A Brief History of VoIP

Document One – The Past

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Introduction

This paper is the first in a three part series that will ultimately detail the past, present and future of Voice over Internet Protocol (VoIP). The purpose of this paper is to detail the history of VoIP and explore this technology/industry by examining its technological history, cultural history and its economic history. For the sake of brevity, this paper (and the two that follow) will focus on this technology and its place in the business world.

The goals for the second paper will be to focus on the present condition of VoIP in the business world and to draw connections to historic events. In a similar structure, the second paper will also focus on the technology, cultural and economic factors that define VoIP in current terms. In addition, the second paper will detail particular legal or ethical issues faced by the industry, the target audience for this industry, and will present the factors leading to an explanation the digital divide.

The goals for the third paper will focus on the future possibilities of VoIP in the business world and will draw connections from both the past and present states of the technology/industry. That document will draw together the hypotheses presented by leaders in the industry and will also include my own analysis of the future of the technology. Furthermore, I will include hypothetical events that may affect the technology, our culture and the industry's economics.

The use of VoIP by individual consumers was the beginning of a massive move from traditional telephone systems to a form of new media where voice and other forms of digital media could converge with an already established data network. Major advancements in the technology are the result of business development and adoption. This paper focuses on the history of VoIP and how this technology fits into the business setting.

Technology Overview

What is VoIP?

VoIP, also known as IP Telephony, is the real-time transmission of voice signals using the Internet Protocol (IP) over the public Internet or a private data network.[1] In simpler terms, VoIP converts the voice signal from your telephone into a digital signal that travels over the Internet. One of the most significant advantages of VoIP (over a traditional public switched telephone network (PSTN - also known as a legacy networks) is that one can make a long distance phone call and bypass the toll charge. This integrated voice/data solution allows large organizations (with the funding to make the transfer from a legacy network to a VoIP network) to carry voice applications over their existing data networks. Not only will this technological advancement have an impact on the large traditional telecommunications industry, it will alter the pricing and cost structures of traditional telephony.[2] Furthermore, when compared with circuit-switched services (yet another name for legacy networks), IP networks can carry 5 to 10 times the number of voice calls over the same bandwidth.[3]

How does VoIP work?

To transport voice over a data network, the human voice must be "packetized." This process contrasts significantly with the circuit-switching mechanism used in traditional networks. Voice packetization involves appending headers with routing information to the voice data. Multiple voice samples are combined into a packet and the voice packet is

[1] Morris Edwards. "IP telephony ready to explode into corporate world. (Industry Trend or Event)." *Communications News* 38, no. 5 (2001): 96-97, Proquest.
[2] P.P. Francis-Cobley and A.A. Coward "Voice over IP versus voice of frame relay" *International Journal of Network Management* 14 (2004): 223-230, Proquest.
[3] See #1

switched hop-by-hop through the network.[1] To summarize, the voice signal is broken up into small pieces (packets) and sent though the network one-by-one. The process of packetization compresses the callers voice signal, transfers it over the IP network, and it is then decompressed at the other end. [2]

Technological History

There are two fundamental technologies that are necessary for the existence of VoIP. The first, and most widely used, is the telephone. The second technology is the Internet. The telephone was as direct result of the (independent) work of Alexander Gram Bell and Elisha Gray in the 1870s[3]. The first regular telephone exchange was established in New Haven in 1878. Early telephones were leased in pairs to subscribers. The subscriber was required to put up their own line to connect with another. In 1889, Almon B. Strowger, a Kansas City undertaker, invented a switch that could connect one line to any of 100 lines by using relays and sliders. This switch became known as "The Strowger Switch" and was still in use in some telephone offices well over 100 years later.[4] To make a call, the user needed to push a button on their phone the required number of times to dial the receivers phone number. This button was replaced in 1896. Interestingly, Philadelphia was the last city to give up the dual service (rotary and button) in 1943.[5]

About the same time the transistor was invented, mathematician Dr. Claude Shannon published "A Mathematical Theory of Communication," which promoted the

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[1] P.P. Francis-Cobley and A.A. Coward "Voice over IP versus voice of frame relay" *International Journal of Network Management* 14 (2004): 223-230, Proquest.

[2] Morris Edwards. "IP telephony ready to explode into corporate world. (Industry Trend or Event)." *Communications News* 38, no. 5 (2001): 96-97, Proquest.

[3] About.com. "The History of the Telephone" http://inventors.about.com/library/inventors/bltelephone.htm (accessed November 8, 2004).

[4] About.com. "Telephone History – Telephone Technology" http://inventors.about.com/library/inventors/bltelephone7.htm (accessed November 8, 2004).

[5] Ibid

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