America's Network
Nov 1, 1999

Eat or be eaten.(IP telephony)(Industry Trend or Event)

Author/s: Ikhlaq Sidhu

Carriers must look to smart client devices to make sure IP doesn't gobble up their networks.

The adoption of Internet Protocol (IP) telephony will lead to a more efficient transport model. Services and features will be enabled that are not possible in today's public switched telephone network (PSTN). But what will IP telephony mean for the companies that have traditionally dominated the telecommunications market?

For many, the prospect of voice over IP (VOIP) may be viewed as cannibalizing traditional telephony and presenting a major threat to revenue sources.

It brings many challenges for established providers, but there are advantages.

The Internet, and the openness that it brings, can be a great opportunity if targeted aggressively. The key to success depends on how well - and how quickly - service providers can adapt their businesses to compete in this new era.

The Next Global Network

Communications will eventually travel over packet-based networks utilizing IP. The IP trend is clear from current discussions by telecommunications standards bodies, such as the International Telecommunication Union (ITU) and the Internet Engineering Task Force (IETF).

Fundamentally, today's phone network is based on archaic technology. It's designed on assumptions that are no longer valid, such as scarcity of bandwidth and computational power. The Internet model is intrinsically better suited for the next global communications network.

Data are sent in packets on the Internet. It does not matter if the

data represent voice or signaling. Because each packet is marked with an IP address destination, the network needs to know nothing about the call or transaction (Web browsing vs. telephony). No start time, stop time, or predefined path is needed.

Every node in the network simply examines the destination address and sends it to the next hop, which is closer to the final destination. The Internet is essentially designed to do one thing really well: forward lots of data (packets of voice, audio and video) at a low cost.

Accelerating the industry's path toward VOIP is the emergence of Session Initiation Protocol (SIP), an inherently Internet-friendly protocol that allows for easy integration between the World Wide Web and voice services. Developed by the IETF, SIP enables all of the custom local area signaling service (CLASS) features such as call blocking, caller ID and call-forwarding.

Additionally, the simplicity and openness of SIP allow a broad array of new, Internet-style services that couple standard telephony with information access and personalization.

Features on demand

In today's telephone network, implementing a new feature or service (such as call-forwarding based on the time of day) is a challenging task. The main reasons for this are the complexity of the PSTN's Signaling System 7 (SS7) architecture and the fact that the telephones are dumb. In an SIP-based telephony architecture, services can be implemented in the network using an SIP proxy server or in a client device, such as an IP telephone.

Since the underlying elements of SIP are so much like hypertext transport protocol (HTTP), creating network-based services, such as time-dependent call-forwarding, is straightforward. Moreover, these services can be implemented within days. Developers can design and implement new voice services as quickly and easily as Web pages. The time it takes to roll out SS7-based network services will always be greater.

In the new VOIP era, the key differentiator for service providers will not be any specific feature or service. Rather, providers will distinguish themselves by transport speed and how quickly they can bring a new service to market.

Features, rather than cost, will become the competitive issue. New voice services will be sold based on differentiating features, not lower cost on a commodity basis. To compete, carriers will have to be innovative in developing new features and be quick to deliver. In the short term, carriers will be able to offer some services over their existing infrastructure, but not others. However, in time, new services will be resolved in a separate or mixed offering.

The New Competition

As features and services become increasingly important, the doors will open for a new breed of competitor to enter the race. Portal companies, such as Yahoo!, America Online (AOL) and Infoseek, will have a particular advantage because they are founded on the principle of service delivery and have established, user-friendly means of interfacing with the customer.

These new competitors understand the velocity issues associated with the Internet. They focus on openness to provide speed of service delivery. Open interfaces, standards and integration of specialty products and services allow them to leverage risk and investment from established experts and creative startups in what is a much more efficient model for service creation.

Domestically, the long distance carriers, AT&T and WorldCom, have combined annual revenues of about $75 billion in residential and business long distance services (added up from third-quarter 1998 results). Of that amount, approximately 40% ($30 billion) flows back to regional bell operating companies (RBOCs) for access charges. RBOCs show revenues of about $160 billion, which includes the access fees paid by long distance carriers (also third-quarter 1998 results).

By adding local and long distance market revenues (without double-counting access charges), telephone revenue in the United States per year is approximately $205 billion. This provides an idea of what telephone companies could end up losing to this new class of Internet telephony service providers.

Incumbent service providers should not despair, however. Their heritage and experience in telecommunications position them well to compete with the new-generation telcos. For example, traditional carriers already know how to operate infrastructure equipment, which will remain a significant part of the business. They also enjoy the advantage of brand name, which is still an important differentiator from the new comers.

To confront competitive pressures, traditional carriers must accept a new philosophy that builds on their strengths, while challenging previous business models and operating principles. Traditional carriers must adopt an open Internet model for service creation.

Specifically, traditional carriers must:

* Look to smart client devices (i.e., IP telephones) as an opportunity to provide part of the customer value;

* Adopt more creative pricing models, based on the assumption that bandwidth is inexpensive and readily available; and

* Adapt to the dramatically changing business landscape by opening interfaces to other services and value segments in the network.

Smart Client Devices

Smart client devices, such as intelligent telephones, will deliver the primary benefits of IP telephony to end users. Software companies can add features to telephones or any other multimedia device much faster than traditional phone companies can roll out comparative services. Examples of the features that software companies could provide include high-fidelity audio, sophisticated call-filtering, unified messaging, computer telephony integration or video.

Personal digital assistants (PDAs), such as the Palm III or Palm V from 3Com Corp., have enough computing power to act as an interface for an intelligent telephone. Expect to see a trend toward integrating telephony functions into PDAs as a result. These PDAs can then become personal communication assistants (PCAs), which make use of personal information to help filter and forward calls. For example, calls from people who are not in the personal directory in the Palm PDA can be forwarded to voice mail.

PSTN-based telephone networks cannot provide these services easily because the phone network does not have access to such personal information. Additionally, the complexity of adding these types of services to the SS7 network is significant.

Some examples of the new applications and services that will be possible are:

* The PCA may store and download to the phone the preferences of the user about the phone operation, such as ringer volume and speed-dial programming;

* The PCA may act as a smart card, providing authentication information for making toll calls;

* The PCA may screen calls, directing callers with a low-assigned priority to voice mail, while forwarding high-priority calls; and

* The user may program the system through the PCA so that, depending on the time of day and diary information in the PCA, the phone forwarding information is dynamically updated.

Traditional carriers will not have the expertise to develop smart client devices themselves. However, by partnering with vendors of strong solutions at the client end, they will be able to speed the provision of features to their end users.

Simplified Billing

Consumers have shown a preference for simplified billing. Various billing models have been introduced in other industry sectors with success. Cellular telephony has developed models for generating revenues and differentiating services by using batch-level pricing. Similarly, Internet service providers (ISPs) have shown the success of fixed-price services.

Simplified billing also has a considerable advantage for carriers. One example is per-call billing, which accounts for 50% to 90% of operational costs. Unlike the cellular example (in which bandwidth is limited, but competition has forced simplified billing, anyway), per-call billing is an artifact of outdated notions in the PSTN that bandwidth is scarce and circuits have to be reserved and held during the call. Given that bandwidth today is relatively inexpensive and readily available, there is no need for bandwidth reservation, just as there is no need for call-based billing.

Carriers need to make the transformation to simplifying cost and service offerings with the customer in mind. With their knowledge of the costs and user experience, they will have a considerable advantage over new entrants into the market, enabling them to potentially provide the most competitive and profitable offerings.

four businesses

Within the next five years, the telecommunications industry as we know it will change dramatically. In the new landscape, four separate businesses will emerge that will perpetuate and sustain the next global communications network and divide the space traditionally owned by the carriers.

The new business areas are:

* Access providers, which will provide broadband access to the IP network via xDSL, cable or leased T1;

* Transport providers, which will ensure lowest cost routing over the network;

* PSTN interworking, which will control the hop-off interface between the Internet and the PSTN or SS7 gateways; and

* Service providers, which will deliver services on the IP network such as telephony, unified messaging and other vertical applications.

Do not expect technological deregulation, rather than legislative deregulation, to force carriers to compete in each of these business models separately. In reality, traditional carriers must understand that they cannot compete if they try to do it all alone. Instead, they must build services and gateways to the PSTN on open standards and open their networks as quickly as possible.

With open networks, carriers can focus on those areas where they have a natural advantage (such as in access or transport provision). They also can foster relationships with innovative service providers for enhanced application offerings and forward-thinking equipment manufacturers for intelligent products. They can then leverage their strong brand name to bring customers to their network.

Should traditional telephony providers drive this evolution toward the new business landscape, or should the portals? Both have much to

learn about the other's business.

out of the pstn box

Traditional carriers have a key role to play in empowering the development of the next global communications network. Only by fully committing to the future will these carriers remain competitive in the long term. With fundamental changes to the business landscape on the immediate horizon, the carriers that will succeed will be progressive, open, Internet-savvy and customer-focused.

Being the first to use existing infrastructure and emerging protocols is a good way to take a leadership position in this new world. It will be very important to think out of the PSTN model in terms of billing, services and user experience to do this well.

In short, traditional carriers must take the competitive advantages of the Internet (e.g., speed and openness), combine them with their knowledge of costs and customer relationships, and apply them with the customer at the center of an enriched service offering.

Ikhlaq Sidhu is vice president of Internet Communications and Andrew Bezaitis is a director of Internet Communications at 3Com Corp.
