



## CHAPTER 3

# Solution Details

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The Cisco Virtual Expert Management solution is specifically targeted at retailers. Cisco has created the Connected Retail model to provide innovative, relevant, and consistent solutions that work together to address the existing and future challenges of today's retailers.

## Connected Retail Overview

Connected Retail is Cisco's industry vision that allows retailers to use the strength of the network to connect their brand to today's consumers who are increasingly digital and mobile. Connected Retail solutions are designed to address the many different facets and challenges that face retailers, from one unified platform. Each solution uses the same scalable and standardized architectures. Connected Retail's value is demonstrated through the following four portfolios, each of which is focused on addressing a different aspect of a retailers business needs:

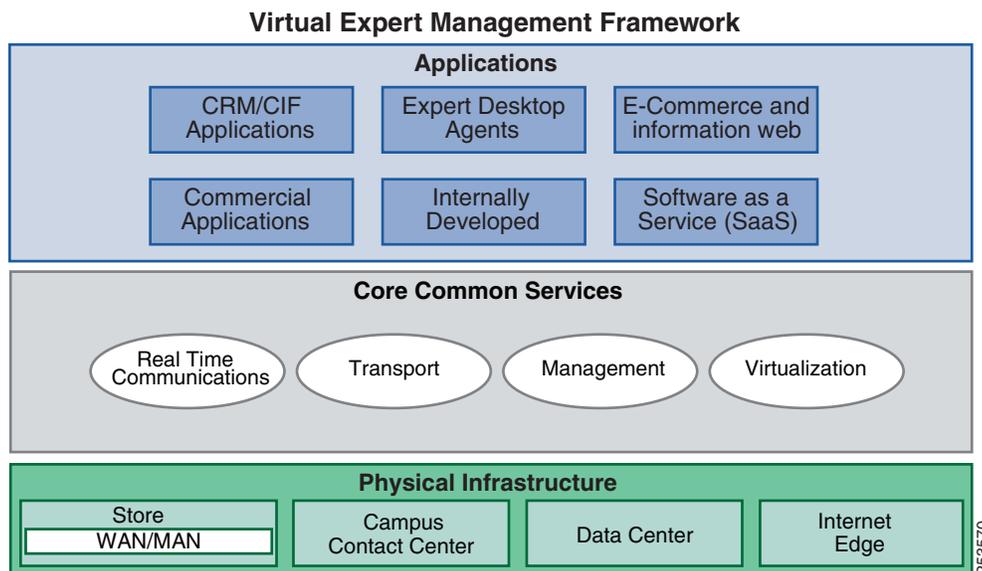
- Customer Experience Transformation—A portfolio of solutions that help a retailer transform and differentiate a customer's experience within their stores.
- Employee Optimization—A portfolio of solutions that are targeted towards increasing efficiency of a retailers workforce.
- Secure Store—A portfolio of solutions that address security and compliance within a retailers enterprise environment.
- Lean Retail—A portfolio of solutions that help a retailer “do more with less”. Data center applications are implemented to expand and contract dynamically with the demands of the resources. Stores are streamlined to minimize cost while increasing functionality.

For more information about the Connected Retail solution portfolios, refer to the following URL:  
<http://www.cisco.com/go/retail>

## Solution Framework

Cisco's Customer Experience Transformation solution portfolio is comprised of solutions that were developed and tested using Cisco's Connected Retail framework. This model depicts the relationships between applications and the network infrastructure. [Figure 3-1](#) depicts the Virtual Expert Management solution framework. The solution framework is divided into three functional layers: applications, core common services, and physical infrastructure.

Figure 3-1 Virtual Expert Management Framework



## Applications

Business and collaboration applications connect users and business processes to the infrastructure. The Applications layer of the framework depicts Cisco's business and collaboration applications. Examples include Contact Center Agent desktop, WebEx, and Cisco's Unified Video Advantage. Cisco's Unified Communication Suite enables collaboration services across the Virtual Expert Management solution. Although these applications are being depicted for the utility that they bring to the Virtual Expert Management solution, it is important to recognize the greater reusable value to the retailer. Applications services are the connection from the Applications layer to the Core Common Services layer.

## Core Common Services

This is where filtering, caching, protocol optimization interact with applications or application middleware services to optimize the performance from the network to the end user. Specific services that are used within the Virtual Expert Management solution include call processing, expert location services, call recording and presence.

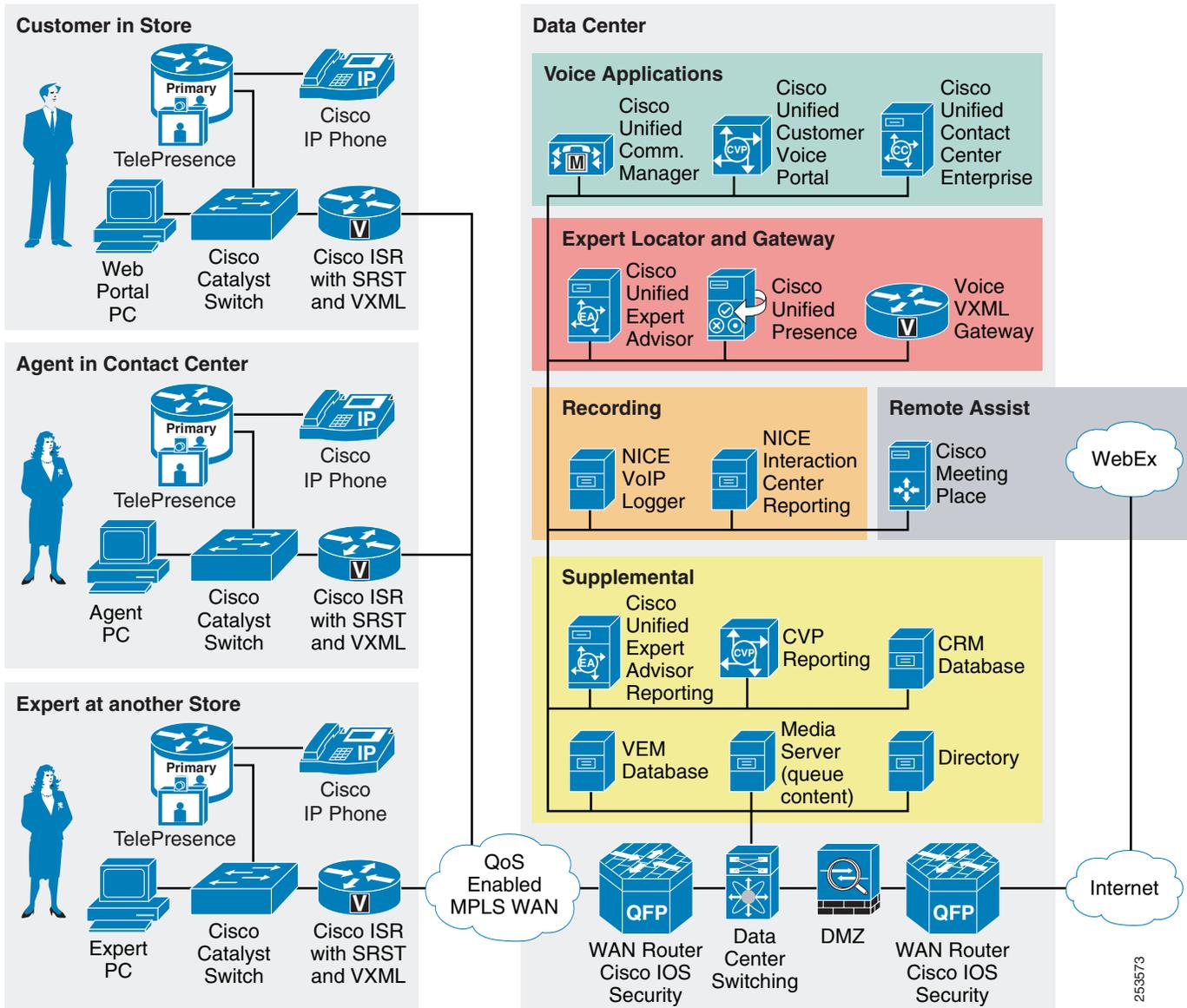
## Physical Infrastructure

The Physical Infrastructure layer is where the physical infrastructure resides. The Connected Retail reference architecture provides the foundation of the Physical Infrastructure layer. These network architectures exhibit best practices for retail networks and provide the robust foundation for higher-level services and applications. Each of these architectures contain additional products and features of a fully functional enterprise network and provide a contextual backdrop beyond what is necessary for the Virtual Expert Management solution. For more information about, Connected Retail, see the following URL: <http://www.cisco.com/go/retail>

# Virtual Expert Management Solution Architecture

The Virtual Expert Management solution is comprised of products from several areas of Unified Communications, primarily Contact Center Enterprise. Cisco Unified Contact Center Enterprise provides the core call handling needed to receive and direct calls for the expert queue. Customer Voice Portal is specifically where the customer call is queued and enables advanced call capabilities to gather information and handle exceptions. Cisco's Expert Advisor product is used in conjunction with Cisco Unified Presence to locate experts and request their availability to engage with a customer. Once an expert accepts an offer they are connected using voice and video to the customer's station. Video can take several forms including TelePresence, Cisco Unified Video Advantage and Cisco IP Video Phones. During the session with the customer, the expert can start a collaborative desktop sharing session using one of several different options; WebEx meeting, Cisco Meeting Place, or WebEx Access Anywhere. These allow the customer and expert to jointly view and control desktop applications (e.g., a web browser) and for the expert to assist the customer in their products of interest. While the customer and expert are conversing, their conversation is being recorded for audit/quality assurance using the NICE recording solutions (non-TP endpoints). [Figure 3-2](#) depicts the logical relationship of the solution components.

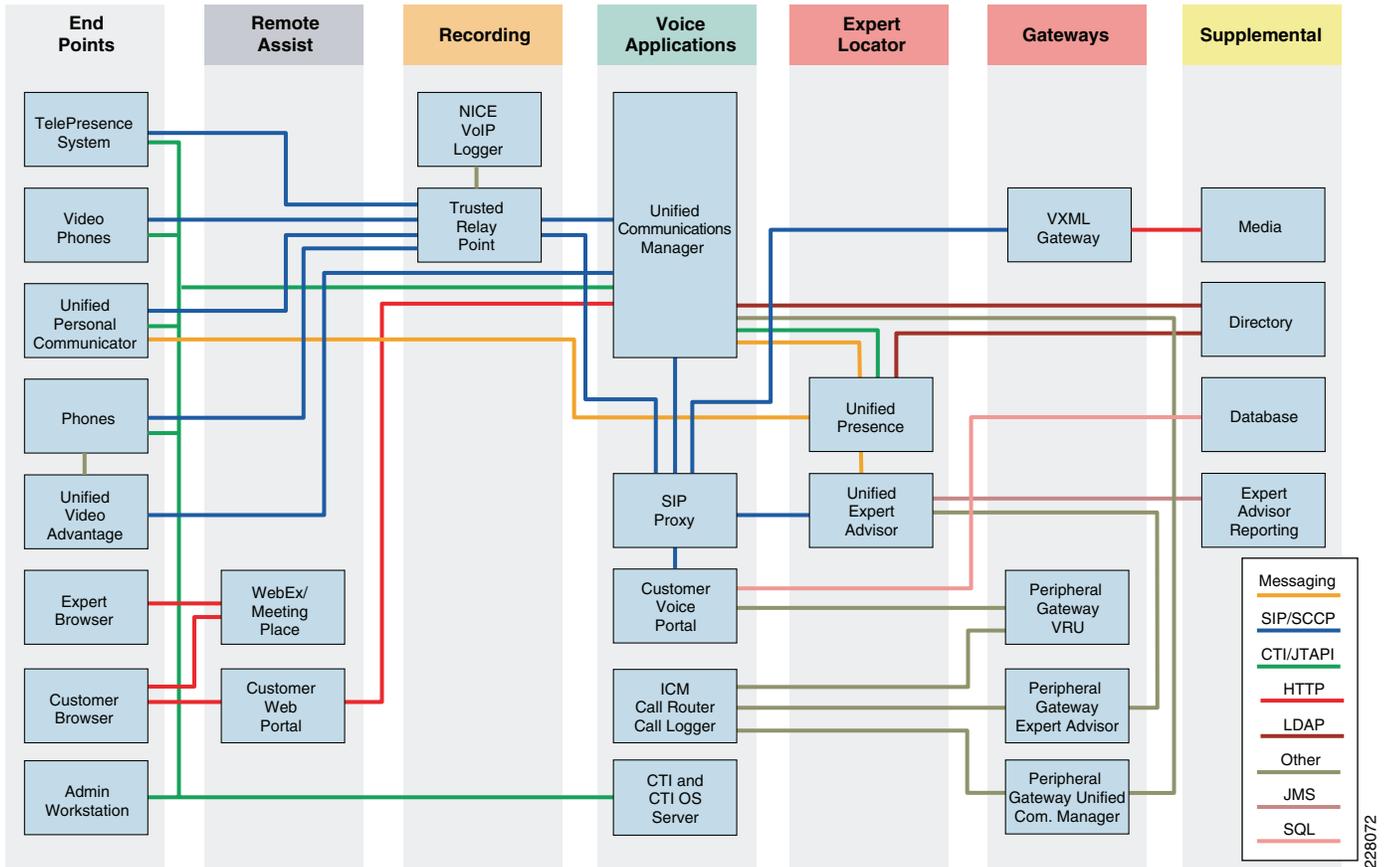
Figure 3-2 Virtual Expert Management Solution Architecture



## Protocols and Services for Virtual Expert Management Solution

Virtual Expert Management is comprised of a complex set of systems located primarily in the retailers' data center. Figure 3-3 shows an overview of many of the protocols and services of the solution and the flows between them.

Figure 3-3 Virtual Expert Management Protocols and Services



The protocols used by the applications deployed need to be considered when implementing quality-of-services in the enterprise, and is covered in more detail in [Chapter 4, “Design Considerations.”](#)

## Solution Components

Many systems are needed to create the Virtual Expert Management solution. The Virtual Expert Management solution is conceptually broken down into several functional groups based on the capabilities they bring to the solution. Each component of the solution and its function is briefly described here.

## Store Endpoints

Two main scenarios tested in this solution contrast the products of Cisco TelePresence and Cisco Unified Video Advantage. The Virtual Expert Management solution is flexible and allows for many different types of communication channels and technologies from the customer to the expert. Validation in Cisco’s laboratories was restricted to several deployment models using several different endpoints. This was not an exhaustive effort of every possible configuration, nor did it account for some additional plausible scenarios.

Common to the two scenarios are the products of CUPC, a Web browser, and desktop phones.

## Cisco Unified Personal Communicator

A powerful desktop computer application that allows easy access to communications applications and services such as voice, video, instant messaging, Web conferencing, voice mail, and presence information from a single, multimedia interface on your PC or MAC. This client is a virtual or soft phone with both voice and video capability. The Cisco Unified Personal Communicator (CUPC) is one of the optional user interfaces in the solution.

Cisco Unified Personal Communicator is currently one of the two supported instant messaging clients of Cisco Expert Advisor. It is used by the expert agents to receive and respond to support requests. Both the customer station and the expert station use the CUPC client. Expert agents advertise their availability to the Cisco Expert Advisor system via their presence status in CUPC. On the customer stations the CUPC client can be used as a voice and video endpoint or solely for its instant meeting capability. CUPC includes the ability to automatically start an instant collaborative meeting session using Cisco WebEx or Cisco Unified MeetingPlace. The CUPC client is configured with the experts meeting account information (e.g., username and password) the CUP Server is configured with the meeting site information and this configuration is sent to the CUPC client. The CUPC meeting capabilities are best used for implementations where the expert needs to share their desktop and web browser with a customer rather than the customer sharing to the expert. When using the CUPC client the customer station is configured to start meeting sessions automatically, the expert clicks the start meeting button in the CUPC session window. Both the customer and expert stations open windows and join the new instant meeting. The expert can immediately start sharing their desktop and show the customer relevant information. For instances where the expert needs to view the customer desktop, Webex Access Anywhere provides the most seamless experience, for more information see the “[Remote Assistance](#)” section on page 3-13.

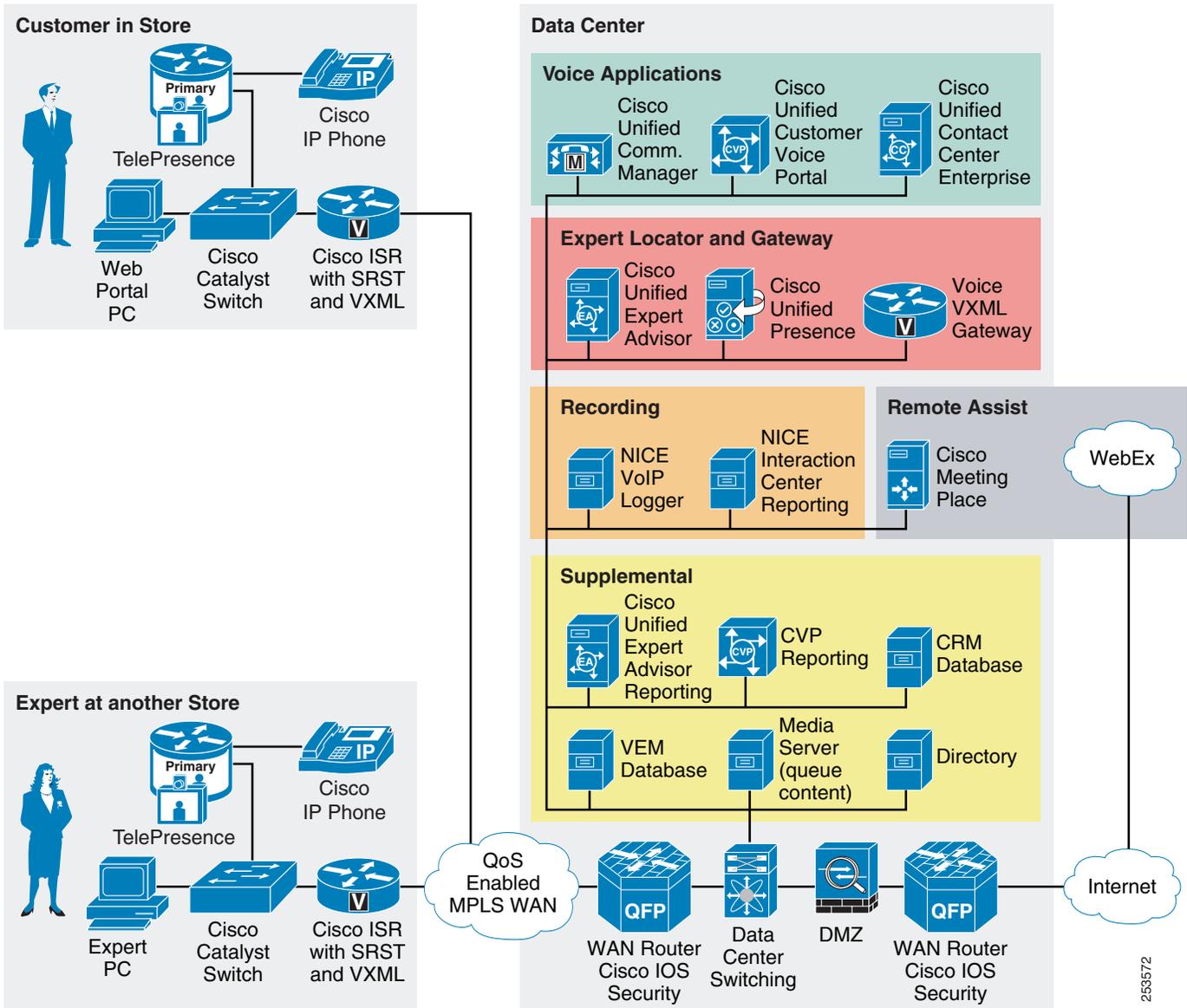
The validated endpoints include the following:

- Cisco TelePresence—High Resolution
- Cisco Unified Video Advantage—Lower Resolution

## Cisco TelePresence

Cisco TelePresence Station (CTS) 500 units provide high-definition video and stereo audio communication between customers and experts as shown in [Figure 3-4](#). Their large screen format and high-quality video provide a true to life experience for face-to-face communication. The CTS 500 units are the most affordable with a smaller 37-inch display, single, primary codec, stereo-only audio and simple pedestal and wall mounting options. They connect to the network via a single Ethernet cable. Configuration and management is simple via Cisco Unified Communications Manager the same as other voice and video endpoints. Cisco TelePresence offers several resolution and quality settings that cover a broad range of available bandwidths. Each of these options are listed in “[Bandwidth Considerations](#)” section on page 4-2. Cisco TelePresence systems are the best solution option for supporting sign language. More information on Cisco TelePresence can be found at the following URL: <http://www.cisco.com/go/telepresence>.

Figure 3-4 Store-to-Store Using TelePresence



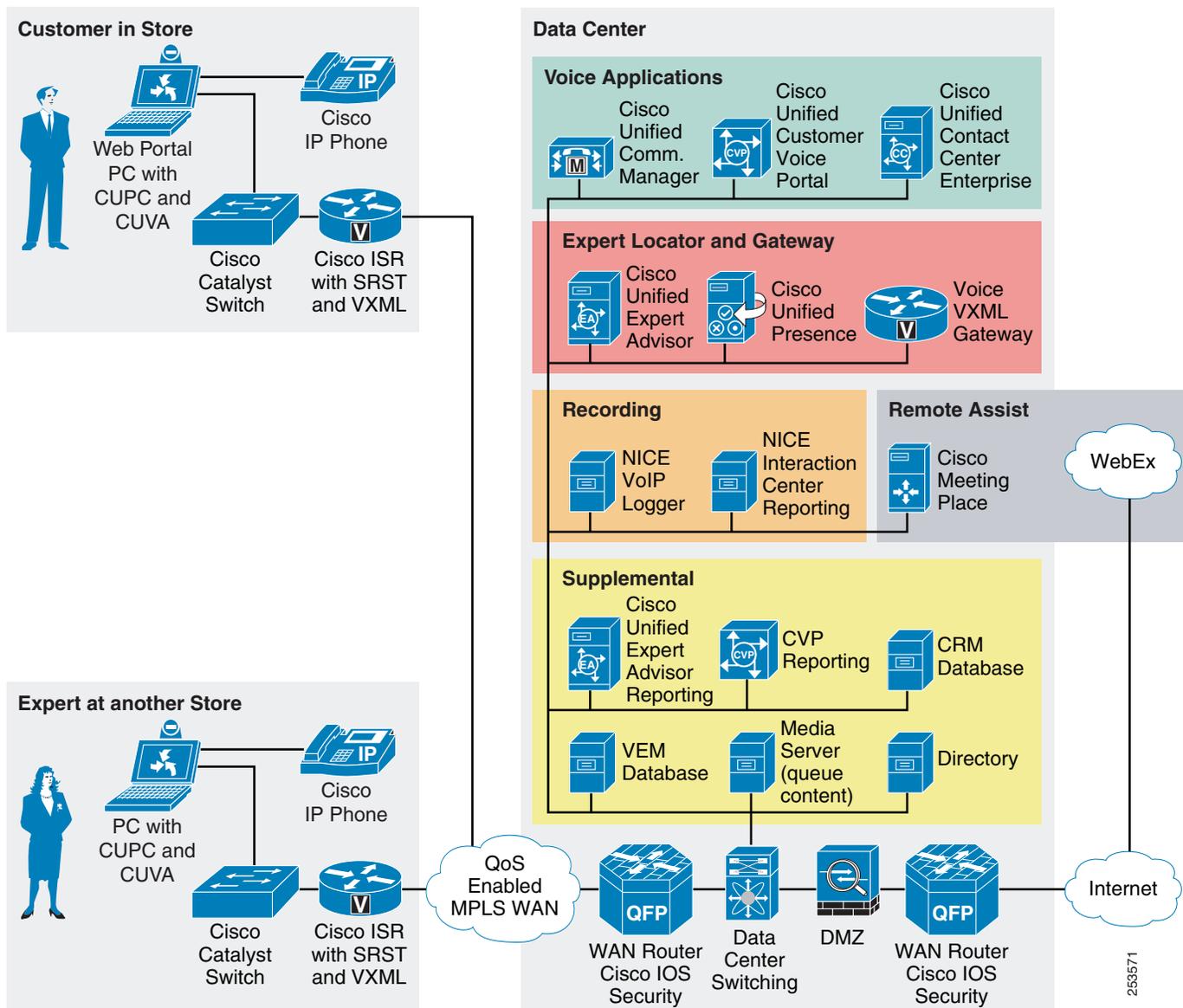
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## Cisco Unified Video Advantage

Cisco Unified Video Advantage (CUVA) is a camera that provides video telephony functionality to Cisco Unified IP phones, 7900 Series, and Cisco IP Communicator softphone application as shown in Figure 3-5. Cisco Unified Video Advantage uses the familiar phone interface to make and receive video calls from Cisco Unified IP phones with the video component being displayed on the PC/Kiosk. Installation is comprised of Cisco Unified Video Advantage software and a Cisco VT Camera II (a video telephony USB camera). Currently, video resolutions up to 352x288 are supported. Video bandwidth and other configuration is simple via Cisco Unified Communications Manager regions. Video starts automatically after the call is passed to the expert from the virtual expert queue. Best functionality was achieved using a second 4 to 3 ratio monitor connected to the customer stations with the video displaying full screen. Even with the lower resolution, quality and performance were acceptable for most use case.

scenarios and it is the most cost effective video solution in conjunction with using Cisco 7900 Series IP phones as the user handsets/speaker phone. More information on Cisco Unified Video Advantage can be found at the following URL: <http://www.cisco.com/go/cuva>.

Figure 3-5 Store-to-Store Using Video Advantage



## Cisco Agent Desktop

Cisco Agent Desktop (CAD) is a computer telephony integration (CTI) solution for IP-based contact centers that allows contact center agents to use powerful tools that help increase agent and supervisor productivity, improve customer satisfaction, and reduce costs. An intuitive GUI decreases IT dependency and simplifies customization, maintenance, and change management. Features a robust CTI screen pop, soft phone with media termination, and agent/supervisor coaching capabilities. Agents see

customer information in an enterprise data window and an optional screen pop. The Cisco Agent Desktop requires minimal screen space and allows agents to customize its capabilities to meet their individual needs.

## Data Center Components and Services

Products in this solution enable experts to be configured, located, and used. How does the expert know what customer needs assistance? Using Cisco Customer Voice Portal (CVP), the scripting capabilities enable the entering of information before a call is queued. Typically, you would have the customer enter their phone number or CRM-based club card number. This would enable the CVP system to perform information lookups across databases and provide the resulting information in the offer and acceptance requests that are sent to the expert. These messages are sent to the expert via their Cisco Unified Personal Communicator (CUPC) client as instant messages directly from the Expert Advisor system.

Additionally, the Expert Advisor product also supports the use of Microsoft Office Communicator as an instant messaging and presence service.

### Cisco Unified Expert Advisor

Cisco Unified Expert Advisor (CUEA) is the core component of the Virtual Expert Management solution. It is available as an optional feature for Cisco Unified Contact Center. It extends the contact center so that highly trained experts can handle certain incoming calls. For example, there might be a call for which the contact center agent and the caller require a discussion with, or advice from, a specialist who is not employed by the contact center, but who agrees to be 'on call' to provide services as a consultant. That person is the expert advisor.

Expert advisors establish their presence and availability to take a call by the state of their instant messaging (IM) client; for example, available or away. The expert advisor IM client effectively serves as the “agent desktop” for experts who establish their willingness to take a call by responding to a message (e.g., *Are you available to handle this contact?*). Once an expert's availability and acceptance of the message request are confirmed, the call is routed to the expert. The contact center agent can also conference the expert into a customer call.

For more information, see the *Administration and Configuration Guide for Cisco Unified Expert Advisor* at the following URL: <http://www.cisco.com/go/ea>

### Expert Advisor

The expert advisor is an informal or occasional agent. Providing assistance is not their primary job, and thus, they may reject tasks. Also, since experts may not be at their desk at all times, they may not be reachable at their primary phone number. To accommodate these restrictions, the CUEA system uses an IM client instead of an agent desktop. IM clients provide a “lightweight” installation option for the expert advisors and expert advisors tend to be already familiar with the technology so that additional training is not required.

IM presence is used instead of explicit login. If an expert advisor is unavailable or not logged into IM, requests are not directed to that expert advisor. Tasks are offered through the IM client and the expert advisor can accept or reject the task. The system is configurable as to how long it waits for a reply, but by default an expert advisor has 30 seconds to respond to the request. If the expert advisor mistyped the phone number, the system will re-query them for the correct phone number to call. The expert advisor can also specify a different number for the system to call.

## User Management—Adding Users, Queue Assignment, Skills and Attributes

The list of available users in the CUEA system is based on users configured on the presence server and synchronized to the expert advisor system based on a schedule. As new presence users are added (either manually or via integration with directory systems), they are then available to be added and configured as expert advisors. When a user is added to the expert advisors group, their skills and attributes are configured and assigned as desired. Once configured these users are now available for queue membership by direct assignment or based on skill and attribute capabilities.

Assignment queues are used to match expert advisors with incoming contact requests. Assignment queues have a one-to-one relationship with Unified ICM Skill Groups. When an assignment queue is created on the CUEA system, a Unified ICM Skill Group is also created and tied to the assignment queue.

There are two selection strategies for assignment queues that can be used:

- Queue ordering (longest available agent, most skilled, or least skilled)
- Spatial (closest match among numeric attributes)

Expert advisors are matched with assignment queues via membership rules in one of two ways:

- Expert advisors—Expert advisors are assigned directly to the assignment queue
- Skills and attributes—A combination of skills and attributes are specified for the assignment queue. Expert advisors are deemed eligible to be offered tasks from the assignment queue if the expert advisor's skills and attributes fall within the skill and attribute parameter ranges of the assignment queue.

An assignment queue is created for each group of expert advisors or skills to which call requests is routed. The queue is then configured to have agents directly assigned by selecting expert advisors on the membership tab, or by specifying skills and attributes on the membership tab.

- If *expert advisors* is selected in the Membership tab, then expert advisors are assigned directly to the assignment queue. When requests are routed to the queue, available expert advisors defined for the queue can receive the request.
- If *skills and attributes* is selected in the Membership tab, then only expert advisors who meet the criteria of the skills and attributes selection are routed the requests.

Skills are classifications for expert advisor abilities, general knowledge, and expertise. The skills summary page on the expert advisors system details the skills that are defined on the system. The summary page displays the skill name and a description for each skill. Once the skills have been defined they can then be assigned to expert advisors and assignment queues and used for proper call routing of incoming contacts.

When adding expert advisors there is a list skills that can be selected for each expert created or edited. Simply check the box next to the names of the skills to add, optionally edit the competency level for each skill assigned. Competency can range from 1 to 100, with 100 being the most competent. The default is 50.

## Custom Messages to Expert Advisors

Message sets are collections of messages that can be sent to or received from expert advisors. Each set of messages contains a set of text strings that are either sent to or received from an expert advisor when certain call events (such as a login, a call transfer, or failover) occur.

The CUEA system includes a set of system defined messages that can be copied and customized to meet many needs, such as defining messages in a foreign language, or for multiple formats, for example, HTML and TEXT.

Messages can use token replacement strings for information sent to the expert advisor. There are two types of token replacement strings that can be used; non-call detail (NCD) and call detail (CD).

There are four NCD token replacement strings:

- `NCD:UserName%`—The login name of the user
- `NCD:UserID`—The ID of the user
- `NCD:TimeLeft%`—The amount of time left to accept the request
- `NCD:InvalidNumber%`—The invalid number that the system tried to call

CD token replacement strings are strings created from system and call attributes, as defined in the **Daily Management > Attributes** menu of the expert advisor system. To retrieve string information from databases the ICM router will need to be configured for database routing. ICM scripts are then crafted to retrieve information from databases, for example, based on caller entered digits or calling phone number, and populated to peripheral variables that are passed to the expert advisor system as call data.

As an example, an attribute can be created called `CustomerName` and mapped to a contact attribute source (e.g., `PeripheralVariable1`), then referenced using a token replacement string in the message to the expert advisor using this syntax `%CD:CustomerName%`. These token replacement strings are replaced with their current value when the message is sent to the expert advisor. See the default message sets for example usage.

Steps for configuring databases in ICM and attributes in expert advisor systems are available in [Appendix B, “Quick Installation and Configuration Steps for Virtual Expert Management.”](#)

## Cisco Unified Presence Server

Cisco Unified Presence Server (CUP) is a standards-based enterprise platform that brings people together in and across organizations in the most effective way. This open and extensible platform facilitates the highly secure exchange of availability and instant messaging (IM) information between Cisco Unified Communications Manager and other applications. Cisco Unified Presence is an essential component in the Virtual Expert Management solution. It integrates the functionality of Cisco Unified Expert Advisor with the experts located throughout the organization so they can be reached using instant messaging instead of having to log into a fat and expensive agent desktop client. Users configured in the CUP server are the base users available for selection in Cisco Unified Expert Advisor. CUP server also provides instant meeting functionality to the CUPC client. Both Cisco Unified MeetingPlace and Cisco Webex meeting services can be configured in the CUP server and applied to different groups of users. Meeting settings are pushed to CUPC clients when logging in and enable the instant meeting feature when communicating with other CUPC-enabled end clients. More information on Cisco Unified Presence can be found at the following URL: <http://www.cisco.com/en/US/products/ps6837/index.html>.

## Voice Applications

The call-processing function of the solution is comprised of several applications that work in coordination to establish intelligent call management. It not only provides basic call establishment, but also offers advanced call treatment for intelligent call routing across channels to appropriate resources and self-service applications.

## Cisco Unified Communications Manager

An enterprise-class IP telephony call-processing system that provides traditional telephony features as well as advanced capabilities, such as preference, and rich conferencing services. Cisco Unified Communications Manager (CUCM) creates a unified workspace that supports a full range of communications features and applications with a solution that is highly scalable. Each CUCM cluster can support up to 30,000 users and the clusters can be distributed for scalability, redundancy, and load balancing. CUCM provides the logical addressing (phone numbers) within the solution and is the core call management component.

## Cisco Unified Contact Center Enterprise

An intelligent contact routing, call treatment, network-to-desktop computer telephony integration (CTI), and multichannel contact management over an IP infrastructure. It combines multichannel automatic call distributor (ACD) functionality with IP telephony in a unified solution, enabling the rapid deployment of a distributed contact center infrastructure. As a core component of the Virtual Expert Management solution, Cisco Unified Contact Center Enterprise (CUCCE) applies business logic to customer calls and is the glue integrating the other components such as Cisco Unified Communications Manager, Cisco Unified Customer Voice Portal, Cisco Unified Expert Advisor and gateways. Contact Center agents connect using a client to track and support customer calls. The system monitors the resources available in the contact center to meet customer needs, including agent skills and availability, interactive voice response (IVR) status, and queue lengths.

For more information on Cisco Unified Contact Center Enterprise, see the following URL:  
<http://www.cisco.com/en/US/products/sw/custcosw/ps1844/index.html>

## Cisco Unified Intelligent Contact Management

A combination of multichannel contact management, intelligent routing, and network-to-desktop computer telephony integration (CTI) capabilities that virtualize contact center routing, reporting, and computer telephony integration across heterogeneous and distributed third-party automatic call distribution (ACD) and interactive voice response (IVR) systems. It interfaces with carriers' intelligent networks for pre-routing and delegation of calls targeted to one or more contact centers. It segments customers and monitors resource activity and availability, delivers each contact to the most appropriate resource anywhere in the enterprise and profiles each customer using contact-related data, such as dialed number and calling line ID. It assigns the most appropriate resources to meet a customer's needs based on real-time conditions (such as agent skills, availability, and queue lengths) continuously gathered from various contact center components. Cisco Unified Intelligent Contact Management (CUICM) is a core component in a Cisco Unified Contact Center Enterprise implementation. It performs the core call-routing functionality between services and systems, integrated database lookup functionality, and all call logging.

## Cisco Unified Customer Voice Portal

An intelligent, personalized self-service over the phone application. Enables customers to efficiently retrieve the information they need from the contact center. Customers can use touch-tone signals or their own voice to request self-service information. If they request live agent assistance, Cisco Unified Customer Voice Portal (CVP) can place a call in queue until an appropriate agent is available and then transfer information given by the customer directly to the agent along with the call itself to provide a seamless customer service experience. In addition, Unified CVP can support video interactions, including self-service, queuing, and agent across mobile devices and kiosks. Unified CVP hosts the various expert advisor queue scripts created for each pool of products and services. It facilitates the

transfer of calls to the VXML gateway and manages call recovery. Cisco Unified Customer Voice Portal is the preferred call-queuing product for Cisco Expert Advisor and the Virtual Expert Management solution.

For more information on CVP, see the following URL:

<http://www.cisco.com/en/US/products/sw/custcosw/ps1006/index.html>

## Remote Assistance

Several products were validated to provide the remote assistance capabilities needed for a remote expert solution. Initially the best options integrated tightly with the Cisco Unified Personal Communicator capability of starting an instant meeting (see “[CUPC Instant Meetings](#)” section on page 4-7). But the best product for collaborative desktop sharing was found to be Cisco's WebEx Access Anywhere. Compared to WebEx Meeting Center and Cisco MeetingPlace which have many manual steps to perform for desktop sharing, Cisco's WebEx Access Anywhere is able to connect automatically to the in store customer station and instantly share the customer's desktop. Cisco WebEx Access Anywhere provides the most seamless user experience of any of the remote assistance options tested.

Each of these products evaluated have a number of useful features as described below and provide a great deal of options and flexibility for a virtual expert solution.

### Cisco WebEx

A hosted service that offers several different products with various capabilities. These include real-time desktop sharing with phone conferencing so that the client sees the same collateral that the remote expert is sharing. This service is only available as a hosted service but has a road map of capabilities that include behind the firewall recording and mixing of sessions using an on-premise appliance. This option can be contrasted with the Cisco Meetingplace products, but as a service can scale dynamically as needed to meet current and future business needs. More information about the WebEx suite of products is available at <http://www.webex.com>

### WebEx Access Anywhere

Cisco WebEx Access Anywhere is a sub-component of both Cisco Meeting Center and Cisco WebEx Remote Support. It enables remote control of a computer via a preconfigured agent that is installed on that computer. The WebEx Access Anywhere sessions can be easily started via a URL link used by the expert. The link can be provided in the instant message along with user credentials needed to access the customer station. The expert is able to instantly see what the customer is looking at and take control as needed to assist the customer. The service enables dual desktop control of the mouse and keyboard, there is no need to switch control back and forth between the expert and the customer. This service also enables the expert to print to a printer connected to the customer station, as well as direct file transfers between customer and expert (i.e., the customer inserts a USB drive to receive a file or digital receipt from the expert). The WebEx Access Anywhere service provides the most seamless experience for a customer using an off the shelf product. Screen shots and installation steps for Cisco WebEx Access Anywhere is available in [Appendix B, “Quick Installation and Configuration Steps for Virtual Expert Management.”](#)

### WebEx Meeting Center

Cisco WebEx Meeting Center integrates closely with Cisco Unified Personal Communicator. It enables an instant meeting to be started between the expert and the customer with a click of button on the CUPC client. The CUPC client is configured with the expert's WebEx account information (e.g., username and

password) the CUP Server is configured with the WebEx site information and this configuration is sent to the CUPC client. WebEx Meeting Center is best used for implementations where the Expert needs to share their desktop and web browser with a customer rather than the customer sharing to the expert. When using the CUPC client the customer station is configured to start meeting sessions automatically, the expert clicks the start meeting button in the CUPC session window. Both the customer and expert stations open windows and join the new instant meeting. The expert can immediately start sharing their desktop and show the customer relevant information. Using meeting center, the desktop sessions can be set to automatically record via the site settings. To enable automatic recording both **Network-Based Recording** and **Unlimited Overage** options need to be added to the site profile. Management of recordings and various features can be achieved through the published API interface.

## WebEx Remote Support

Cisco WebEx Remote Support combines several virtual expert management features in a single “hosted as a service” product. It does not include any of the other products mentioned (e.g., CUCM, CUEA, CVP, CUP, CUPC, CUICM, etc). Call flows are processed through WebEx and direct via VIOP. WebEx Remote Support includes WebEx WebACD, a Web-based ACD where queues and experts can be created and managed. For each ACD queue a *Click-to-Connect* link and Web icon is created that can be embedded in the retailers site for both internal and external customer access. This link and icon change dynamically based on whether agents are available to provide immediate support or to leave a message. Experts load the WebACD client and are assigned to various queues by a supervisor/manager. When a customer clicks on the remote support link their browser loads a thin client (similar to Meeting center) and connects them to the WebACD queue. The customer is prompted for basic information items (e.g., name and a phone number) as information that can be passed to the agent. An agent would then select the new customer from the WebACD queue and be connected with voice and video. The voice connection supports both voice-over-IP (VoIP) within the browser, if the customer has a microphone and speakers connected to their PC, or via a phone line as a callback to the customers entered phone number. The agent can then also share their desktop, or view the customer desktop as desired. Upon completion of the session, the customers' web browser is automatically directed to a survey site where they can provide feedback. WebEx Remote Support also includes integrated recording of voice, video, and desktop sharing sessions. WebEx Remote Support also is capable of remote printing and drag and drop file transfers. As a hosted-service WebEx Remote Support is a quick and easy solution for virtual expert management to both customers at home and in the store. WebEx Remote Support is also the most flexible, enabling expert agents to provide assistance from anywhere via a simple Web browser. More information regarding WebEx Remote Support can be found at the following URL: <http://www.webex.com/product-overview/support-center/remote-support.html>

## Cisco Unified Meetingplace

Cisco Unified Meetingplace is an in-house service (contrasted with the hosted Cisco Webex service) that allows real-time desktop sharing with phone conferencing so that the client sees the same collateral that the remote expert is sharing.

Cisco Unified Meetingplace integrates closely with Cisco Unified Personal Communicator. It enables an instant meeting to be started between the expert and the customer with a click of button on the CUPC client. The CUPC client is configured with the experts Meetingplace account information (e.g., username and password) the CUP Server is configured with the Meetingplace site information and this configuration is sent to the CUPC client. Cisco Unified Meetingplace is best used for implementations where the expert needs to share their desktop and web browser with a customer rather than the customer sharing to the expert. When using the CUPC client the customer station is configured to start meeting sessions automatically, the expert clicks the start meeting button in the CUPC session window. Both the customer and expert stations open windows and join the new instant meeting. The expert can immediately start sharing their desktop and show the customer relevant information.

## Recording

There are several well known products that facilitate recording of call center audio sessions. In the Virtual Expert Management solution, NICE fulfills this requirement.

### NICE Perform Recording

Compliance recording within the contact center and experts in the store has become a necessity for businesses to ensure compliance with both external and internal regulations and procedures. Non-compliance can cost millions of dollars in fines and litigation, damage business reputation, increase customer churn, and raise exposure to fraud. Recording customer interactions provides a valuable tool for:

- Compliance with regulations requiring recording
- Dispute resolution and legal defense
- Verbal contract documentation
- Accuracy verification
- Employee compliance monitoring and verification

The NICE Perform Recording solution offers a reliable and resilient compliance recording solution, enabling contact centers, stores, corporate offices, and other sites to document all information related to certain business operations, protect the business, and mitigate risk. The solution provides the capability to capture, store, and maintain customer conversations and activity.

NICE compliance recording is available for TDM, VoIP, and hybrid environments. It is seamless integration with other NICE SmartCenter solutions such as Interaction Analytics and Quality Management enhances NICE's offering to deliver significant value added capabilities which can optimize operational efficiency and provide detailed customer insight.

### NICE Perform Technology

The power of NICE Perform lies in the unique synergy between Cisco and NICE's advanced technology components:

- NICE Perform can capture and store all calls as required, and the unique NICE technology stores digitalized voice recording in a highly efficient manner, making rapid identification and retrieval simple and inexpensive.
- NICE Perform is fully integrated with Microsoft.NET client-server technology, reducing overheads, improving response time, and easing the installation of updates and new versions.
- NICE Perform's audio analysis capabilities are the most advanced and accurate available, allowing word spotting, emotion detection, and voice analysis.
- NICE Perform works in traditional, hybrid and VoIP environments.

The aggregation of the various tools and technologies included in NICE Perform allow users to find and use the insights hidden in the enterprise's unstructured data. For more information about NICE Perform, see the following URL: [http://www.nice.com/solutions/enterprise/nice\\_perform.php](http://www.nice.com/solutions/enterprise/nice_perform.php)

## Supplemental

This section addresses some of the additional functions and features that are available for reporting and enhancements.

### Cisco Unified Customer Voice Portal Reporting Server

The Unified Customer Voice Portal Reporting Service provides historical reporting for virtual expert needs as well as to a distributed self-service deployment in a call center environment. The system is primarily used to assist call center managers with call activity summary information to manage daily operations. It can also provide operational analysis of various IVR applications.

The Reporting Service receives reporting data from the IVR Service, the SIP Service, and the VXML Server. It is deployed together with an Informix database management system, and it transforms and writes this reporting data into that database. The database schema is prescribed by the CVP product, but the schema is fully published so that customers may develop custom reports based on it.

The reporting service itself does not perform database administrative and maintenance activities such as backups or purges. However, Unified CVP provides access to such maintenance tasks through the Operations Console.

For more information on CVP Reporting, see the following URL:

[http://www.cisco.com/en/US/docs/voice\\_ip\\_comm/cust\\_contact/contact\\_center/customer\\_voice\\_portal/cvp7\\_0/configuration/guide/cvp702rpg.pdf](http://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/customer_voice_portal/cvp7_0/configuration/guide/cvp702rpg.pdf)

### Cisco Expert Advisor Reporting Server

The Cisco Expert Advisor Reporting Server is one of three servers that comprise the Cisco Unified Expert Advisor cluster. It is optional to install the reporting server. The advantage of doing so is that this server hosts the database used by reports generated from the Expert Advisor historical reports templates. Reports generated from these templates provide additional detail on expert advisor call activity and statistics than what is available from the WebView reports. Administrators can view (in real-time) experts' availability and occupancy within given assignment queues (or skill groups) for higher control and insight into business operations. An open (public schema) database is used and includes reports to view historical records of detailed experts' activities and call-handling behavior.

For more information on Cisco Expert Advisor Reporting, refer to the *Reporting Guide for Cisco Unified Expert Advisor* at the following URL starting on page 51:

[http://www.cisco.com/en/US/docs/voice\\_ip\\_comm/cust\\_contact/contact\\_center/cisco\\_unified\\_expert\\_advisor/ea\\_761/user/guide/ea76rptg.pdf](http://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/cisco_unified_expert_advisor/ea_761/user/guide/ea76rptg.pdf)

For more information on Cisco Expert Advisor, see the follow URL:

<http://www.cisco.com/en/US/products/ps9675/index.html>

### Media Server

Media Server is a server that serves up audio files and media supporting queue script configuration options to the VXML gateways. In this solution, the media server was implemented using Microsoft IIS on a Windows 2003 server. Separate folders were created for the content used in the queue scripts. Examples of the content served includes voice prompt wave files such as **agentbusy.wav** and **get4digits.wav**. Step-by-step installation of the media server is available in the [Appendix B, "Quick Installation and Configuration Steps for Virtual Expert Management."](#) Additionally, the *CVP*

*Implementation Guide* includes the media server and other options for media management in detail (local storage on VXML gateways, media caching, etc) For more information on CVP, see the following URL: [http://www.cisco.com/en/US/products/sw/custcosw/ps1006/prod\\_installation\\_guides\\_list.html](http://www.cisco.com/en/US/products/sw/custcosw/ps1006/prod_installation_guides_list.html)

## VEM Database

A database with a table was created in SQL for correlating the customers expert station location using the calling phone number with the WebEx Access Anywhere remote control URL that is sent to the expert when an offer is accepted. This is a simple database of just two columns that is referenced in the queue script. Database access is based on credentials in the ICM call router (see the [Appendix B, “Quick Installation and Configuration Steps for Virtual Expert Management”](#) for installation steps on setting up database access in ICM). For the database server MS SQL server 2003 was used.

## Customer Relationship Management Database

The Customer Relationship Management (CRM) database is used to track all information and contacts with a customer. For this purposes of this validation, a simple database with a table was created in SQL for correlating the customers entered digits when in the expert queue and other customer information that would typically be found in a CRM system such as the customer's name, account balance, or last purchases. This information is sent to the expert as part of an offer or after the offer is accepted. This is a simple database with several columns of information that are referenced in the queue script and matched against. Database access is based on credentials in the ICM call router (see [Appendix B, “Quick Installation and Configuration Steps for Virtual Expert Management”](#) for installation steps on setting up database access in ICM). For the database server MS SQL server 2003 was used.

## Directory

A directory server is necessary for managing users in an enterprise. Best practices for user management in Cisco Unified Communications Manager are to link users in Communications Manager directly with a directory server. For this solution, Microsoft's Active Directory was used. Several users in the directory contained phone number information allowing proper linking to Cisco Unified Presence users using the Cisco Unified Personal Communicator clients. These users also directly tie together as the users listed in Cisco Unified Expert advisor to be assigned as experts. Adding new users to the solution can take several process steps depending on deployments but will typically follow the new user addition steps for the individual products in the [Appendix B, “Quick Installation and Configuration Steps for Virtual Expert Management.”](#)

## Gateways

### Peripheral Gateways

Peripheral gateway is a service component enabled within Cisco Unified Intelligent Contact Manager. A peripheral is a switch, such as an ACD, PBX, VRU, or CUCM. Calls arrive at the peripheral through trunks that are organized into trunk groups. ICM software monitors activity at each peripheral and can route calls to targets at each peripheral. The logical interface controller and physical interface controller represent the Peripheral Gateway (PG) through which the peripheral communicates with the ICM system. Two PGs are implemented in the VEM solution with three Peripheral Interface Modules (PIM); CUCM, EA and VRU. Additional gateways may be necessary based on the deployment needs of the enterprise. PIMs facilitate the communication between the differing components in a Contact Center

deployment. The CUCM PIM connects the Cisco Unified Communication manger to the contact center for call routing and all of the devices used by experts and agents. The EA PIM connects the Cisco Expert Advisor system to the contact center, enabling users via instant messaging clients to act as contact center agents and accepting calls. The VRU PIM connects Cisco Customer Voice Portal to the contact center and provides the interface for incoming customer calls to be directed through scripts to each queue. More information on Peripheral Gateways for ICM can be found on page 83 of the ICM Configuration guide for Cisco Unified ICM Enterprise at the following URL:

[http://www.cisco.com/en/US/docs/voice\\_ip\\_comm/cust\\_contact/contact\\_center/icm\\_enterprise/icm\\_enterprise\\_7\\_5/configuration/guide/icm75cfg.pdf](http://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/icm_enterprise/icm_enterprise_7_5/configuration/guide/icm75cfg.pdf)

## Cisco Voice XML Gateway

Voice Extensible Markup Language (VXML) is a standard defined by the World Wide Web Consortium (W3C). It is designed to create audio dialogs that provide synthesized speech, recognition of spoken words, recognition of DTMF digits, and recorded spoken audio. The VXML server and clients use the well known HTTP protocol to exchange VXML documents/pages. VXML is supported on several Cisco router/gateway platforms. In this solution validation, the VXML Gateway is implemented on a centralized Cisco ISR router running Voice software in the Data center. Calls are passed to the VXML gateway to play media and receive responses from callers as specified in the queue scripting. Scaling of the gateway is based on the call capacity of the gateway router and the expected call load of concurrent calls that would be in the queue at any one time. Configurations for setting up the VXML gateway on an ISR router are provided in the [Appendix B, “Quick Installation and Configuration Steps for Virtual Expert Management.”](#)