The Changing Landscape of Business Communications

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Summary

As recently as the 1970s, business communications could be summarized in one word: the telephone. Ma Bell supplied a circuit switched network that connected us to the world.

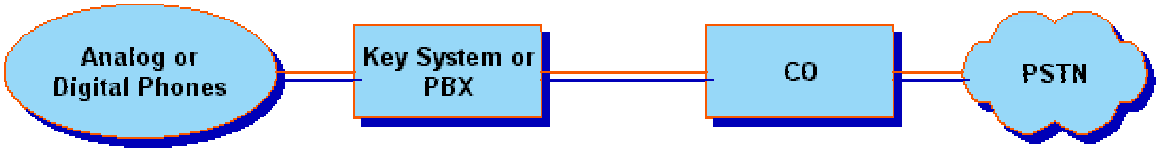
Today, there are e-mails and instant messages, audio conferences and chat sessions. People work from their offices, but also from home and the road. Multiple networks have replaced the single network. Managing business communications is more complex, and the risk of technological obsolescence has increased significantly.

Most observers agree that the future of business communications lies in packet-based technology, which allows voice, data, and video to travel over a single connection. There are issues to resolve, but this approach simplifies management and reduces costs, and also provides a flexible platform that enables future communications needs to be met quickly and inexpensively.

As this trend, know as "convergence," becomes more common, business communications will be back where it began: a single network will handle all forms of communication.

The Age of the Single Network

Since the 1970s, business communications has relied on circuit switching, through what is known as the Public Switched Telephone Network (PSTN). Whether the phones were analog or digital, the PSTN connection was supplied by a single provider - the telephone company.



The 1970s were the years of analog telephony. Communication consisted of telephones that were connected by a twisted pair of wires to a key system or PBX. These systems were connected over trunks to a Central Office (CO) switch and then to the larger PSTN. Although voice quality was not the best, it made use of the technology available at the time.

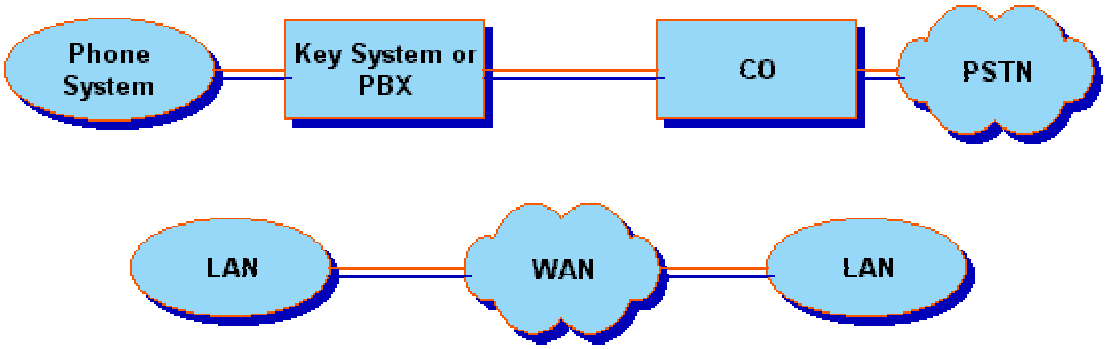
Digital phone systems appeared in the early 1980s. These systems enabled significant improvements in voice quality and telephone functionality, but did not change the fundamental structure of business communications. The single network – the PSTN – still dominated.

The Age of Multiple Networks

Personal computers started to appear on office desktops in 1984. The PC led to greater productivity, but it was a stand-alone device that did not communicate.

As PCs proliferated, the idea of connecting them together gained momentum, resulting in the Ethernet. By 1990, most PCs "sat" on a network that was completely different from the voice network: the Local Area Network, or LAN.

Soon, Wide Area Networks, or WANs, connected the LANs in multiple office situations. The age of multiple networks had begun.

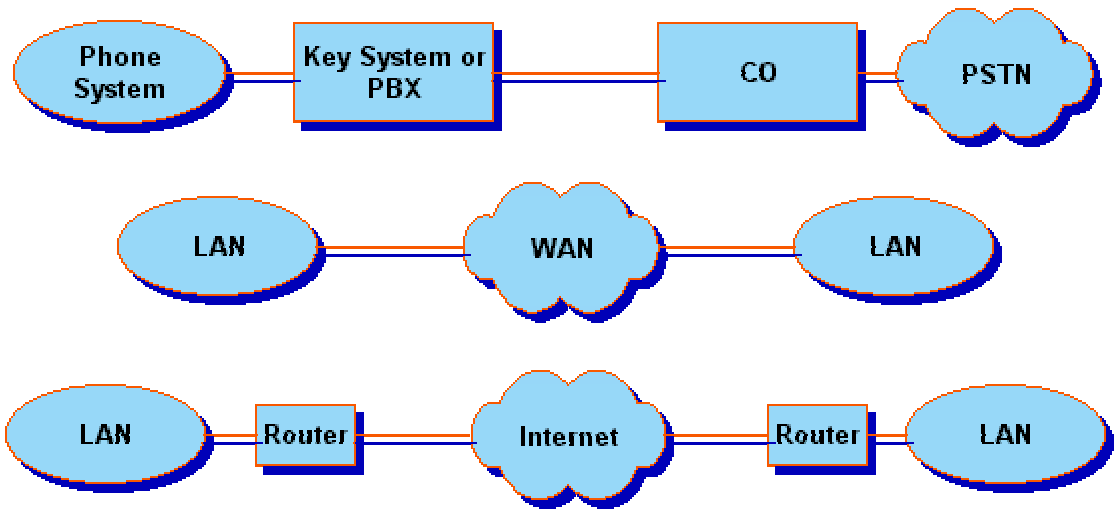


The Internet

Nothing really shook the world of business communications for a few years after the LAN and WAN. There was voice mail and paging, but it was not until 1996 that that the Internet brought such indispensable tools as e-mail, instant messaging and chat to the desktop. A new form of telecommunications provider - the Internet Service Provider, or ISP – also arose.

Now there were as many as four networks to manage:

- Circuit-switched (PSTN) network for voice
- LAN
- WAN
- Internet



The Beginning of Convergence

Installing and maintaining separate networks is not cost-effective. These systems involve a great deal of redundancy because they require:

- Two devices on the desktop - a PC and a telephone
- Two infrastructures
- Two or more sets of hardware
- Two or more sets of lines to the outside world
- Two or more network services providers
- Two sets of staff – one for voice and the other for data.

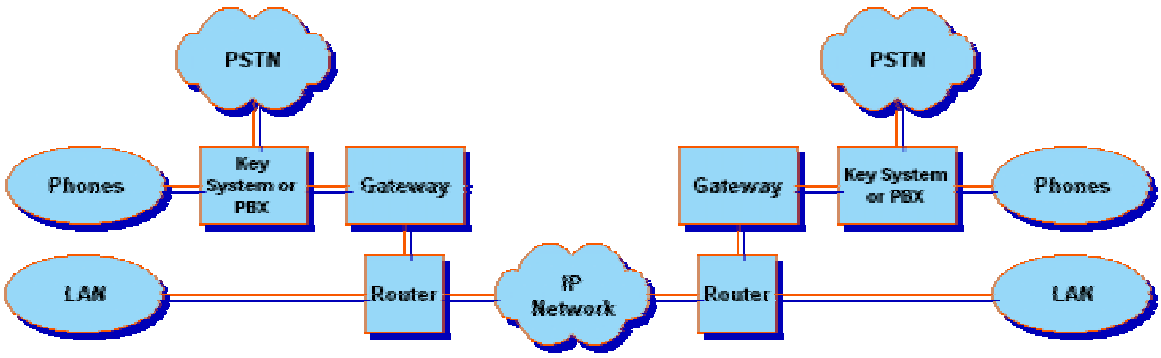
Multiple networks make managing business communications far more complex than it ought to be.

So in the late 1990s, and in response to the problems created by multiple networks, the idea of routing voice and data over a single network began to gain momentum.

1997 – Voice over Internet Protocol (VoIP) Gateways

VoIP technology was introduced in 1997 and began the move toward converging the separate worlds of voice and data communications.

The first enterprise-ready VoIP solution was the VoIP gateway. VoIP gateways are computers or other devices that turn voice signals into packets, which are sent over an IP network. Gateways have T1 or ISDN interfaces to the PSTN (usually via the key system or PBX) and an Ethernet interface on the IP side.



Gateways enable companies and organizations to cut long distance calling costs. And even to avoid long distance tolls entirely: in a toll bypass solution, calls between offices are routed as VoIP calls to eliminate completely the involvement of the regular telephone system.

VoIP gateways have the additional advantage that they do not require that "legacy" key systems or PBX equipment be replaced. However, this is a two-edged sword: key systems and PBXs can be costly to maintain and upgrade, and they cannot provide the features that a complete IP voice solution can offer. Also, as the drawing above indicates, this approach still depends on the PSTN, if only for local calling.

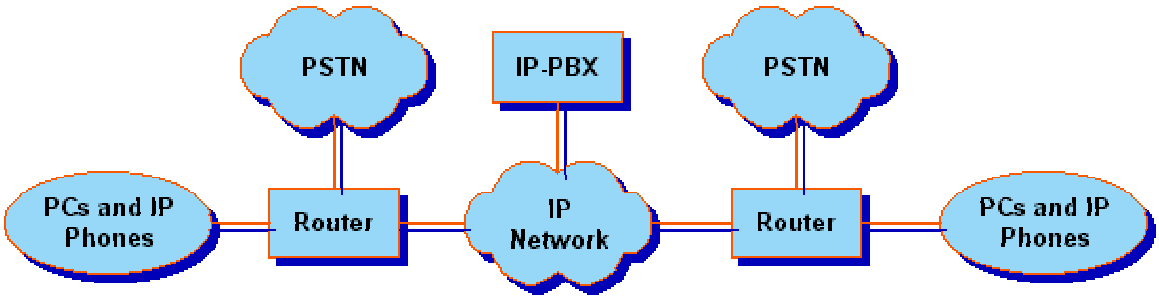
1998-1999: The IP Telephone and IP PBX

IP telephones, which began to appear in 1998, take it all a step further. IP telephones look like and function identically to digital telephones, except that the voice signals are turned into packets by the telephone (rather than the VoIP gateway) and sent to the LAN over a built-in Ethernet connection.

An IP Phone from Cisco Systems

In 1999, various vendors introduced IP PBX solutions. This solution further simplifies business communications and provides the platform necessary for a truly converged communications solution.

Now, companies and organizations no longer need multiple separate network infrastructures – one network with one set of equipment can do it all. For the first time since the 1980s, the amount of equipment needed to provide business communications could actually be reduced.



An IP telephone/IP PBX solution brings other benefits as well. The technology reduces the costs of moves, adds and changes; provides support for telecommuters, and enables seamless dialing between offices in a multiple office environment.

"SoftPhone" from Cisco Systems supports telecommuters

Also, PCs and telephones connect directly to a single infrastructure, the LAN, and the LAN connects to the local environment via a single packet connection (T1, DSL, wireless, CATV, etc.). The elements needed for convergence in business communications are now in place.

Barriers to Convergence

What stands in the way of this new world of business communications?

Not technology: The technology required to make converged networks a reality exists and has been proven in production environments.

The most important barrier is the ubiquity of the PSTN. In theory, the traditional telephone system is obsolete – IP can perform all of its functions and indeed, many more. However, IP networks do not have the same universality as the PSTN. Until they do, there will continue to be a need to connect the IP voice system to the PSTN, at least for local calls.

Another barrier is IP voice quality and reliability. For the most part, this concern is due to the fact that convergence has come to be equated with the public Internet. For all of its benefits, the public Internet is simply not yet ready for real

time. However, a great deal can be done today to make VoIP quality equal the traditional phone system.

2000 and Beyond: Converged Networks

All voice, video and data traffic will one day travel along with other forms of data on IP networks. No one knows exactly when this will occur, but it is a reality that is not disputed even by converged networking's most pessimistic detractors.

One day, the LAN will have devices that will enable all forms of communication, whether wireless or wireline. From a networking perspective, the line between voice and data will be blurred and even obliterated.

The idea of convergence is powerful, beautiful and elegant. It has captured the imagination of such visionaries as George Gilder, who speaks poetically about it in his best selling book Telecosm: "When anyone can transmit any amount of information, any picture, any experience at any time, instantaneously without barriers of convenience or cost, the resulting transformation becomes a transfiguration."

Once convergence is a reality, business communications will have returned to where it began: a single connection will meet all of a company or organization's communications needs.

About Appia Communications

Our mission is to bring the power of Internet Protocol technologies to bear on the problems that the people who are in charge of telecommunications face very day in their companies and organizations. Our inTrex products are designed to help our customers minimize their upfront investments and ongoing operating costs, regardless of where they are on the convergence "path." For more information about Appia and inTrex, see www.appiacomm.com.