# ENTERPRISE VOICE WITH MICROSOFT UNIFIED COMMUNICATIONS

Now, we will cover voice in the enterprise, which has been a fluctuating and quickly evolving market over the past century. Through this experience, you will learn how a software manufacturer like Microsoft has transformed the telephony industry through software-powered voice and will forever change existing voice communications as you know and use them today with the Microsoft Unified Communications platform.

In a market that has been dominated by the likes of Cisco, Nortel, Avaya, Aastra, Siemens, NEC, and other large telecommunications manufacturers as well as hybrid IP-PBX system providers such as Digium (Switchvox), and Fonality, Microsoft, the software manufacturer, not telephony device manufacturer, has made an enormous splash that is transforming the unified communications industry forever through the power of software and has played a strategic role to now be considered a leader in the Unified Communications market as identified by Gartner Research within its Magic Quadrant for Unified Communications, as shown in Figure 4.1.
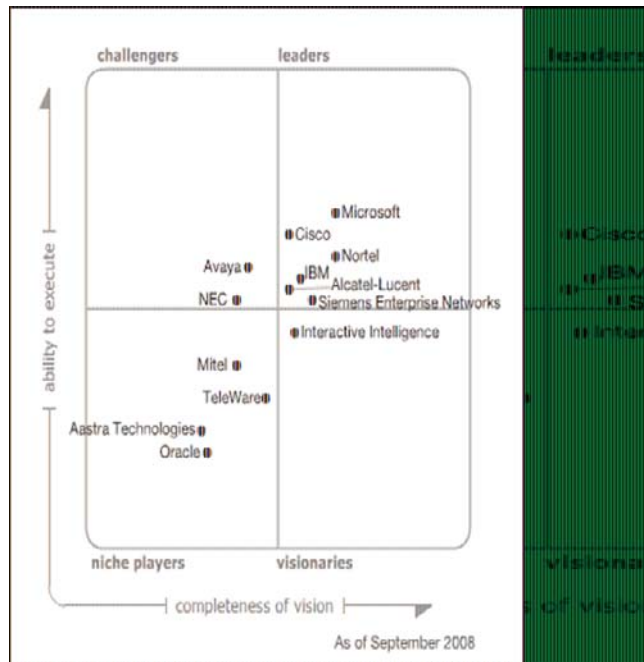
FIGURE 4.1 Magic Quadrant for Unified Communications

Gartner UC Magic Quadrant (© 2008 Gartner Research)

Originally targeting mail, collaboration, and Instant Messaging (IM) separately, Microsoft has now combined the Office suite of products—Outlook, Word, Excel, and PowerPoint—with the MVPs of Microsoft enterprise products, Microsoft Exchange Server and Microsoft Office SharePoint Server to compete in a mature marketplace from both an application and device perspective. I have been personally involved with Microsoft's independent UC products since Microsoft Exchange 5.5 and Live Communications Server 2003. Beginning with IM, Microsoft targeted products including IBM's popular Sametime Instant Messaging server. I actually left IBM Global Services to begin working on the first Live Communications Server deployment at a multibillion dollar oil, gas, and exploration company headquartered in London, England, to enable this conglomerate with a new IM solution to compete with their internal IBM Sametime solution. Following this project, I helped organize the largest IM deployment for a financial institution and then a U.S. federal agency, all existing IBM Sametime customers. Needless to say, IBM became threatened by this new kid on the block—not me, Microsoft—and began to offer Sametime licenses for free.

After three releases of Live Communications Server (2003, 2005, and 2005 SP1), the Unified Communications team decided to focus on integrating voice into the collaborative mix and changed the name of the product to **Office Communications Server (OCS)**. Now in its 2007 R2 release, OCS packs a punch by providing enterprise, secure IM, but also enterprise voice and conferencing solutions including recording and archiving tools. Adding integration with Microsoft's signature enterprise messaging system, Microsoft Exchange Server, the Unified Communications solution provides integrated Unified Messaging as well as the ability to dial into Exchange Server via phone to retrieve e-mail and voicemail messages and to create and edit meetings and conferences all via phone.

The OCS client, Office Communicator, is now an all-in-one client to enable Instant Messaging between internal and partner organizations as well as with the public networks including AOL, Yahoo, and MSN/Windows Live. Communicator also is to be used as a VoIP and Remote Call Control (RCC) client to communicate via voice from your PC to internal and external system users. With built-in conferencing solutions that can be hosted internally within the OCS with Live Meeting 2007, users can host conferences as well as create conferences and meetings directly from within Outlook or Communicator making collaborating and communicating with contacts easy. Adding Microsoft Office SharePoint Server to the mix, users can enable Instant Messaging, conferencing, and voice directly from within portal sites, rounding out a truly collaborative, communications-enabled solution.

How does the market perceive this? Well, if this is the first time you have read anything about Microsoft's Unified Communications platform, it may be as confusing to you as it is to market analysts. Still, Microsoft is viewed as a leader in this market area and will be the most dominating market share leader starting with the Wave 14 release of the product, which includes all the SIP/VoIP calling features without the need of gateways or in-between server routing solutions that drive up cost and complexity of a deployment. Cisco and Nortel, two dominating PBX and Unified Communications providers, have maintained market share only because their solutions are based on the proven and legacy focus on hardware devices. The two organizations work against each other in cross-competitive marketing campaigns that reflect whose hardware is cheaper or better as of now, and I was a large part of this with my marketing release of the Nortel UC Green story, whose hardware is more energy efficient. Microsoft partners with these organizations currently with a sugar-coated marketing campaign of not to "Rip & Replace" your hardware, but

"Surround the Socket" by using the vendor's hardware and Microsoft's software connecting users to phone devices and services using Microsoft OCS and Microsoft Office Communicator. For some reason, Cisco, Nortel, and others bought into this, or more than likely, were paid to participate in this campaign, hopefully knowing full well that Microsoft will directly compete with all these leading Telco providers head on by 2010. Whoever missed this is either extremely naive or too hesitant to communicate concern. Regardless, this is where we are: transitioning as a market and from a technology perspective of hardware-based communication solutions to software-powered voice solutions.

Now that you somewhat understand where the current market lies, let's dive into what products make up the Microsoft Unified Communications platform.

Microsoft Office Communications Server

Office Communications Server (OCS) is Microsoft's enterprise voice server, the cornerstone of the Microsoft Unified Communications platform, and the future of Microsoft's Voice and Unified Communications vision. This software-powered voice solution will be the market leading and market-changing voice platform server of the century. OCS has gone through many version releases and upgrades—some good, some shocking—but all necessary to prepare the product for its sole purpose in the industry, the ultimate PBX killer. Forget the "VoIP as you are" campaign hailed highly from Microsoft today. In the next two years, Microsoft OCS will be the socket and will enable branch offices and enterprise organizations to leverage a price performance voice solution that spans applications, networks, and devices, reminding me of Bill Gates' initial vision around the .NET strategy of connecting people, applications, and devices across ubiquitous networks. This is it folks, the real deal.

From RTC to UC

Before OCS was part of the Unified Communications Business Group at Microsoft, its predecessor, LCS, was part of the Real-time Collaboration (RTC) Business Group. Back "in the day" things were much simpler. We didn't have to worry about voice channels, Quality of Service (QoS) issues, and so on, and could just focus on the collaboration functionality of this newly released SIP server from Microsoft. Back then, we just worried

about server placement and federation with public IM networks such as Yahoo, MSN, and AOL, which were the source of the biggest headaches—security and archiving. I can't remember how many hundreds of internal Microsoft employees and field reps in each region of the world I trained just on what Transport Layer Security was. Having worked on some of the largest and initial RTC projects and receiving one of the first two Microsoft Most Valuable Professionals awards within the RTC community, I witnessed the evolution of LCS to OCS through the addition and focus on integrated voice services through VoIP and traditional telephony solutions through the PBX. At that time, our incubation center group grew into an actual Business Group (BG) at Microsoft with the internal merger of the RTC team and the prestigious and money making Microsoft Exchange Server team. Two years later, the BG is now composed of some of the top voice communications talent from a sales, marketing, and product development perspective in the industry. Bottom line, it was a challenging transition, but we all made it through and are all now poised to make a killing in the market.

Office Communications Server Editions

Many people think that OCS is simply just another Microsoft server. They do not realize that there are many components to the OCS environment, including the Multi-Point Control Units (MCUs) that are used within a single or multi-OCS server configuration to host voice, conferencing, and data (Instant Messaging, Presence, and so on) as well as archiving, call recording, PBX Remote Call Control, monitoring servers, mediation gateways, and not to exclude, conferencing, phone devices, and a full-featured end-user client application in Office Communicator. To provide you with a better understanding of these components, I'll break these down one by one.

OCS Multipoint Control Units

Let me start by stating that OCS is a SIP and RTP server. As mentioned earlier, SIP clients, which would be the users of the OCS client application, Office Communicator, connect to this SIP/RTP server to consume features such as voice, video, conferencing, and Instant Messaging. In a SIP/RTP environment, features, such as audio, video, voice, Web conferencing, and Instant Messaging, are provided and hosted through an MCU. With the Microsoft Unified Communications platform there are three MCUs—one each for Audio/Video, Instant Messaging, and Web Conferencing (see Figure 4.2).

Audio/Video MCU   Instant Messaging MCU   Web Conferencing MCU
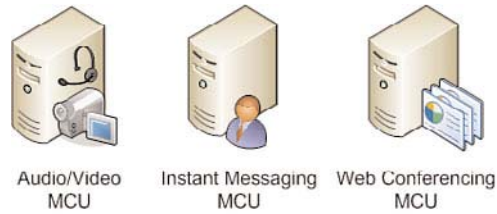
Figure 4.2 Microsoft Unified Communications platform

These MCUs can host a certain number of users to provide the Unified Communications features that the end users consume to communicate and collaborate with internal and external contacts. Because the MCUs can only handle a certain number of users (based on hardware and usage patterns), OCS is broken out into two separate editions, Enterprise and Standard.

Audio/Video MCU

The OCS Audio/Video MCU provides the ability to host audio and video sessions within a Unified Communications environment. End users leveraging the Microsoft OCS client, Microsoft Office Communicator, can participate in voice and video sessions with other contacts inside the corporate network as well as remotely and with external participants. The Audio/Video MCU enables this capability by hosting this traffic and enabling the required audio and video codecs to perform the transmission of these SIP packages across the network. In the R2 release of Microsoft OCS 2007, the Audio/Video MCU plays a very important role by enabling HD-quality video communications so that you can truly use video conferences on a wider scale and video conversations for a small group or 1:1 format. You can feel as if you are right there with the party on the other end of the camera!

Instant Messaging MCU

The OCS Instant Messaging MCU is dedicated to host the IM services used by the OCS client application, Office Communicator. Through the IM MCU, Communicator sends and receives Instant Messages throughout the internal OCS environment as well as brokers IM communications between the internal environment with federated/connected OCS environments and public IM networks such as AOL, Yahoo, and Windows Live/MSN. As explained earlier, Microsoft uses SIP as its communication protocol for video, voice, and data. Through the MCU architecture, the

IM MCU provides the ability to enable IM data as well as presence. This technology is not really anything new as Microsoft has used SIP as its default protocol for IM through previous Unified Communications product versions with Live Communications Server 2003—Live Communications Server 2005 SP1. These previous products only provided IM without voice, so this architecture has been included inside the IM MCU through Office Communications Server 2007 and today's R2 version release.

Web Conferencing MCU

Building on the success of Microsoft Office Live Meeting, one of the most popular online hosted Web conferencing solutions in the marketplace, OCS offers a Web Conferencing MCU that enables organizations with a hosted server-based internal Live Meeting conference server that runs within OCS. This allows organizations to host Live Meeting conferences on their internal infrastructure, which can be accessed by internal and remote users as well as external contacts. This Web Conferencing MCU gives the organization the ability to control meeting services within their own enterprise and to enable global meeting services that include audio, video, sharing of presentations and other data, as well as provide the ability to securely conference, communicate, and record these entire sessions for future research, retention, or compliance policies. The Microsoft Office Live Meeting service is also available in its existing Microsoft online-hosted format that companies or individuals can use to subscribe to as well. Offering both hosted and on-premise solutions for using Live Meeting is a clear differentiating factor between Microsoft and its competitors, such as GoToMeeting or AT&T Conferencing services, and sets the bar for the future of conferencing services. The only close competitor in this space would be WebEx with its EMX on-premise conferencing solution, which Cisco is currently using as its Web conferencing platform. But this is still a somewhat disconnected application, which does not allow users to integrate the conferencing service with other desktop tools.

What's also great about Live Meeting is the ability to escalate communications from a Microsoft Office or Information Worker perspective. For example, users can start with e-mail, progress to Instant Messaging for faster results, move on to multiparty voice and videoconferencing for even faster results, and ultimately engage in a Live Meeting session to really share a business idea or collaborate more effectively by sharing video, voice, and data. This progression is seamless through Microsoft's Unified Communications platform; these products integrate and work perfectly together.

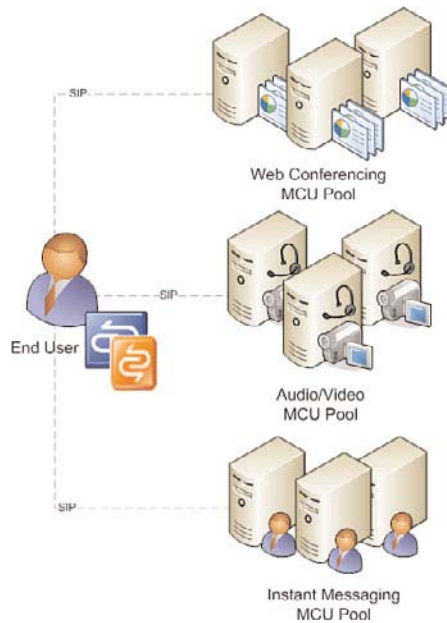### Office Communications Server Enterprise Edition

OCS Enterprise Edition is the full enchilada of voice, video, and conferencing. The most scalable version of OCS Enterprise Edition enables organizations to fully deploy a global Unified Communications solution by architecting a distributed network of OCS servers and performing backup and entire site failover functionality. By offering this open architecture, organizations can specify which servers are used for what functionality in regards to hosting audio/video, Instant Messaging, or Web conferencing on separate servers or on all three MCU components hosted on one server. Each Enterprise Edition server can be, and is architected to be, enabled for high-redundancy and failover in the format of clustering and network load balancing. Each OCS Enterprise Edition server can support thousands of users per server, but it is important to plan effectively for the number of users per MCU within a given environment.

To properly plan for an enterprise deployment, Microsoft released a planning wizard that can be used to determine the number of servers and provides additional planning information that you can download for free via http://www.microsoft.com/downloads. Simply search for "Planning Tool for Office Communications Server 2007."

The architecting of OCS server placement and which MCUs will be hosted on each OCS environment really depends on the number of users, locations, and requirements for backup and site failover per customer. Most Microsoft Unified Communications services partners, including my firm, provide **Architecture Design Sessions (ADS)**, which are typically one- to two-day sessions in which the services team meets with a customer alongside a Microsoft representative to architect a Unified Communications environment to fit the customer's needs. Using the Enterprise Edition of Microsoft OCS, you can scale out a global architecture to provide specific servers that host audio/video, Instant Messaging, and Web conferencing (see Figure 4.3). By scaling out this architecture, you can provide a geographically dispersed Unified Communications platform, connecting people, processes, and applications worldwide.

In this example, each server hosts an individual MCU to provide better bandwidth to users as well as to support the number of users required in each region. The Enterprise Edition of OCS uses a "pool" architecture to provide this level of scalability to enterprise organizations that demand it. Enabling a pool of OCSs allows organizations to not have to worry about failover or redundancy issues, which is the main difference between the Enterprise and Standard Editions of this software.

FIGURE 4.3 Example of how Microsoft OCS can be architected using OCS Enterprise Edition

Office Communications Server Standard Edition

In contrast to the OCS Enterprise Edition server architecture, OCS Standard Edition is a stand-alone server. OCS Standard Edition provides all the Instant Messaging, audio/video, and Web conferencing features out-of-the-box in one server, offering customers who do not have failover requirements a lightweight server to support a fair number of users per server. Obviously, you still need additional servers to support voice such as the OCS Mediation Server, but smaller departments or organizations can definitely utilize this simplified deployment solution to leverage the power of OCS in one physical machine. For detailed information on how many users are supported per server, the OCS planning tool, referenced earlier in this section, is exactly what you need.

What's great about the Standard Edition of OCS is that smaller companies or departments/divisions of larger enterprises that may not have the large number of users that would demand an OCS Enterprise Edition

server can implement all-in-one Standard Edition servers internally to host the features that they require. OCS Standard Edition is also a great solution for companies during a Proof of Concept (POC) environment giving the company the ability to test and play with the features provided by OCS with a less lengthy deployment cycle in a sandbox or test environment, requiring little equipment and configuration.

To help you better understand OCS Standard Edition's role in an OCS environment, Figure 4.4 adds an OCS Standard Edition server in a couple of additional locations to enhance the OCS Enterprise Edition architecture illustrated previously in Figure 4.3.
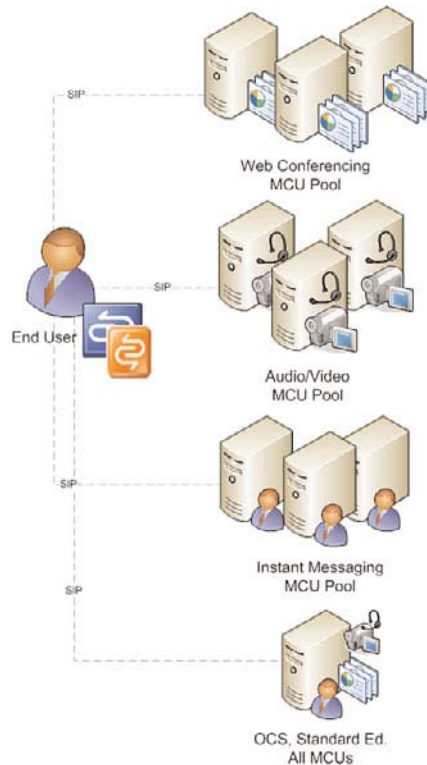
Figure 4.4 OCS Standard Edition server added

In this example, OCS Standard Edition is used to host users in two new locations within the previously architected enterprise environment. What's great about the OCS design is that we can accommodate single office, multioffice, and multisite locations. Given that OCS as well as the entire Microsoft Unified Communications platform relies on Microsoft Active Directory, we can connect these networks together to provide shared directories in each location.

Office Communications Server Edge Servers

Taking OCS to the next level, Microsoft provides three externally-facing Edge Servers to provide audio/video, Web conferencing, and SIP traffic over the Internet. Each of the three Edge Server roles are used within an OCS environment to provide federation with other OCS environments and federation with public IM networks including AOL, Yahoo, and Windows Live/MSN as well as to provide a server contact point for users who want to connect to an OCS server from outside the corporate network, but still want to be able to use voice, video, conferencing, and Instant Messaging. I like to call this server a "UC Freedom Server" in that it enables the full functionality of OCS both globally and remotely. Because I always work in a mobile environment, the OCS Edge Server roles are critical to me personally and to my organization as a whole. Together we can join conferences and invite outside contacts/partners to share voice, video, Instant Messaging, conferences, and data remotely, and we are still using a secure connection.

To build on the previously designed architecture, Figure 4.5 now adds an OCS Access Edge Server to connect remote users and enable the ability to federate between partner organizations and with the public IM networks such as AOL, Yahoo, and Windows Live/MSN as well as perform external voice access.
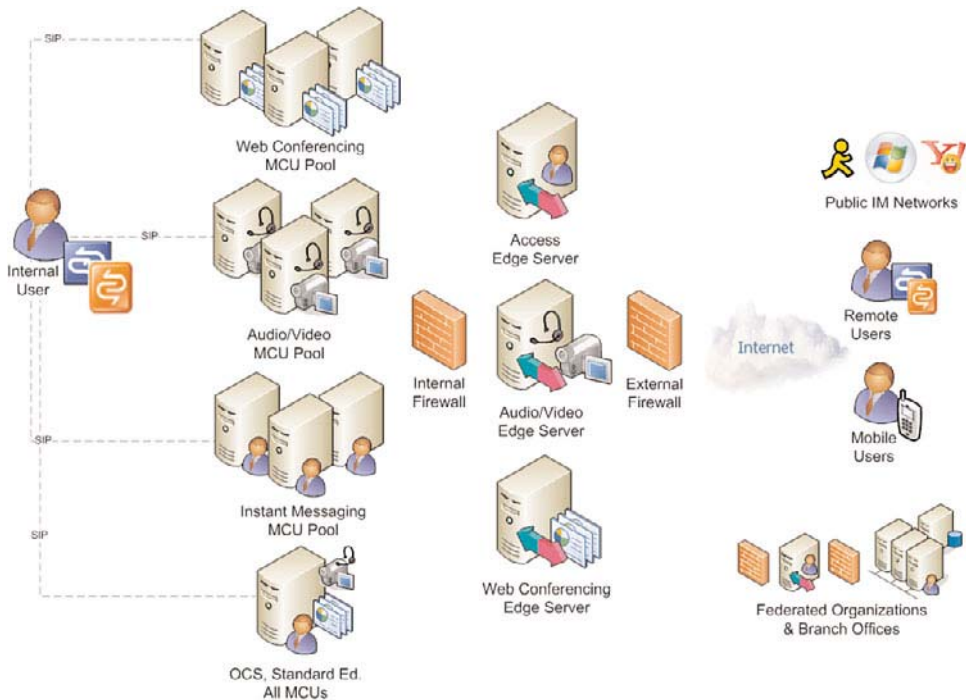
FIGURE 4.5 OCS Access Edge Server added

It is also important to note the OCS Edge Server's equipment requirements. Whereas a normal OCS server, Enterprise or Standard Edition, requires a typical server hardware configuration, the OCS Edge Server requires more processing power, less data, and a dual Network Interface Card (NIC) card. The Edge Server does not store much data at all outside the configuration details of the server and the security certificates used to broker secure communications with partners and remote workers, so the type of server needed must factor in the number of connections required from the outside. A single OCS Edge Server for most enterprise organizations would not suffice because if thousands of users need remote access, they federate with multiple organizations, and they enable all their users to communicate with the public network, it would stretch this one server beyond its capability, although a single OCS Edge Server can handle 15,000 concurrent users for IM alone. What's great about the OCS Edge Server design is that you can architect and deploy an array of OCS Edge Servers to provide better bandwidth support as shown in Figure 4.6.
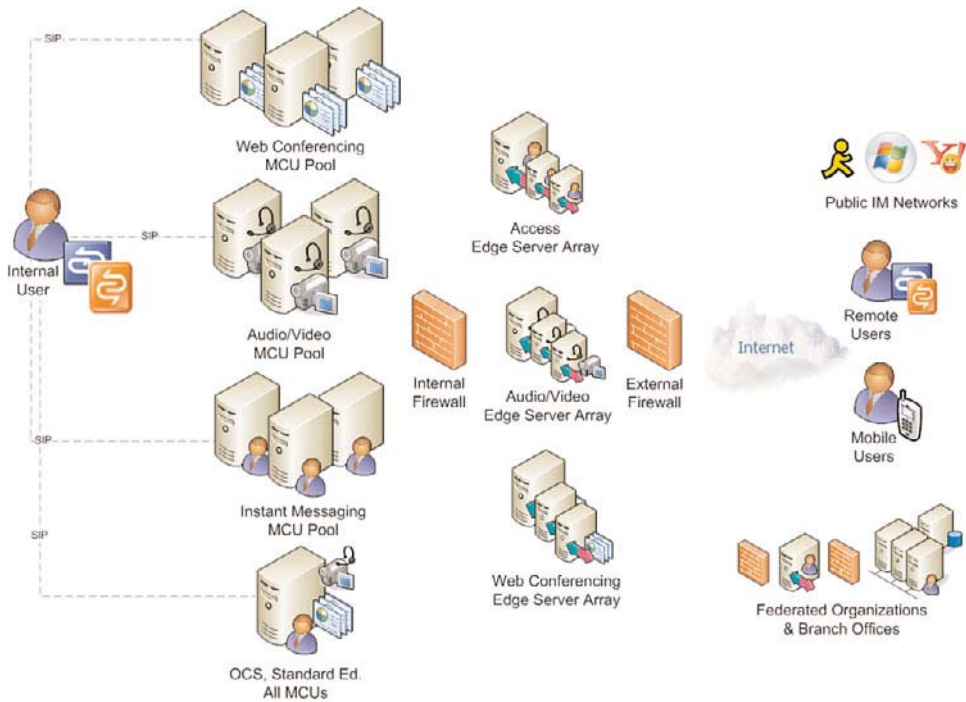
Figure 4.6 Array of OCS Edge Servers

Another element critical to the OCS Edge Server as well as the entire OCS environment is how to configure the required Transport Layer Security (TLS) certificates on the server. As explained in Chapter 1, "The Communications Renaissance," TLS is the encryption used to secure communications within a SIP environment. Microsoft uses TLS within OCS to secure client and server communications by using TLS certificates. Each OCS server is configured with a server certificate, and client PCs or Macs are configured with a machine-level trusted root certificate to enable the clients to connect to an OCS server, whatever the role may be. From an OCS Edge Server perspective, two types of certificates are needed, public and private. Normally, an organization deploys internal TLS certificates on all the servers and client machines internally and then uses a publicly trusted certificate from companies such as a VeriSign, Entrust, and GoDaddy on the outside edge of the Edge Server. Remember when I mentioned that an OCS Edge Server requires two physical network ports? Well, within the

management console of the OCS Edge Server you configure the private edge and public edge of this server. On the private edge, you configure a private IP address that provides the Edge Server with connectivity to the next-hop OCS server, which may be an OCS Director server, OCS Standard Edition server, or load balancer.

As depicted in Figure 4.7, you also configure one of the TLS server certificates from the internal Certificate Authority that you used for all your other internal OCS servers to safely and securely connect the OCS Edge Server internally. On the flip side, you configure the outside network port as the outside edge of the OCS Edge Server. From this side, you assign a public IP address that connects the OCS Edge Server to the public Internet and configure a public TLS certificate that can be trusted by remote users, federated partners, and the public IM networks including AOL, Yahoo, and Windows Live/MSN.
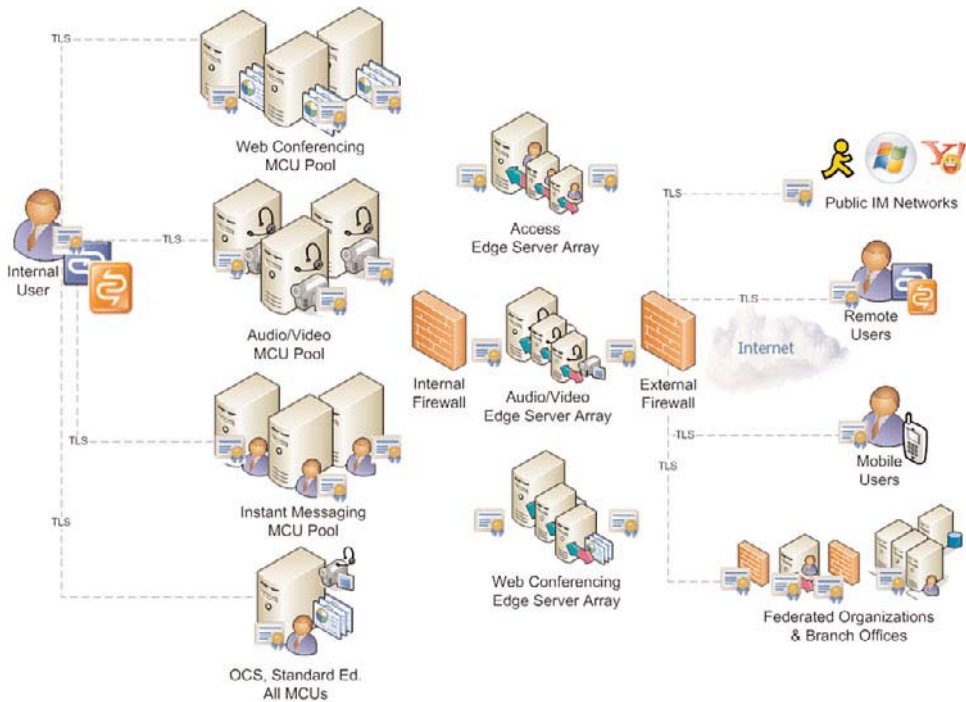
FIGURE 4.7 Secured voice communications through TLS and MTLS

Did you imagine that such a single server configuration could do so much? Well, that's why Microsoft is a leader in the UC Magic Quadrant as reported by Gartner Research. Microsoft is able to consolidate and expose many features, out of the box, using software-powered VoIP, which leads us to our next OCS server role, the OCS Mediation Server, which is used for voice integration and SIP Trunking support for the OCS environment.

Office Communications Server Mediation Server

The OCS Mediation Server is the most critical component in the current version of OCS, at this time, 2007 Release 2. The Mediation Server is used to connect the OCS environment to an external or internal telephony and VoIP environment. You would use the Mediation Server to connect to a media gateway device to connect a PBX to the OCS environment. This enables existing PBX users to use their existing extension and phone number from within the OCS client application, Office Communicator, as a Softphone or from an Office Communicator Phone Edition desk phone. This service also enables what is called dual-forking and simultaneous ring that enables all of your Office Communicator devices, mobile devices, and PBX phones to ring at the same time enabling you to decide how to answer the incoming call or defer the call to voicemail or another device.

The Mediation Server is also used to connect an OCS environment to a SIP Trunk. As mentioned earlier and explained in the section regarding Microsoft Response Point, a SIP Trunk is provided by an Internet Telephony Service Provider (ITSP). The ITSP SIP Trunk provides VoIP service to a Response Point Base Unit and now an OCS Mediation Server directly so that your clients can use Office Communicator applications via the PC, Mac, Web, or mobile to communicate using VoIP instead of using a PBX or POTS/analog lines.

Figure 4.8 depicts how the OCS Mediation Server is architected to connect to a PBX, SIP Trunk, and Gateway PSTN services.
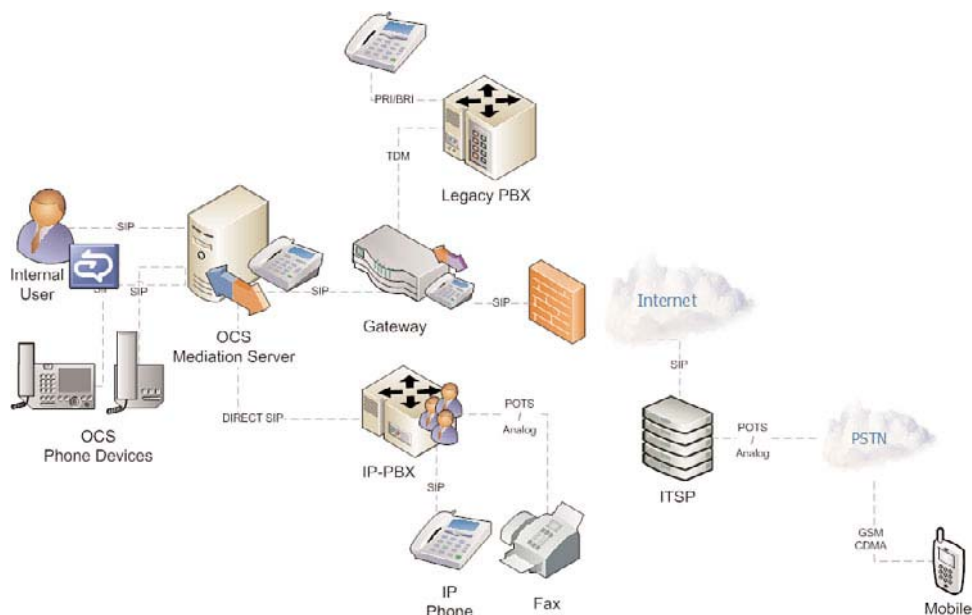
Figure 4.8 OCS Mediation Server

The real Return on Investment (ROI) for implementing a Unified Communications environment, such as OCS, Exchange Server, and Live Meeting, has to do with the Mediation Server. PBX systems incur a tremendous payload in regards to recurring costs, upgrades, license fees, and as we are now seeing, extreme power consumption, which causes a dramatic expense in the data center to power and cool a PBX system and its required components as well as on the desk with a user's PBX phone. The same applies to the recurring monthly voice charges involved in using PSTN/POTS/analog and PBX-PSTN services. If you only use SIP Trunking and VoIP services, you pay a fraction of the cost on a monthly or annual subscription basis as well as still have the ability to communicate to the PSTN networks through the services provided by the ITSP. As mentioned earlier in the book, the ITSP provides VoIP-to-VoIP communication as well as connectivity to the PSTN network to communicate with mobile, landline, POTS or analog lines, as well as other companies that have PBX systems in-house that have external VoIP or PSTN integration enabled. So you are not losing anything by implementing a fully VoIP integrated system in terms of functionality and reach, but are saving millions and ultimately billions of

dollars in the enterprise. By implementing a voice solution using technology such as Microsoft's Unified Communications platform, you become the trusted advisor and the bottom line hero of your organization!

Office Communications Server QoE Monitoring Server

As mentioned in Chapter 1, Quality of Experience (QoE) represents the overall quality of each user's experience within a voice communications environment. Microsoft uses QoE to ensure that not only the service itself is optimal, but that the users are happy as well. The Microsoft OCS QoE Monitoring Server is a free downloadable application that runs within the OCS environment and captures the experience of sessions that occur in real time and then reports the data of each session at the end of the session.

Figure 4.9 is an example of how the QoE Monitoring Server would be applied to a Unified Communications architecture.
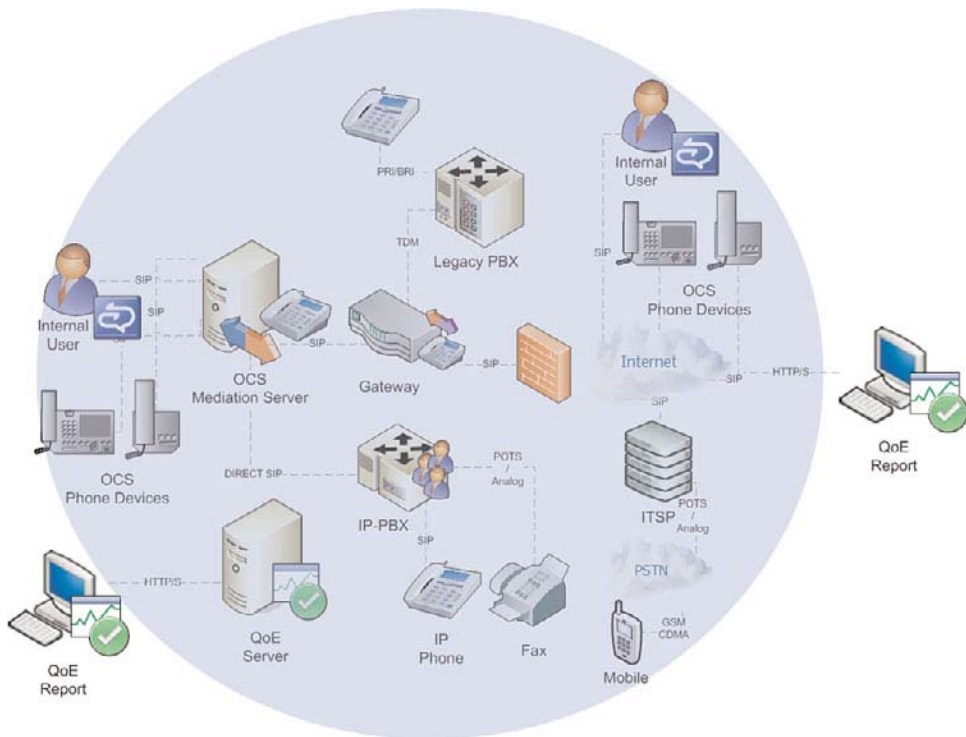
FIGURE 4.9 QoE within a UC environment

As mentioned earlier in the book, most Telco providers are obsessed with the quality of the voice service itself and charge exorbitant fees for their high-quality QoS routers. Microsoft applies the same obsessiveness in respect to the quality of the service itself, but making sure that the end user is satisfied is the most important requirement in driving the overall success of a Unified Communications implementation.

Figure 4.10 is an example of a QoE report portal provided by the QoE Monitoring Server.
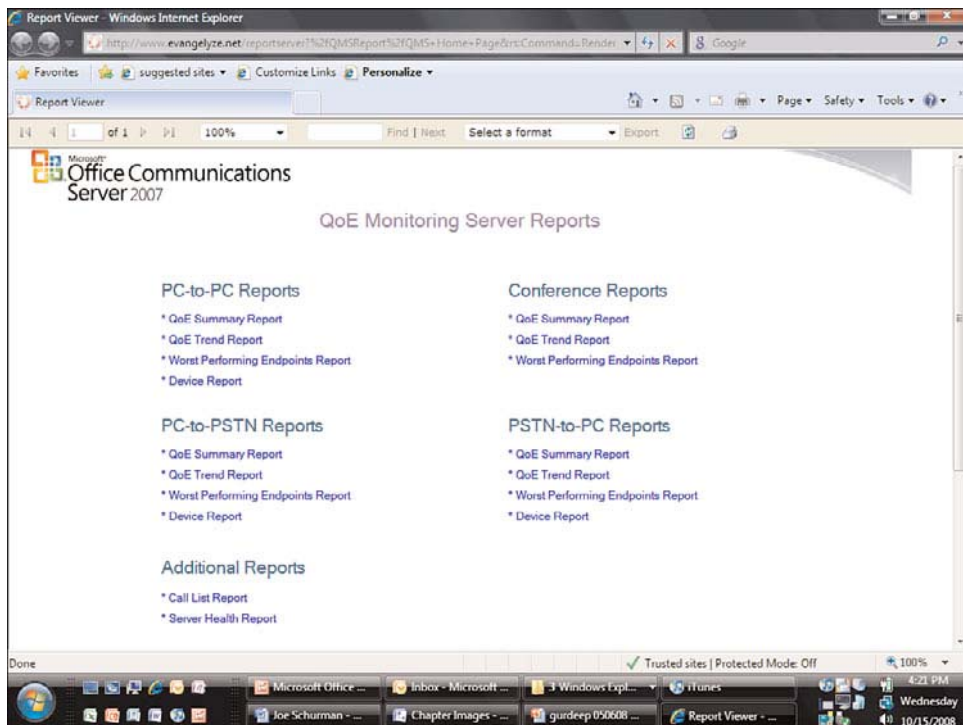
FIGURE 4.10 OCS QoE Server Reports

These QoE reports also help identify the soft and hard ROI of the implemented voice system by identifying the appropriate level of quality for an organization to tweak its infrastructure to enable the proper level of optimal performance. Figure 4.11 is an example of a QoE report provided by the QoE Monitoring Server that aids in this process and analysis.
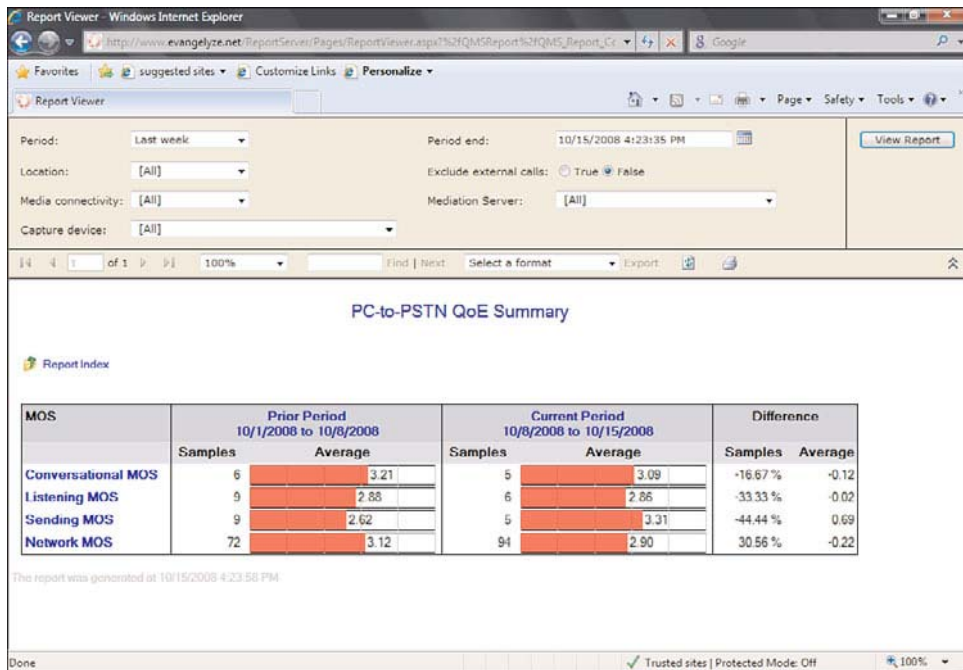
FIGURE 4.11 Sample QoE report

Office Communications Server Archiving Server

The OCS Archiving Server role provides the ability to record and archive conferencing and Instant Messaging sessions that take place within an OCS environment. There are three types of data you can archive within an OCS environment, including

- Call Detail Records (CDR)
- Instant Messages
- Live Meeting Conferencing Content

CDRs capture the history of voice calls that are made. These reports show the type of call made (PSTN, VoIP/SIP, internal) and show detail such as caller ID, account information for each user, duration of the call, and so on. The OCS Instant Messaging Archiving Service uses another

Windows-based technology called **Microsoft Message Queuing (MSMQ)**, which is a message delivery service that sends messages from the OCS front end servers to the archive server, which stores all the data transmitted during an IM session for internal and external IM sessions. Live Meeting conference archiving provides the capability to store the content, such as PowerPoint presentations, used during a Live Meeting session. Enabling these OCS recording and archiving services enables businesses to archive all their communications for the purposes of general retrieval and indexing for future research as well as for more tactical matters, such as compliance policies including, but not limited to, HIPPA, Sarbanes-Oxley, or other federal/governmental regulations.

Figure 4.12 depicts the OCS Archiving and CDR Server role configuration.
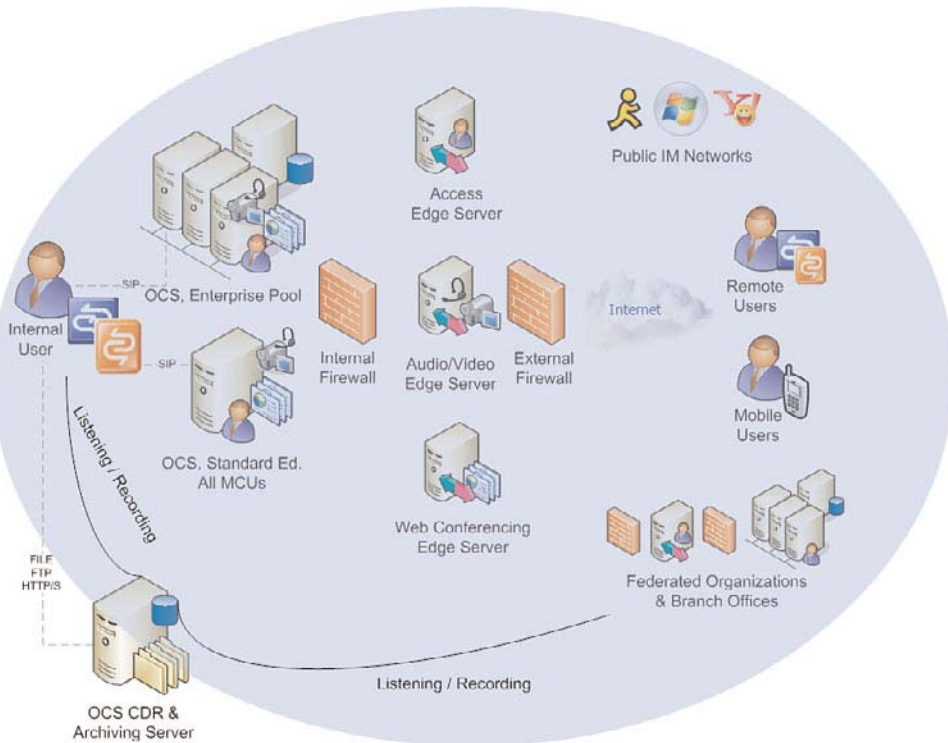
FIGURE 4.12 OCS CDR & Archiving Server

Another flexible feature of the optional archiving and recording services provided within OCS is the reporting capability. All the data collected and stored is deposited into what is becoming the most popular and most used database server in the industry—Microsoft SQL Server. Using Microsoft SQL Server as the database store for all this information enables developers to create customized reports to show how the Unified Communications environment is being used, what kind of communications are being transmitted, and the details of those communications. This data can also be used to provide estimates of usage of services that can be identified as costs that can be tracked to show the executives and business owners the true ROI of the UC environment. More detail about how Microsoft SQL Server is used as the OCS back-end server role is explained in the next section.

Office Communications Server Back-End Servers

As mentioned earlier, OCS uses Microsoft SQL Server as its back-end server role. The data stored in an OCS back-end server includes presence information, server configuration data, contact lists, block and allow settings, as well as archived information such as Instant Messaging sessions, Live Meeting conference recordings, and CDRs. The current version, OCS 2007 R2, requires that the OCS back-end server runs Microsoft SQL Server 2005 or 2008. If SQL Server is running on the same server as the OCS server, the platform support version must be 64-bit. Leveraging SQL Server database functionality enables high-performance features such as clustering and failover to provide a fast and scalable data network. Using SQL Server, you can also connect the data store to a Storage Area Network (SAN) system for even further storage capacity and record retention, which is common in most enterprises organizations.

To provide an example architecture of how Microsoft SQL Server would play a role in our fictitious Unified Communications environment, Figure 4.13 depicts the OCS back-end server role.
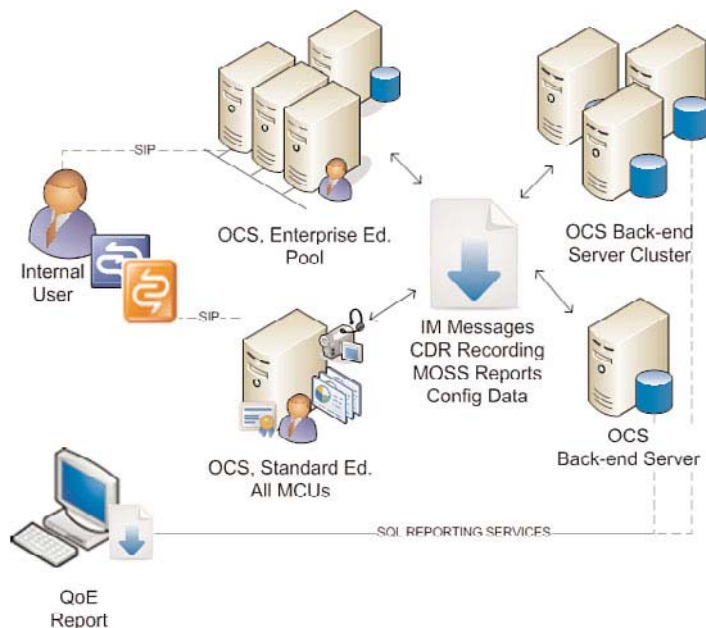
Figure 4.13 OCS back-end data services

This architecture approach uses SQL server to provide data storage for
the OCS servers as well as the OCS Archiving Service. The provided archi-
tecture also meets this enterprise organization's requirements for site
failover and scalability.

Office Communications Server Management Tools

Now you might ask, with all these different server roles that OCS enables,
how would an organization manage all these different server configurations
and settings? Great question. The answer is that you can't. Microsoft
decided it would be best for you to figure this out on your own or hire
resources to man each individual server for updates and configuration
changes. Just kidding! There are actually two practical ways to manage an
entire OCS environment using the following tools:

■ Microsoft OCS Management Console
■ Microsoft Systems Center

Without purchasing another Microsoft server product, the OCS Management Console that can run on a PC or can be opened from one of the OCS servers itself provides a management view of the entire OCS server environment and all its settings, minus the configuration settings of the OCS Edge Server. Because the OCS Access Edge Server does not live inside the internal network but is placed in a **Demilitarized Zone (DMZ)**, which is a network zone between the actual public Internet network and a company's internal network, a management console can be viewed from the servers individually using the Microsoft Windows Server management console (MMC).

Figure 4.14 is a screen shot of the OCS Management Console.
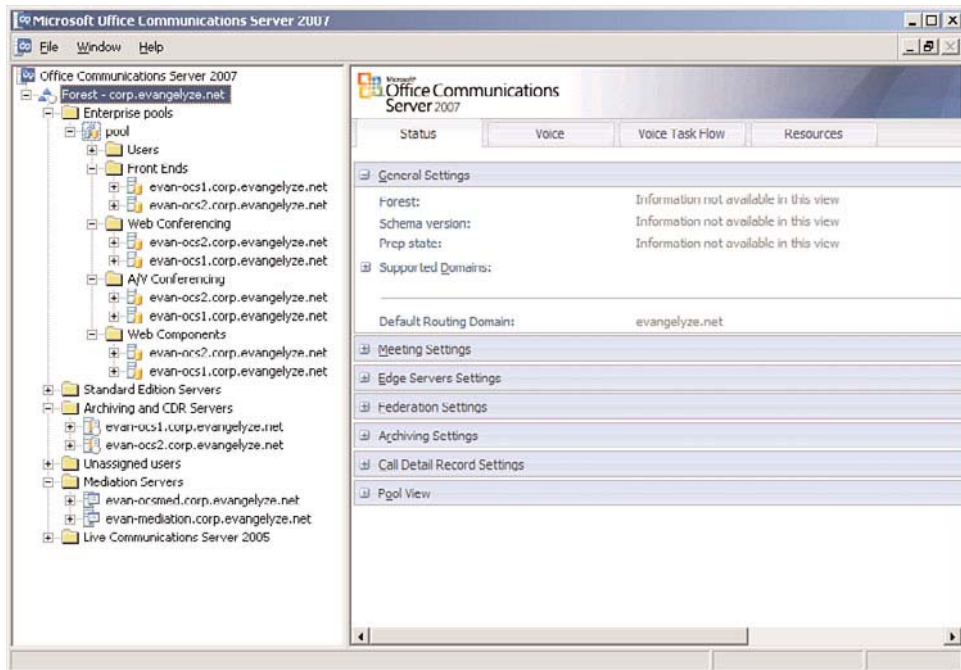
FIGURE 4.14 OCS Management Console

If you want a collective snapshot of the OCS environment, minus the OCS Access Edge Server, along with your other enterprise servers within the company network, including SQL Servers, Exchange Servers, and so on, you can use Microsoft Systems Center. This product is not part of the Unified Communications platform but is a great management tool to use within a Microsoft network.

Both solutions work well and provide the capability to edit and update configuration settings for your OCS servers, but Microsoft Systems Center is a great tool to use to manage and monitor your entire Microsoft Unified Communications platform.

In September 2008, Microsoft released a free management pack called the Microsoft Office Communications Server 2007 Management Pack for Operations Manager 2007, which can be downloaded, for free, via the Microsoft Downloads Web site at http://www.microsoft.com/downloads.

Microsoft Office Communicator

Now that we have provided insight into the OCS server environment, let's now take a look at what the end users of the system are enabled with! Microsoft Office Communicator is the client software used to connect to an OCS environment and is the feature-rich interface that enables users to leverage the following out-of-the-box highlighted features:

- Instant Messaging
- Presence of contacts to show their availability as well as enhanced presence showing a contact's status of being on the phone, in a conference, or in a meeting
- Search, which provides the ability to search contacts that are not in your contacts list, view their Presence availability, as well as contact details such as phone numbers, e-mail addresses, and other information
- Access to public IM networks (AOL, Yahoo, Windows Live/MSN)
- Peer-to-Peer audio and video sessions
- Voice calling features
- PBX Remote Call Control, which gives a user the ability to control his PBX desk phone from the Communicator application
- Dual-forking incoming calls to phones, PCs, and Communicator devices
- Conferencing access to Live Meeting
- Customized Presence (You customize your availability.)
- Recording of voice communications
- File transfer, which enables users to send files from one user to another internally and across firewalls
- Desktop sharing
- Multicontact audio and video conversations

■ Exchange distribution groups, which allow you to add company defined groups within Microsoft Exchange Server and Microsoft Active Directory to your contacts list as well as create on-the-fly meetings and conversations with an entire group at once.

The features listed previously are just a minor subset of the features available to end users through the Microsoft Office Communicator client application. For a full list of features, please visit http://www.microsoft.com/communicationsserver/en/us/capabilities.aspx. Office Communicator is available in four versions to extend functionality of the client application to the Web, phone, mobile device, PC, and even competitive Windows platforms such as the Mac OS X and BlackBerry devices.

Office Communicator (PC Edition)

The default PC client version of Office Communicator enables full voice, video, and data access from one console to provide end users all the communication features they need to Instant Message; view Presence of contacts; communicate with internal and external contacts; share video, audio, and data; as well as have access to conferencing and voicemail from one application (see Figure 4.15).
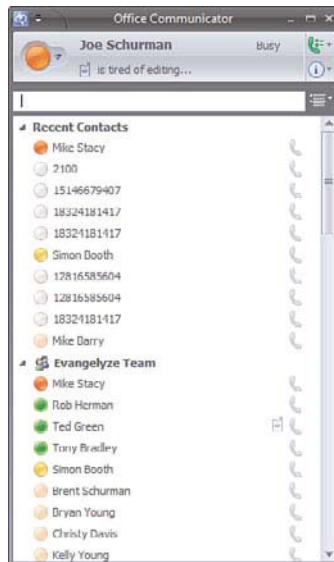
FIGURE 4.15 Office Communicator client running on a Windows Vista PC

Once you have Communicator locked and loaded, innovation is at your finger tips with the ability to Instant Message, start a voice call or an audio/video session, share your desktop, start a conference call, start a meeting, and much more as depicted in Figure 4.16 through Figure 4.23.
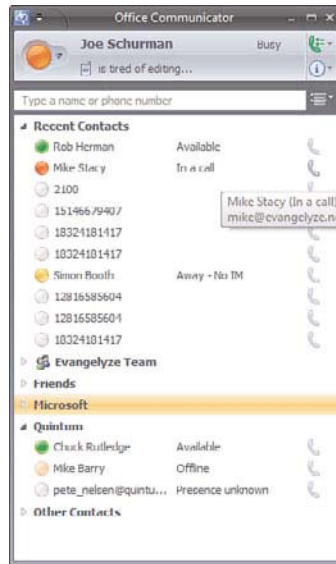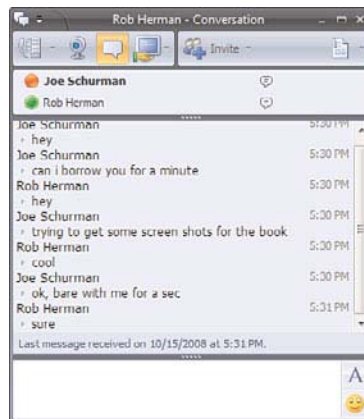

FIGURE 4.16 Presence and Out of Office
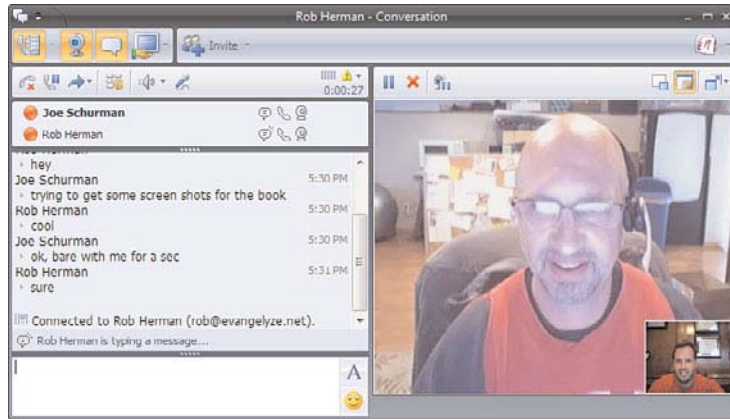

FIGURE 4.17 Instant Messaging

Figure 4.18 Audio/video session
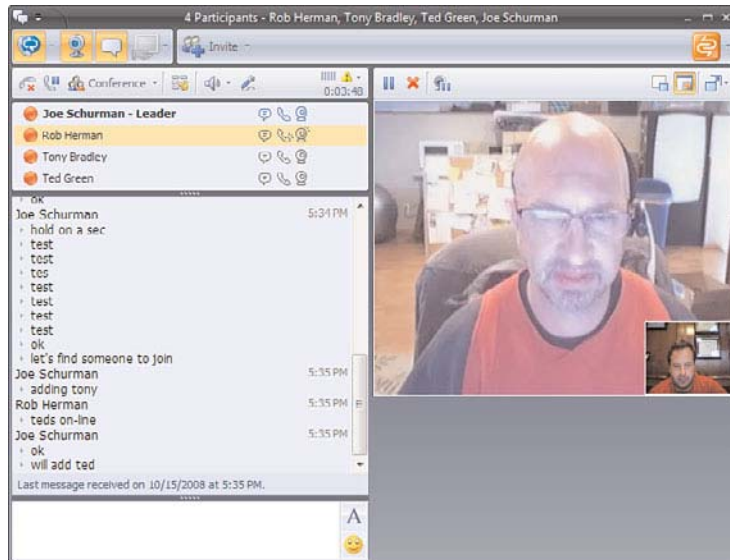
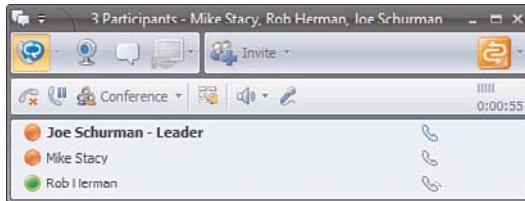**Figure 4.19** Multiparty IM and audio/video session

Figure 4.20 Voice call

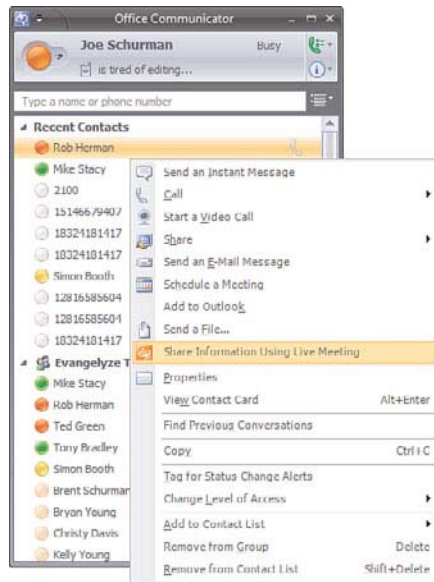**FIGURE 4.21** Conference call
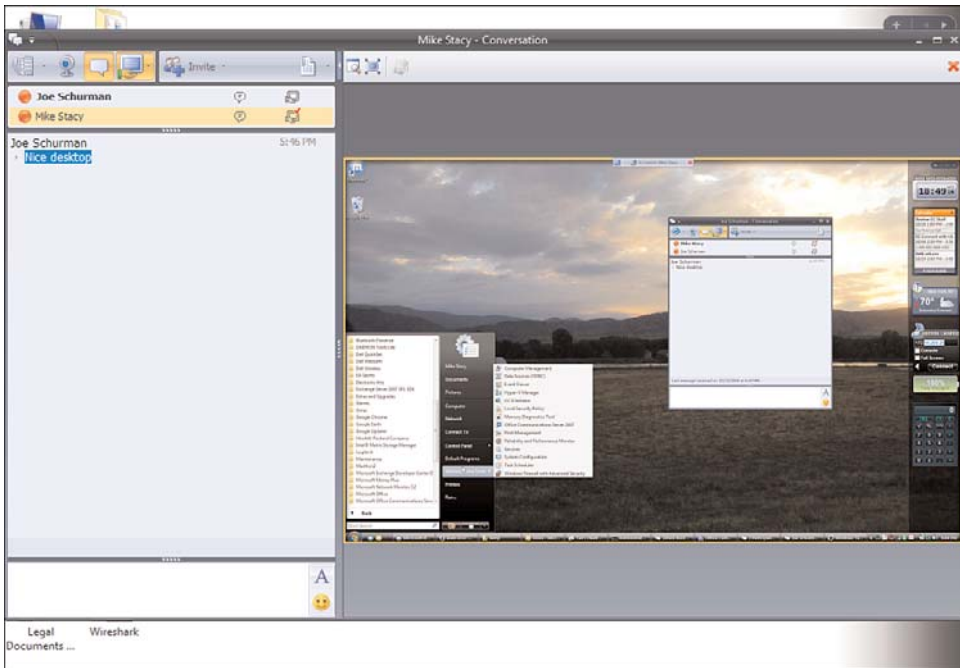
FIGURE 4.22 Desktop sharing

Figure 4.23 Starting a meeting

Office Communicator Attendant Console

The Communicator Attendant Console is the newest member to the Office Communicator client team, providing office secretaries or attendants with the ability to better manage incoming calls and conferences on behalf of their teams or executives through an intuitive software application that leverages Presence to show team and individual availability, enforcing the best means of contact for each.

Figure 4.24 shows a list of incoming calls and how an attendant would route these calls by dropping the incoming call to a specific person or team. The attendant can also apply notes based on speaking to the incoming caller and transferring the call along with the notes to the responsible party, providing additional intelligence to the communication.
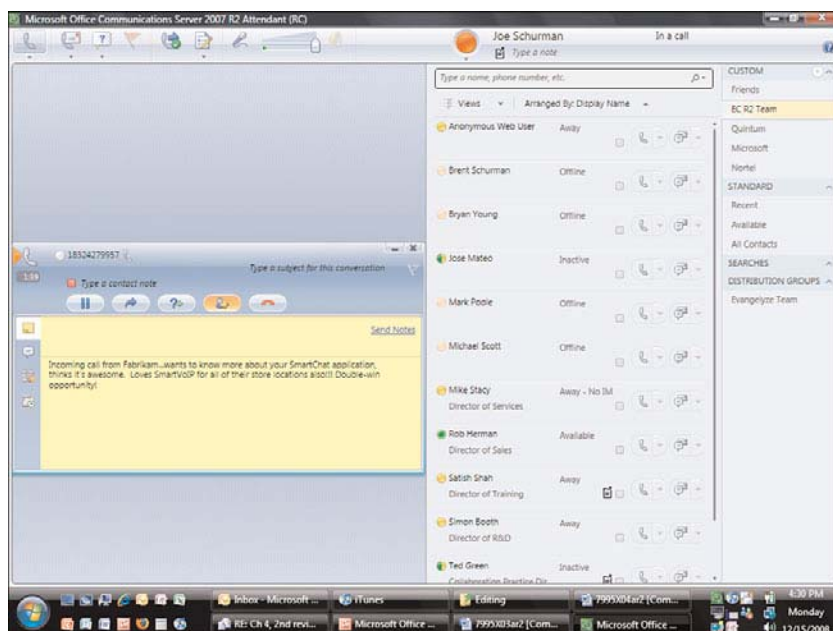
FIGURE 4.24 Communicator Attendant Console

Office Communicator Web Access

Communicator Web Access (CWA), as shown in Figure 4.25, is a lightweight Communicator client version that enables Instant Messaging and Presence functionality via the Internet and, with the R2 release of Microsoft OCS, the ability to provide voice dial-back functionality as well as the extension of tabs for further application integration! Now, with the ability to join conference calls (have the conferencing server dial you back at your preferred number), this Web-based application merely highlights the focus of the Microsoft Voice and Unified Communications vision of software-powered voice and hosted services. This solution is really great for users who cannot install Communicator on their desktop or those who need to access Communicator from another computer or Web console. CWA supports Internet Explorer, Firefox, Safari, and Opera, which are the most widely used Web browsers in the industry, and this also provides Communicator with interoperability with an organization's users who may be running Unix, Linux, or other nonsupported desktop or server operating systems.
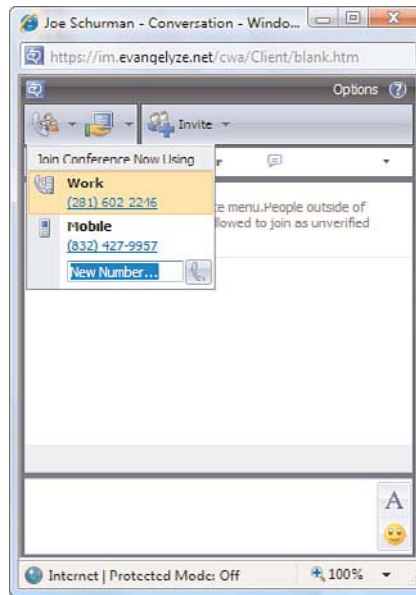
FIGURE 4.25 CWA client

Group Chat Client

The newly provided, and highly anticipated, Group Chat client now provides users with the ability to collaborate over topics that persist over time. Packed with chat rooms, archives, searching, and history discussions, the Group Chat client was a much awaited product from Microsoft within the unified communications platform. Through an acquisition of Parlano, a former Microsoft partner, Microsoft has further developed Parlano's previous group chat application and has made it a critical part of the Microsoft Unified Communications client product family.

As seen in Figure 4.26, the Group Chat application shows the ability to extend Presence through topic-based threads.
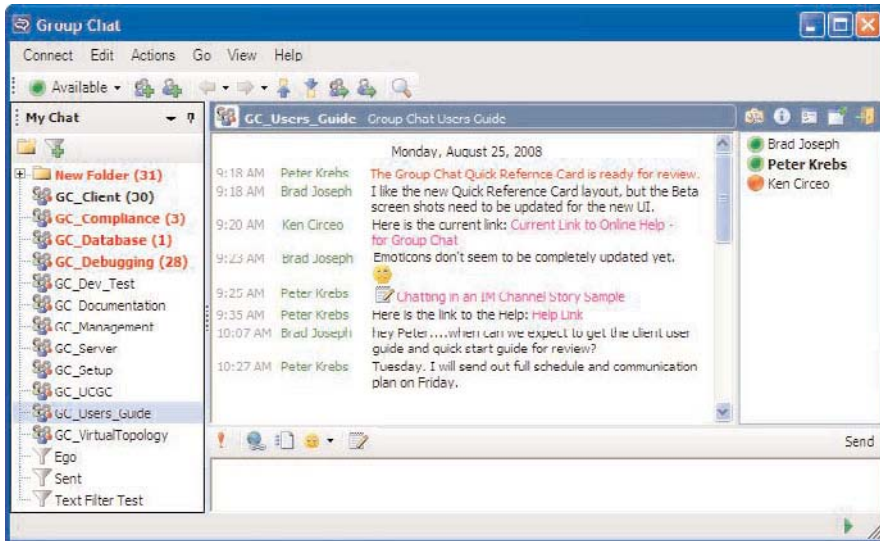
FIGURE 4.26 Group Chat

Office Communicator Mobile

Communicator Mobile, also known as **CoMo**, is an innovative mobile solution for Communicator that runs on both Microsoft Windows Mobile devices (as shown in Figure 4.27) as well as on competitive mobile devices such as the popular BlackBerry device, Nokia S40, and the Motorola RAZR, providing single-number reach to each device as well, making the cell phone an extension of the office phone. This client version of Office Communicator is similar to the CWA version in that it provides only Instant Messaging and Presence functionality on the device, but is great if you are a road warrior or simply want to be able to reach someone fast when you are on the run. One of the coolest features I have found in this version of Communicator is the ability to use the search feature to find contacts that are not in my contacts list to retrieve phone numbers, e-mail addresses, and other contact details. When I travel from one Microsoft office to another in countries all over the world, I meet with thousands of Microsoft employees and partners. I like knowing that if I need to meet someone at the office I am speaking at that day, I can easily find a local contact to either let me in the door or help me easily find resources at those specific facilities.
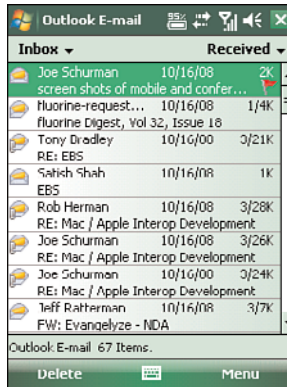
FIGURE 4.27 Office Communicator Mobile application running on a Windows Mobile device

Office Communicator Phone Edition

The Communicator Mobile client and the Communicator Phone Edition client are often mistaken for one another. Whereas the Communicator Mobile application version is specific to mobile devices, Microsoft partnered with several OEM vendors that have designed Communicator-specific phone devices that run a version of Communicator on the specific device. The first OEM device to market was the LG|Nortel IP8540 phone device, an actual phone that runs the Communicator client on the phone and has a bright screen that displays all your Communicator contacts with their Presence availability directly via the screen, which is also touch-enabled to allow users to call contacts directly via a push of the finger (see Figure 4.28).

Figure 4.28 Microsoft Office Communicator Phone Edition running on an LG|Nortel IP8540 device

Microsoft Messenger for Mac OS X

I have to be honest. The Mac Messenger 7.1 client, which enables Communicator functionality for the Mac OS X, is the coolest Communicator client out of the stack—even though it does not enable Remote Call Control for PBX integration or VoIP calling capability outside the OCS environment. This client alone allows me to integrate Presence within my Mac Book Air running the latest version of the Mac Office suite, with Mac Office 2008. The client is nicely developed as with all Mac OS X applications and really answers the question of Microsoft's ability to inter-operate with competitive platforms and applications. Integrated with Mac Entourage 2008, I can see the status availability of my corporate and personal contacts as well as participate in audio, video, and data sharing sessions internally and outside the corporate network. Many people say that Microsoft technology runs better on a Mac, and that is definitely the case in my experience. On top of these cool features, the client is absolutely free and downloadable via the Microsoft downloads Web site http://www.microsoft.com/downloads. Search for "Mac Messenger 7.1" and try it out for yourself.

Figure 4.29 through Figure 32 show the user interface for the Microsoft Messenger client for the Mac.

Figure 4.29 Microsoft Messenger for Mac OS X
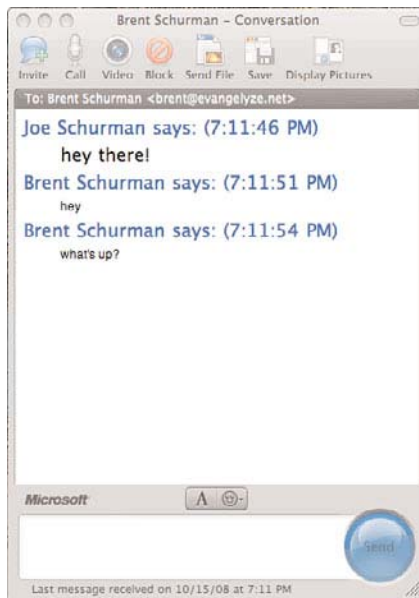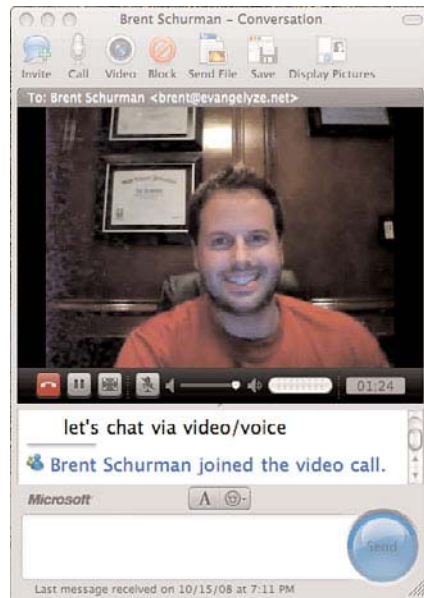
Figure 4.30 Instant Messaging session

FIGURE 4.31 Audio/video session

**FIGURE 4.32** Incoming call notification

Providing multiple versions of the Communicator client enables greater reach across different operating systems, Web applications, and devices to provide anywhere access to voice, video, and data, and truly provide a Unified Communications solution.

Microsoft Office Live Meeting

As mentioned earlier in the overview of the OCS Conferencing MCU, Microsoft Office Live Meeting is Microsoft's most innovative conferencing solution to date and slaughters the competition including Web-Ex, which has been the most popular Web conferencing application in the industry.

Adding to this innovative brilliance, Microsoft released a Microsoft hardware device in its release of the Microsoft Office RoundTable conferencing device. This device connects to a PC via a USB connection and serves as a video and voice device for the Live Meeting conference through either the hosted on-premise Conferencing MCU through OCS or through the Microsoft hosted-online Live Meeting Service. The device has a series of cameras and mirrors on the top part of the device that captures a video of each meeting participant around the device and then displays these participants in a panoramic view of the Live Meeting client application. If you need to join a team meeting remotely or if you are setting up RoundTable meetings from one site to another, you can see a panoramic view of everyone in the conference room as well as see the active speaker in the provided active speaker window with the shared data and presentations in the middle of the screen (see Figure 4.33).
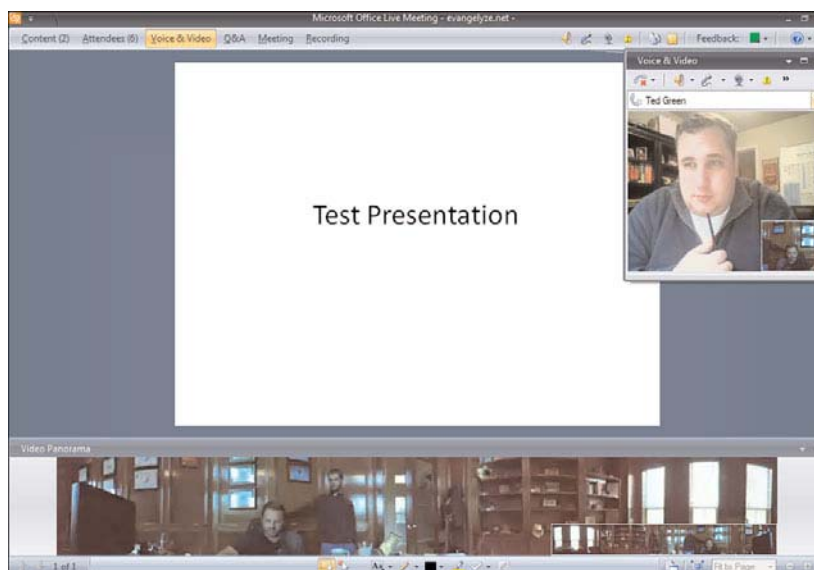
FIGURE 4.33 Live Meeting client showing participants and speaker

Live Meeting also enables cross-firewall connectivity so that you are able to host RoundTable sessions between partners, customers, and internal remote sites without any Web configuration needed. Talk about innovative, this is the future of real-time communication and lessens the burden of cost and time away from the office when you must travel. With energy costs rising and technology such as this available, there will not be as much of a need to attend meetings in person because you can see, communicate, and share documents and presentations as if you were sitting in a conference room or office location on-site.

Microsoft Exchange Server

Although not really a VoIP product, Microsoft Exchange Server is at the forefront of the Unified Communications platform in providing features such as enterprise mail, calendar, and contacts, but more importantly as it affects Unified Communications overall—Unified Messaging and Voice access to the Exchange Server. To be honest, my team on the Real Time

Collaboration (RTC) incubation team would have taken a different course within the large business group silos at Microsoft had it not been for the Exchange Server team's willingness to include us in their run for Unified Communications. Most of the marketing budget, development, integration, and sales revenue generation are funneled directly through the industry's most respected and market dominating e-mail server platform.

The following are features of Microsoft Exchange Server with its 2007 Service Pack 1 release:

- Enterprise E-mail
- Enterprise Calendar
- Enterprise Contacts
- Unified Messaging (voicemail/e-mail integration)
- Presence
- Click-to-Call
- Integration with Microsoft Office Live Meeting
- Integration with Microsoft Office Communicator
- 64-bit operating system support
- Windows Server 2008 and Hyper-V support

Unified Messaging

With the release of Microsoft Exchange Server 2007, Service Pack 1 (SP1), Exchange Server enables the capability to receive voice messages within your e-mail inbox similar to how we explained the features of Unified Messaging within Microsoft Response Point. Exchange Server provides more advanced Unified Messaging services than Response Point in that the server provides synchronization with the e-mail client to review played messages, communicating back to the voicemail system that the message has been reviewed. In Microsoft Response Point, you have to delete the message or review the message on your phone itself to update the system that the voicemail has been reviewed.

By configuring the Unified Messaging server role within Microsoft Exchange Server 2007, SP1, Exchange Server becomes the organization's voicemail server as well as an organization's enterprise e-mail and calendar server. Figure 4.34 depicts how a voice call and voicemail message are generated through a Microsoft Exchange Server Unified Messaging environment.
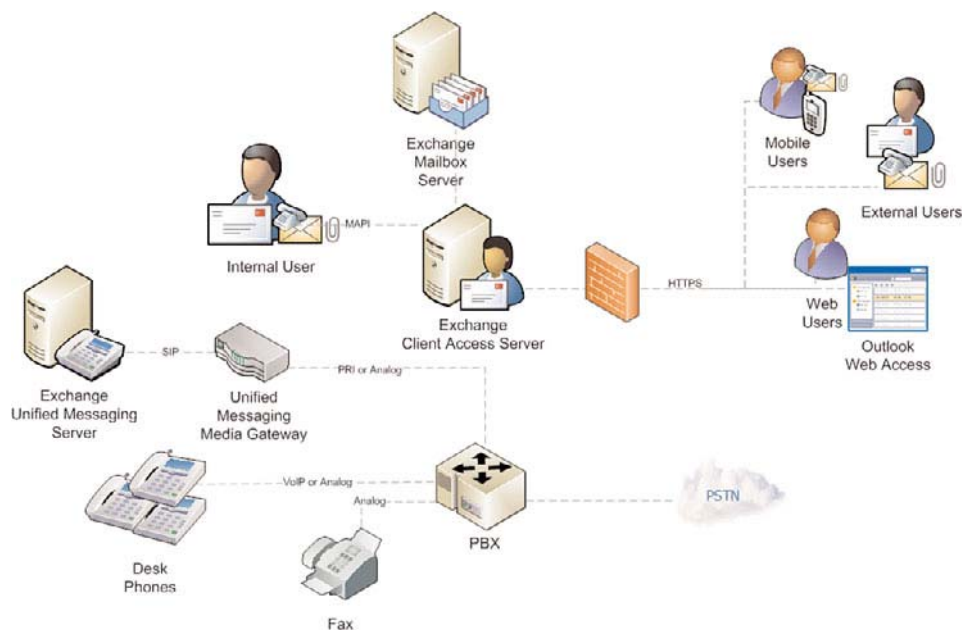
FIGURE 4.34 Microsoft Exchange Voice Architecture

Exchange Server provides a powerful voicemail platform in that if a voice message is left in your Exchange voicemail account, a message is generated from the Exchange Server to your client application via e-mail, whether you are using a mobile device, PC, or Web browser (see Figure 4.35). If you don't have access to a PC, you can call into your Exchange Server from your phone and have the server read out your messages and calendar events.

You can also check your voicemail and calendar via a Windows Mobile device, the ever-popular iPhone, and from a Web browser. Exchange Server's Outlook Web Access solution for the 2007 SP1 version allows you to review your voicemail from within Firefox, Safari, Internet Explorer, and even Opera and other supported browsers through Outlook Web Access, as shown in Figure 4.36.
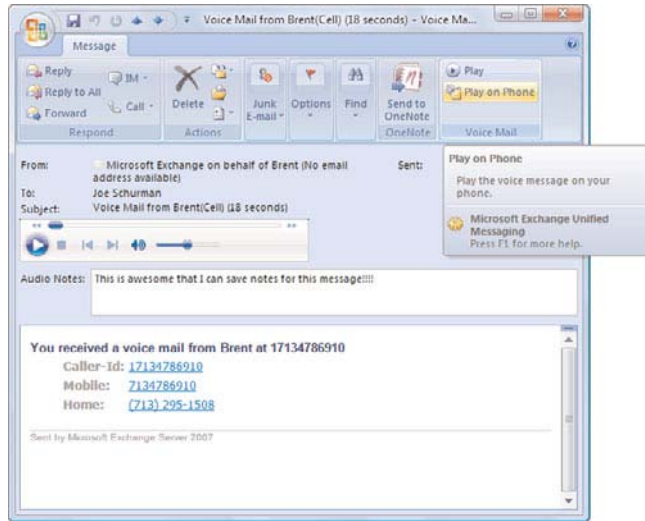
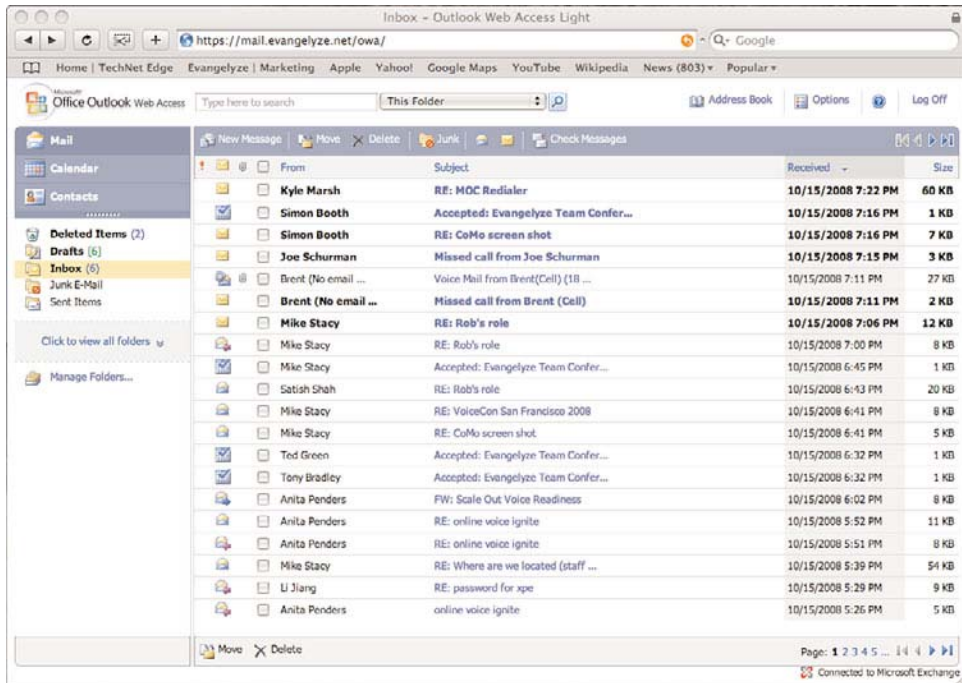**FIGURE 4.35** Microsoft Office Outlook 2007 voice and message

FIGURE 4.36 Outlook Web Access

Extending the reach even further, you can pick up the same voicemail message via e-mail on the iPhone, as shown in Figure 4.37.


FIGURE 4.37 Retrieve voicemail via e-mail on an iPhone

## Microsoft Office Live Meeting and Communicator Integration

With the Microsoft Office Live Meeting 2007 add-in toolbar, scheduling Web conferences from within Outlook 2007 is a breeze. Using the toolbar, you can create a Live Meeting hosted conference using the public Live Meeting service online, a hosted Live Meeting conference via the OCS, or a conference call using your conference bridge or using a Communicator call enabling a ton of flexibility for a business user (see Figure 4.38).

This capability of a one-click conference solution is a Web-Ex and competitive online Web conferencing killer. With this add-in toolbar to Live Meetings, a business user is enabled with a flexible conferencing solution with one-click access.
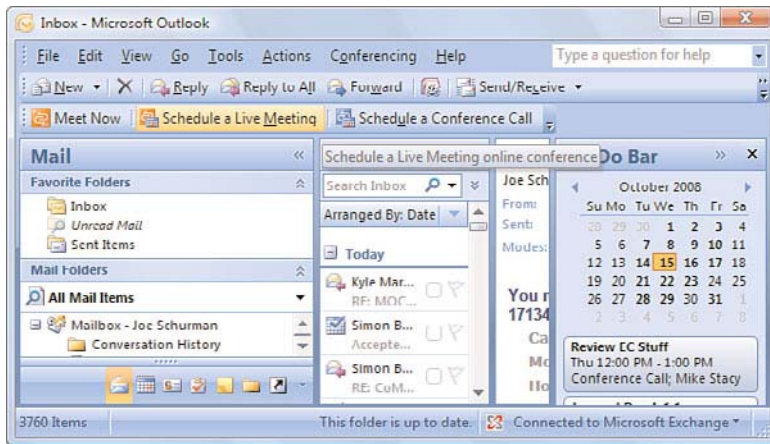
FIGURE 4.38 Microsoft Office Live Meeting toolbar within Microsoft Office Outlook

With the Office Communications Server 2007 R2 release, users now have the ability to leverage dial-in conferencing to host their own conference calls via the OCS conferencing server functionality, cutting costs dramatically. Through my organization, we obtained a Direct Inward Dialing (DID) number from our ITSP provider which we leveraged for outside callers to reach our OCS conferencing server remotely and applied the setting through the new menu provided within the Live Meeting setup console, as seen Figure 4.39.
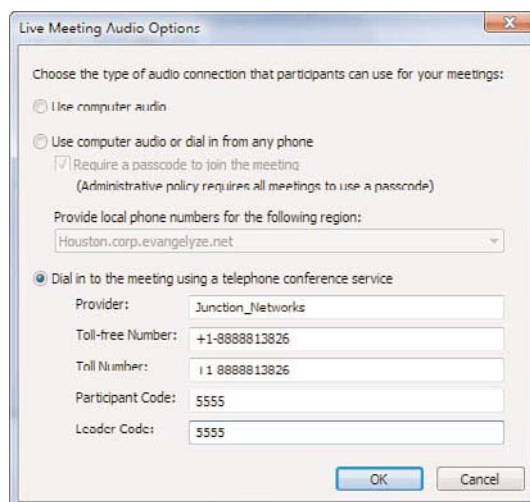
FIGURE 4.39 Dial-in conferencing settings within Live Meeting (hosted)

Calling Features within Outlook 2007

If someone told you a couple of years ago that you could use telephone functionality within Outlook, you would have looked at them funny. Oddly enough, there is a feature within Outlook that enables a user to dial out to a contact or connect to voicemail directly within the Outlook client that leverages the voice features of Communicator and OCS. Figure 4.40 is an example of how you can Click-to-Call a contact directly from within your Outlook inbox based on the recognition of a phone number by the client application itself.
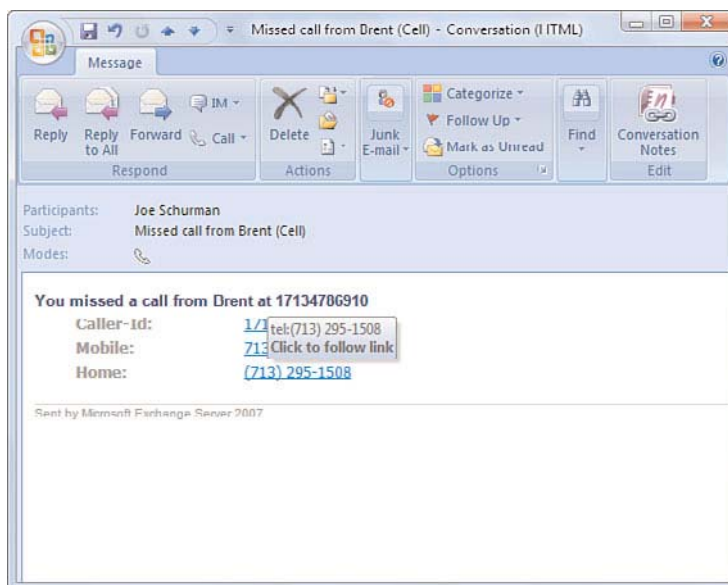
FIGURE 4.40 Microsoft Office Outlook Missed Call Notification

Microsoft Exchange Server Push E-mail for Outlook Mobile

One feature missing for years in the Exchange Server platform is the push e-mail feature provided by the BlackBerry Enterprise Server platform, giving BlackBerry devices the competitive edge over other e-mail devices in the industry. Push e-mail is nothing new to Microsoft as it has been in existence since the release of Microsoft Exchange Server 2003 SP2. This feature is a built-in service even today with Microsoft Exchange Server 2007

that provides instant e-mail transmittal to mobile devices and applications as soon as new mail is received. Goodbye, BlackBerry! No longer do enterprise organizations have to purchase additional server equipment and software licenses from RIM, the manufacturer of the BlackBerry devices and BlackBerry Enterprise Server, to enable instant e-mail delivery. A most notable recent release was the announcement of the Apple iPhone's support for Microsoft Exchange Server's push e-mail feature, giving the most innovative phone in history a corporate look and feel. I hope to see more of this innovation from a mobile perspective take place over the next few years, wiping RIM out of the market. For more detailed information about my views on this matter, feel free to read my *Pocket PC* magazine article of April 2006, titled, "BlackBerry vs. Windows Mobile, Battle for the Enterprise." It's about time these predictions came true!

Figure 4.41 depicts the user interface via Outlook Mobile for Windows Mobile devices.
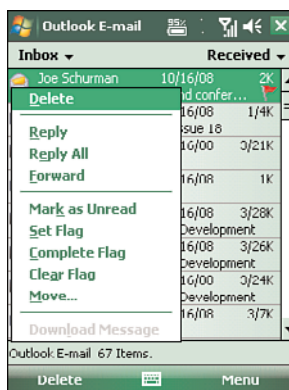

FIGURE 4.41 Microsoft Outlook Mobile for Windows Mobile

Microsoft Unified Communications Devices

I talk a lot about the power of virtual PBX systems and Softphone devices, but I will say, some of the devices that Microsoft and Microsoft's partners have produced as of late are just flat out cool. As mentioned earlier, Microsoft produced a beautiful conferencing device with the RoundTable, but Microsoft's OEM partners such as Nortel, Polycom, NEC, Jabra, Samsung, ViTELiX, and even some of the devices on the horizon that have

yet to be released are amazing. What's even cooler is that with the power of OCS, I can acquire any of these devices and sign into my account to leverage the VoIP features explained throughout this book. What's also cool (my son Davis loves this) is the ability to see all these devices ring at the same time when an incoming call comes through.

One of my favorite UC photos is the one of Gurdeep Singh Pall, whose commentary is included in this book, sitting at a desk full of these devices. I actually used the image shown in Figure 4.42 in an article I wrote for *Redmond* Magazine in the November 2007 issue.


FIGURE 4.42 Gurdeep Singh Pall, Microsoft Corporate VP, UC Group, with UC devices

To download your own images of these devices, visit http://www. microsoft.com/presspass/presskits/uc/gallery.mspx.

Microsoft Entourage 2008 for Mac OS X

Another brilliant move by Microsoft was providing Exchange Server access from a Mac OS X operating system. Through the Microsoft Mac Office 2008 platform, Microsoft Entourage provides the ability to connect to multiple Microsoft Exchange Servers, something that cannot be done within one Microsoft Office Outlook profile on the PC, and enables Presence, Unified Messaging access, as well as access to corporate contacts, distribution groups, and sharing of calendars (see Figure 4.43).
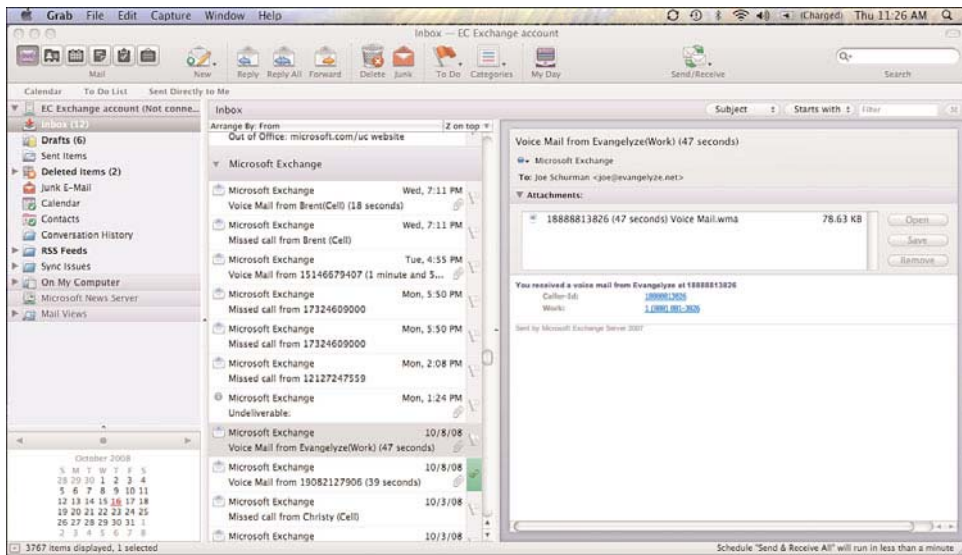
FIGURE 4.43 Microsoft Entourage client running on Mac OS X

What's even cooler, and the main reason why I provided an interview for the TechNet Edge team, is the fact that through Microsoft Entourage 2008 for the Mac, I can add multiple Microsoft Exchange Server accounts, which is something not currently possible with Microsoft Office Outlook. Taking this a step further, the calendar on the Mac can pull in my schedule from multiple accounts, synchronizing them all into one view! That's just brilliant! In addition to the Microsoft Office 2008 suite for the Mac, the Entourage client also comes with a handy tool called My Day, as shown in Figure 4.44. This application shows a review of my daily schedule combining multiple Microsoft Exchange Server calendars and my personal calendar.

FIGURE 4.44 My Day application on my MacBook Air

Microsoft Exchange E-mail for the Apple iPhone

Let me repeat that I used to be an Apple hater. I used Windows Mobile, I was a heavy Zune user, and "I am proud to be a PC." However, I decided to give the Apple iPhone a trial run, still keeping my Verizon Wireless Motorola Q Windows Mobile 6.0 device. The end result was that I liked the iPhone so much, I canceled my Verizon service and purchased iPhones for my entire family two days later. I still use a PC—I run Office on a PC and a Mac—but to be truly honest, the iPhone just completely slaughters Microsoft's integrated portable music and mobility platform. I even bit the bullet and repurchased all the same music I had on my Zune account via my new iTunes account, which was a major pain, but it is worth having everything in the palm of my hand.

Figure 4.45 shows the E-mail Account settings menu on the iPhone.

Figure 4.45 Exchange E-mail Account setup page via iPhone

More importantly Microsoft Exchange mobile e-mail on the iPhone is nice, clear, vibrant, and easy to read and respond to (see Figure 4.46). I also like the quick ability to respond, mark as unread, and other features that take a few more clicks on a Windows Mobile device. And a few more clicks for me is a no-go—that is my number one pet peeve. Additionally, the iPhone was the first to the market on mobile devices for threaded SMS text messaging, so when you don't want to use e-mail, you can easily text single or multiple contacts easily and review the thread later on.
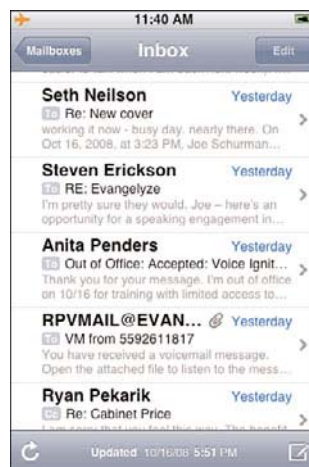
Figure 4.46 My sample Exchange push e-mail via the iPhone

The Microsoft Unified Communications Vision

The information contained in this chapter only outlines the products that are available today as part of the Microsoft Unified Communications platform. To truly understand where the future of the UC vision is taking place, you have to look at what is happening from a software and services perspective. In the future, nobody cares where the dial tone is coming from and end users will have an enormous selection of desktop and handheld devices to choose from. What sets UC manufacturers competing in this space apart? Software+Services. Through S+S, Microsoft is providing application developers with the tools that will enable them to develop voice-enabled Line of Business applications that will transform the way businesses operate by integrating voice and unified communications solutions into their business processes. In addition to this, Web services and hosted Unified Communications solutions will be available for organizations to outsource their communications infrastructure to key hosting providers as well as leverage Web services to connect to networks and markets they could not connect to before. This is the future of Unified Communications. This is the Communications Renaissance.

As mentioned before, I have been involved with the Microsoft Unified Communications business, marketing, product development, field services, and sales teams for the past eight years. But a turning point came when I watched Steve Ballmer, Microsoft CEO, step on stage in front of thousands of attendees at the Microsoft Worldwide Partner Conference in Houston, Texas, and state that UC is one of Microsoft's top four investments for the 2009 fiscal year. It was then, that the several hundred thousands of dollars that I invested to start an enterprise voice practice, the writing of this book and my previous books, and the time spent developing products and relationships over the past eight years really felt worthwhile. In that one second where Ballmer, nearly screaming with enthusiasm, stated this focus, I finally felt confident in the strategy my team and I bet on years ago. It is now, with the support of the Microsoft Unified Communications Group, its key partners, and the Microsoft field, that we can show the world this new transformation of voice communications through the power of software.