Chapter 1

Unified Communications from A to Z

In This Chapter

- Learning about the evolution of communications technology
- Merging communications methods
- Understanding the future of unified communications

One of the most important aspects of doing business is communication. ***Users*** need to communicate effectively with each other, whether it is

- A written memo
- A phone call
- An e-mail
- An instant message
- A text message on a mobile phone

Today's business has an arsenal of communications tools at its disposal. The problem is in using the communications tools efficiently and productively. Unified communications seeks to converge the various communications methods together to provide a seamless communications experience. With unified communications, co-workers can identify whether peers are busy or available and can choose to reach them by whichever method is most convenient or best suited for the moment. Unified communications represents a strategic advantage for those organizations that understand and leverage its potential before their competitors.

Evolving From Voice to VoIP

The voice network that we have today is quickly evolving and bears less resemblance with each passing day to what Alexander Graham Bell envisioned

in 1876. The world has grown up and we need a communications system that can keep pace with the 21st century.

PSTN

A network of wires has grown around the world to enable parties from Albuquerque to Zimbabwe to simply pick up a phone and dial a number in order to communicate. This network is the PSTN (Public Switched Telephone Network).You can easily place a call to anyone, anywhere with a standard phone.

PBX

Traditional business telephone systems use a PBX (Private Branch Exchange). The PBX manages calls within the business and connects business calls to the PSTN if necessary.

One of the primary advantages of a PBX was cost. If each employee phone within an organization were connected to the PSTN, then an internal call from one employee to another would have connection charges from the service provider. By managing inter-company calls internally, the organization avoided paying a provider to connect those calls.

The PBX connects to the PSTN through a *trunk* (see Figure 1-1) to enable inbound and outbound calls with the public phone system.

A PBX trunk isn't like an elephant trunk or a storage trunk. In voice communications terms, a trunk is a connection between two switched networks. A business PBX is typically connected to the PSTN using one or more trunks.

PBXs provide a range of functions for voice communications such as:

- Hunt groups
- Account code dialing
- Call forwarding
- Call transfer
- Call park
- Three-way calling

These are just a few of the more common PBX features. The PBX is the hub of voice communications for most businesses and provides a vast array of options for managing voice calls.

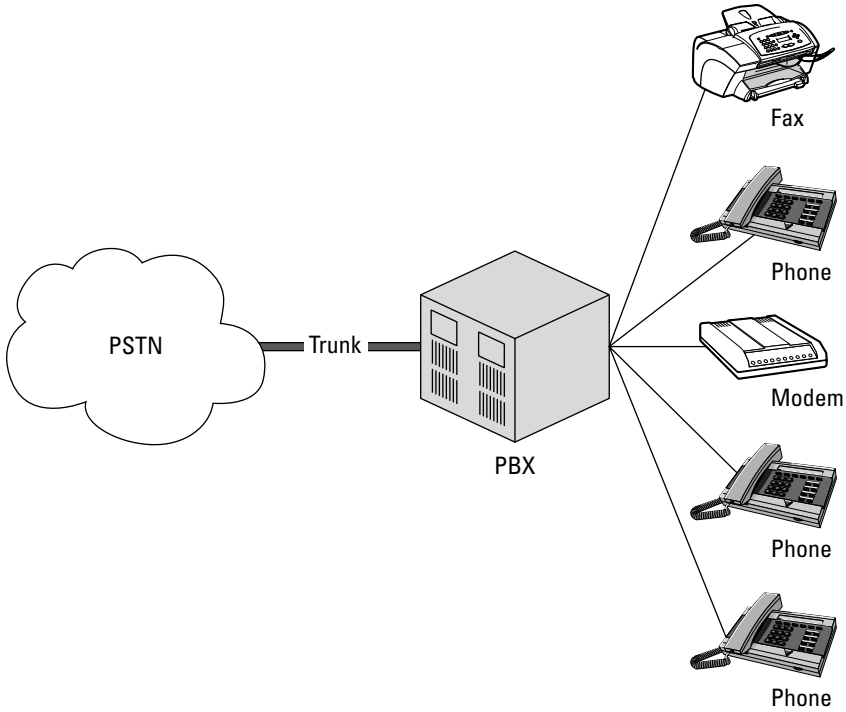

Figure 1-1: A PBX connects to the PSTN and provides communications switching and functionality for internal devices.

These functions help businesses communicate more effectively. For example, a phone number dedicated to customer sales can be set up on a hunt group that will ring all the extensions in the sales department to ensure that someone gets the call and that a potential sale isn't lost.

The Internet

In the early 1990s, a new era of communications was introduced with the advent of the Internet. Although the personal computer had been around for nearly 20 years, suddenly people and businesses could connect their PCs to the global network that we call the Internet and interact and communicate with each other.

Ironically, early connections from the PC to the Internet usually were over the PSTN:

- A modem converted the digital computer data into analog signals for transmission over the copper phone lines.
- Modem is short for *modulator–demodulator.* It's a device that facilitates the conversion of digital data to analog signals and from analog signals to digital data.

At the other end, another modem converted the analog signals back into digital data that the receiving computer could understand. With communications of all sorts moving from analog to digital, and with businesses already investing in switch and router technology, it didn't take long for the data and telephone engineers of the world to see that the packet-switching network could transmit voice data. Using the same infrastructure as the data network offered some significant savings, and the global interconnectivity of the Internet meant that voice communications could be less expensive as well.

The move of voice communications onto the data network became known as Voice over Internet Protocol (VoIP) because voice was now being transmitted over the IP (Internet Protocol) network. The transition from traditional PBX to IP PBX and from PSTN telephony to Internet telephony marked the beginning of the unified communications evolution.

Converging Communications

Unified communications is about more than voice. The road to unified communications is paved with more than the migration of traditional phone communications onto the IP network. New kinds of communications use the new technology.

You've got mail!

E-mail quickly emerged as one of the primary methods of communication for businesses and individuals alike. It surpasses voice communications for many organizations. One of the factors that made e-mail compelling when it was introduced is that it enabled users to communicate on their own terms. Traditional voice communication, commonly referred to as "phone calls," had a couple of significant drawbacks in the efficiency department:

- Phone calls are often an ineffective use of time:
  - The caller may waste time calling multiple numbers trying to track down a person and each failed attempt to contact the individual is simply more wasted time.
  - Answering a phone call is generally an interruption of something else.
- Phone calls are typically one-on-one conversations. If the same information needs to be conveyed to a whole team, the caller would need to either
  - Place multiple calls to repeat the same message
  - Set up a conference call

E-mail overcomes these shortcomings of voice calls:

- Senders can compose and send the message when it fits their schedule.
- Recipients can read and respond to e-mail when it fits their schedule.
- E-mail can be directed to many e-mail addresses at the same time.

E-mail has a couple of other benefits that aren't possible with traditional voice calls:

- It's an automatic written record of the conversation.
- E-mail can contain more than the message itself:
  - Hyperlinks can access documents on the World Wide Web.
  - File attachments can share documents, spreadsheets, and other data.

Communication at the speed of light

Although e-mail is delivered almost instantly around the world, you can't be sure that the recipient will actually download it or even read it. Actually, delivery and read receipts can be requested within most e-mail systems, but the recipient has the option of not responding to those requests so the absence of a receipt doesn't necessarily mean that the message wasn't received or read.

What's a person to do when he wants to communicate with someone in writing, and e-mail simply isn't fast enough? Use instant messaging. Instant messaging, or *chatting*, is a real-time conversation between two or more parties via the Internet. It's almost like a hybrid solution between voice and e-mail in that it offers the immediacy of a phone call with the written record and retention of an e-mail. Corporations didn't immediately jump on the instant messaging bandwagon. Consumers were the first to see the value of instant messaging and corporations joined the party later, in many cases reluctantly, as a result of demand from users. Users started off using services such as AOL Instant Messenger and ICQ (Figure 1-2) at home and then installed the applications on their work computers so they could still keep in touch during the workday.

Figure 1-2: Instant messaging programs like ICQ became popular with home users then migrated to the workplace.

Instant messaging also offered a couple of other new advantages to the communications mix:

- The instant messaging software lets users see which of their contacts are currently online. Obviously, if a contact isn't online, there is no way to have an instant messaging conversation with that person. This rudimentary capability to determine the status of a given contact forms the basis of *presence* which is a key component of unified communications. Presence is discussed in more depth in Chapter 2.
- Instant messaging allows for more efficient multitasking. A user can simultaneously participate in a voice call and instant messages. Multiple simultaneous voice conversations aren't practical.

The call heard around the world

VoIP allowed a new twist on traditional handset-to-handset phone calls. Because a voice call on VoIP is nothing more than data packets traveling on the same IP-based network as all the other data, the computer itself can be used as the phone.

As long as there is a microphone to speak into and speakers to hear from, the computer itself can be the phone. The capability to make and receive calls can be incorporated into virtually any software.

One of the first places that this functionality began to appear was within the instant messaging clients. From the instant messaging software, users could click to open a text chat window or click to initiate a voice call. Aside from the novelty of using the computer for voice calls, this solution also offered the advantage that users could connect with and talk to people around the world without incurring any toll call charges. The voice call was just more data traveling around the Internet.

Tying voice calls into software provides other benefits as well, such as the capability to either

- Call someone by simply clicking a name in a contact list.
- Look up a phone number on the Internet and place a call by clicking the number.

Can you see me now?

If you add a camera of some sort, the computer can then connect you to your contacts via video for a virtual "face-to-face" chat (Figure 1-3).

For home users, video conferencing may be a novelty. It's nice to see family and friends who live across the country or around the world. Video calls can let grandparents watch as Junior opens the Nintendo Wii for his birthday, or let parents who have to travel on business see their children rather than just talking to them on the phone.

For businesses, however, video conferencing provides a variety of benefits, including the potential to save significant time and money. Companies spend huge sums of money to send people around the world to various meetings. They might be

- Internal corporate meetings
- Sales meetings with prospective customers
- Meetings with partners to discuss marketing strategy

Rather than spending for airfare, hotel lodging, rental car, and dining and other incidental expenses, on top of the lost productivity of the travel time itself, video conferencing can achieve the same sort of synergistic interaction for a fraction of the cost.

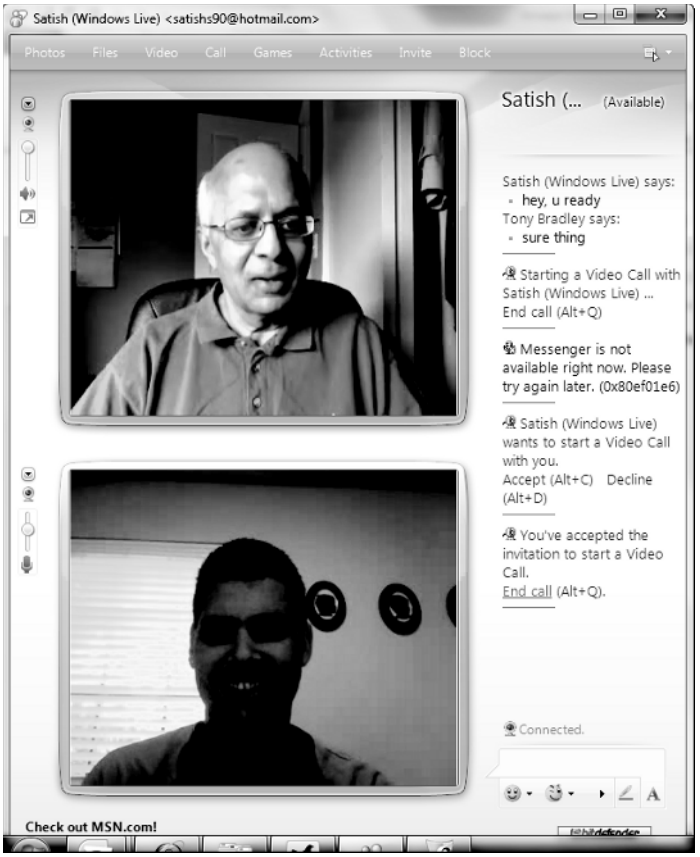

Figure 1-3: A video chat session using the Windows Live Messenger client software.

Future of Unified Communications

Even though there is confusion in the marketplace about which unified communications components make the most sense for a particular business, this book attempts to reduce that confusion. Presenting a clear business case for unified communications is easier said than done. Even though uniform standards may be lacking, the vendors have adopted Session Initiation Protocol (SIP) for components to converge and create unified communications. There is still a need for these components from various vendors to co-exist and integrate smoothly in the existing environment. Businesses will still need to define a clear ROI (return on investment) from unified communications to justify their investments.

Even with all these factors, the unified communications market continues to grow and play a defining role for many organizations' IT strategy. A 2008 report from UC Strategies claims that the unified communications market in 2007 was only about $200 million, but also predicted that the segment would grow about 1,200 percent to more than $2.4 billion by 2012.

All hardware and software vendors are vying for a piece of that $2.4-billion market. Major vendors such as Microsoft and Cisco have promising platforms that have begun the convergence to where a business can form a strategy of co-existence. It's true that none of the vendors' solutions alone may provide you all the unified communications components.

To provide a complete unified communications solution, organizations must combine VoIP infrastructure and unified communications components from various hardware and software vendors. A key issue for enterprises with an existing Microsoft infrastructure will be determining which options can integrate smoothly and enhance or extend functionality instead of creating headaches. Organizations must also consider how the combined solution will be maintained and scaled to meet future needs. I have attempted to provide solutions and alternative options so that you may choose to achieve the best results for your organization.