A Managerial Perspective of Mobile VoIP

Mahesh S. Raisinghani
TWU School of Management, USA

INTRODUCTION

Voice over IP (VoIP) is the convergence of Internet technology and mobile telephones that offers low-cost voice communication services. It is still in its infancy but has a potential to be adopted by masses in the future, as the technology matures. VoIP is a technology that is used to make telephone calls using a broadband internet connection instead of a regular phone line. There are some services that allow the users to make calls to other people with the same service; other services allow the user to make calls to any number (FCC Web site). VoIP traffic can be deployed on any IP network. It also includes the ones not having connection with the rest of the Internet such as local area network (LAN) (Wikepedia.org).

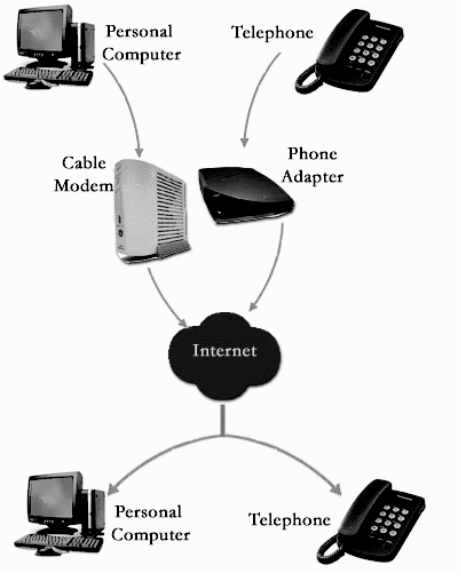
HOW DOES VOIP WORK?

Voice over Internet protocol (VoIP) is a revolutionary technology that has the potential to completely rework the phone systems all over the world (Howstuffworks.com). It converts the voice signal from the phone to the digital signal that travels over the Internet. The voice data, just like other data, is transmitted over the Internet in packets and converted to analog for playback (Comer, 2004). In order for a VoIP technology to work, one must have a high-speed Internet connection through cable modem, DSL, or LAN. One can hook up an inexpensive microphone to the computer or connect a phone directly to a telephone adapter (Anonymous, n.d.).

The VoIP architecture has the elements shown in Table 1.

There are number of enabling technologies that include protocols, industry standards, and transmission technologies that operate behind the scenes for VoIP to work.

Figure 1. How does VoIP work? (Source: http://www.fcc.gov/voip/)



EVOLUTION OF VOIP

The concept of VoIP originated in 1995. It all started when the hobbyists began to recognize the potential of sending voice data packets over the Internet, just like any other data. The PC users could avoid long-distance phone charges. The first Internet phone software appeared in 1995. VoIP required people on both sides of the call to have the same software, sound cord, and microphone. The early application of VoIP was of poor connectivity and voice quality. Over the next few years, the VoIP technology evolved and reached a point in 1998 where some small companies started to offer PC to phone service to the customers. The VoIP traffic accounted for one percent of voice traffic in the United States (www.whichviop.com, 2005). Soon, phone to phone services were also offered. A computer was necessary to establish connection. The early VoIP services had to rely on the sponsorship to subsidize costs for their customers, rather than charging them for the service. The introduction of broadband Ethernet connection helped in providing call clarity, and reduced latency. There were still issues such as difficulty in making connection between the Internet

Table 1. Network elements in VoIP architecture (Source: (http://www.nortel.com/solutions/providers/enabling_tech/voip/voip_enabling.html#networkelements)

Network Element	*Description*
Communication Server (Call Server or Softswitch)	Provides call control, gateway control, service intelligence, and other centralized functions
Signaling Point	Enables the VoIP network to communicate with the Signaling System 7 network
Line and Trunk Gateways	Provide connectivity to the public network
Core Switches and Routers	Keep traffic moving through the core of the IP network
Application Server	Provides voice, data and multimedia services from a central location in the IP network

Table 2. Enabling technologies for VoIP (Source: http://www.nortel.com/solutions/providers/enabling_tech/voip/voip_enabling.html#networkelements)

Technology Standards/Protocols	*Description*
ATM (Asynchronous Transfer Mode)	Network transmission technology supporting voice, video, and data
BICC (Bearer Independent Call Control)	A protocol used to manage voice traffic between communication servers
H.248	An open industry standard providing highly efficient real-time call performance and gateway control
H.323	One of the original VoIP signaling protocol
IP (Internet Protocol)	Used to route messages within an IP network
SIP (Session Initiation Protocol)	A Web-based protocol supporting IP-based devices such as IP phones, PCs, PDAs
SIP-T (Session Initiation Protocol for Telephony)	Provides SIPS communications between communication servers
TDM (Time Division Multiplexing)	A transmission technology enabling a network to transmit multiple signals simultaneously over a single transmission path

and public switched telephone network (PSTN) and static during the calls (Anonymous, 2004).

It was a breakthrough in VoIP history, when hardware manufacturers like Cisco and Nortel started to produce equipment for VoIP that was capable of switching. Switching the voice data packet into something that could be read by PSTN was previously performed by the computer's CPU. This new VoIP equipment helped make VoIP hardware less dependent on computer. As the hardware of VoIP became more affordable, large companies started to implement VoIP on their internal networks. The long distance service providers also began to route some of the calls on their network over the Internet. Since the beginning of 2000, there has been dramatic expansion of VoIP usage. Companies have been switching to VoIP to save on long distance calls and the infrastructure costs. The service has been offered to the residential customers also. By the year 2000, three percent of the total voice traffic was represented by VoIP.

By the year 2005, the issues with the voice quality had been resolved and to ensure reliability, clear sounding and unbroken phone calls, VoIP traffic could be prioritized over the data traffic. Revenue from VoIP equipment is expected to reach $8.5 billion by the end of 2008 (Anonymous, 2005).

BENEFITS AND DRAWBACKS OF VOIP

There are number of advantages of using the VoIP for voice communications. These are listed below: