



Defining the Space: VoIP, IP Telephony and Convergence

White Paper

March, 2003



Table of Contents:

Section 1: Introduction

Section 2: In Brief

Section 3: VoIP

Section 4: IP Telephony

Section 5: Voice and Data Convergence

Section 6: Summary



Section 1: Introduction

Accompanying any new technology is a litany of terminology and labels. Where the subject matter deals with a convergence of technologies and applications, it is even easier for the terminology to become blurred by common and misdirected use.

The purpose of this document is to align on common definitions and clarify the differences between *Voice over Internet Protocol (VoIP)*, *IP Telephony* and *Voice and Data Convergence*.

Section 2: In Brief

VoIP is the basic *transport* of voice in a packet form on an IP-based data network. It is the transmission of telephony over a data network and offers little in the way of features and functionality.

IP Telephony uses VoIP but is a *software application suite* offering rich feature applications. These modular applications lend themselves to cost-effective integration with other applications that share the IP network.

Voice and Data Convergence is the integration of voice and data communications applications with key business applications. The business applications are usually tied to business processes, which are central to an organization's operations. Ultimately this will be over any network and any device.

Section 3: VoIP

The basic principle of VoIP, which is to take a voice conversation and transport it over a computer network using the Internet Protocol (IP), is employed in both IP telephony and convergence. It involves taking a telephone call and breaking it down into discrete digital packets, which are then routed over the IP network. The primary benefit is cost savings through avoiding long distance and international toll charges. In addition, by routing calls between locations on the IP network, IT or telecom managers are able to reduce the number of dedicated leased-lines and enjoy the administrative and cost advantages of operating a single unified network rather than separate networks for voice and data traffic.

The difference between VoIP and IP telephony – VoIP is associated with the basic transport or transmission of voice in a packet form. Indeed, the voice call may be the only place where IP is involved, with people at either end using traditional analog or digital telephones.

With VoIP, although the voice traffic and data traffic share the same "one pipe," there is little in the way of business-grade voice applications, such as conferencing and centralized voicemail, and no integration with data applications. VoIP may also lack some of the mechanisms for assuring the quality of the sound of the voice transmission. Components that take into consideration packet loss, delay and jitter tend to mark the threshold to IP telephony.

- With VoIP, although the voice traffic and data traffic share the same 'one pipe,' there is little in the way of business-grade voice applications, such as conferencing and voicemail, and no integration with data applications.



Section 4: IP Telephony

IP telephony employs VoIP, but takes it an important step further. Not only does it help assure quality of service (QoS), but as a voice-based application suite it provides the same end-user functionality, features and interfaces as a traditional voice network plus much more.

- IP telephony employs VoIP, but takes it an important step further. Not only does it help assure quality of service, but as a voice-based application suite it provides the same end-user functionality, features and interfaces as a traditional voice network, and much more.

It is this notion that IP telephony is an application that sets it apart from VoIP. IP telephony applications are modular and software-based and by using open standards and a common architecture, are easier and more cost effective to integrate with data applications.

There are two categories of IP telephony that are in common parlance today:

IP-enabled PBX – a traditional PBX system that is equipped with appropriate software and IP network connections to allow IP telephones, IP endpoints and IP trunks to be easily added. This approach to IP telephony enables enterprises to maximize use of their existing network and desktop equipment while moving on a path to converged communications at a pace that suits their needs. In many instances a business can start enjoying the benefits of IP telephony for the cost of a standard PBX upgrade. IP-enabling represents a highly cost-effective route to IP telephony, particularly in cases where there is an existing substantial network infrastructure investment.

IP-PBX – the term IP-PBX is somewhat of a misnomer as it does not represent a PBX as most people know it. Essentially it is a new IP-based communications platform comprised of a server or media servers and gateways with a packet switched network architecture that supports the full range of IP, digital, analog and wireless phones. It represents a sophisticated ground-up IP telephony solution that is feature rich and highly suited to serving a distributed environment as it can be mapped onto different topologies to satisfy different business needs. The IP-PBX is delivering on the promise of the technology as a tool for business efficiency. It operates within the guidelines of open standards, like QSIG and all forms of PSTN connectivity, and optimizes the use of signaling and transport protocols like IP, H.323 and SIP for networking, while integrating XML-based applications. This flexibility and functionality has led it to become the system of choice for many 'green field' sites where there is no existing infrastructure.

Unlike VoIP, IP telephony is not simply about cost savings. Mobility, productivity and business continuity are equally important drivers. Furthermore, IP telephony offers benefits and functionality that are either not available or difficult to achieve using a traditional PBX system. For example:

- A sales manager away from the office may conveniently initiate phone calls via his or her laptop computer, or have calls redirected from the office phone to their PDA, cell phone or softphone on their laptop.
- Using IP telephony, it is easier to extend all the functionality of the corporate network to branch offices. By connecting IP telephony to a company's wide area network (WAN), features such as 6-digit dialing and company-wide directories can easily be made available to users in remote offices. Furthermore, the plug and play simplicity of the IP addresses of IP telephones help lower the cost and administrative burden of moves adds and changes.



- **Converged voice and data is the integration of voice communications (such as tele-conferencing and speech access) with key business applications (such as force automation and supply chain management).**

- In a multi-site environment, IP telephony offers a cost-effective approach to ensuring that inter-office business communications stay up and running. To avoid disruption, the client-server architecture can enable communications to be rerouted or transferred seamlessly to alternative locations or through another node on the WAN.
- IP telephony inhabits the same IP-based environment as popular productivity applications such as Microsoft Outlook and Lotus Notes. This common environment lends itself to the simple and cost-effective deployment of Unified Messaging and Unified Communications applications.
- IP telephony lends itself to contact centers for the ease of integration with sophisticated multi-media applications as well as computer telephony integration, intelligent call routing and distributed or virtual contact center applications.

The merging of voice and data applications, such as Unified Messaging, is perhaps indicative of where IP telephony as a voice-based application leaves off and convergence starts.

Section 5: Voice and Data Convergence

Converged voice and data is the integration of voice communications applications (such as tele-conferencing and speech access) with key business applications (such as sales force automation and supply chain management). The business applications are predicated on business processes that are the lifeblood of most organizations. Ultimately, convergence benefits emerge by marrying these applications on any network and on any device. But it's the ability for communications to drive superior results that transform the very way an organization performs its business is why convergence is so significant.

Several examples of how converging communications applications and business applications can benefit a business:

- By integrating a communications conferencing application with a sales force automation system, a company might choose to automate the process for pursuing important sales leads. The converged conferencing and notification application could automatically convene key members of the sales team for a conference call within 6 hours for an opportunity over \$5 million but reduce this to 1 hour for sales opportunities over \$10 million.
- A simple application of convergence is the use of natural speech recognition for order placement. The voice command interfaces with an order database and results in an action.

Strictly speaking, convergence is about the integration of communications and business applications and processes on a converged network. While it could take place without IP, an IP network greatly facilitates the process, from a technology, cost and ease of deployment standpoint. This is due to the inherent ease and widespread use of the IP environment for embracing a wide range of software applications. Looked at another way, the TCP/IP protocol and client-server architectures are the common denominators that enable the fractious business components of voice and data applications to be brought together into a cohesive IT



architecture. Open software and the use of wide spread standards such as Session Initiation Protocol (SIP), H.323, presence, XML, Web and application servers, etc., will play an increasingly crucial role in enabling the integration of communications applications with enterprise business applications.

Section 6: Summary

VoIP - is the basic *transport* of voice in a packet form on an IP-based data network. Although the voice traffic runs on the data network there is little in the way of features and functionality and no integration with the data traffic that runs over the same pipe.

IP Telephony – employs VoIP at its core but takes it further, embodying it within an *application suite* on the network. IP telephony offers greater functionality than many traditional voice networks, particularly in the area of mobility, productivity and convenience of network management. It also lends itself to the integration of voice with other applications.

Voice and Data Convergence – is the integration of communications applications with key business applications. The business applications are usually tied to business processes, which are central to an organization's operations. Converged communications help organizations to unlock network value by realizing the benefits of tying together applications that until now have been completely separate. Ultimately, the marriage of these applications will be over any network and any device. Benefits include cost reduction, improved operational efficiency, enhanced responsiveness and productivity; in short, helping customers to achieve superior communications-driven results, enabling enterprises to reach a higher plane of communication.

About Avaya

Avaya enables businesses to achieve superior results by designing, building and managing their communications networks. More than one million businesses worldwide, including 90 percent of the FORTUNE 500®, rely on Avaya solutions and services to enhance value, improve productivity and gain competitive advantage.

Focused on enterprises large to small, Avaya is a world leader in secure and reliable IP telephony systems, communications software applications and full life-cycle services. Driving the convergence of voice and data communications with business applications – and distinguished by comprehensive worldwide services – Avaya helps customers leverage existing and new networks to unlock value and enhance business performance.



IP Telephony

Contact Centers

Unified Communication

Services

© 2003 Avaya Inc.

All Rights Reserved. Avaya and the Avaya Logo are trademarks of Avaya Inc. and may be registered in certain jurisdictions. All trademarks identified by the ®, SM or TM are registered trademarks, service marks or trademarks, respectively, of Avaya Inc. All other trademarks are the property of their respective owners. Printed in the U.S.A.

03/03 • EF-LB2020