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## VoIP: The Next Big Breakthrough in Communications?

Nearly everyone agrees that the Internet has revolutionized information delivery. Now it seems that the Internet is poised to revolutionize telephony as well. How? Voice over Internet Protocol – VoIP.

### How it's done

VoIP works a lot like your e-mail. Rather than transmitting your voice directly over the traditional circuits of the public switched telephone network, VoIP sends your voice as digital data in discrete packets over the Internet. Those packets are reassembled on the receiving end. The voice data packets can be interspersed with e-mail and other web traffic, making phone calls as cheap to send as e-mail.

With the state of the current technology, VoIP usually relies on a phone adapter that can be

attached to any touch-tone phone, corded or cordless. The adapter, which communicates with the Internet via your computer modem, gives you the dial tone most of us are accustomed to and allows



you to call any phone number on earth. If the phone you're calling doesn't have VoIP capability, your data packets will be converted back to a regular signal at the receiving end. And as long as you have a regular phone number, anyone can call you without special equipment. Some VoIP providers also offer a service that allows you to

speak directly through your computer.

But you can't switch your phone service to VoIP if you're still using dial-up to connect to the Internet. A broadband Internet connection is required to make VoIP calls.

### Advantages

From a technical standpoint, the biggest advantage of VoIP is that it separates the voice from the copper telephone network. This decoupling makes voice available anywhere IP is available – cable, fixed wireless, fiber, satellite. And, compared to a conventional phone network, VoIP doesn't require a continuous connection to the phone company, making it a more efficient means of communication.

All of that translates to VoIP's biggest advantage –

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VoIP ...Continued from front cover

*From a technical standpoint, the biggest advantage of VoIP is that it separates the voice from the copper telephone network.*

cost. VoIP is cheaper than traditional telephony. Some experts estimate the savings to be as high as 40 to 60 percent. And even if you have to pay for upgrading to broadband in order to use VoIP, the average net monthly savings is still about \$8.

VoIP is also cheaper for the provider, because it relies on software, not hardware. And software is cheaper to alter and maintain. Installing a packet-switching network costs only about a third the cost of a circuit switching system. VoIP also encourages competition because service providers don't need to build their own infrastructure or rely on existing lines.

Cost alone might not be enough reason for many consumers to make the switch to VoIP. But the added features may. VoIP allows users to access voicemail through e-mail, conference large groups of people, select their phone's area code, and use their phone service anywhere there's a broadband Internet connection. As the technology continues

to improve, VoIP is becoming integrated into PDA, Webcam, instant messaging, even game consoles.

#### **Disadvantages**

As with any new technology, there are downsides. Perhaps the biggest is a dead line during power outages. With a traditional land-line phone, you are always connected, even when the power's out. But no power can mean no VoIP, unless the provider offers substantial backup power during outages. And at least for now, VoIP offers limited 911 emergency functions and may be incompatible with home alarm systems.

Despite the disadvantages, people who use their phones a lot are becoming increasingly interested in VoIP. Even Uncle Sam is jumping in, with the Department of Commerce using the technology to boost its communications capabilities.

Of course, the Federal and State governments are doing more than looking at VoIP as a viable means of

communication. Predictably, they are looking at the new technology as a source of revenue. Traditional phone service includes fees collected by both the State and Federal governments. What happens to those fees if land-line use falls out of favor? That issue is now being addressed in Congress and State legislatures. (*See Government Watch article on page 3.*) Many government watchers fear that fees levied on VoIP may ultimately threaten Internet freedom as we now know it.

#### **Down the Road**

Is Internet telephony the wave of the future as some industry mavens predict? Will traditional telephones eventually disappear? The jury is still out. But for the moment it seems that VoIP technology is best suited for technophiles who want the latest bells and whistles and are willing to put up with a few glitches for the satisfaction of shedding their dependence on telephone companies. ✍

# government watch

## Internet telephony

Is it a phone service or information? What happens to traditional telephone fees? Who regulates it? Will wiretaps be possible? These are just a few of the questions that Congress, state agencies, and the FCC are wrestling with as they confront the emerging technology known as Voice over Internet Protocol (VoIP).

As early as 1998, the FCC, in its *Universal Service report to Congress*, discussed the difficulty of categorizing IP telephony and recommended that government take a wait and see attitude. The agency reiterated that position in a 1999 Working Paper. But today, as VoIP is becoming more of a reality and less of a technological curiosity for the average consumer, government agencies are starting to flex their regulatory muscles.

### FCC Action

Among the most recent attempts to address VoIP regulation was an FCC hearing on wiretap laws. Held on August 4, the hearing concluded that

wiretap laws, as outlined in the Communication Assistance for Law Enforcement Act (CALEA), apply to all types of broadband Internet access service. FCC Chairman Michael Powell stated, "CALEA requirements can and should apply to VoIP and other IP-enabled service providers. Above all, law enforcement access to IP-enabled communications is essential."

Despite that ruling, the FCC continues to classify VoIP as an information, not telecommunications, service. All five FCC commissioners agree that maintaining VoIP's status as an information service is important for keeping regulations at a minimum in order to foster the emerging technology. At the same time, the commission recognizes the importance to law enforcement of full electronic surveillance capability. Whether the FCC's recommendation will make it to final approval remains to be seen. Commissioner Kathleen Abernathy

emphasized that it is still an open question whether CALEA applies to broadband services. She noted that the final decision may lie with the courts.

### Regulatory Control

On the legislative side, Sen. John Sununu (R-NH) has introduced the VoIP Regulatory Freedom Act (S. 2281) to keep VoIP regulation in the hands of the Federal government. Sununu and bill supporters reason that IP-enabled networks are interstate in nature, so should fall under the jurisdiction of the Federal government only. Sununu's concern is that states might try to saddle VoIP providers with access fees and require them to meet different sets of state regulations that would stymie the emerging technology.

It appears that Sununu is right to be concerned. Minnesota and New York have already tried to



Sen. John Sununu

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-- FCC Commissioners

regulate the VoIP company, Vonage. So far, the federal courts refuse to lump the IT applications with traditional telecommunication services.

Sununu's attempt to keep VoIP free of state tariffs met a snag when the bill was discussed in July hearings of the Senate Commerce, Science, & Transportation Committee. While the Committee approved the bill, it attached some significant amendments that restore to the states some ability to regulate VoIP.

The amended bill allows states to tax and regulate VoIP applications with respect to 911 and E-911 services, intercarrier compensations, universal service, consumer protection measures, and unfair or deceptive trade practices. The amended bill also deletes the original bill's separate ban on state taxation of VoIP applications. And it removes the proposed limits on FCC regulations

and creates a broad array of state powers that apply to any VoIP application.

Many experts believe the amended bill effectively reverses Sununu's original intention. And while Sununu continues to work for final passage of a bill this year, few government watchers believe that any VoIP regulatory bill stands a chance of passing this Congress.

**Doubtful Passage**

The stakes may be too high for any rapid solution. Billions of dollars in state revenues stand to be lost if VoIP manages to escape the regulation of traditional telephony. VoIP providers are just as determined to keep those dollars in their own pockets. Among the lobby groups newly formed to influence Congress's decisions about the nascent technology is a group calling itself The Voice of the Net Coalition. Made up of the nation's leading VoIP companies, the group stated in a recent press release that "it will resist the erection of

regulatory barriers that could stall VoIP while actively advancing a policy framework that allows VoIP to deliver its many benefits."

Earlier this year, Sununu commented, "Voice communications are at a watershed moment. Beyond improving productivity and creating valuable new service features, the innovation created by VoIP applications forces a complete shift in the way traditional voice communications is viewed." Sununu may be right about VoIP. But barring a startling new paradigm in the U.S. Congress, deciding how – or even if – to regulate Internet telephony is probably years away.

For more information about Sununu's bill and other legislation of importance for the IT community, visit the government news page of our website, [www.zyquest.com](http://www.zyquest.com).



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# employee watch

## Greg Goodfellow

It wasn't Shakespeare's suggestion about lawyers that tipped the balance of Greg Goodfellow's career choice from the law to computer science, but a simple realization that computer programming was a lot more fun.

### Hindsight Saga

In college, Greg started as a computer science major at UW-La Crosse. But in his second semester, he took some political science classes and became really interested in law. By his sophomore year, he had switched his major to political science and was on course for a career in the law until his last semester when he was required to take a business class. A business class may sound like a blow-off course, but it proved pivotal for Greg's future career.

That class was business computing. As it turns out, Greg was the only student in the class who knew anything about programming – not a problem until the students were required to create

software in dBaseIII+ to run a fictional business. Greg tells the story this way: "We could pick any business we wanted. We had to create the software in dBaseIII+ to run that business start to finish. Needless to say, I was busy on a lot more projects than just mine. It was then I realized that the computer thing gets me a lot more excited than law or constitutional stuff."

### On to the Windy City

Ever practical, Greg decided that rather than switching his major again at that late date, he would get the political science degree and then look around for a computer science program that would let him get a second degree as quickly as possible. When his wife took a job in Chicago, Greg started looking in that area and found the DeVry Institute. DeVry offered a three-year computer science program. Greg finished it in a year and a half, getting experience in CICS, COBOL, JCL, IDMS, and fourth-generation

languages.

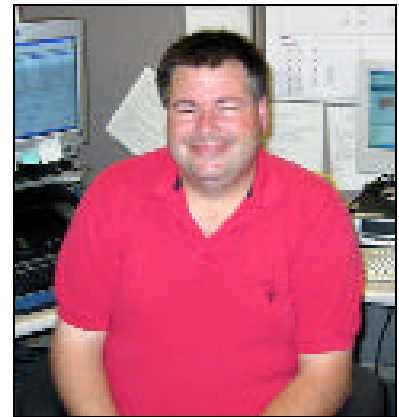
### Back to Packer Country

After a stint working in Chicago, doing COBOL and CICS programming for Policy Management Systems Corporation, Greg and his wife returned to their home state of Wisconsin and settled in Appleton. Greg expanded his skills and interests to include Lotus Notes and Unix.

After working several years for Employers Health Insurance (now Humana) and Wausau Insurance, Greg found his way to ZyQuest.

### A home with ZyQuest

Since joining ZyQuest seven years ago, Greg has been practicing his computer expertise at Kimberly-Clark. Greg chuckles as he admits that he wasn't expecting to stay so long at one client. "This isn't exactly what I signed up for, but I'm absolutely



*Greg Goodfellow*

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*“At some point we’ll start seeing people switch away from land lines, but I’ll bet it’s not for at least another ten years.”*

~~ Greg Goodfellow

happy,” Greg said. “What I like is the opportunity to try new things. There’s a lot of that here. Being in Web Services, we’re pretty much on the leading edge of a lot of technologies that are going on,” he added.

### On the horizon

So what are the hot new technologies? According to Greg, one of them is Voice over Internet Protocol – VoIP. (*For more information on VoIP, see Innovention’s cover story.*) Put simply, VoIP sends voice information over the Internet in much the same way that it sends e-mail. The science behind it seems sound, Greg says, but there are concerns. “All that traffic is being routed over a public switching network. As a computer guy, I recognize that anything that isn’t encrypted can be easily accessed,” he said. “And it looks like the government would be able to intercept your calls without even a wiretap. It’s a public network that you’re putting your packets out on.”

Despite security concerns, it looks like VoIP use may become increasingly common, particularly in the business world. Greg commented that while VoIP might not necessarily facilitate business, it will certainly make it cheaper. “If you’re using a public switch network that

already exists, you don’t have to pay for it, certainly that’s dollars off your bottom line right there,” Greg said. He added, however, that “if we see large companies switching off their phone companies, which assess fees and taxes that go to the government, we might see the government starting to assess Internet use fees.”

And even with the advent of VoIP and cell phones, Greg doesn’t see land lines going away any time soon. “A land line in the house is very comfortable for most people. For example, even if the power goes out, I know my phone will work. But if I forget to charge my cell phone, it’s dead. I’m off the air,” Greg said, adding, “I think at some point we’ll start seeing people switch away from land lines, but I’ll bet it’s not for at least another ten years.”

Greg also predicted that wireless networking will improve and become more mainstream in the future. “Right now, you can get only 300 feet from your desk with cables. With wireless, you don’t have those limitations. There was recently a conference of hackers out in Las Vegas. They had a contest to see who, using just garden variety wireless equipment, could hook up the longest wireless link. I think a couple of 19-year-

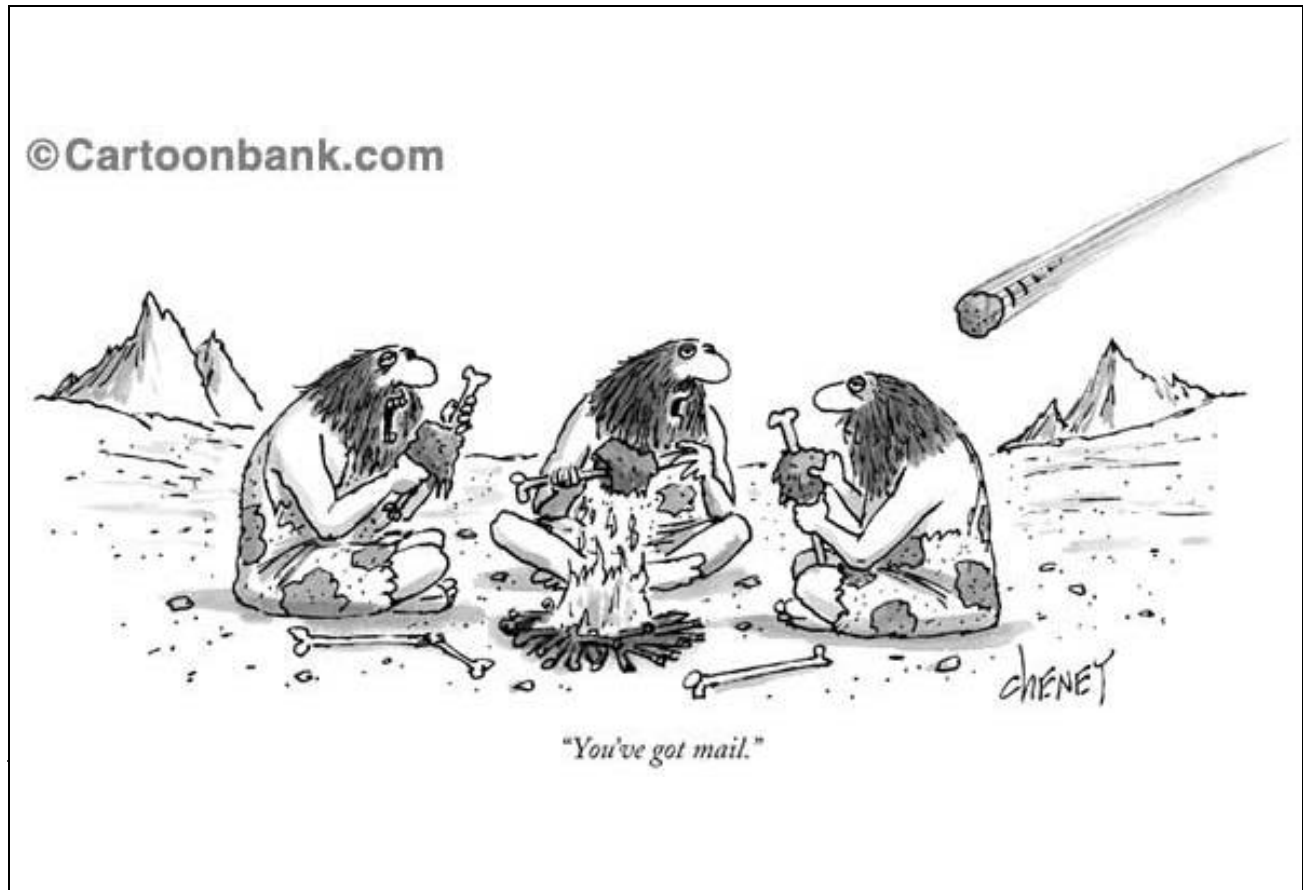
old guys made a link of 55 miles. They probably could have gone more, but they apparently ran out of road. Granted, they’re out in the desert and there’s nothing in the way – no hills, no trees. But 55 miles, using your standard wireless routers – ½ watt, that’s hardly anything – to be able to go that distance, that’s pretty impressive. I think you’re really going to see a lot more of the wireless networking going on,” Greg commented.

### In an ideal world

If Greg weren’t in the computer world, you’d probably find him working on the water somewhere. Even after working for six summers driving tour boats on the upper Dells, Greg hasn’t tired of the water. “I once thought about being a tugboat captain on the Mississippi,” he admits. “The whole riverboat traffic thing on the Mississippi really intrigues me.”

While it isn’t water world, life as a ZyQuest consultant is good, too, Greg says. “My experience with ZyQuest has been wonderful. I’ve had contact with other consulting companies by working with people from those places, and I always tell them that if they’re ever unhappy, give ZyQuest a call. ZyQuest has always done right by me.” ✍

On the lighter side...



Coming up...

In the next issue of *Innovention*...

...we'll look at some of the challenges involved in providing computer services for an international relief organization active in some of the world's most dangerous hot spots;

...we'll revisit *Spam*, post anti-spam legislation;

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... we'll speculate on technology trends for 2005 and look back on 2004.

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