

## Implications of Peer-to-Peer Communication

### INTRODUCTION

Peer-to-peer (P2P) networking, popularized by Napster for music file sharing, is rapidly being adopted by the consumer market for PC-to-PC IP telephony communications. Companies like Skype have significantly improved the quality and operational efficiencies of voice over the Internet (VoIP). As these solutions approach transparency with a conventional phone, the VoIP hybrid client / server, centralized, SIP, and H.323 community are analyzing the approach. The primary objective of this paper is to look at the strategic and business implications of P2P for the traditional voice business model from the standpoint of network operators and technology suppliers. Our objective is to provide the necessary framework for understanding the implications of P2P relative to the efficiency, costing, pricing, price elasticity tendency, business process, and distribution of voice communications services. Using this foundation framework, companies can perform comparative analysis relative to their own current business model and metrics. The underlying implications of P2P – highly decentralized computing over the pervasive Internet – is having a far more profound impact on the traditional carrier's business model than the revenue opportunities any VoIP-based network can promise.

### WHAT IS P2P COMPUTING?

P2P computing is a highly scalable and decentralizing virtual method of internetworking that leverages the embedded processing power inherent in all PCs combined with the ever-growing pervasive Internet network. Unlike the traditional centralized or client / server architecture, users can directly launch a variety of asynchronous and synchronous applications directly between two or more PCs without any intermediary server.

### SOUND QUALITY

PC-to-PC and PC-to-Phone calling is nothing new. However, prior to Skype's P2P implementation, the appeal of the product was limited by quality and usability issues. Early users of these services were willing to put up with the inferior quality in exchange

for the significant savings in international long distance toll charges. The first generation products were plagued by poor quality issues. In the past poor reliability was attributable to the latency induced by the centralized model, inferior client, and lack of integration with the embedded components required in the computing environment. Now, companies like Skype have created a P2P software client that allows seamless and effortless IP-PC communications. According to a recent editorial in The Wall Street Journal (July 23, 2004), the number of users who have access to this software could reach into the hundreds of millions.

### CENTRALIZED VERSUS DECENTRALIZED

It is important to understand the fundamental difference between centralized and decentralized architecture. This is central to the paradigm shift. The topology of the P2P network has far more strategic implications than the VoIP protocols themselves. The current centralized SS7 based voice networks are maintaining the same topology as they roll out SIP and H.323 VoIP based service. As we will discuss, the decentralized model is having much more profound impact than the underlying VoIP protocols. For simplicity of this discussion, we will use Dial Tone to represent the basic service or product. The assumption is that Dial Tone can be used for supporting Centrex features and voicemail. The main point is to understand the implications of P2P to a typical cash cow product that represents the traditional 80% - 20% revenue model.

### ECONOMIC IMPLICATIONS

P2P is already having significant impact on consumer services price elasticity. Users with the client application downloaded on their PCs can call each other for free. This fundamental value added is having the net effect of accelerating price erosion.

Analogous to Salesforce.com's successful ASP model for delivery of CRM business application, companies like Skype have a significant cost advantage over traditional network operators. Every PC has the potential of becoming a phone system or PBX. These innovative companies view the capital investment and

network ownership superfluous. Communications is achieved through the creation of a thin client that leverages a ubiquitous decentralized IP computing network. Facility based network operators are at a significant cost disadvantage. Higher operating costs and continued price erosion is forcing further consolidation.

Skype is the most notable P2P based voice services today. Skype's successful P2P approach demonstrates closer alignment with customer value. In less than a year, Skype boasts 15 million downloads with estimated 500,000 regular users (WSJ, 2004). The closest second achievement is Vonage with 140,000 subscribers. Although the fundamental approaches are very different, Skype's remarkable organic results will have profound impact on the \$300 billion telecom market.

While, in general, VoIP and P2P are making network ownership irrelevant to delivery of voice services, network access is ultimately the foundation to internetworking. One thing the Telecom Act of 1996 proved is that the cost of last mile ownership is beyond the reach of most carriers. Today's access is, in effect, a duopoly shared by the four regional bell operating companies (RBOCs) and cable companies. While prices continue to fall as carriers chase a limited number of subscribers, carriers like AT&T are forced to exit the consumer market. In fact, a number of major U.S. carriers will be forced to sell off their operations, only to reenter the market with virtual partnerships. Many traditional facility-based carriers are trying to make this transition before the last vestige of asset – brand equity – also vanishes. The trends that are taking place in IT, are paving the way for new alternative ways of communicating. Within a year we will witness the convergence of VoIP enabled IM clients and Wi-Fi capable mobile computing devices.

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