

**xoIP:**

# The Emergence of “Anything Over Internet Protocol”

Here’s another aspect, involving basic economics, of the “open access” ideas discussed last month

By Bruce Bahlmann ■ *Birds-Eye.Net*

In broad outline, investment in broadband infrastructure in the United States is following two widely differing models. Traditional communications giants are installing fiber with the assurance that they can control what they pay for. Municipalities and smaller companies are installing fiber with the hope of attracting all possible users – even competing users – to deliver programming and services on the same network. In a sense, there’s nothing new here. Worldwide, the history of delivering electronic services has always followed the lead of a dominant delivery medium. Broadband is the medium of the future, and standard network management protocols let anyone drive the information highway. Just as thousands of brave pioneers carved wagon ruts in the dirt for others to follow in search of a better life, the widespread adherence to Internet Protocol (IP) has established a similar following, and precedence, and vision of things to come. This article will focus on xoIP (anything over IP) in terms of what it means for service providers, their customers (we, as consumers), and their vendors.

Current standards are not up to the task, however. It will be at least two years before xoIP offers the quality of service that customers will need with regard to security, availability, and functionality. The first beneficiaries may be customers of Broadband over Power Lines. The details:

**By the Numbers, What is Driving xoIP?**

Service providers continue to place capital at risk for the opportunity of

being first to the market, whether that market will materialize or not. In a perfect world, wouldn’t it be great if you had a limitless connection to your customers, limitless financial means, and then could quickly and cheaply purchase and install all the equipment you need to deliver a wide variety of services to them? Owning everything has tremendous advantages when it comes to exploiting all the possible secondary and tertiary revenue streams. These companies cannot escape the realities of maintaining balanced financials as well as the need to show quick profits to anxious shareholders, however. Even though they would love to sell their wares to everyone, the reality is that only a limited number of companies have the financial means, infrastructure, support staffing, and experience to deliver certain services. Those services that fall outside this zone of confidence with dominant players represent unproven, or not yet profitable services.

The need for cost savings and application communication standardization are the principal driving forces of the widespread adoption of xoIP. Remember, IP is open and available to everyone. This encourages innovation and rapid product development and evolution, because small innovators do not have to pay for engineering the entire system. For example, a rough estimate places the development of new switch functions for a Public Switched Telephone Network (PSTN) platform at two years and \$5 million as compared with similar functions for VoIP at one month and \$50,000. If the estimate holds, it means that using xoIP func-

tions produce services in about four percent of the time for one percent of the development cost of PSTN functions.

While this may be a special case, comparable savings should surface for other xoIP services including the up-and-coming Television over IP (tvoIP) protocol.

**Dumb Pipe, increasingly Smart Customers, and Costly Duplication**

One has to look no further than offering long distance telephone service as a problem area for those wanting to own everything. Today, only a handful of service providers really do this themselves. The rest partner with the dominant providers. That’s because building out a service is generally more expensive than buying it from another company -- especially when the service has been around long enough to become a commodity. It is, again, like those early settlers who followed the wagon ruts of their predecessors to their ultimate destination rather than go off on some risky, unknown, or unproven tangent.

As a result, the small, often innovative, developers of new programming services adhere to the operational requirements placed on them by the haves to create a de facto standard anyway – the standard that must be supported in order to offer services through a supplying partner. Whether the underlying technology is IP, Asynchronous Transfer Mode (ATM), or something else, what is important here is that someone other than the service provider is calling the shots when it comes to the technology.

Adherence is the result of the need to reduce costs.

Today, a large amount of service duplication exists on the Internet. One finds many different suppliers of web hosting services, email services, phone services, video services, music services, movie services, security services, and so on—all with the intention of being different or better than the competition. Virtually any kind of service one needs and that can be offered over the Internet is available for purchase from two or more different suppliers. Just about everything outside of the physical connectivity that makes up Internet service can be obtained freely or for a very small fee elsewhere on the Internet.

Consumers are increasingly aware of this fact and can easily add up the costs of the services they receive, compare these services against cheaper or more feature-rich services from new vendors, and then weigh these advantages against the inconvenience in changing providers.

What does this have to do with offering anything over IP? In the language of economists and MBAs, xIP effectively commoditizes all services that can be delivered to the consumer over IP, thereby economically impeding any service provider who has gone ahead and purchased the equipment necessary to deliver one of these commoditized services.

A commoditized service even places companies who have gone ahead and purchased IP-centric service equipment at risk, because such services would need to directly compete with larger providers of these services who have set up shop on the Internet and potentially have access to a larger prospective customer base.

Profits for such aggressive service providers will greatly depend on their ability to differentiate their service and quality from that of their competitors. The “four percent/one percent” example above compared long distance service to a technological wagon rut --but perhaps it's more correct to speak of a philosophical rut of decision-making individuals hardwired for or against “build” versus “buy.”

### One Transport, Multiple Revenue Streams, “No Problem”

The future sees IP carrying not only data and an increasing amount of voice traffic across the Internet but also video and anything else we dream up to throw at it. Nokia, which is after all mainly a supplier of equipment for plain old telephone service, claims that “Using

IP protocols enables information to be seamlessly transported and accessed, regardless of whether the information is data or voice, passive or interactive, stored or real-time.”

In reality, all these services are available today in one form or another to consumers and businesses so offering them over IP could be considered as just



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a better mousetrap – cheaper, or more flexible, but still for catching mice. What makes the mousetrap delivered over IP better than the one consumers already have such that they will switch to the new one?

For example, if you have a television, why would you upgrade to another television unless the picture is markedly larger,

the overall picture is noticeably better or clearer, or the features and maybe extra channels that come with it push you to the point where you must have it?

### IP is Not All Glimmer and Lights

There are also disadvantages to the “all comers are welcome” philosophy. First, there are very large functional holes in

IP even though, by and large it works. The biggest problem is clearly QoS, or Quality of Service. By QoS I mean the fairly obvious – the management of throughput, reliability and integrity of the data communications between consumers and the services they are interacting with. New services such as VoIP and tvIP place a premium on QoS, when it comes to a network supporting latency and jitter-critical applications.

In networks that are resource-constrained (wireless networks or last-mile connections over shared broadband networks like cable) an automatic, standard arbitrator is required for QoS, which only complicates this further. Right now, QoS over IP provides something that resembles “better than best effort” more than true QoS over all applications and services with which consumers are interacting.

Other functional holes in the existing IP setup include security and the lack of a sufficient number of addresses to handle every one or every thing that requests a service.

While monster efforts are well on their way to address such issues as the development of IPv6 (which addresses many aspects of all functional holes), no quick fix or overall solution to all the functional holes exists, nor will a solution be widely available or deployed for at least another two years. One of the first class of service providers to use xoIP will likely be electric utilities as they roll out data services using Broadband over Power Lines (BPL).

This pure implementation allows BPL deployments to start off with a clean slate and not have such a heritage to overcome – the electric utilities can therefore invest aggressively in the latest technologies (like all-IPv6 compliant hardware) and leapfrog many of the struggles that existing service providers still face in moving completely to xoIP. ♦

### About The Author

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