Contact Center Overview

This chapter covers the following subjects:

- An overview of the Cisco Contact Center
- An introduction to the benefits and features offered by the Cisco Contact Center
- An understanding of the different products within the Contact Center suite

A call or contact center is often thought of as a centralized office or building with the sole focus on handling customer queries, usually with a high volume of calls typically over the telephone.

The nature of inbound queries varies greatly depending on the type of business operating the contact center, but usually the calls provide product support or information inquiries to the business's customers. Many organizations of various sizes have their own contact center, with the number of agents ranging from a handful to several thousand employees. Some of the organizations that do not have their own contact center or require additional capacity outsource their contact center needs to a third party. This third party handles customer calls as if it were part of the original company.

Most major organizations use contact centers to interact with their customers. In addition to handling inbound calls, many contact centers offer their customers a wide range of options for contacting them. Email, web collaboration, instant messaging (IM), fax, and video chat are all gaining popularity as the acceptance of residential broadband connectivity with higher connection speeds and bandwidth availability becomes more widespread.

In addition to inbound contact, some contact centers also perform outbound calling. For example, telemarketing operations call existing and prospective clients to offer new products and services. Technologies such as Short Message Service (SMS) text messaging have also proved to be popular as a less-intrusive form of outbound contact.

Historically, many contact centers have been built using traditional private branch exchange (PBX) equipment which, over time, has been enhanced and upgraded to what is now referred to as an Automatic Call Distributor (ACD). The ACD is a platform that can

handle incoming calls and distribute them to specific groups or teams of agents within the contact center. The calls are usually routed depending on business logic programmed into the ACD. Logical groupings of agents can be defined depending on the business functions that they can offer. For example, a small business could offer its callers two inbound phone numbers. One number reaches agents in the support team, and the second number could be delivered to the sales department. Agents can be selected to receive the calls based on various metrics or formulas. Two of the most popular methods for distributing calls are as follows:

- Longest available agent (LAA): This method selects the agent from a skill group that has been sitting idle for the longest period of time. LAA is often considered to be a fair call distribution method in favor of the agents as calls are delivered to the agents who have the longest time period since handling their last call.
- Minimum expected delay: This call distribution method could be used when all the agents are currently busy and the caller needs to be queued against a single skill group. The contact center platform would calculate, from short-term historic values of handling times, what the expected delay could potentially be for each skill group. Assuming that each of the skill groups would handle the call effectively, it would be beneficial to the caller to deliver the call to the skill group with the smallest expect delay value.

Many vendors exist that manufacture ACD equipment. Traditionally, the majority of ACD equipment was built around proprietary hardware and software, with the only level of integration being through standards-based telephony protocols such as Integrated Services Digital Network (ISDN). With the emergence of Voice over IP (VoIP) in the last decade, many vendors have redeveloped their platforms to support IP and the various standards-based protocols offered, such as ITU-T H.323 and Session Initiation Protocol (SIP). In addition to this integration, the vendors have also opened interfaces, or application programming interfaces (API), to allow third-party organizations to develop additional products providing enhanced and advanced features.

As organizations grow through expansion or acquisition, many find themselves with several contact centers distributed over multiple geographic locations. With voice and data connectivity between these locations, several companies look to enhance their existing investment in their current platform by creating a virtualized contact center over many sites, including many different ACD types. With the current shift toward VoIP, many enterprise customers seek to renew or replace their time-division multiplexing (TDM) equipment with IP-based contact centers before the support contracts expire on their TDM platform.

After an IP contact center has been implemented, the next step for many organizations is that of business transformation. With the use of intelligent endpoints offering integration with many back-end systems or existing business processes, business transformation not only seeks to reduce costs but also to enable users to be more productive. A large proportion of contact centers uses only a small percentage of the platform's capability. By leveraging existing functionality not currently in use, both end-user productivity and customer satisfaction can be increased.

Contact Center Characteristics

Cisco has a strong track record in providing robust and scalable data network infrastructure and applications. With the acquisition of GeoTel in the late 1990s, Cisco branched out into ACD technology. Through further acquisition and a strong in-house product team, Cisco has an extensive voice product suite and impressive network virtualization strategy that provide the following benefits:

- Self-service: Enabling the customers to manage their interaction with the business without requiring human intervention not only reduces the payroll expense for the company but also has many additional benefits, including removing the repetitive and mundane calls from the agents.
- Dual-tone multifrequency (DTMF) touchtone: This is the most popular technology used for self-service, but speech recognition has been widely adopted as the performance and recognition capabilities of speech platform have increased. The use of extensible markup language (XML), and in particular VoiceXML (VXML), has also enabled organizations to develop a single back-end platform that can be accessed through many user interfaces. For example, a web page and self-service Interactive Voice Response (IVR) script both have different user interfaces but can connect to a single back-end system through VXML-capable middleware.
- Call control: To provide feature-reach telephony platforms offering the functionality expected by end customers, Cisco developed a series of protocols to enable IP phone and voice gateway connectivity. Skinny Client Control Protocol (SCCP)—also known as Skinny—and MGCP (Media Gateway Control Protocol) are still in use today but are also joined by SIP. H.323 has also been supported in gateways since the early versions of the Cisco platforms.
- Call routing: An essential requirement of any contact center is the capability to route calls. Having the capability to route calls over multiple vendors, multiple sites, and based on complex business policies demonstrates a scalable platform.
- **Video calls:** The capability to provide a human touch is essential to the success of a contact center's role in customer service. With the advent of video technology, some organizations offer video kiosks to enable the caller to have a face-to-face videoconference with a representative of the company. The kiosk can be located at a branch office or even a remote location over a network. As well as providing face-to-face conversation, the kiosks can also be used as video self-service or enable an agent to "push" prerecorded video to the kiosk to assist the customer.
- Presence: Although first-time call resolution is a great measure of customer satisfaction, it is inevitable that a portion of calls need to be transferred elsewhere within the organization. Having the ability to see the real-time status of colleagues or experts, or even using instant messaging to chat to them before attempting to transfer a call can greatly reduce the amount of handoffs experienced by the caller. Federation also provides the ability to extend contact to organizations or staff outside the contact center.

- Interoperab
 - Interoperability: No vendor can be expected to provide the entire stack of applications to do the tasks required by the business for the contact center. Many vendors have comprehensive partnership and development programs with published APIs into the contact center products to enable third-party vendors to provide enhanced applications. This interoperability includes functions such as customer relationship management (CRM) software, IVR, workforce management, and voice recording.
 - Reporting: Without the visibility of the contact center as a whole, it would be impossible to understand how the business can achieve customer satisfaction. Management information is an essential tool for any contact center manager to visualize performance and ensure that key performance indicators (KPI) are being achieved. A good reporting platform tracks all contact from start to end, also termed *cradle to grave*.

Contact Channels

Traditionally, call centers offered only limited methods of getting in touch with an organization. Although customer contact over the telephone is still the most popular method, various other media channels are now available to enable customers to reach out to the contact center. Many variations of voice contact have emerged in addition to traditional landline circuits, cell phones, Internet-based voice such as Skype, or SIP-based services. These emerging media channels are instant messaging, video chat, email, web collaboration, and fax.

Web collaboration is currently used by many organizations on their support and sales web portals. The sales teams use it to reach out to potential customers currently browsing the companies' websites to answer questions with a personal touch and guide the customer, eventually to a point where the customer is informed enough to make a purchasing decision. The support teams find collaboration useful to guide existing customers to find specific resources that can solve their issues in a prompt and efficient manner, thus improving customer satisfaction.

All channels connect back to individuals or groups of people in the organization. The front-line staff that usually handles these contacts can be the on-site agents or shop retail staff. Providing location flexibility for these staff is important and easily achieved with technology, allowing the agents to be home- or mobile-based. Location independence also comes into play if you have remote resource, such as at a branch office, that you would like to become part of the virtualized team. The ability to provide the same technology and contact handling regardless of location can also become beneficial during disaster scenarios. A second tier of staff also exists for assisting the front-line staff with queries or problems outside of their knowledge base. This is where the experts are used. These knowledge workers are not typically the first responders in the same way as the front-line staff, but are available, perhaps on an ad hoc basis, to assist where possible.

Cisco Contact Center Features

The suite of products within the Cisco Contact Center portfolio offers a wide range of features available to customers. This product suite meets the traditional requirements of call handling with the advanced features available from an IP-based solution.

The features offered include the following:

- Contact center virtualization
- Feature-rich agent and supervisor desktop controls
- Computer Telephony Integration (CTI) and CRM integration
- A choice of client software for call control
- Knowledge worker functionality
- Support for remote and mobile agents
- IVR self-service and call-treatment capabilities
- Reporting
- Platform management portal
- Outbound option
- Third-party integration

The sections that follow cover these features/products in greater detail.

Virtual Contact Center

Cisco Unified Contact Center coordinates an agent's ability to work on multiple simultaneous tasks from various channels (voice, email, and chat) while allowing the agent to be interrupted with high-priority tasks, if required. For example, an agent can handle multiple chat sessions at the same time, or tasks from different channels such as responding to an email inquiry at the same time as handling a voice call. In this way, Cisco Unified Contact Center can optimize the agent's time, helping to allow the maximum amount of customer contact with the resources available.

Cisco Agent Desktop with Presence

Presence information provides a real-time status indicator that displays the ability and willingness of a colleague for communication. Popularized through many of the instant messaging chat clients, the user can publish his presence state, such as Available, Busy, or Away, allowing other presence users to instantly see the person's availability.

Integrating Cisco Agent Desktop with presence extends real-time collaboration into the broader enterprise. Through this integration, agents and supervisors can collaborate with relevant colleagues and subject matter experts outside the contact center. For efficiency and convenience, the contact center defines the view to show only the colleagues who are appropriate for agents to access.

Presence information has also proved popular with front-line telephony users or reception staff that handle a large number of calls requiring transfer to another party. Seeing the presence state of a user allows the transferring party to better handle the call and provide meaningful information back to the caller, such as providing the caller with the option to leave a voicemail if the party is away or even providing a time that the party will return.

CTI and CRM Integration

CTI is a key driver in enabling business efficiency and improving customer satisfaction. Forcing a caller to repeat account information when transferring calls, not having access to his customer records or call history, and having no awareness of simple details such as the time spent in queue before he was answered are surefire ways of annoying callers and leaving them with a bad impression.

Cisco Unified Contact Center provides a wide range of tools and features to perform CTI. The call-routing platform and Agent Desktop combine to provide the agent with enterprise-wide call-event and customer-provided data. This data is screen-popped to the agent on call delivery, providing the agent with all the required information before she answers the call.

Customer Relationship Management (CRM) integration takes CTI to the next level by further improving efficiency and therefore reducing costs. Cisco provides a range of CRM connectors for many of the popular third-party CRM applications, including Siebel, SAP, Salesforce.com, and Microsoft CRM. CRM integration enables the agent to use a single CRM screen with all the telephony controls embedded into it. The agents therefore log in, control their state, and perform all call handling through a single user interface. When a new call arrives, a screen pop appears in the CRM application displaying all the caller's account information retrieved from the CRM database, perhaps based on the caller's Automatic Number Identification (ANI) or account number collected from an IVR. Enabling account data and call control to occur in the same screen saves the agent time that would be spent double-typing information into various desktop applications, thus reducing call-handling times and improving efficiency.

Agent Desktop Options

Cisco Unified Contact Center offers a variety of desktop options for contact center agents, including the following:

- Cisco IP Phone Agent: IP Phone Agent provides basic ACD functions on a Cisco Unified IP Phone, and in many cases, it eliminates the need for installing an agent desktop on the agent's PC.
- Cisco Agent Desktop (CAD): Cisco Agent Desktop provides built-in agent desktop capabilities that allow agents to perform call-control functions directly from their

desktops. CAD offers an out-of-the-box, rapid, easy, low-risk deployment. Desktop workflow and screen pop are natively provided functions that do not require the skills of a development team. CAD also supports presence and web browser integration.

- Cisco CTI OS Toolkit Desktop: The CTI OS Toolkit Desktop is available for companies that require specialized, custom desktop capabilities tailored to meet the specific needs of their contact center operations. The CTI OS custom development kit simplifies custom CTI integrations as it provides support for many different programming languages through its software development kit (SDK). The toolkit comes with a compiled agent and supervisor desktop. These are not actually meant to be deployed because they are a basic example of what can be achieved with the toolkit; however, many organizations use them as an initial deployment before rolling out a custom CTI OS desktop at a later date.
- Pre-integrated CRM desktop: This is a strategic integration with the leading CRM vendors including Salesforce.com and Siebel. Pre-integrated desktops save customers time and effort that would have been spent performing CTI development.

Cisco Unified Expert Advisor

Many contact centers require the capability to provide agents with the backup skill available from a product specialist or knowledge worker. These specialists typically have work activities other than providing assistance to customers, so the contact center platform requires the capability for the knowledge worker to handle incoming customer calls without the need for them to conform to the rigid business rules of the contact center. Cisco Unified Expert Advisor provides this facility through the use of a presence desktop application, allowing contact center agents to see the experts' availability.

Call context data can be transferred between the agent and the knowledge worker through the creation of specific URLs that can link to data with a CRM system to access all the caller information and call history.

Using knowledge workers throughout the enterprise can improve first-call resolution and hence increase customer satisfaction.

Support for Remote and Mobile Agents

Cisco Unified Mobile Agent enables the contact center to include temporary and remote agents in the business during high-volume periods.

Mobile Agent allows you to use clients irrespective of geographic location. They don't have to be extensions of the Cisco Unified Communications Manager (Unified CM) cluster. They can be on a third-party ACD or even a plain old telephone service (POTS) line at home or a cell phone. All the call control is performed through a desktop client that supports both CAD and CTI OS. When an agent logs in, he provides a contact phone number to which he would like the contact center to deliver the calls. Mobile Agent is also great for use in disaster scenarios or situations where the calls need to be delivered to a system

or phone line where no peripheral gateway (PG) connectivity is present. The Mobile Agents are reported active, just as if they are in any other standard contact center agent.

Cisco Unified Mobile Agent adds the capability to bring temporary agents online during seasonal high call volume with reduced startup costs. Agents can choose their destination phone number during signup time and change the number as often as they want, providing both the contact center and the agent with total flexibility.

Self-Service and Call-Treatment Capabilities

Cisco Unified Contact Center offers two options for self-service and call treatment:

- Cisco Unified IP Interactive Voice Response: Cisco Unified IP IVR facilitates self-service applications, such as access to bank account information or voice menus, by processing user requests through touchtone input or speech-recognition technologies. Customers can use voice commands to retrieve the information they require without ever speaking with an agent, or to quickly navigate to the correct department or agent who can help them.
- Cisco Unified Customer Voice Portal: Cisco Unified Customer Voice Portal (CVP) operates with both TDM and IP-based contact centers to provide a call-management and call-treatment solution with a self-service IVR option that can use information available to customers on the corporate web server.

Note For example, with Unified CVP, customers can pay a bill, order products and track delivery, locate a dealer, schedule a pickup, change name and address information, make travel arrangements, check payment status, receive notification of unusual activity, or request literature or product information.

Reporting

The Cisco Unified Contact Center solution provides real-time and historical data necessary for contact center reporting. The reporting function provides accurate and timely reports on contact center activity, helping managers make informed decisions regarding staffing levels and contact handling. Standard reporting templates provide automatically operational functions for common reporting needs. Custom reports can extend the standard reporting package to meet specific reporting needs. Reporting data can be exported to external data warehouse environments or analysis tools.

Cisco acquired the company Latigent that created an advanced reporting application, which Cisco rebranded as the Cisco Unified Intelligence Center (CUIC). CUIC provides a single environment for developing ad hoc reports. Users/supervisors also have some flexibility in tailoring the reports. CUIC does not require the same level of expertise to create the reports as with some other reporting packages.

In addition to CUIC, Cisco also has an integrated reporting tool called WebView. WebView has been available since the early versions of Cisco Unified Contact Center Enterprise (UCCE) and provides a comprehensive range of more than 200 out-of-the-box reporting templates. Custom templates can also be created using Sybase InfoMaker, which is a report generation tool similar to the popular Crystal Reports application.

Over time, the presentation layer of CUIC will replace WebView.

Management Portal

The Cisco Unified Contact Center Management Portal (CCMP) provides the contact center management team with an intuitive web-based administrative interface to facilitate day-to-day tasks. The CCMP interface is aimed at the user who needs to complete common administrative tasks such as adds, moves, and changes of various configurable items including agents, skill groups, phones, and teams.

CCMP not only configures UCCE elements but can also configure some Unified CM end devices such as IP phones.

CCMP is a partitioned system that can support multiple business units with complete autonomy and offers hierarchical administration to support multiple business-level users with specific roles and responsibilities. CCMP provides audit trail reports detailing all configuration changes and usage of the management portal.

Cisco Contact Center Portfolio

The Cisco Unified Contact Center product portfolio (see Figure 1-1) is composed of several platforms of which Cisco UCCE is actually a product suite. To better understand the product placement within the portfolio, it is important to understand the solutions that are available, and then further see how they can be broken down into their component parts.



Figure 1-1 Cisco Contact Center Product Suite

The three solutions available in the contact center portfolio are based upon sizing:

- Single-site ACD: For an organization with a single site and a small number of agents, the Cisco Unified Contact Center Express (UCCX) platform is preferred.
- Multisite ACD: Should the organization have multiple sites or require a virtualized platform, the Cisco Unified Contact Center Enterprise (UCCE) for VoIP or Cisco Unified Intelligent Contact Manager (UICM) for TDM platforms are often used.

Hosted ACD: Cisco Unified Contact Center Hosted is typically aimed at service providers to enable multitenant platforms for its customers, but it is also used by some large enterprise customers to provide segregation among several business entities where routing, reporting, and security need to be kept independent.

Before getting into a detailed breakdown, it is important to be aware that as of Cisco Contact Center release 7.0, the following name changes were introduced. However, the name changes have not yet been consistently integrated into the documentation set or the software:

- Cisco Intelligent Contact Management Enterprise Edition is renamed Cisco Unified Intelligent Contact Management Enterprise (Unified ICME).
- Cisco Intelligent Contact Management Hosted Edition is renamed Cisco Unified Intelligent Contact Management Hosted (Unified ICMH).
- Cisco IP Contact Center (IPCC) Enterprise Edition and Cisco IPCC Hosted Edition are renamed Cisco Unified Contact Center Enterprise (Unified CCE) and Cisco Unified Contact Center Hosted (Unified CCH), respectively. Cisco System IPCC is renamed Cisco Unified System Contact Center Enterprise (Unified SCCE).

The use of the generic abbreviation *ICM* is intended to include both Unified ICMH and Unified ICME.

The use of the generic abbreviation CC in this document is intended to include Unified CCH, Unified CCE, and Unified SCCE, but not Unified Contact Center Express (Unified CCX).

It is important to understand what makes Unified CC different from Unified ICM, and also to understand the demarcation between Enterprise and Hosted. If you disregard UCCX initially as this is a totally different product, you quickly realize that the following three products share the same code base:

- Cisco Unified Contact Center Enterprise
- Cisco Unified Contact Center Hosted
- Cisco Unified ICM Enterprise

The product name is allocated depending on the ACD technology used in the deployment and whether the product is being deployed in a hosted environment.

Unified Contact Center Enterprise (UCCE) and Unified Intelligent Contact Manager Enterprise (UICME) are deployed in similar enterprise situations. The difference between these two products is that UCCE is deployed with the Cisco Unified Communications Manager IP-based PBX, whereas UICME is typically deployed on legacy ACD environments.

A similar product definition could exist for both Unified Contact Center Hosted and Unified Intelligent Contact Manager Hosted. In theory, the former platform would be purely for hosted Unified CM servers and the latter for a mixture of legacy ACD types.

In reality, most hosted service providers actually have a single platform that supports a mix of both Unified CM and legacy ACDs. Some instances of where a pure Unified Contact Center Hosted is deployed are usually for relatively new service providers or outsourcers looking to provide a pure IP-based multitenant platform. This is because the new hosted platforms usually do not have any old legacy ACD equipment to support, so choose an IP PBX and build up from a greenfield site. A greenfield site is generally considered to be a new office or building that the organization moves to during relocation.

Cisco Unified Contact Center Express

As previously mentioned, the entire line of contact center models shares a similar code base with the exception of UCCX. UCCX is a different product aimed at a much smallersized contact center deployment. The characteristics of UCCX are as follows:

- Designed for midmarket, enterprise branch, or corporate departments, UCCX provides a sophisticated customer interaction solution for up to 300 agents.
- UCCX can be installed as part of a UCCE solution using the parent/child model.
- Earlier versions of UCCX were frequently deployed as coresident solutions with Unified CM. However, since version 5.0 of Unified CM, the Unified CM platform has ported to a Linux-based appliance model, so a minimum of a two-server solution is now required.
- UCCX also supports Cisco Unified Communications Manager Express (CUCME), which is not supported by UCCE.
- Sharing a similar agent desktop to one of the available desktops to UCCE, UCCX provides an agent environment that is almost cross-platform, enabling experienced agents to work on either UCCE or UCCX without a great deal of adjustment.
- Although UCCX supports both the Cisco Agent Desktop and the IP Phone Agent, it does not come with a development toolkit for CTI OS SDK.

Cisco Unified Contact Center Enterprise

Cisco UCCE is a highly evolved, best-of-breed, advanced contact center routing platform. UCCE is actually a suite of products because UCCE comprises several Cisco solutions, including the following:

- Cisco Unified Intelligent Contact Management (Unified ICM)
- Cisco Unified Communications Manager (Unified CM)
- Cisco IP Interactive Voice Response (Unified IP IVR)
- Cisco Unified Customer Voice Portal (Unified CVP)

In addition to the preceding applications, a Cisco network infrastructure, including Cisco voice gateways and IP Phones, is also required to support these products.

Cisco Unified Contact Center Hosted

Cisco Unified Contact Center Hosted is suitable for both large enterprise companies and service providers. It also works well for outsourced contact centers that host several of their customers on a single platform. For enterprise companies with multiple branches or divisions, the value is a centralized contact center infrastructure that can offer services to remote locations. For incumbent service providers and new service carriers, the product creates a new, high-margin service revenue stream. The service provider hosts the contact center infrastructure software, which is shared by multiple customers (multitenancy) in its central office or data center. Subscribing customers can have IP or TDM infrastructures, or a combination of the two.

UICMH is a high-capacity, high-reliability network service platform that offers a wide range of services for IP- and TDM-based networks. Its services include traditional intelligent-network routing, IVR, and network-queuing services to Cisco Unified Intelligent Contact Management platforms of service provider customers or enterprise branch offices. Therefore, UICMH functions much like a service control point (SCP) to a full set of hosted contact center features. You can integrate UICMH with existing TDM, ACD, and IVR equipment in addition to Cisco Unified CM and Cisco Unified CVP.

UICMH has been deployed in high-capacity carrier environments since 1997 and has proven its capability to handle millions of calls every day. It delivers an excellent service value today as part of a UICMH solution and facilitates a smooth transition to other IPbased voice services.

One of the many early advantages for end customers of using a hosted TDM platform was the ability to preroute calls in the service provider network before delivering them to the most suitable site. Before the advent of voice and data convergence, prerouting in the service provider's network gave multisite contact centers a distinct cost savings normally associated with secondary routing. For example, without prerouting, a two-site contact center has no way of informing the carrier's network of agent or resource availability at its contact center sites. Inbound calls would typically be delivered to each of the sites based on a static percentage split, that is, 50 percent of inbound calls delivered to site A and the remaining 50 percent delivered to site B. Should a call arrive at one of these sites without available resources, the call could either be queued until the next free agent can take the call or it could be automatically rerouted over a tie line between the sites. Even with this routing in place, it does not mean that the other site has free resources to handle the call.

Prerouting changed this poor call handling by providing a mechanism whereby the service provider's intelligent network has visibility of the resources at each site. This was made possible through the use of a UICMH platform in the network obtaining a realtime data feed from a peripheral gateway installed at the customer's site. The ACDs provide the PG with resourcing information that is sent back to the UICMH platform, allowing the service provider's intelligent network (IN) to make a decision about which site to route the call to.

Delivering the call to a site that had free resources, or had agents likely to become available in the shortest period of time, allows the customer to reduce the amount of intersite voice traffic and therefore reduces the number of tie lines required between their sites. For customers with more than three sites, large cost savings can be achieved.

Cisco Unified Intelligent Contact Manager Enterprise

Cisco UICME has the same code base as UCCE. The main difference of UICME over UCCE is that UICME provides an abstraction layer for many different TDM-based ACDs. Cisco UICME was the precursor to UCCE.

Cisco UICME is pitched at the contact center that uses one or more legacy ACDs. By legacy ACD, Cisco is actually referring to any non-Unified CM ACD or PBX. Because of the abstraction layer provided by the peripheral gateway, several different ACD types can be connected by a single UICM platform. This was the original design intention of the platform many years ago—to connect several disparate ACD types into a single routing and reporting interface to be used throughout the enterprise.

As the UICME product has evolved, various different ACD types, vendors, and models have been supported and withdrawn. A popular current use of UICME is for organizations wanting to migrate from their legacy ACD to UCCE. Several enterprise organizations have many different ACD types. This usually comes about because the ACDs have been purchased from various vendors over a long period of time depending on pricing and functionality available at the time. Each vendor has a different management and reporting interface for the business and technology teams to learn. UICME provides a common interface over the different ACDs for reporting and configuration. After UICME has been deployed and successfully integrated with the organization's ACDs, the next step for migration is typically the deployment of Unified CM and its subsequent integration with UICME. Many organizations then take a phased approach to slowly migrate legacy ACD handsets across to IP endpoints.

Cisco Unified IP IVR

Cisco Unified IP IVR is a software-based IVR system that processes IP streams routed to it by the Unified CM and UCCE. These streams typically take the form of contact center queue announcements, prompt and collect menu structures, and self-service applications.

Unified IP IVR has an open and extensible architecture allowing the developer to incorporate out-of-the-box and custom-developed Java classes. This enables a wide range of scalable and portable applications to be developed to meet business needs.

Unified IP IVR was the IP IVR of choice before Unified CVP was introduced into the product suite. It is still a popular IVR choice today and is typically chosen over CVP when single-site platforms are being deployed, or when a low IVR port density is required.

Cisco Unified Customer Voice Portal

Cisco Unified Customer Voice Portal (CVP) integrates with both TDM- and IP-based contact centers to provide a call-management and call-treatment solution with a self-service IVR option that can use information available on the corporate web server. With support for ASR and Text-To-Speech (TTS) capabilities, callers can obtain personalized answers to their questions and can conduct business in new ways—all without the costs of interacting with a live agent.

To protect existing investments in contact center technology assets, you can deploy CVP in both TDM and IP contact centers. More important, you can deploy the application in a hybrid environment that many businesses have as they migrate their telephony networks to a common converged environment for data, voice, and video traffic. Thus when agent assistance is required, CVP can easily provide call-routing and -transfer services over either TDM or IP to route calls to the best location and resource to handle the inquiry.

CVP includes support for agent queuing and multisite call-switching capabilities that use standard Internet technologies to provide a smooth customer experience, even when transferring calls between multiple locations. With support for the UICME and UCCE, CVP delivers self-service as part of a comprehensive customer-contact strategy that attracts customers by providing unique, personalized interactions.

Used with UCCE, CVP is often seen as an advanced IVR and queuing solution that comprises a carrier-grade platform that can scale to support a high IVR port density. Expanding beyond the functionality provided by IP IVR, CVP delivers both voice and video self-service applications. CVP provides callers with touchtone and speech recognition.

In comparison with IP IVR, CVP has a greater degree of complexity and cost but also provides greater scalability and redundancy. Because of the distributed architecture of CVP, one of its often-used features is the capability to handle and queue calls on the network edge (or most efficient location) through the use of a voice browser.

CVP can also be deployed as a standalone IVR without the need to rely on UCCE. It can also be deployed in front of an ACD.

CVP applications are created using Unified Call Studio, which is an integrated development environment (IDE) based on Eclipse. The IDE offers a drag-and-drop user interface.

Other Voice Components

Although this book focuses on only the application layer of UCCE, it is also important to understand the other essential voice components required for a UCCE deployment:

- Cisco Unified Communications Manager: More than just an IP PBX, the Cisco Unified Communications Manager (Unified CM) is a powerful call-processing platform that is both scalable and distributable. The Unified CM solution supports voice and video at its core and also has a suite of management and third-party tools to provide a rich telephony platform.
 - An essential part of UCCE, Unified CM is a powerful call-processing platform that is both scalable and distributable. The Unified CM solution supports voice and video and also has a suite of management and third-party tools to provide a rich telephony platform. Unified CM provides the underlying telephony delivery that UCCE takes advantage of to enable a higher layer of intelligent routing.
- LAN/WAN architecture: A key part of voice and data convergence is the underlying network infrastructure needed to support the voice, video, and signaling traffic. IP telephony places strict requirements on network characteristics such as packet loss, delay, and jitter to ensure that voice and video quality is achieved; therefore, you need to deploy quality of service (QoS) mechanisms on the routers and switches throughout the network. As well as server and application redundancy, you can achieve network redundancy through the duplication of devices and links that provide quick network convergence and adaptability or rapid convergence should a topology change occur.
- Voice gateways: Providing connections to other organizations, voice gateways allow the enterprise to connect to the outside world. Various types of voice gateways exist. The functionality provided relies on the voice modules configured in the voice gateway. T1/E1/FXO cards are usually connected to the PSTN or other switch types. FXS modules can be used to connect to internal telephony endpoints such as fax machines. IOS configuration allows SIP trunks to connect.
- UC endpoints: Unified Communications endpoints are user devices such as a deskphone, a softphone application running on a client PC, or even a video camera connected to the phone and PC for videoconferencing. IP handsets have all the functionality you would expect from a normal telephone but also include advanced functionality such as directory applications and presence running on the phone.

Summary

This chapter has provided a high-level overview of some of the features and platforms that comprise the Cisco Contact Center suite. Although you know that these products share the same code base, you have learned that they have a different focus depending on the end customer's telephony requirements:

- Cisco Unified Intelligent Contact Manager Enterprise (UICME): Aimed at customers who have one or more legacy ACDs within their enterprise. Typically, it is for customers who are looking to implement a unified management and reporting interface as an abstraction layer over their existing ACD and IVR equipment. Implementing Cisco UICME is also a common path for customers wanting to migrate to VoIP while still benefiting from their legacy investment.
- Cisco Unified Contact Center Hosted (UCCH): Aimed at the customer who wants to outsource his telephony and/or contact center technology to a third party, typically a network telephony carrier. The hosting company provides all the hardware and software to deliver and manage the platform, whereas the customer pays for and benefits from a managed solution.
- Cisco Unified Contact Center Enterprise (UCCE): An enterprise solution aimed at the customer who wants to use a VoIP contact center based around the Cisco Unified Communications Manager IP PBX. This solution is the most popular Cisco contact center deployment model and is the focus of the remainder of this book.