 Multipoint Bridge Compatibility

Signaling Model	Endpoints	Required Bridge(s)
CUCM Only	CTS-500 only	CTMS
CUCM Only	CTS-500 and CUVA	CTMS and CUVC
VCS only	EX series, C series, Edge 95 MXP	4501 MCU
CUCM and VCS	CTS-500, EX series, C series, Edge 95 MXP, CUVA	CTMS and CUVC

Note If the video endpoints do not support the same type of video format, then the appointment has to be multipoint to enable interoperability. If the same video format is supported by both endpoints, interoperability is supported in a point-to-point configuration.

Figure 3-2 illustrates the general architecture of the Cisco HealthPresence solution in an environment that has both Cisco TelePresence System 500 video conferencing and other supported video conferencing systems. Figure 3-3 illustrates the general architecture of the Cisco HealthPresence solution in an environment that has only traditional Tandberg video conferencing.

Figure 3-2 Cisco HealthPresence Solution Architecture

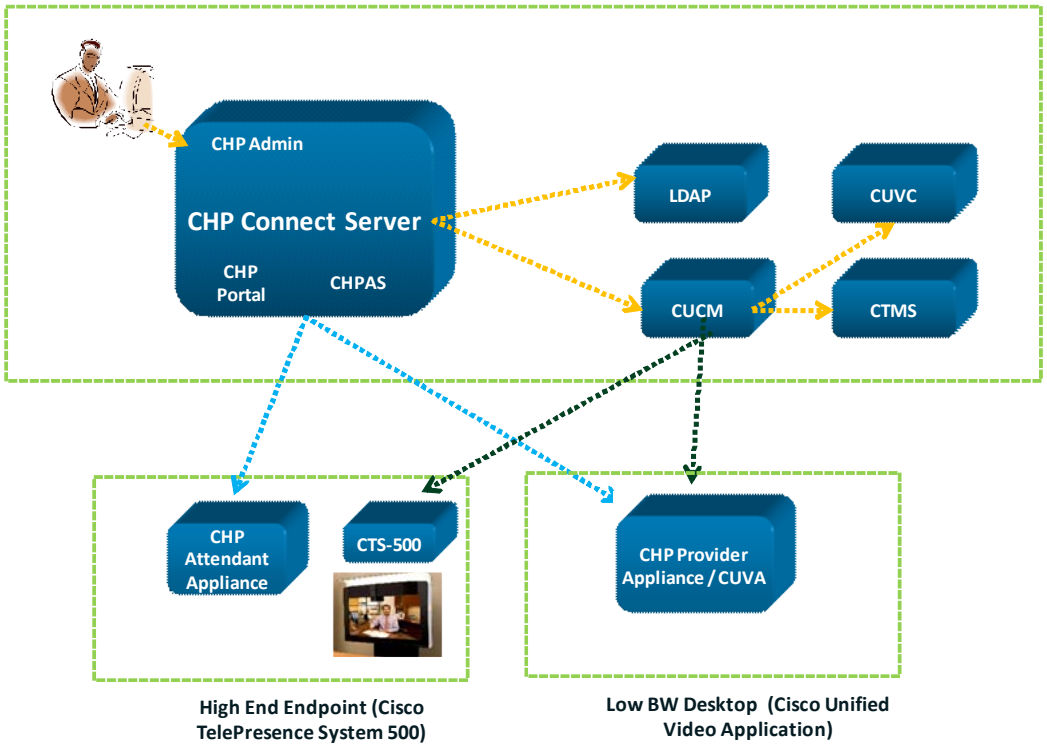


Figure 3-3 Cisco HealthPresence Solution High Level Architecture with VCS

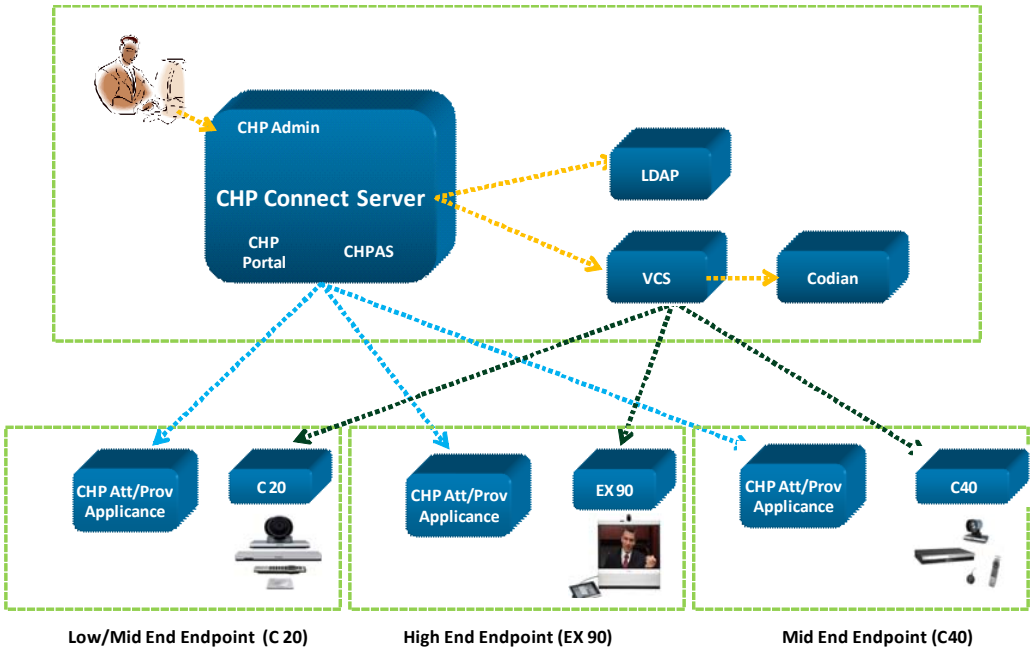


Table 3-2 For More Information on Multipoint Bridges

Multi-Point Switch	Data Sheet
CTMS	http://www.cisco.com/en/US/prod/collateral/ps7060/ps8329/ps8331/ps7315/product_data_sheet0900aecd805faa74.pdf
CUVC 5110 MCU	http://www.cisco.com/en/US/prod/collateral/video/ps7190/ps10463/data_sheet_c78-565209.pdf
MCU 4501	http://www.tandberg.com/video-conferencing-multipoint-control/tandberg-codian-mcu4501.jsp

Other Considerations

Video Endpoints and Furniture Choices

Cisco HealthPresence supports several options for video endpoints, as described in Video Endpoints, page 1-7. Any of these video endpoints are appropriate for the Provider Station. For the Attendant Station, it depends on the furniture option selected.

For more information, see Furniture Options, page 1-10.

Video Endpoints and Bandwidth Requirements

The bandwidth requirements vary depending on the video endpoint and configuration options selected. Refer to Chapter 4, “Cisco HealthPresence Bandwidth Requirements and Quality of Service Recommendations” to understand the bandwidth options for each endpoint.

CHAPTER 4

Cisco HealthPresence Bandwidth Requirements and Quality of Service Recommendations

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This chapter discusses the minimum recommended bandwidth required for the Cisco HealthPresence solution and the recommended QoS settings to ensure that the Cisco HealthPresence solution works as designed and that existing network traffic is not impacted by the addition of Cisco HealthPresence traffic.

For more information on QoS, refer to one of the following:

- ***Medianet Campus QoS Design 4.0***
- ***Enterprise Medianet Quality of Service Design 4.0 - Overview***
- ***Enterprise QoS Solution Reference Network Design Guide***

Bandwidth Requirements for Cisco HealthPresence Endpoints

The bandwidth required for a Cisco HealthPresence endpoint is the sum of the bandwidth required for the medical device streaming and bandwidth required for video conferencing. Bandwidth requirements vary depending on the following factors:

- the number of Provider endpoints in a single appointment (each Provider receives streaming multimedia from the Attendant endpoint.)
- the quality selected for the video endpoint.
  - The Cisco TelePresence System 500 offers two resolution settings (720p or 1080p) and four quality settings (lite, good, better or best). Other video endpoints also have multiple resolution settings.
  - The Cisco TelePresence System EX60/EX90/Edge 95 MXP and the Cisco TelePresence C20/C40 offer high, medium, and normal settings at 30fps or 60fps.

Note The recommended minimum bandwidth for any Cisco HealthPresence endpoint is 512kbps, but more may be required depending on the medical devices used and the video endpoints deployed. See Table 4-2 and Table 4-3 for more details.

Bandwidth Required for Streaming Video and Audio from AMD Medical Devices

Streaming audio and video is transmitted directly from an Attendant endpoint to a Provider endpoint in all cases (regardless if multi-point or point-to-point is configured). If an Attendant will have two Providers in a single appointment and plans to stream video or audio to both, then the Attendant endpoint requires twice as much bandwidth for streaming.

Table 4-1 AMD Telemedicine Medical Device Bandwidth Requirements in kbps[1]

Content	BW in kbps
Audio Streaming	128
Video Streaming	800
Vitals	50
Medical Device Total	978

Video Endpoint Bandwidth

The bandwidth requirements can vary based on a number of parameters: video endpoints, resolution, frames per second (fps), and for certain endpoints, the optimal definition profile. The bandwidth required at the per video endpoint is:

- Cisco TelePresence System 500: between 1164 kbps and 4628 kbps for transmitting and between 1292 kbps and 4756 kbps for receiving.
- Cisco TelePresence System EX60/EX90/Edge and the Cisco TelePresence C20/C40: between 512kbps and 2560kbps.

Cisco TelePresence System 500 Bandwidth Requirements

The Cisco TelePresence System 500 offers seven different options that affect bandwidth requirements as illustrated in Table 4-4.

Table 4-2 Cisco TelePresence System 500 Bandwidth in kbps[2]

BW in kbps	1080p Best	1080p Better	1080p Good	720p Best	720p Better	720p Good	720p Lite
Transmit	4628	4128	3628	2878	2128	1628	1164
Receive	4756	4256	3756	3006	2256	1756	1292

1. These values include the encapsulation overhead.
2. Add 20% for encapsulation overhead.

For example, assume an Attendant endpoint has a Cisco TelePresence System 500 and has been configured for 720p Best. Then Cisco TelePresence requires 3006 kbps. Allowing 20% for overhead, figure 3607 kbps for Cisco TelePresence. The Cisco HealthPresence medical device data/content requires 2650 kbps, including overhead. If the Attendant endpoint will connect to two Provider endpoints concurrently, bandwidth required for the Attendant endpoint is 3607 + (2 * 2650) or 8907 kbps. (A Provider endpoint with a Cisco TelePresence System 500 only requires the 6257 kbps, because it will only receive only one video and one audio stream.)

Cisco TelePresence System EX60/EX90/Edge 95 and Cisco TelePresence C20/C40 Bandwidth Requirements

For the Cisco TelePresence System EX60/EX90/Edge 95 and Cisco TelePresence C20/C40, the minimum bandwidth required depends on the optimal definition profile (normal, medium or high), the resolution (from 288p to 1080) and the frames per second (fps). The Optimal definition profiles can be used when light conditions are optimal in order to increase frame rate and resolution for lower bandwidths. In Cisco TelePresence System Codec software, it is possible to increase the video resolution for situations where light conditions are especially good. These settings are found under the OptimalDefinition Profile settings menu. Refer to the operating manual for your endpoint.

The high setting should be used in dedicated rooms with optimal lighting conditions. Medium is for good, stable light conditions. Normal is the default and is recommended in most cases. Test every room when selecting either Medium or High mode. In rooms with daylight, the light conditions will vary and testing should been carried out at nighttime.

Table 4-3 Cisco TelePresence System EX60/EX90/Edge95 MXP and Cisco TelePresence C20/C40 Minimum Bandwidth Requirements in kbps[3]

30fps	1080p	720p	576p	448p
Normal	2560	1152	768	512
Medium	1929	768	512	512*
High	1472	768	512	512*
60fps				
Normal		2240	1472	1152
Medium		1472	1152	768
High		1152	768	512

* Recommended. See note below.

Note For the Cisco HealthPresence solution, Cisco recommends a minimum Committed Information Rate (CIR) of 512kbps, regardless of the capabilities or specifications of the video endpoint.

3. Add 20% for encapsulation overhead.

Bandwidth Requirements for a Cisco HealthPresence Data Center

The bandwidth required for a Cisco HealthPresence data center depends on whether point to point or multipoint is configured. The only significant traffic that flows through the data center (or more accurately, through the multipoint switch) is the video conferencing traffic in a multi-point configuration. Therefore, to estimate the bandwidth required at a data center, determine the maximum number of concurrent endpoints that will be in a multi-point appointment at any point in time, and add the bandwidth required for each endpoint using the values specified in either Table 4-2 or Table 4-3, and then add 20% for encapsulation overhead.

Consider this example. Referring to Table 4-2, assume there are five Cisco TelePresence System 500 endpoints each using the best resolution for 720p. Then Cisco TelePresence requires enough bandwidth at the data center to transmit five video streams of 2878kbps + 20% overhead, and to receive five video streams at a bandwidth of 3006kbps + 20%. This equates to a Tx BW of 17,268kbps and a Rx BW of 18,036kbps, or approximately 19 Mbps for each.

All medical device data and streaming content is peer-to-peer so streaming medical data does not add any bandwidth requirements to the data center, unless the data center site is also the site of one or more Cisco HealthPresence endpoints.

Quality of Service

A major benefit of the Cisco's HealthPresence solution is that real-time[4], high-definition video and audio (Cisco TelePresence) and streaming video and audio (from medical devices) can be transported over a converged IP network. The key enabling technology to accomplish this convergence is Quality of Service (QoS).

QoS technologies refer to the set of tools and techniques (such as queuing and prioritization) to manage network resources so that varying network traffic requirements are addressed. In particular, for real-time interactive traffic, such as Cisco TelePresence, latency, jitter, and loss are minimized. QoS technologies allow different types of traffic to intelligently contend for network resources. For example, voice and real-time video may be granted strict priority service, while some critical data applications may receive (non-priority) preferential services and some undesired applications may be assigned deferential levels of service. Therefore, QoS is a critical, intrinsic element for the successful network convergence of voice, video, and data.

The Cisco HealthPresence solution incorporates a number of components. Several of these components generate a different type of traffic and hence have different QoS requirements. The traffic types include:

- **Cisco Telepresence System 500:** To create an optimal "face-to-face experience over the network, Cisco TelePresence requires very strict service levels when it comes to latency, jitter, and loss. In a multi-point implementation, this traffic always flows through a Cisco TelePresence Multipoint Switch (CTMS) in the data center. In a point-to-point environment, this traffic goes direction from one endpoint to another.
- Other Video Conferencing Systems: While less bandwidth intension, other supported video conferencing endpoints still require adequate bandwidth and prioritization to assure that the end user experience is optimal.

4. Real-time, in this instance, refers to the traffic classification of Cisco TelePresence. The Cisco HealthPresence-Connect software is not intended to perform real-time, active, or online patient monitoring, and does not transmit or display any real-time data that is intended to alert a physician of alarms or other conditions that require a physician's immediate action or response.

- Multimedia streaming traffic (Cisco HealthPresence medical devices stream video and audio from the Cisco HealthPresence Attendant Appliance to the Cisco HealthPresence Provider Appliance). This traffic always flows directly from the Attendant Appliance to the Provider Appliance and does not go through the data center.
- HTTPS/HTTP data (patient data, vitals data, and application data to begin and end appointments and manage the flow of the Cisco HealthPresence telemedicine appointment). This traffic is typically encrypted and always goes to the data center. It is not significant from a bandwidth perspective. For simplicity, this data can be marked and queued with the multimedia streaming traffic or left unmarked and sent in the best effort queue.

QoS Best Design Practices for Cisco HealthPresence

When designing a network to support Cisco HealthPresence, QoS best design practices should be employed wherever possible. These best practices include the following:

- Classification and marking policies should be implemented in Cisco Catalyst hardware as close to the source of the traffic as possible (e.g., on the access edge switch to which the Cisco HealthPresence System is attached).
- Use Differentiated Services Code Point (DSCP) whenever possible. DSCP provides more granularity than IP Precedence.
- Always deploy QoS in hardware, rather than software, whenever a choice exists. QoS policies, like classification, marking/remarking, and/or policing can all be performed at line rates with zero Central Processing Unit (CPU) impact in Catalyst switches. Cisco IOS routers, on the other hand, perform QoS operations in software, resulting in a marginal CPU impact, the degree of which depends on the platform, the policies, the link speeds, and the traffic flows involved.
- Follow industry standards whenever possible, as this extends the effectiveness of your QoS policies beyond your direct administrative control. For example, if you mark a real-time application, such as VoIP, to the industry standard recommendation as defined in RFC 3246 (An Expedited Forwarding Per-Hop Behavior), it receives high priority servicing at every node within your enterprise network. When you hand off this traffic to a service Provider, they provision traffic marked Expedited Forwarding (EF - or DSCP 46) in a strict priority manner. Therefore, even though you do not have direct administrative control of the QoS policies within the service Provider's cloud, you have extended the influence of your QoS design to include your service Provider's cloud simply by following the industry standard recommendations. The relevant standards are listed below in chronological order:
  - Between Cisco's QoS Baseline and RFC 4594 is the RFC 4594 recommendation to mark Call Signaling as CS5. Cisco plans to continue marking Call Signaling as CS3 until future business requirements arise that necessitate another marking migration. Therefore, for the remainder of this document, RFC 4594 marking values are used throughout, with the one exception of swapping Call-Signaling marking (to CS3) and Broadcast Video (to CS5). These marking values are summarized in Table 4-4.

Table 4-4 Cisco Marking Recommendations

Application	L3 Classification PHB	L3 Classification DSCP	Application Examples
Network Control / Routing	CS6	48	EIGRP, OSPF, HSRP, IKE
VoIP Telephony / Voice	EF	46	Cisco IP Phone
Broadcast Video (RFC 4594 only)	CS3 by RFC 4594, CS5 by Cisco	24 by RFC4594, 40 by Cisco	Cisco IPVS, Enterprise TV
Real-time Interactive	CS4	32	Cisco TelePresence System 500, Cisco HealthPresence Medical Device traffic
Multimedia Conferencing	AF4	34	Cisco CUPC, WebEx, Interactive Video
Multimedia Streaming	AF3 or CS4	26	Cisco DMS, IP/TV,
Call Signaling (same name used by both)	CS5 by RFC 4594, CS3 by Cisco	40 by RFC4594, 24 by Cisco	SCCP, SIP, H323
Low-Latency Data / Transactional Data	AF21	18	ERP Apps, CRM Apps
Operations/Administration /Management (OAM) / Network Management	CS2	16	SNMP, SSH, Syslog
High-Throughput Data / Bulk Data	AF11	10	Email, FTP, Backups
Best Effort - same name used by both	DF	0	Default Class
Low-Priority Data / Scavenger	CS1	8	You Tube, Gaming, P2P

Best Practices for Converged Networks

In addition to the above best practices, the following best practices apply to converged networks:

- Limit the amount of real-time voice and video traffic to 33% of the link capacity or else data may be starved out resulting in very slow and erratic performance of data applications.
- Reserve at least 25% of the link bandwidth for the default Best Effort data class.
- Utilize a 1% Scavenger or Low-Priority class to ensure that unruly applications do not dominate your default Best Effort data class.
- Use Weighted Random Early Detection (WRED) on all TCP flows, where ever possible, preferably DSCP-based WRED.

Marking Cisco HealthPresence Traffic

The recommended marking for traffic is as follows:

Cisco TelePresence System 500: Class Selector 4 (CS4)

Interactive video from all other video endpoints: DSCP AF41

Cisco HealthPresence streaming multimedia: Class Selector 4 (CS4).

You can mark Cisco HealthPresence streaming multimedia by doing the following steps:

Step 1 Create an access list for Cisco HealthPresence traffic:

ip access-list extended CHP-ACL

permit udp [CHP_APPL_IP_ADDR] any eq 5000

permit udp [CHP_APPL_IP_ADDR] any eq 5001

permit udp [CHP_APPL_IP_ADDR] any eq 5002

permit udp [CHP_APPL_IP_ADDR] any eq 5003

! Put all traffic from the Cisco HealthPresence Appliance interface with ports 5000-5003 into access-list CHP-ACL

Step 2 Use the following global commands to match access-group CHP-ACL to a class named CHP-CLASS and then mark all the CHP-CLASS traffic as DSCP 32.

class-map match-all CHP-CLASS

match access-group name CHP-ACL

! maps all traffic in access-group CHP-ACL to the class named CHP-CLASS

!

policy-map MARK-CHP-DSCP

class CHP-CLASS

set dscp 32

! sets dscp to 32 for all traffic in the class named CHP-CLASS

CHAPTER 5

Cisco HealthPresence Security

Revised: November 16, 2011

Overview

The security policy for the Cisco HealthPresence solution should be determined prior to installation. As part of the install process, you will be asked how you want your end users to be authenticated and if you want the end users authenticated by Cisco HealthPresence, how you want passwords, inactivity and lockout handled. This section covers the decisions you need to make prior to installation and in addition, discusses other security features of Cisco HealthPresence.

Note This chapter discusses the security features in the Cisco HealthPresence solution. It is the responsibility of the enterprise to assure that any other required security measures are implemented (for example, securing data sent to a printer or protecting passwords.)

Authentication / Access Control

Authentication Options

Cisco HealthPresence allows end users to be authenticated in one of two ways:

- External LDAP server
- Cisco HealthPresence

If required, you can configure your system to support both means of authentication. The alternatives are described below.

External LDAP-Authentication

There are a number of reasons to choose external LDAP authentication. By choosing to authenticate using an external LDAP directory:

- End users can use the same username for multiple applications.
- End users change their password once and the new password is then valid across all systems that interface to the LDAP server.

- Administrators can remove an end user from all systems at once.
- Administrators can reset a password and have it affect all systems at once.
- Site wide security policy and changes are automatically reflected in Cisco HealthPresence.

Dedicated Cisco HealthPresence Authentication

You can choose to have Cisco HealthPresence authenticate end users if you do not have an external LDAP server or if you want Cisco HealthPresence users to have a unique user name or password that works only with Cisco HealthPresence (but note that there is no way to assure that the end user doesn't use the same password in all cases).

Mixed Authentication

Mixed authentication offers the best of both worlds. It allows you to leverage your LDAP directory to authenticate most Cisco HealthPresence users, but it also allows special user IDs to be created ad hoc for training purposes or perhaps for temporary employees. It also allows you to utilize the training and testing user names that ship with the product, regardless of how you want other users authenticated. If you opt for mixed authentication, your site administrator can add users to be authenticated by Cisco HealthPresence or enable users (who are authenticated using an external LDAP directory) to use Cisco HealthPresence.

Cisco HealthPresence Security Policy

As part of the installation of Cisco HealthPresence, you need to make certain decisions about the security policy you want to have enforced. That security policy primarily applies to Cisco Health-Presence Authenticated Users, but has two additional parameters that apply to all users.

Security Policy Controls for Cisco HealthPresence-Authenticated User Names

Access to the Cisco HealthPresence system is controlled by passwords at both the Attendant endpoint and the Provider endpoint. These passwords are encrypted using AES encryption before being transmitted over the network, and encrypted using MD5 before being stored in the Cisco HealthPresence data base.

The following security policies can be modified for end users that are authenticated by Cisco HealthPresence (dedicated):

- Force a password change on the first login.
- Disable an account if the user does not log in for a certain number of days. The inactivity days can range from 1 to 730. (This does not apply to the site administrator id.)
- Have passwords expire after a certain number of days. The expiration days can range from 1 to 999.
- Require strong passwords. You can specify the minimum password length and the minimum number of character types. The length of strong passwords can be between 1 and 15 characters with a minimum of character types ranging from 1 to 4.
- Prevent password reuse. You can specify the number (1-20) of saved passwords.

Security Policy Controls for All Cisco HealthPresence User Names

The following security policy affects all users (including externally authenticated users):

- Auto-log out a user for PC inactivity (pressing enter, clicking a mouse key, etc.) during a Cisco HealthPresence session. The log out can be specified to occur after a specified period (between 1 and 999 minutes) of inactivity, after which a warning message is displayed. You can also specify the duration of time after the warning message and before the log out. It can be any integer between 1 and 60 minutes.

Other Authentication Security Features

To enhance security, both the end user and the Cisco HealthPresence Endpoint must be authorized to access Cisco HealthPresence.

Enabling an Endpoint to Access Cisco HealthPresence

An Endpoint Administrator is responsible for configuring an endpoint to enable it to communicate with Cisco HealthPresence.

Enabling Users to Access Cisco HealthPresence

A site administrator is responsible for configuring Cisco HealthPresence end users to enable them to access the Cisco HealthPresence system. Configuration varies dependent on how those end users are authenticated.

- End users authenticated by Cisco HealthPresence must be ***added***. The site administrator must specify a username, password and display name. In addition, the site administrator must check a box for each profile that this end user will require. Profiles include: Provider, Attendant, Presenter, Participant and Siteadmin. An end user can be configured with any combination of these profiles.
- Externally authenticated end users are ***enabled*** to access Cisco HealthPresence. In addition, these end users can be configured to support any combination of the five user profiles. The display name of externally authenticated end users is their LDAP common name.

Cisco HealthPresence Appliance Security

The Cisco HealthPresence Provider and Attendant Appliances are hardened PCs[1] with all unnecessary software removed. When a Cisco HealthPresence user logs into a hardened Cisco HealthPresence Appliance, the login screen appears immediately and no other services can be accessed. The non-essential services that are removed as part of the PC hardening include:

- Windows Error Reporting Service
- Tablet PC Input Service
- Security Center Service
- Remote Registry Service
- Protected Storage Service
- Portable Device Enumerator Service
- Windows Search Service

1. If PC Hardening is selected when the system is installed.

Also as part of PC hardening, firewall settings are modified to assure that only authorized processes and services can be accessed from the Cisco HealthPresence Appliance.

Note PC hardening is not required but is recommended to assure the security of the Cisco HealthPresence system.

Transmission Security

HIPAA compliancy requires Electronic Protected Health Information (ePHI) be protected from unauthorized access. That means that any time health information is transmitted with an identifier (such as a patient's name), that information must be protected from unauthorized access. As part of the Cisco HealthPresence Plan, Design and Implement phase, Cisco or its partners will review the customers security requirements and take these requirements into consideration in the design. It is imperative that the customer's Security Office be involved in the design sign off. Their involvement and sign off will help ensure that the technology design integrates with the customers policies, procedures and workflow to allow the customer to achieve HIPAA compliance. The customer and covered entity is ultimately responsible for HIPAA compliance.

When ePHI traverses public networks, some form of encryption must be utilized. To provide security, HTTPS is the default for communication across all web services.

The following security measures are implemented to prevent unauthorized access for data in transit:

- HTTPS channel
- Auto redirect from HTTP to HTTPS
- Folders on the Cisco HealthPresence Portal Server accessible with SSL encryption only
- Secure Web services for registration and authentication

Patient Privacy

Cisco HealthPresence uses 128-bit encryption to protect patient information. In addition to transmission security, patient data is protected by preventing unauthorized access to the data on the Cisco HealthPresence PCs (both the display screens and the hard drive) at either the Provider or Attendant sites.

All modules are protected by various username/password combinations based on the role (Provider/Attendant) and the module and, hence, accessible only by appropriate authorized personnel. The Cisco HealthPresence solution does not store any patient data on a permanent basis within its domain.

- The audio and video streams do not pass through the various modules in the solution. The video and audio streams flow directly between the Cisco HealthPresence Connect Appliance at the Attendant station and the doctor(s) UI.

  The streams are not recorded at either end point. They are transmitted using RTP (UDP-based) and encrypted using AES-128.

- After the Attendant clicks **Ready** and then **Share** to share vitals data, it is temporarily stored in memory. Any Providers requested by the Attendant to participate in the appointment will see the vitals data once they enter the appointment. When the Provider leaves the appointment, the vitals data is removed from the Provider's Cisco HealthPresence Appointment window. Anyone not a part of the same appointment as the Attendant is unable to view the shared data.

When the Attendant leaves the conference, the shared vitals data is deleted. If the Attendant logs off the without leaving the conference, the shared vitals data is deleted as well.

If a session is idle for a configurable number of minutes, the end users get a warning message. If there is no response to the warning message in 5 minutes[2], the conference is terminated and the data is discarded.

Network Security

The Cisco network has inherent security features that provide additional security. These include:

- VPN Security
- Endpoint Encryption
- CTMS Encryption
- Dedicated Overlay
- Firewall Access

As part of the Cisco HealthPresence Plan, Design and Implement phase, Cisco or its partners will utilize one or more of these capabilities to implement the security requirements defined by the customer's security officer.

Using Firewalls in Converged Networks

A firewall is a part of a computer system or network that is designed to block unauthorized access while permitting authorized communications. It is a device or set of devices which is configured to permit or deny computer applications based upon a set of rules and other criteria. By controlling access to Cisco HealthPresence servers, a firewall can prevent malicious or unauthorized network connections from being initiated to critical servers, which could impact performance or availability. By inspecting the connections to ensure that they meet the access control policy and that the connection conforms to expected behavior, firewalls provide a first line of defense for a secure deployment.

To enable firewalls and allow Cisco HealthPresence to function properly, you may need to know the ports and protocols used by the Cisco HealthPresence solution. Table 5-1 shows the ports and protocols used by various components of the Cisco HealthPresence solution. If using a video endpoint other than the CTS-500, verify that the correct ports are opened.

Also, to efficiently manage certain tasks, you may want to provide access between Cisco HealthPresence servers and outside resources. For example, you may want to enable Cisco support to remotely access the Cisco HealthPresence Connect Appliance. You may need remote printing or access to LDAP directories or Electronic Medical Records systems.

2. This is the default, but the value is configurable.

Cisco HealthPresence and Cisco TelePresence TCP and UDP ports

The Cisco HealthPresence solution uses the ports described in Table 5-1.

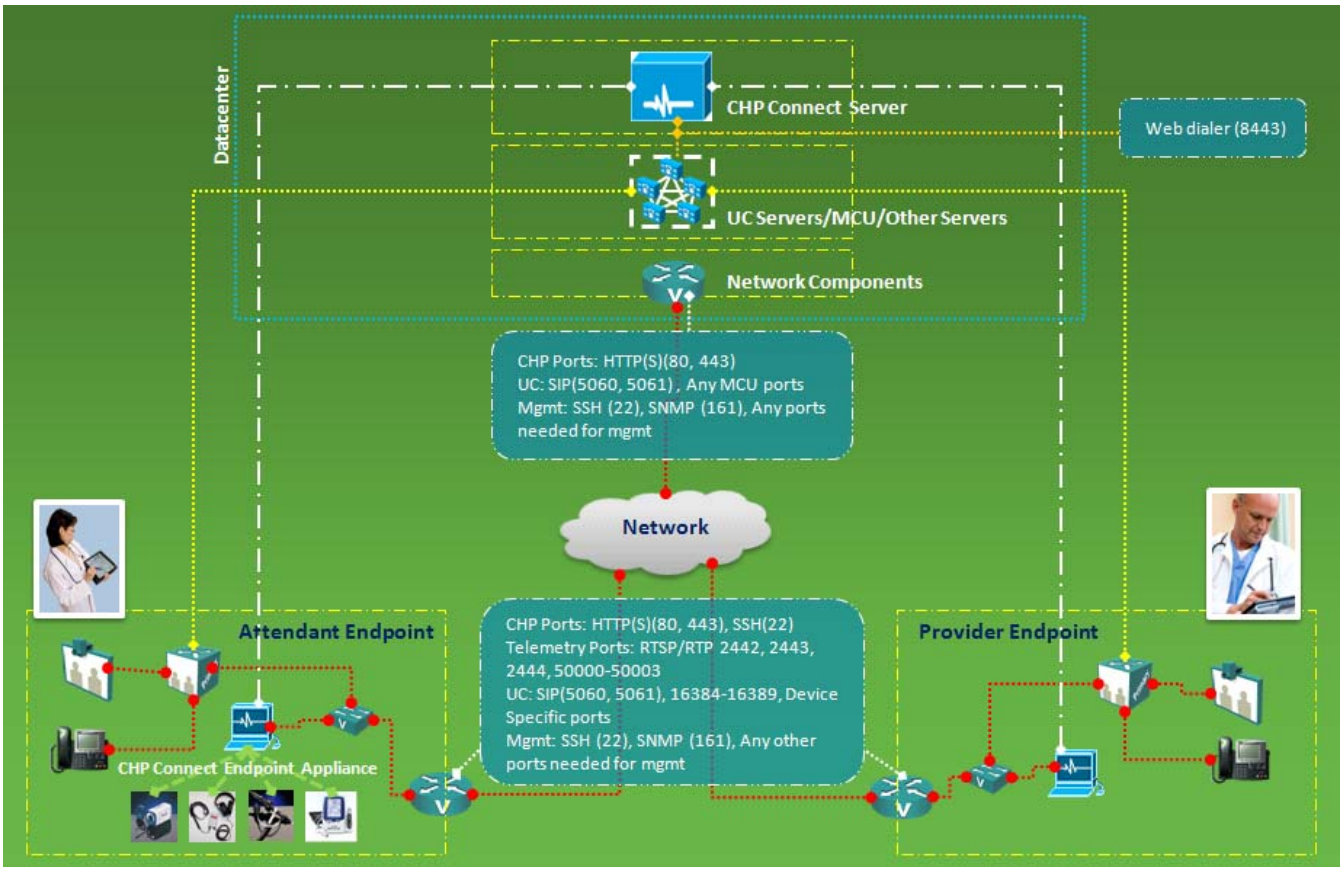
Table 5-1 Ports used by the Cisco HealthPresence [3]

Product	Protocol	Transport	Ports
Cisco HealthPresence Attendant/Provider Appliance	HTTP/HTTPS, SSH, SNMP	UDP/TCP	22, 80, 161, 443, 2442, 2443, 2444, 50000-50003
Cisco TelePresence System 500	SIP/RTP	UDP	5060, 5061, 16384-16389
Cisco HealthPresence Connect Server	HTTP/HTTPS	UDP/TCP	161, 443
CUCM	JTAPI	UDP/TCP	2748
CUVA	CUVA	UDP	5445
	Cisco Audio Session Tunnel (CAST)	TCP	4224

Figure x provides a representative view (for a CTS-500 and AMD medical device solution) of the required ports and where the firewalls must be adjusted to allow required traffic to pass through.

3. You may need to enable additional ports for your specific video endpoints, for EMR, for LDAP, or for a networked printer. This should be determined as part of the Planning phase.

Figure 5-1 Cisco HealthPresence Ports and Protocols: CTS-500 and AMD Example



CHAPTER 6

Cisco HealthPresence Room Design and Physical Requirements

Revised: November 16, 2011

Physical Room Design and Requirements[1]

To maximize the aesthetics and usability of the Cisco HealthPresence solution, pay careful attention to the design of the rooms that will house the Cisco HealthPresence pods. Ensure the pod sites include the following:

- Network outlets: At least two network ports are required. Ideally, these should be installed on the wall where the Cisco HealthPresence furniture or video communications display will be placed.
- Power outlets: For Attendant stations with a Cisco TelePresence System 500, at least two dedicated power drops are required (with quad outlets preferred). Each power drop must be on a dedicated circuit protected by separate circuit breakers. For any other video conferencing system, only one circuit/power drop is required (with quad outlets preferred). Ideally, these should be installed on the wall where the Cisco HealthPresence Connect Appliance and video communications display will be placed. For specifications and standards compliance information, refer to the ***Cisco HealthPresense Specifications, Warnings and Precautions*** document.
- External phone jack - This is optional but recommended for making external calls to Cisco HealthPresence support organizations or emergency services.
- Lighting: The video conferencing experience will be best with 300–400 lux of evenly dispersed, indirect ambient light.
- Noise levels: Ideally, the Cisco HealthPresence Provider or Attendant station placement should be such that outside noise is minimal, as it could negatively impact the Cisco HealthPresence experience.

1. This chapter assumes this is a new installation.

Room Dimensions and Characteristics

Room Dimensions

The recommended room size varies based on a number of parameters. Key among those are the following:

- Furniture size - The room must be sized to allow for patient and Attendant mobility while accommodating the furniture and storage used to house the video conferencing equipment, medical equipment and the Cisco HealthPresence Connect Appliance. The dimensions of the optional Cisco HealthPresence Patient Pod and the mobile Clinical Presence System are included later in this chapter.
- Distance between patient/Provider and camera - Depending on video conferencing endpoint, you need to allow at least two and a half to four feet between the video conferencing camera and the Provider and between four to six feet between the video conferencing camera and the patient (where a larger field of vision is typically required.) It depends on the size of the screen and whether or not the camera has a tilt feature. Consider this when deciding on the room size and furniture placement. Refer to the installation manual for the particular video camera to determine the optimal distance and if required, test the distance as part of the installation.
- Air flow - The room needs to be large enough to provide adequate air flow to dissipate the heat from the video equipment and other gear in the room. (Refer to the HVAC section of this chapter).

Room Dimensions for Cisco HealthPresence Furniture Options

Cisco HealthPresence Patient Pod

If you select the Cisco Health Presence Patient Pod, the recommended minimum room size is ten feet by eleven feet. Figure 6-1 shows the dimensions of the Cisco HealthPresence Patient Pod. Table 6-1 provides the recommended room dimensions for a room that is to contain the stationary Cisco Health Presence Patient Pod.

Since the doctor's endpoint typically has no medical equipment, the doctor's office/endpoint can be a bit smaller. If you are using a CTS-500, the dimensions for the doctor's endpoint should be no smaller than 6 by 8 feet and the CTS-500 should be placed along the 6 foot wall.

Figure 6-1 Dimensions of the HealthPresence Patient Pod (Pictured with a Cisco TelePresence System 500)

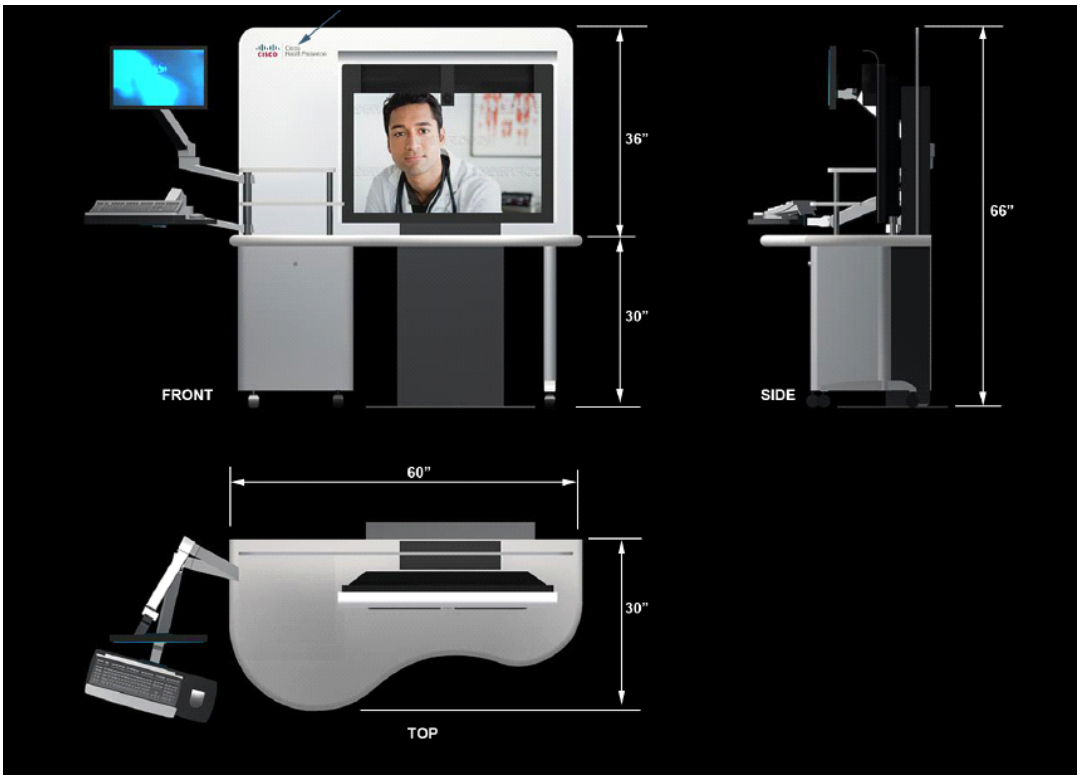


Table 6-1 Recommended Room Dimensions

	Width	Depth	Height
Minimum	10 feet (3.04m)	11 feet (3.35 m)	9 feet (2.43m)
Maximum	15 feet (4.57m)	15 feet (4.57m)	10 feet (3.04m)

Clinical Presence System

The Clinical Presence System is a portable system that enables the “Attendant station” to be moved to the patient’s room. It includes a Cisco TelePresence System C40 for video conferencing and another monitor to use with the Cisco HealthPresence Connect Appliance. Attendant medical equipment stores in the cabinet in the base.

The dimensions of the Clinical Presence System are as follows:

- Width: 25” / 63.5 cm
- Depth: 33” / 83.8 cm
- Height:
  - Lift down: 67” / 170.2 cm
  - Lift up: 77” / 195.6 cm

While the room dimensions are not really an issue, doors must be 30 inches wide to accommodate the system.

Figure 6-2 Clinical Presence System

Ceiling Height

Ceiling heights should be between 8' and 10'. Adequate height is necessary to allow the ceiling fixtures enough distance to dissipate lighting across the environment in an even manner. Lower ceilings tend to promote greater contrast in lighting conditions and hot spots on participants' shoulders.

Ceilings higher than 10' (3.05m) may need special acoustic treatment as higher ceilings usually have a corresponding greater amount of hard surface wall space. Adding acoustic paneling to the walls can treat this. Open air ceilings, such as found with "rooms within a room" are not recommended due to possible distractions from exterior sources of sound and privacy concerns for the patient.

Door Locations

Doors can be located anywhere within the room. However it is optimal to have them out of view from the camera and not behind the system. If doors must be within camera view they should be located on side walls. Doorways should also provide a sealed closure in order to block noise transferring from exterior corridors. Gaskets and door skirts should be used along with solid or insulated doors for best sound insulation. Shielded from distraction and insuring privacy are highly desirable characteristics to a Cisco HealthPresence room.

Windows

Cisco recommends that a Cisco HealthPresence room have windows or glass walls that consume less than 20% of vertical wall space. Windows and glass walls allow uncontrollable light to affect the quality of the video and overall experience. These hard surfaces will also promote undesirable acoustical

conditions such as audio reverberation. All windows and glass walls must be treated with materials that have acoustical dampening and light blocking characteristics. No external window should be in view of the camera. If it is unavoidable, window coverings should be installed to block any external lighting. The furniture should be set up so that the covered window is not behind the participants.

Heating, Ventilating, and Air Conditioning (HVAC)

Heat dissipation from the Cisco TelePresence unit and other devices in the room will increase the temperature in the room. Table 6-2 illustrates the power used and resulting BTUs dissipated per hour for each of the various devices and for each person in a room with a Cisco HealthPresence Pod. (Remember that not all devices are powered on all day long, so that actual BTUs could vary.)

These numbers assume an interior room with proper air circulation, walls painted neutral colors, and temperatures averaging 72-76 degrees Fahrenheit. Conditions not in line with these recommendations may require additional cooling.[2]

Table 6-2 BTU Summary

Entity	Power	BTU/Hr
Cisco TelePresence System 500	0.36kW	1230 BTU/Hr.
Cisco TelePresence System EX90	0.15kW	512 BTU/Hr.
Cisco TelePresence System EX60	0.08kW	256 BTU/Hr.
Cisco TelePresence Codec C20	0.08kW	256 BTU/Hr.
Cisco TelePresence Codec C40	0.18kW	597 BTU/Hr.
LCD 100L Pro 32N monitor (for C20/C40)	0.16kW	546 BTU/Hr.
Ceiling Lights (120 sq. ft.)	0.17kW	580 BTU/Hr.
AMD Medical devices	0.1kW	340 BTU/Hr.
Cisco HealthPresence Connect Appliance	.09kW	307 BTU/Hr.
Each PC in the room	0.055kW	187 BTU/Hr.
Each person in the room	0.065kW	225 BTU/Hr.

Illumination

Consider the following lighting recommendations:

- Avoid direct light on people or the camera lens. Direct light will create harsh contrasts and shadows.
- If you have poor lighting in the room, you may need to use indirect, artificial light. Indirect light from shaded sources or reflected light from pale walls often produces excellent results.
- "Daylight" type lamps are most effective. Avoid colored lighting that might tint your image.
- Don't place reflective white-boards directly behind people or where lighting may reflect and cause glare. If they are not required, remove them altogether.

2. The operating temperature for the Cisco HealthPresense Solution is between 50° to 104° (10° to 40° C) unless using the mobile cart, in which case the temperature range is 50° to 95° (10° to 35° C).

Depending on your environment and choice of video endpoint, you may want specific lighting to be installed in the ceiling to fill in the shadows often seen masking participant's eyes and other facial features.

You can optionally enhance the experience further by adding specific lighting to create a more dramatic effect with the depth perception and architectural features.

Considering Light Angles and Direction

In a three-point lighting system, three points, or directions, of light influence what the camera sees:

- The light that fills the entire environment is ambient light, or fill light. This light generally comes from fixtures in the ceiling to blanket the room in even, well-distributed light.
- The light that falls on a participant's face is participant light, or point light. This light illuminates the face to reduce shadows around the eyes, neck, and other such surfaces that directly face the camera. Point lighting generally does not exist in the average conference room and, therefore, is supplied as part of the Cisco TelePresence system. It is not inherent in the other video communication systems.
- The perceived depth in an image as viewed by a camera is best when the subjects' shoulders and the tops of their heads are gently illuminated, causing them to “pop out" from the background behind them. This is shoulder lighting, or rim lighting and is optional for a high-quality video communications image. You can also use rim lighting to illuminate the wall behind the participants to achieve a similar effect (depth in the perceived image).

The critical types of light for a Cisco TelePresence solution are ambient (fill) and participant (point) lighting. Shoulder (rim) lighting is optional and left to the discretion of the customer whether to implement it.

The Cisco HealthPresence System operates best with 300-400 lux of evenly dispersed, indirect ambient light. Indirect fluorescent lighting fixtures often provide best results. These fixtures are most efficient when an asymmetrical light distribution is used. This will ensure greater illumination of participants without bleeding light onto plasmas and projection screens. Color temperature is also an important factor as it helps to unify the environment and provide a higher quality experience. A 4000K type 5 or 8 fluorescent lamp is recommended.

Ideal Lighting Environment

- Average lighting at 300-400 lux vertical plane
- Lighting on horizontal plane below 700 lux
- Lighting even throughout the room
- Windows covered with light blocking material
- Auto feature setting of Cisco TelePresence disabled

Background Recommendations

The camera will show what ever is behind the participant in a video conference. To optimize the experience for the participants:

- Provide a calming background with a neutral color, medium contrast and soft texture.
- Avoid patterns on the walls.

- Avoid moving backgrounds such as curtains in a draft or people walking behind you. This may reduce image quality and distract the attention of those on the far end.
- Do not place the camera facing a doorway.
- Choose a table that is light but not reflective. A light natural wood is a good choice.
- Avoid unnecessary furniture or clutter in the room.

Paint Colors

The background wall (the wall visible to the other party in a video conferencing call) should be painted a neutral color with medium contrast and soft (not glossy) texture. Avoid patterns on the wall or clutter in the line of sight of the camera.

For best results, use a warm tone color on the back wall. Do not use dark colors or very light colors. Because of the vast number of different color systems and paint manufacturers throughout the world, it is not possible for Cisco to specify exact color reference indexes on a global level. Therefore, for simplicity and optimal results, refer to the following Benjamin Moore paint colors as a reference:

- Cork 2153-40
- August Morning 2156-40
- Classic Caramel 1118
- Wilmington Tan: HC-34
- Huntington Beige: HC-21
- Woodstock Tan: HC-20
- Fairmont Gold: 1071

For more information on room design, see the Cisco TelePresence Room Design (a chapter of Cisco TelePresence Fundamentals) at http://www.ciscopress.com/articles/article.asp?p=1351075.

Chair Requirements

To maximize the effectiveness of the Cisco HealthPresence appointment, it is best if the patient sits in a chair in front of the Cisco TelePresence camera. However, you may need to also offer an examination table for patients who are not well enough to sit.

Note If the patient needs to lie down during the exam for medical reasons, the physician and patient can still see each other, but since you might be putting the patient outside of the optimal CTS-500 camera focal range, the patient will appear smaller in the physician's Cisco TelePresence screen. Also, patient facial expressions and true skin color may be harder for the physician to see, and eye contact may not be possible.

The chair used in the Attendant endpoint should have the following characteristics:

- Height adjustment capabilities, so that the patient’s head can be raised to approximately the height of the Cisco TelePresence camera[3]. This puts the patients face near the top of the Cisco TelePresence screen and makes eye contact easier.

3. The required maximum seat height can vary depending on the height of the Cisco TelePresence camera.

- Wheels and mobility, so the Attendant can easily move the patient when getting video images and concurrently checking the focus on the telemedicine appointment screen. This also enables the Attendant to move the patient per physician instructions.
- Locks on wheels, to prevent unintentional movement.
- A chair back that doesn't impact the physician's ability to view the patient. The back should not be too high or wide as it blocks the physician's view of the patient's back. Best choices have a small back pad for support.
- Chair material that allows for proper sanitation between visits.

The chair used in the Provider end point should have height adjustment capabilities, so that the physician's head can be raised to approximately the height of the Cisco TelePresence camera. (At this height, the physician appears to make eye contact, making the Cisco TelePresence session feel more personal.)

Note You may want arms on the chair so that the patient's arm is supported when having their blood pressure taken. In addition, shorter patients may feel more comfortable if the chair has a foot rest that raises with the chair.

CHAPTER 7

Cisco Services for Cisco HealthPresence

Revised: November 16, 2011, OL-23332-08

Challenge

To provide affordable health care and to address the needs of people in remote geographical areas, medical care Providers need to virtually eliminate geographic boundaries and leverage the medical talent in central locations. Cisco HealthPresence offers a new technology platform that creates “in-person” experiences between patients and medical care Providers regardless of their locations. However, to gain the full advantages of this solution, organizations need to make sure that Cisco HealthPresence is properly deployed and that the critical elements of the solution are functioning optimally at all times.

Note For the latest Cisco Service descriptions, see http://www.cisco.com/web/about/doing_business/legal/service_descriptions/index.html.

Solution

To ensure that the Cisco HealthPresence solution offers the best performance, highest security, and most reliable operation, Cisco offers a full lifecycle of professional services from planning through installation and optimization. Starting with the planning phase, the solution is designed to meet specific customer requirements and at the same time optimize the network for reliability, security and performance. Next the solution is installed, configured and tested on site. The customer is trained to use both the HealthPresence software and the medical devices. The solution is not considered delivered until the customer signs off on both the functionality and the training.

Once the customer accepts the solution, Cisco's suite of “day two” operational services ensure that issues are addressed quickly and efficiently.

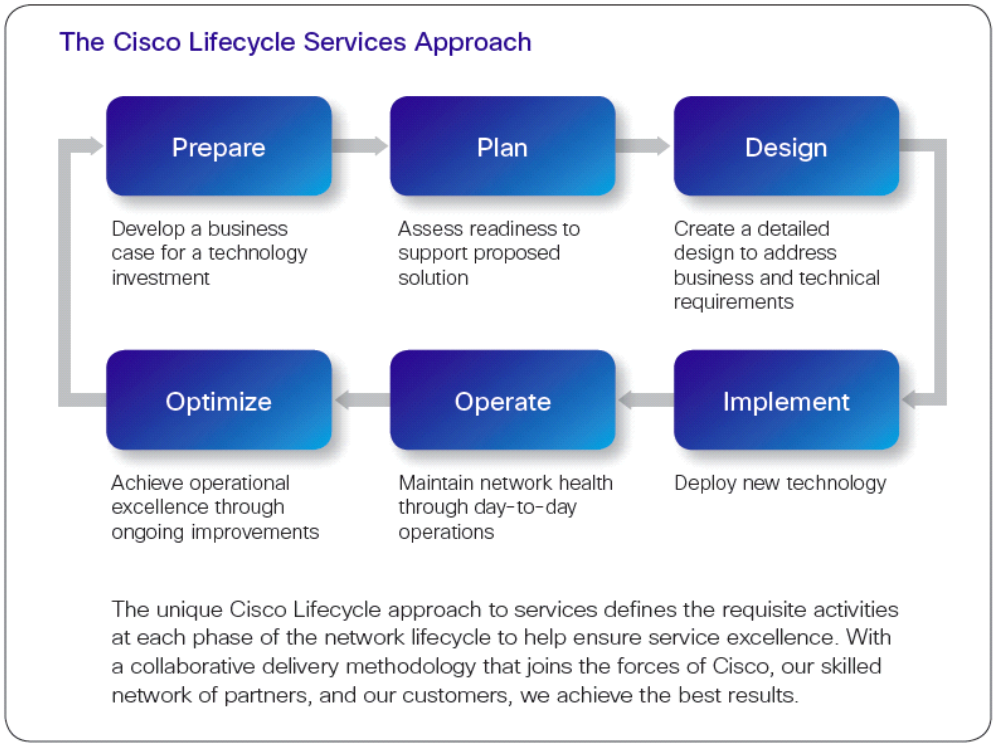
These services play an essential role in the successful deployment and ongoing operation of Cisco HealthPresence technology by protecting the enterprises' investment and helping them achieve the full benefits of the solution. Ultimately, Cisco Services for Cisco HealthPresence let enterprises focus on business transformation-not the technology.

Cisco Services for Cisco HealthPresence encompass the following service offerings:

- Cisco HealthPresence Workshop
- Cisco HealthPresence Plan, Design, and Implement Service (PDI)
- Cisco HealthPresence Product Level Day 2 Support:
  - Cisco HealthPresence Custom Application Support (CAS)
  - Cisco HealthPresence Application and Telemetry Support (ATS)
  - Cisco SMARTnet®
- Cisco HealthPresence Solution Level Day 2 Support
  - Cisco HealthPresence Remote Management Services (RMS)
  - Partner Delivered Day 2 Support Model
  - Customer Managed Day 2 Support Model

Together, these offerings provide a comprehensive suite of services designed specifically for Cisco HealthPresence solutions, based on the Cisco Lifecycle Services framework shown in Figure 7-1. The services draw on proven methodologies to accelerate the business benefits of Cisco HealthPresence technology, and focus on the solution 24 x 7 so that enterprise IT departments can focus on their core business.

Figure 7-1 The Cisco Lifecycle Services Approach



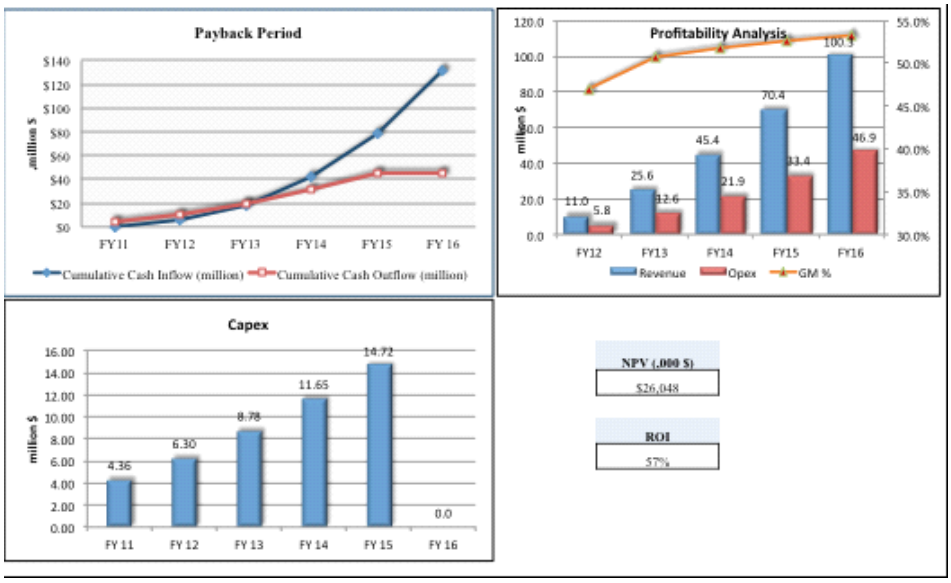
Note Configuration and support are strictly provided within the labeled usage approved by the United States Food and Drug Administration and other such regulatory jurisdictions where Cisco HealthPresence is approved for use by licensed health care professionals.

Cisco HealthPresence Workshop

A Business Value engagement identifies the cost savings, productivity enhancement and business transformation opportunities enabled by the Healthcare Collaboration and video platform, which provides a detailed quantification of the business benefits. This is a collaborative exercise between Cisco and the customer. The solutions as well as related quantifications are developed and validated with the customer before being finalized.

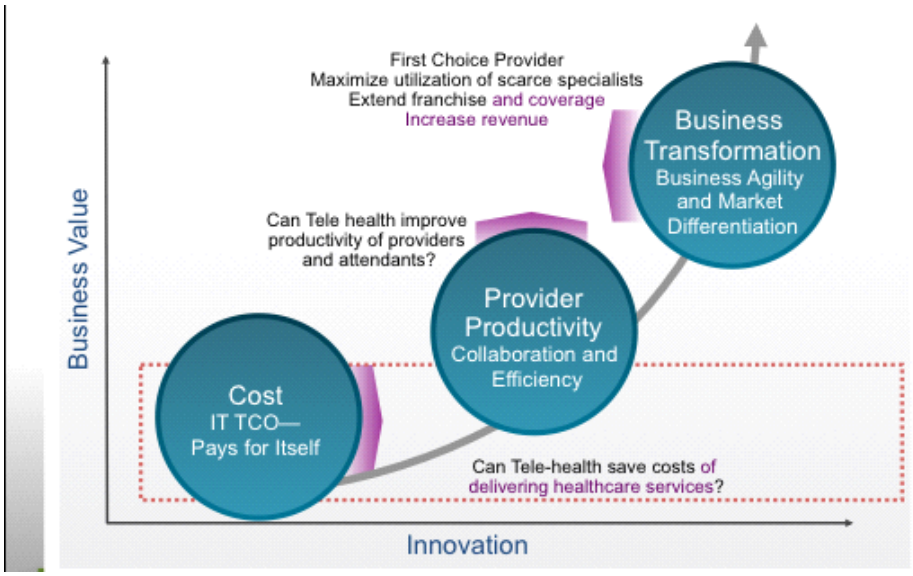
- Quantify through a systematic process the savings potential and business benefits of Tele-health, as shown in Figure 7-2.

Figure 7-2 Healthcare Service Return on Investment



- Quantify the productivity and business transformation impact of Tele-health and the collaborative video-enabled healthcare provided by the Cisco HealthPresence solution, as illustrated in Figure 7-3.

Figure 7-3 Evaluation of Tele-Health on Business Impact



The Cisco HealthPresence Plan, Design, and Implement Service

Cisco HealthPresence technology has a profound effect on an organization's ability to provide high-quality medical care to remote locations. However, to provide the consistent, high-quality experience required, the organization's network, Cisco HealthPresence endpoints, and the Cisco HealthPresence solution itself must be optimally designed and implemented. Without careful consideration of an enterprise's specific business and technical requirements, IT and end-user experience, and the effects of Cisco HealthPresence on the overall network, organizations might not realize the full potential of the solution.

The Cisco HealthPresence Plan, Design, and Implement Service provides comprehensive support throughout the planning and deployment of a Cisco HealthPresence solution, helping organizations quickly realize the benefits of this new real-time[1], immersive technology. The service helps enterprises achieve their business objectives by assessing the existing network and physical environments, developing an implementation-ready design based on the organization's unique requirements, and working with internal IT staff throughout the implementation and testing of the solution as well as through end-user training.

The Cisco HealthPresence Plan, Design, and Implement Service consists of the following service components:

- Project Management - When an enterprise is ready to begin the plan phase of deployment, Cisco or a certified Cisco partner delivers a comprehensive project schedule for the implementation and provides a single point of contact for all issues relating to the solution.
- Requirements Validation - The project team performs a detailed requirements validation to assess the customer's business and technical requirements and verify that the deployment will meet expectations.

1. Real-time, in this instance, refers to the traffic classification of Cisco TelePresence. The Cisco HealthPresence-Connect software is not intended to perform real-time, active, or online patient monitoring, and does not transmit or display any real-time data that is intended to alert a physician of alarms or other conditions that require a physician's immediate action or response.

- Room Remediation Requirements - in parallel with requirements validation, the team validates that all Cisco HealthPresence rooms meet dimension, lighting, HVAC, power, network connectivity, and noise-level requirements.
- Network Path Assessment - The customer network and the links between sites are examined in-depth to identify the optimal path and network requirements for the solution.
- Detailed Design Development - A detailed design for the entire solution is created, including recommendations for network components (switches and routers), network configuration recommendations (e.g. security and QoS), CUCM and CTMS components, link speeds and other related components that affect the efficiency and effectiveness of the Cisco HealthPresence solution.
- Network Implementation Plan - The implementation plan includes all configuration details, including IP addresses, CUCM and CTMS configuration parameters, user IDs and passwords. The implementation plan is then used to configure the Cisco HealthPresence components.
- Solution Acceptance Testing - Once the solution is installed and configured the team performs a Solution Acceptance Test that includes test cases for all sites to validate readiness of the solution for live production.
- Administrative knowledge transfer- The project team coordinates knowledge transfer to make sure the system administrators, support staff, and end users all can make full use of the Cisco HealthPresence technology.

Cisco HealthPresence Product Level Day 2 Support

Even when Cisco HealthPresence is deployed by trained professionals, enterprises still need ongoing support and maintenance to safeguard all of the essential products included in the solution. Cisco HealthPresence includes three service offerings to support and maintain the Cisco HealthPresence solution components:

- Cisco Healthpresence Custom Application Support - for the Cisco HealthPresence software
- Cisco HealthPresence Application and Telemetry Support (ATS)
- SMARTnet - for the other solution components from Cisco

Cisco HealthPresence Custom Application Support (CAS)

To maximize customer productivity, Cisco Healthpresence Custom Application Support provides timely fixes to issues found in the Cisco HealthPresence code and ongoing software upgrades for minor releases of Cisco HealthPresence. It also enables the customer to use a single point of contact to address any issues with any of the components. This service is a Cisco Advanced Services Subscription offering and it must be purchased with every Cisco HealthPresence License and be renewed annually.

Cisco HealthPresence Application and Telemetry Support Service

Cisco HealthPresence Application and Telemetry Support Service allows customers and their IT staff to focus on their core business while Cisco provides proactive services to assure the resiliency of your Cisco HealthPresence solution and all supported devices.

- Configuration management component: Maintain an inventory of the Cisco HealthPresence solution components and update the solution configuration as needed with a qualified support team. Help to identify any issues that may impede adherence to regulatory requirements.
- Change Management component: Manage network resiliency by assuring changes are made in a manner that maximizes availability and performance while minimizing the impact on normal business processes.
- Incident Management component: Manage Tier-2 escalated incidents and problems to resolution and closure on Cisco products in the Cisco HealthPresence solution. Review all complaints with clinical implications and take any action required as a device manufacturer.

Cisco HealthPresence Application and Telemetry and Support Service is a required Cisco Advanced Service Offering that must be ordered for every Cisco HealthPresence Endpoint and renewed annually as long as the endpoints are in use.

Cisco SMARTnet

To complement Cisco HealthPresence Custom Application Support, Cisco SMARTnet provides dedicated, system-level support and maintenance for all other Cisco components of the Cisco HealthPresence solution – voice and video, software and hardware. SMARTnet provides global 24-hour-day, 365-day-a-year access to highly skilled engineers, providing a comprehensive support environment.

Cisco SMARTnet includes advance hardware replacement options with the option of onsite installation, providing enterprises with parts delivery and replacement by the next business day or within four hours on the same business day. The service also includes ongoing operating system and application software updates, which strengthen the reliability, functionality, and stability of Cisco HealthPresence Solution.

In addition, companies gain registered access to an array of powerful, industry-leading online support and information systems. These include interactive consulting tools, a comprehensive database, and knowledge transfer resources available through Cisco.com. This robust set of Cisco technical tools and product information increases the self-sufficiency and unified communications expertise of internal IT staff, improving productivity while protecting the Cisco HealthPresence investment.

Cisco SMARTnet should be ordered and renewed annually (unless other service or parts replacement strategy is in place) to ensure the high availability of the solution.

Cisco HealthPresence Solution Level Day 2 Support

There are three alternatives for Day 2 Service. One of the following strategies must be put in place for every Cisco HealthPresence installation and kept in place as long as the Cisco HealthPresence Solution is in use.

- Cisco HealthPresence Remote Management Service (RMS)
- Partner Delivered Day 2 Support Model
- Customer Managed Day 2 Support Model

Cisco HealthPresence Remote Management Services (RMS)

While sound planning and ongoing support help enterprises quickly benefit from Cisco HealthPresence technology, many organizations do not have the in-house Cisco HealthPresence expertise to optimally remote monitor and manage the solution on a day-to-day basis. Developing that expertise can represent a significant investment in time, people, and resources that can impede the operational efficiency of in-house IT staff.

Cisco HealthPresence remote services provides 24x7 proactive remote monitoring and management support for the solution to give enterprises greater peace of mind and allow internal IT administrators to focus on core business requirements, instead of Cisco HealthPresence. The service combines all of the components of the Cisco HealthPresence SMARTnet with world-class Remote Services from Cisco Remote Management Services (RMS), including a redundant remote network operations center (NOC) infrastructure that monitors the solution at all times and provides a single point of contact for rapid service restoration.

RMS includes the following key deliverables:

- Tier 1 Service Desk
- Remote Monitoring and Management

Tier 1 Service Desk

The Tier 1 Service Desk triages issues and opens a case regardless of where the issue lies. If a problem arises with the technology, enterprise IT administrators do not have to determine if the problem lies in the voice, video, IP aspects of the solution, medical devices or Cisco HealthPresence-specific software. Instead, this consolidated support model means that one telephone call connects administrators with highly trained and experienced engineers who understand Cisco Unified Communications products and technologies, Cisco HealthPresence components and who specialize in complex IP communications environments. These engineers can diagnose an issue and, if necessary, facilitate collaboration across multiple Unified Communications technology experts, third-party medical device experts[2] or Cisco HealthPresence software experts to accelerate the resolution of any Cisco HealthPresence problem. This system-level technical support can help enterprises quickly and cost-effectively resolve issues with any aspect of the Cisco HealthPresence solution.

Remote Monitoring and Management

With remote monitoring and management services, Cisco engineers with in-depth expertise in managing converged infrastructures provide ongoing proactive management, monitoring, reporting, and issue diagnosis and remediation to proactively solve real-time incidents. Problems are followed through to resolution and if necessary, replacement hardware is ordered per the existing agreements with either Cisco SMARTnet or the medical device vendor. Remote monitoring ensures that the solution is highly available and operating to its fullest potential. The enterprise retains ultimate control while Cisco monitors the availability and performance of Cisco HealthPresence around the clock, proactively identifying and resolving issues and collaborating with the IT team as needed.

Most issues are resolved before the user experience is ever affected. This extensive monitoring and management helps deliver the highest level of customer satisfaction in terms of product reliability, usability, and availability. As a result, enterprises can reduce the operational costs of supporting the solution with in-house resources and help ensure that Cisco HealthPresence technology is available, secure, and supporting business goals, consistent with the labeled and approved usage of Cisco HealthPresence.

2. A valid third party support contract must be in place for third party devices.

Proper planning, expert ongoing support, and real-time remote management can all accelerate the benefits of Cisco HealthPresence and give enterprises greater peace of mind using the solution. But what can organizations do to help ensure that virtual presence sessions will always run smoothly? For example, what if the person leading the session schedules an important conference incorrectly or needs to make a change at the last minute and cannot remember how?

Remote Management Services offers real-time administrative support during Cisco HealthPresence sessions. Users in any managed Cisco HealthPresence endpoint have access to remote assistance with Cisco HealthPresence scheduling and Cisco TelePresence call setup. In addition, they can get answers to questions about how to use the solution. As a result, users can quickly find answers and resolve unexpected issues, and help ensure a smoother, more effective Cisco HealthPresence experience.

Cisco HealthPresence Partner Delivered Day 2 Support Model

This option is for Cisco partners who wish to offer Day 2 Support for the Cisco HealthPresence solution to their customers.

As part of this support model, partners do the following:

- Provide support for the Cisco HealthPresence solution and video components (i.e. Cisco TelePresence)
- Provide a Help Desk for Incident and Problem Tracking and Facilitation. They will escalate to the Cisco Technical Assistance Center (TAC) or 3rd Party support as required.
- Perform Level 1 Initial Triage (Cisco HealthPresence Solution-based support)
- Perform Level 2 Video Support
- Assess all reported issues to categorize customer service requests versus customer complaints
- Escalate customer complaints directly to Cisco
- Maintain incident records and adhere to Cisco's document retention policy: 5 years after the product end of life date

As part of this support model, Cisco will:

- Support partner-escalated Cisco HealthPresence solution issues and Cisco product issues
- Perform Complaint Handling on partner-escalated customer complaints per regulatory guidelines
- Train the partner on how to identify and report complaints to Cisco
- Work with the Cisco Partner Channels Organization to perform periodic audits to ensure that Partner is correctly identifying and reporting customer complaints to Cisco
- Verify that Partner is maintaining records of all customer complaints

Cisco HealthPresence Customer Managed Day 2 Support Model

This option is for Cisco customers who wish to perform their own Day 2 Support for the Cisco HealthPresence solution, using their own internal technical support team. The customer does the following:

- Provide Tier 1 (initial triage and troubleshooting) support for Cisco HealthPresence
- Escalate issues to Cisco using SMARTnet and CAS contracts for entitlement

As part of this support model, Cisco will:

- Provide Tier 2 support for customer-escalated Cisco HealthPresence solution issues and Cisco product issues

- Perform Complaint Handling on customer-escalated complaints per regulatory guidelines
- Manage actionable complaints per Cisco's Complaint Handling Procedure

Figure 7-4 compared the four Cisco HealthPresence Day 2 Managed Service Offerings.

Figure 7-4 Comparison of Cisco HealthPresence Day 2 Managed Service Offerings

	Cisco RMS	Solution Support	Partner-Delivered	Customer-Managed
24 x 7 Proactive Remote Monitoring	CISCO	CUSTOMER	PARTNER	CUSTOMER
Incident and Problem Management	CISCO	CUSTOMER	PARTNER	CUSTOMER
Level 1/Tier 1 Support – Triage & Initial Troubleshooting	CISCO	CUSTOMER	PARTNER	CUSTOMER
Level 2 / Tier 2 – Solution level support	CISCO	CISCO	CISCO	CISCO
Configuration and Change Management	CISCO	CISCO	PARTNER	CUSTOMER

Benefits

Cisco Services for Cisco HealthPresence provide a comprehensive set of activities that are essential to the successful deployment and optimal ongoing operation of Cisco HealthPresence technology. The Cisco HealthPresence Plan, Design, and Implement Service protects organizations against downtime caused by improper solution design, helps enterprises avoid costly deployment delays, and helps ensure that the solution fully meets expectations. Cisco HealthPresence Custom Application Support and SMARTnet protect against downtime caused by hardware and software issues and provides critical assistance and expertise to keep innovative Cisco HealthPresence solutions running smoothly. Cisco HealthPresence RMS provides experts that focus on Cisco HealthPresence 24x7 so that users and in-house IT administrators can focus on their business. Together, these services deliver a consistent, high-quality Cisco HealthPresence experience and allow organizations to focus on transforming their business – not supporting technology.

Cisco Services for Cisco HealthPresence help organizations:

- Accelerate the business benefits of Cisco HealthPresence by accurately assessing the effects of the solution on the network and on physical locations, and addressing potential issues before they arise
- Protect against downtime caused by improper infrastructure support or hardware and software issues
- Decrease deployment times and avoid costly deployment delays, minimizing the risk associated with adopting advanced technologies
- Realize greater peace of mind through proactive remote monitoring and comprehensive operational support and management of all elements of the Cisco HealthPresence solution, delivered through a single, dedicated support environment
- Transform business and technical requirements into a detailed design that can be implemented efficiently and effectively and can provide a Cisco HealthPresence solution that meets expectations
- Improve the performance and availability of the Cisco HealthPresence solution to better meet business requirements and provide a robust foundation for supporting innovative communications applications and intra-company collaboration

Why Cisco Services

Cisco Services make networks, applications, and the people who use them work better together.

Today, the network is a strategic platform in a world that demands better integration between people, information, and ideas. The network works better when services, together with products, create solutions aligned with business needs and opportunities.

The unique Cisco Lifecycle approach to services defines the requisite activities at each phase of the network lifecycle to help ensure service excellence. With a collaborative delivery methodology that joins the forces of Cisco, skilled network of partners, and customers, the best results are achieved.

For More Information

For more information about the Cisco Services for Cisco HealthPresence or other Cisco services, contact your Cisco service account manager.

GLOSSARY

Revised: November 16, 2011, OL-25099-01

A

AMD AMD Global Telemedicine

Attendant The licensed health care professional who attends the patient. This role includes greeting the patient, taking the patient's vitals, and using the medical devices to assist the Provider in evaluating the patient. An Attendant can be a medical technician, a nurse, a nurse practitioner, or a physician.

Attendant Endpoint A Cisco HealthPresence endpoint from which the end user logged in as an Attendant. (To perform any medical evaluations, the end user must be at an Attendant Station. In any case, the end user will be presented the Attendant screens.)

Attendant Station The place where the patient and the Attendant meet. This area contains the medical device(s) used by the Attendant, the video conferencing system, and the Cisco HealthPresence Connect Appliance. It may also contain special furniture offered by Cisco.

B

B2B Business-to-Business

B2B Group A B2B Group is a group of business entities whose endpoints can participate in an appointment.

Business Entity In Cisco HealthPresence, refers to the resources (Attendant and Provider endpoints and users) managed by a single Cisco HealthPresence Application Server.

B2B Feature The B2B feature enables consultation between endpoints belonging to different business entities. Each business entity is managed by a single instance of Cisco HealthPresence.

C

CHP Admin See Cisco HealthPresence Administration.

CHP B2B Admin See Cisco HealthPresence B2B Administration.

CHP B2B Manager See Cisco HealthPresence B2B Manager.

CHP B2B Server See Cisco HealthPresence B2B Server

CHP Portal See Cisco HealthPresence Portal.

CHPAS See Cisco HealthPresence Administration.

Cisco HealthPresence Administration	The application used by the installation team to configure, administer and manage the CHPAS and the CHP Portal.
Cisco HealthPresence Application Server	The Cisco HealthPresence component that maintains the master information of resources and manages conferences, sessions and appointments. CHPAS interfaces with CHP Admin, CHP Portal, the EMR integration engines, Unified Communications (UC) servers and the CHP Connect Server software at the endpoints. For B2B appointments and conferences, CHPAS interfaces with the B2B Manager.
Cisco HealthPresence B2B Administration	The application used by the installation team to configure, administer and manage the B2B Manager.
Cisco HealthPresence B2B Manager	The application that manages conferences, sessions and appointments between endpoints residing in different tenants.
Cisco HealthPresence B2B Server	The orderable software that includes the B2B Manager and B2B Administration.
Cisco HealthPresence Connect	The Cisco HealthPresence software that runs on the Appliance at both the Attendant and Provider endpoints.
Cisco HealthPresence Connect Server	The orderable software that includes the Cisco HealthPresence Application Server, Cisco HealthPresence Portal and Cisco Health Presence Administration.
Cisco HealthPresence Device	Refers to the Cisco HealthPresence components residing at an Attendant Station.
Cisco HealthPresence Endpoint	The collection of a video endpoint, the Cisco HealthPresence software and optional device aggregation software running on a Cisco HealthPresence Appliance, and optionally the medical devices.
Cisco HealthPresence Appliance	A hardened PC that resides at either a Provider or Attendant station and runs the Cisco HealthPresence Connect Client software and optionally the AMD device aggregation software.
Cisco HealthPresence Portal	The master portal that interfaces with the CHPAS and acts as a proxy for requests from the CHPPC. It maintains the portal login sessions and provides interface for the CHPAS to validate sessions.
Cisco HealthPresence Solution	A solution the combines video, medical devices, computer networking and a graphical user interface (GUI) to enable Providers to offer medical consultations to patients in a remote Attendant station.
Cisco TelePresence Video Communication Server	A video server that provides Session Initiation Protocol (SIP) proxy and call control as well as H.323 gatekeeper services for video endpoints. The Cisco VCS Control application connects all infrastructure, management, and endpoint devices and is critical to interoperability with unified communications and IP telephony networks and voice-over-IP (VoIP) devices.

Cisco TelePresence Multipoint Switch Switches multipoint conference end points based on routing information that the CUCM servers provide.

Cisco Unified Communications Manager The application that extends enterprise telephony features and capabilities to packet telephony network devices, such as IP phones and multimedia applications. Open telephony application interfaces make possible services, such as multimedia conferencing and interactive multimedia response systems.

Codian MCU A multi-point control unit (MCU) used to switch video from Tandberg video endpoints.

CTMS See Cisco TelePresence Multipoint Switch.

CUCM See Cisco Unified Communications Manager.

CUVC Cisco Unified Video Communications

D

Default Region The region available on a fresh install that includes all the resources controlled by this CHPAS. Customers who do not require partitioning of their resources to not have to configure additional regions.

E

E- Pen Electronic Pen. Allows physicians to write online prescriptions.

Electronic Protected Health Information Any protected health information which is created, stored, transmitted, or received electronically.

ePHI Electronic Protected Health Information

H

HIPAA Health Insurance Portability and Accountability Act

Hosted In Cisco HealthPresence, refers to a software delivery model in which the Cisco HealthPresence software and associated client data reside in a central location managed by a hosting service and accessed by clients using a web browser.

M

Multi-point video conferencing Simultaneous video conferencing among 3 or more participants where video conferencing content flows from the source through a multipoint control unit or switch and then is transmitted to two or more recipients.

Multi-tenancy In Cisco HealthPresence, multi-tenancy refers to running multiple instances of the operating system, databases and Cisco HealthPresence software on the same physical server (also known as Hardware Virtualization).

P

PHI Protected Health Information

Provider A licensed medical professional who provides medical consultation in a Cisco HealthPresence environment.

Provider Endpoint A Cisco HealthPresence Appliance from which the end user logged in as a Provider.

Provider Station A Cisco HealthPresence station designed for use by a Provider and consisting of a video endpoint and the Cisco HealthPresence software running on the Cisco HealthPresence Appliance.

R

Region A subset of a endpoints and multipoint bridges controlled by a single Cisco HealthPresence Application Server or Tenant. Dividing a Tenant into regions can help minimize latency when meeting resources (that is, multi-point bridges or switches) are geographically dispersed, or to partition appointments across multi-point bridges to balance workload.

T

Tenant An instance of the Cisco HealthPresence software run on a physical server in its own virtual machine.

TeleHealth The delivery of health-related services and information via telecommunications technologies. Telehealth is an expansion of telemedicine, and unlike telemedicine (which more narrowly focuses on the curative aspect) it encompasses preventive, promotive and curative aspects.

U

UC Unified Communications

User Profile Your User Profile determines which screens you see, and which functions you can perform. User IDs are configured so that users with a particular role (or roles) see only the screens and options appropriate to that job description. Any given user can have from one to five roles, or User Profiles, within one User ID. The Site Administrator configures the User IDs.

V

VCS Video Communication Server

Vitals Patient data including: temperature, blood pressure, (blood) oxygen saturation and pulse.