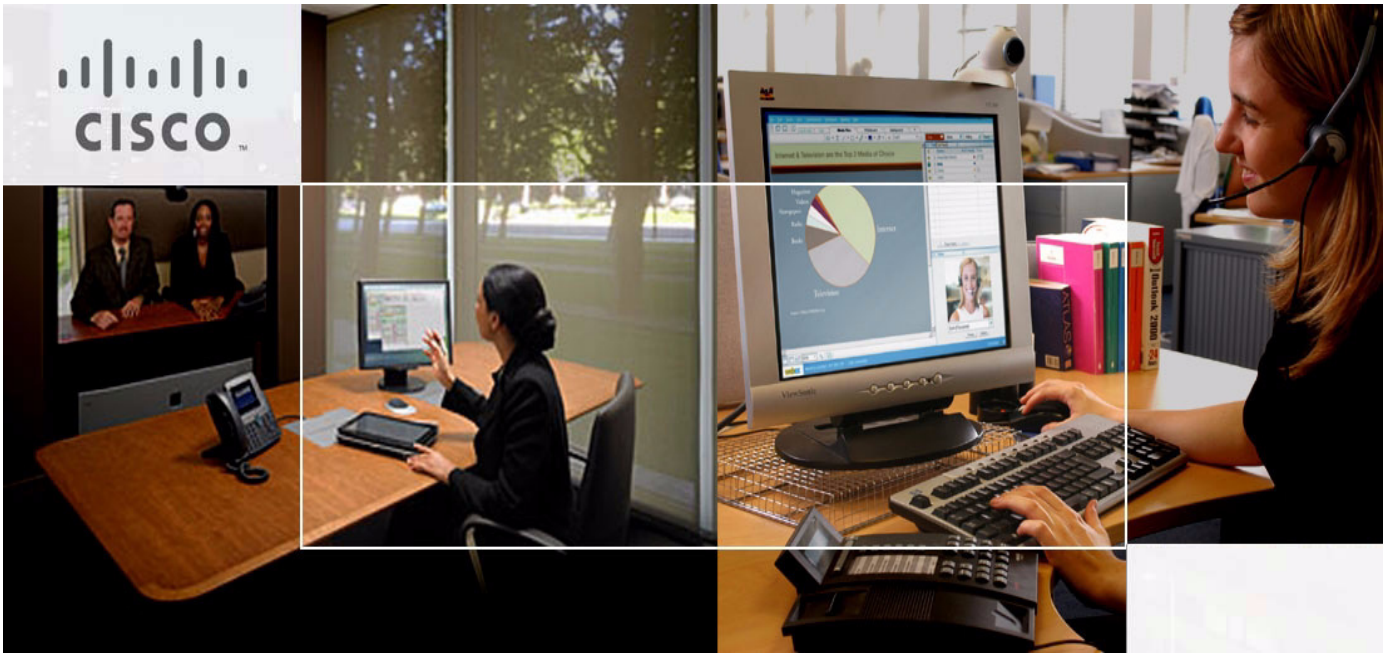

Cisco Virtual Expert Management for Financial Services Design and Implementation Guide

Last Updated: March 24, 2010

Cisco Validated Design

Building Architectures to Solve Business Problems

About Cisco Validated Design (CVD) Program

The CVD program consists of systems and solutions designed, tested, and documented to facilitate faster, more reliable, and more predictable customer deployments. For more information visit www.cisco.com/go/designzone.

Solution Authors

Bart McGlothin

Bart McGlothin, Vertical Solutions Architect, CMO ESE, Cisco Systems

Bart is an Industry Solution Architect at Cisco Systems. With over 13 years of industry experience, Bart leads Cisco's involvement with the National Retail Federation's Association for Retail Technology Standards Committee.

Christian Janoff

Christian Janoff, Vertical Solutions Architect, CMO ESE, Cisco Systems

Christian is an Industry Solution Architect at Cisco Systems. With over ten years of industry experience, Christian leads Cisco's participation on the Payment Card Industry Security Standards Council. He was elected to the PCI Council's Board of Advisors in May, 2009. Christian holds a bachelors degree from University of California at Santa Cruz.

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CHAPTER 1

Financial Services Business Challenges

Scaling Expertise Across Delivery Channels: Increasing Sales Revenue While Reducing Operational Cost

In every financial market segment the evolving demands of today's customer requires a portfolio of complex financial products and services that can be delivered anytime, anywhere. These offerings include investments, loans and credit, wealth management, annuities, risk management, retirement planning, and many others. When making critical decisions, today's customer requires that a financial institution provide personalized expertise to handle their inquiries and provide advice. Industry research indicates that addressing this need is essential to both the customer and the financial institution, as a high percentage of customers will turn elsewhere when their needs are not met at the time of their request, independent of delivery channel. Whether the customer interaction takes place in a branch, online, via mobile device, or through a call to the contact center, customers seek personalized interaction with an expert, preferably in a face-to-face format for more complex, financial products and services.

To meet market demands and gain a greater customer "wallet share", today's retail banks, insurance agencies, and brokerage firms have expanded their product and service portfolios. Additionally, financial institutions are expanding their capabilities across delivery channels in an effort to address different market segments and the ever-changing demands of a mobile customer base. Many institutions recognize that providing personalized expert-based service is the best business model for establishing competitive differentiation and organic growth that leads to increased shareholder value.

The operational cost to provide personalized expert-based service across delivery channels presents a significant challenge to financial institutions that have an additional need to focus on efficiency ratios and profitability. It is expensive to staff specialists at every branch, let alone each delivery channel, and as a result, current multi-product specialist coverage does not effectively address the multi-channel requirements of today's customer. A typical regional bank with hundreds of branches has specialized product line specialists (i.e., loans and credit, wealth management, annuities, risk management, retirement planning, etc.) in less than 5 to 10 percent of these locations, instead opting to concentrate experts in relatively few centers to maintain reasonable levels of utilization and acceptable operational expense. The inability to respond to customer sales opportunities across delivery channels anytime, anywhere can result in revenue leakage, lost opportunities, and customer dissatisfaction.

Enabling Personalized Multi-Channel Interaction: Cisco Virtual Expert Management

The Cisco® Virtual Expert Management (VEM) solution connects customers with experts in an immersive, virtual face-to-face interaction regardless of their physical location. A customer service agent in the branch can now easily locate a suitable expert using skills-based routing and availability monitoring, then seamlessly connect the expert and customer using TelePresence, desktop video, voice, and content sharing technology. The result is a superior consultative and advisory customer experience in the branch that improves customer acquisition and retention without the cost of physically distributing expensive subject matter experts.

Specialized experts may now cover larger territories, meet with more prospects, generate more business and forge better relationships by meeting customers more often and based on customer lifestyle.

Solution Benefits

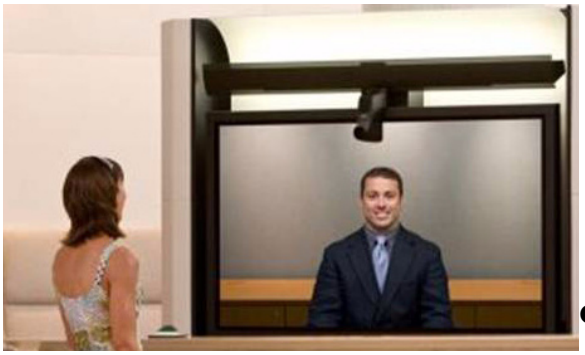
The deployment of the Cisco Virtual Expert Management solution enables financial institutions to evolve their customer interaction business model, which results in the following:

- *New Sales and Cross-Sales Revenue*—Remote expert capabilities help reduce revenue leakage by enhancing conversion rates. Forrester estimates that, if an expert is not present in the delivery channel when and where a customer/prospect makes an initial inquiry regarding a product or service, 70 percent of the customers/prospects will choose alternative providers. Furthermore, elating to enhancement to contact center interaction, the conversion rate of an interaction between a subject matter expert and a potential customer using audio only is 50 percent. The conversion rate with audio and video is greater than 90 percent (Forrester). Finally, this research shows that cross sales increased from 1.4 products per customer to 2.5 products per customer when video capabilities are added to audio-only capabilities.
- *Cost Efficiency*—Financial institutions are able to leverage pools of specialists to provide coverage throughout the enterprise. Virtualizing specialists not only improves their utilization by expanding the coverage area but also reduces travel expenses specialists would otherwise incur physically covering a territory. Telecommunications costs continue to fall over time while travel costs rise, so net efficiencies improve year over year.
- *Customer Acquisition*—Financial institutions are aggressively developing and marketing products to a wider set of prospective customers. VEM creates a differentiated experience that impresses and attracts new customers.
- *Customer Retention*—The ability to offer customers instant access to knowledgeable sales specialists, even in remote areas, introduces a personal service resulting in improved customer confidence in the relationship and greater loyalty.
- *Green Initiative/Carbon Footprint Reduction*—Environmental concerns, corporate imperatives to become "carbon neutral", and rising energy costs all call for a reduction in environmentally damaging business practices. Video communication plays a significant role in reducing travel, saving time, and improving operational efficiency, thereby effectively addressing banks green initiatives. Expenses related to specialist travel and individual branch training are significantly reduced. This reduced carbon footprint contributes to green-initiatives.

The Cisco Virtual Expert Management solution also provides a powerful collaboration foundation that financial institutions can leverage to enhance other customer service channels such as contact centers and customer and advisor web portals. The collaborative enterprise fabric can also aid middle and back-office operations, streamlining business processes and improving resolution of exception issues.

Target Audience

This document is intended for technical professionals within the financial services industry who are interested in deploying the Cisco Virtual Expert Management solution to enhance their customer interaction.



CHAPTER 2

Solution Requirements and Process Flow

Scope

The Cisco Virtual Expert Management solution is a powerful, flexible communication solution that addresses a variety of technical, business, and associated service preferences. Deployment of the Virtual Expert Management solution is customized to suit the specialized services, expertise, and in house applications of a particular financial institution. Lab validation testing is used to demonstrate how the components that comprise the solution may be integrated to address the business issues that were identified in Chapter 1, "Financial Services Business Challenges." The scope of this document is restricted to specific products and use cases. However, the reader is encouraged to consider that certain products may already exist in a retail banking environment that may be integrated into the solution to provide similar functionality. Other products and services could be integrated into the solution beyond the scope of this document that may offer significant business value. In addition, the testing that was completed to document the solution was restricted to branch-to-branch/other location and branch-to-contact center communication. Home-to-branch and home-to-contact center were outside the scope of the testing completed for this document but are potential use cases for this solution. A complete list of components that were validated and tested within the scope of this document is available in Chapter 3, "Solution Details."

Solution Capabilities

Specific solution capabilities are addressed within the scope of the Virtual Expert Management solution:

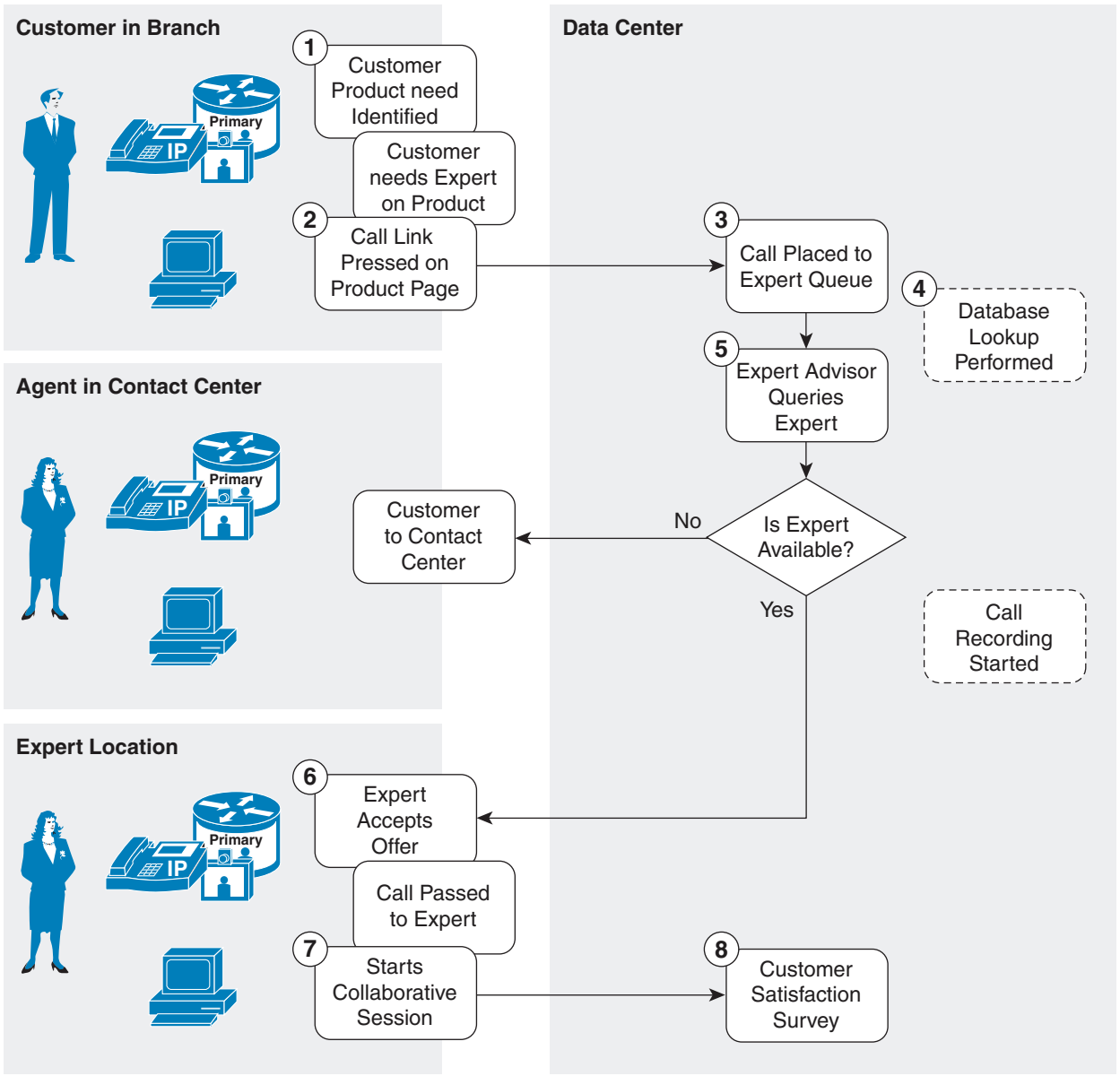
- *Audio and Video Conferencing between the Customer and Expert*—Provides several options to enable audio and video consultation between the customer and the expert. The quality of video and associated products are flexible and adapted to the needs of the financial institution and allows for the capability of the solution to grow as the needs of the institution increases.
- *Ability to define and search for multiple types of expertise*—Intelligently and automatically search for any administratively predefined range of expertise.
- *Rich Collaboration*—Bidirectional document sharing allows either the customer or the expert to input information into relevant documents, web pages, or customer-related material.
- *Peripheral Device Sharing*—Provides the option to print shared documents or collateral locally or at another location within the institution's enterprise.
- *Multimedia Playback*—provides the ability for the expert to play multimedia content (instructional videos, pre-recorded material) for the customer.

- *Survey*—enables an institution to offer a customer an optional, customized survey at the end of a session by directing them to an appropriate URL.
- *Security*—secure interactions between a customer and expert include many options for session encryption and privacy settings. These designs build on best practices for secure enterprise architectures.

Solution Use Case Walk-Through

The customer enters the financial institution featuring the Cisco Virtual Expert Management solution and is led to the Virtual Expert station by a branch associate under an unattended scenario, or the area where the Virtual Expert station is operated by the greeter in an attended scenario. Figure 2-1 shows the process flow of providing expert assistance to a customer.

Figure 2-1 Process Flow of Customer Connecting to an Expert



Note Dotted process steps are optional based on deployment scenarios and implemented solution components.

The following steps describe the flow in Figure 2-1:

Step 1 Using the virtual expert station, the customer (unattended scenario) or branch associate (attended scenario) searches for a product of interest. This web portal would typically be the financial institution's specialized portal listing their products and services.

Step 2 Once the product of interest is identified, it is determined whether the need can be fulfilled with local resources or whether a remote expert is required.

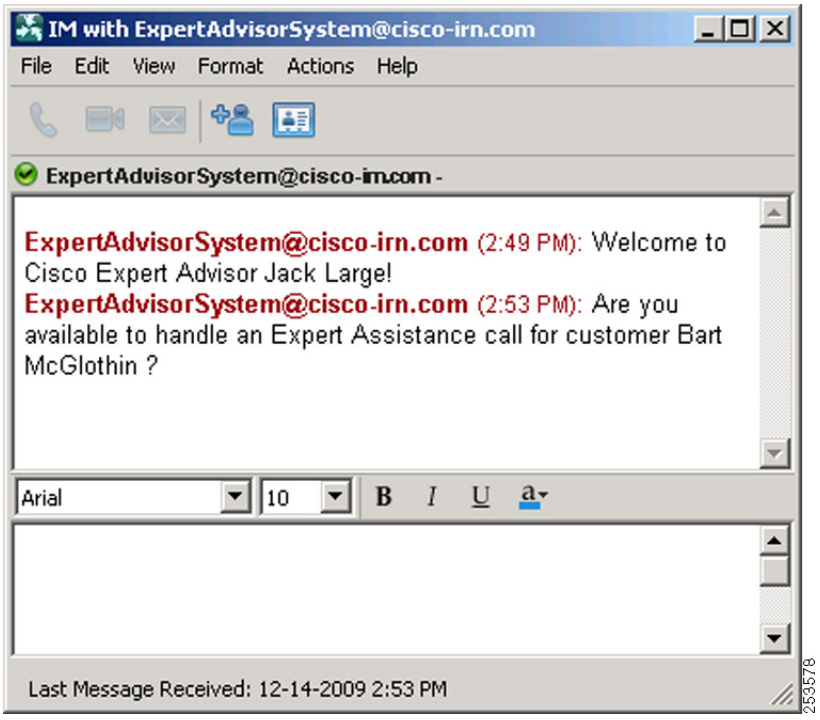
Step 3 After determining that a remote expert is required, the **Talk to Expert** button is clicked, at which point the web portal server accesses the Cisco WebDialer WSDL service to place a call to the appropriate expert queue.

Step 4 Optionally, the financial institution may integrate a database lookup to access the Customer Information System (CIS) or Customer Relationship Management (CRM) System for additional customer information. Once the connection to the expert queue is established, a script could be configured to request additional information from the customer before processing the call, such as data required to validate the customer's identification. After identification is determined, the system may be able to retrieve customer profile information based on the customer key. In addition, the location of the customer can be determined by the phone number of the customer station and referenced in a database that includes all VEM stations. This information is used to customize messages subsequently sent to the experts.

Step 5 The expert advisor locator service sends out instant messages to one or many experts soliciting their assistance with the customer. If a database lookup was performed, this solicitation could include information such as the customer's name, balances, last transaction, or customer ID for combined customer profile lookup. Expert selection is determined based on the financial institutions' business process and associated queuing method (longest available agent, most skilled, or least skilled) or spatiality (closest match among numeric attributes).

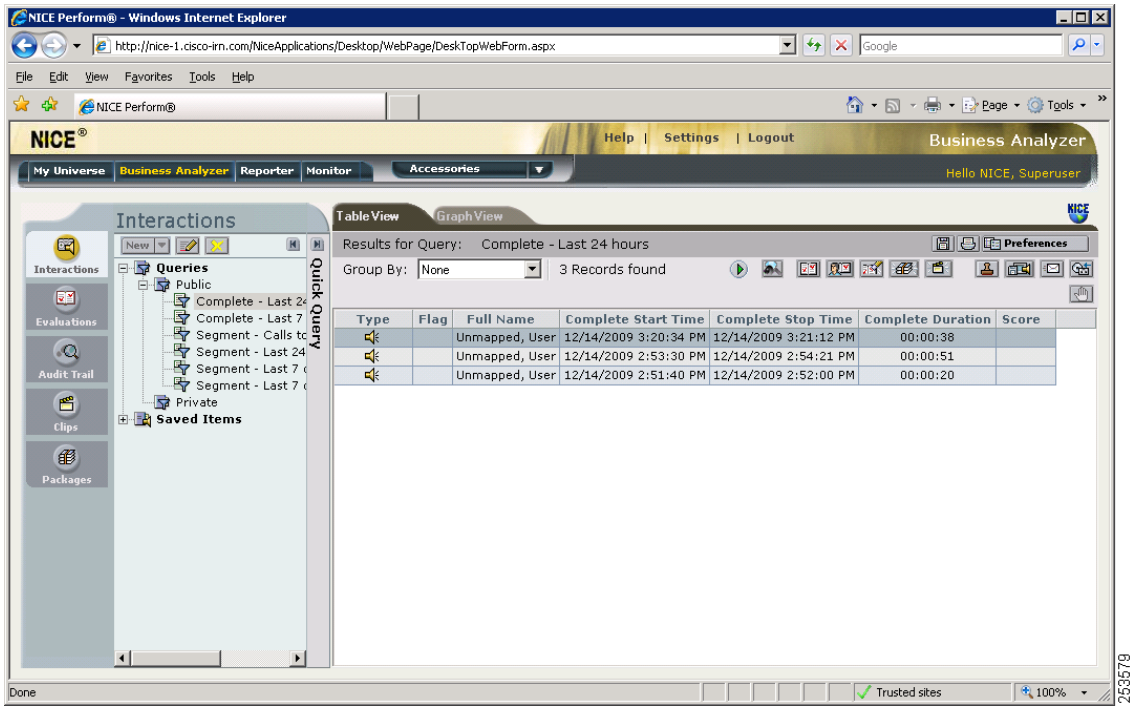
If an expert is not available, queue scripting would typically include forwarding the call to a Contact Center agent or answering service, based on the institutions defined business process. See Figure 2-2.

Figure 2-2 Expert Instant Messaging with Customer



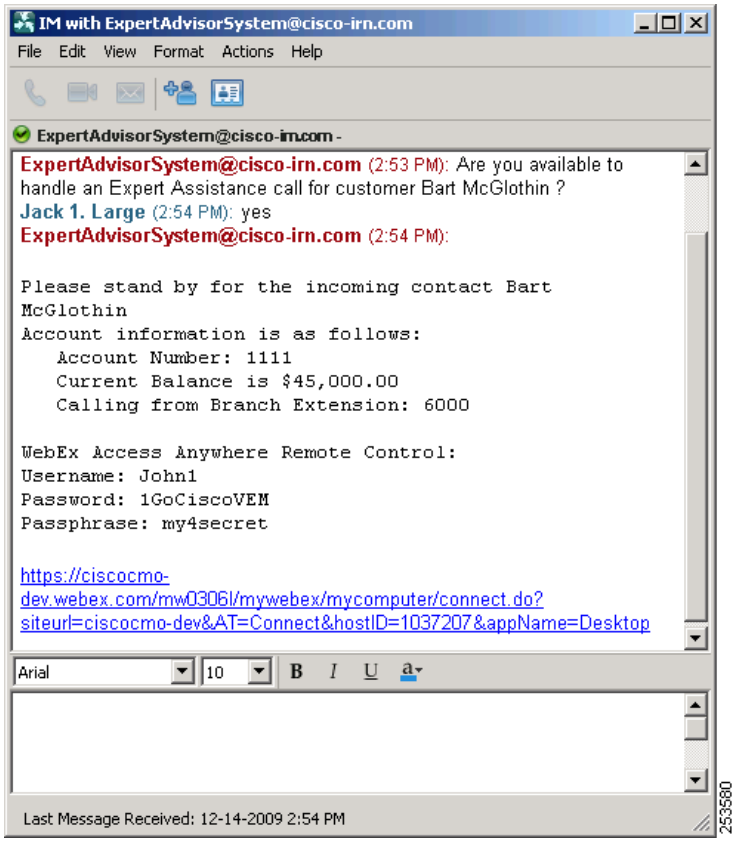
An optional solution component is customer interaction recording to enhance customer service and/or meet regulatory requirements. The audio session between the customer and expert can be recorded in several deployment scenarios. The scope of this document and associated testing did not address recording of video streams, desktop collaboration and TelePresence calls. Recordings using NICE are logged and stored for reporting and audits. See Figure 2-3.

Figure 2-3 NICE Reporting



Step 6 When an expert accepts a contact request, the requests to the other experts are revoked. If a database lookup was performed, additional information could then be provided in the subsequent messages. See Figure 2-4.

Figure 2-4 Customer Accepting Contact Offer

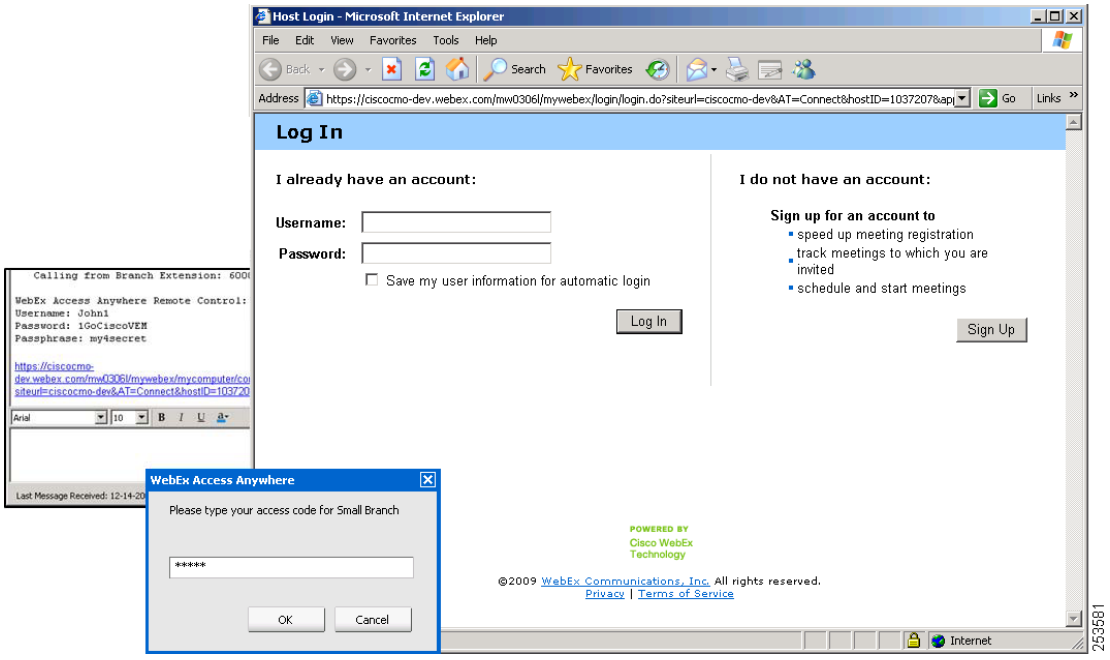


The expert advisor locator system then connects the expert and customer with voice and video. When additional collaboration is needed, a desktop sharing session can be started. Desktop sharing is available via several products. In this example, the expert is able to remotely control the customers desktop using WebEx Access Anywhere. See Figure 2-5.

Figure 2-5 The Advisory Experience

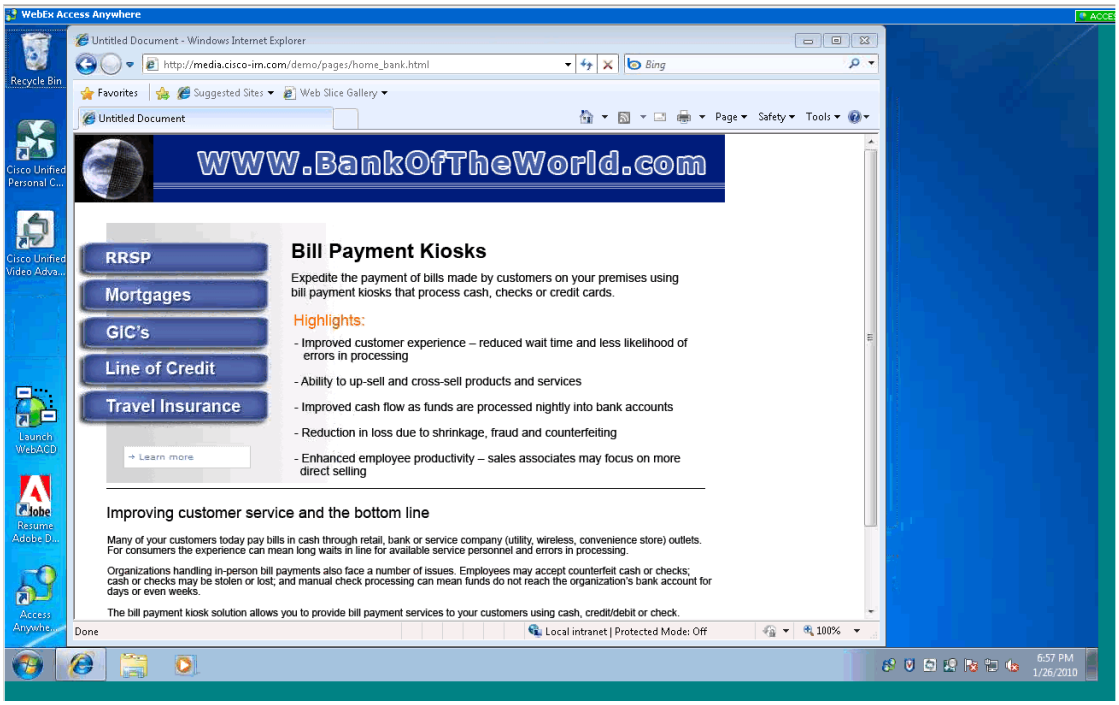
The link for the session is provided in the acknowledgement message along with the necessary credentials. See Figure 2-6.

Figure 2-6 Expert Accessing the Customer Desktop



Step 7 Once connected, both the customer and the expert are able to collaboratively control the virtual expert station desktop. The expert can direct the customers browsing experience, help complete complex application and investment web forms, and provide the expert services that the customer needs. See Figure 2-7.

Figure 2-7 Customer and Expert Interacting



Step 8 Once the conversation is complete, the expert optionally may direct the browser to a customer satisfaction survey site.

CHAPTER 3

Solution Details

The Virtual Expert Management solution is part of the Cisco Collaborative Customer Experience solution portfolio for retail banking. The solution portfolio provides a comprehensive suite of solutions to help financial institutions excel at meeting business imperatives based on delivering advanced business capabilities. Incorporating innovative technologies from leading financial industry partners and a highly flexible Cisco network foundation, the Cisco Collaborative Customer Experience solution portfolio helps institutions meet the market challenges of today and tomorrow, and delivers a superior banking experience to the evolving financial services consumer.

Enabling a Collaborative Customer Experience

In today's competitive marketplace, the difference between attracting and retaining customers or losing them to the competition comes down to providing a compelling personalized experience with each interaction. The Cisco Collaborative Customer Experience solution portfolio can help optimize collaboration across an institution, extend accurate and timely information to all customers and employees, and deliver a superior customer experience. Delivered in partnership with leading providers of innovative banking applications, these technologies provide ideal capabilities to address the unique challenges faced by today's financial institutions.

Today, the Collaborative Customer Experience solution portfolio is helping financial institutions:

- Deliver personalized sales and service
- Improve security and reduce operational risk
- Add advanced applications without major network upgrades
- Integrate communications and information across business lines and delivery channels
- Deliver dynamic real-time marketing communications
- Accelerate new product and service launches
- Reduce revenue leakage by maximizing alignment and availability of experts across the enterprise

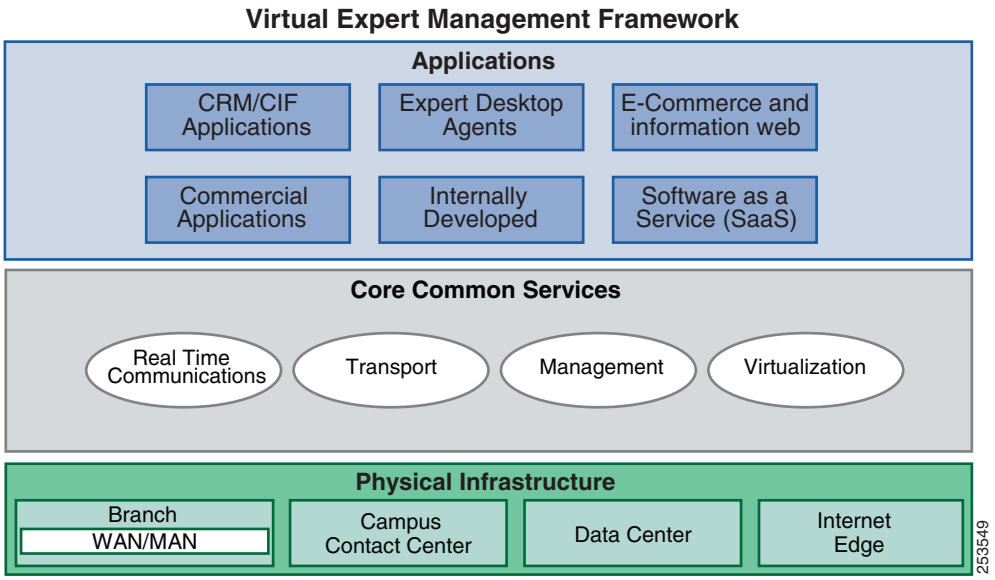
The Collaborative Customer Experience solution portfolio is the result of Cisco's investment in extensive technology development and close partnerships with banking industry leaders. Cisco holds a unique position within the global financial services industry as the key IT-enabler for supporting next-generation banking communications, and forging closer connections between all bank employees, customers, and partners.

For more information about the Cisco Collaborative Customer Experience solutions, refer to the following URL: www.cisco.com/go/financialservices.

Solution Framework

Cisco's Collaborative Customer Experience solution portfolio is comprised of solutions that were developed and tested using Cisco's Collaborative Customer Experience business and technical architecture framework. This model depicts the relationships between applications and the network infrastructure. Figure 3-1 depicts The Virtual Expert Management solution framework which is divided into three functional layers: applications, core common services, and physical infrastructure.

Figure 3-1 Cisco's Collaborative Customer Experience 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 financial services institutions. Applications services are the connection from the Applications layer to the Core Common Services layer.

Core Common Services

The Core Common Services enable filtering, caching, and protocol optimization interaction 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, presence, etc.

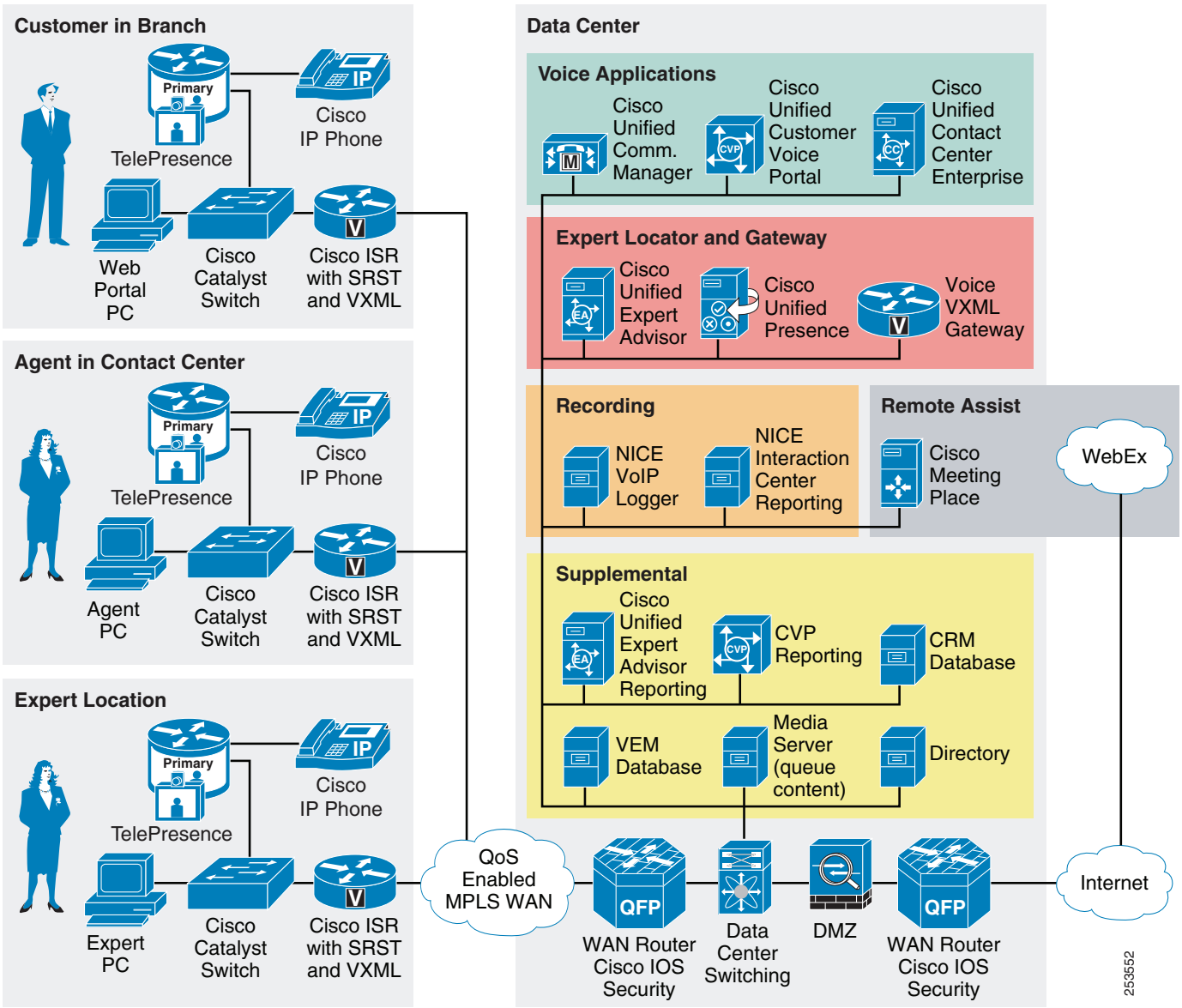
Physical Infrastructure

The Physical Infrastructure layer is where the physical infrastructure resides. This includes network routers, switches, ATMs, kiosks, and other peripheral devices used in banking. For more information about the Cisco Virtual Expert Management solution, refer to the following URL: www.cisco.com/go/retailbanking.

Virtual Expert Management Solution Architecture

The Virtual Expert Management solution is comprised of products from several areas of Cisco's Unified Communications product line, primarily Unified Contact Center Enterprise (UCCE). Cisco Unified Contact Center Enterprise provides the core call handling needed to receive and direct calls for the expert queue. Cisco 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 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 such as 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-TelePresence endpoints). Figure 3-2 depicts the logical relationship of the solution components.

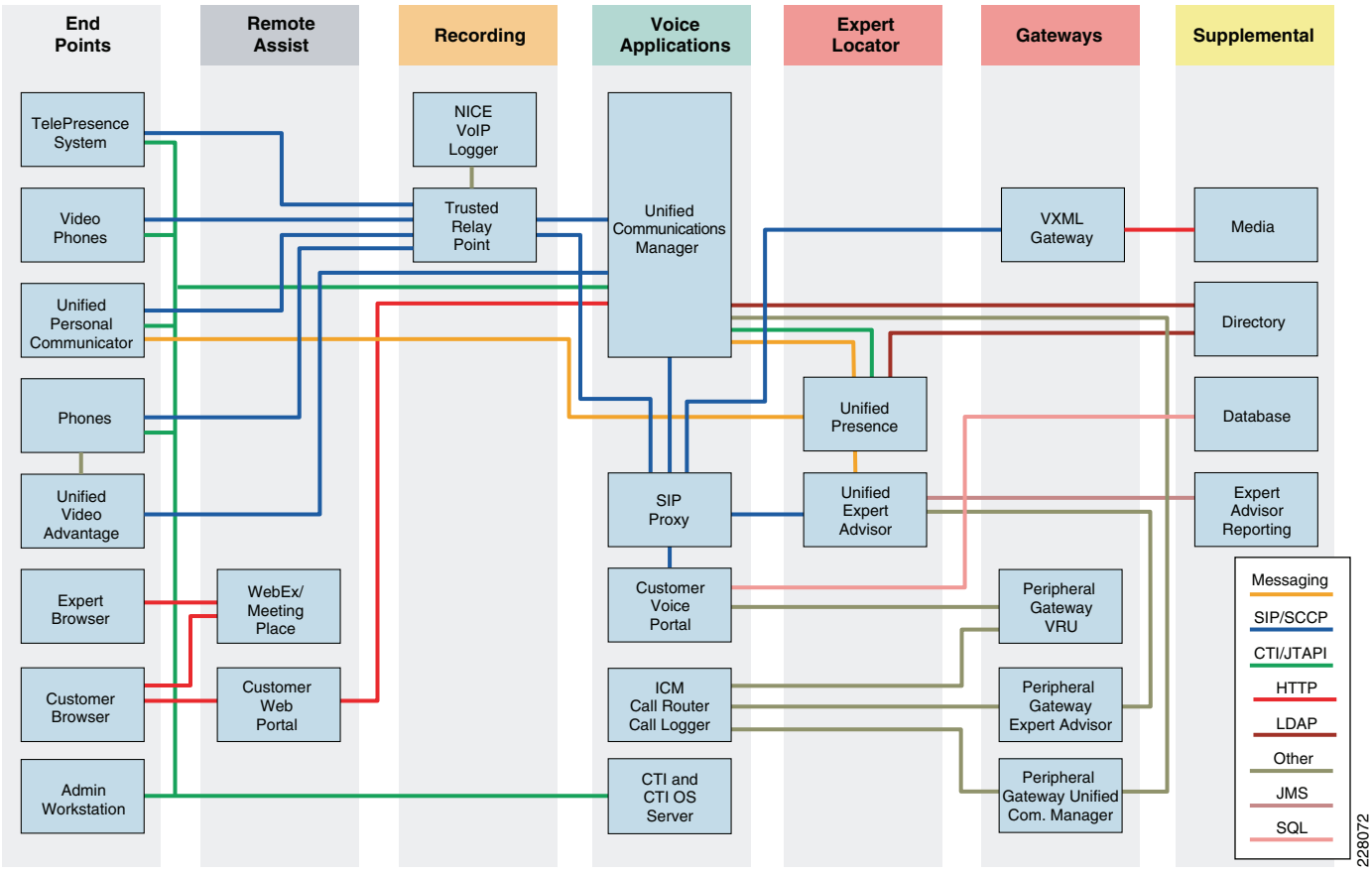
Figure 3-2 Virtual Expert Management Solution Architecture



Protocols and Services for Virtual Expert Management Solution

Virtual Expert Management is comprised of a complex set of systems located in the financial institutions' data center, with end points located where experts reside and customers interact with the institution. 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

Several 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 below.

Branch Endpoints

The Virtual Expert Management solution offers various alternatives for delivering a virtualized experience to end users, including 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. The scope of this document is based on validation in Cisco laboratories of several deployment models using several different endpoints.

Common to the two scenarios discussed 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 customer 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 customers 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 customer. Expert agents advertise their availability to the Cisco Expert Advisor system via their presence status in CUPC. On the customer stations, the CUPC customer 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 customer 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 customer. 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 customer 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 below.

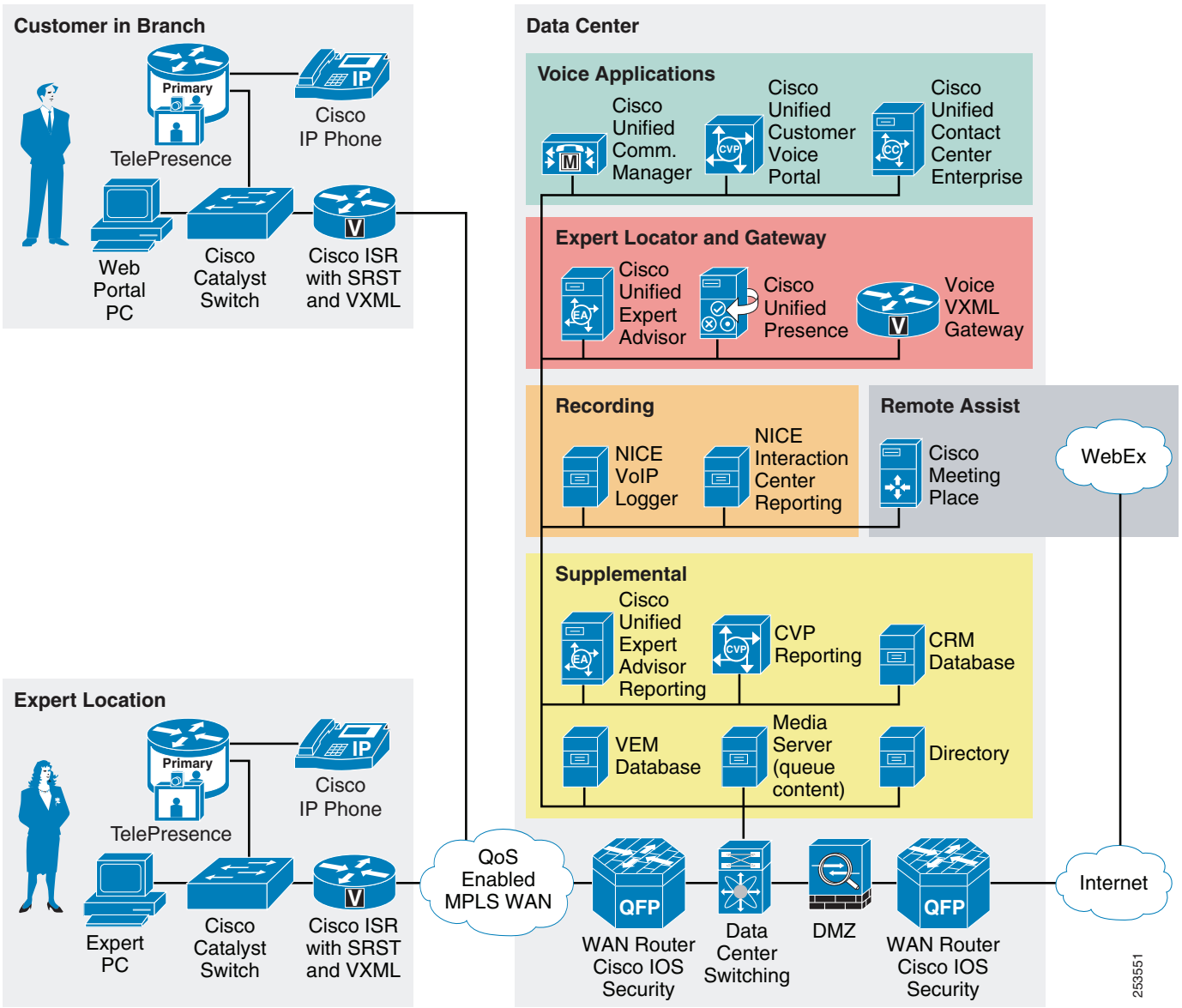
The validated endpoints include the following:

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

Cisco TelePresence

Cisco TelePresence System 500 (CTS500) 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 is 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 Branch-to-Branch or Other Location Using TelePresence

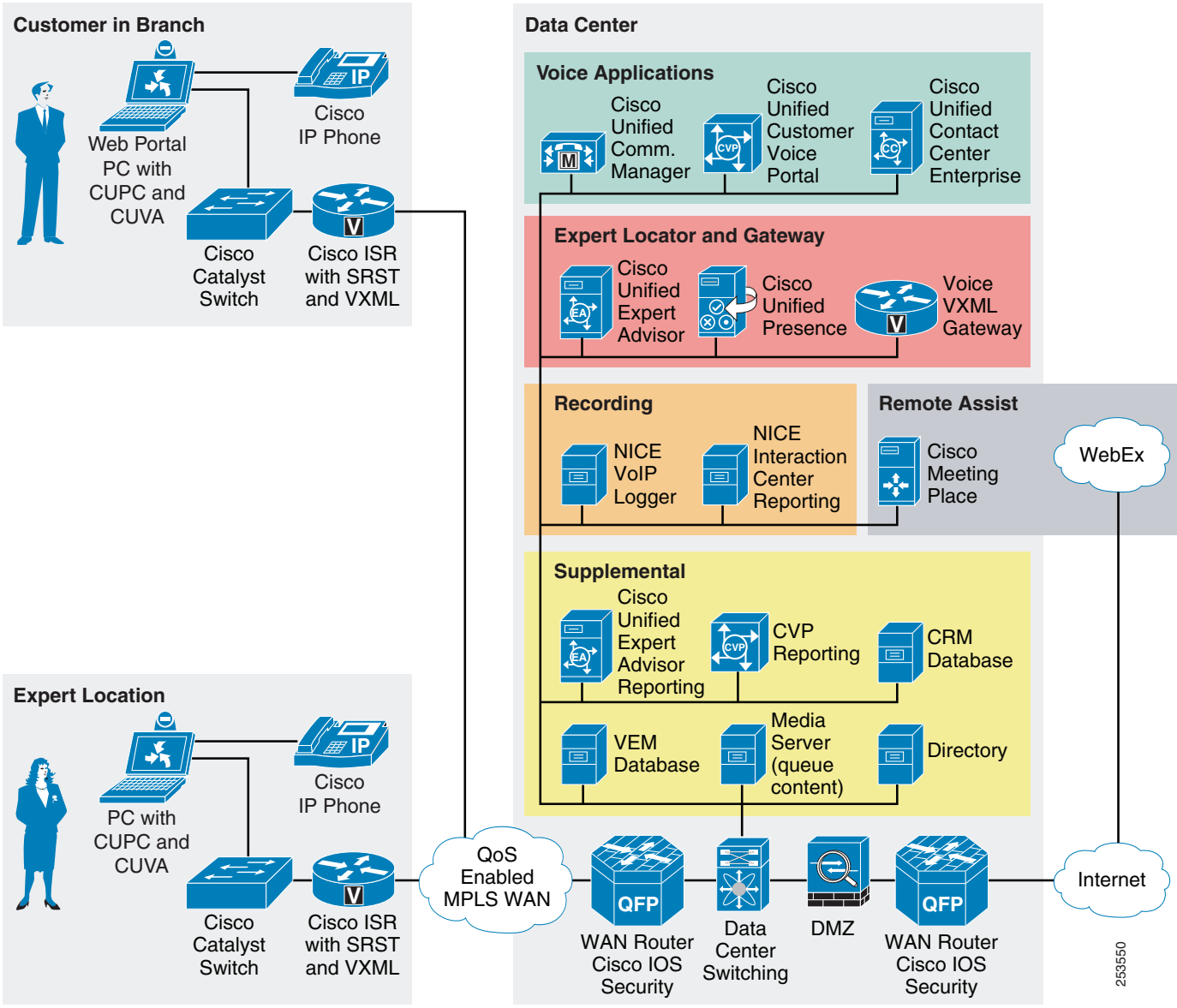


Cisco Unified Video Advantage

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 configurations are 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 4:3 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 Branch-to-Branch or Other Location 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

The Data Center Components and Services enable experts to be configured, located, and accessed. 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, a financial institution enters the customer's phone number, account number, or customer ID. 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) customer 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) customer; for example, available or away. The expert advisor IM customer 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 customer instead of an agent desktop. IM customers 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 customer 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 requery 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 advisor* 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 called *CustomerName* can be created and mapped to a contact attribute Source (e.g., *PeripherialVariable1*), 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 (CUP) Server 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 customer. 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 customer. 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 customers when logging in and enable the instant meeting feature when communicating with other CUPC-enabled end customers. 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 customer 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 4-6). However, 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 branch customer station and instantly share the customers desktop. Cisco Webex Access Anywhere provides the 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 customer 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 customer. The CUPC customer is configured with the experts 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 customer. 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 customer 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 process 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 Financial Institution 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 customer and are assigned to various queues by a supervisor/manager. When a customer clicks on the remote support link, their browser loads a thin customer (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 call back to the customers entered phone number. The agent can then also share their desktop, or view the customers' desktop as desired. Upon completion of the session, the customer's 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 branch. 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 customer 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 customer. The CUPC customer 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 customer. 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 customer 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 branch 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, branches, trading floors, 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 customer-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

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

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* (starting on page 51) at the following URL:
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 include 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

Virtual Expert Management Database

A database with a table was created in SQL for correlating the customer's 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 simple database of just two columns 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 transaction. 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 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 customers. 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

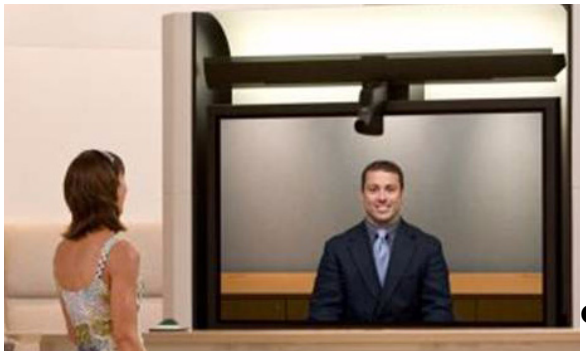
Peripheral Gateways

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 customers 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

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 customers 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.”



CHAPTER 4

Design Considerations

QoS Recommendations

Financial Institutions have many business applications that have different requirements for priority when traffic congestion occurs. A strategic QoS deployment will allow for an enhanced customer experience. Some applications will greatly disrupt the performance of other well behaved applications when they are erroneously deployed. The ability of the Financial Institution to successfully plan, implement and manage Enterprise scale QoS deployments is important. Improperly configured routers and switches are as big a threat to performance as rogue applications. Network staff should prioritize traffic by exclusion, meaning that they classify and prioritize the known important applications explicitly (e.g., voice, video and POS, leaving remaining traffic to participate in the best effort queue.

Financial Institution and service providers are encouraged to adopt RFC 4594 provisioning recommendations with the aim of improving QoS consistency, compatibility, and interoperability. Since these are guidelines and not standards, modifications can be made to these recommendations as specific needs or constraints require. A summary of Cisco's implementation of RFC 4594 is presented in Table 4-1.

Table 4-1 Cisco Differentiated Services (DiffServ) QoS Recommendations for Medianets

Application Class	Per-Hop Behavior	Admission Control	Queuing and Dropping
VoIP Telephony	EF	Required	Priority Queue (PQ)
Broadcast Video	CS5	Required	(Optional) PQ
Real-Time Interactive	CS4	Required	(Optional) PQ
Multimedia Conferencing	AF4	Required	BW Queue + DSCP WRED
Multimedia Streaming	AF3	Recommended	BW Queue + DSCP WRED
Network Control	CS6		BW Queue
Call Signaling	CS3		BW Queue
Ops/Admin/Mgmt (OAM)	CS2		BW Queue
Transactional Data	AF2		BW Queue + DSCP WRED
Bulk Data	AF1		BW Queue + DSCP WRED
Best Effort	DF		Default Queue + RED
Scavenger	CS1		Min BW Queue

The method of QoS used in the testing lab was based on the Cisco Enterprise Quality of Service reference design as shown in Table 3 - Cisco Enterprise Quality of Service.

For more information on QoS, see the following:

- Cisco Enterprise Quality-of-Service

  http://www.cisco.com/en/US/solutions/ns340/ns414/ns742/ns817/landing_voice_video.html
- QoS Design Recommendations for Medianets

  http://www.cisco.com/en/US/docs/solutions/Enterprise/Video/qosmrn.html
- Cisco TelePresence Design Guide - QoS

  http://www.cisco.com/en/US/docs/solutions/Enterprise/Video/tpqos.html
- Network Ports Used by Cisco Unified Personal Communicator

  http://www.cisco.com/en/US/docs/voice_ip_comm/cupc/7_0/english/release/notes/ol15710.html

Bandwidth Considerations

Each of the video options in the solution have differing bandwidth requirements which can dramatically affect the design and deployment scenarios. Table 4-2 provides a brief overview of the different requirements for each product.

Table 4-2 Bandwidth Requirements

Product / Platform	Bandwidth Audio & Video	Resolution	Frame Rate	Notes
TelePresence-500 Best	4128Kbps	1920x1080p	30fps	Best Quality
TelePresence-500 Better	3628Kbps	1920x1080p	30fps	Better Quality
TelePresence-500 Good	3128Kbps	1920x1080p	30fps	Good Quality
TelePresence-500 Best	2378Kbps	1280x720p	30fps	Best Quality
TelePresence-500 Better	1628Kbps	1280x720p	30fps	Better Quality
TelePresence-500 Good	1128Kbps	1280x720p	30fps	Good Quality
TelePresence-500 Lite	936Kbps	1280x720p	30fps	Extended Reach
Video Advantage	384-1500Kbps	352x288,320x240, 176x144, and 160x120	up to 30fps	
CUPC Video	384-512Kbps	352x288 / 176x144	up to 30fps / 15fps	
Cisco 9900 Series Phones	up to 1000Kbps	up to 640x480	30fps	
Cisco 7985 Series Phones	up to 768Kbps	352x240	30fps	
Cisco WebEx	384Kbps	320x240	7-15fps	

Table 4-2 represents raw bandwidth requirements and also needs to accommodate additional IP overhead.

For more information on Cisco TelePresence resolution and bandwidth, refer to the following URL: http://www.cisco.com/en/US/docs/solutions/Enterprise/Video/tpover.html#wp1043742

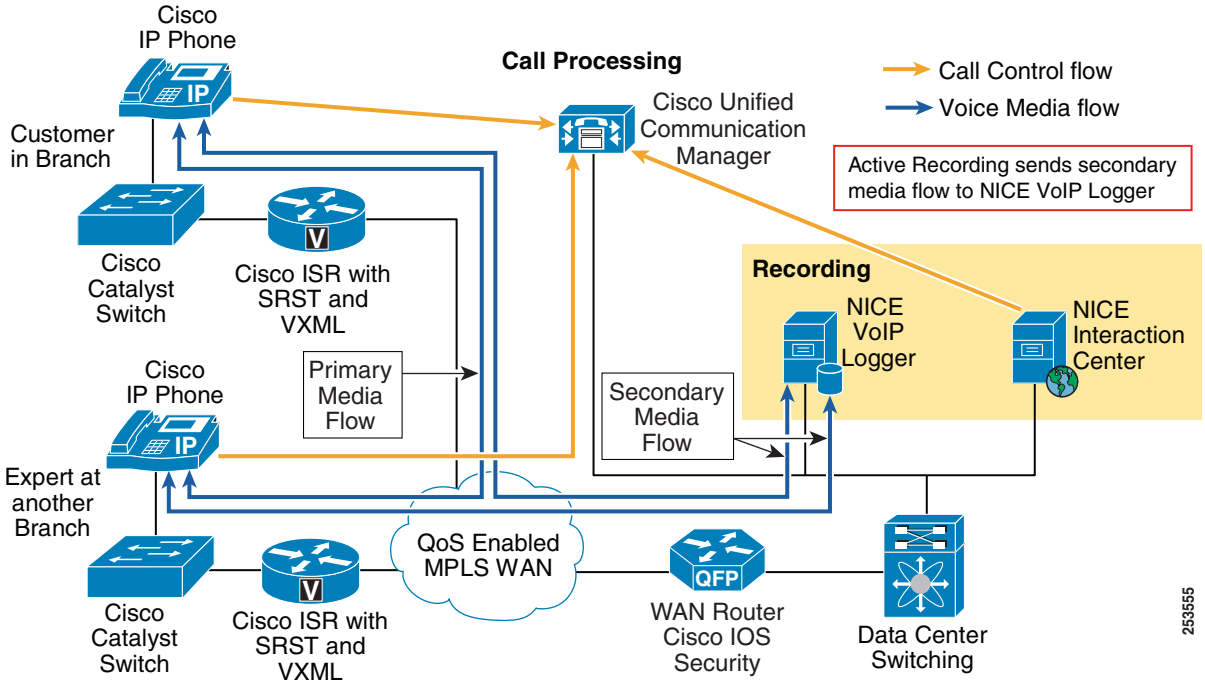
NICE Perform Release 3.2

NICE Perform can support many methods of recording including distributed, centralized and active recording. This solution validated the functionality of both centralized recording using a trusted ready point and monitor port as well as active recording, a feature on newer Cisco 7975, 7965 and 7945 series phones.

Active Recording

When the customer talks to the expert agent, the Cisco Unified Communications Manager (CUCM) sets up an additional call between the agent's phone and the NICE VoIP Logger. The voice itself is replicated at the phone's BIB (Built in Bridge) and sent to the VoIP Logger IP address. Figure 4-1 shows the call flows for call control and the media flows between devices and the NICE VoIP logger.

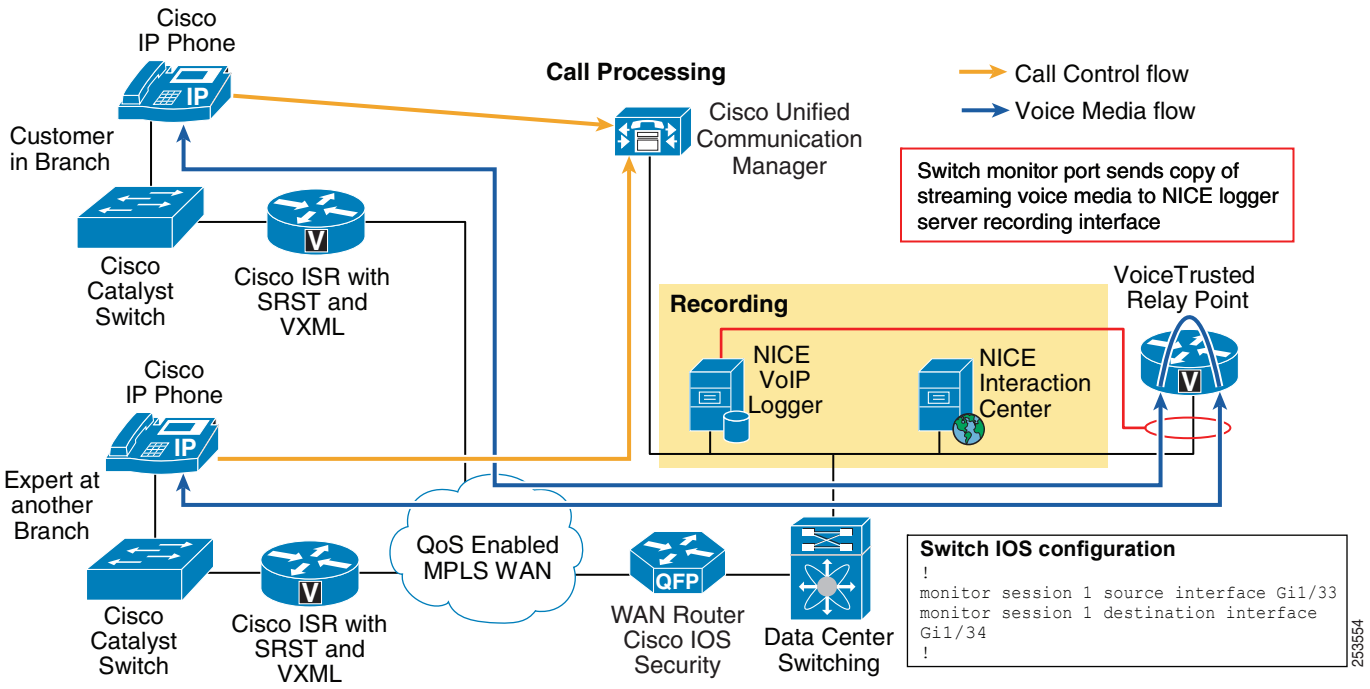
Figure 4-1 Active Recording to NICE VoIP Logger in Data Center



Centralized Recording

When the customer talks to the expert agent, the Cisco Unified Communications Manager (CUCM) routes all calls for these stations through a trusted relay point. The voice itself is then replicated at the switches interface port of the trusted relay point and sent to the VoIP Logger monitoring interface. Figure 4-2 shows the call flows for call control and the media flows between devices.

Figure 4-2 Passive Recording via Trusted Relay Point in Data Center



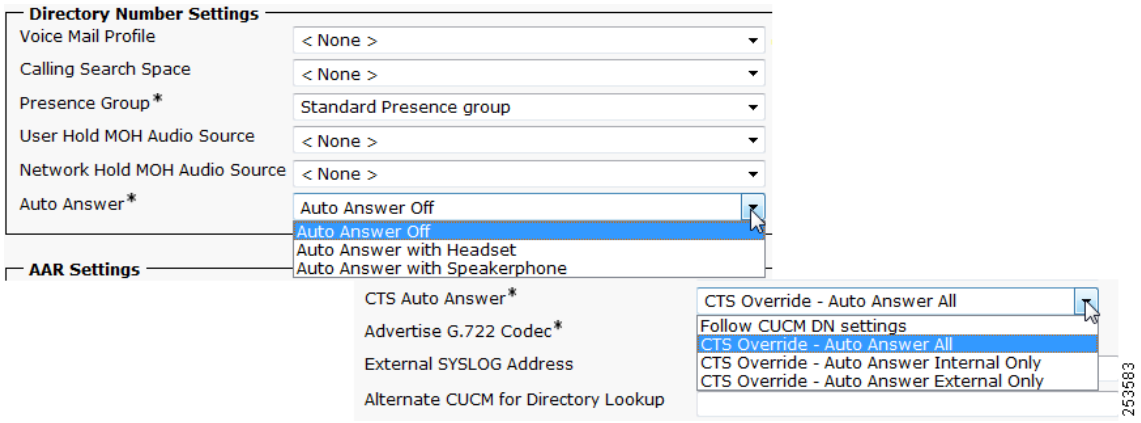
Lessons Learned

TelePresence Lessons Learned

The video portion of a TelePresence call will not work with a regular deployment when following the configuration guide *Cisco Unified Communications Manager Configuration Guide for the Cisco TelePresence Systems* http://www.cisco.com/en/US/partner/docs/telepresence/cucm_cts/1_6/configuration/guide/cucm_cts_1_6.html.

In the above guide, the directory number used by the CTS unit and associated 7975 handset is a shared line. Within the installation steps, the directory number is specified to be configured as **Auto Answer with Speakerphone** in the Auto Answer drop-down menu. This configuration causes problems when calls are routed over SIP trunks to other systems (e.g., between Call Manager clusters to CVP queue, etc.). The Cisco 7975 phone will auto answer before the CTS unit as the transferred SIP call will appear as an audio-only call. In order to have the CTS unit answer the call and perform a reinvite, adding video back to the call between the endpoints, the directory number must be configured with **Auto Answer off** and in the CTS unit Product Specific Configuration Layout section of the CTS device configuration set the CTS Auto Answer drop-down menu to **CTS Override - Auto Answer All**. See Figure 4-3.

Figure 4-3 Configuring Directory Number



Trusted Relay Point for Calls

The Cisco Unified Communications Manager enables the insertion of trusted relay points (TRPs). The insertion of TRPs into the media path is most often used in a network virtualization environment and when QoS enforcement is needed. In the Cisco Virtual Expert Management solution, the TRP is used to reroute the media stream from the call endpoints and force them to flow through the TRP. On the switch port where the TRP connects a SPAN session is created to mirror all traffic to the NICE recording server. This is a cost-effective way to implement a centralized recording solution for non-encrypted audio calls on devices that do not support duplicate audio streams (e.g., Cisco 7985, 7960, etc) like the newer Cisco 7975 phones. With proper decode codec support on the recording server, even TelePresence calls can be recorded. A TRP can be configured on Cisco ISR routers with Voice IOS software. A typical TRP configuration in IOS would look as follows:

```
!
sccp local FastEthernet0/0
sccp ccm 192.168.45.182 identifier 1 version 7.0
sccp
!
sccp ccm group 1
associate ccm 1 priority 1
associate profile 1 register MTP-01
!
dspfarm profile 1 mtp
codec g711ulaw
codec pass-through
maximum sessions software 110
associate application SCCP
!
```

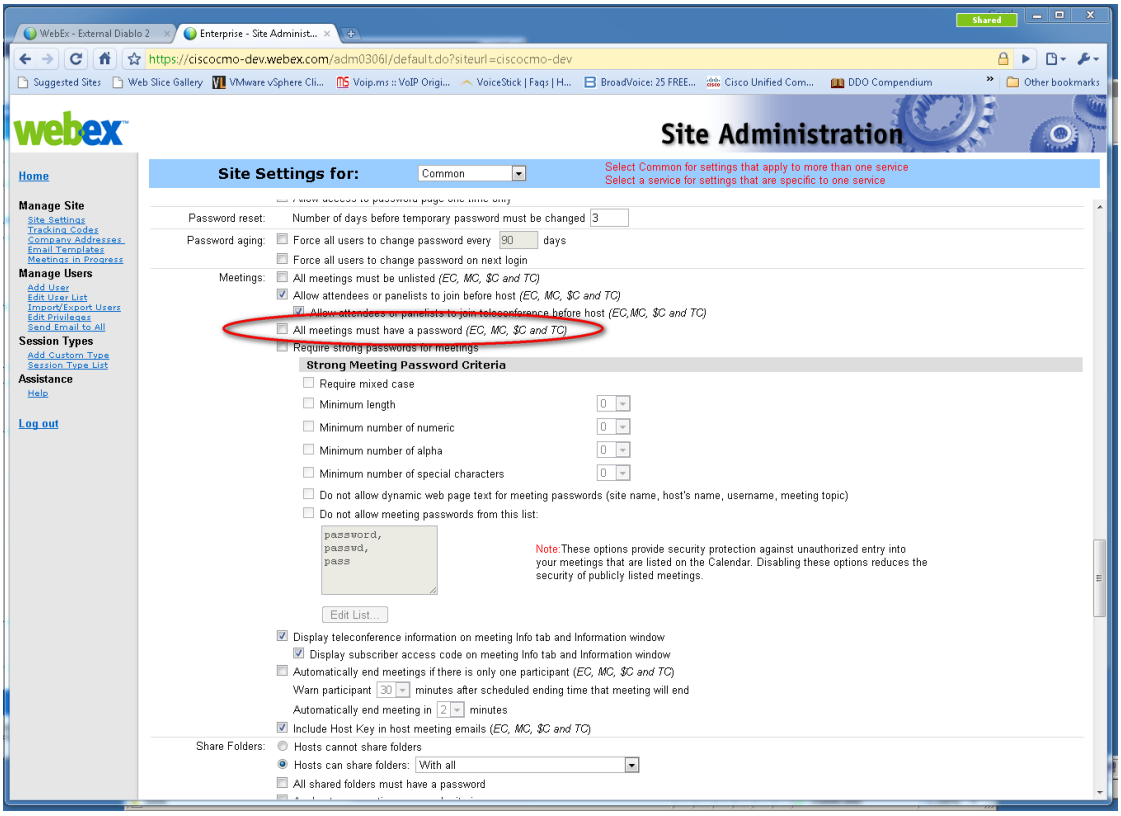
Once the TRP is configured, a Media Termination Point (MTP) is added to the CallManager under the Media resources menu. The MTP name must match the register name specified on the TRP. After the TRP is configured and registered, each phone can be configured to use the TRP individually or based on a device pool.

For more information on configuring TRPs and MTPs, see Media Resources in *Cisco Unified Communications Manager System Guide for Cisco Unified Communications Manager Business Edition, Release 7.1(2)* at the following URL: http://www.cisco.com/en/US/docs/voice_ip_comm/cucmbe/admin/7_1_2/ccmsys/a05mtp.html#wpxref35934

CUPC Instant Meetings

One of the primary advantages of using CUPC customer over other IM services is the ability to start an instant meeting with the other party of a VEM session. When a customer call is passed from the expert queue to the Expert Agent the CUPC customers on both systems share call information and enable the start of an instant meeting using either Cisco MeetingPlace or Cisco WebEx Meeting. When using Cisco WebEx Meeting there are several configuration items that need to be taken into consideration. The CUPC customer does not use the stations proxy configuration settings when launching a meeting. If your enterprise uses a proxy when connecting to Internet sites, special considerations need to be taken for connecting to the WebEx meeting servers. Additionally, version 7.02 and later of the CUPC customer is not able to dynamically generate a meeting password for instant WebEx meetings. Consequently, when using CUPC the requirement for a meeting password in the WebEx site administration must be disabled to use WebEx meetings for collaboration in the Virtual Expert solution. See Figure 4-4.

Figure 4-4 Instant Meetings



Summary

Retail banks that want to deliver enhanced product expertise or specialized services could benefit from implementing the Virtual Expert Management Solution. It performed well in face-to-face consultation through video, voice and content sharing between branches with the most appropriate subject matter expert. Its ability to locate and seamlessly connect experts across the enterprise using skill based routing and presence availability enabled branches to capture the same business opportunity without deploying subject matter experts at every branch. The Virtual Expert Management solution helps retail banks differentiate themselves by redefining superior customer service expertise.

Partner Profile

NICE Solutions for Financial Institutions

Complying with regulations, improving customer retention, and enhancing operational efficiency is critical in today's complex business environment. Achieving these goals while reducing expenses in a tough economic climate is no easy task. To empower organizations and attain these business objectives, NICE has developed a set of innovative enterprise solutions for contact centers, branches (including home agents and backoffice operations), and trading floors.

NICE's enterprise solutions deliver the powerful tools necessary to address critical business needs including the following:

- Compliance and risk management
- Customer retention and insight
- Operational efficiency

For more information about the NICE Solutions refer to the following URL:
http://www.nice.com/solutions/enterprise/index.php

IP Phone-Based Active VoIP Recording

NICE active VoIP recording enables the delivery of centralized recording capabilities in distributed environments. All NICE Perform servers are consolidated in the data center, where all calls that take place in the organization's branches and other remote locations are recorded.

By reducing the need for costly branch set-up, administration, and management of recording servers, NICE helps to flatten the organization and enables simple, yet efficient handling of remote employees.

This IT-friendly technology makes active VoIP recording the ideal solution even for single-site operations. NICE's solution for IP-phone-based active recording for Cisco Unified Communications Manager (CUCM) is another component of NICE's extensive portfolio of active recording integrations.

Solution Benefits

Consolidation

NICE active recording for Cisco enables the centralization of the recording system in the data center, in a similar manner to the centralization of the CUCM servers. This allows the organization to benefit from reduced expenses and to enjoy both economies of scale and the lower support costs, thanks to simplified and consolidated administration, management, and maintenance.

IT Friendliness

Passive VoIP recording requires the use of mirroring (“SPAN”) sessions. These sessions have to be maintained for supporting moves, adds and changes of the telephony and data networks. This may conflict with organizations' IT policies. IP-phone-based active recording does away with the need for mirroring sessions, thus reducing the network management load on IT staff.

Lower Total Cost of Ownership

NICE offers a reduced footprint, industry standard servers, the highest number of recording channels per server, and advanced compression capabilities that reduce long-term storage volume and ensure lower ownership costs.

Freedom from Size Limitations

The NICE integrated recording solution meets the recording needs of all sizes and kinds of business, from small enterprises recording a few dozen phones to large single-site and multi-site operations with tens of thousands of phones.

Cohesive, Integrated Solution Suite

NICE meets all the organization's call recording requirements. The same system can support all recording modes—Total recording, user initiated recording-on-demand, and rule-based recording, including sampled recording for quality management in contact center environments.

NICE offers a unified solution for recording in mixed telephony environments, specifically where CUCM is serving the back office of a financial trading floor while a turret system is being utilized in its front office.

Improved Operational Control

NICE offers organizations better control by means of centralized administration, recording and playback. All the operational and administrative activities can be performed over the network.

High Security

Extensive privilege-based user access mechanisms provide full control of user operations, while an integral audit trail provides detailed information of user activity.

Unlimited Storage

In addition to off-line storage capabilities, NICE's integration with leading enterprise storage management vendors enables centralized archiving with seamless on-line media access.

Theory of Operation

NICE Perform Architecture

The NICE Perform solution is composed of four main elements:

- Interactions Center

  The Interactions Center connects to the CUCM CTIManager using TAPI (or to the Cisco Unified Contact Center Enterprise CTI Gateway in contact center environments) for receiving call events. It implements recording rules, handles recording requests and controls the loggers.

- Loggers

  The VoIP loggers capture and record the voice packets.

- Database

  The Database maintains the call details and the system's administrative information.

- Application Server

  The Application Server provides access layer for the system to the end user applications. The system's elements may be consolidated in a single server or a pair of servers, or distributed among several servers, according to the scale of the solution.

Additional optional elements include screen loggers for recording the screen activity of the users, a Storage Center for managing long-term storage of the recorded data, and audio analytic servers for automated voice analysis.

Contact centers can take advantage of the advanced NICE SmartCenter solution. NICE SmartCenter provides organizations with capabilities to improve performance at the agent, operational and enterprise levels. This solution drives contact center and enterprise performance by leveraging the synergies of the combined capabilities of NICE's offering for interactions capture, quality management, interaction analytics, workforce management, performance management, coaching, and customer feedback; each the leading solution in its category, unified within a Service-Oriented Architecture (SOA) framework, providing powerful functionality with maximum flexibility.

Phone-Based Active VoIP Recording

One of the new features Cisco Unified Communications Manager (CUCM) version 6 had introduced is an integration capability for providing IP phone-based recording. Cisco IP-phones are capable of forking the received and transmitted voice traffic in two separate Real Time Protocol (RTP) streams. NICE Perform uses SIP trunk in order to connect to the CUCM cluster. Over this SIP trunk the CUCM and the NICE Interactions Center exchange SIP messages which direct the recorded calls from the IP-phones to their destination—the VoIP logger.

Recording Modes

The NICE-Cisco phone-based active recording integration supports the following recording modes:

- Total Recording

  Total recording is used where all the calls need to be recorded. The recording session automatically establishes when an agent answers or initiates a call.

- Interaction-based recording, including record-on-demand or quality management recording programs.

  Interaction-based recording serves for recording specific calls. NICE Perform invokes the recording session for an active call through the CUCM CTIManager using TAPI. The trigger for recording calls in interaction-based recording may be a human recording request or a recording rule, based on the call's details.

The setting of the recording mode is based on directory numbers (DNs), and mixed recording modes are supported within the same system for different DNs. The recording capability is a CUCM administered feature. The phone's DN is configured as “Automatic recording” for total recording or as “Application-invoked recording” for interaction-based recording in the CUCM administration.

Recording Transparency and Tones

Even though the IP-phone actively participates in the recording process by sending out the audio streams, the recorded user does not receive any visual or audio indication that recording is taking place.

Note that in certain jurisdictions, a requirement exists to inform the calling or the called party by means of a specific tone that their call is being recorded. The IP phone is capable of inserting this notification tone, ensuring that the called or the calling party (or both) is notified that recording is taking place.

Supported Versions and Phone Models

IP-phone based active recording is supported by CUCM 6.0 and above. The recorded IP phones must be able to fork media. The supported models are Cisco third-generation IP phones: 7906G, 7911G, 7931G, 7941G, 7941G-GE, 7942G, 7945G, 7961G, 7962G,7965G, 7961G-GE, 7970G, 7971G-GE, 7975G.

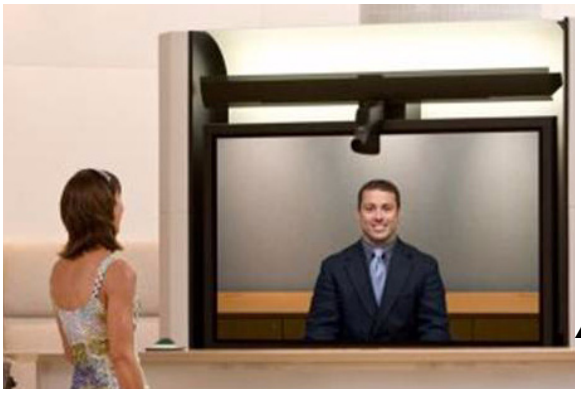
For earlier CUCM versions and for other phone models, NICE offers three recording methods:

- Passive VoIP recording
- Active VoIP recording-based on NICE's VoIP Recording Gateway
- Active VoIP recording-based on NICE's VoIP Recording Agent

The VoIP Recording Gateway is a network element that filters RTP traffic and forks it, sending the forked streams to the recording system. Distributed implementation of the VoIP Recording Gateway enables consolidation of the recording system servers, and is not dependant on CUCM version or phone models.

The VoIP Recording Agent is software that runs on a PC, capable of forking the RTP packets of a Cisco IP Communicator softphone or of a daisy-chained hard IP-phone. The VoIP Recording Agent then sends the forked streams to the VoIP logger, in a similar manner as the phone-based active recording.

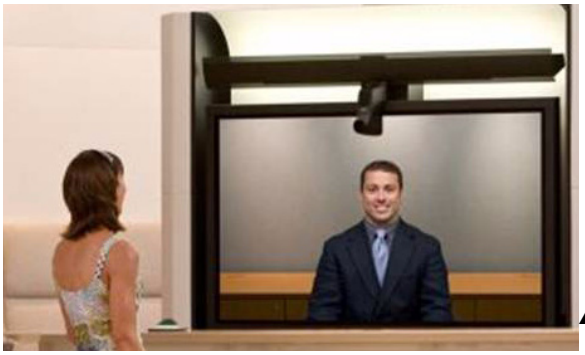
NICE Perform software migration paths are available once the CUCM system and phones are upgraded to support phone-based active recording. Where only a portion of the phones are of the models that support phone-based active recording, the rest of the phones can be recorded using any of the other above-mentioned methods. NICE Perform supports mixed recording methods in the same system.



APPENDIX A

Product List

Product / Platform	Software Release
Cisco Call Manager	7.1(2a)
Cisco Unified Contact Center Enterprise	7.5(5)
Cisco Customer Voice Portal Call Server	7.0(2)
Cisco Expert Advisor Runtime Servers	7.6(1)
Cisco Expert Advisor Reporting Server	7.6(1)
Cisco Unified Video Advantage	2.1(2)
Cisco Unified Presence Server	7.0(4)
Cisco Unified Personal Communicator Client	7.0(2)
Cisco TelePresence 500 systems	1.5.3(2115)
Cisco Media Conferencing Unit (MCU)	5.7(0)
Cisco MCU	
IOS XML Gateway	
Windows Workstation (Expert & Customers)	Windows 7 and XP w/sp3
Cisco WebEx	current
NICE Perform Recording Server	Release 3.2 Version 9.10.6.356



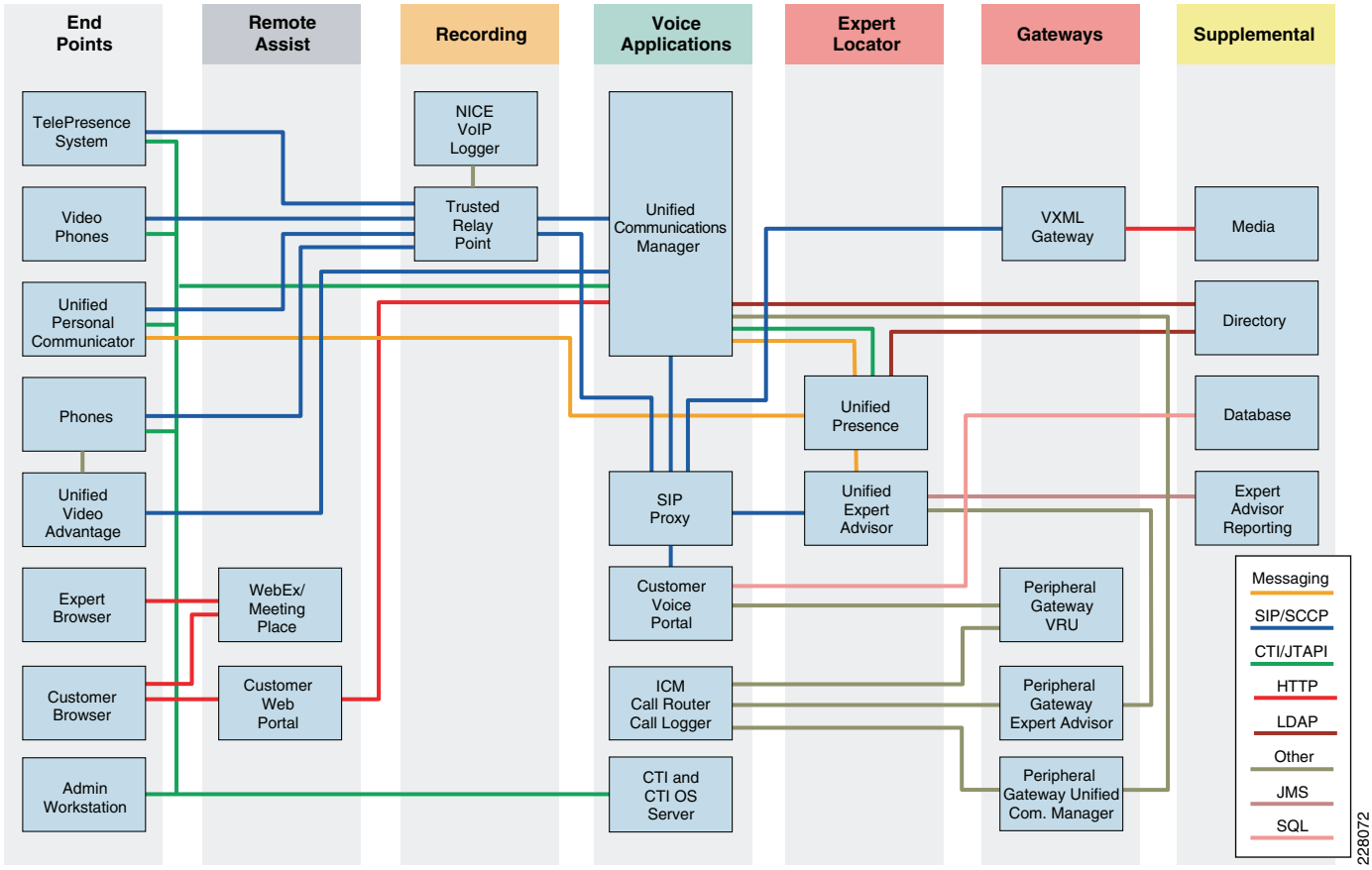
APPENDIX **B**

Quick Installation and Configuration Steps for Virtual Expert Management

Introduction

This section is based on internal guides created by Laurent Pham and Shahazd Ali. It has been expanded to include all VEM components, and updated to reflect the specific settings and items used in the validation lab. Figure B-1 depicts the components and endpoints that are covered.

Figure B-1 Virtual Expert Management Protocols and Services



Prerequisites

Cisco recommends that you should have knowledge of the following topics:

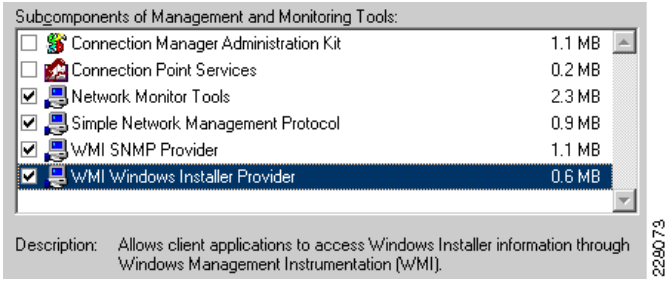
- Cisco Unified Communication Manager (CUCM)
- Cisco Unified Intelligent Contact Management (CUICM)
- Cisco Unified Cisco Voice Portal (CUCVP)
- Cisco Voice Gateways and VXML Gateways
- Cisco Unified Expert Advisor
- Cisco Unified Presence and SIP Proxies
- Cisco Unified TelePresence
- Cisco Unified Video Advantage
- Cisco Unified MeetingPlace
- Cisco WebEx Meeting
- Cisco WebACD
- Cisco WebEx Access Anywhere

Preparing the Environment

System Information

- This guide assumes that CUCM is installed and configured with appropriate endpoints. For a quick guide to install and configure CUCM with CVP and VXML GW, refer to the following URL: https://supportforums.cisco.com/docs/DOC-1374
- All domain controllers in your domain or forest must be running Windows Server 2003 with the domain functional level set to Windows Server 2003, thereby all domain- and forest-wide features needed are available.
- Before installing ICM software components, the computers must have the Microsoft Windows operating system—including SNMP and (for Windows 2003) WMI and, for some components, Microsoft SQL Server database management software installed. See Figure B-2.

Figure B-2 System Installer



- This installation includes setting up the Windows Active Directory services for ICM software. Setting up Active Directory entails adding the Cisco Root Organizational Unit, one Facility Organizational Unit, and one Instance Organizational Unit to the Active Directory Schema. These steps require domain admin-level access.

For more information, refer to the *Staging Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted* and the *SNMP Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted* at the following URLs:

http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_technical_reference_list.html

http://www.cisco.com/en/US/products/sw/custcosw/ps1001/products_installation_and_configuration_guides_list.html

CCE components that operate on Cisco IPT Windows OS 2003 Enterprise Edition must also have the following services installed and started:

- DNS Service—Required for AD
- Replication Service—Required for AD
- Task Scheduler Service—Required for ICM Installation
- Install WMI Windows Installer Provider—Required for ICM Router Installation
- NT LM Security Support Provider—Required for AD
- File Replication—Required for AD

The CUICM components Router, Logger, AW, PG, and CTIOS Server must communicate with the Active Directory server and join a domain. In this validation setup, the Active Directory Domain Controller and DNS Server are already set up and have been used in previous solutions. For more information on installing and setting up Active Directory, refer to the Windows 2003 server administration guides.

SQL server is a required component for the Logger platform. Installation of this software is covered in the *Staging Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted* referenced above.

ICM software requires Microsoft SQL Server databases on each Logger, Historical Data Server (HDS), and each Real-time Distributor Admin Workstation (SQL Server is not required for Client AWs). SQL Server must be installed on each of these computers before you install the ICM software.

Virtualization Support

Beginning with Cisco Unified ICM and Unified Contact Center Enterprise and Hosted Editions Release 7.5(3), servers can be consolidated by deploying a virtualization solution for Client Administrative Workstations (AWs) and certain Peripheral Gateways (PGs) on the VMware platform. For the virtualization requirements, mapping to discrete servers, and CPU processor and RAM requirements for each of the supported PG and Client AW virtual machines (VMs), refer to the latest version of the *Hardware & System Software Specification (Bill of Materials) for Cisco ICM/IPCC Enterprise & Hosted Editions*, available at the following URL:

http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_implementation_design_guides_list.html

Before you incorporate virtual machines into your contact center design and deployment, you must read through and follow the guidelines and restrictions described in the *Virtualization Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*, available at the following URL:

http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_user_guide_list.html

Other Unified ICM and Unified CCE components, such as the CallRouter, Logger, AW Distributor, HDS, WebView Server, and CAD Server, as well as the Cisco Unified Contact Center Management Portal (Unified CCMP), and Cisco Unified Intelligence Suite, are not supported in a virtualized environment at this time.

Hardware Components

The following are the hardware components of the IPCC laboratory system:

- Two Cisco 794x/796x/797x series IP phones as Expert Advisor user phones
- One MCS Server for CUCM
- Two servers running Windows 2003 Enterprise Edition for CUICM Enterprise Components in duplex mode:
  - Router
  - Logger
  - AW
  - CUCM PG
  - CVP VRU PG
  - CTIOS Gateway or CTIO PG
  - CTIO Server
- Windows 2003 Enterprise Edition-based server running the following CVP components:
  - CVP Call Server
  - CVP Media Server
  - Microsoft IIS Web Server
- One MCS server for Cisco Unified Presence
- One MCS server for Cisco Unified Expert Advisor
- Windows XP based agent PC
- Cisco 3845 Router
  - Ingress PSTN Gateway
  - VXML Gateway
- PSTN Simulator (CUCME gateway with cross over T1 PRI cable connected to CVP Gateway could be used)

Unified CCE 7.5(1) components are supported only on Cisco MCS or MCS-equivalent servers. For further specifics on hardware requirements including recommended platform sizing guidelines (not specific brands or models of servers), based on the types of available hardware systems, refer to the *Hardware and System Software Specification (Bill of Materials) for Cisco Unified ICM/Unified Contact Center Enterprise & Hosted, Release 7.5(1)* at the following URL:

http://www.cisco.com/en/US/products/sw/custcosw/ps1844/products_user_guide_list.html

Software Components

The software release is based on the system Release 7.1(3):

- Cisco IOS Software Releases 12.4(24)T1 Voice Feature Set on the VXML Gateway
- Cisco Unified Communication Manager version 7.1(3)
- Cisco Unified Presence Server 7.0(5)
- Cisco Unified ICM version 7.5(6)
- Cisco Unified CVP version 7.0(2)
- Cisco Unified Expert Advisor 7.6(1) SR1
- Cisco CTI Object Server 7.5(6)
- JTAPI Client version is CUCM bundled

Installation

The following component need to be installed:

- Install CUCM (Publisher and Subscriber)
- Install TelePresence endpoints
- Install CCE / ICM
- Install CVP
- Install CUP and CUPC Clients
- Install EA

Pre-requisite:

- Be familiar with CUCM, Unified CCE, and Unified CVP

Note This appendix does not cover the basic installation of Unified CCE and Unified CVP. It assumes you have basic knowledge of CUCM, Unified CCE, and Unified CVP.

CUCM Installation

- In VMWare environment, a minimum of 72 GB disk is required
- Version: 7.1.3.10000-11
- Make sure the CTI Manager and Cisco AXL Web services are running

CCE Installation

To install 7.5(6), l UCCE 7.5(1), many need to be installed first and then upgraded to 7.5(6) (the upgrade is available on cisco.com).

The full installation and design guidance for the Cisco Unified Contact Center Enterprise can be found in the *Cisco Unified Contact Center Enterprise Solution Reference Network Design (SRND)*. The system prerequisites are also covered in the *Staging Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*. For details, refer to the following URLs:

http://www.cisco.com/en/US/solutions/ns340/ns414/ns742/ns818/landing_contact_ctr.html

http://www.cisco.com/en/US/products/sw/custcosw/ps1001/prod_technical_reference_list.html

The ICM Setup program allows you to install, update, and configure your ICM software. It is located on your ICM CD. Run Setup on each machine in the ICM system: each CallRouter, each Logger, each Peripheral Gateway (PG), and each Admin Workstation. At initial installation, a local version of the Setup program is installed on each ICM component at **\icm\bin\ICMSetup.exe**.(On an Admin Workstation, the Cisco Admin Workstation group contains an icon for this program.)

In order to run Setup, you must be a local.

Installation of each of the ICM components is performed through the ICMSetup application. This application is located in the **ICM\bin** directory of the DVD as well as the ICM directory after an installation has already been accomplished.

After executing the ICMSetup program, the **ICM Component Selection dialog** box appears where the buttons used to install the components are displayed. The following components were used in the validation testing:

- Admin Workstation
- Router
- Logger
- Peripheral Gateway
- CTI Server
- CTI OS Server

About the ICM Setup Program

The ICM Setup program allows you install, update, and configure your ICM software. It is located on the ICM CD. Run Setup on each machine in the ICM system: each CallRouter, each Logger, each Peripheral Gateway (PG), and each Admin Workstation. At the initial installation, a local version of the Setup program is installed on each ICM component at **\icm\bin\ICMSetup.exe**. (On an Admin Workstation, the Cisco Admin Workstation group contains an icon for this program.)

In order to run Setup, you must be a local administrator and belong to the setup group for any instance that you are installing a component.

Note During the installation of the Central Controller and Administration and WebView Reporting, the ICM installer checks to see whether there is a Microsoft.NET Framework 3.5 installed. If it is not installed, Setup will install it. After the installation of the Microsoft.NET Framework 3.5, it might prompt you to reboot the system. If prompted, reboot the system and run Setup again.

About ICM Component Installation Order

You can install the various components in the order in which they are treated in this appendix. In general, there is a great deal of flexibility in the order of installation, provided that you know the names and locations for the various components beforehand. However, the following presents the standard approach:

Step 1 Install either the CallRouter or the Logger first. It does not matter in which order you install the CallRouter and Logger.

Step 2 Install both the CallRouter and the Logger before you install an Admin Workstation (AW).

Step 3 ICM Setup and Installation Guide Cisco Unified ICM/Contact Center Enterprise & Hosted 7.5(1)

Step 4 If you are using WebView, install it after you have installed the Real-time Distributor AW.

Step 5 Install the CallRouter, Logger, and AW before you install the Network Interface Controller (NIC) and Peripheral Gateway (PG), but it does not matter in which order you install the NIC and PG.

Step 6 Install the CTI Server after you have installed the CallRouter, Logger, AW, NIC, and PG.

Creating an ICM Instance

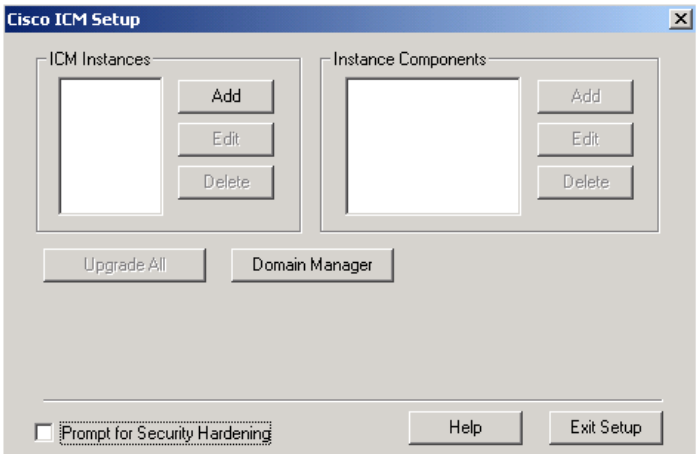
- Before any ICM components can be installed and ICM instance must first be created
- Before an instance can be selected the proper entries must first be created in the domain using the Domain Manager

Configure Domain Manager

Step 1 Start the Cisco Unified ICM installation by running the **ICMSetup.exe** application on the CD or local directory as appropriate.

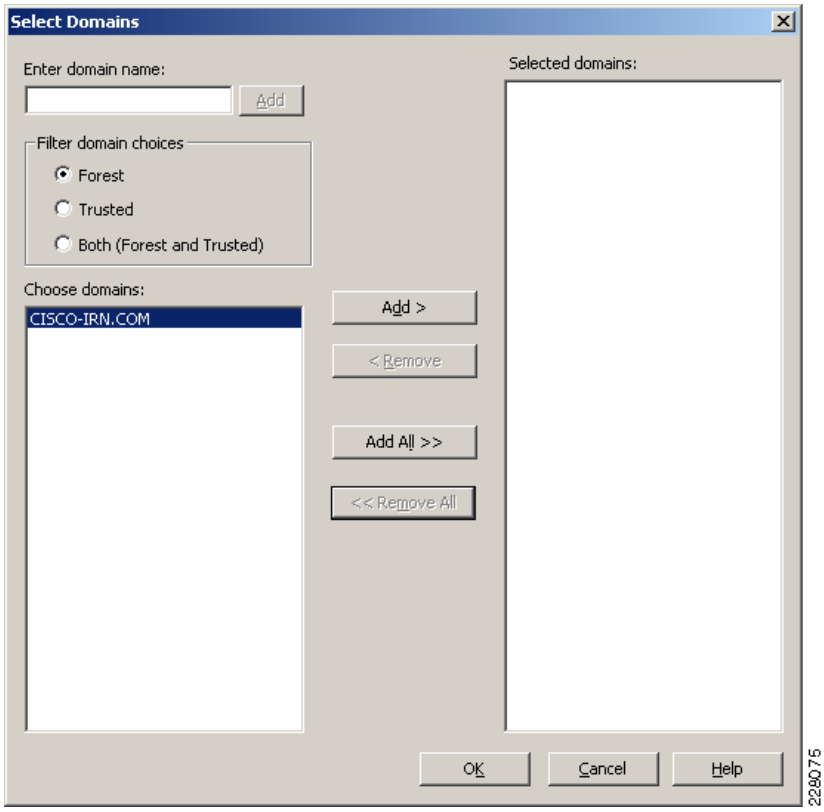
Step 2 Click the **Domain Manager**. See Figure B-3.

Figure B-3 Domain Manager



Step 3 Select the desired domain from the list on the left and click **ADD**, then click **OK**. See Figure B-4.

Figure B-4 Selecting Domain

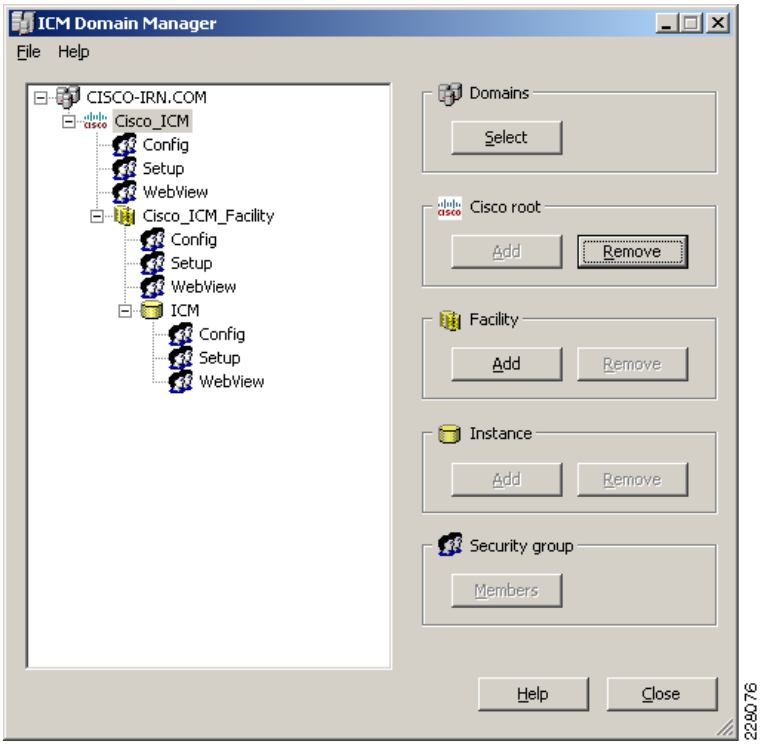


Step 4 After the domain is selected, click **Add** it under the Cisco root section. Enter an appropriate name such as **Cisco_ICM** and click **OK**.

Step 5 With the new root selected, click the **ADD** button under the Facility option. Enter an appropriate Facility name such as **Cisco_ICM_Facility** and click **OK**.

Step 6 Once the Facility has been added, select it and click **Add** under the Instance option. Enter an instance name such as **ICM** and click **OK**. See Figure B-5.

Figure B-5 Adding Instance Name



Step 7 After adding the root, facility and instances click ***close***. After the domain components have been created, you can then add the instance in the ICM setup.

At least one ICM instance must be added before you can install any ICM components.

Note Before you can create an ICM instance, you **must** have set up the Windows Active Directory services for ICM software. You must also have added the Cisco Root Organizational Unit, and at least one Facility Organizational Unit with one Instance Organizational Unit. Refer to the *Staging Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted*.

Step 8 In the Cisco ICM Setup dialog box, in the ICM Instances section, click **Add**. The Add Instance dialog box opens:

a. Select the network **Domain** for the instance.

b. Select the **Facility** Organizational Unit for the instance.

c. Select the **Instance Name** for the instance.

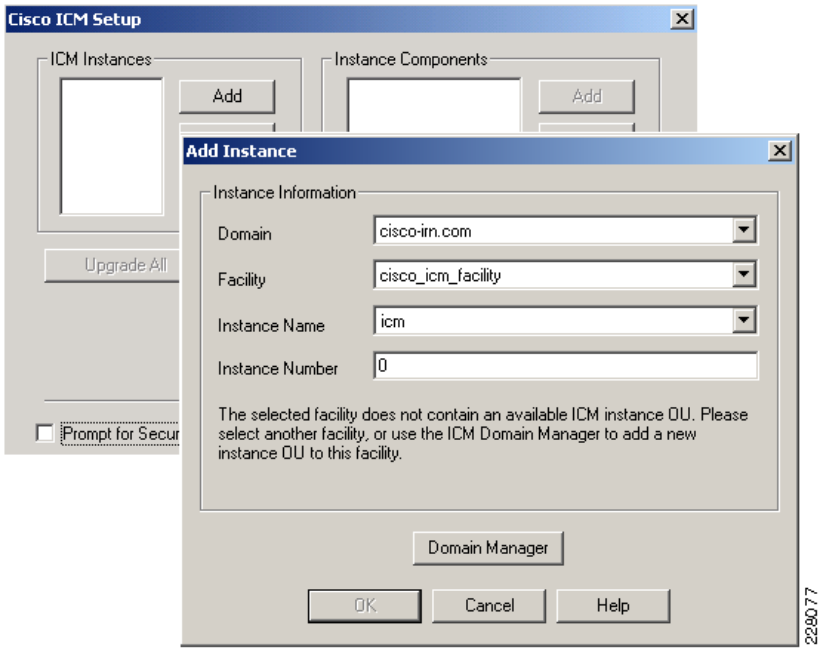
Note The ICM Instance Name is the name of the Instance Organizational Unit.

Use the **Instance Number** generated by the ICM software. (For standard single-instance ICM configurations, the instance number is 0.)

Note The mappings of instance names to instance numbers must be the same on every node in the system.

Step 1 Click **OK**. See Figure B-6.

Figure B-6 Creating an Instance



Step 2 You can now add ICM Instance components. First create and install Router and Logger ICM Servers. When installed together they are commonly referred to as a Rogger Server.

Refer to Chapters 5 and 6 of the *ICM Setup and Installation Guide* at the following URL:

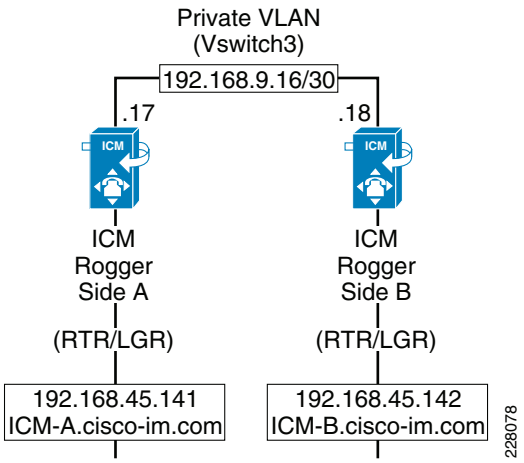
http://www.cisco.com/en/US/docs/voice_ip_comm/cust_contact/contact_center/icm_enterprise/icm_enterprise_7_5/installation/guide/icm75instl.pdf

Install the Router and Logger

Call Router Installation

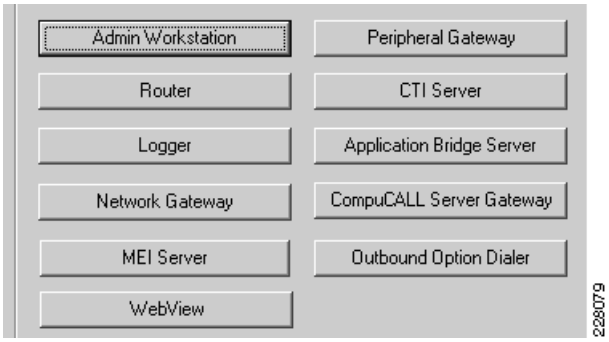
The CallRouter (generally referred to in this document simply as the *Router*) is the component that contains the contact routing logic and makes all routing decisions. It receives contact routing requests and determines the best destination for each contact. It also collects information about the entire system. This appendix explains how to install the CallRouter software and perform some basic configuration. For this configuration, you must know the visible and private network addresses (either host names or IP addresses) of the CallRouter and, for a duplexed configuration, the addresses of the CallRouter on the other side. The CallRouter and Logger are typically on separate computers. However, in small contact center configurations they can both be on the same computer. See Figure B-7.

Figure B-7 Router and Logger Servers



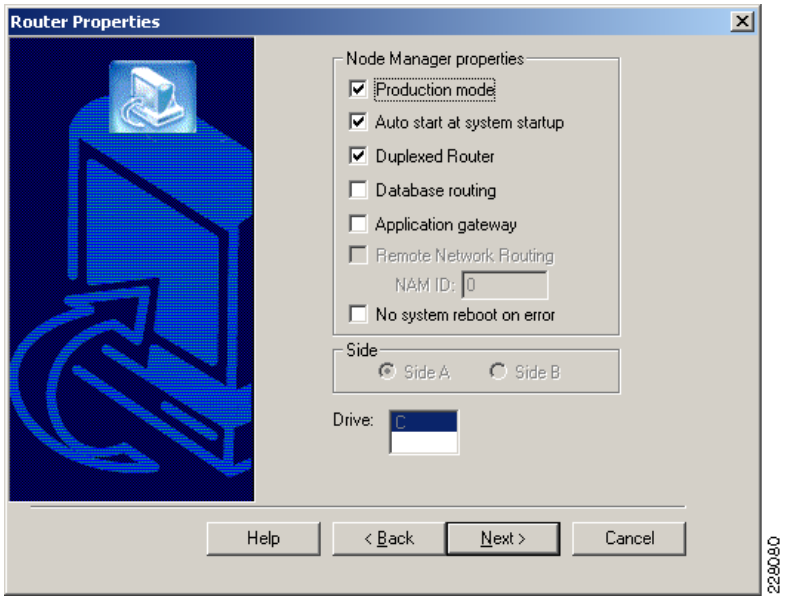
Step 1 In the ICM Setup application, click the **Add** button on the right under **Instance Components**. See Figure B-8.

Figure B-8



A new dialogue window will appear where you will be able to select the Router component. See Figure B-9.

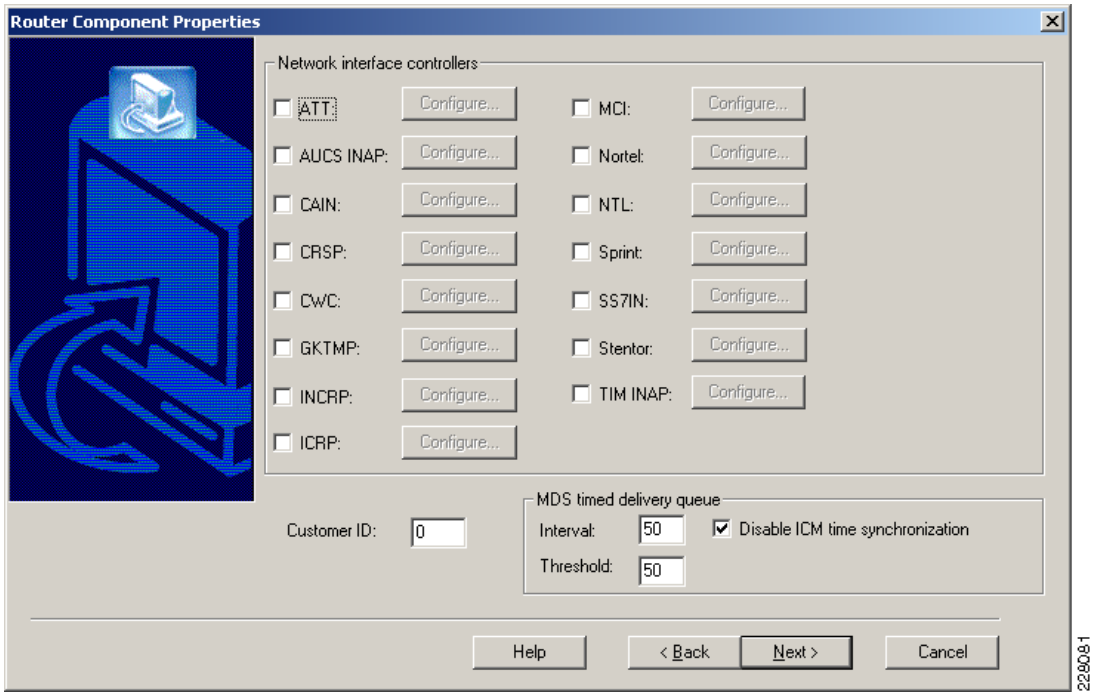
Figure B-9



Step 2 For high availability installations select the **Duplexed Router** option and click **Next**.

Do not select any Network Interface Controllers. Leave all the options as default. The Customer ID is insignificant for this solution. See Figure B-10.

Figure B-10

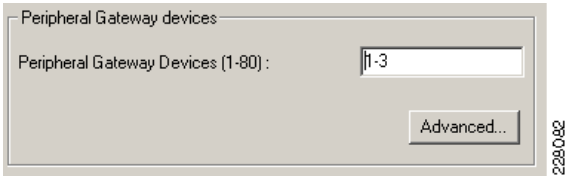


Step 3 Click **Next**.

For the lab validation, two peripheral gateways were used; one for CUCM and another as VRU PG for CVP and expert advisor.

The number of PGs must be entered as a range or comma separated list. For the two PGs, it could be entered as either "**1-2**" or "**1,2**". See Figure B-11.

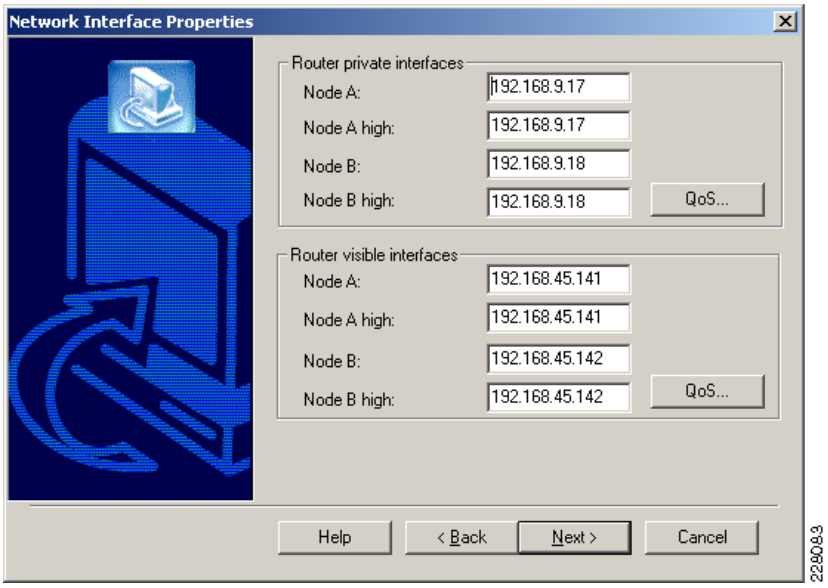
Figure B-11



Step 4 Accept the current settings and click on **Next** for the following screens.

It is best practice to use IP addresses rather the hostnames when identifying the public and private interfaces for the Router. The following image and other similar installation screens during CUICM component installation will be similar. See Figure B-12.

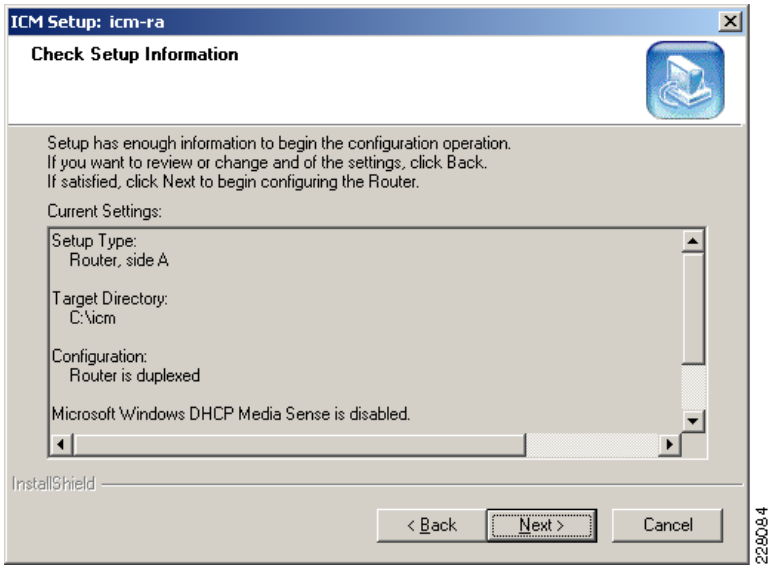
Figure B-12



Note If the CallRouter is simplexed, enter **localhost** in both the **B** and **B high** fields.

Step 5 After entering the Router interface IP addresses click **Next**. See Figure B-13.

Figure B-13



Step 6 At the ICM setup, review the installation settings and click ***Next*** to complete the installation of the Call Router.

Logger Installation

In the ICM Setup application, click the **Add** button on the right under "Instance Components". A new dialogue window appears where you will be able to select the Logger component. See Figure B-14 and Figure B-15.

Figure B-14

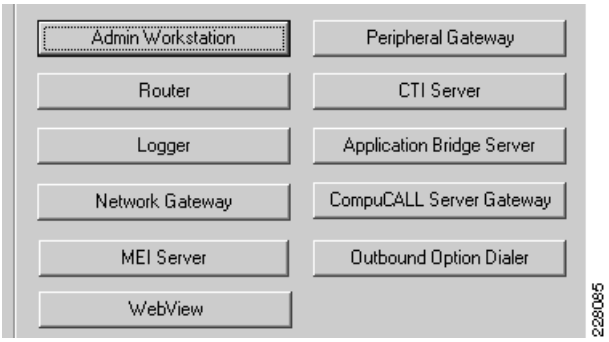
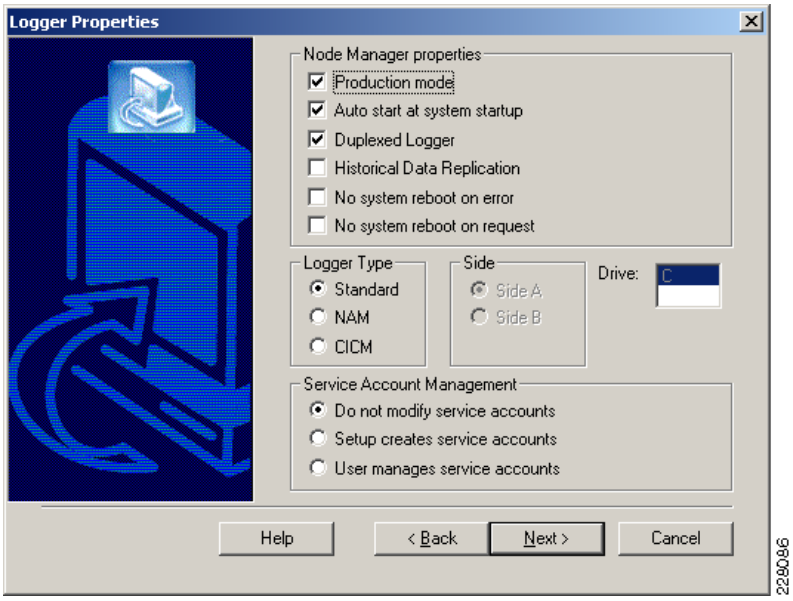
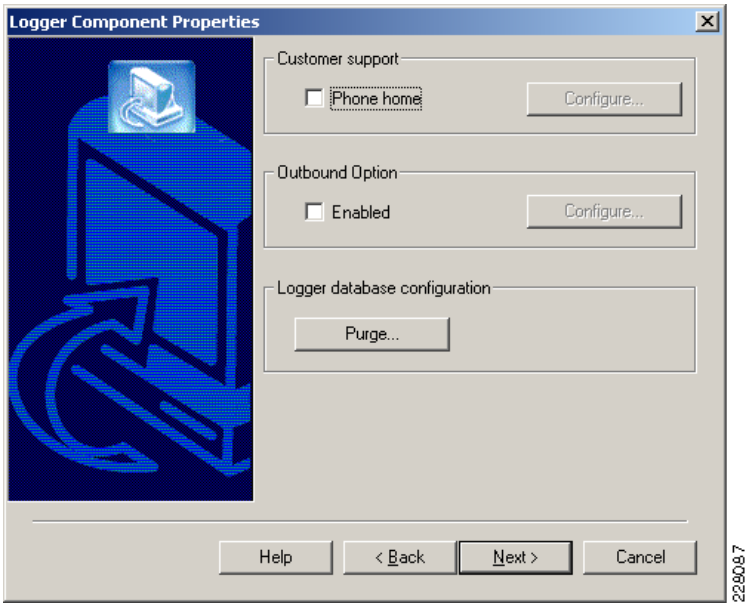


Figure B-15



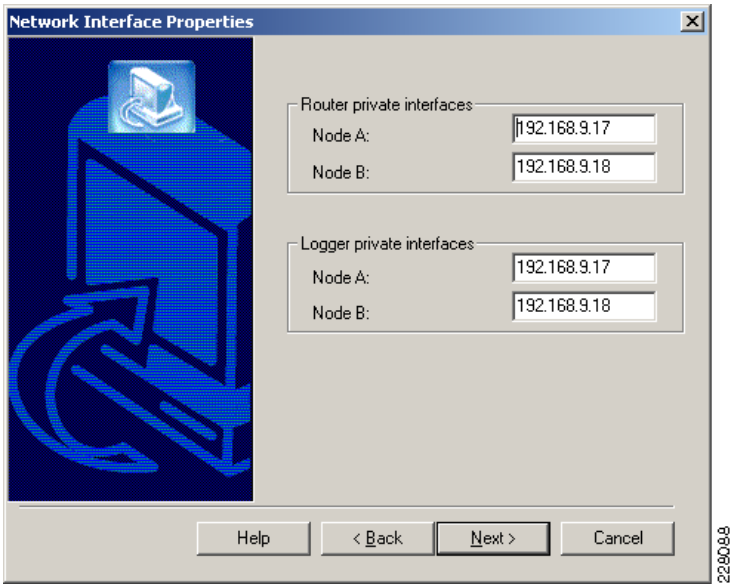
Step 7 Select production, Auto startup and Duplexed logger options, then click **Next**. See Figure B-16.

Figure B-16



Step 8 Click **Next**. See Figure B-17.

Figure B-17



Step 9 Configure the public and private Router and Logger interfaces using the IP address. Click **Next**.

Step 10 At the end of the ICM setup, review the installation settings and click **Next** to complete the installation of the Call Logger.

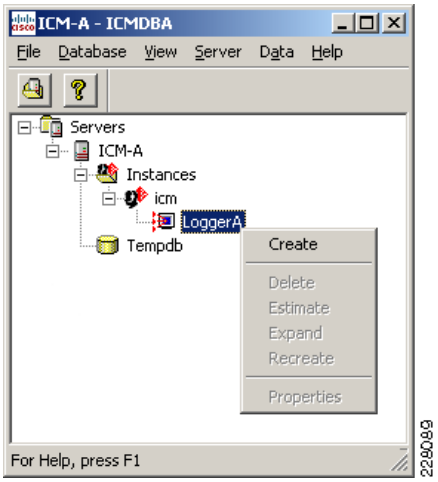
Create ICMDB on Logger

You must create a database for each Logger, it is best to do this before installing other components. To create the database and determine the appropriate size of the database, run the ICM Database Administration (ICMDBA) tool. This tool is installed on each ICM component that has an installed database (ICMDBA is in the **\icm\bin** directory) and on each Admin Workstation.

For more information on using the ICMDBA tool, refer to the *ICM Administration Guide for Cisco Unified ICM/Contact Center Enterprise &Hosted*.

Once the proper size is determined, run the **icmdba.exe** file from the local ICM directory to create and configure the new database. See Figure B-18.

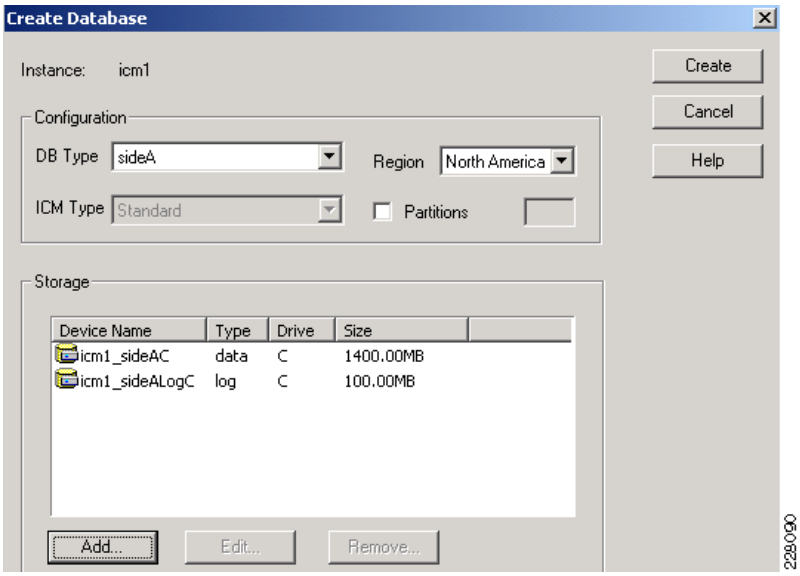
Figure B-18



If you are prompted that the SQL Server is not configured properly, click **yes** and then set the memory requirement to 0 and the recovery interval to 1. As this may have interrupted the installation process, you will see that no new database has been created. You need to once again select **Create** under the database option.

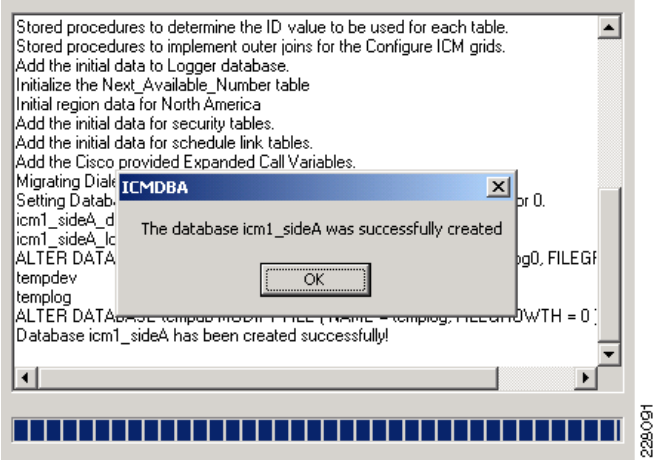
This time all the necessary changes have been made, you will be able to create the database. Now add the data and log databases to the list and create the database. See Figure B-19.

Figure B-19



You will notice a screen similar to screen shown in Figure B-20 and once the database is created successfully click **OK**.

Figure B-20

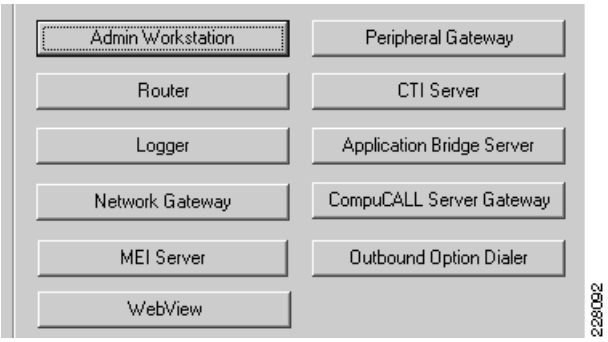


Installing the Admin Workstation

After completing the installation of the Router and Logger, the Admin Workstation can be set up. The Admin workstation is configured before the other PGs as it assigns the IDs needed for the Router, Logger, and PGs to communicate through.

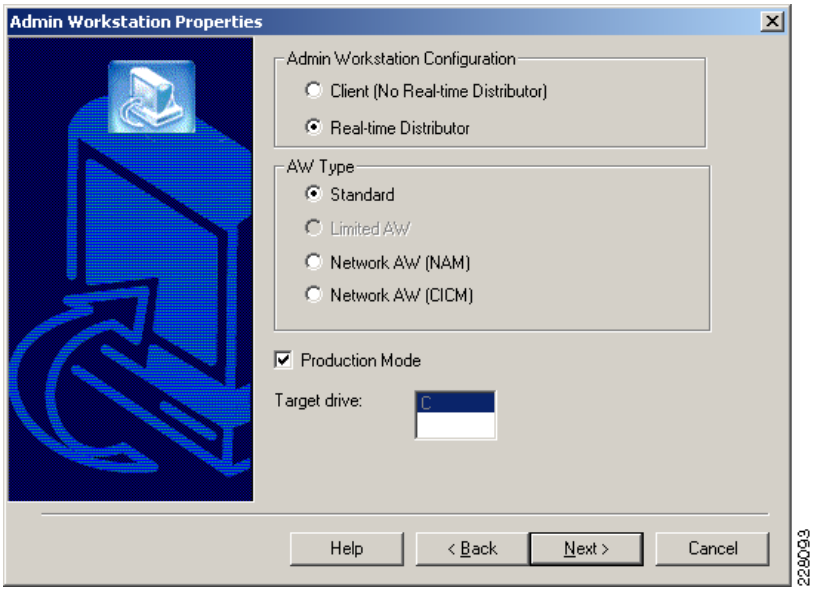
The Admin Workstation (AW) is the human interface to the ICM software. It serves as a control console where you can monitor agent and contact center activity and change how the ICM software routes contacts. For example, you can use the Admin Workstation to configure the ICM contact center data and to create routing scripts. Admin Workstations can be located anywhere, as long as they have LAN, WAN, or dial-up connections to the ICM software. Typically, the Admin Workstation is installed on a Windows operations console used by system administrators, not the Router, Logger, or other ICM server systems. It requires an SQL database and must be a member of the Active Directory Domain. See Figure B-21.

Figure B-21



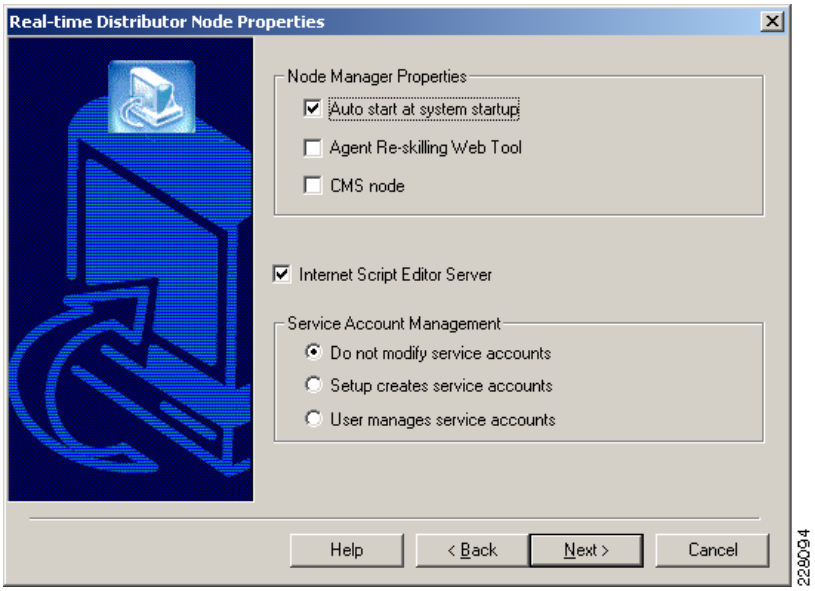
Step 1 From the ICM Setup applications, select **Add** for the ICM instance and then "**Admin Workstation**". See Figure B-22.

Figure B-22



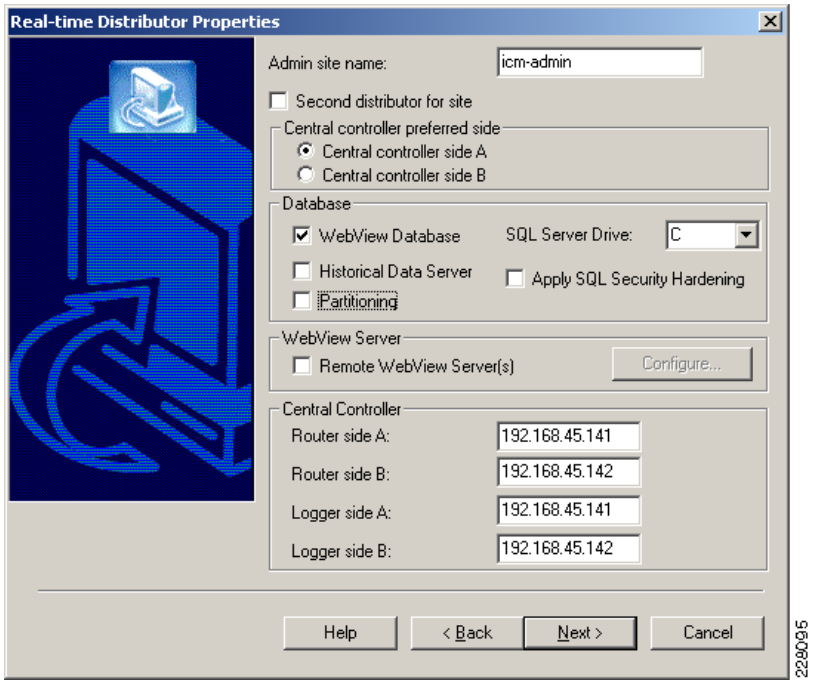
Step 2 Select **Next**. See Figure B-23.

Figure B-23



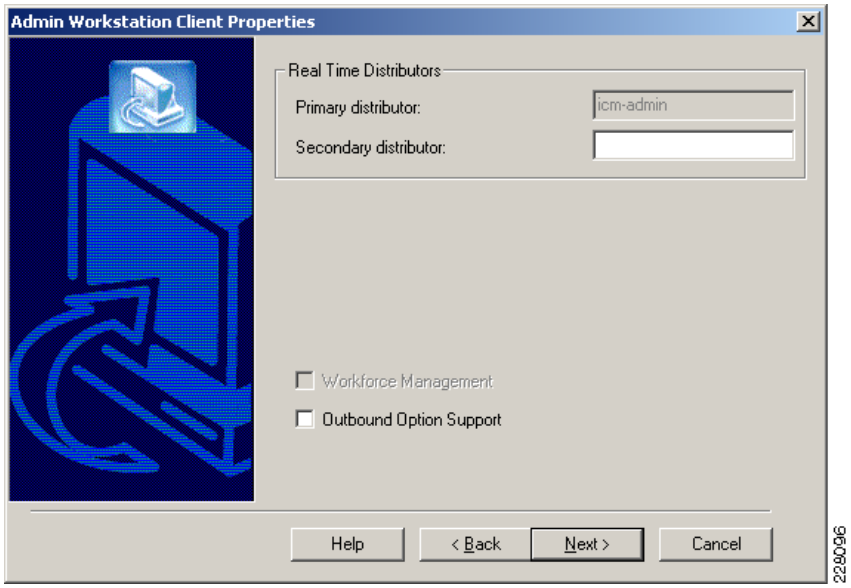
Step 3 Select **Next**. See Figure B-24.

Figure B-24



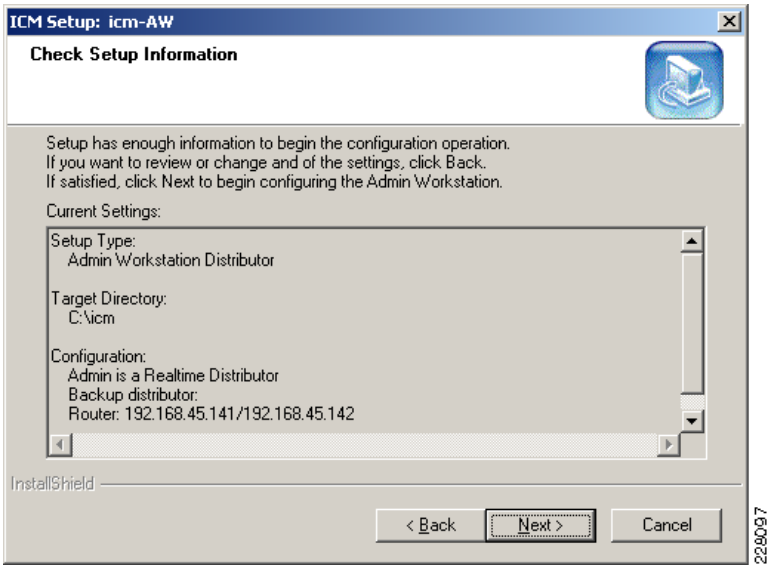
Step 4 Select **Next**.See Figure B-25.

Figure B-25



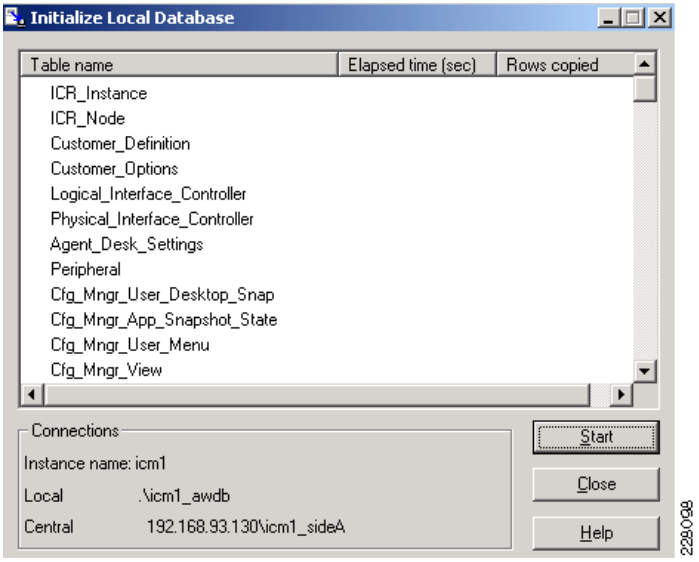
Step 5 Verify Setup parameters and select **Next** to finish. See Figure B-26.

Figure B-26



Step 6 After the AW installation is complete, you must initialize the local database. The initialize database dialogue will appear after the Admin Workstation module installation is completed. See Figure B-27.

Figure B-27



When you install a Distributor Admin Workstation, ICM Setup automatically sizes and creates a local database on the machine. Because this database is constantly overwritten by new data, the database size remains fairly constant. You normally do not need to resize the Distributor Admin Workstation (AW) real-time database. If you do need to resize the Distributor AW database, you can do so using the ICM Database Administration (ICMDBA) tool.

AW Configuration Manager CUCM PG Setting

Each peripheral communicates with ICM software through a Peripheral Gateway, called a PG. The PG is a computer that communicates directly with the ACD, PBX, VRU, or Call Manager at a contact center, monitoring status information from the peripheral and sending it to the ICM system's Central Controller. If the peripheral acts as a routing client, the PG sends routing requests to ICM software.

The PG can be a single-simplexed computer or a pair of duplexed computers. A single PG can service more than one peripheral; however, each peripheral uses only one PG.

Note Although a PG can consist of a pair of duplexed computers, only one of them is active at a time, so that ICM software sees it as a single logical and physical PG.

Primary CTI OS Server

Before adding the peripheral gateways to the CUCCE Servers, they must first be created in the Admin Workstation Configuration Manager. This generates the peripheral IDs that are necessary for the PG/PIM installations.

To create the peripheral gateways in Configuration Manager there must first be an Agent Desk Settings List entry as it is one of the required settings under a PG controller configuration.

Create a new Agent Desk Settings list as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **Agent Desk Settings List** option under the **Tools >Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add**.

Step 5 Enter an appropriate list name such as **Agent_Desk_Settings_1**.

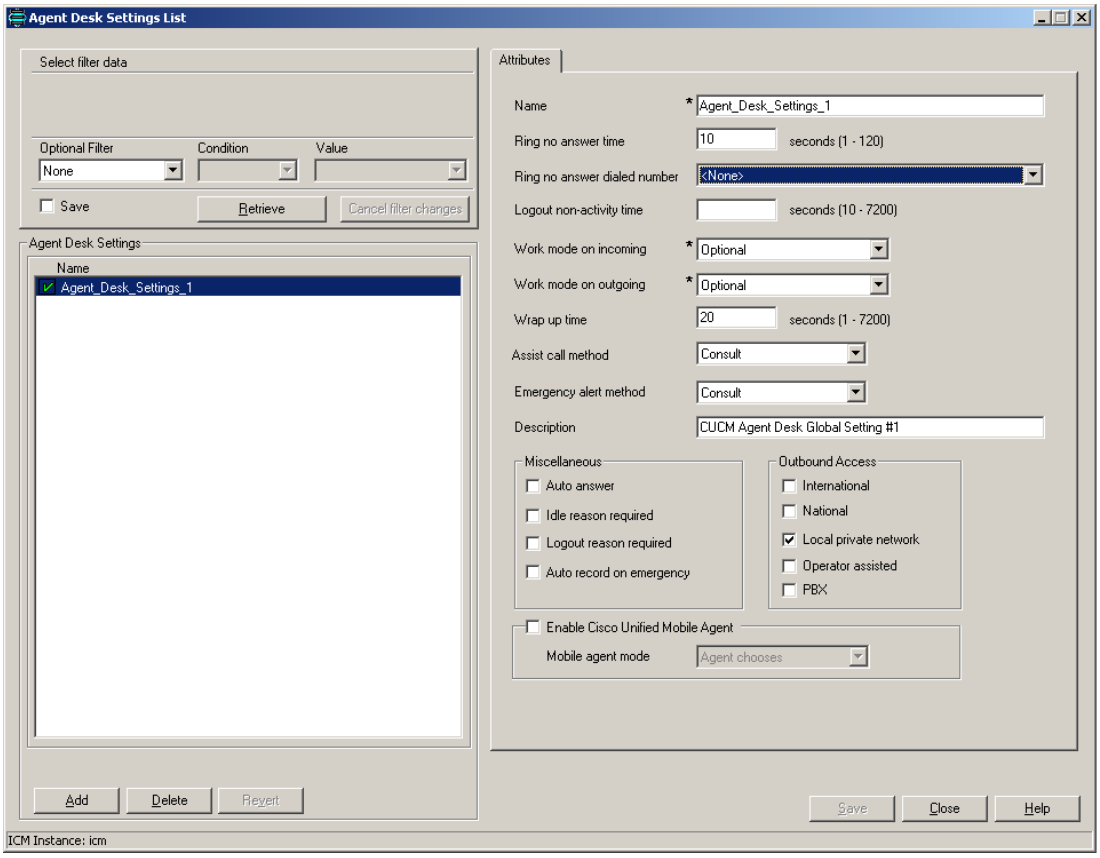
Step 6 Enter a proper description.

Step 7 Set the Ring no Answer time to **10**.

Step 8 Set the Wrap up time to **20**.

Step 9 Click **Save**. See Figure B-28.

Figure B-28



To create the peripheral gateways in Configuration Manager, there must also be an Media Routing Domain list entry as it is one of the required settings under a PG controller configuration.

Create a new Agent Desk Settings list as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **Media Routing Domain List** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add**.

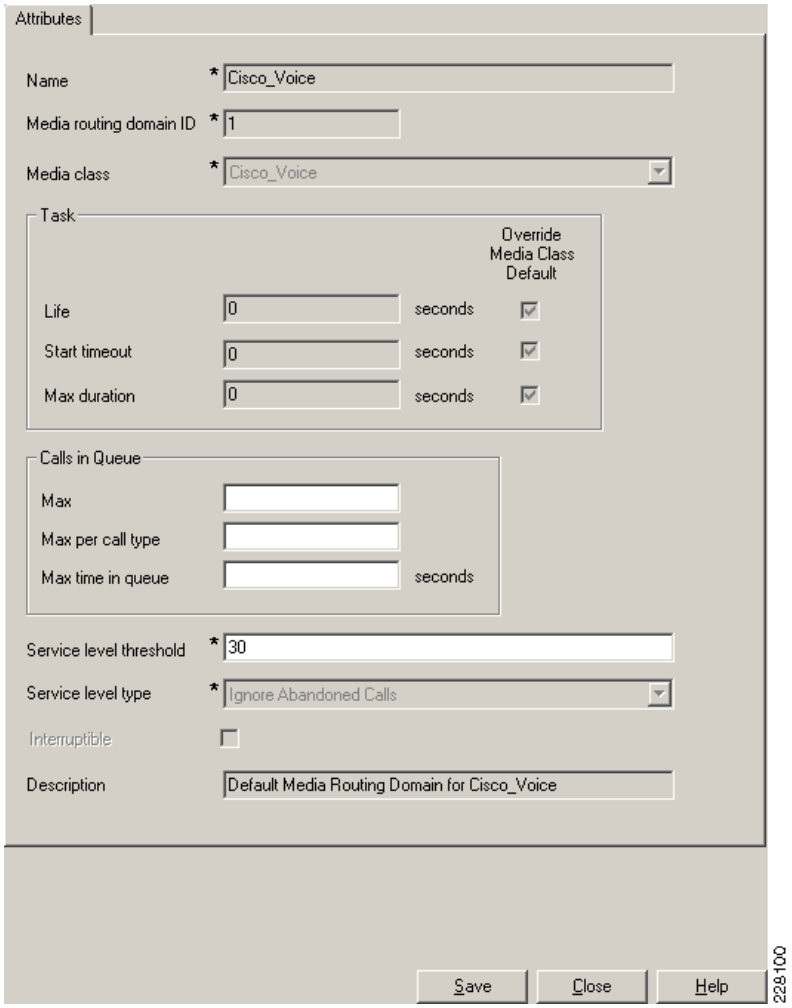
Step 5 Enter an appropriate list name such as **Cisco_Voice**.

Step 6 Enter a proper description.

Step 7 Set the Media Class to **Cisco_Voice**.

Step 8 Click **Save**. See Figure B-29.

Figure B-29



Once the Agent Desk setting list and the Media Routing Domain have been created, the new PG logical controllers for the Call Manager, CVP, and Expert Advisor can be created.

There are several methods for creating PGs and their underlying Peripheral Interface Managers (PIMS). For this solution, two PGs are created. One PG is generic and have the CUCM and VRU_CVP PIMS, the other PG is for Expert Advisor and have the EA PIM. Each ICM server set that is deployed can have a maximum of two Peripheral Gateways. The PG Explorer on the AW Configuration Manager generates and maintains PG records for a logical interface controller, a physical interface controller, associated peripherals, and, if appropriate, an associated routing client.

Create the first peripheral gateway logical controller as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **PG Explorer** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add PG**.

Step 5 Enter an appropriate name such as **Generic_PG_1**.

Step 6 Enter a proper description.

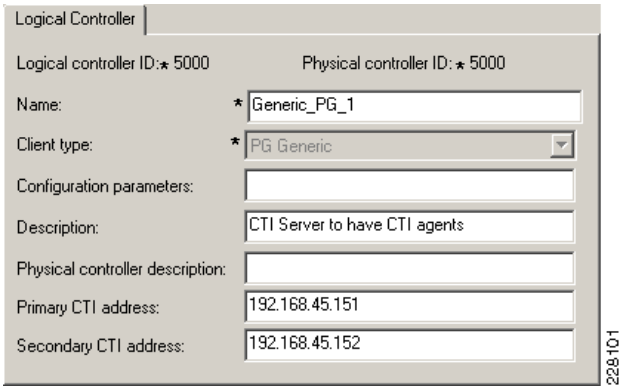
Step 7 Set the client type to **PG Generic**.

Step 8 Set the IP address for the primary and secondary CTI Servers.

Step 9 Click **Save**.

After clicking **Save**, the logical and physical controller IDs will be automatically generated. Note them for later use when installing the peripheral gateways in ICMSetup later. See Figure B-30.

Figure B-30



After creating the logical controller, the first of the underlying peripherals can now be added as follows:

Step 1 Select the **Generic_PG_1** PG that was just added from the PG explorer results on the left.

Step 2 Click **Add Peripheral**.

Step 3 Enter an appropriate peripheral name such as **CCM_PIM_1**.

Step 4 Select the Client Type as **CallManager/SoftACD**.

Step 5 Select the Default Desk Settings option that was created earlier **Agent_Desk_Settings_1**.

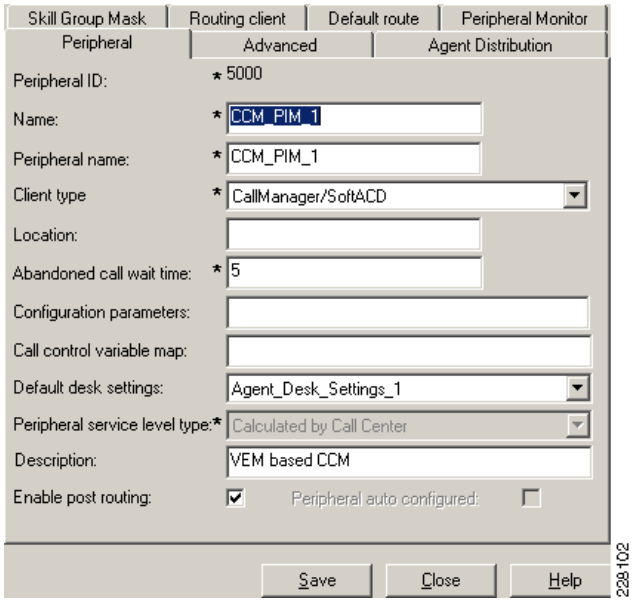
Step 6 Enter a proper description.

Step 7 Check the **Enable post routing** option.

Step 8 Then Click **Save**.

After clicking **Save** the peripheral ID will be automatically generated; note it for later use when installing the peripheral gateways in ICMSetup. See Figure B-31.

Figure B-31



Select the Routing Client tab and enter the following information for the peripheral:

Step 1 Enter an appropriate name and Peripheral name such as **CUCM_RC**.

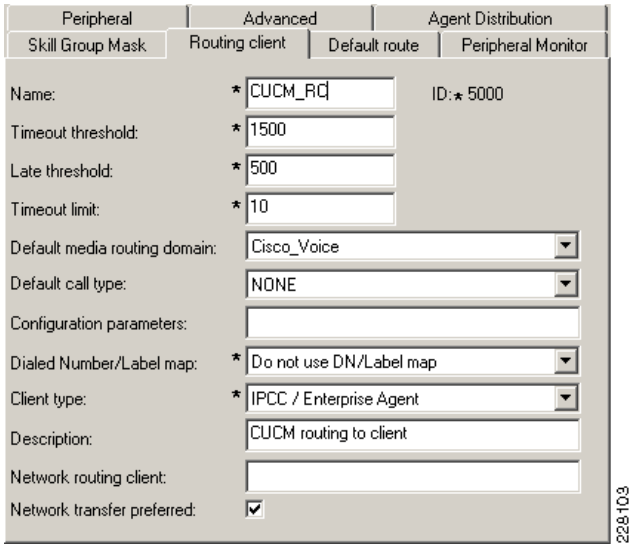
Step 2 Select the Client Type as **PCC/Enterprise Agent**.

Step 3 Select the Default media routing domain option to **Cisco_Voice**.

Step 4 Enter a proper description.

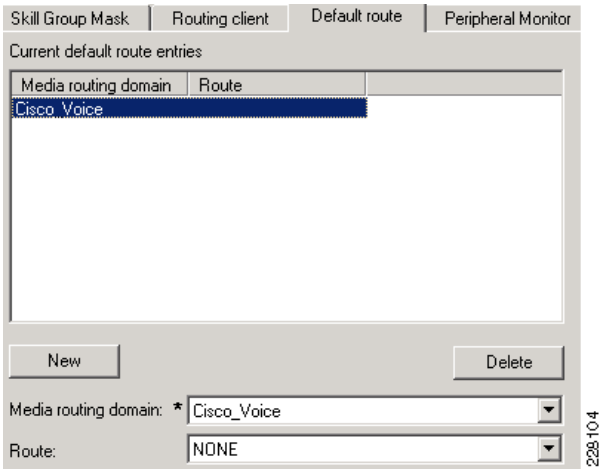
Step 5 Click **Save**. See Figure B-32.

Figure B-32



Step 1 On the Default Route tab ensure that **Cisco_Voice** is selected. See Figure B-33.

Figure B-33



After the creation of the CUCM peripheral the second CVP VRU peripheral can now be added as follows:

Step 1 Select the **Generic_PG_1** PG that was added from the PG explorer results on the left.

Step 2 Click **Add Peripheral**.

Step 3 Enter an appropriate name and peripheral name such as **CVP_VRU_PIM_2**.

Step 4 Select the Client Type as **VRU**.

Step 5 Select the Default Desk Settings option to **NONE**.

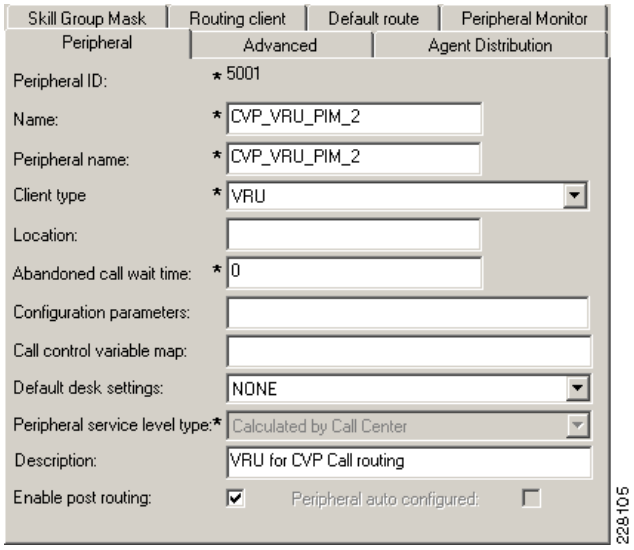
Step 6 Enter a proper description.

Step 7 Check the **Enable post routing** option.

Step 8 Click **Save**.

After clicking **Save**, the peripheral ID will be automatically generated; note it for later use when installing the peripheral gateways in ICMSetup. See Figure B-34.

Figure B-34



Select the Routing Client tab and enter the following information for the peripheral:

Step 1 Enter an appropriate name and Peripheral name such as **CVP_VRU_PIM**.

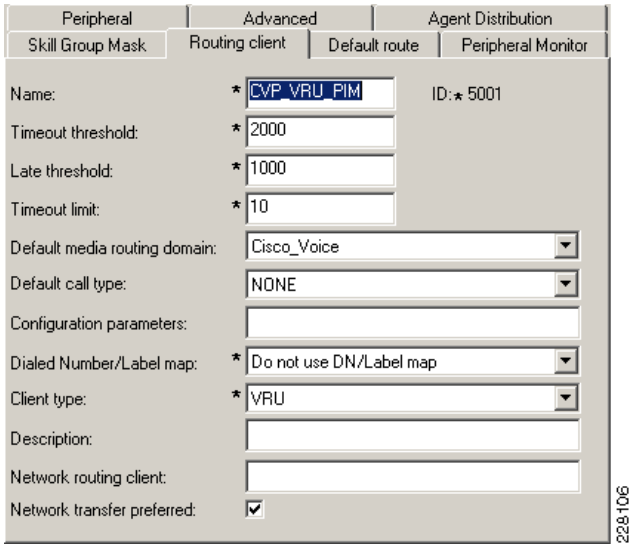
Step 2 Select the Client Type as **VRU**.

Step 3 Select the Default media routing domain option to **Cisco_Voice**.

Step 4 Enter a proper description.

Step 5 Click **Save**. See Figure B-35.

Figure B-35



Create the second peripheral gateway logical controller for the Expert Advisor as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **PG Explorer** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add PG**.

Step 5 Enter an appropriate name such as **EA_PG_2**.

Step 6 Enter a proper description.

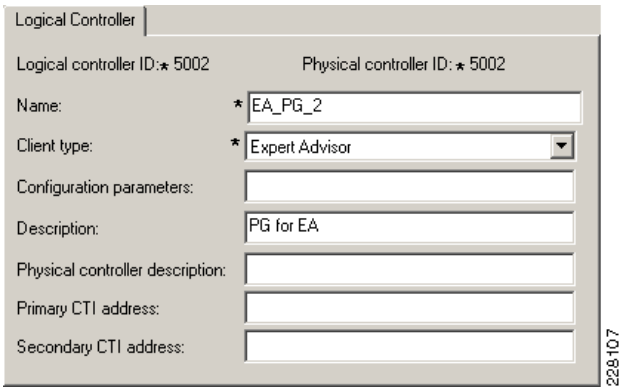
Step 7 Set the Client Type to **Expert Advisor**.

Step 8 Leave the IP address for the primary and secondary CTI Servers blank.

Step 9 Click **Save**.

After clicking **Save**, the logical and physical controller IDs will be automatically generated; note them for later use when installing the peripheral gateways in ICMSetup later. See Figure B-36.

Figure B-36



After the creation of the logical controller the underlying peripheral can now be added.

Step 1 Select the **EA_PG_2** PG that was just added from the PG explorer results on the left.

Step 2 Click **Add Peripheral**.

Step 3 Enter an appropriate peripheral name such as **EA_PG_2_1**.

Step 4 Select the Client Type as **Expert Advisor**.

Step 5 Under Configuration Parameters enter **/ExtendedAgent**.

Step 6 Select the Default Desk Settings option to **NONE**.

Step 7 Enter a proper description.

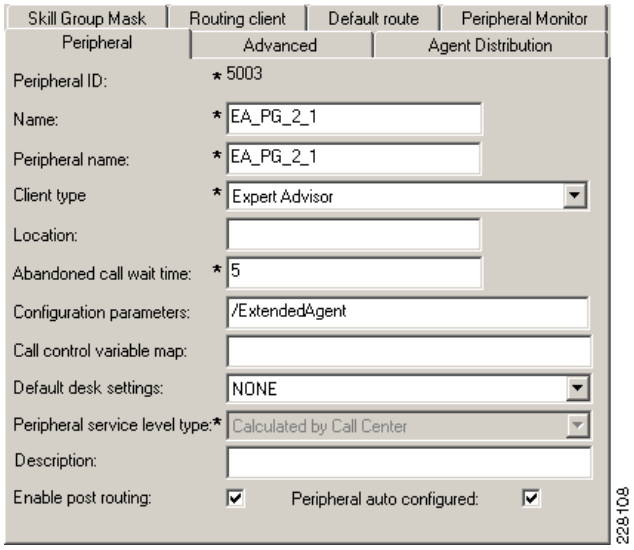
Step 8 Check the **Enable post routing** option.

Step 9 Check the **Peripheral auto configured** option.

Step 10 Click **Save**.

After clicking **Save**, the peripheral ID will be automatically generated; note it for later use when installing the peripheral gateways in ICMSetup. See Figure B-37.

Figure B-37



Select the Routing Client tab and enter the following information for the peripheral:

Step 1 Enter an appropriate peripheral name such as **EA_PIM**.

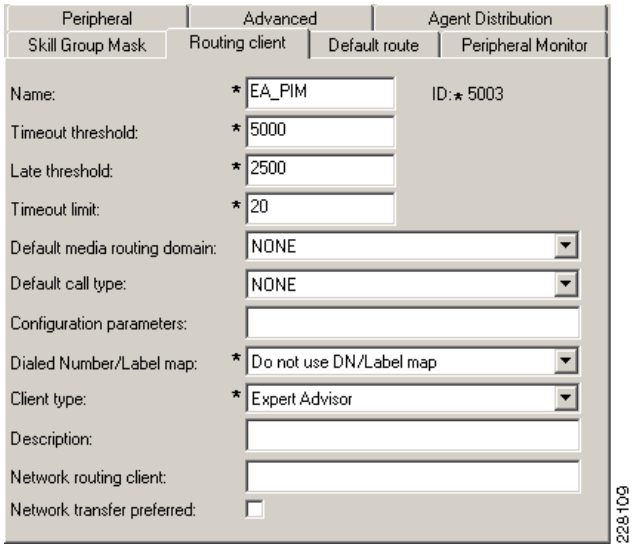
Step 2 Select the Client Type as **Expert Advisor**.

Step 3 Select the Default media routing domain option to **NONE**.

Step 4 Enter a proper description.

Step 5 Click **Save**. See Figure B-38.

Figure B-38



Step 6 On the Advanced tab, ensure that the **Agent auto-configuration** option is not checked.

Once all of the peripheral gateways and peripheral interface managers have been created in the Admin Workstation Configuration Manager the can then be installed in the ICM servers.

Peripheral Gateway Installation for CUCCE

Each contact center device (ACD, PBX, or IVR/VRU) communicates with ICM software through a Peripheral Gateway (PG). The PG reads status information from the device and passes it back to the ICM software. The PG runs one or more Peripheral Interface Manager (PIM) processes, which are the software components that communicate with proprietary ACD and IVR/VRU systems.

Note A single PG can support ACD PIMs, VRU PIMs, and Media Routing PIMs, though the ACD PIMs must all be of the same kind and the VRUs must all be of the same kind.

Before you install a Peripheral Gateway (PG), the Windows operating system (for version specifics refer to the Cisco Intelligent Contact Management Software Release 7.5(1) Bill of Materials—including SNMP and (for Windows 2003) WMI—must be installed on the computer, you must have setup the Windows Active Directory services for ICM software, and you must have setup at least one ICM instance.

Further, before you can complete the installation of a Peripheral Gateway, you must create configuration records in the ICM database. To create these configuration records you must have installed the CallRouter, a Logger, and the Admin Workstation.

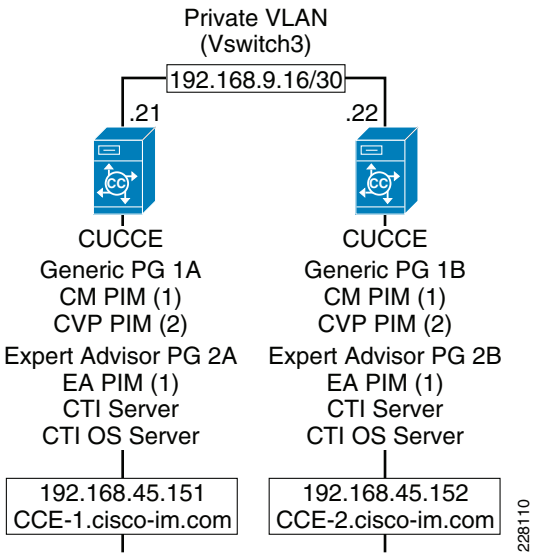
To configure a PG, you must know the visible network addresses for the CallRouter machines. If the PG is duplexed, you must know the visible and private network addresses of its duplexed peer.

For each PG, you must have defined a *Logical_Interface_Controller* record, a *Physical_Interface_Controller* record, and a Peripheral record for each PIM you intend to configure--though at least one Peripheral record is necessary. (Configure ICM creates these records automatically if you choose Configure a PG using the PG Explorer.)

Note ICM software restricts running more than two PGs of the same instance on a single machine at the same time.

Figure B-39 shows the deployment of redundant servers with peripheral gateways.

Figure B-39 Cisco Unified Contact Center Servers



The following section outlines the steps to install two peripheral gateways with three peripheral interface managers for the solution. More information on peripheral gateway installations and configurations can be found in the *ICM Setup and Installation Guide*.

On the servers selected for the peripheral gateways start the ICMSetup.exe application. At least one ICM instance must be added before you can install any ICM components.

In the Cisco ICM Setup dialog box, in the **ICM Instances** section, click **Add**. The Add Instance dialog box opens. Complete the following steps:

Step 1 Select the network **Domain** for the instance.

Step 2 Select the **Facility** Organizational Unit for the instance.

Step 3 Select the **Instance Name** for the instance.

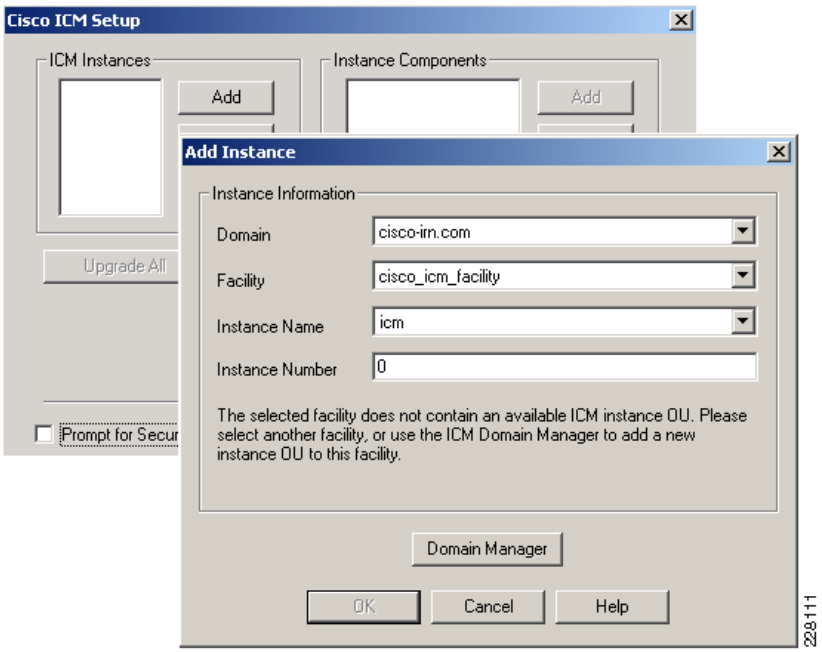
Note The ICM Instance Name is the name of the Instance Organizational Unit.

Step 4 Use the **Instance Number** generated by the ICM software. (For standard single-instance ICM configurations, the instance number is 0.)

Note The mappings of instance names to instance numbers must be the same on every node in the system.

Step 5 Click **OK**.

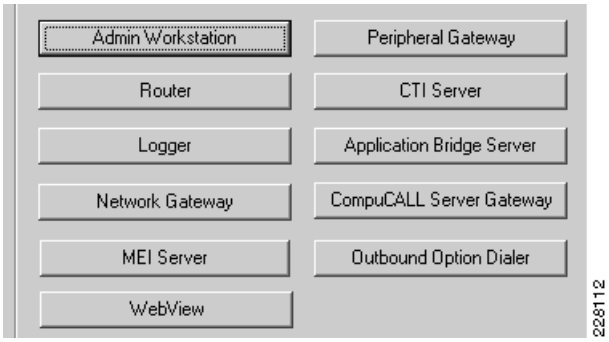
Figure B-40



You can now add ICM Instance components.

Step 1 In the ICM Setup application, click the **Add** button on the right under **Instance Components**. See Figure B-41.

Figure B-41



Step 2 A new dialogue window will appear where you will be able to select the Peripheral Gateway component. In the Peripheral Gateway properties window configure the following:

a. Check the **Production** node.

b. Check the **Auto start at system startup**.

c. Check the **duplexed Peripheral Gateway**.

d. Set the PG Node Properties ID to **PG 1** and select the appropriate side for duplexed installations.

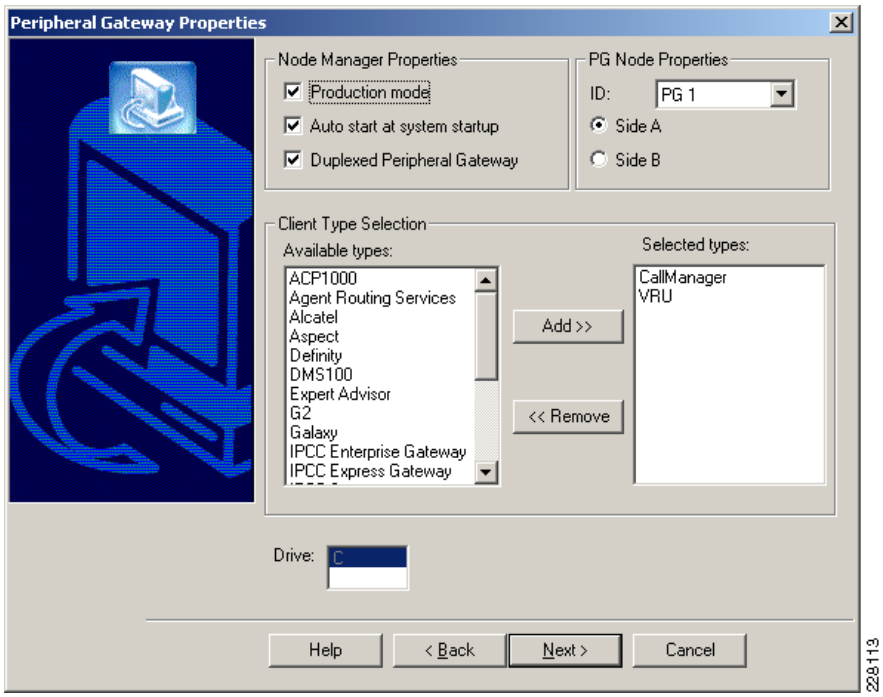
e. Select the following client types and click the **Add** button:

   – CallManager

- VRU

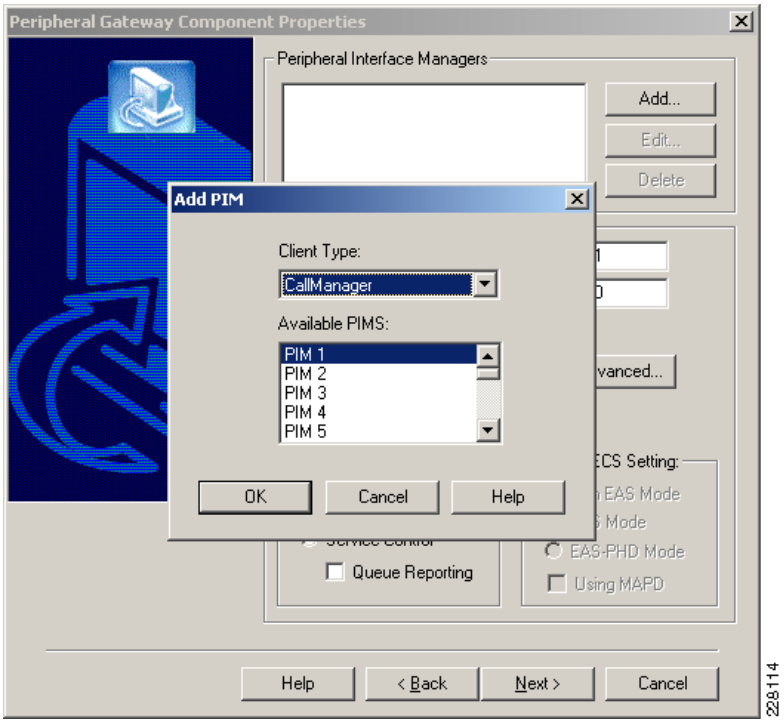
f. Click **Next**. See Figure B-42.

Figure B-42



Step 3 For the Peripheral Gateway Component Properties click **Add** in the Peripheral Interface Managers section. Set the Client type as **CallManager** and select **PIM 1** from the Available PIMS List. Click **OK**. See Figure B-43.

Figure B-43



Step 4 In the PIM Configuration dialogue, configure the PIM as follows:

a. Select **Enable**.

b. Enter an appropriate Peripheral name.

c. Enter the Peripheral ID that was assigned by the Configuration Manager on the Admin Workstation.

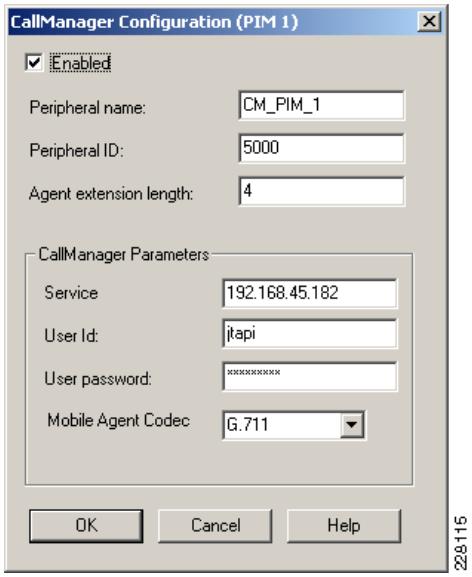
d. Specify the appropriate agent Extension length for DN's on the Cisco Unified Communication Manager (this is critical as additional digits are added for call handling to CVP and call handoff will fail when mismatched).

e. In the CallManager Service Parameter enter the IP address of the call manager cluster publisher.

f. Enter the CCE username and password created in the Call Manager (i.e., jtapi user).

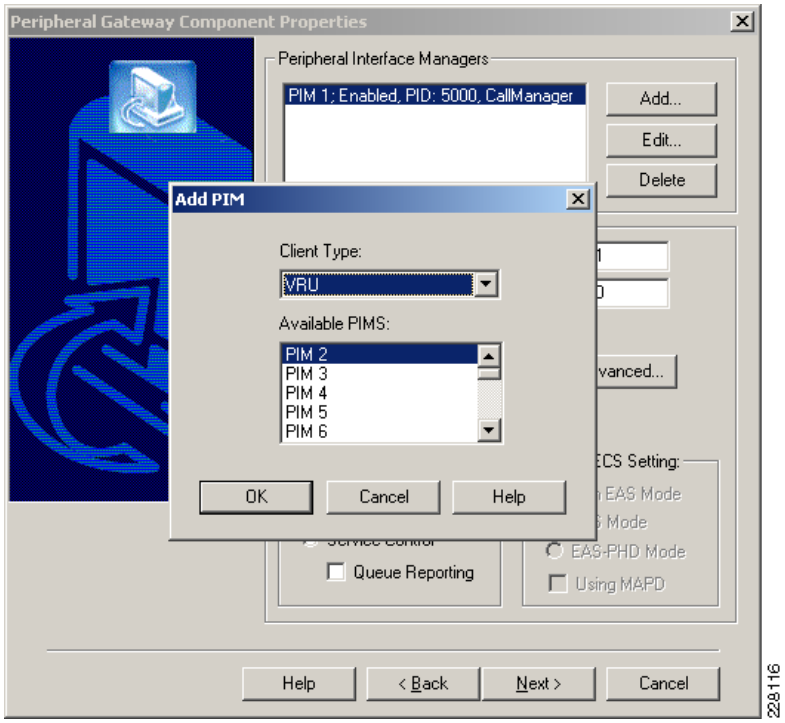
g. Click **OK**. See Figure B-44.

Figure B-44



Step 5 Back on the Peripheral Gateway Component Properties click **Add** in the Peripheral Interface Managers section again. Set the Client type as **VRU** and select **PIM 2** from the Available PIMS List. Click **OK**. See Figure B-45.

Figure B-45



Step 6 In the PIM Configuration dialogue, configure the PIM as follows:

a. Select **Enable**.

b. Enter an appropriate Peripheral name.

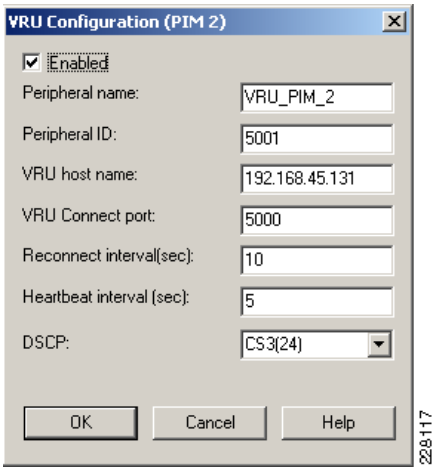
c. Enter the Peripheral ID that was assigned by the Configuration Manager on the Admin Workstation.

d. In the VRU Hostname enter the IP address of the CVP Server.

e. Enter VRU connection port.

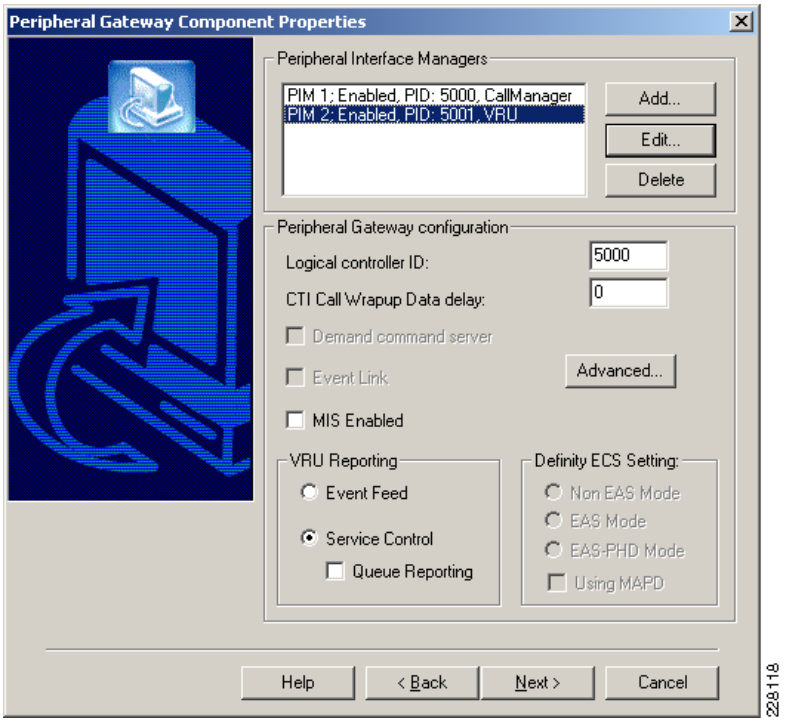
f. Click **OK**. See Figure B-46.

Figure B-46



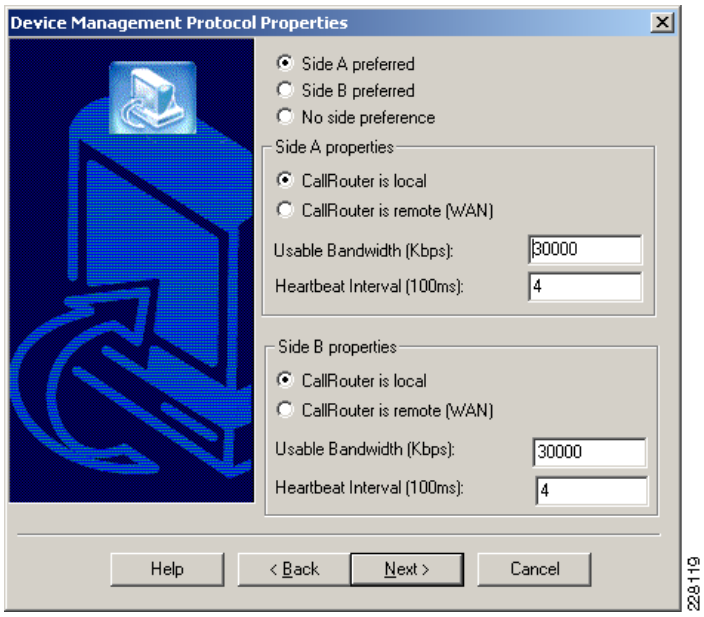
Step 7 Back on the Peripheral Gateway Component Properties enter the Peripheral Gateway Logical controller ID that was generated by the Configuration Manager on the Admin Workstation and click **Next**. See Figure B-47.

Figure B-47



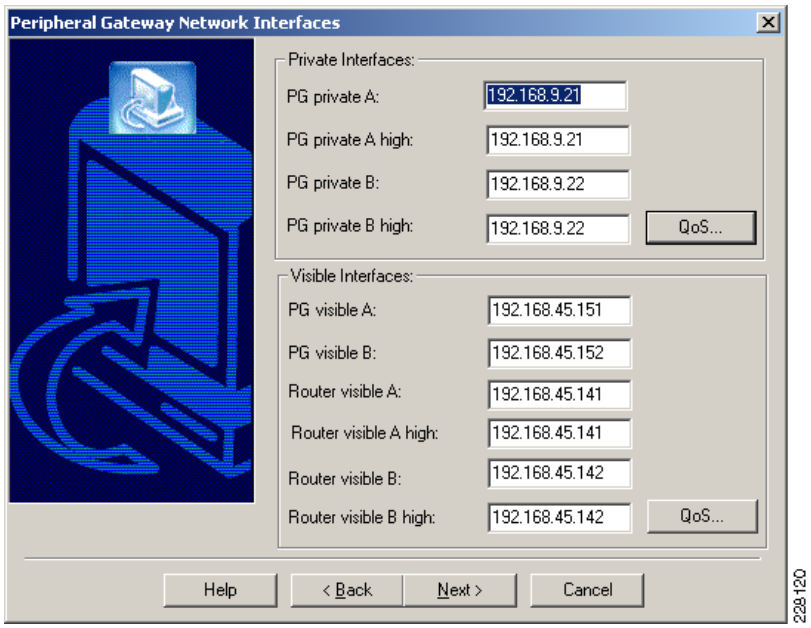
Step 8 On the Device Management Protocol Properties set **Side A preferred** option and click **Next**. See Figure B-48.

Figure B-48



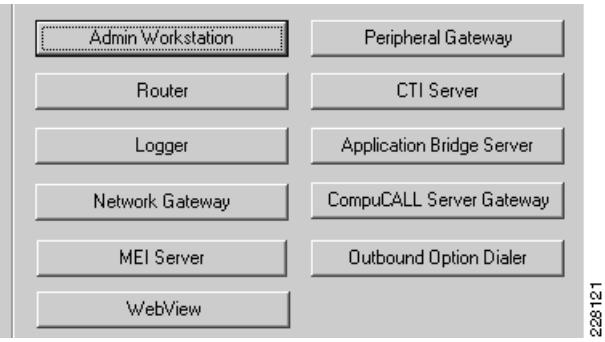
Step 9 Enter the name or IP addresses for the Visible and Private Interfaces of the PG and Router. Optionally, enable QoS for these interfaces as desired. Click **Next**. See Figure B-49.

Figure B-49



Step 10 Review the PG setup information and click **Next** to complete installation of the first PG. The ICM interface will return to the ICM Setup application, click the **Add** button on the right under "Instance Components" to add the second peripheral gateway. See Figure B-50.

Figure B-50



Step 11 A new dialogue window will appear where you will be able to select the Peripheral Gateway component. In the Peripheral Gateway properties window configure the following:

a. Check the **Production** node.

b. Check the **Auto start at system startup**.

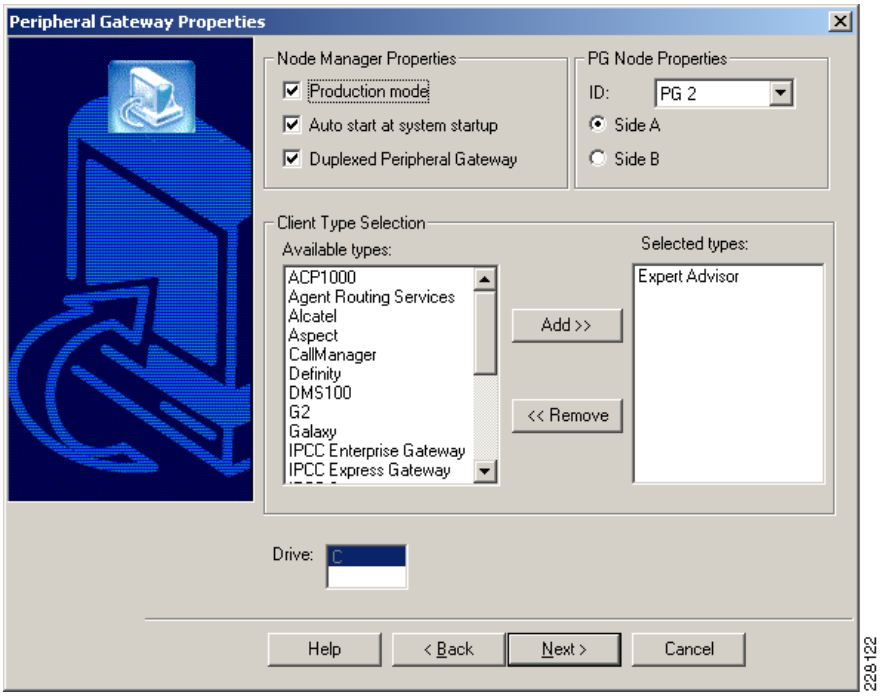
c. Check the duplexed Peripheral Gateway.

d. Set the PG Node Properties ID to **PG 2** and select the appropriate side for duplexed installations.

e. Select the **Expert Advisor** client type from the list of available types and click the **Add** button.

f. Click **Next**. See Figure B-51.

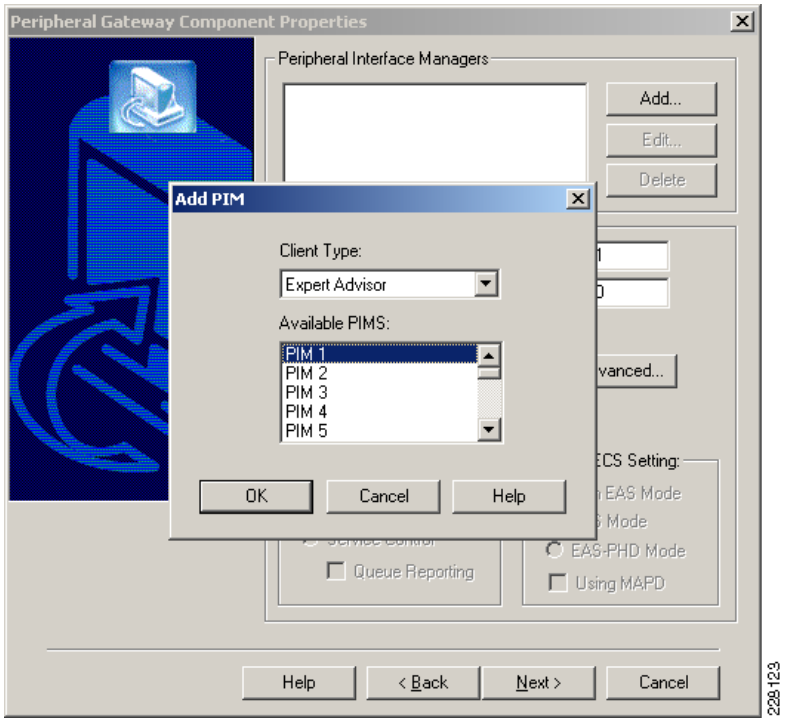
Figure B-51



Step 12 For the Peripheral Gateway Component Properties click **Add** in the Peripheral Interface Managers section. Set the Client type as **Expert Advisor** and select **PIM 1** from the Available PIMS List. Click **OK**. See Figure B-52.

Note The number of PIMs is only significant within the respective PG. If you have only a few PGs deployed with few PIMs, it is acceptable to assign PIMs that match the PG numbering for ease of documenting.

Figure B-52



Step 13 In the PIM Configuration dialogue, configure the PIM as follows:

a. Select **Enable**.

b. Enter an appropriate Peripheral name.

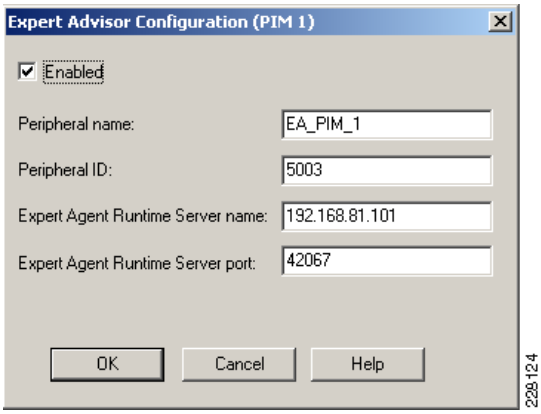
c. Enter the Peripheral ID that was assigned by the Configuration Manager on the Admin Workstation.

d. Enter the IP address or name of the Expert Advisor Runtime Server.

e. Accept the default Expert Advisor server port or enter a different one as configured.

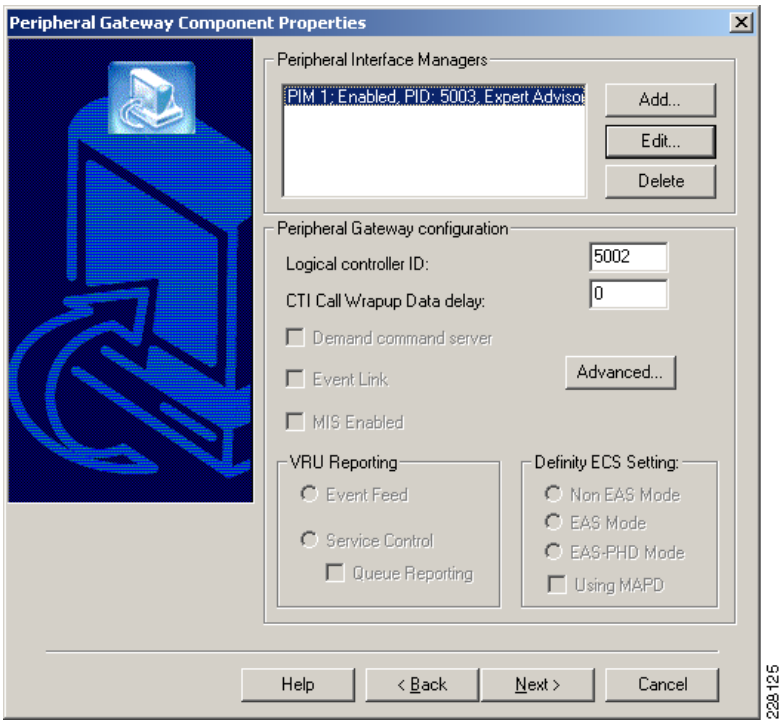
f. Click **OK**. See Figure B-53.

Figure B-53



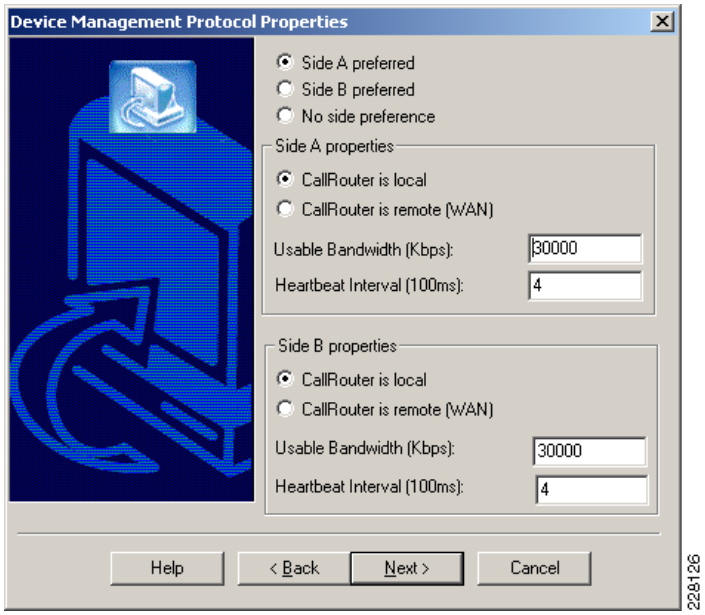
Back on the Peripheral Gateway Component Properties, enter the Peripheral Gateway Logical controller ID that was generated for the Expert Advisor PG by the Configuration Manager on the Admin Workstation and then click **Next**. See Figure B-54.

Figure B-54



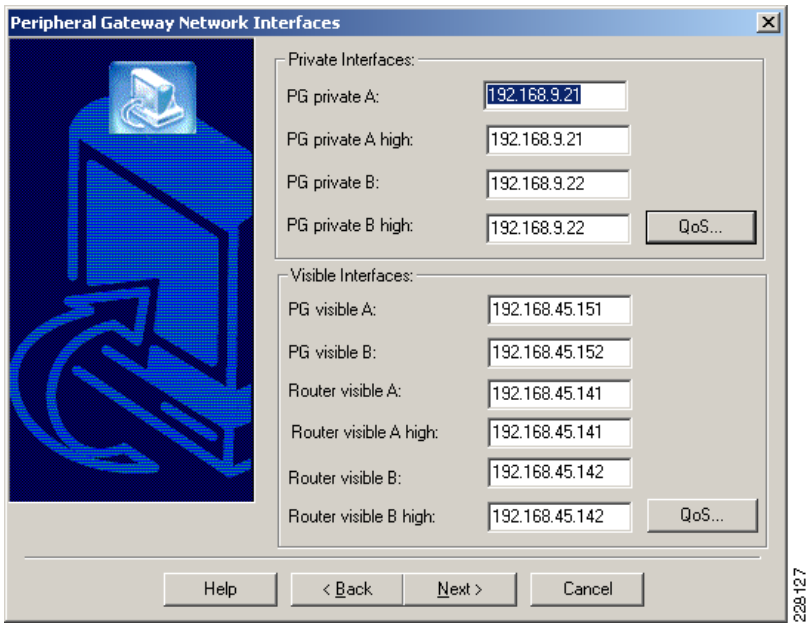
Step 14 On the Device Management Protocol Properties set **Side A preferred** option and click **Next**. See Figure B-55.

Figure B-55



Step 15 Enter the name or IP addresses for the Visible and Private Interfaces of the PG and Router. Optionally, enable QoS for these interfaces as desired. Click **Next**. See Figure B-56.

Figure B-56



Step 16 Review the PG setup information and click **Next** to complete installation of the PG.

JTAPI Client Installation

It is mandatory to install the JTAPI client on the CUCM PG (which is PG1 in this setup) machine, so that it can talk to the CUCM via JTAPI interface. Once this has been completed, there will be a new process called JTAPIGW, which should be active even if no agents or phones are created in the CUCM.

Associate all of the agent's phone device's with this user in CUCM as well. To install the jtapi client, download the client from the CUCM administration interface and install it on the PG1 machine.

Within the Cisco Unified CM Administration interface select **Application** and then **Plugins**. Click the **Find** button to list all available plug-ins. Download and install the **Cisco JTAPI for Windows** plug-in. See Figure B-57 and Figure B-58.

Figure B-57

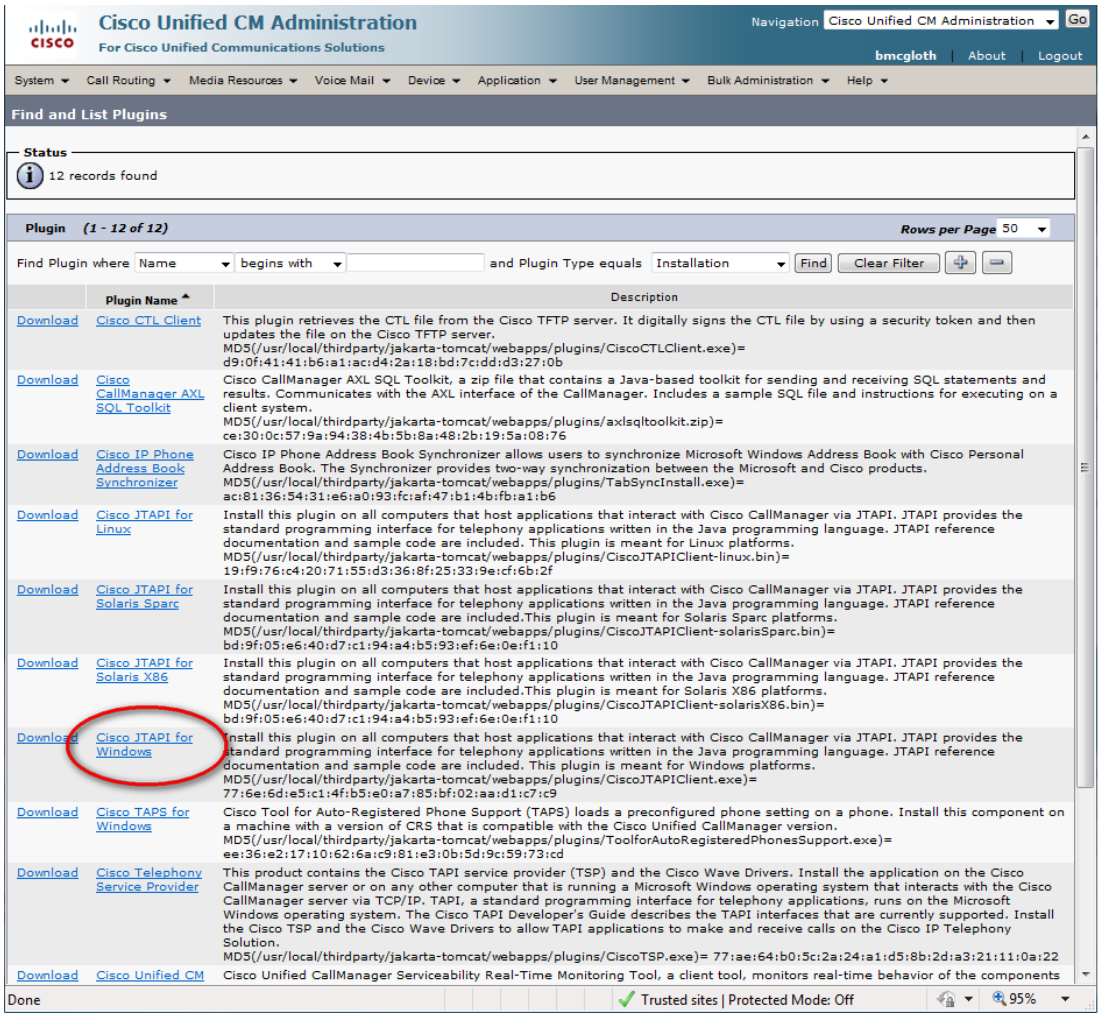
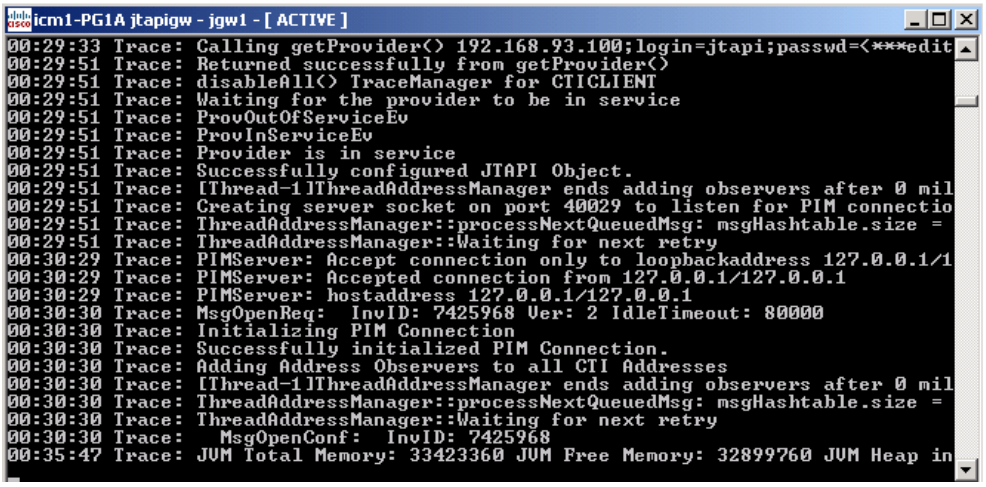


Figure B-58



After completion of the JTAPI plug-in, install the CTI Server.

CTI Server Installation

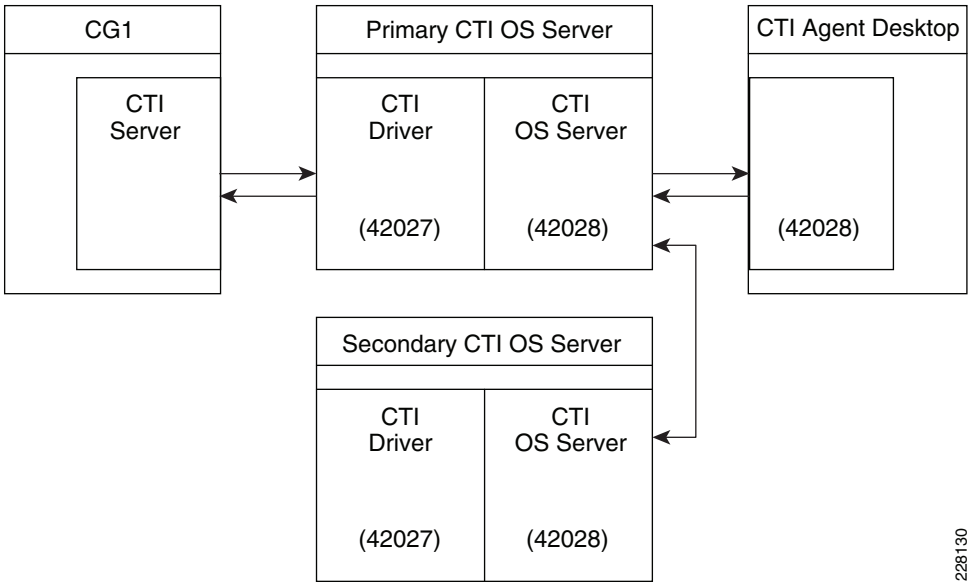
The CTI Server is an optional ICM node that allows a desktop or server application to receive call control information from the ICM and from call center peripherals. This information can be used, for example, in a screen pop on the agent's desktop. The CTI Gateway is available as part of the Cisco Enterprise CTI product.

Note Cisco supports installation of CTI Server on the same machine where the Peripheral Gateway software is installed. Installing CTI Sever on a machine separate from the PG may cause network problems including, but not limited to, network disconnects, agents missing calls, and agents forced into *Not_Ready*.

Before installing CTI Server, you must have installed/set up all the other components of ICM as described in the preceding sections.

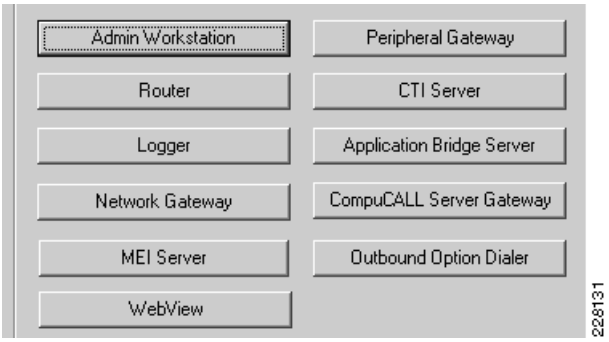
CTI Server (*ctisvr*) is also called CG (short for CTI Gateway) which connects to the CTI OS Server using the *ctidriver* service running on the CTI OS Server machine. Logically, it can be viewed as shown in Figure B-59.

Figure B-59 CTI Communication



In the ICM Setup application, click the **Add** button on the right under **Instance Components**. See Figure B-60.

Figure B-60



A new dialogue window will appear where you will be able to select the CTI Server component.

In the CTI Server properties window configure the following:

Step 1 Check the **Production node**.

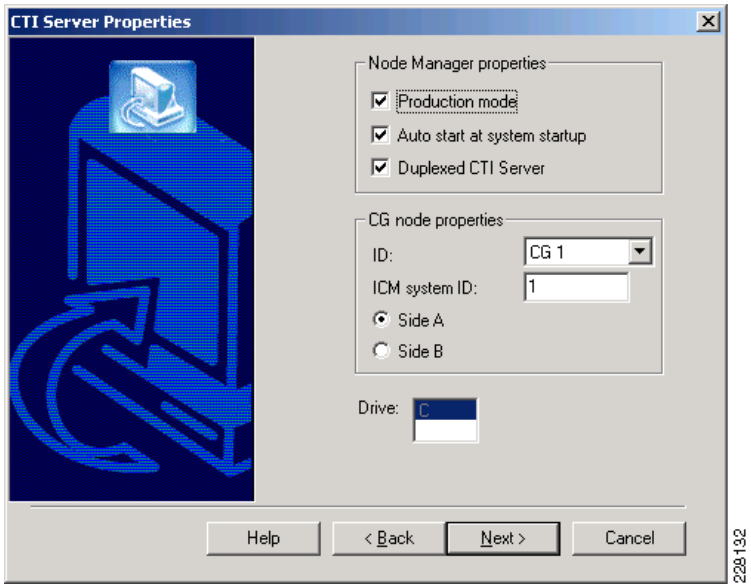
Step 2 Check the **Auto start at system startup**.

Step 3 Check the **duplexed** Peripheral Gateway.

Step 4 Set the CG Node Properties ID to **CG 1** and select the appropriate side for duplexed installations.

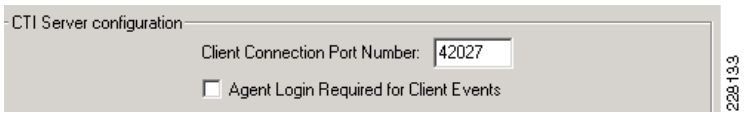
Step 5 Click **Next**. See Figure B-61.

Figure B-61



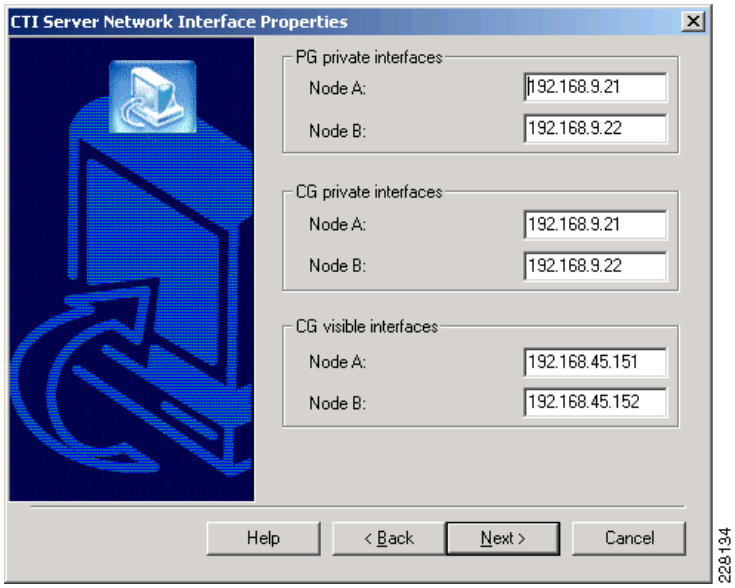
Step 6 CTI Server as a default connects to the CTIOS Server on port 42027, but can be configured to use a different port. Click **Next**. See Figure B-62.

Figure B-62



Step 7 Configure the PG and CG Public and Private interfaces. Click **Next**. See Figure B-63.

Figure B-63



Step 8 Review the CG setup information and click **Next** to complete installation of the CTI Gateway.

CTIOS Server Installation

The Computer Telephony Integration Object Server (CTI OS) is Cisco's next generation customer contact integration platform. CTI OS combines a powerful, feature-rich server and an object-oriented software development toolkit to enable rapid development and deployment of complex CTI applications.

Refer to the *CTI OS System Manager's Guide for Cisco ICM/IPCC Enterprise & Hosted Editions* for a complete explanation of configuring peripherals and connection profiles in the CTI OS Server. http://www.cisco.com/en/US/partner/products/sw/custcosw/ps14/prod_installation_guides_list.html

From the Server directory on the CD, run **Setup.exe** (or if already installed **C:\icm\CTIOS_bin\setup.exe**). Click **Yes** on the Software License Agreement screen. The CTI OS Instances dialog appears.

Step 1 The CTIOS Instances dialog allows you to create CTI OS Instances and add CTI OS Servers to a configured instance of CTI OS. You will create only one CTI OS instance for each ICM instance.

Step 2 Under the CTI OS Instance List, click **Add**.

Step 3 Enter an instance name (e.g., "**ctios**").

Step 4 Now click on **Add** inside the CTI OS Server List. The Add CTIOS Server dialog appears.

The CTIOS Server Name is filled in with the string "CTIOS" followed by the next available index for a CTI OS Server. If a CTI OS Server has been deleted, the CTIOS Server Name string is filled in with the index that was deleted.

If you are installing CTI OS Server for the first time, an Enter Desktop Drive screen appears. Accept the default installation drive or select another drive from the pull down list. See Figure B-64 and Figure B-65.

Figure B-64

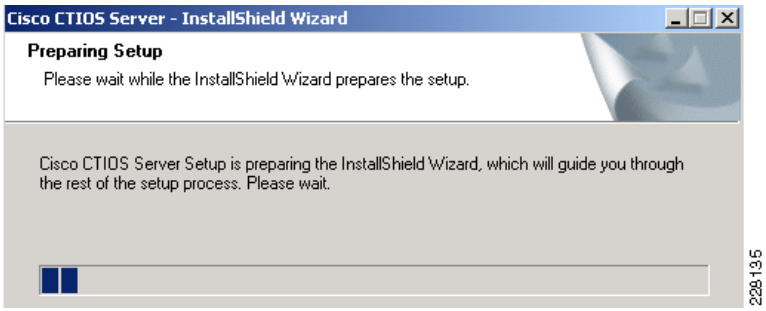
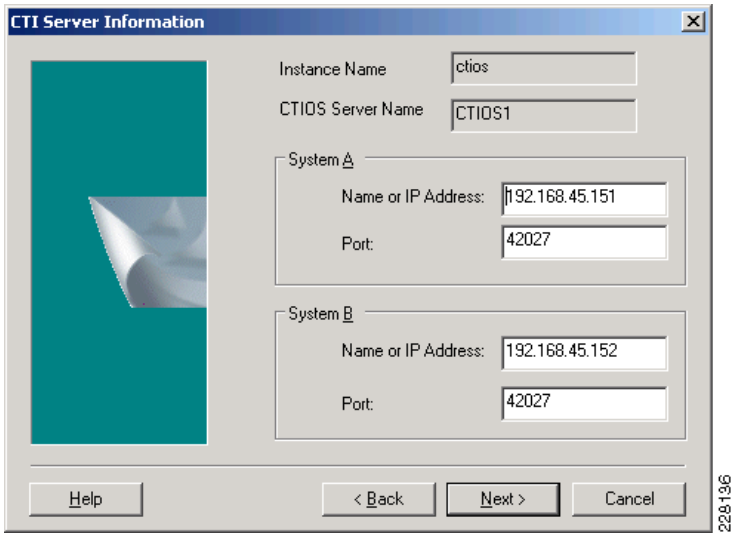
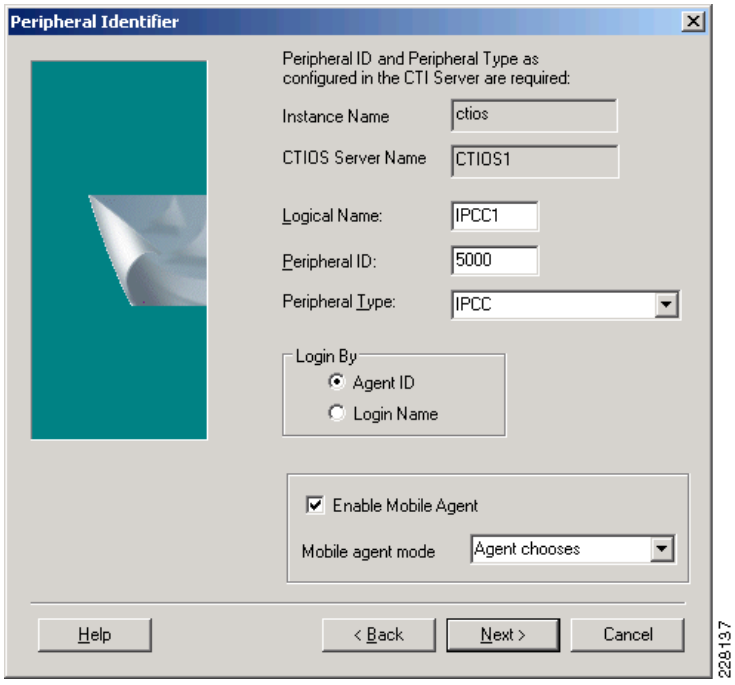


Figure B-65



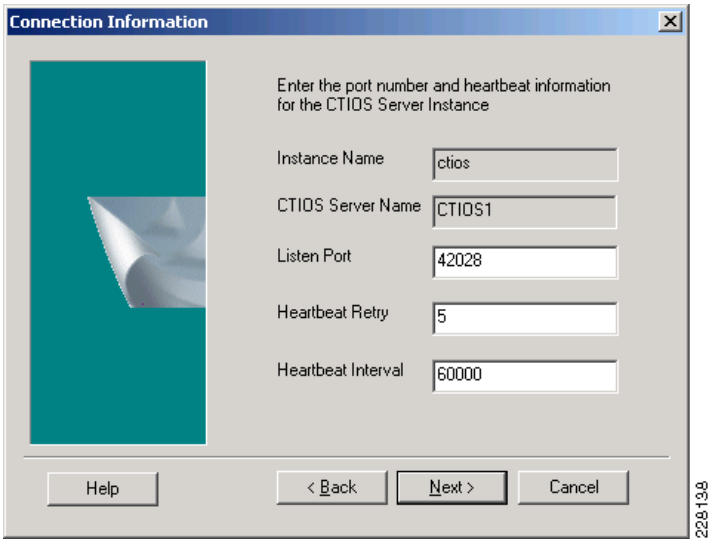
Step 5 The Peripheral ID here is the same ID that was assigned during the CUCM PG configuration in the Configuration Manager on AW. The agent desktop communicates with the CUCM IP Phone. See Figure B-66.

Figure B-66



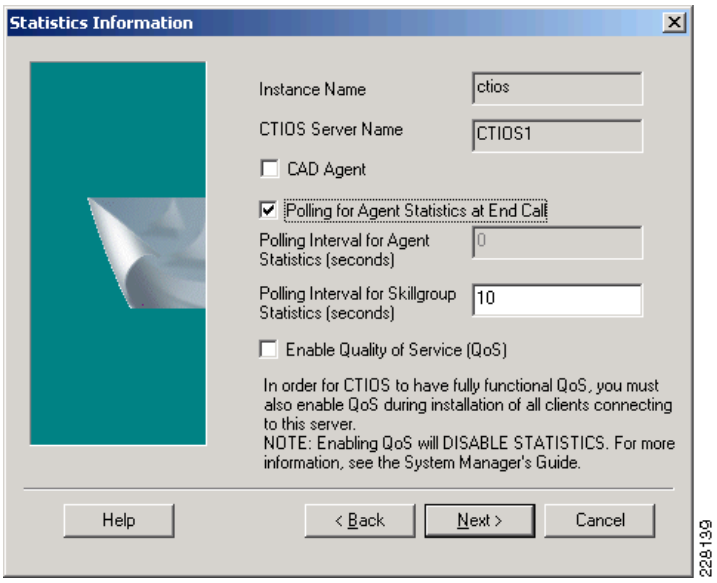
Step 6 The listen port is where CTI Desktop Agent will connect. This port will also be used if a secondary CTIOS Server wants to talk to this one in an high availability environment or setting. See Figure B-67.

Figure B-67



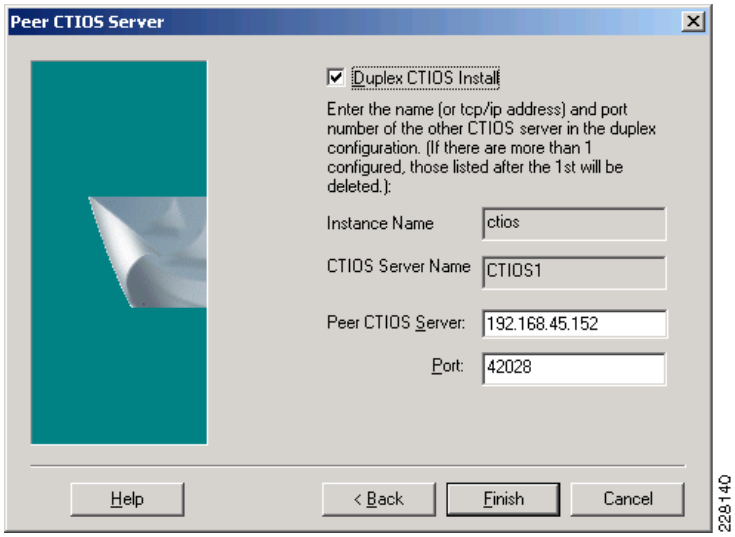
Step 7 Enter the default polling interval for Skillgroup statistics (in seconds). Click **Next**. See Figure B-68.

Figure B-68



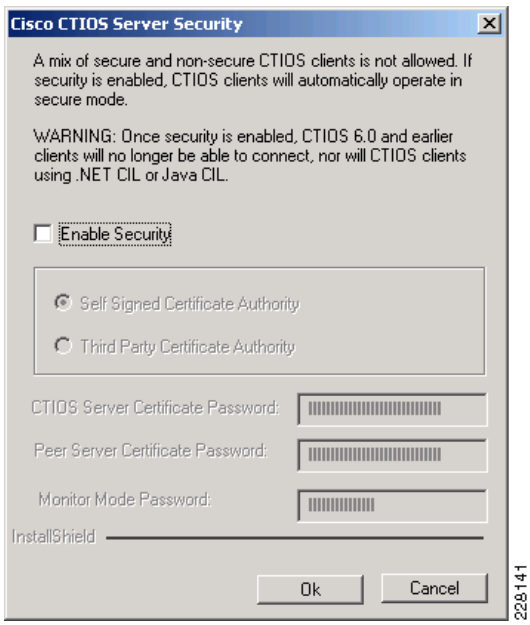
Step 8 The Peer CTIOS Server dialog is used to configure a CTI OS Peer Server. It is also used for Chat and CTI OS Silent Monitoring. Enter the appropriate information. After you click **Finish**, and the files are laid down, the service is registered, and Registry entries are made. See Figure B-69.

Figure B-69



Step 9 The Security installation is launched with the dialog shown in Figure B-70.

Figure B-70



Step 10 If you wish to disable Security, just click **OK**; otherwise, check the checkbox and enter the appropriate information, and click **OK**. For more information about CTI OS Security, see Chapter 7, "CTI OS Security" in the *CTI OS System Manager's Guide for Cisco ICM/IPCC Enterprise & Hosted Editions Guide*.

Upon the completion of the CTI OS Server the next step is to create device targets in Configuration Manager. Device targets are the extensions used by the formal Contact Center agents when the login into the Agent Desktop application. These next configuration steps are for formal contact center agents that would be used in addition to the Expert advisor agents. It is recommended to install a few formal agents for testing prior to the completed Expert Advisor implementation.

Create Device Target in Configuration Manager

Create each of the Device Targets using the following steps:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **Device Target Explorer** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add Device Target**.

Step 5 Enter an appropriate name such as the agent Extension “6001”.

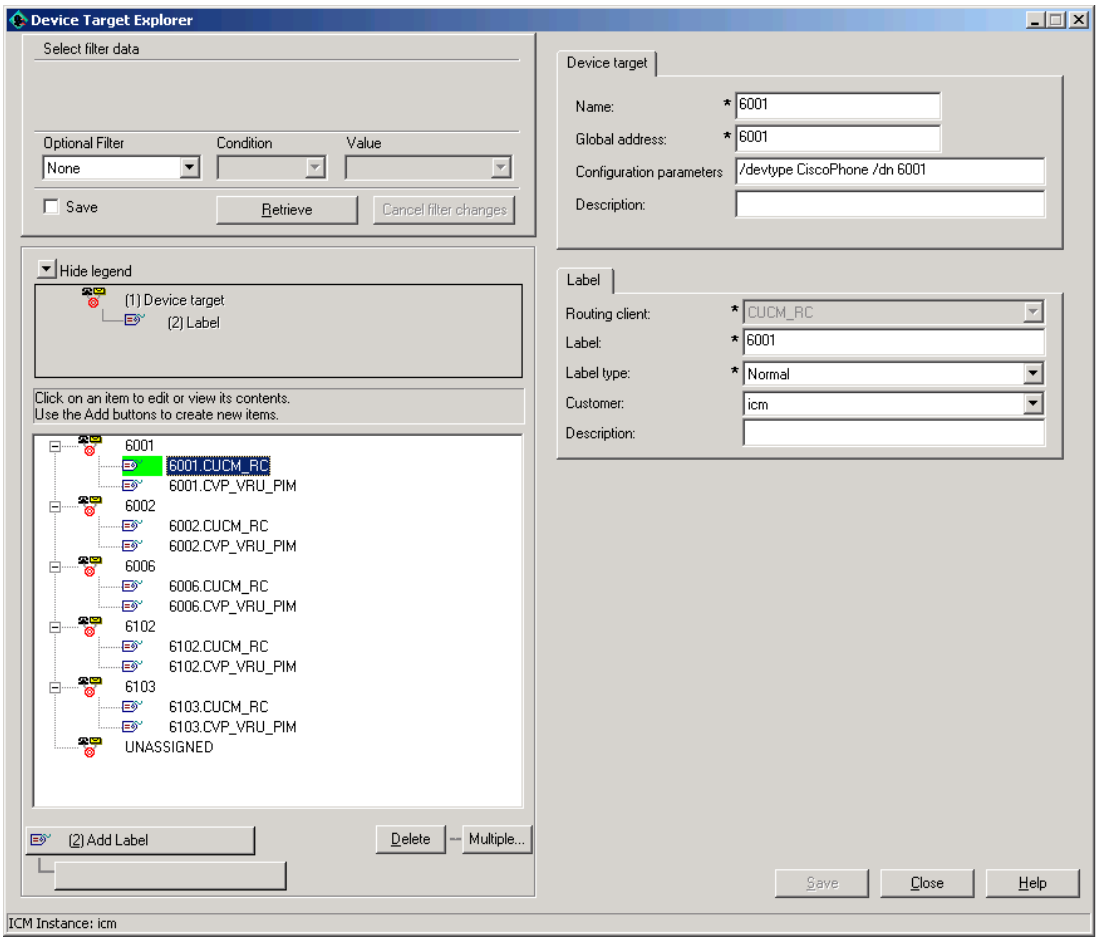
Step 6 Enter the Global Address, also the extension number for fully qualified number.

Step 7 Enter the Configuration parameters as follows “/devtype CiscoPhone /dn 6001”.

Step 8 Enter a description if desired.

Step 9 Then Click **Save**. See Figure B-71.

Figure B-71



Step 10 Add label for each of the routing-clients. In this setup there are the following two routing clients:

- CU Communication Manager

- CU CVP VRU

These two routing clients can request for labels from CUICM and CUICM will return the label to the routing-client. Figure B-72 shows a label for CUCM Routing Client.

Figure B-72

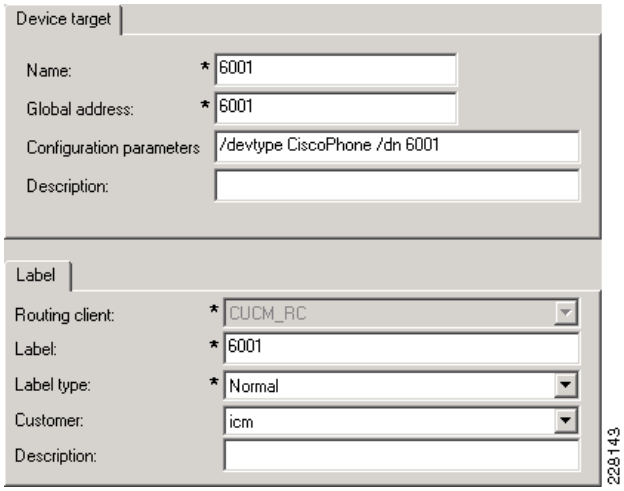
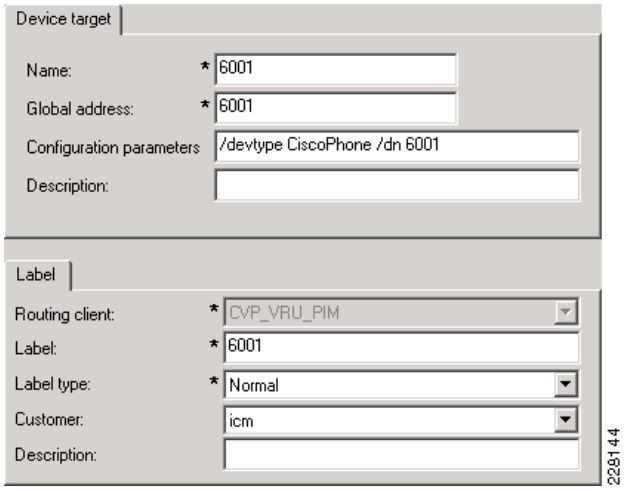


Figure B-73 shows a label defined for CVP Routing Client.

Figure B-73



Network VRU Configuration in AW Configuration Manager

Create the Network VRU device as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **Network VRU Explorer** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add Network VRU**.

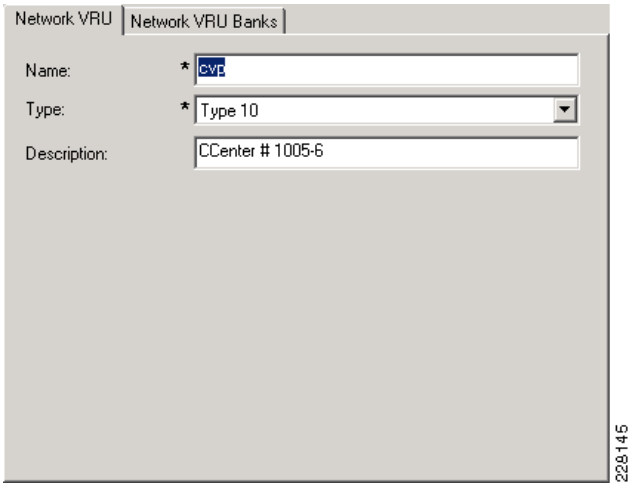
Step 5 Enter an appropriate name such as "**cvp**".

Step 6 Select the type as "**Type 10**".

Step 7 Enter a description such as the extension numbers associated with CVP and the VXML Gateway.

Step 8 Then Click **Save**. See Figure B-74.

Figure B-74



After the Network CVP VRU is created, add labels for each of the Route Clients as follows:

Step 1 Click **Add Label**.

Step 2 Select the Network VRU **cvp**.

Step 3 Select the Route Client **CUCM_RC**.

Step 4 Enter the label of the CVP Extension line **1005**.

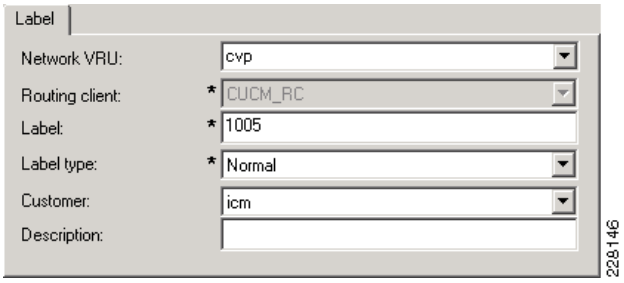
Step 5 Select **normal** for the label type.

Step 6 Select **icm** as the Customer.

Step 7 Enter a description as desired.

Step 8 Click **Save**. See Figure B-75.

Figure B-75



Perform the same steps and add a label for the CVP VRU PIM Route client as follows:

Step 1 Click **Add Label**.

Step 2 Select the Network VRU **cvp**.

Step 3 Select the Route Client **CVP_VRU_PIM**.

Step 4 Enter the label of the CVP Extension line **1006**.

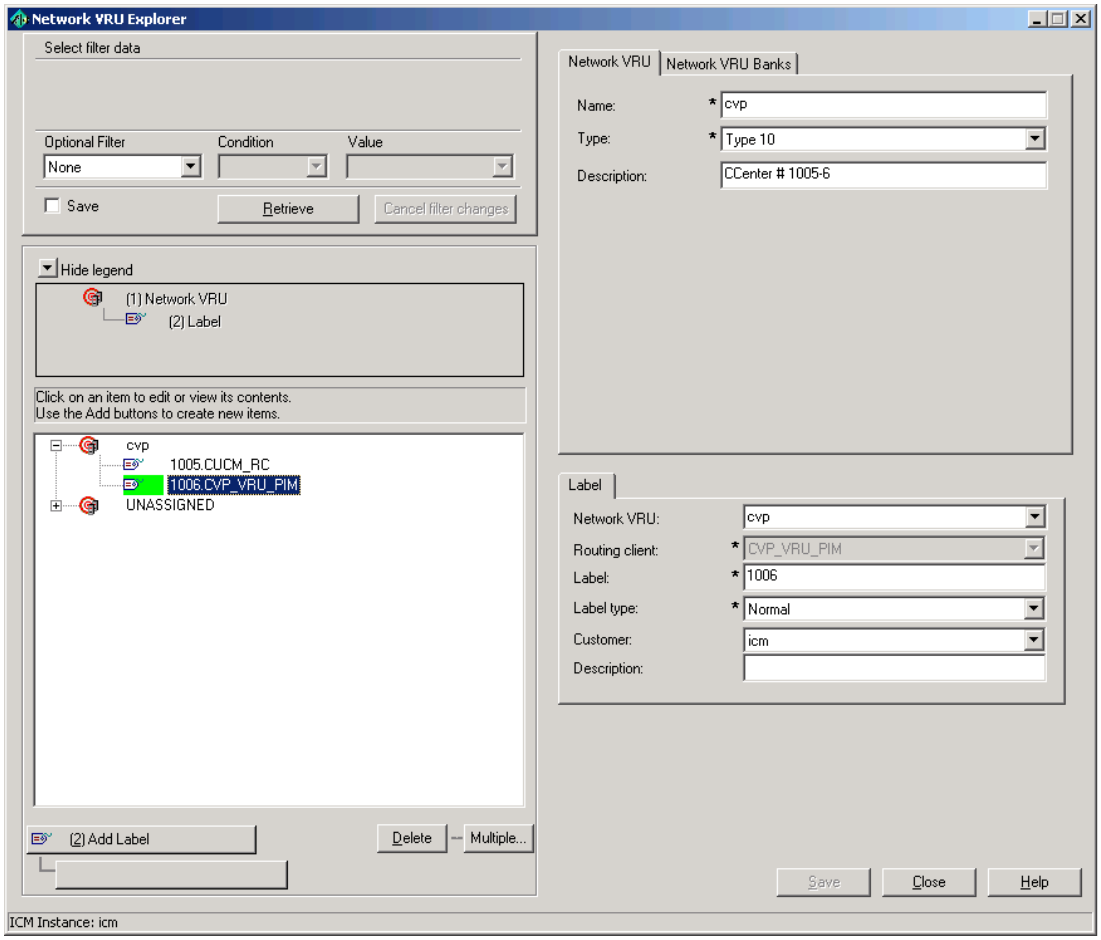
Step 5 Select **normal** for the label type.

Step 6 Select **icm** as the Customer.

Step 7 Enter a description as desired.

Step 8 Click **Save**. See Figure B-76.

Figure B-76



Step 9 After the network VRUs have been created, add a Contact Center Agent and Skill Group for testing purposes.

Add Agents

Create the Agent as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **Agent Explorer** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add Agent**.

Step 5 Enter an appropriate first, last, and login name.

Step 6 Enter an appropriate password.

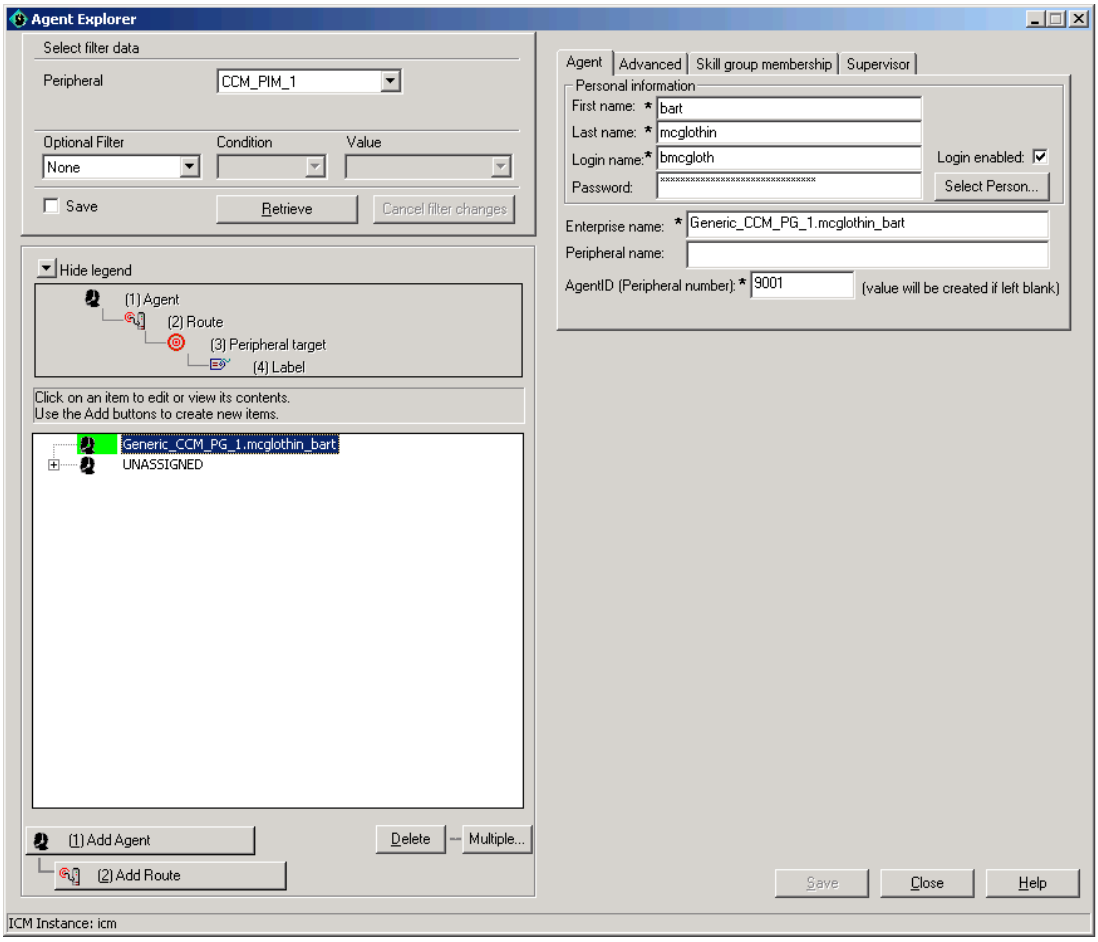
Step 7 Verity the Enterprise name that was generated is appropriate.

Step 8 Enter an AgentID number or allow one to be generated automatically. This number is used during agent login to the Agent desktop client.

Step 9 On the Supervisor tab, check **Supervisor agent** if desired.

Step 10 Click **Save**. See Figure B-77.

Figure B-77



Add Skill Group

Create a Skill Group as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **Skill Group Explorer** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add Skill Group**.

Step 5 Enter a Peripheral name such as **PreSale**.

Step 6 Enter an appropriate Name such as **Generic_Presale**.

Step 7 Select the Media Routing domain **Cisco_Voice**.

Step 8 On the Skill Group Members tab click add and select the agent created earlier.

Step 9 Click **Save**.

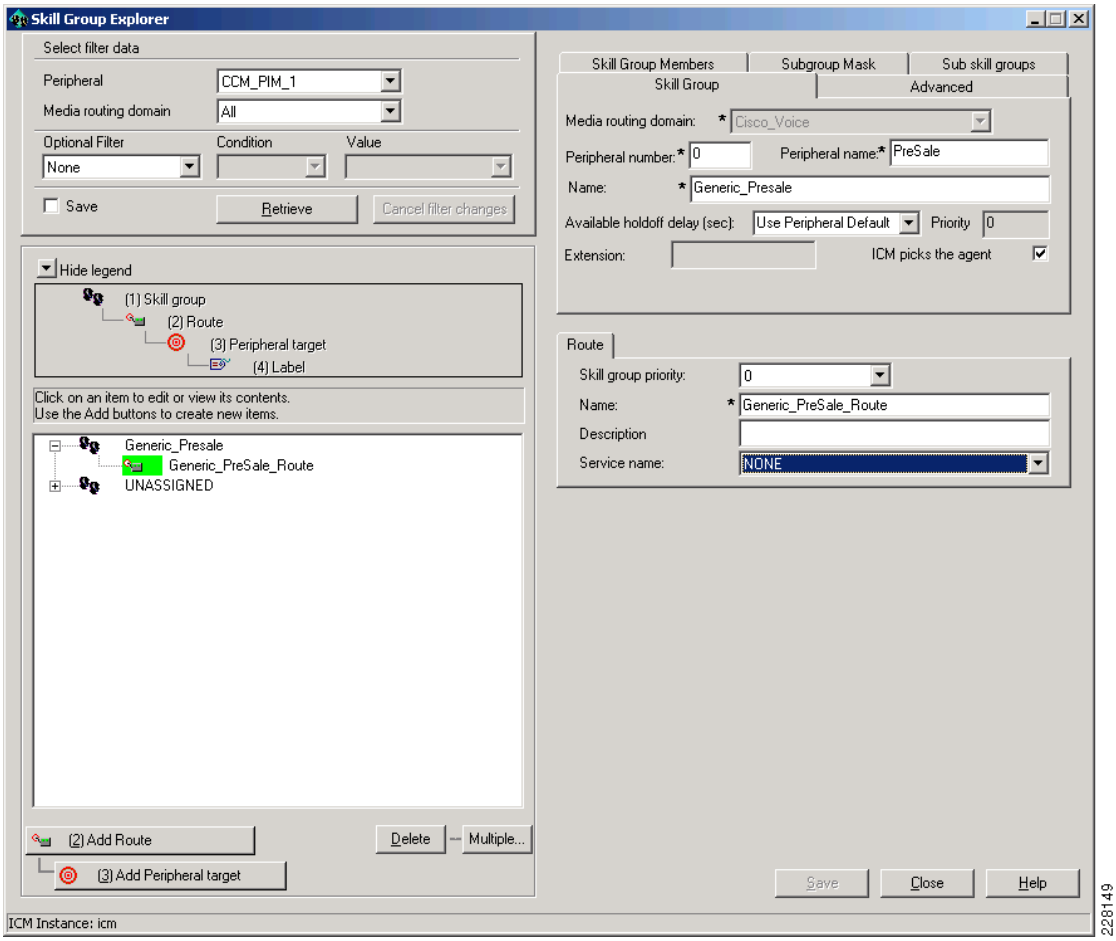
Step 10 Add route option in the skill group.

Step 11 Click **Add Route**.

Step 12 Assign an appropriate name such as **Generic_PreSale_Route**.

Step 13 Click **Save**. See Figure B-78.

Figure B-78



Step 14 The next step is to create Call Type Lists for the Presales group and the Expert Advisor Service.

Add Call Type List

Create a Call Type List as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **Call Type List** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add**.

Step 5 Enter a name such as **PreSales_SanJose** or **Expert_Advisor_Service**.

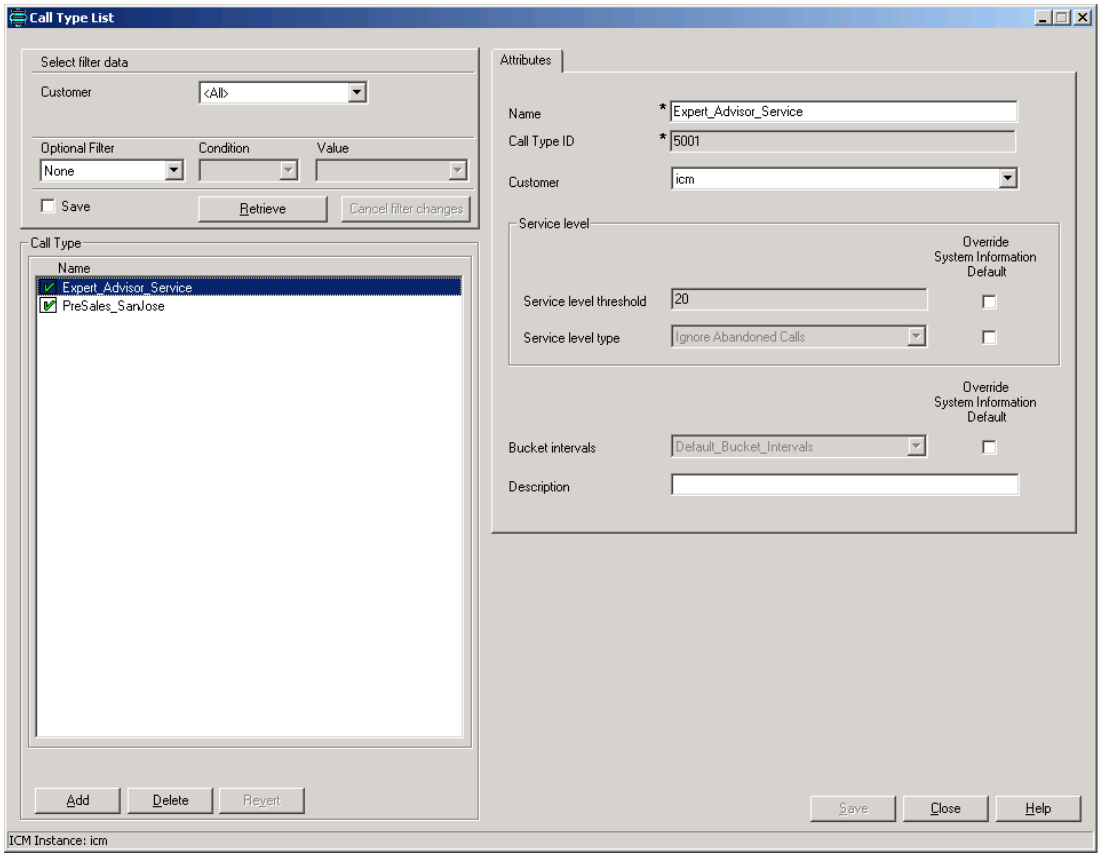
Step 6 Select the Customer **icm**.

Step 7 Enter an appropriate description as desired.

Step 8 Click **Save**. See Figure B-79.

Step 9 Repeat for second list.

Figure B-79



Add Dialed Number/Script Selector List

Create a Dialed Number List as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **Dialed Number/ Script Selector List** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add**.

Step 5 Select the Routing client **CUCM_RC**.

Step 6 Select the Media routing Domain **Cisco_Voice**.

Step 7 Enter the Dialed Number string that is called to reach this queue.

Step 8 Enter a name such as **CUCM_RC.1000** or **CUCM_RC.1301** as appropriate.

Step 9 Select the Customer **icm**.

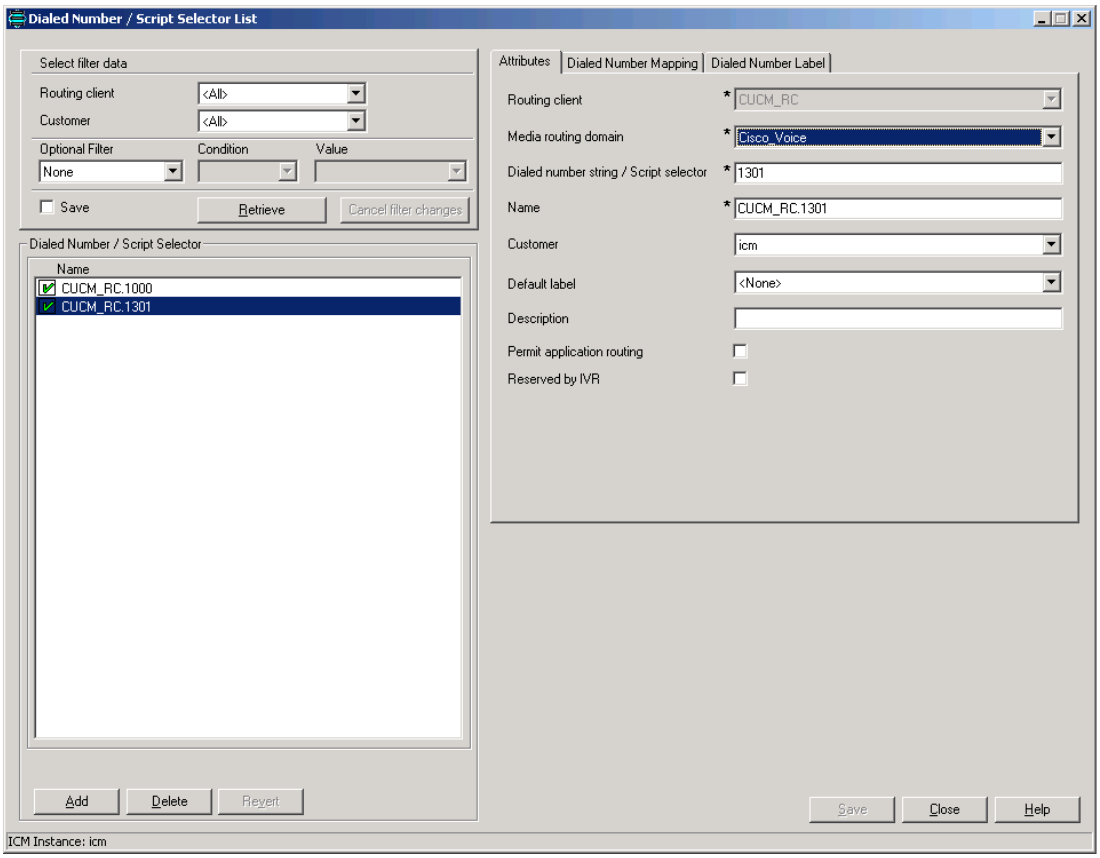
Step 10 Leave the default Label as **<None>**.

Step 11 Enter an appropriate description as desired.

Step 12 Click **Save**. See Figure B-80.

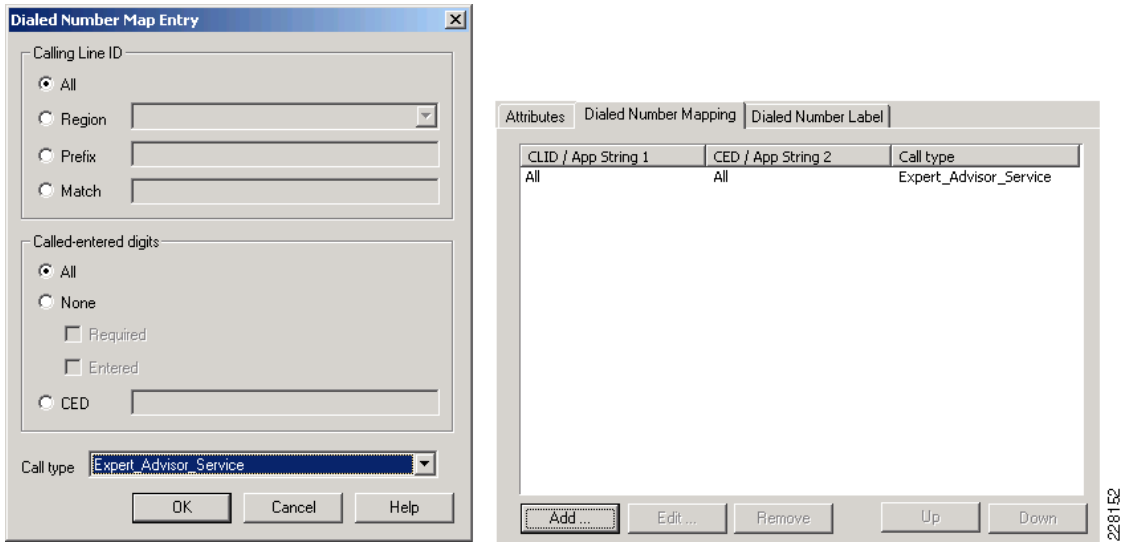
Step 13 Repeat for additional dialed numbers.

Figure B-80



Step 14 On the Dialed Number Mapping Tab, select the calling line ID, Caller Entered digits (if any) and the Call type. For the 1301 dialed number the **Expert_Advisor_Service** was selected, for the 1000 dialed number **PreSaled_SanJose** was selected. See Figure B-81.

Figure B-81



Enable Expanded Call Context

To ensure proper call routing, ensure that **Expanded call context** is enabled in the System information configuration as follows:

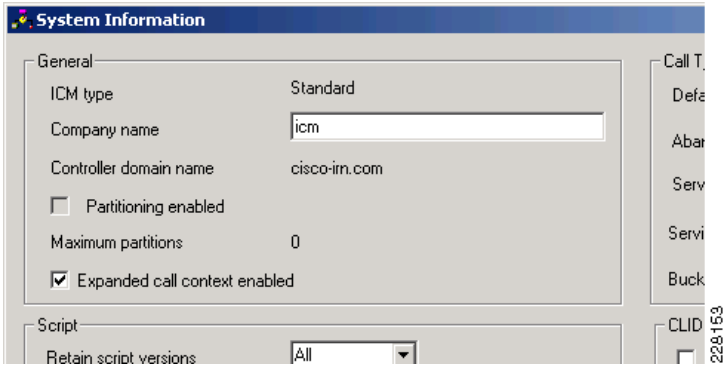
Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **System Information** option under the **Configure ICM > Enterprise > System Information** group.

Step 3 Check the **Expanded call context** option.

Step 4 Click **Save**. See Figure B-82.

Figure B-82



CUICM Instance Explorer Setting

An additional customer definition must be created for CVP under the ICM instance.

Create a customer definition as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **ICM Instance Explorer** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Select the desired instance.

Step 5 Click **Add Customer definition**.

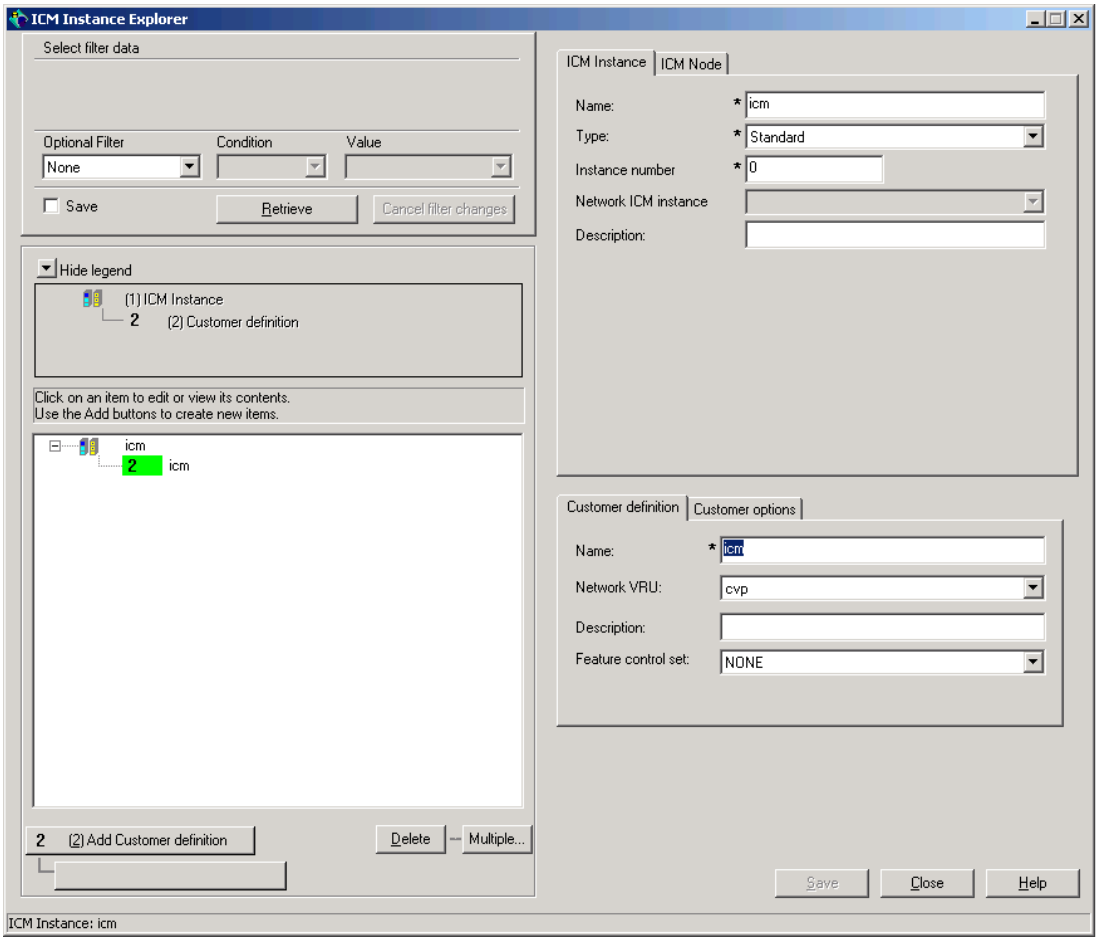
Step 6 Enter an appropriate name.

Step 7 Select the Network VRU as **cvp**.

Step 8 Enter an appropriate description as desired.

Step 9 Click **Save**. See Figure B-83.

Figure B-83



Add Expanded Call Variable List

Call variables are used to carry various pieces of information between systems as a call flows through the queue script steps. The default installation lacks several variables used in an Expert Advisor deployment and as such need to be added.

Add additional call variables as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **Expanded Call Variable List** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add**.

Step 5 Using the table of information below, configure each variable.

Step 6 Enter the variable name.

Step 7 Set the variable maximum length.

Step 8 If an array size is defined, check the array option and set the size.

Step 9 Set the variable as enabled.

Step 10 Set as persistent if specified.

Step 11 Enter an appropriate description as desired.

Step 12 Click **Save**. See Figure B-84.

Step 13 Repeat for each call variable.

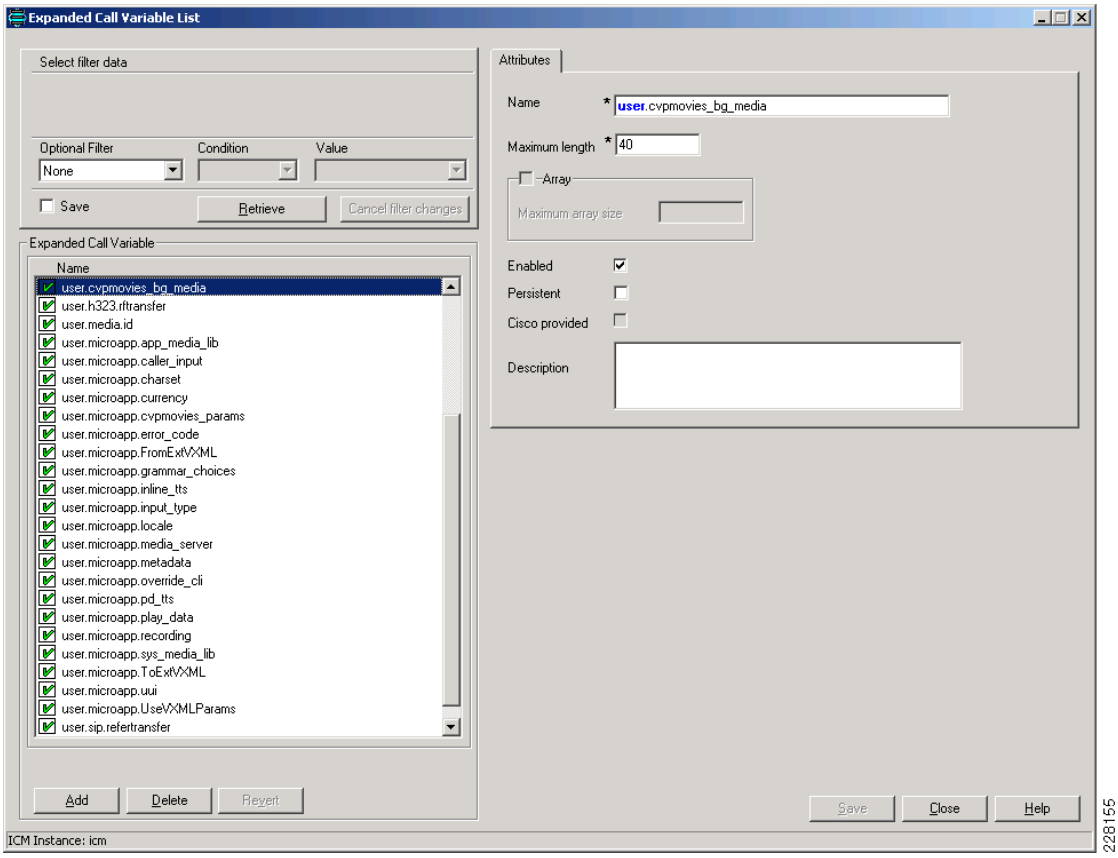
Table B-1 Expanded Call Variables

Name	Max Length	Array size	Enabled	Persistent
user.cvpmovies_bg_media	40		yes	
user.h323.rftransfer	1		Yes	
user.media.id	36		Yes	
user.microapp.app_media_lib	10		Yes	
user.microapp.caller_input	210		Yes	
user.microapp.charset	10		Yes	Yes
user.microapp.currency	6		Yes	
user.microapp.cvpmovies_params	40		Yes	
user.microapp.error_code	2		Yes	
user.microapp.FromExtVXML	210	1	Yes	
user.microapp.grammar_choices	210		Yes	
user.microapp.inline_tts	210		Yes	
user.microapp.input_type	1		Yes	
user.microapp.locale	5		Yes	
user.microapp.media_server	30		Yes	
user.microapp.metadata	62		Yes	

Table B-1 Expanded Call Variables (continued)

user.microapp.override_cli	1		Yes	
user.microapp.pd_tts	1		Yes	
user.microapp.play_data	40		Yes	
user.microapp.recording	40		Yes	
user.microapp.sys_media_lib	10		Yes	
user.microapp.ToExtVXML	210	1	Yes	
user.microapp.uui	131		Yes	
user.microapp.UseVXMLParams	1	1	Yes	
user.sip.refertransfer	1		Yes	
user.video_media_server	40		Yes	

Figure B-84



Network VRU Script List

The Network VRU enables interaction with the caller using a variety of external scripts. The scripts created in the Network VRU Script List are then made available in the Script Editor.

Create the following scripts for use later in the Script Editor.

Create the VRU Scripts as follows:

Step 1 Open the Configurations Manager on the AW.

Step 2 Select the **Network VRU Script List** option under the **Tools > Explorer Tools** group.

Step 3 Click **Retrieve**.

Step 4 Click **Add**.

Step 5 Using the table of information below, create each of the VRU Scripts.

Step 6 Enter the script name.

Step 7 Set the Network VRU as **cvp** for all entries.

Step 8 Enter the VRU script name.

Step 9 Enter the Timeout length.

Step 10 Enter the Configuration param.

Step 11 Set the Customer as **icm**.

Step 12 Enter an appropriate description as desired.

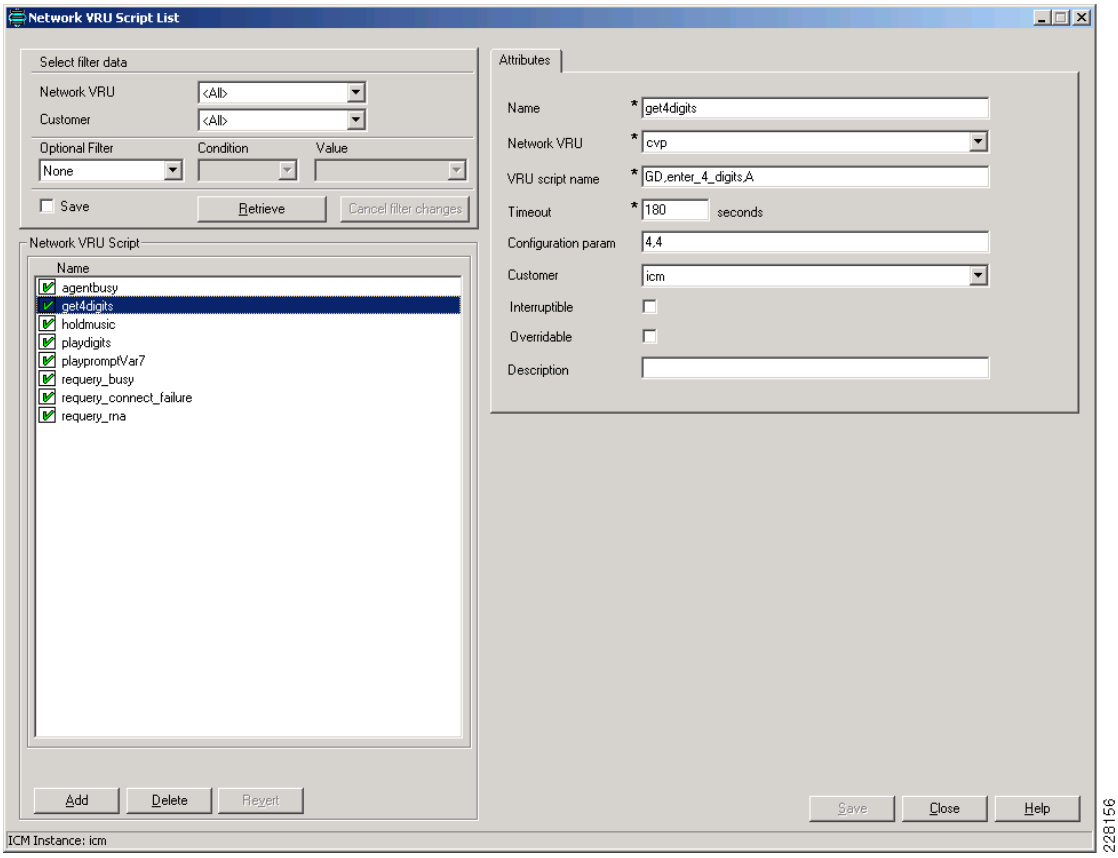
Step 13 Click **Save**.See Figure B-85.

Step 14 Repeat for each Network VRU Script in the table.

Table B-2

Name	VRU Script name	Timeout	Config. Param	Int	Ovr
agentbusy	PM,agentsbusy	180			
get4digits	GD,enter_4_digits,A	180	4,4		
holdmusic	PM,holdmusic	600		y	Y
playdigits	PD,Char	180		y	
playpromptVar7	PM,-7	180		y	
requery_busy	PM,requery_busy	180			
requery_connect_failure	PM,requery_connect_failure	180			
requery_rna	PM,requery_rna	180			

Figure B-85



CTI Toolkit Agent Desktop Client Installation

For Agents located in Contact Centers, or agents that would service more standard call center queues; the cisco Agent Desktop facilitates access to the queue and the tools necessary to track and monitor queue status.

The Cisco agent desktop is installed by running the Setup.exe program on the CTI disc (i.e., **D:\ctios_builds\Release\ctios\Installs\CTIOSClient**).

After running **Setup.exe**, complete the following steps are complete:

Step 1 Click **Next**, to continue.

Step 2 Click **Yes** on the confirmation page.

Step 3 Select the Installation drive.

Step 4 Click **Next**.

Step 5 Select the **Agent Desktop** feature.

Step 6 Click **Next**.

Step 7 Enter the CTIOS Server information.

Step 8 Enable QoS as desired.

Step 9 Click **Next**.

Step 10 If the formal agents are also using video endpoints select **Enable** for CVP Video.

Step 11 Click **Next**.

Step 12 Verify installation items and click **Next**.

Step 13 Once the installation is complete you will need to enter a CTIOS Client Certificate password between 8 and 30 characters long to secure communication between the Agent desktop and the CTIOS Server. Click **OK**.

Step 14 Review the *Important Not*e content and click **Next** to install security compontes.

Step 15 Once the client security setup is complete click **Finish**.

Step 16 Once the client setup is complete click **Finish**. See Figure B-86 and Figure B-87.

Figure B-86

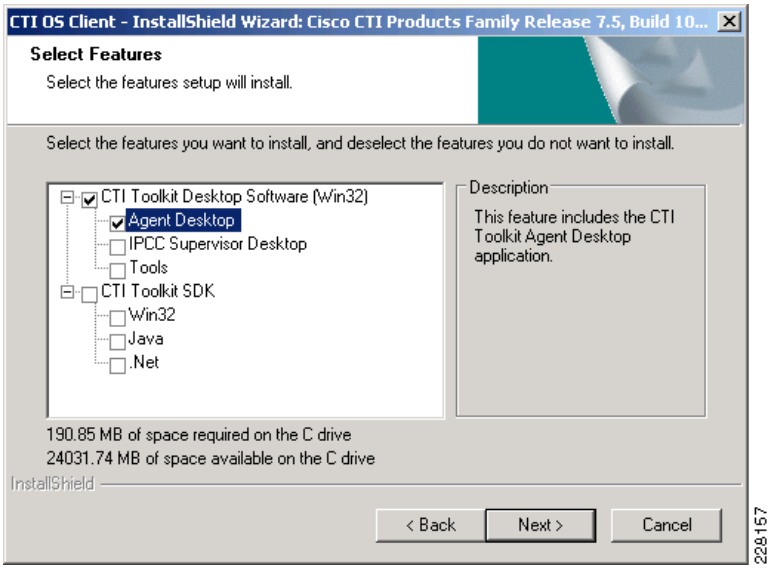
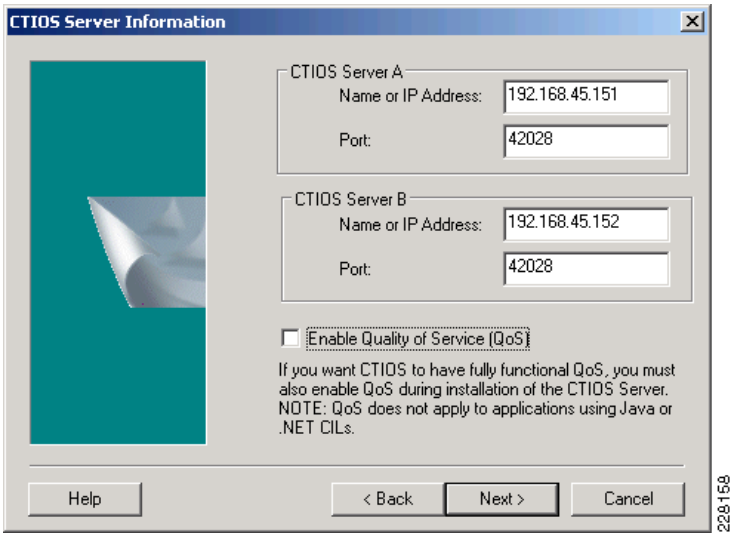


Figure B-87



If all configurations are good and communication to the CUCM via PG is active, then agent should be able to login. At this point, it is also good idea to check if calls are being routed to the agent by making a simple ICM routing script. **Start >LAA >Skill Group Selection >Stop**.

CUICM Routing Script

Create and schedule a routing script on AW by using the Script Editor software. Figure B-88 shows a sample routing script. The logic that is followed for creating this script is as follows:

Step 1 Start the script with the start node.

Step 2 Set the value of media server HTTP URL in Call.user.microapp.media_server variable. This is the web server URL from where **.wav** files will be played (e.g., http://media.cisco-irn.com).

Step 3 Set the value of language in *Call.user.microapp.locale* as **en-us**.

Step 4 Set the value of input type (which is digits in this sample script) in *Call.user.microapp.input_type* variable to **D**.

Step 5 Set the value of the *Call.user.microapp.app_media_lib* to **Custom**.

Step 6 After setting the variables send the call to IVR using “Send to VRU” node.

Step 7 Run external script called “get4digits” that will ask the customer to enter 4 digits (i.e., an account number).

Step 8 Use the Set Variable to save the value **Call.CallerEnteredDigits** in the *Call.user.microapp.play_data* variable.

Step 9 Run another external scrip called *playdigits*. This script will play the value stored in *Call.user.microapp.play_data* variable.

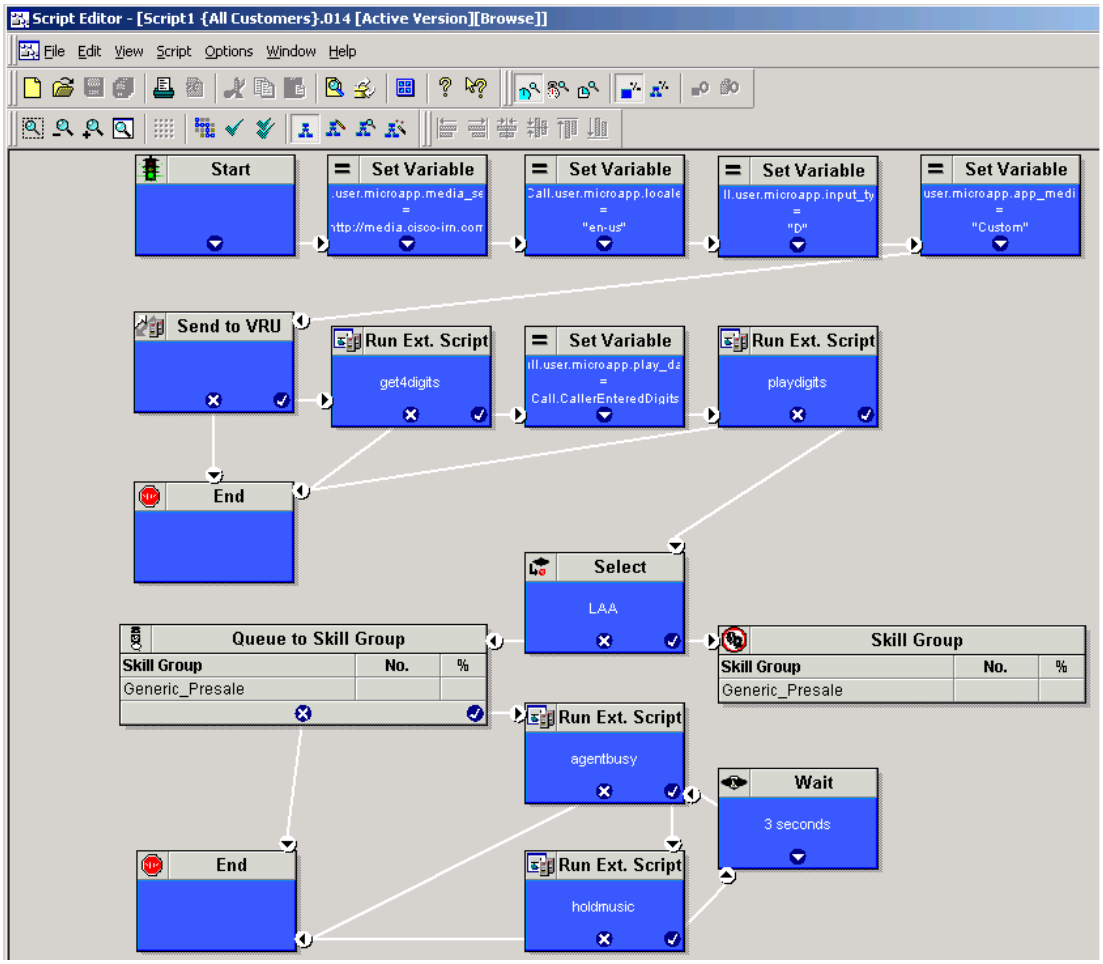
Step 10 The select Longest Available Agent (LAA) decision object.

Step 11 If agent is available, send the caller to agent using the Skill Group node.

Step 12 If agent is not available, send the caller to **Queue**.

Step 13 While the caller is in queue, play agent busy and music on hold **.wav** files in loop.

Figure B-88



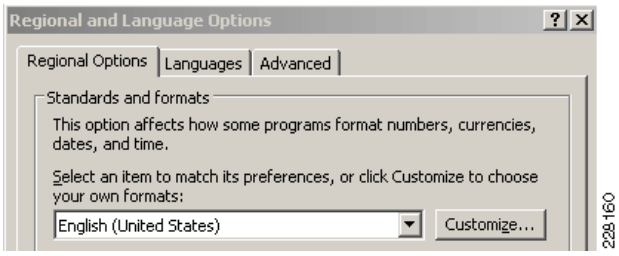
Cisco Voice Portal Installation

Prerequisites

- The CVP server hostname should not contain any hyphen.
- Arrange for CVP license.
- Regional and language options should be set to English.

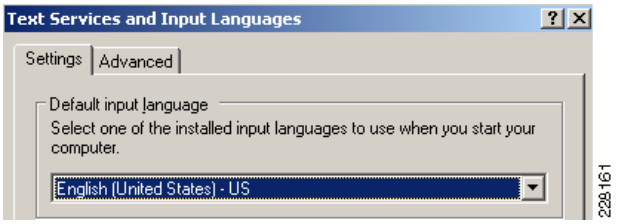
See Figure B-89.

Figure B-89



Text services and input languages options should be set to English (United States) - US. See Figure B-90.

Figure B-90



Only one Ethernet connection should be active on the machine. See Figure B-91.

Figure B-91

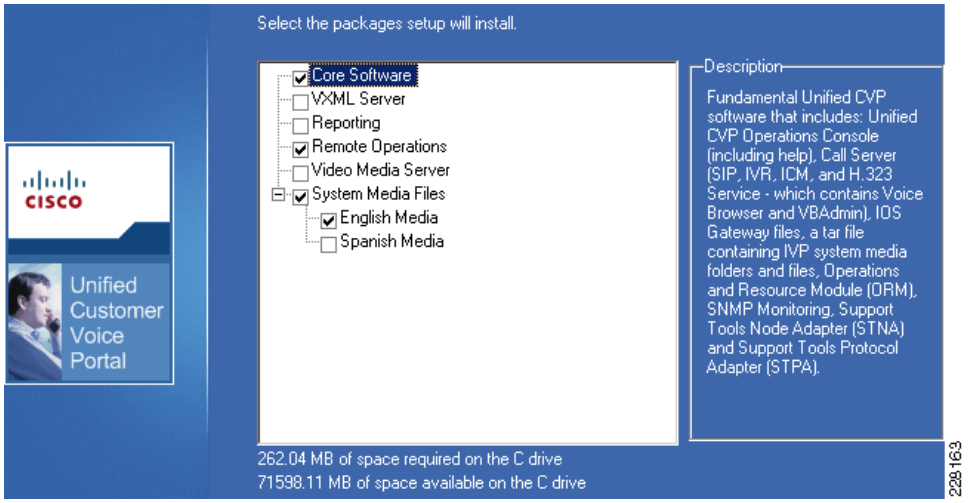
CVP Call Server, Operation Console and Media Server Installation

In this solution deployment lab validation, CVP Call Server and the Operation Console collocated on the same machine for ease of testing.

Install the CVP server by running the **Setup.exe** program from the installation DVD. Step through the installation using the following information:

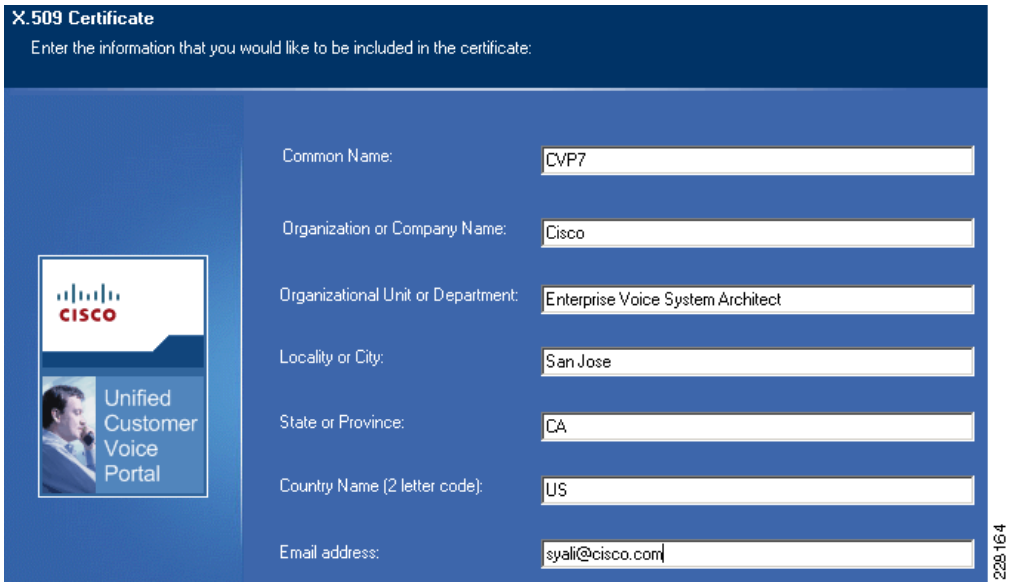
Step 1 Select Core Software, Remote Operations and System Media Files. See Figure B-92.

Figure B-92



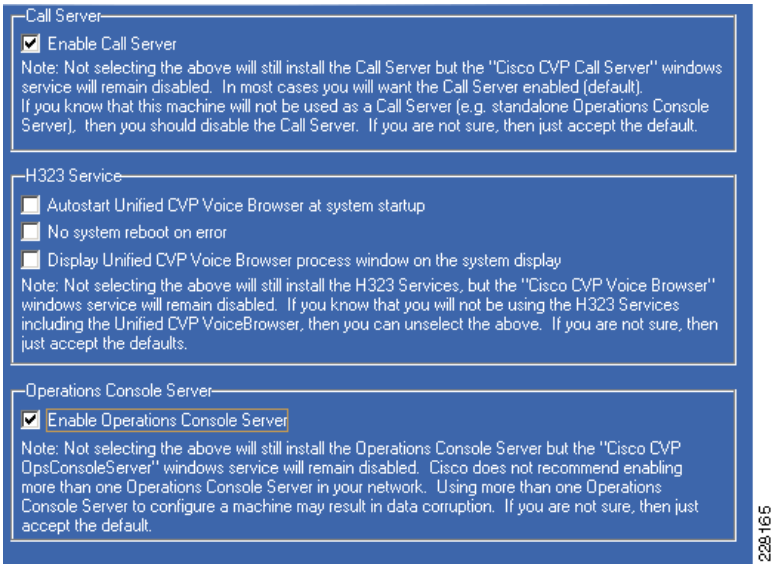
Step 2 Enter appropriate security certificate information. See Figure B-93.

Figure B-93



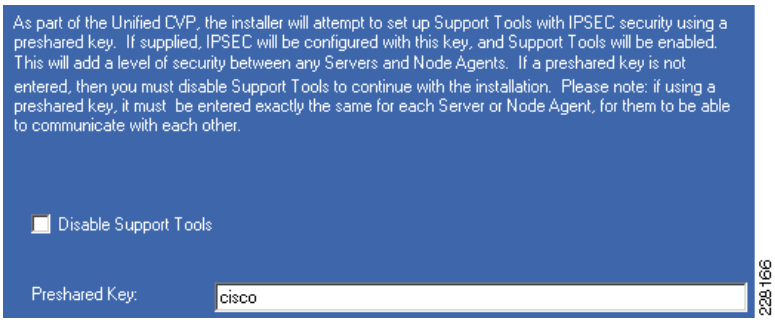
Step 3 Enable the Call server and the Operations console.See Figure B-94.

Figure B-94



Step 4 Enter the preshare key to use between servers and node agents software. See Figure B-95.

Figure B-95



CVP Component Configuration

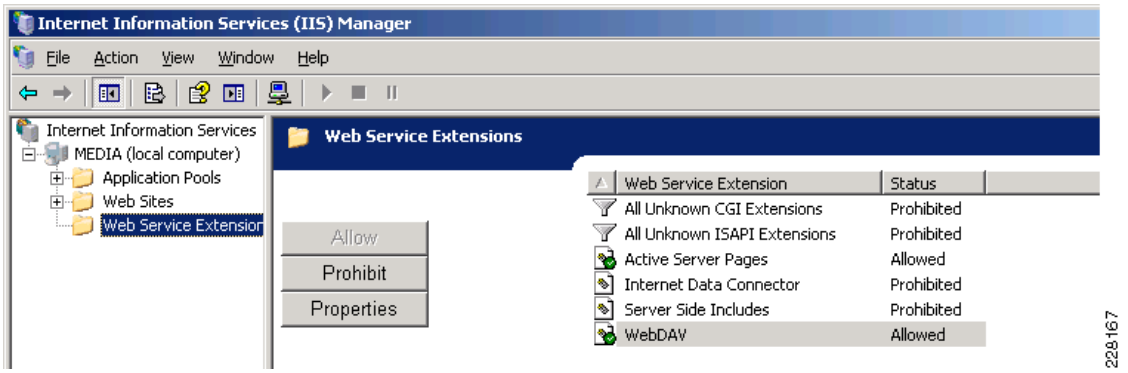
There are several components that needs to be configured before CVP can operate properly. They are as follows:

- CVP Media Server Configuration
- CVP Call Server Configuration

CVP Media Server Configuration

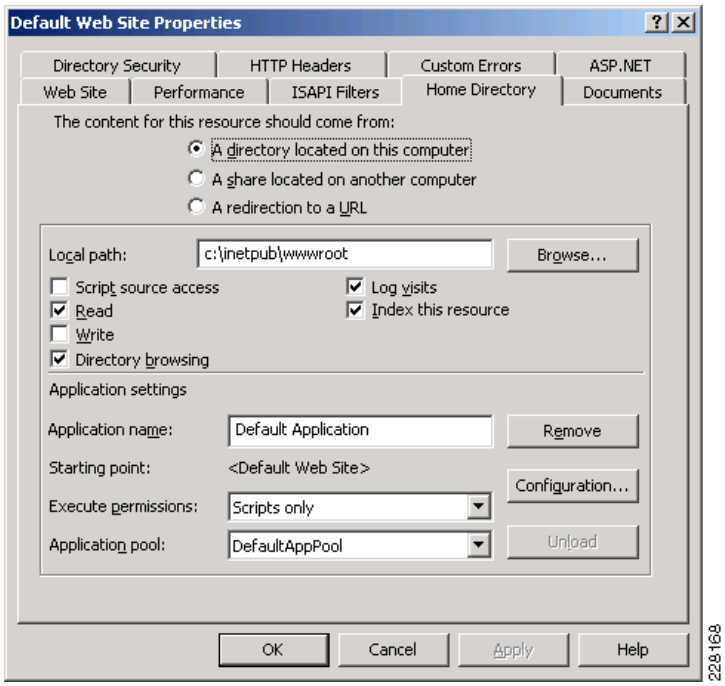
This setup used Microsoft IIS as the web server to host the media files. See Figure B-96.

Figure B-96



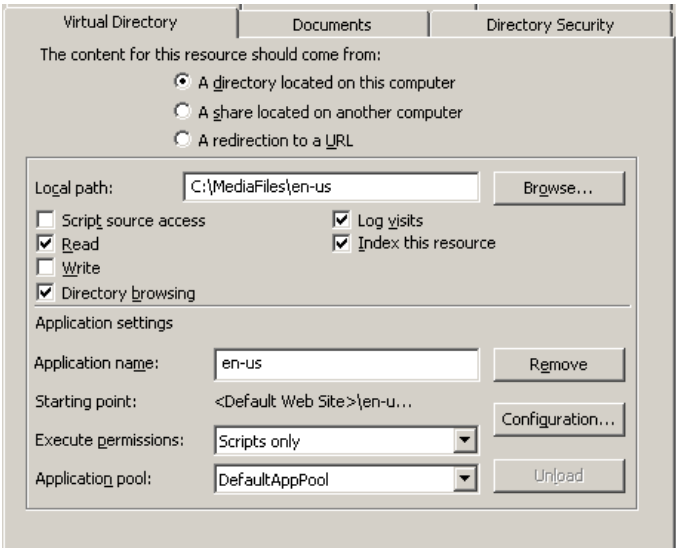
Step 1 Enable read permission to the directory where **.wav** files are saved. See Figure B-97.

Figure B-97



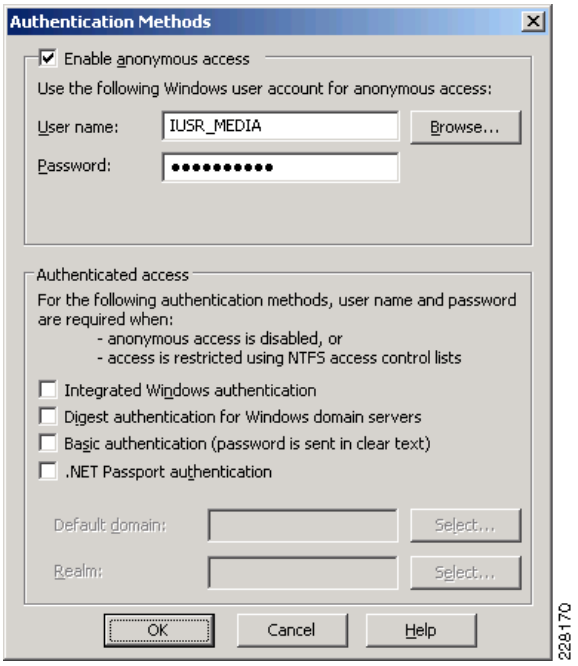
Step 2 Either create a Virtual Directory linking to the Media Files installed by the CVP **setup.exe**, or copy the "**en-us**" folder to the root of the IIS Web server. See Figure B-98.

Figure B-98



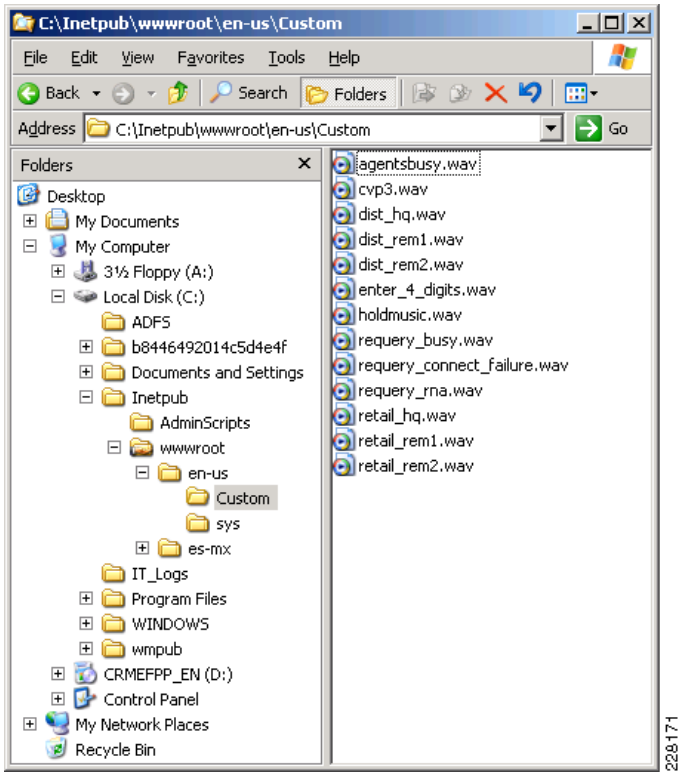
Step 3 Make sure anonymous access is enabled and the built-in IIS User is assigned. See Figure B-99.

Figure B-99



Step 4 Create a folder named **Custom** below the **en-us** folder for the audio files in the custom scripts. See Figure B-100.

Figure B-100



CVP Call Server Configuration

Before configuring CVP call server, it should be important to know little bit about the setup and SIP call flows. Notices that these call flows are valid for the Type 10 VRU only. Also notice that "**cid**" is actually the correlation ID and is a numerical value.

Call Flow

CUCM Originated Calls

Table B-3 CUCM Originated Calls

CUCCE Pilot Number	IP Phone caller dials CTI route point number 1000
Routing Client	SIP Gateway is the routing client
Label Returned to SIP GW by CUICM	1000+cid
Processing at SIP GW	SIP GW receives the label and sends the call to CVP Call Server
Processing at CVP	CVP receives this label and send it to CUICM as a new route-request.
Routing Client	Notice that now CVP is the routing-client
Processing at CUICM	CUICM receives its own generated label again and knows that loop is complete. And then generates a new label 1000+cid and sends to CVP

Table B-3 CUCM Originated Calls (continued)

Processing at CVP	CVP Call Server send this label 1000+cid to VXML-GW
Processing at VXML-GW	VXML-GW has an incoming dial-peer configured that basically invokes the bootstrap tcl service
	Now a sequence of VXML communications happens between the VXML GW and CVP IVR Service. This communication is called MicroApps.
Processing at CVP	At this point CVP sends the same label 1000+cid to CUICM to inform that VXML-GW resources are engaged

Once you understand the high level overview of the call flow, it will be easy to understand the static routes needed by the CVP Call Server. Using the SIP Gateway, a single static route can be used, (e.g., **>, sip-1.cisco-irn.com**)

CVP Operation Console Server

CVP Operation Console Server provides web-based front-end to configure different components in CVP environment.See Figure B-101 and Figure B-102.

Figure B-101 CVP Call Server General Setting

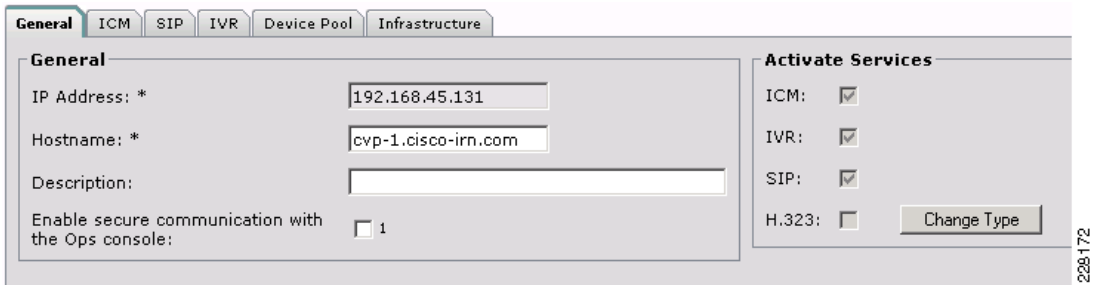
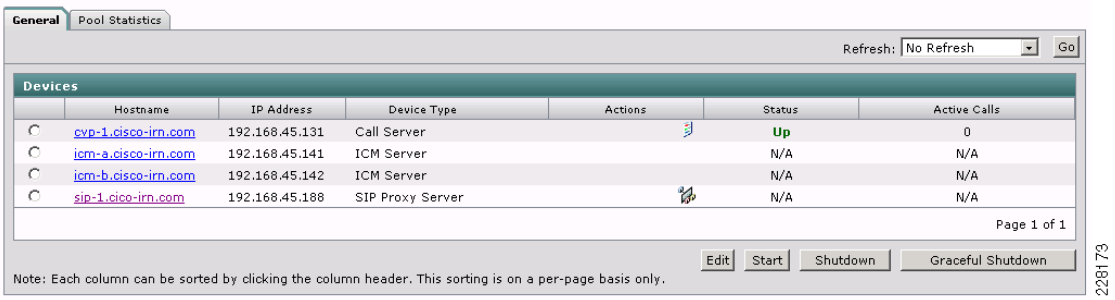


Figure B-102



CVP Call Server ICM Configuration

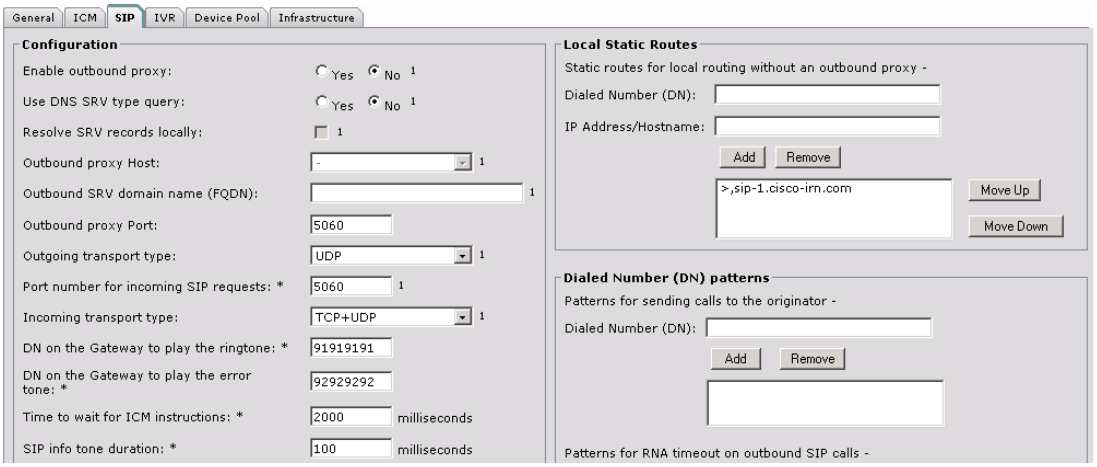
See Figure B-103.

Figure B-103

CVP Call Server SIP Configuration and Static Route

Default information was used and no fields were modified. See Figure B-104.

Figure B-104



VXML and Ingress Gateway Configuration

In this setup, the same router can be used as an ingress gateway as well as the VXML gateway. Note that due to VXML compatibility issues, all Cisco IOS versions are not supported. In this lab validation tested **c2800nm-ipvoicek9-mz.124-24.T1.bin**.

Copy following files to VXML Gateway router's flash memory:

```
bootstrap.tcl
bootstrap.vxml
cvperror.tcl
CVPSelfService.tcl
CVPSelfServiceBootstrap.vxml
survivability.tcl
handoff.tcl
ringtone.tcl
recovery.vxml

holdmusic.wav
```

```
    ringback.wav
    pleasewait.wav
    critical_error.wav
    en_0.wav
    en_1.wav
```

Configuration

```
version 12.4
service timestamps debug datetime localtime show-timezone
service timestamps log datetime localtime show-timezone
no service password-encryption
!
hostname VXML
!
boot-start-marker
boot system flash c2800nm-ipvoicek9-mz.124-24.T1.bin
boot-end-marker
!
logging message-counter syslog
logging buffered 100000
enable password cisco
!
no aaa new-model
clock timezone PST -8
clock summer-time PSTDST recurring
!
dot11 syslog
ip source-route
!
!
ip cef
!
!
ip domain name cisco-irn.com
ip name-server 192.168.42.130
no ipv6 cef
ntp server 192.168.0.1
ntp server 192.168.42.130
ntp server 192.168.62.161 prefer
ntp server 192.168.62.162
multilink bundle-name authenticated
!
!
voice service voip
 allow-connections h323 to h323
 allow-connections h323 to sip
 allow-connections sip to h323
 allow-connections sip to sip
 fax protocol cisco
 h323
  emptycapability
  no telephony-service ccm-compatible
  no ccm-compatible
  h225 id-passthru
  call start slow
  h245 passthru tcsnonstd-passthru
 sip
  ds0-num
```

```
  header-passing
!
!
!
voice class codec 1
 codec preference 1 g711ulaw
 codec preference 2 g729r8
!
voice class h323 1
  h225 timeout setup 3
!
!
voice translation-rule 1
 rule 1 /987654/ //
!
!
voice translation-profile block
 translate called 1
!
!
voice-card 0
 dsp services dspfarm
!
http client cache memory pool 15000
http client cache memory file 500
ivr prompt memory 15000
!
application
 service new-call flash:bootstrap.vxml
  paramspace english language en
  paramspace english index 0
  paramspace english location flash:
  paramspace english prefix en
 !
 service cvp-survivability flash:survivability.tcl
  paramspace english language en
  paramspace english index 0
  param alert-timeout 20
  paramspace english location flash
  paramspace callfeature med-inact-det enable
  param setup-timeout 7
  paramspace english prefix en
 !
 service ringtone flash:ringtone.tcl
  paramspace english language en
  paramspace english index 0
  paramspace english location flash
  paramspace english prefix en
 !
 service recovery flash:recovery.vxml
  paramspace english language en
  paramspace english index 0
  paramspace english location flash:
  paramspace english prefix en
 !
 service cvperror flash:cvperror.tcl
  paramspace english index 0
  paramspace english language en
  paramspace english location flash
  paramspace english prefix en
 !
 service takeback flash:survivability.tcl
  paramspace english language en
  paramspace english index 0
```

```
  paramspace english location flash
  paramspace english prefix en
 !
 service HelloWorld flash:CVPSelfService.tcl
  paramspace english index 0
  paramspace english language en
  param CVPSelfService-port 7000
  param CVPSelfService-app HelloWorld
  param CVPPrimaryVXMLServer 192.168.45.131
  paramspace english location flash
  paramspace english prefix en
  param CVPBackupVXMLServer 192.168.45.132
 !
 service handoff flash:handoff.tcl
  paramspace english language en
  paramspace english index 0
  paramspace english location flash
  paramspace english prefix en
 !
 service bootstrap flash:bootstrap.tcl
  paramspace english index 0
  paramspace english language en
  paramspace english location flash:
  paramspace english prefix en
 !
!
vxml version 2.0
!
archive
 log config
  hidekeys
!
!
interface FastEthernet0/0
 description Connection to SACCESS-g1/33
 ip address 192.168.45.101 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 no ip address
 shutdown
 duplex auto
 speed auto
!
interface GigabitEthernet1/0
 no ip address
 shutdown
!
!
ip forward-protocol nd
ip route 0.0.0.0 0.0.0.0 192.168.45.1
!
ip http server
no ip http secure-server
!
control-plane
!
mgcp fax t38 ecm
mgcp behavior g729-variants static-pt
!
! <====Configuration for Trusted Relay===>
sccp local FastEthernet0/0
sccp ccm 192.168.45.182 identifier 1 version 7.0
```

```
sccp ccm 192.168.80.181 identifier 2 version 7.0
sccp
!
sccp ccm group 1
 associate ccm 1 priority 1
 associate profile 1 register MTP-01
!
sccp ccm group 2
 associate ccm 2 priority 1
 associate profile 2 register MTP-02
!
dspfarm profile 2 mtp
 codec g711ulaw
 codec pass-through
 maximum sessions software 110
 associate application SCCP
!
dspfarm profile 1 mtp
 codec g711ulaw
 codec pass-through
 maximum sessions software 110
 associate application SCCP
! <====End Configuration for Trusted Relay===>
!
dial-peer voice 9191 voip
 service ringtone
 session protocol sipv2
 incoming called-number 9191T
 dtmf-relay rtp-nte
 codec g711ulaw
 no vad
!
dial-peer voice 9292 voip
 service cvperror
 session protocol sipv2
 incoming called-number 9292T
 dtmf-relay rtp-nte
 codec g711ulaw
 no vad
!
dial-peer voice 1006 voip
 translation-profile incoming block
 service bootstrap
 session protocol sipv2
 incoming called-number 1006T
 dtmf-relay rtp-nte
 codec g711ulaw
 ip qos dscp cs3 signaling
 no vad
!
dial-peer voice 987654 voip
 translation-profile incoming block
 incoming called-number 987654
!
!
!
line con 0
 exec-timeout 0 0
line vty 0 4
 exec-timeout 0 0
 password cisco
 login
line vty 5 15
 exec-timeout 0 0
```

```
 password cisco
 login
!
scheduler allocate 20000 1000
end
```

Expert Advisor Installation

The installation is on VOS. It is very simple. Refer to the *Installation Guide for Cisco Unified Expert Advisor 7.6(1)* for additional information. Follow these steps:

Step 1 Media Check: select **Yes** if you want to check the media.

Step 2 Product Deployment Selection: Click OK.

Step 3 Proceed with Install: **Yes**.

Step 4 Platform Installation Wizard: Click on **Proceed**.

Step 5 Apply Patch: Click **No**.

Step 6 Basic Install: Click on **Continue**.

Step 7 Timezone Configuration: Select your timezone.

Step 8 Auto Negotiation Configuration: Select the default option **Yes**.

Step 9 MTU Configuration: Select the default option: **No**.

Step 10 DHCP Configuration: Select **No**.

Step 11 Static Network Configuration: Enter the information for your network.

Step 12 DNS Client Configuration: Click **Yes**.

Step 13 DNS Client Configuration: Enter your DNS information.

Step 14 Administrator Login Configuration: Enter your Administrator ID and password information.

Step 15 Certification Information: Enter your Certificate Information.

Step 16 First Node Configuration: Click **Yes** if you are installing your first node. If you are installing the second Expert Advisor Server or the reporting server, click **No.**

Step 17 Network Time Protocol Client Configuration: Click **Yes**.

Step 18 Network Time Protocol Client Configuration: Enter the NTP Client information.

Step 19 Database Access Security Configuration: Enter the system security password.

Step 20 SMTP Host Configuration: Select **No** if you are not configuring a SMTP Host for this machine.

Step 21 Application User Configuration: Enter the Application (GUI) username and password.

Step 22 Platform Configuration Confirmation: Click on **Ok**.

For more information on the installation of the Expert Advisor servers, refer to the *Installation Guide for Cisco Unified Expert Advisor* 7.6(1).

CUP Installation

The CUP installation is very similar to the installation of Expert Advisor, since it is also running on Unified Communications Operating System (UCOS). Follow the steps above for base installation.

Once the server is installed, a few post install steps need to be done; log into the server via the web interface: **http://<YourCUPServerAddress>/ccmadmin**.

After the install, enter the post install information. See Figure B-105 to Figure B-109.

Figure B-105

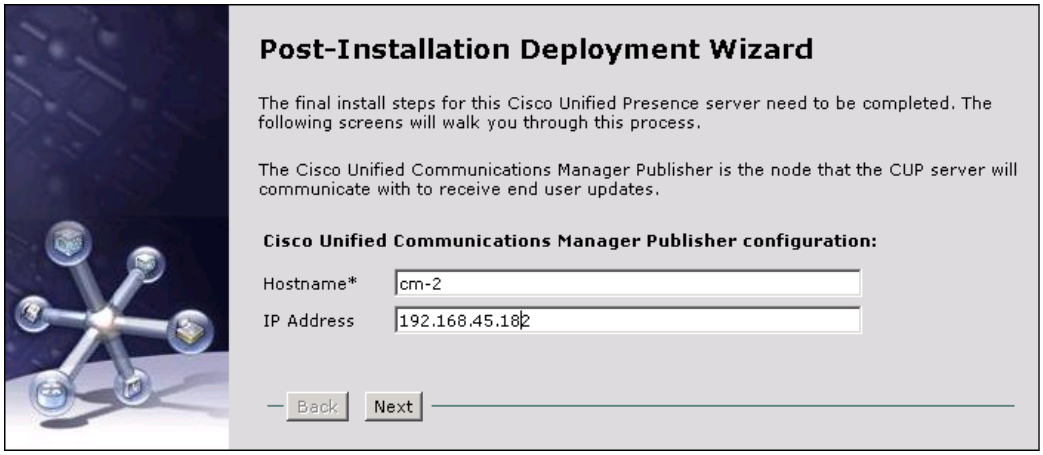


Figure B-106

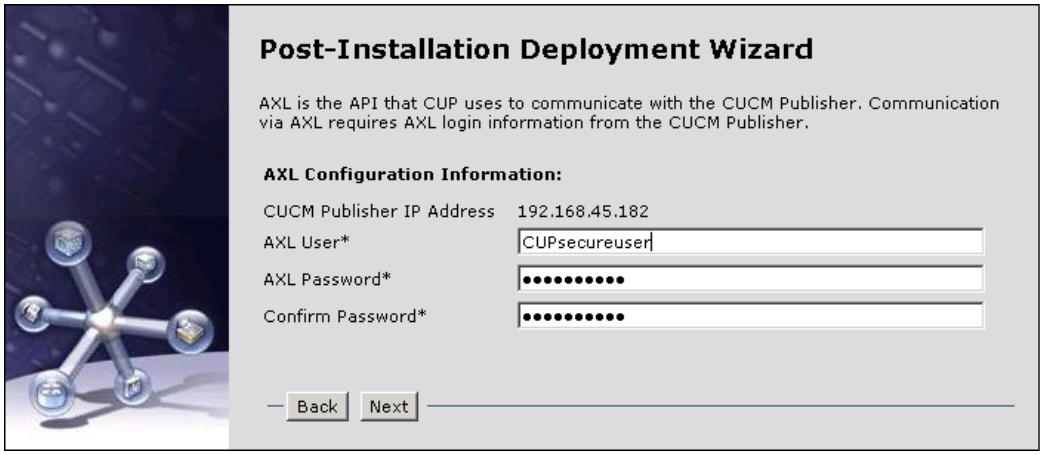
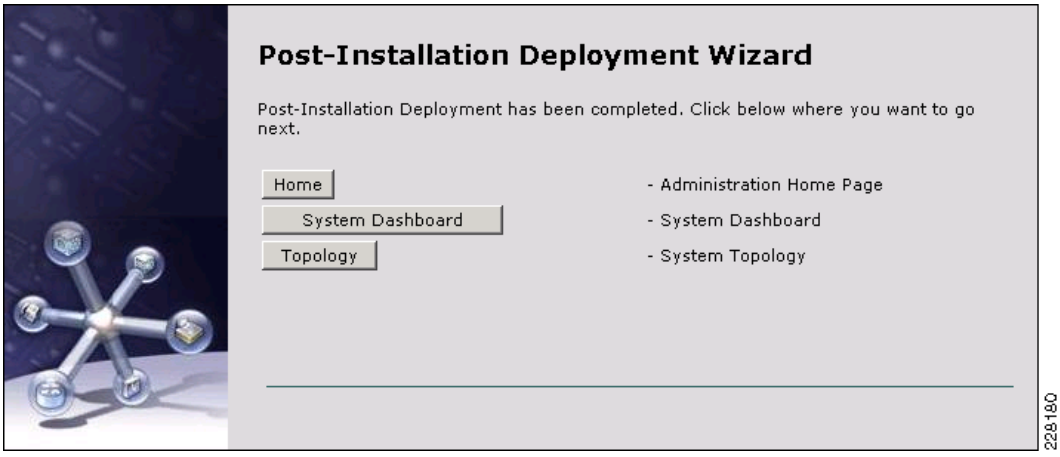


Figure B-107

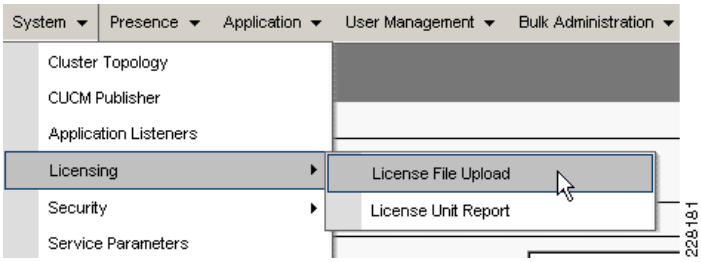
Figure B-108

Figure B-109



Obtain a license. Upload the license. See Figure B-110.

Figure B-110

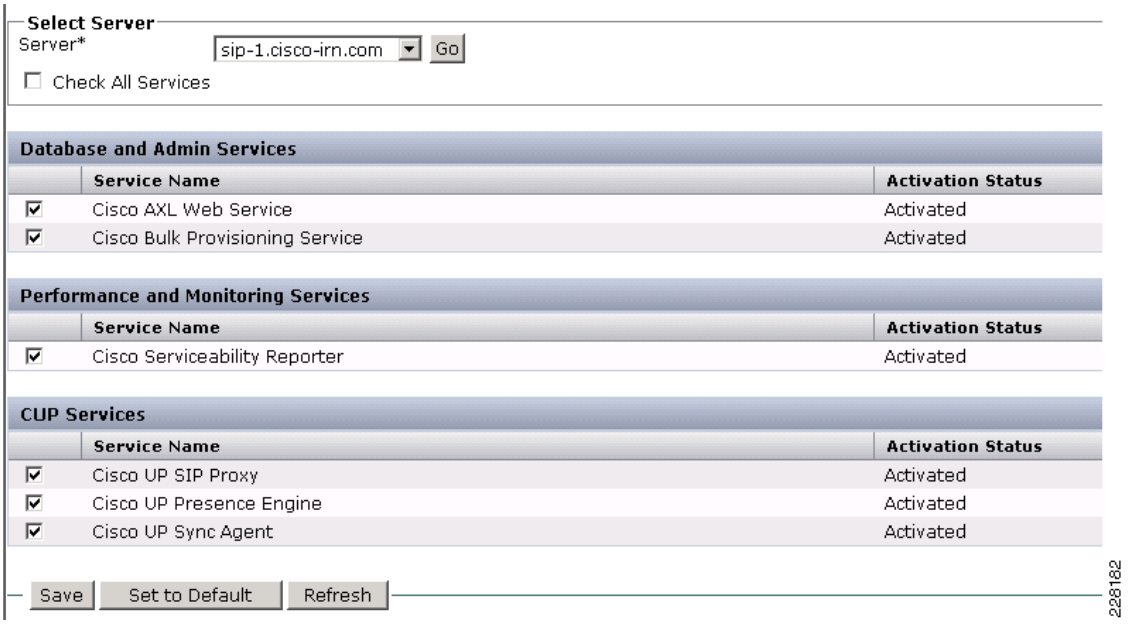


Configuration

CUP

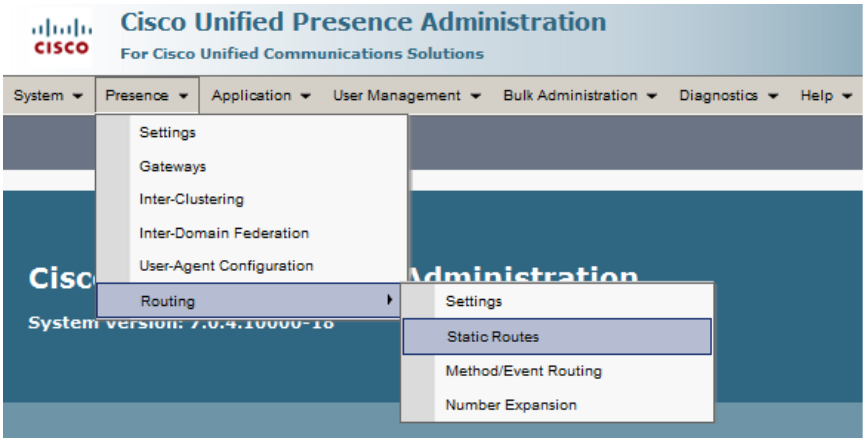
Step 1 Activate the **Cisco UP SIP Proxy**, **Cisco UP Presence and Cisco UP Sync Agent** Services. See Figure B-111.

Figure B-111



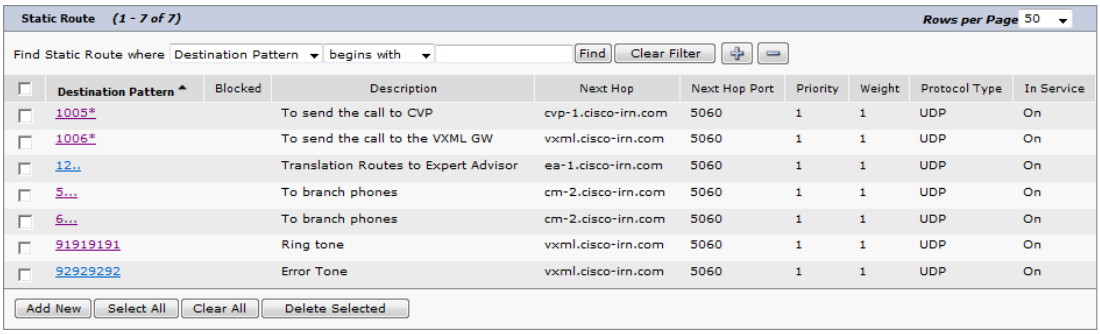
Step 2 Go to **Presence > Routing > Static Routes**. See Figure B-112.

Figure B-112



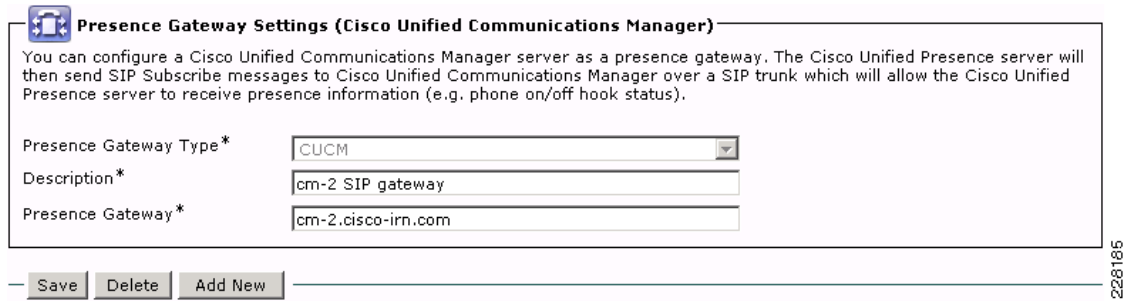
Step 3 And add routes to the Expert Advisor Runtime server. See Figure B-113.

Figure B-113



Step 4 Create a Presence Gateway so that Unified CM can send presence information to the Cisco Unified Presence Server. Go to **Presence > Presence Gateways**. See Figure B-114.

Figure B-114



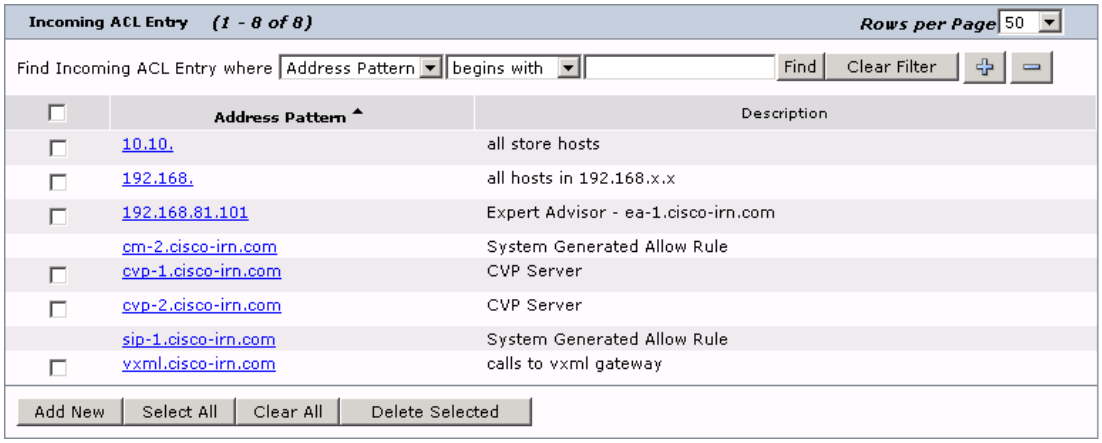
Step 5 Configure a Proxy Domain so that CUPC users can connect to the CUP server to obtain presence information. Go to **System > Service Parameters**.

Step 6 Set the "Proxy Domain" field to the correct DNS domain.

Step 7 Configure Incoming ACL: configure which hosts, domains, and CUPC clients can access CUP Server.

Step 8 Go to **System > Security > Incoming ACL**. See Figure B-115.

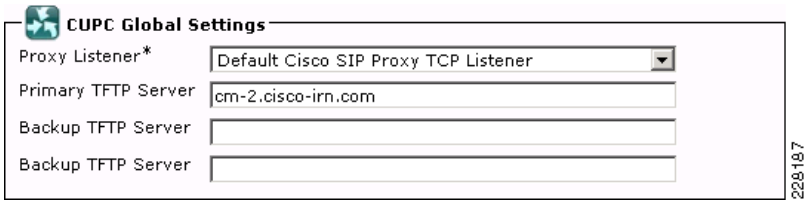
Figure B-115



Step 9 Configure TFTP Server for CUPC.

Step 10 Go to **Application > Cisco Unified Personal Communicator > Settings**. See Figure B-116.

Figure B-116



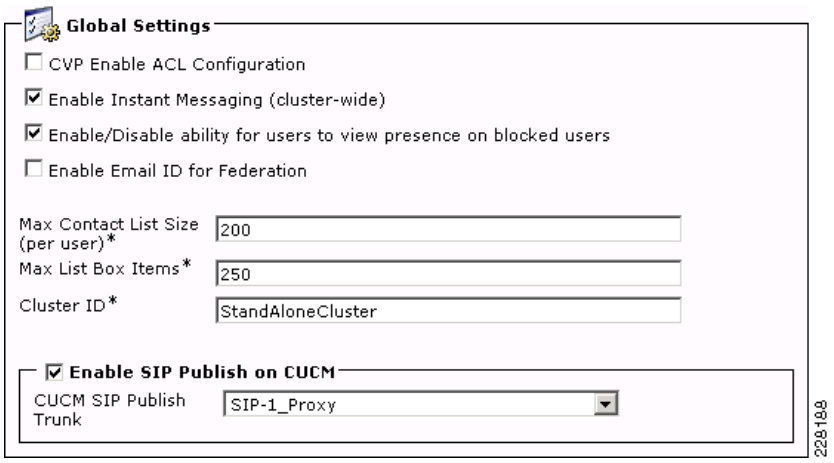
Step 11 Add SIP Publish capability to the SIP trunk between CUCM and CUP. This will allow CUCM to provide phone presence information to CUP server.

Step 12 Go to the CUP server, **Application > Presence > Settings**.

Step 13 Check the **Enable SIP Publish on CUCM**.

Step 14 Select the SIP trunk configured on CUCM. See Figure B-117.

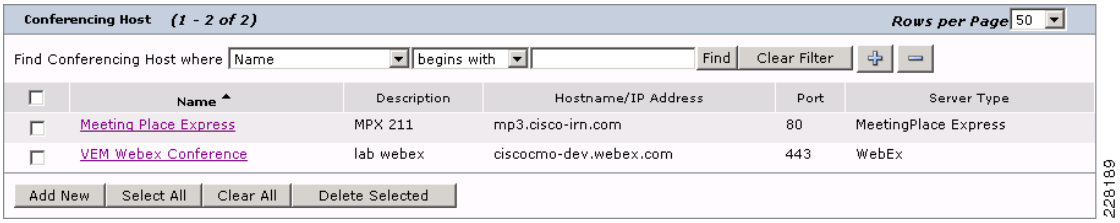
Figure B-117



Note Another way to do this is to go directly to the CUCM admin page, **Service Parameter**, **Cisco CallManager**, and select the SIP trunk in the field **CUP Publish Trunk**

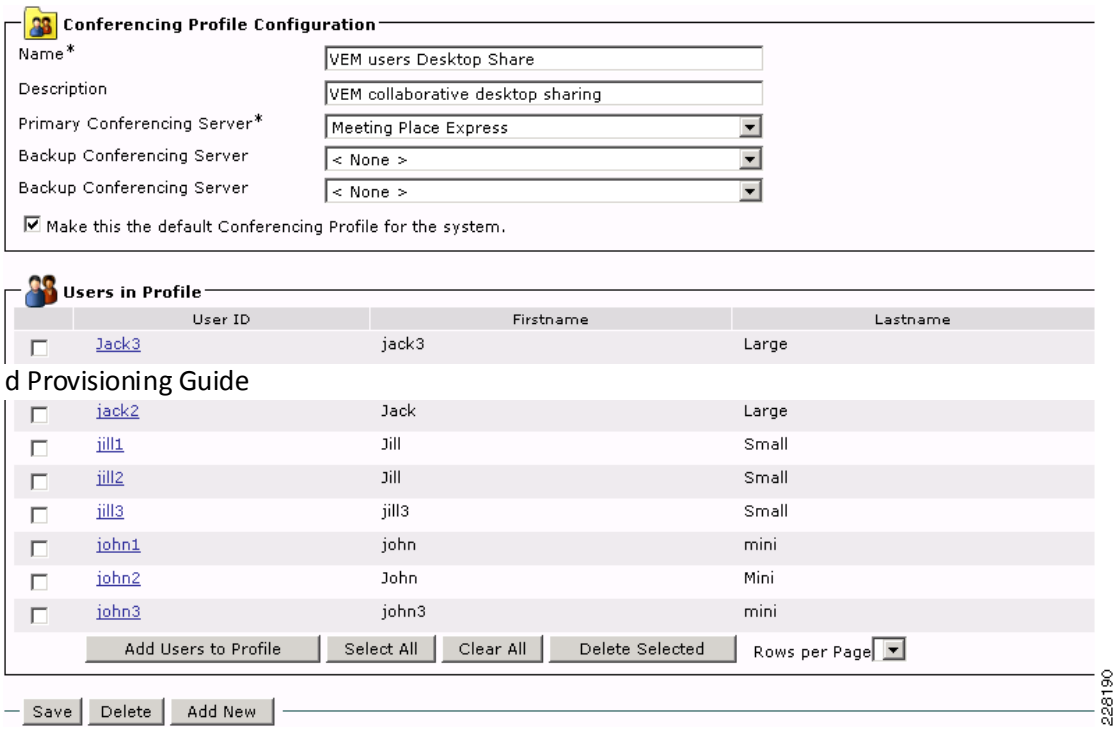
Step 15 Configure Conferencing hosts as appropriate. Go to **Application > Cisco Unified Personal Communicator > Conferencing Server**>New servers. See Figure B-118.

Figure B-118



Step 16 After the server is configured, create a Conferencing profile and add users to the profile. See Figure B-119.

Figure B-119



CUCM

Since in this solution calls are originated from an IP Phone, create a CTI RP (you could also send the call to CVP with a Route Pattern, but here, the scenario covers where the call is sent to CVP using a CTI RP) and add a DN for this CTI RP(in our example, 1000 and 1301 DNs are used). If your calls are coming directly to CVP via a PSTN GW, you do not need these steps. See Figure B-120 and Figure B-121.

Figure B-120

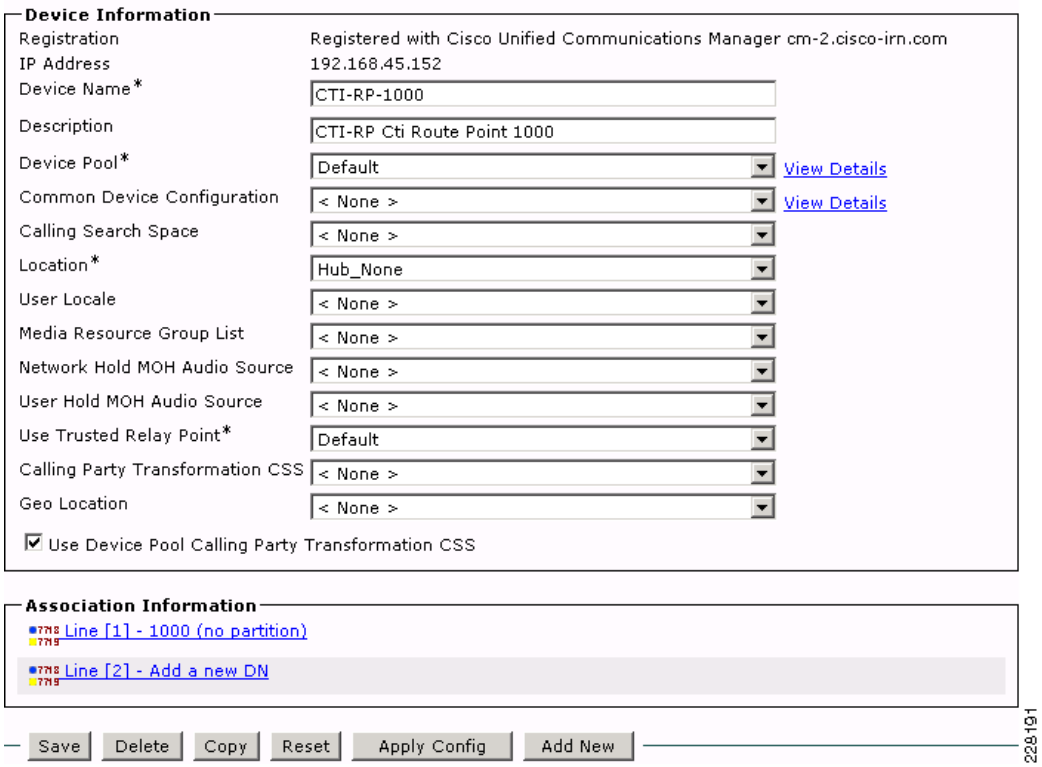
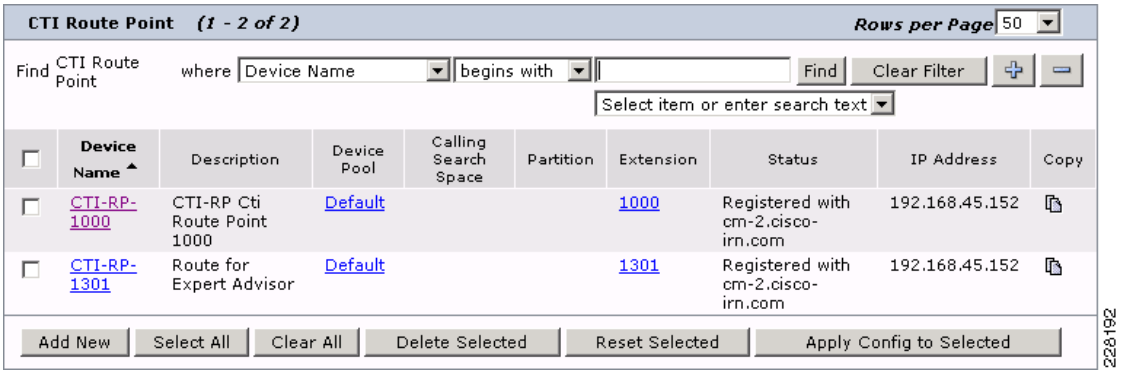
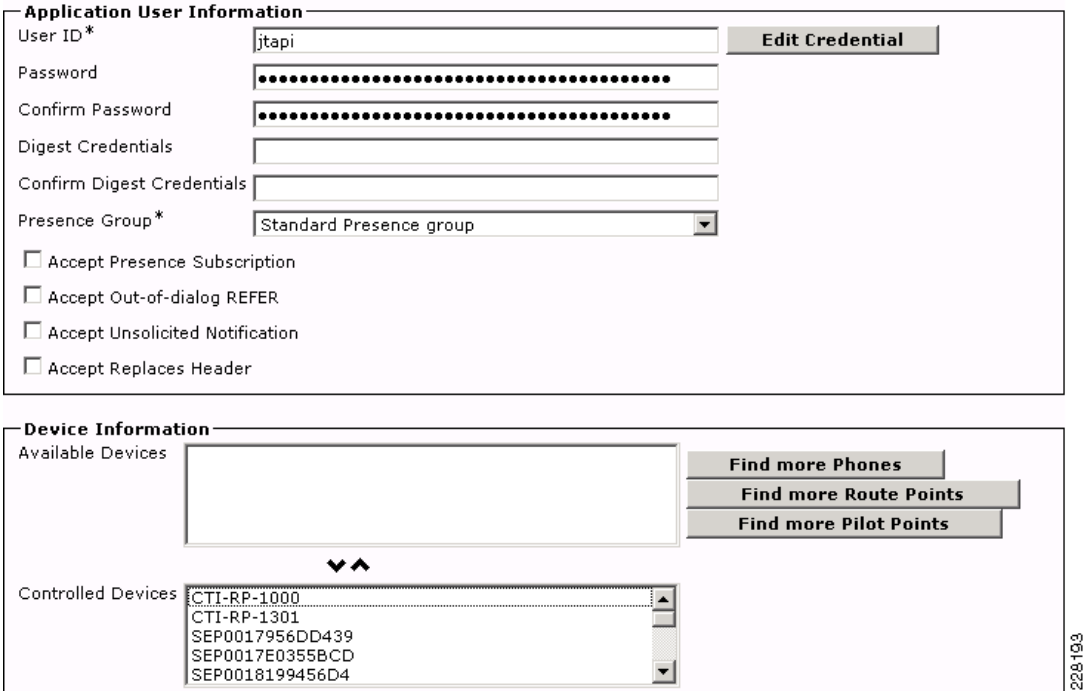


Figure B-121



Step 1 Associate the CTI-RP to the jtapi user that the Agent PG is using to connect to CUCM. See Figure B-122.

Figure B-122



Step 2 Add the CUP server in the Application server Configuration as shown in Figure B-123 and Figure B-124.

Figure B-123

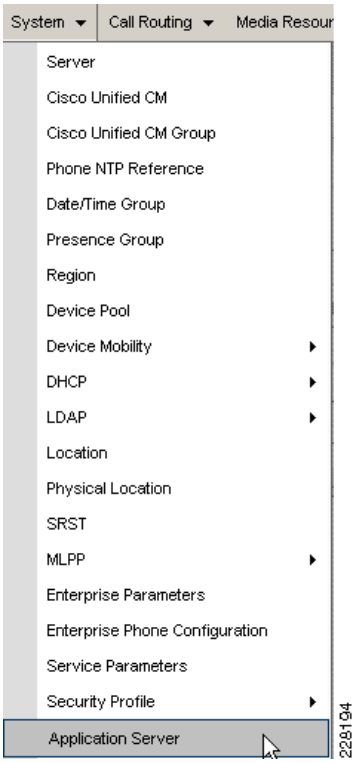
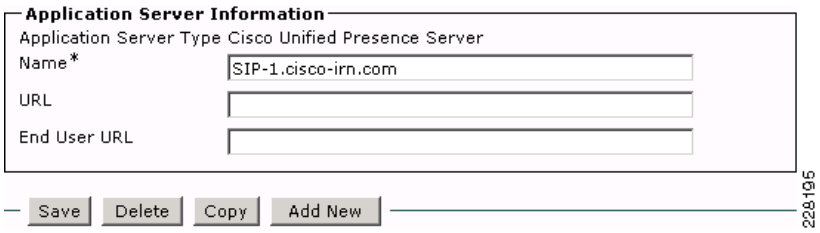
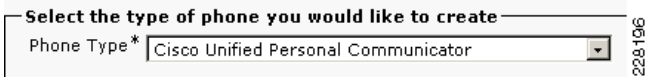


Figure B-124



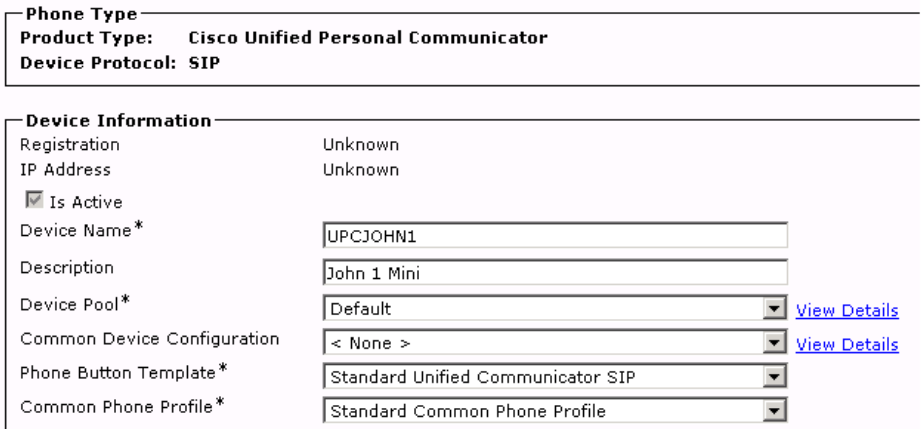
Step 3 If the expert advisor user will use CUPC as a softclient, create a phone device on CUCM for the CUPC softclients. Select the **Cisco Unified Personal Communicator** Phone Type. See Figure B-125.

Figure B-125



Step 4 The device name must start with UPC and be followed, all capital letters, by the username of the expert advisor that will use the client. See Figure B-126.

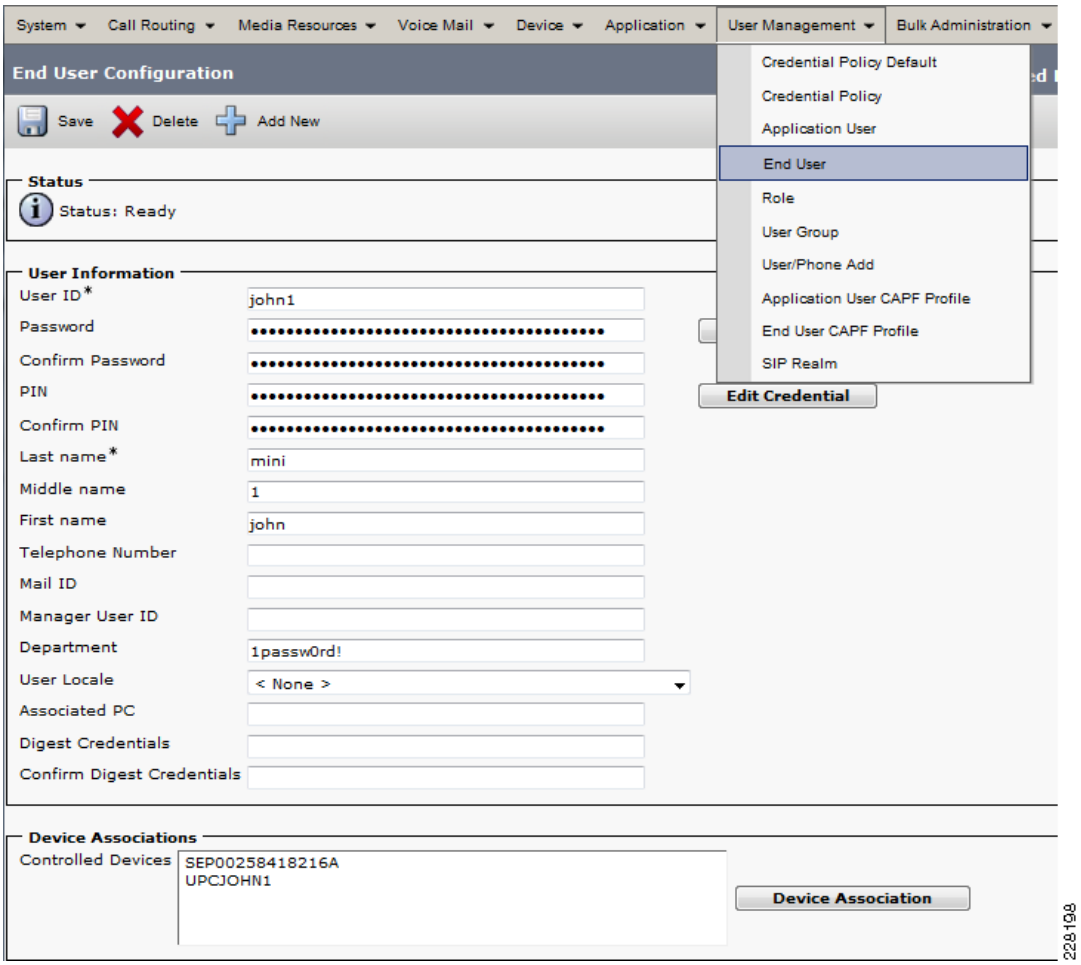
Figure B-126



Step 5 Add a DN for each of the CUPC device.

Step 6 Add expert advisor users as shown in Figure B-127.

Figure B-127



Step 7 In the *Directory Number Association* field, select the primary Extension for the user. See Figure B-128.

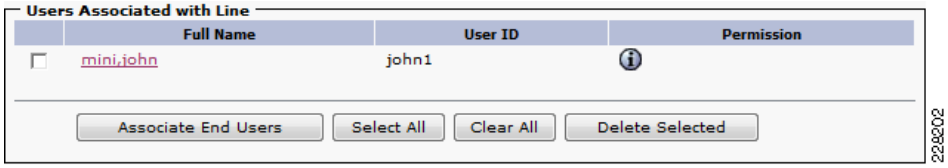
Figure B-128

Step 8 If allowing CTI deskphone mode for the users, make the user part of the S**tandard CTI Enabled** user group. See Figure B-129.

Figure B-129

Step 9 For each Expert Advisor user, go to their phone configuration and then line configuration, go to the section **Users Associated with Line**, and associate the end user (expert advisor user) that will use this phone. See Figure B-130.

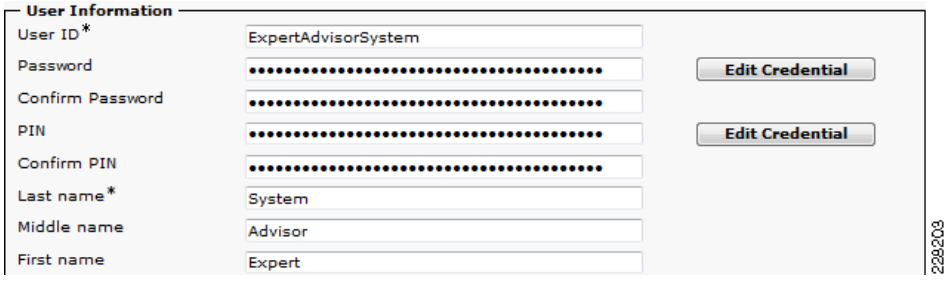
Figure B-130



This will change the CUPC client availability to “On the Phone” when the expert advisor user goes off hook on one of his associated phone devices.

Step 10 Add an CUCM user for each Expert Advisor Runtime server.See Figure B-131.

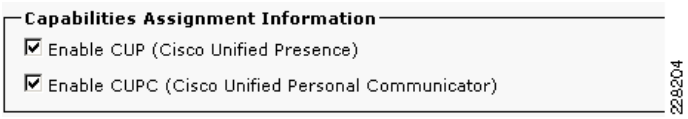
Figure B-131



Step 11 Enable presence and CUPC capabilities for the Expert Advisor users and also for the user that the Expert Advisor runtime server will use to connect to CUP (in our case, ExpertAdvisor user).

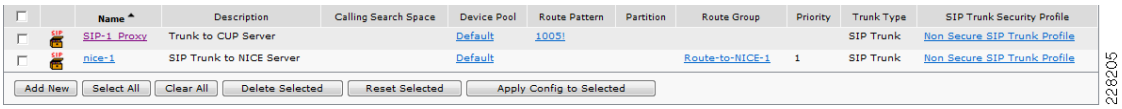
Step 12 In **System > Licensing > Capabilities Assignment**, enable CUP and CUPC for each Expert Advisor user. See Figure B-132.

Figure B-132



Step 13 Configure a SIP Trunk between CUCM and CUP server (enter the IP address or DNS name of the CUP server in the *Destination Address* field). See Figure B-133.

Figure B-133



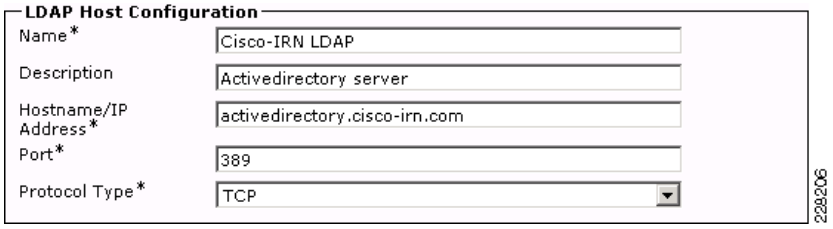
CUP Server Configuration

LDAP Configuration

LDAP is an optional component of the Unified Expert Advisor system and is not required for routing requests. It allows Expert Advisor users to search through the AD with their CUPC client.

Step 1 Go to **Application > Cisco Unified Personal Communicator > LDAP Server**. See Figure B-134.

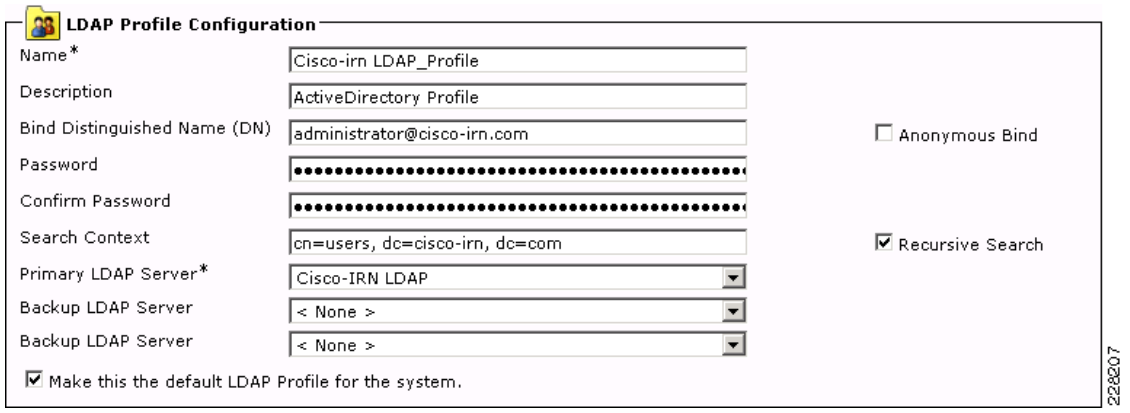
Figure B-134



Step 2 Go to: **Application > Cisco Unified Personal Communicator > LDAP Profile**.

Step 3 Enter the information of your LDAP directory and click on **Add Users to profile**. The users that are shown are the users entered in CUCM that were downloaded into CUP server, with the right capability settings configured in CUCM administration page. See Figure B-135.

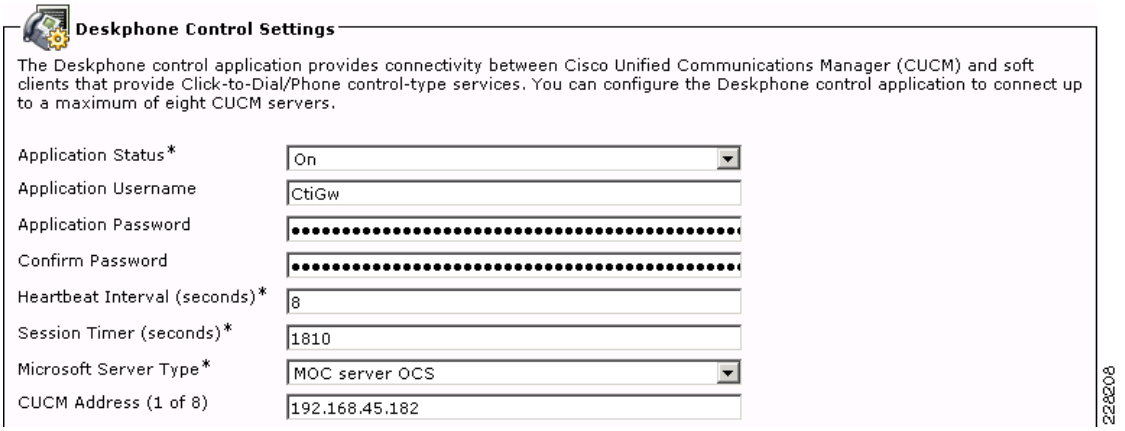
Figure B-135



Step 4 If you are deploying OCS/LCS and want to enable deskphone control with CUPC, go to **Application > Deskphone Control > Settings.**

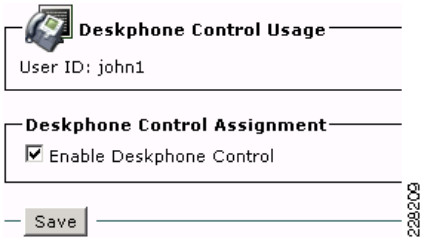
Step 5 Select **On** for the **Application Status** and enter the jtapi CtiGw information and CTIM information. See Figure B-136.

Figure B-136



Step 6 Select **Application > Deskphone Control > User Assignment** and check the **Enable Deskphone Control** checkbox. See Figure B-137.

Figure B-137

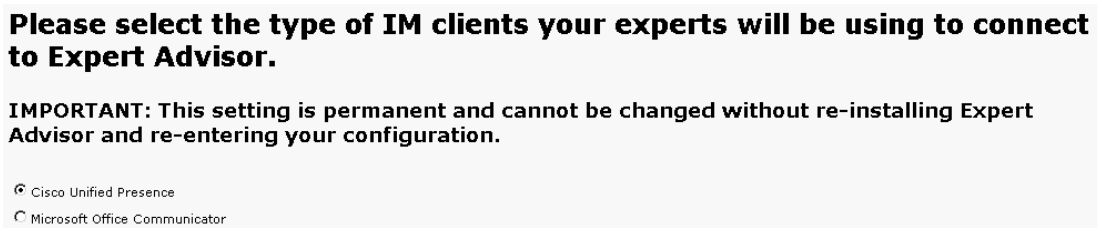


Note You do not have to go to **Application > Deskphone Control > Settings** in order to enable **Deskphone Control**, if you are not using OCS/LCS.

Expert Advisor Configuration

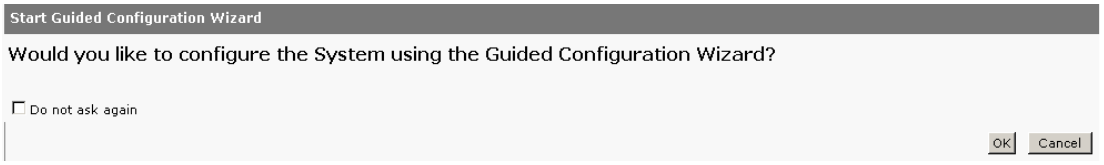
Step 1 Go to **http://**<*EA-ip-address*>. Expert Advisor system can be deployed with expert advisor users using either Cisco Unified Presence or Microsoft Office Communicator, not both types in the same Expert Advisor deployment. See Figure B-138.

Figure B-138



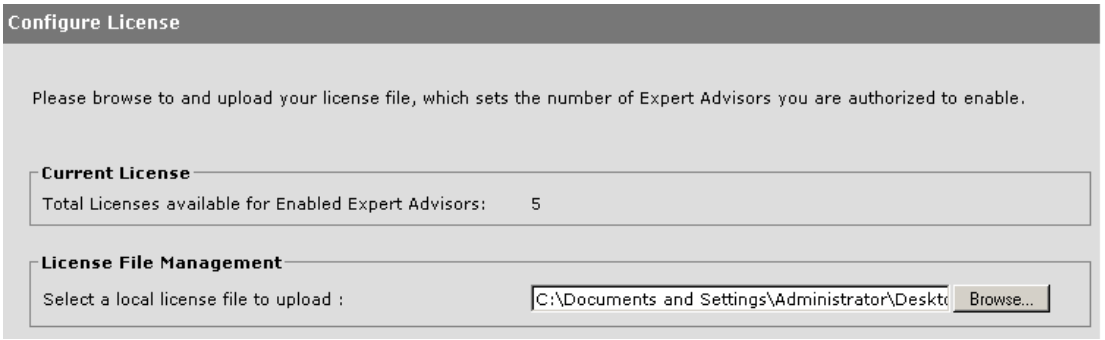
Step 2 Go through the Guided Configuration Wizard. See Figure B-139.

Figure B-139



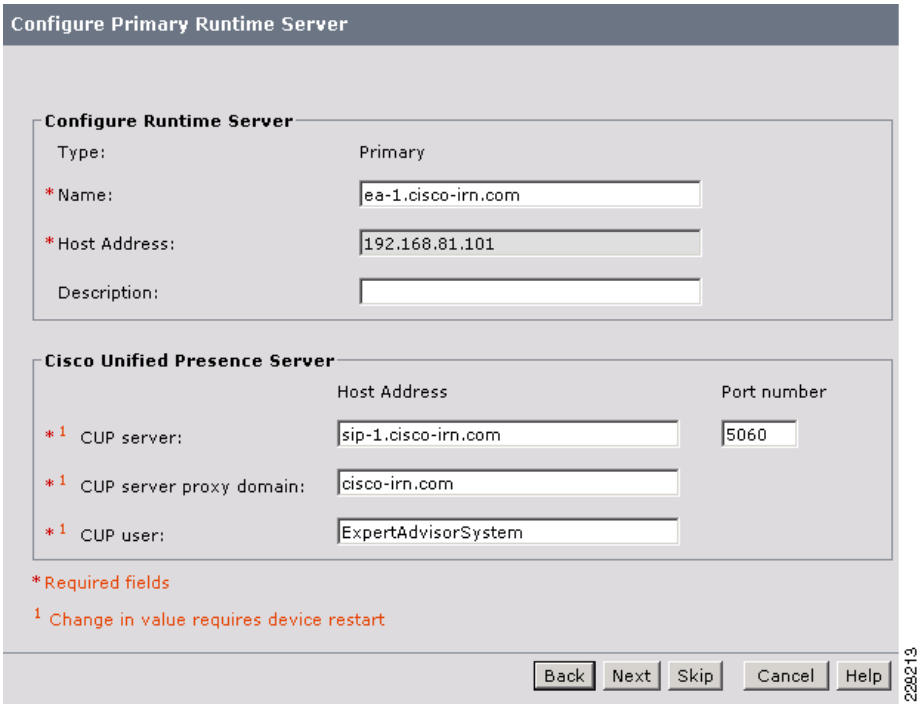
Step 3 Upload the license. If not, the system comes with a default license of 5 users. See Figure B-140.

Figure B-140



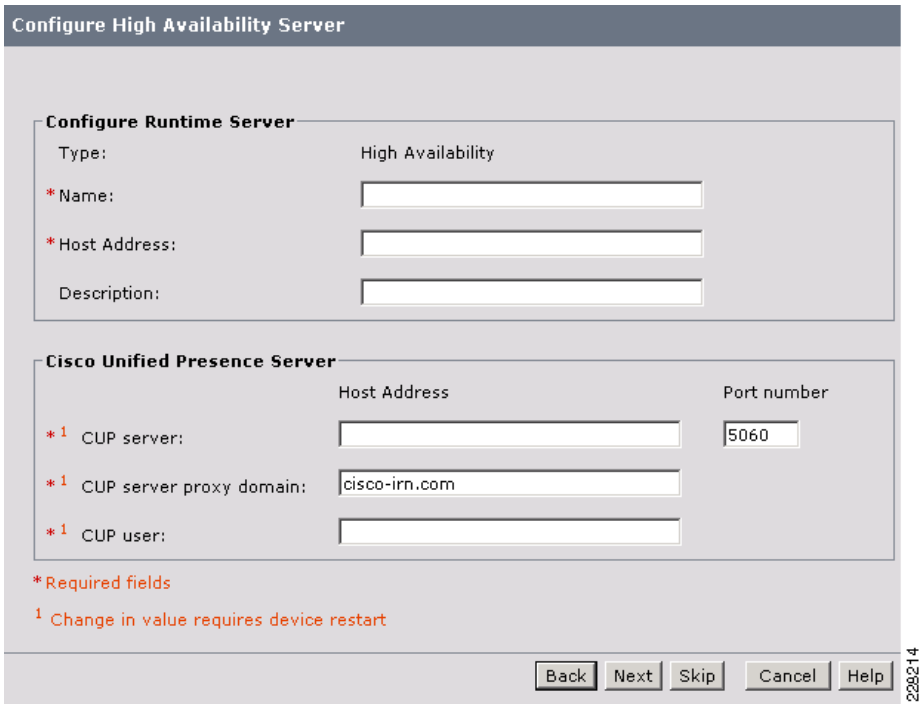
Step 4 Configure the Primary Runtime Server. In the *CUP user* field, enter the CUP user that Expert Advisor runtime server will use to connect to the CUP server. See Figure B-141.

Figure B-141



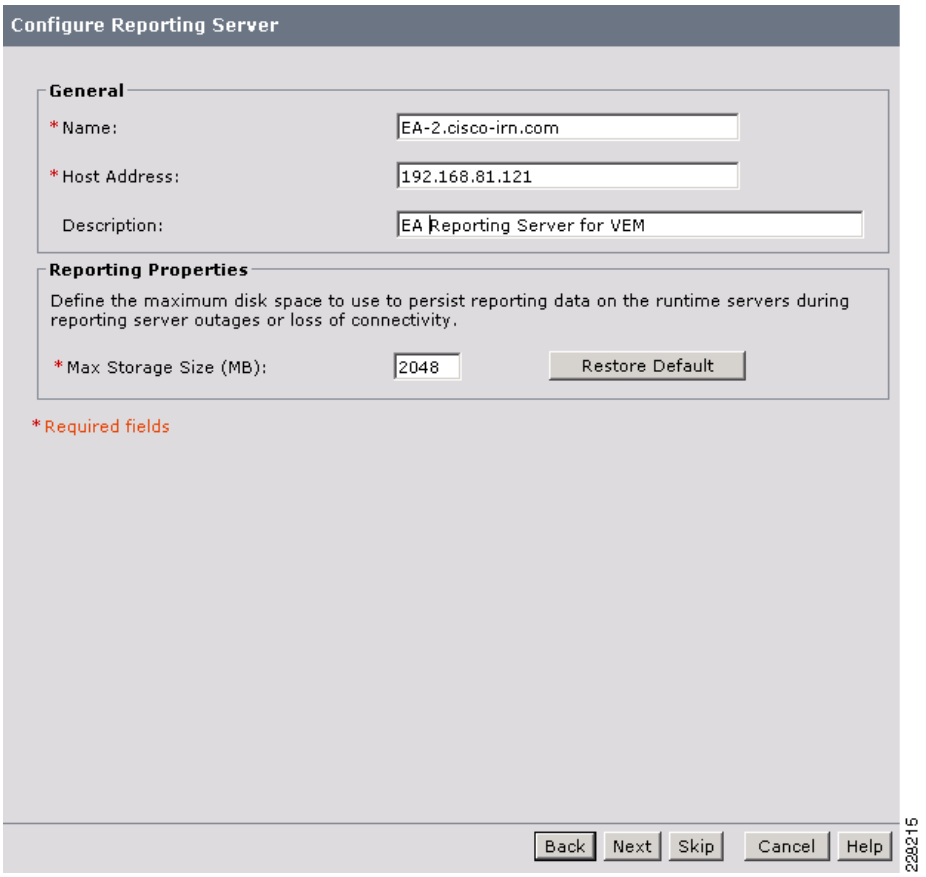
Step 5 Configure the secondary Runtime Server. Skip if you do not deploy a HA Runtime server.See Figure B-142.

Figure B-142



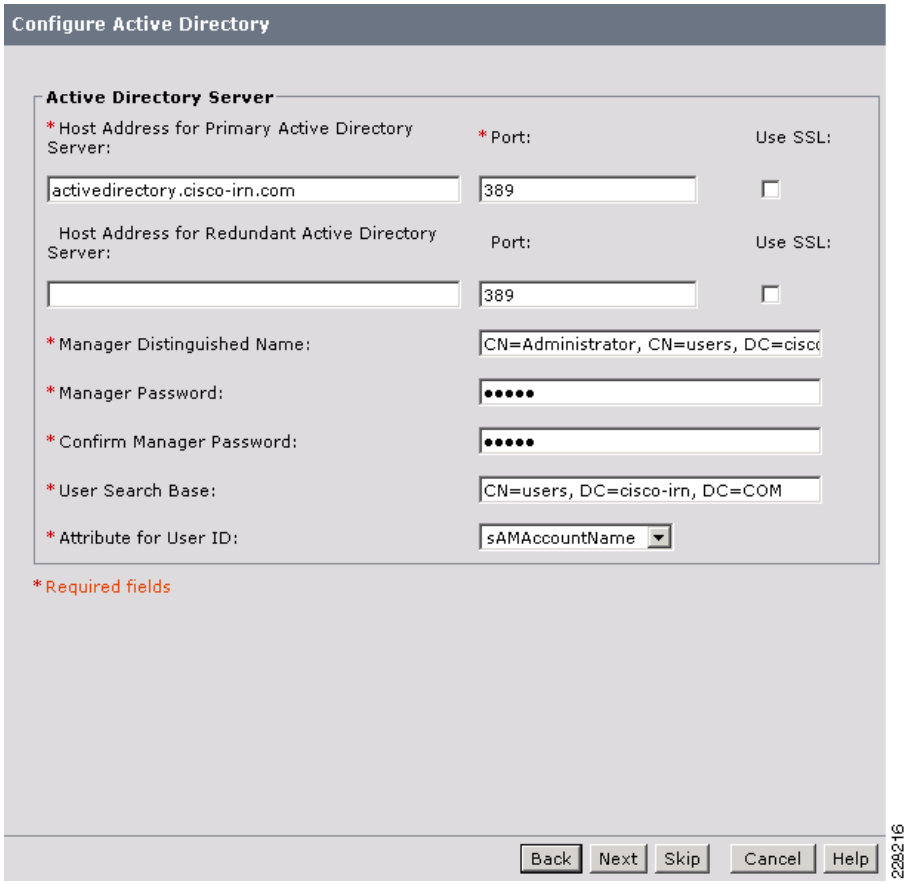
Step 6 Configure an Expert Advisor reporting server. Skip if you do not deploy a Expert Advisor reporting server. See Figure B-143.

Figure B-143



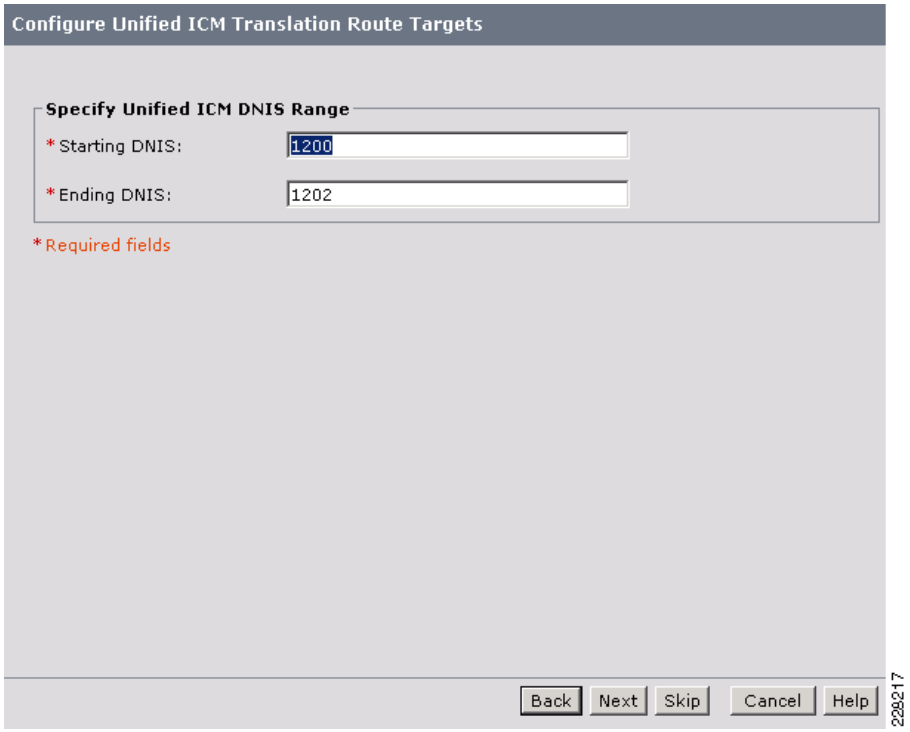
Step 7 Configure a AD server. See Figure B-144.

Figure B-144



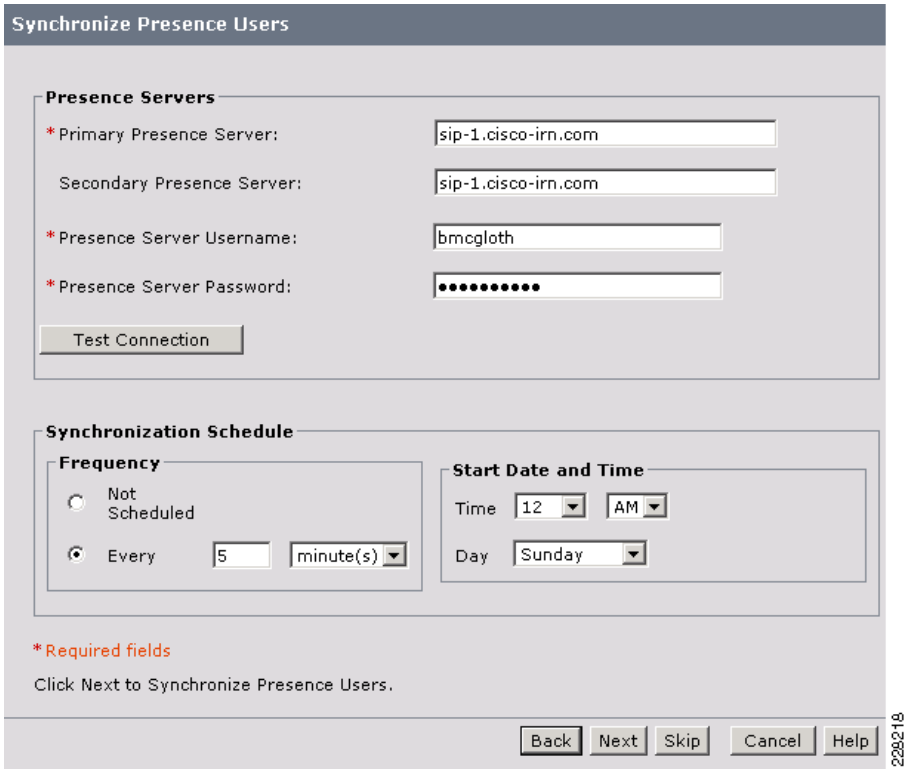
Step 8 Configure the ICM translation route. These DNIS numbers need to be routable by your system (for example, enter a route in CUP SIP proxy). See Figure B-145.

Figure B-145



Step 9 Configure the Cisco Unified Presence servers. See Figure B-146.

Figure B-146



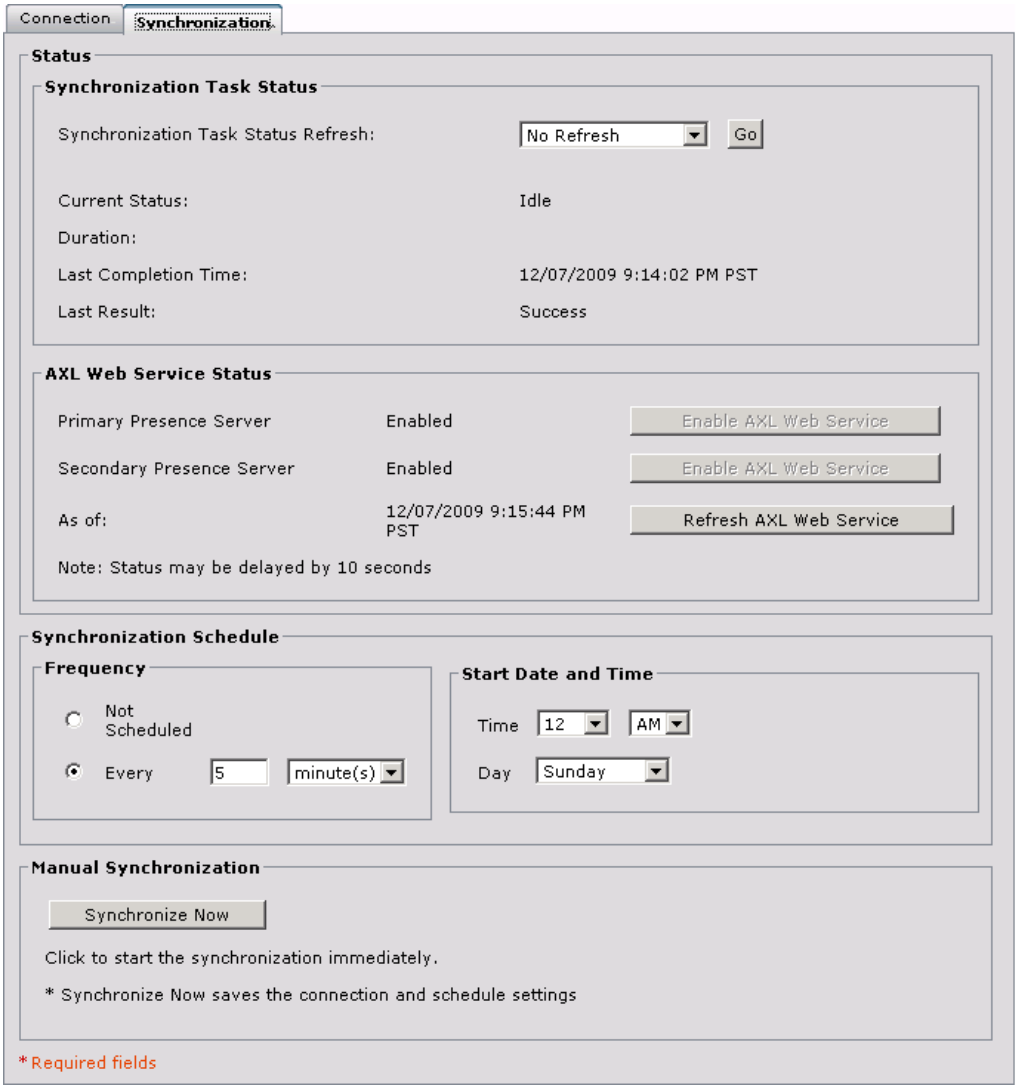
Step 10 Verify the summary. See Figure B-147.

Figure B-147

Step 11 In **System Management** tab, click on **Synchronize Presence Users**.

Step 12 Click on the **Synchronization** tab, click on **Synchronize Now**. Among other tasks, this will download the list of users from the CUP server. See Figure B-148.

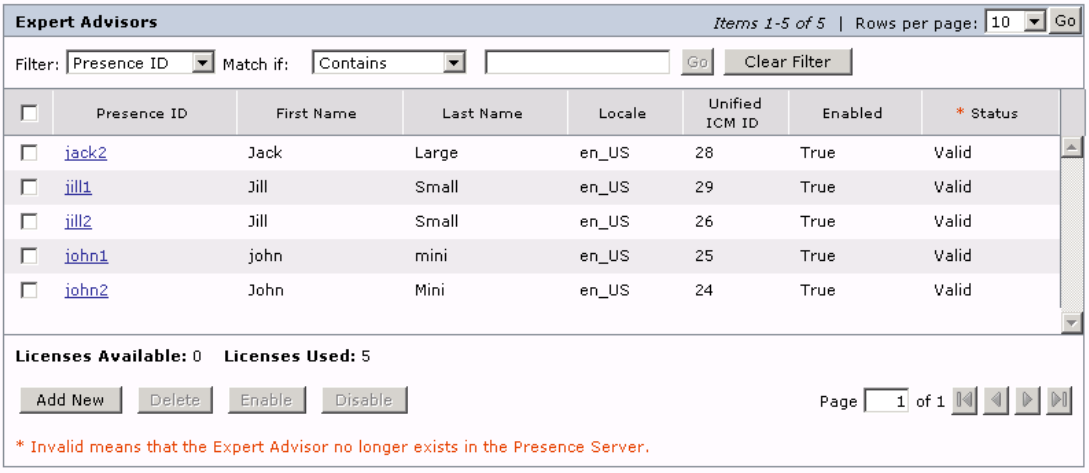
Figure B-148



Step 13 Add Expert Advisor users. In Daily Management tab, click on **Expert Advisors**.

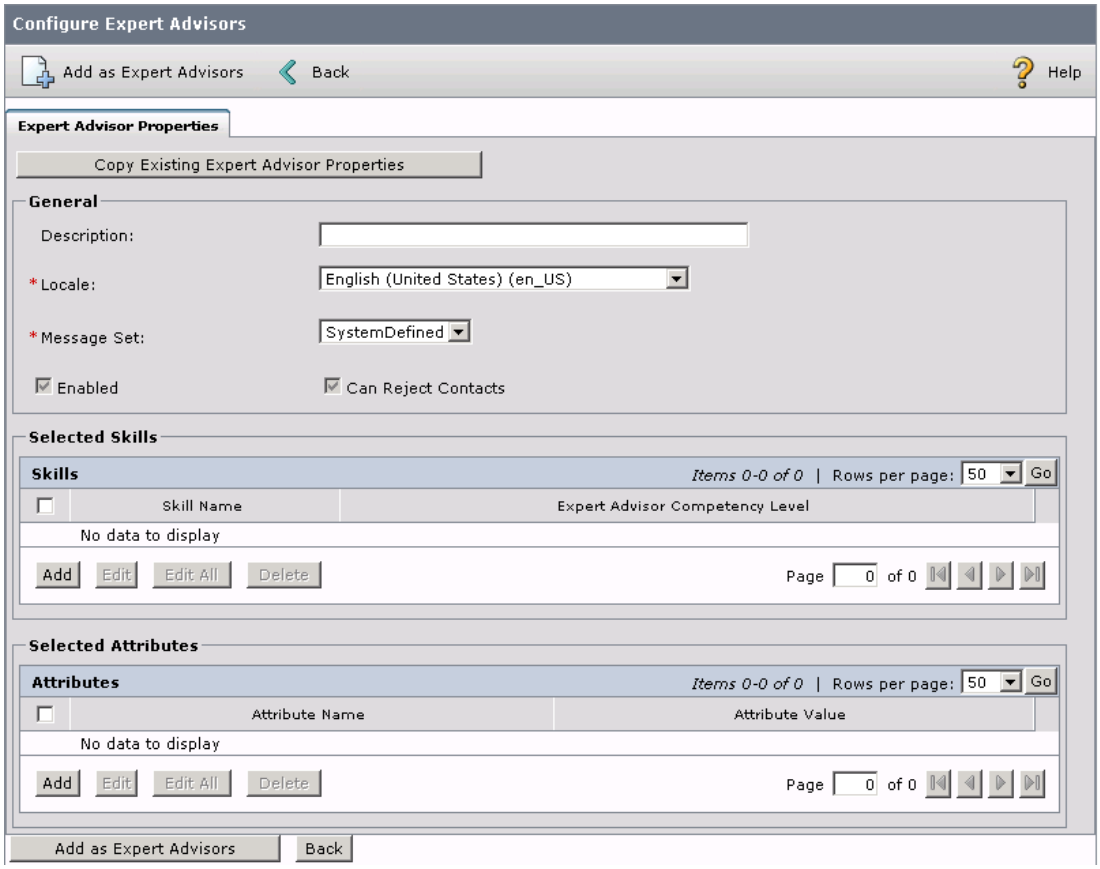
Step 14 Click on **Add New**. Select the users from CUP. See Figure B-149.

Figure B-149



Step 15 Configure settings for the expert advisor users and click on **Add as Expert Advisors**. See Figure B-150.

Figure B-150



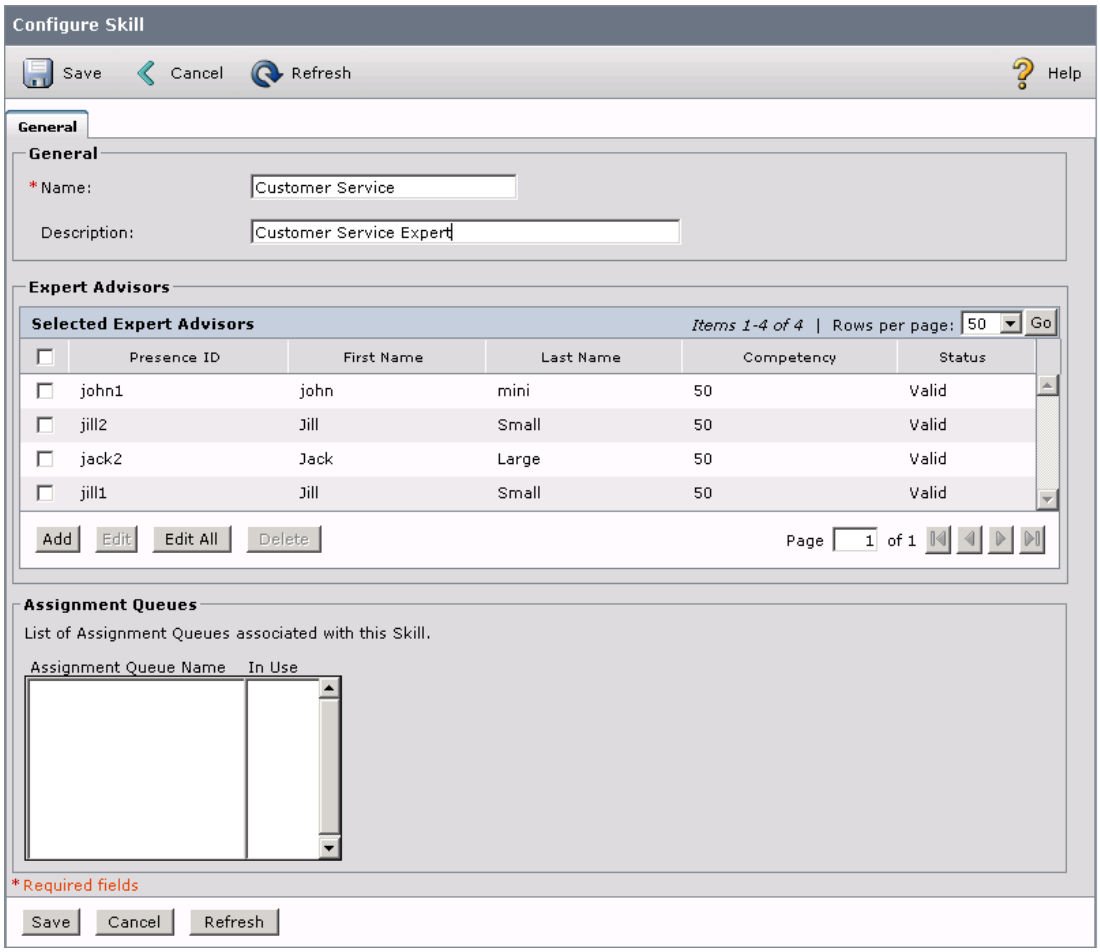
Step 16 In **Daily Management**, select **Skills**. Click on **Add New**.

Step 17 Enter a name for the Skill and click on Add in the **Expert Advisors** section.

Step 18 Select the users that will belong to this skill and click on **Add and Close**.

Step 19 Click on **Save**. See Figure B-151.

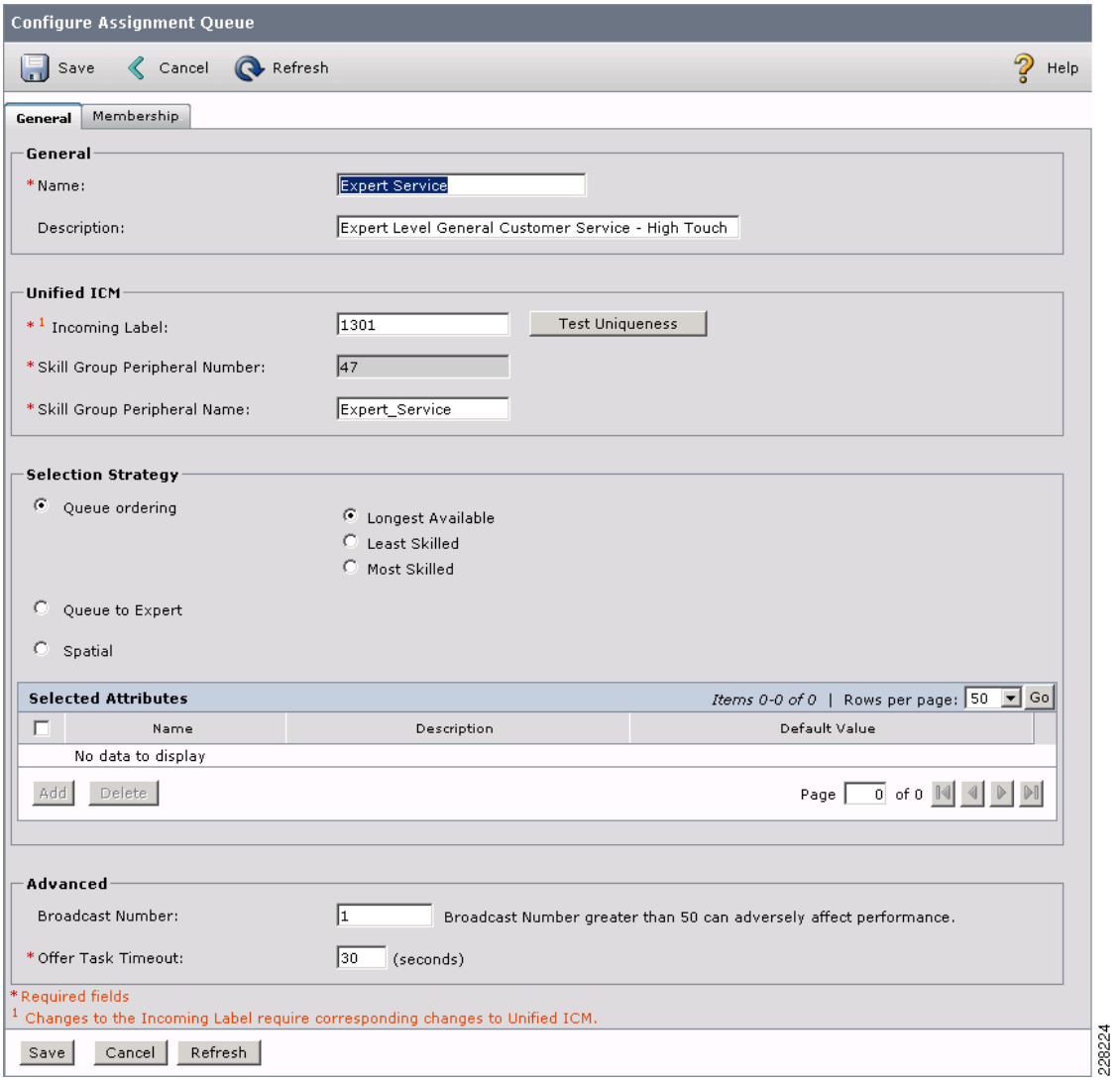
Figure B-151



Step 20 Create an Assignment Queue.In **Daily Management**, select **Assignment Queues**. Click on **Add New**.

Step 21 Enter a Name for the assignment queue. Enter an incoming label. This label will need to be routable by the CUP SIP Proxy. Select the other appropriate settings, for simplicity use the Queue CTI-RP DN number. Click on **Save**. See Figure B-152.

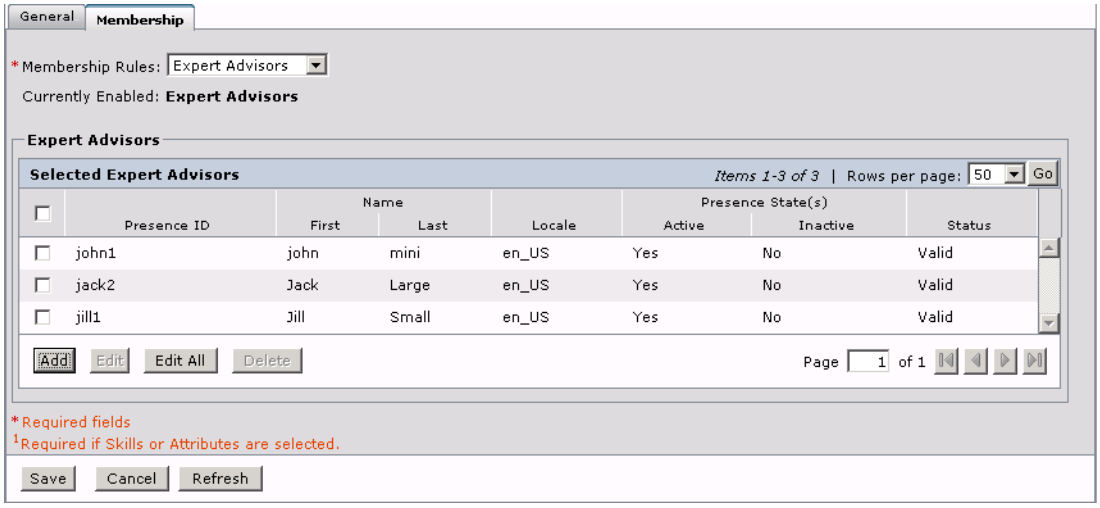
Figure B-152



Step 22 Click on the **Membership** tab.

Step 23 Add the expert advisor users that should belong to this assignment queue. Click on **Add and Close**.See Figure B-153.

Figure B-153



Step 24 Start the Expert Advisor runtime service.

Step 25 Go to **Serviceability > Control Center**. Select the runtime server and click on **Start**. The status should be in "Running (in service)". See Figure B-154.

Figure B-154

ICM Configuration

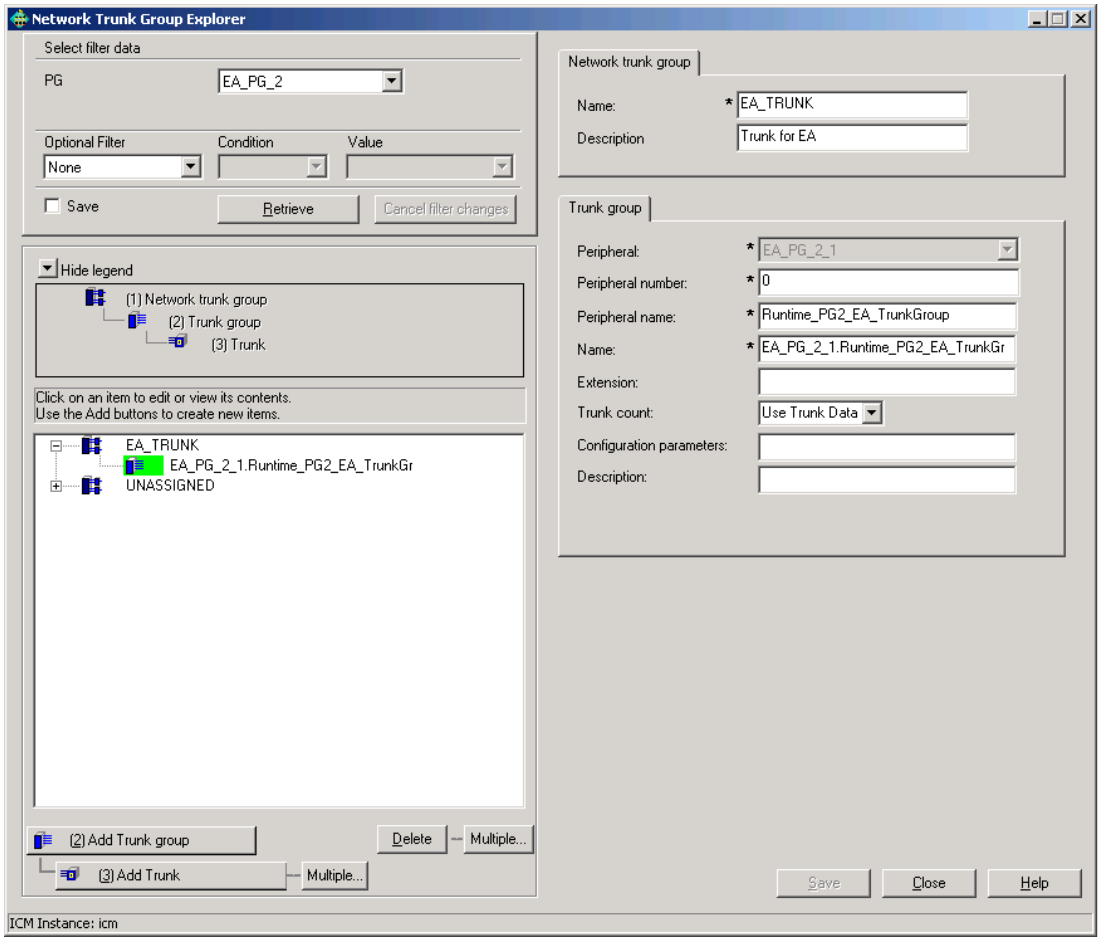
To configure ICM, complete the following steps:

Step 1 Select the PG for expert advisor and click on **Retrieve**.

Step 2 Click on **Add Network Trunk** group. Enter a name for the Network trunk group.

Step 3 Click on **Add Trunk**. Provide a Peripheral name, and select **Use Trunk Data** for the Trunk count. See Figure B-155.

Figure B-155



Step 4 On the Unified ICM Configuration Manager, select **Explorer Tools > Skill Group Explorer**.

Step 5 Select the Expert Advisor PG, select **Retrieve**.

Step 6 You should see the Skill Group/AssignmentQueue that was configured on Expert Advisor.

Step 7 Click on **Add Route** and add the route information.

Step 8 Click on **Save**. This adds a new button to **Add Peripheral target**. Click on that button.

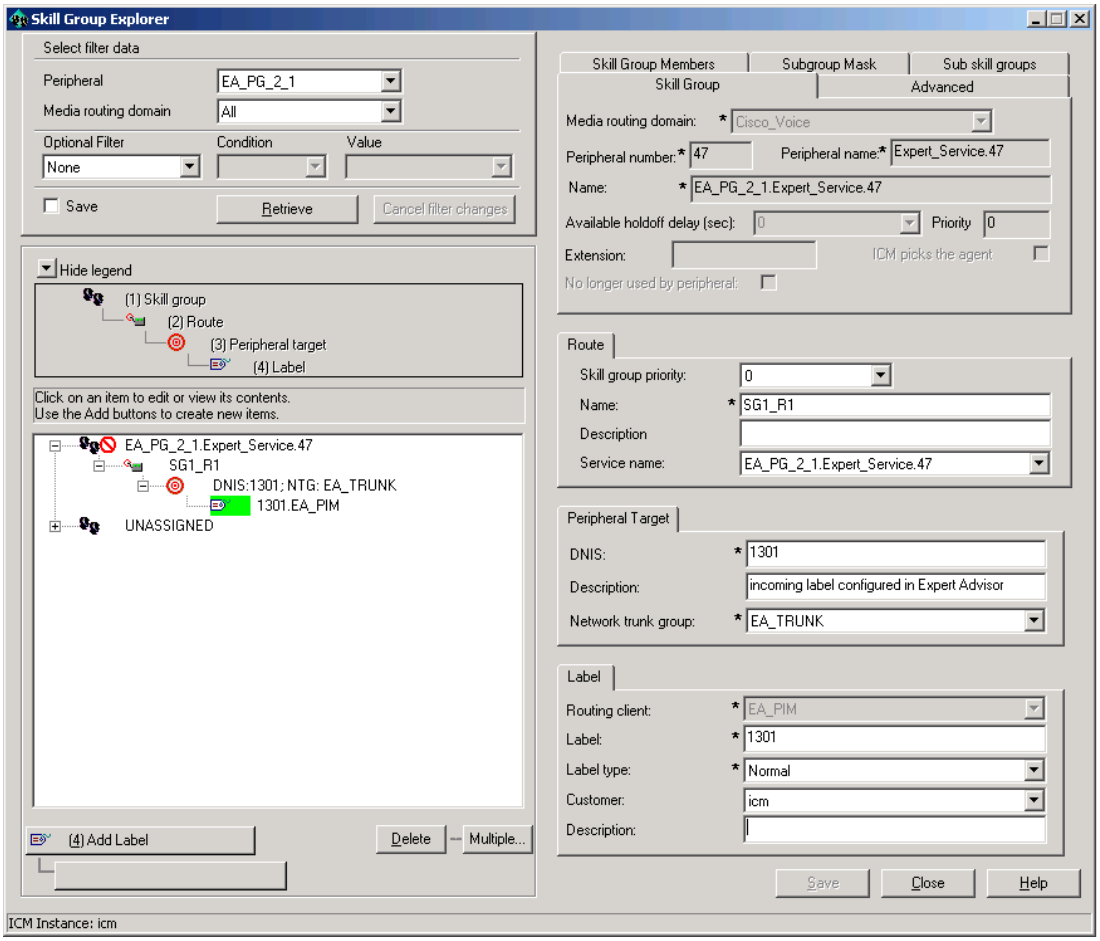
Step 9 Enter the DNIS that should be the same as the Incoming Label configured on Expert Advisor Operations Console.

Step 10 Select the Expert Advisor Network trunk group. Click on **Save**.

Step 11 Click on **Add Label**. Select the Expert Advisor PIM. Enter the label that should be the same as the DNIS entered above.

Step 12 Click on **Save**. See Figure B-156.

Figure B-156



Step 13 Configure the translation routes. On Configuration Manager, select **Explorer Tools > Translation Route Explorer**.

Step 14 Select the PG for the Expert Advisor runtime server. Click on **Retrieve**.

Step 15 Click on **Add Translation route**. Enter a name for the translation route. Click on **Add Route**.

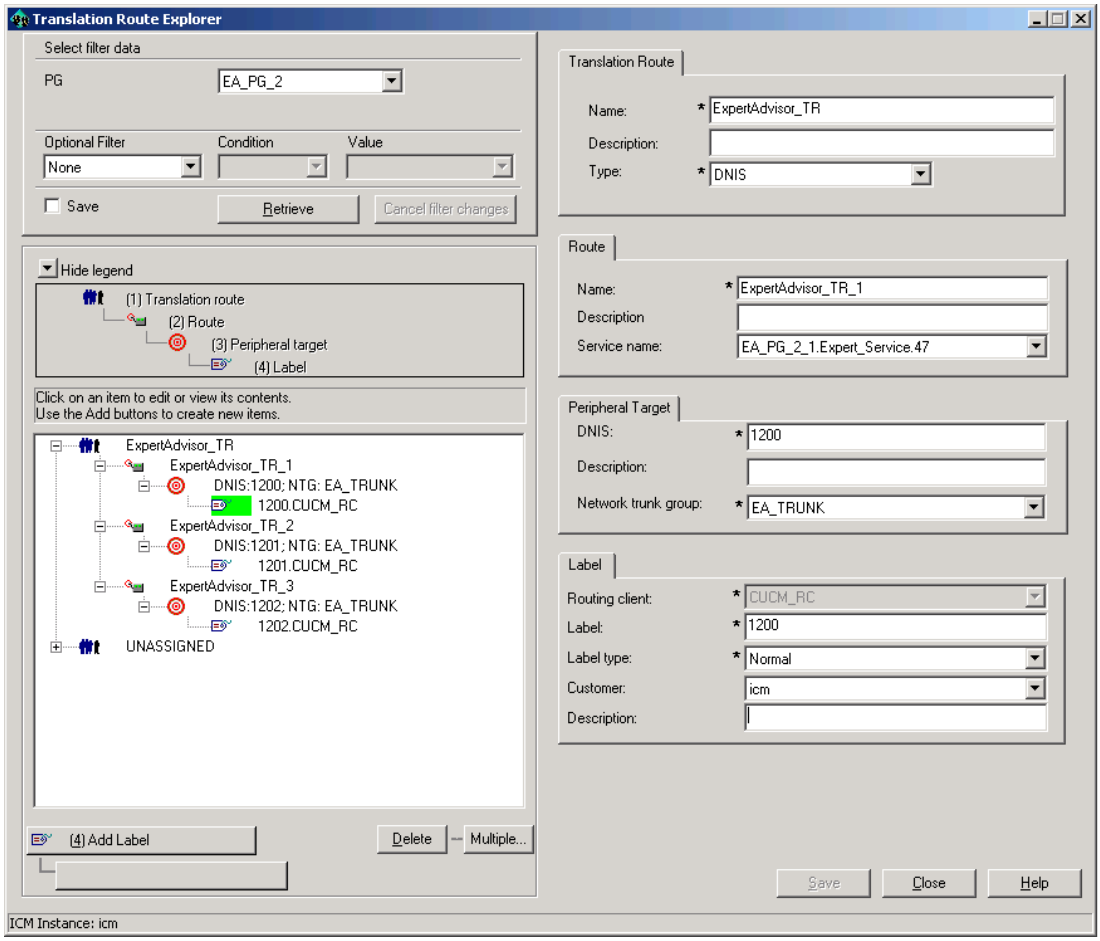
Step 16 Enter a name for the Route and click on **Save**.

Step 17 Click on **Add Peripheral target**. Enter the DNIS to send the call to Expert Advisor runtime. Select the **Network trunk group** and click on **Save**.

Step 18 Click on **Add Label**. Select the CVP Routing client, enter the label (same as the DNIS configured for the Peripheral target). Click on **Save**. See Figure B-157.

Step 19 Repeat those steps for other Translation Routes assigned to Expert Advisor.

Figure B-157



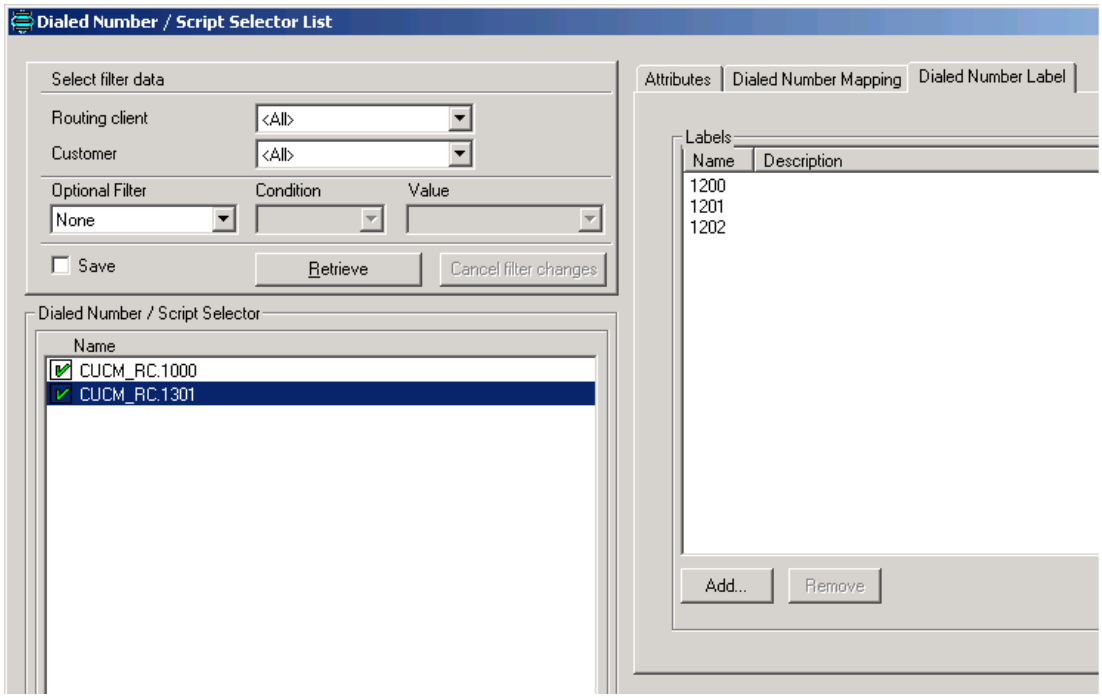
Step 20 Edit the Dialed Number for the Expert Advisor. This is the number that customer or agent will dial to reach an expert advisor user.

Step 21 In Config Manager, go to **List Tools > Dialer Number / Script Selector List** and edit the Dialed Number for the CM Routing Client that was created previously.

Step 22 Go to the **Dialed Number Label** tab and click on **Add**.

Step 23 Select all the translation routes configured for Expert Advisor and press **OK**. See Figure B-158.

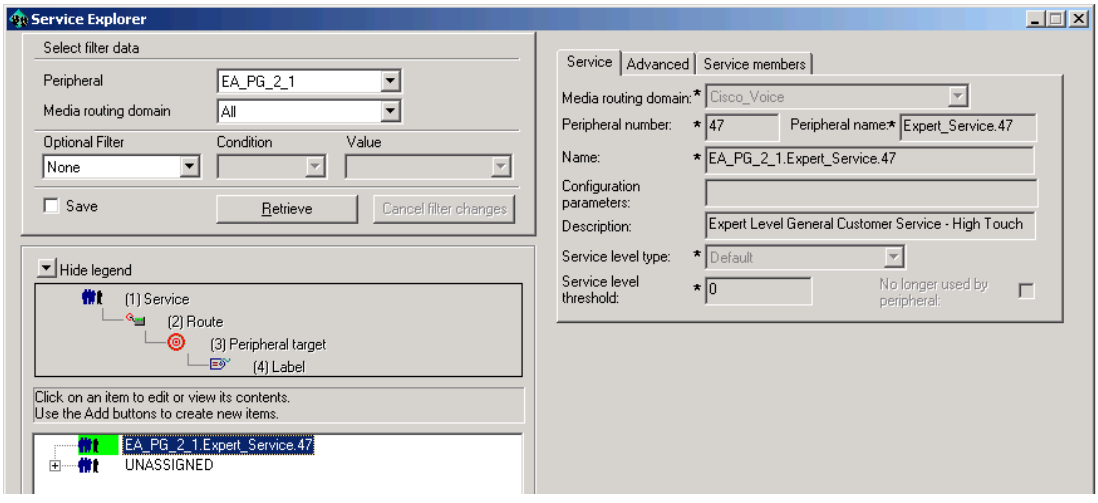
Figure B-158



Step 24 Click on **Save**.

Step 25 In the Config Manager on the Admin Workstation open the **Service Explorer** option under **Tools >Explorer Tools**. Check that the Expert Advisor server has connected to the queue service. See Figure B-159.

Figure B-159



Expert Advisor Script

Create the ICM Script for the Expert Advisor Queue on the AW by using the Script Editor software. shows a sample routing script. The logic that is followed for creating this script is as follows:

Step 1 Start the script with the start node.

Step 2 Set the value of media server HTTP URL in *Call.user.microapp.media_server* variable. This is the web server URL from where **.wav** files will be played (e.g., http://media.cisco-irn.com).

Step 3 Set the value of language in *Call.user.microapp.locale* as **en-us**.

Step 4 Set the value of input type (which is digits in this sample script) in *Call.user.microapp.input_type* variable to "**D**".

Step 5 Set the value of the *Call.user.microapp.app_media_lib* to **Custom**.

Step 6 After setting the variables send the call to IVR using **Send to VRU** node.

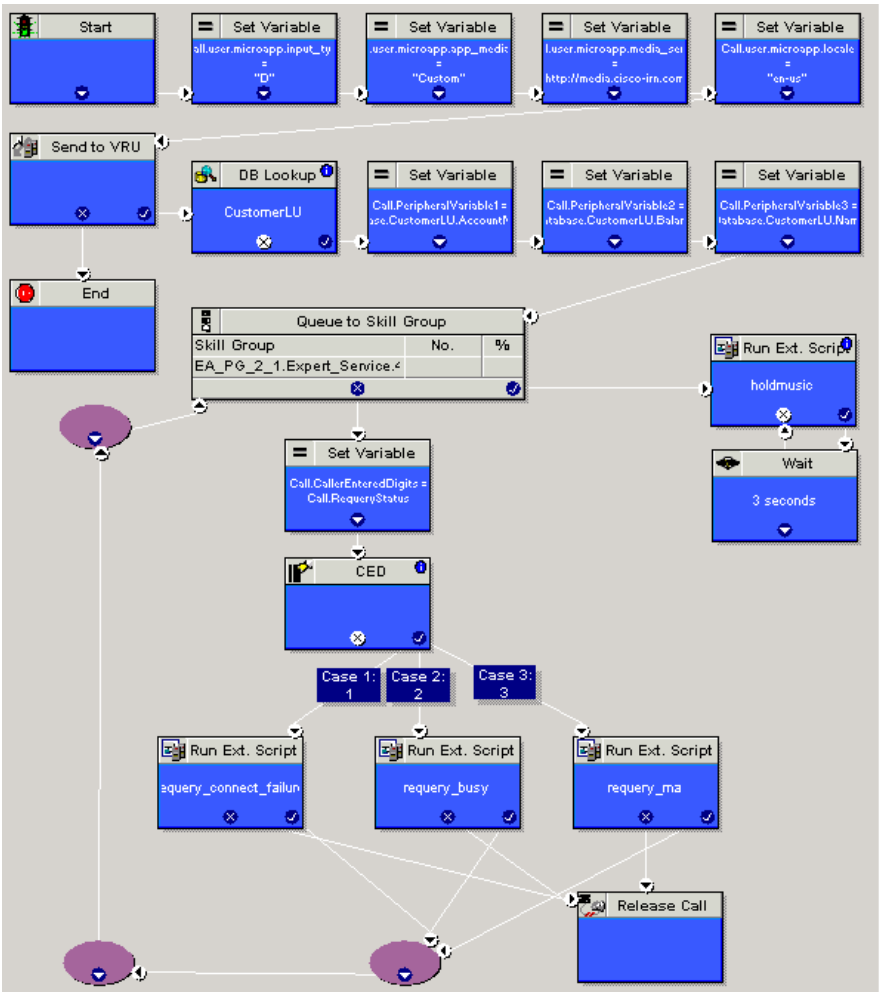
Step 7 Perform a DB lookup based on the calling number and/or caller entered digits for an account number.

Step 8 Use the Set Variable to save the values of the data retrieved from the Database as PeripheralVariables under the Call object type.

Step 9 Send the caller to Queue using the Queue to Skill Group, add the **EA_PG_2_1 Skill** group.

Step 10 While the caller is in queue, play agent busy and music on hold **.wav** files in loop. See Figure B-160.

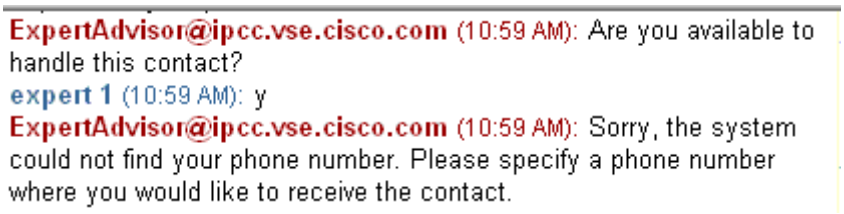
Figure B-160



Trouble Shooting Tip

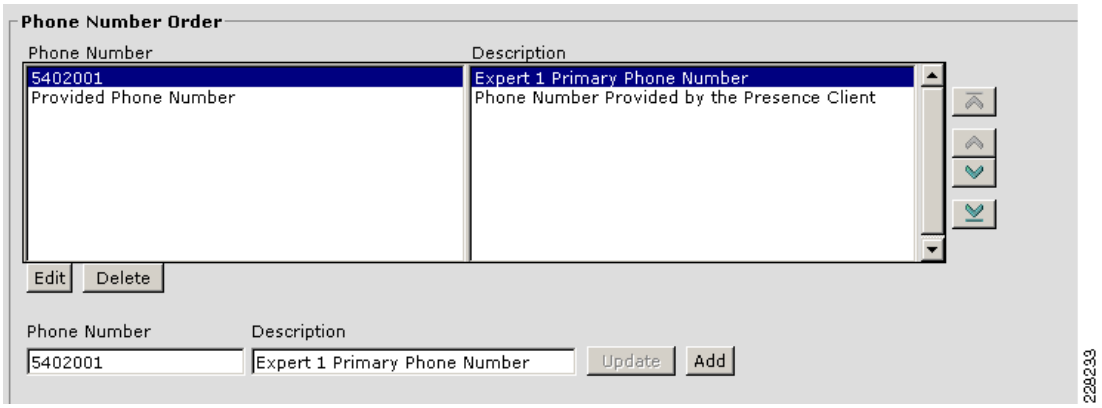
If using CUPC in the deskphone mode, you might see the following error message when the expert advisor is replying with a "**Yes**" that you will not see in the softphone mode. See Figure B-161.

Figure B-161



As a remedy, configure the Phone Numbers in the Expert Advisor page. See Figure B-162.

Figure B-162

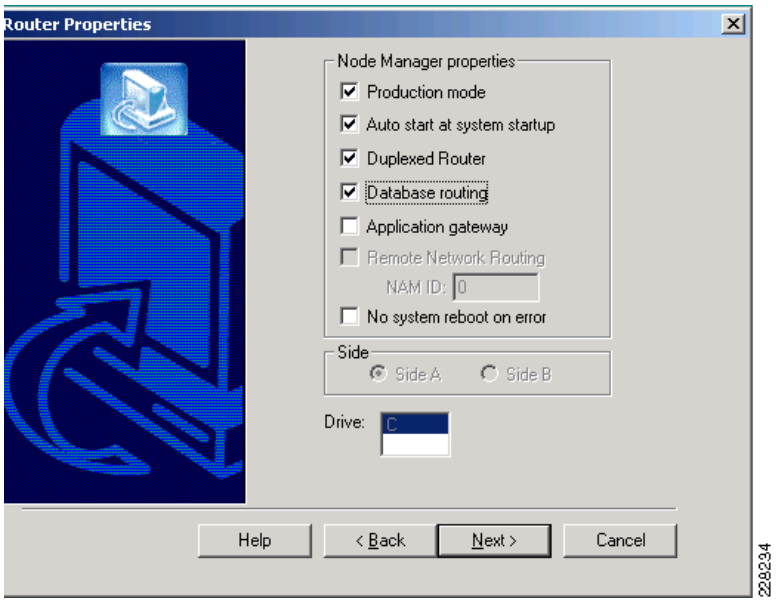


Database Lookup and Passing Data to the Expert

Step 1 Prepare your Database/CRM. Make sure you configure a primary key in your table.

Step 2 On the ICM Router servers execute the ICM setup utility (Run **C:\icm\bin\ICMSetup.exe**) and turn on Database Routing. See Figure B-163.

Figure B-163



Step 3 On the ICM Router server, open the regedit utility and edit the registry key for the Database configuration as follows:

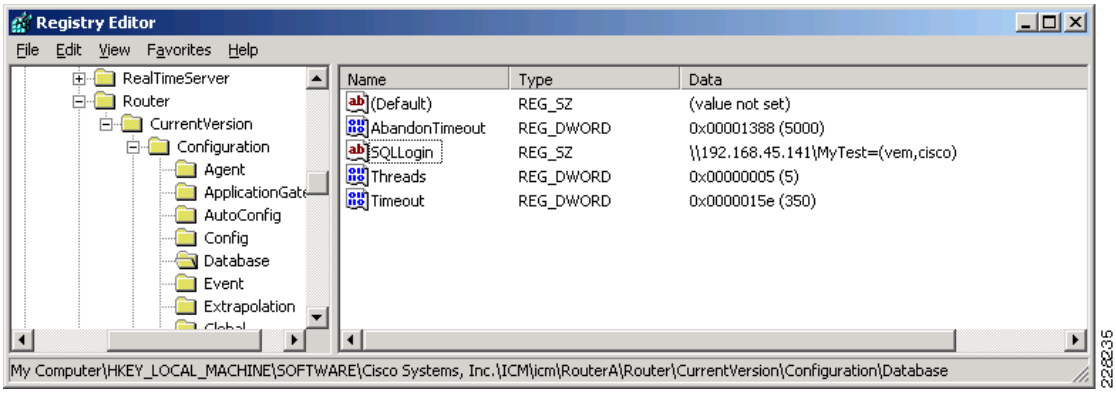
a. Locate **HKEY_LOCAL_MARCHINE\SOFTWARE\Cisco Systems, Inc.\ICM\<instance>\RouterA\Router\CurrentVersion\Configuration\Database**.

b. For the SQLLogin key, enter the information of your database:

\\<*ipaddress-or-name*>\<*Database_name*>=(<*username*>, <*password*>)

Figure B-164.

Figure B-164

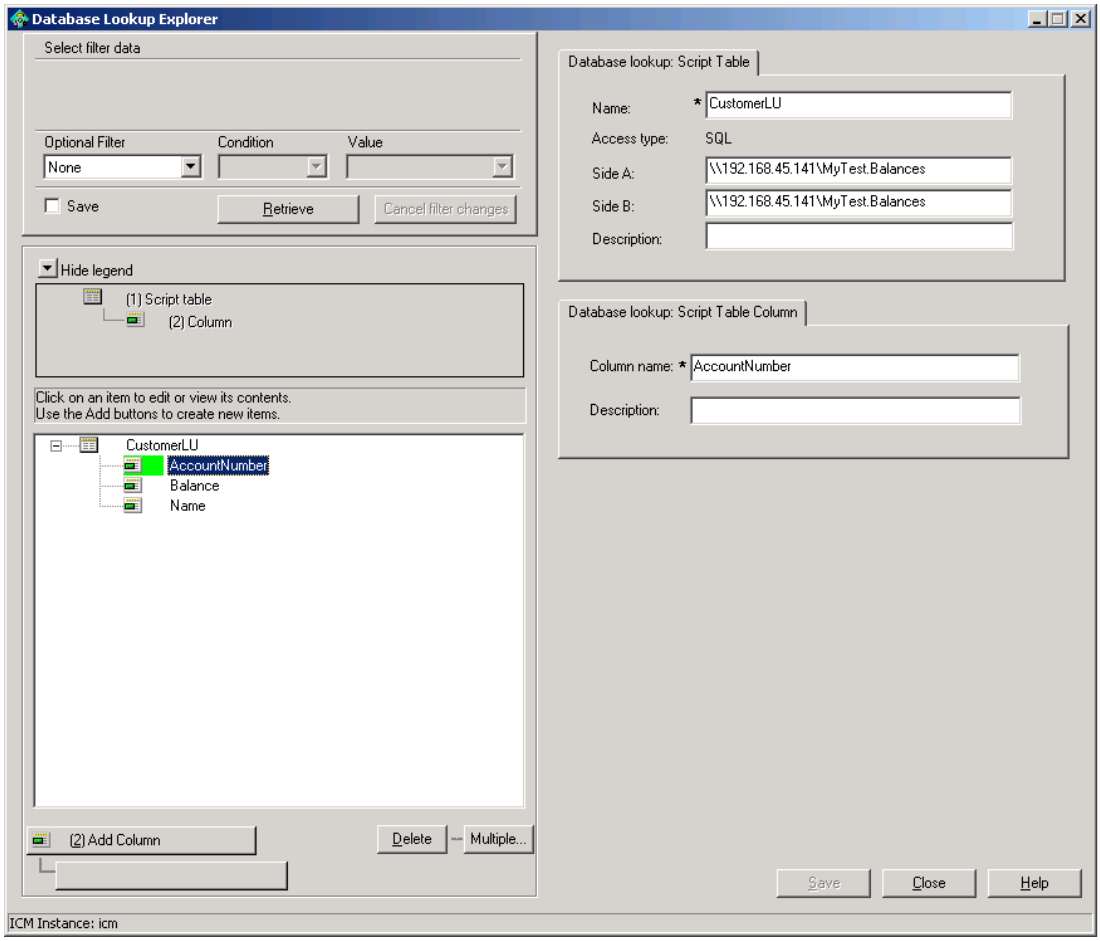


Note You need to do that only on one side. This setting will be automatically replicated to the other side.

Step 4 In ICM Configuration, open the DB Lookup Explorer.

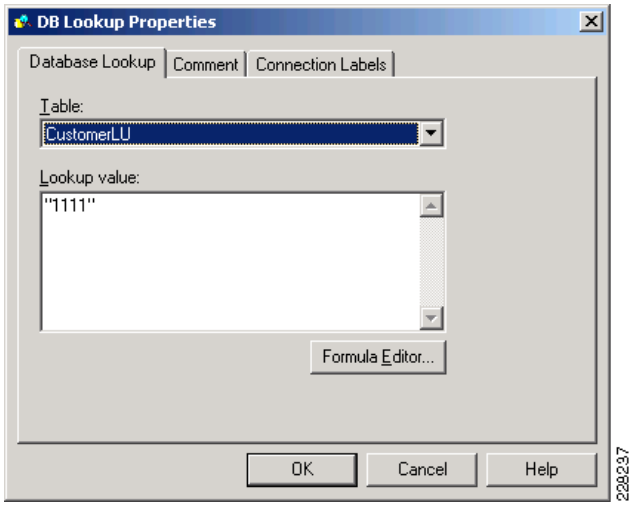
Step 5 Enter a name for the Script Table. For side A and B, enter the DB server information with DB name and table as: \\<*IPorHostname*>\<DB>.<*Table*>. See Figure B-165.

Figure B-165



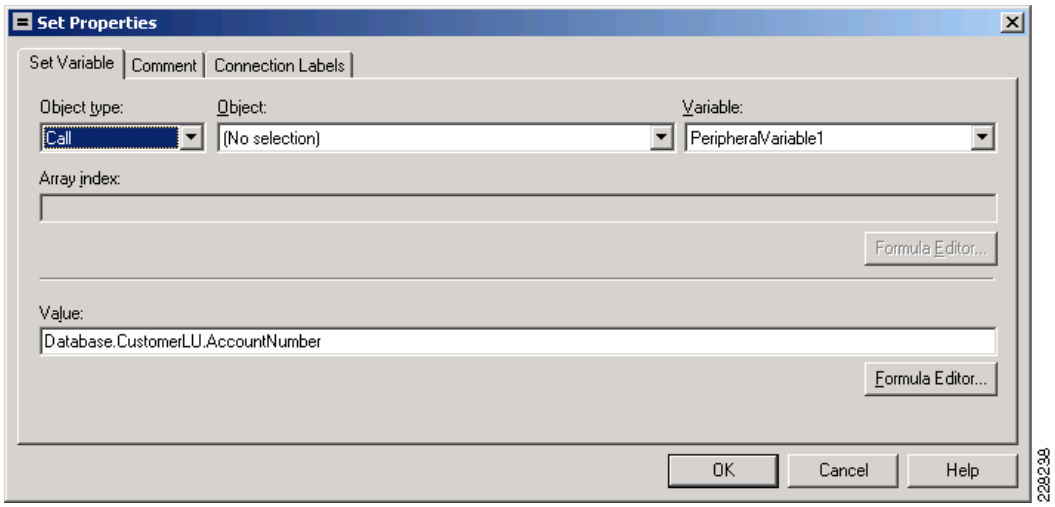
Step 6 In the ICM script, perform add a DB Lookup step to select the row you are looking for. For example, if the account number should match "1111", then enter the following information in the Database Lookup step. See Figure B-166.

Figure B-166



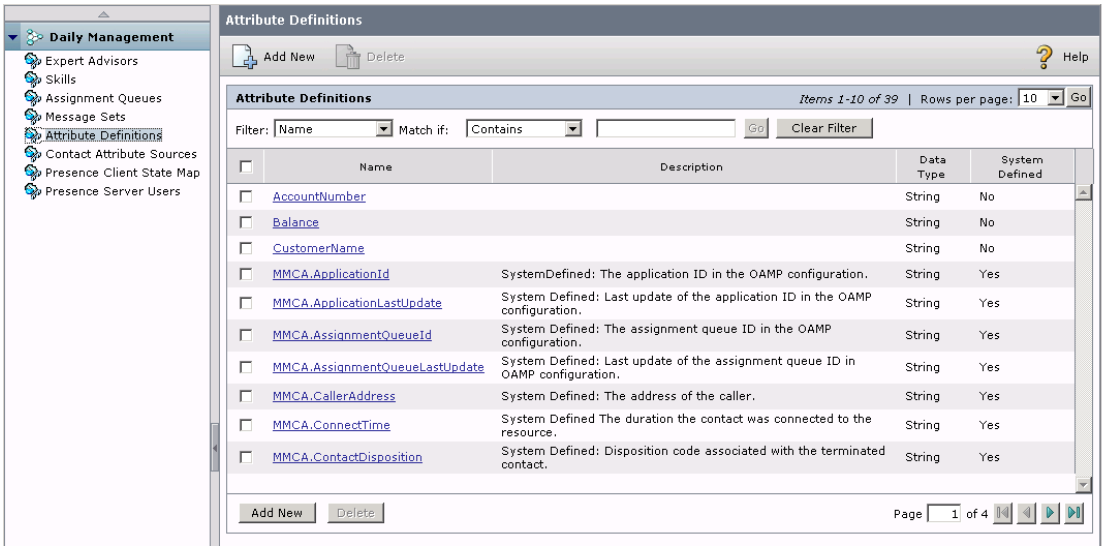
Step 7 After a match is found other column data can be retrieved for this record. In the following example, we set the *PeripheralVariable1* to the AccountNumber column of the DB record, using the **set** step. Later on, with Expert Advisor, we will map this Peripheral Variable1 to an Expert Advisor variable, also called Expert Advisor attribute. See Figure B-167.

Figure B-167



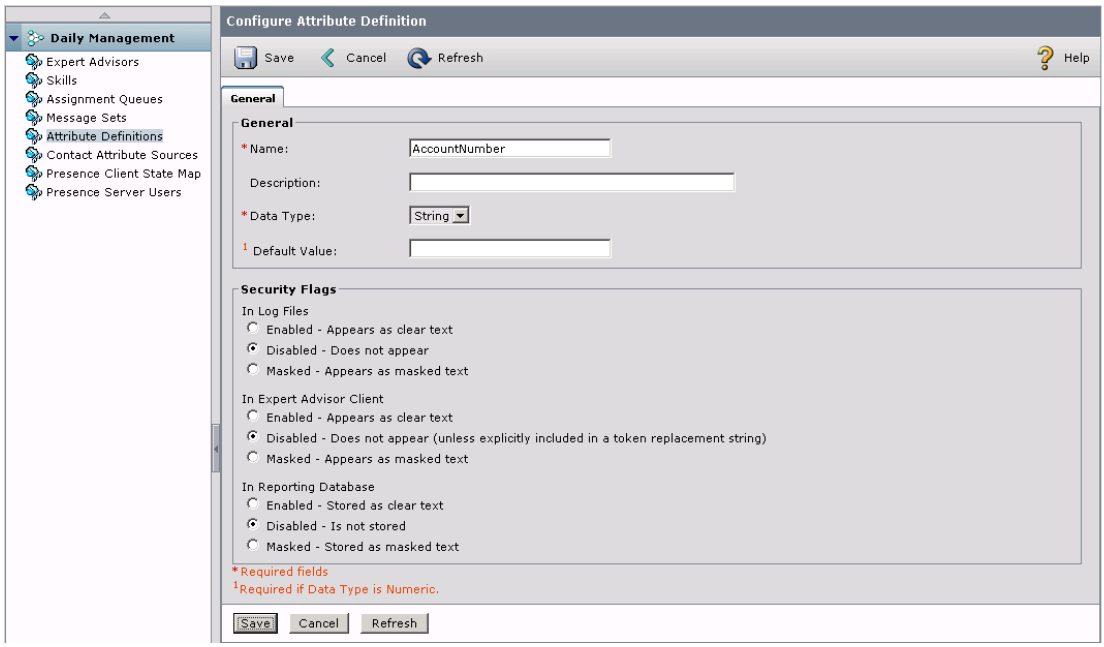
Step 8 On Expert Advisor OAMP, if you want to display this information to the expert, create new Attribute Definitions. Go to **Daily Management**, select **Attribute Definitions**. See Figure B-168.

Figure B-168



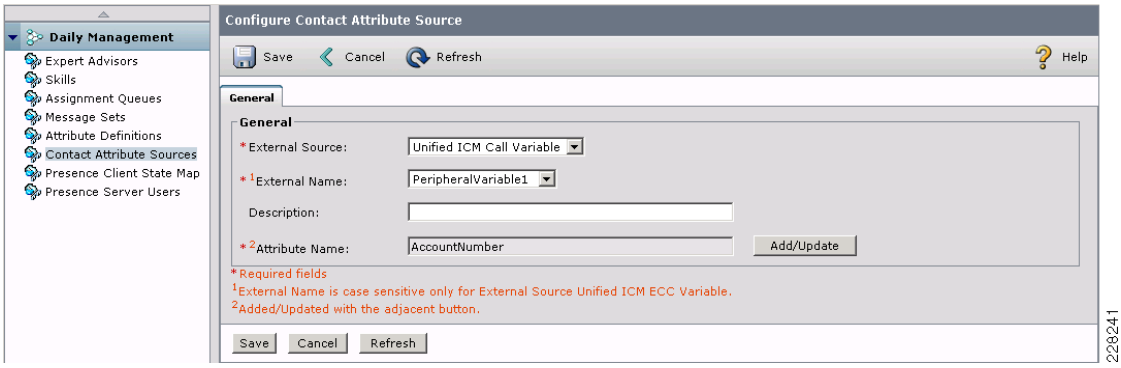
Step 9 Add new attribute definitions. Click on **Disabled** in the **In Expert Advisor Client**. See Figure B-169.

Figure B-169



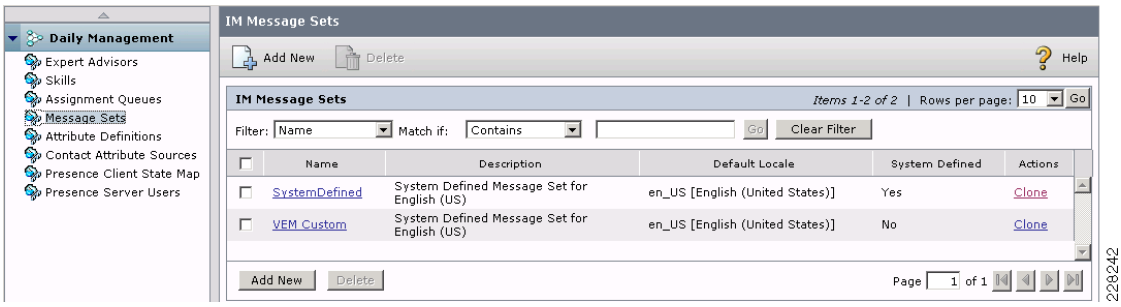
Step 10 In Contact Attribute Sources, map the new Attribute Definitions to Variables you use in the ICM script. See Figure B-170.

Figure B-170



Step 11 Modify the messages sent to the expert. Go the **Daily Management > Message Sets**. You can for example use the Clone functionality to clone the System Defined Message for English.See Figure B-171.

Figure B-171

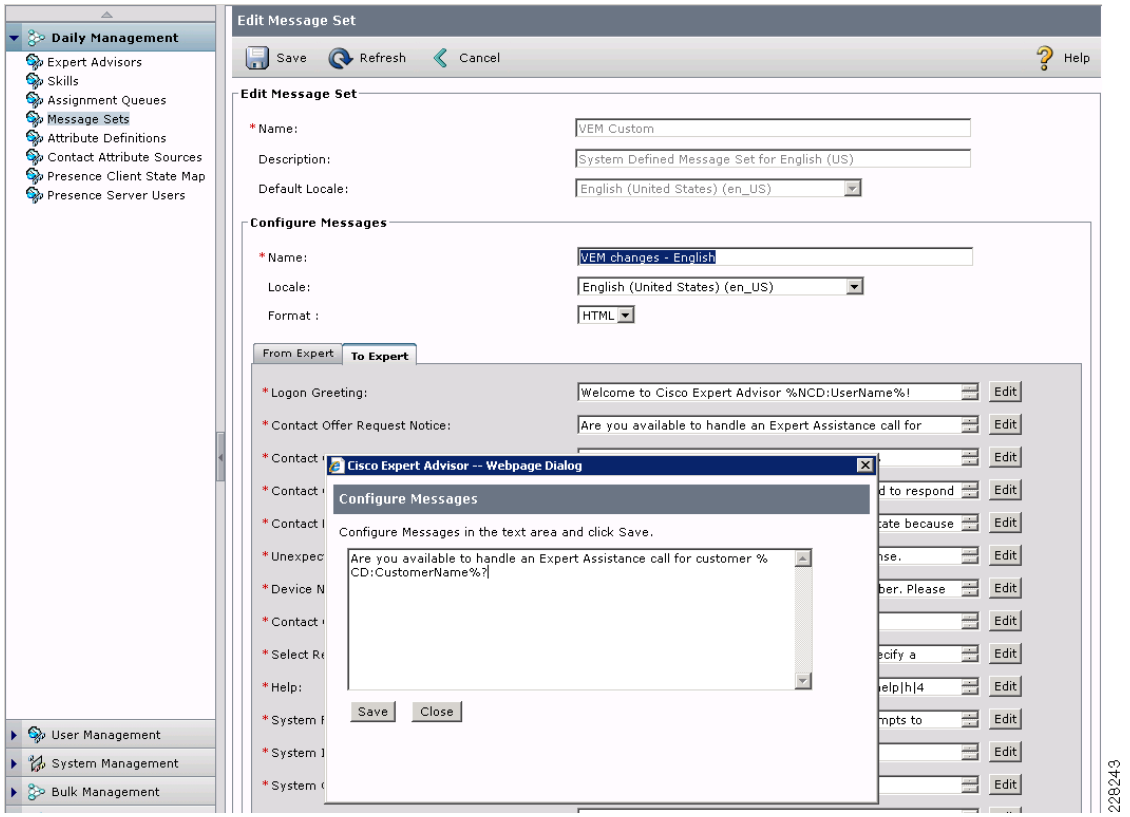


Step 12 Edit the new message set and choose the **To Expert** tab.

Step 13 Edit the **Contact Offer Request Notice**.

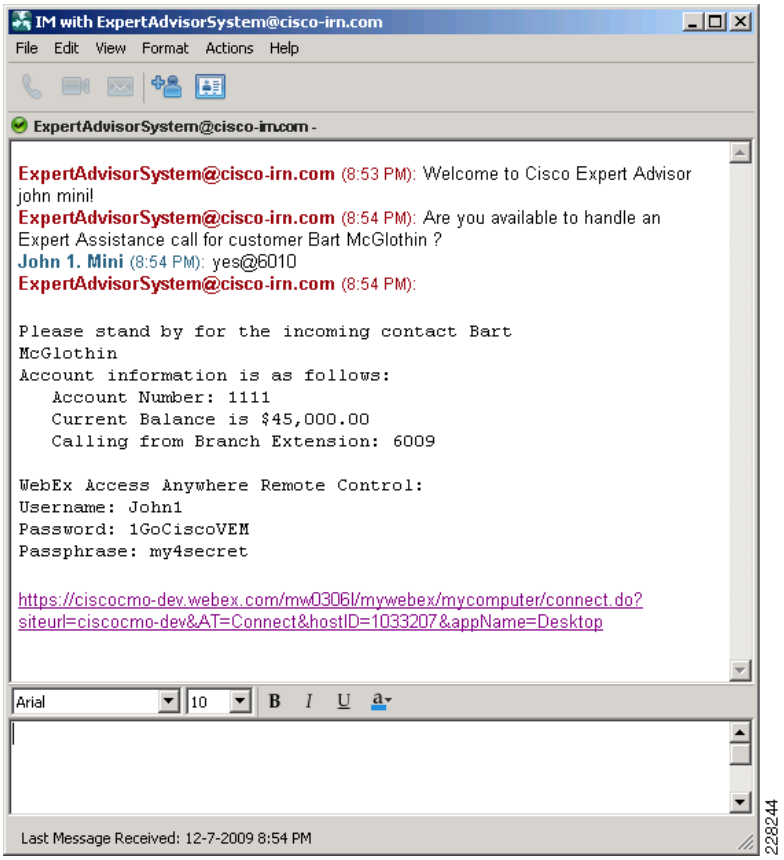
Step 14 Edit the **Contact Offer Notice**. See Figure B-172.

Figure B-172



The dialogue with the Expert will then look like to what is shown in Figure B-173.

Figure B-173



For more information on DB Lookup, refer to the *Scripting and Media Routing Guide for Cisco Unified ICM/Contact Center Enterprise & Hosted* and the *Administration and Configuration Guide for Cisco Unified Expert Advisor 7.6(1)* at the following URLs:

http://www.cisco.com/en/US/products/sw/custcosw/ps1001/products_user_guide_list.html

http://www.cisco.biz/en/US/products/ps9675/prod_maintenance_guides_list.html

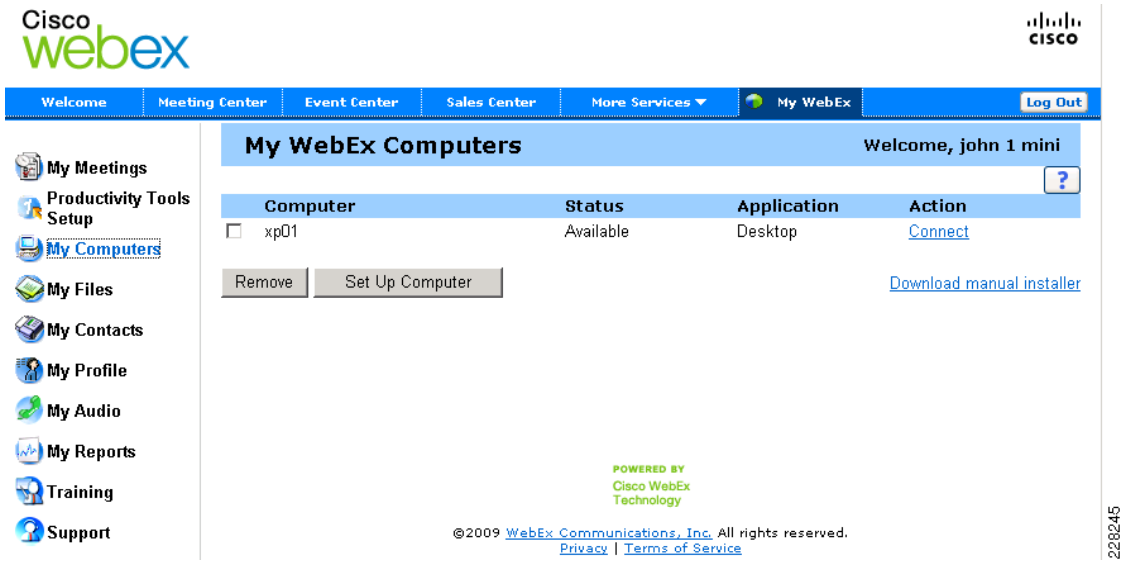
WebEx Access Anywhere

WebEx Access Anywhere is a simple method for an Agent to control the desktop and system that the customer used when contacting the agent from within the enterprise. The WebEx Access Anywhere service uses an agent installed on the remote system to allow connection and control from an Expert Agent without the customer having to connect to, navigate or share the system they are using via services such as WebEx meeting or Cisco Meeting Place sessions.

Step 1 To install the WebEx Access Anywhere agents on a system, login to the WebEx account.

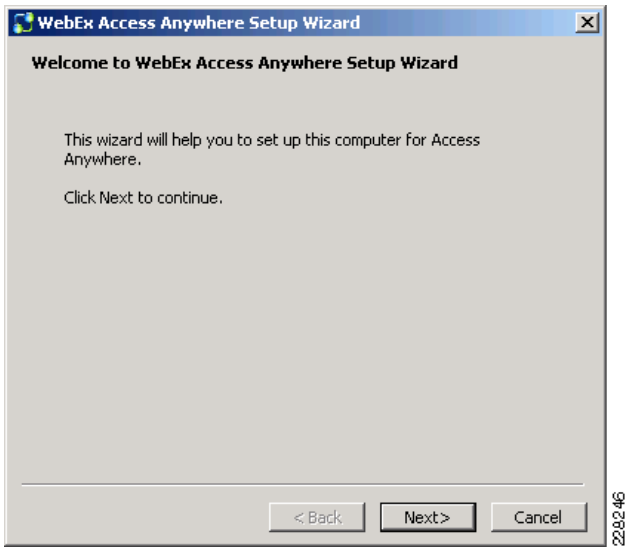
Select **My WebEx** from the tool menu and then click on **My Computers**. See Figure B-174.

Figure B-174



Step 2 Click on **Set up Computer**. Accept the Security Warning for ActiveX. See Figure B-175.

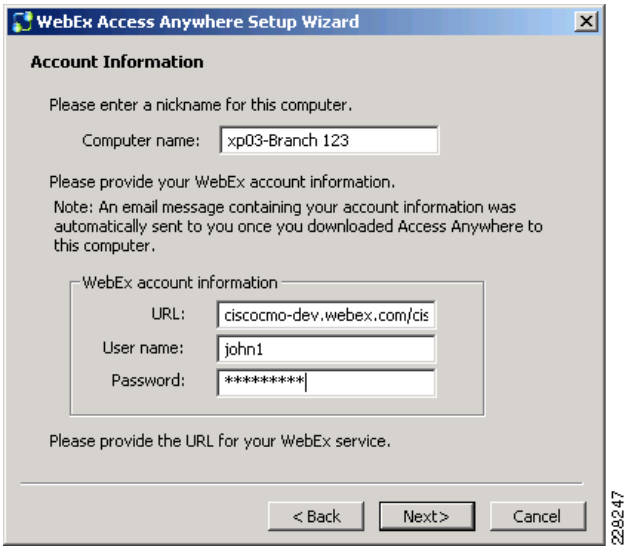
Figure B-175



Step 3 Click **Next**.

Step 4 Enter the Computer name and WebEx Account Info and click **Next**. See Figure B-176.

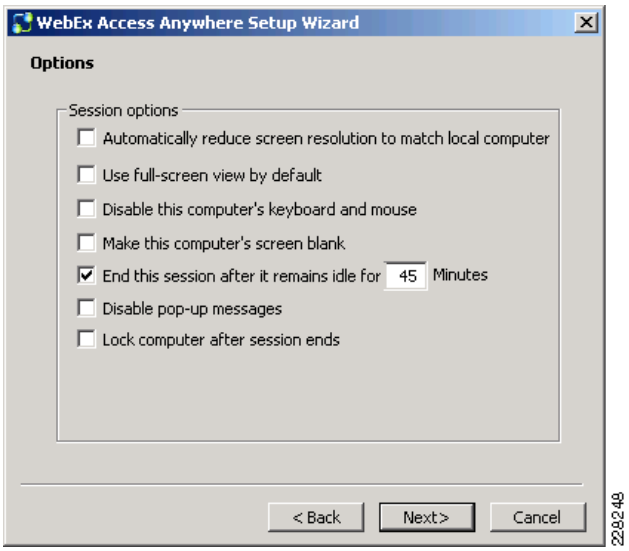
Figure B-176



Step 5 Click **Next**.

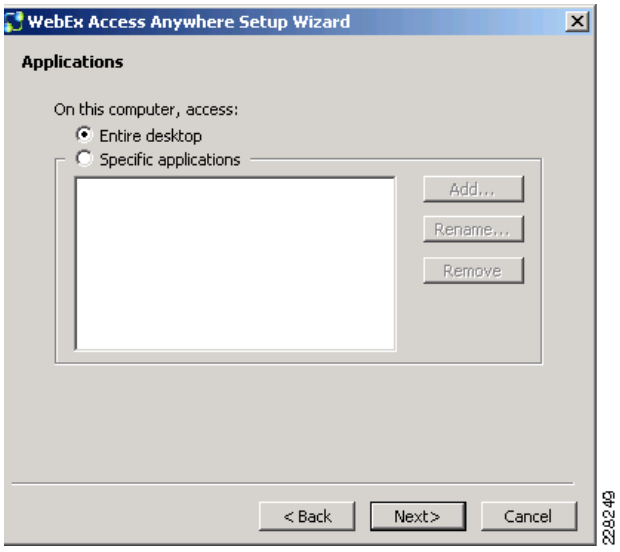
Step 6 For Virtual Expert Kiosks in an Enterprise Branch configure the session options to enable both the Expert and the customer to access and control the System at the same time. Click **Next**. See Figure B-177.

Figure B-177



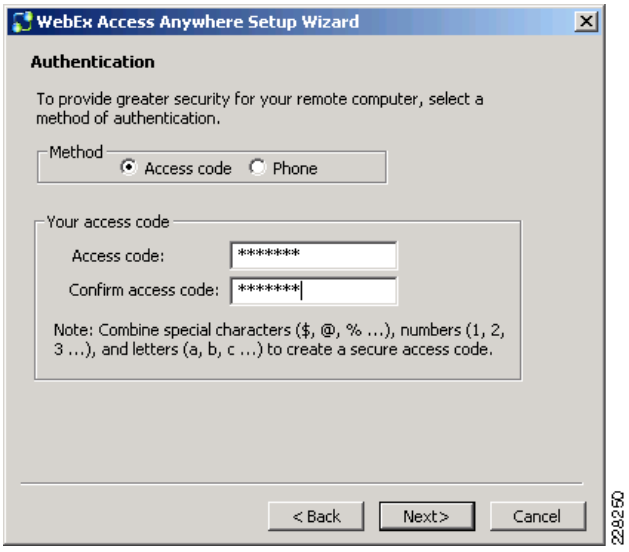
Step 7 Configure access for the entire Desktop and click **Next**. See Figure B-178.

Figure B-178



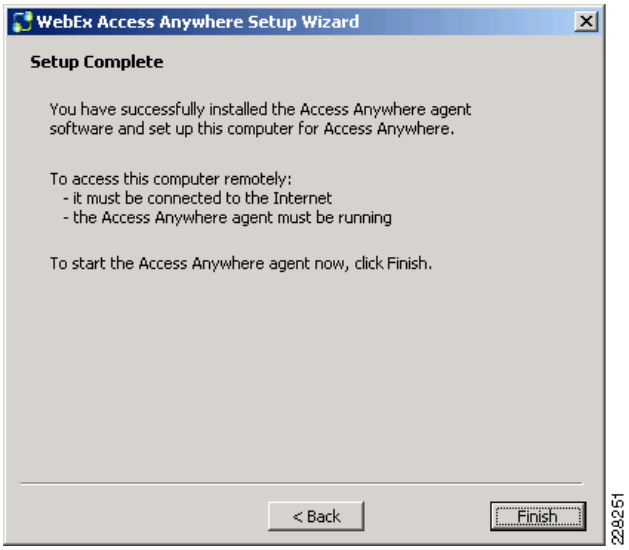
Step 8 Set the Access code for this system and click **Next**.Figure B-179.

Figure B-179



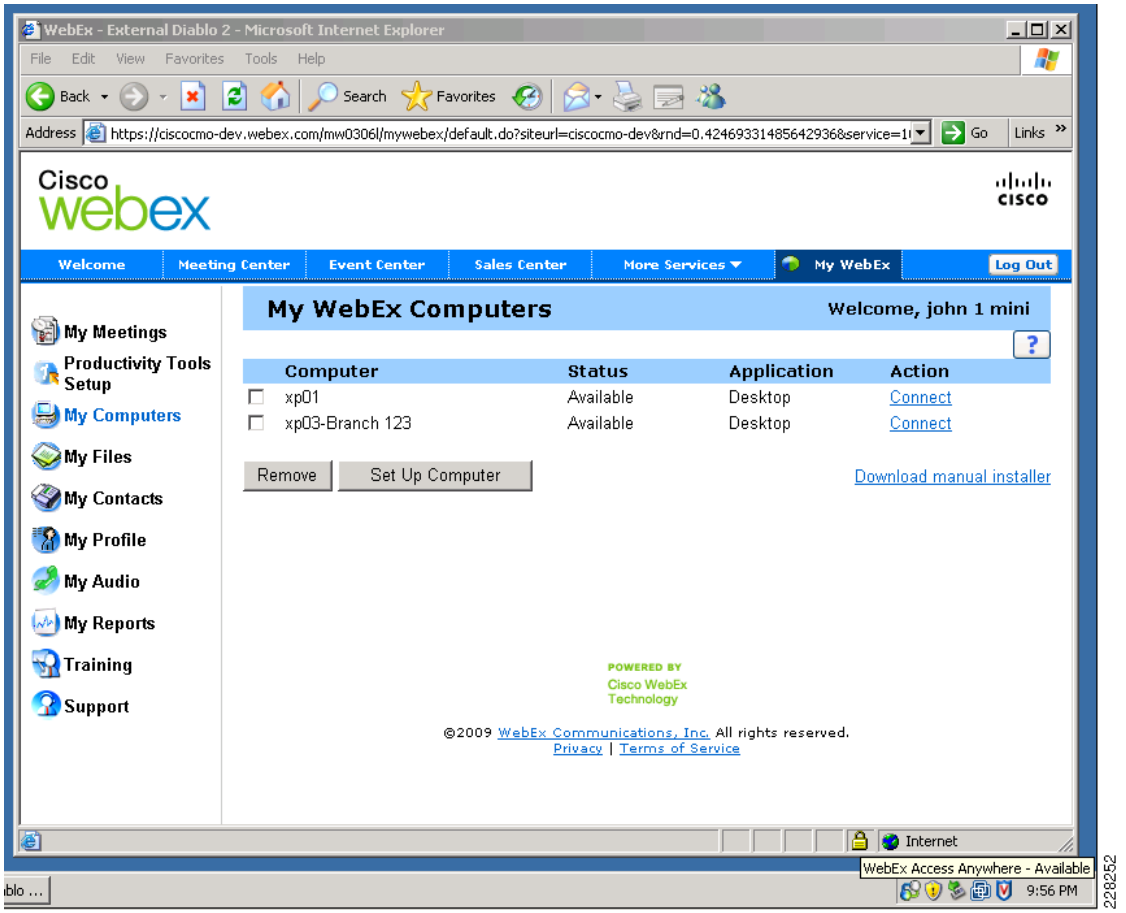
Step 9 With setup completed, click **Finish**. See Figure B-180.

Figure B-180



Step 10 The newly added system will be listed in the My WebEx Computer table and the WebEx Access Anywhere agent will be running in the System Task Tray waiting for a connection. See Figure B-181.

Figure B-181


WebEx - External Diablo 2 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address https://ciscocmo-dev.webex.com/mw0306l/mywebex/default.do?siteurl=ciscocmo-dev&rnd=0.42469331485642936&service=1
Go Links
Cisco webex
cisco
Welcome
Meeting Center
Event Center
Sales Center
More Services
My WebEx
Log Out
My Meetings
Productivity Tools Setup
My Computers
My Files
My Contacts
My Profile
My Audio
My Reports
Training
Support
My WebEx Computers
Welcome, john 1 mini
Computer
Status
Application
Action
xp01
Available
Desktop
Connect
xp03-Branch 123
Available
Desktop
Connect
Remove
Set Up Computer
Download manual installer
POWERED BY
Cisco WebEx Technology
©2009 WebEx Communications, Inc. All rights reserved.
Privacy | Terms of Service
Internet
WebEx Access Anywhere - Available
9:56 PM
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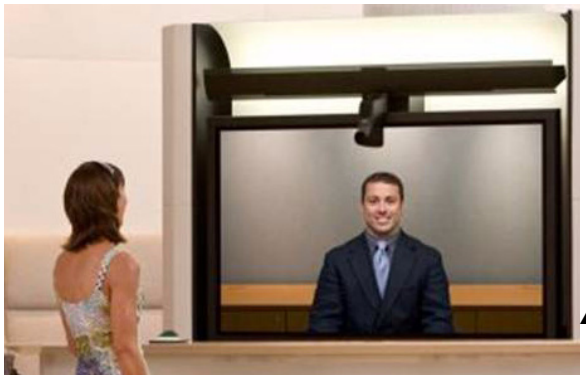

APPENDIX C

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