



NH'S

EVOLVING Telecom Industry

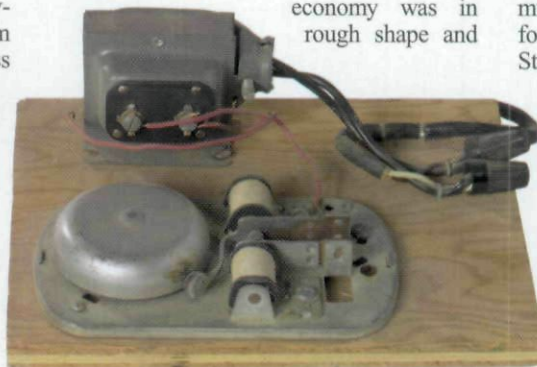
New technology and expanded services enter NH's marketplace.

BY MARK LALIBERTE

For the past five years, the telecommunications industry hibernated — recovering from the high-tech crash that left it decimated. However, like the economy itself, telecom has awakened. Fed by a business climate clamoring for new and faster services, both service providers and the companies developing telecom technology are expanding.

“To look at telecom’s resurgence during the past three years has to be one of the great stories of the high-tech era,” says Kevin Brown, executive vice president of marketing for Pannaway Technologies, an IP-based service transport solution provider in Portsmouth. “The conversations

we are having in 2005 were not happening in 2001 or even 2002. The technology and telecommunications economy was in rough shape and



the innovations you hear about today were in their infancy.”

In 1996, Congress passed the Telecommunications Act, which helped to lower prices for standard phone service. The Granite State, riding high on the tech wave, had some of the highest Internet usage per capita in the country and saw 8.2 percent of the population employed in high-tech. It was a great time to be in telecom.

However, when the tech bubble burst at the end of 2000, telecom was one of the hardest hit industries. Cabletron broke up, while many up-and-coming telecom and IP companies, like the Taylor Group in Bedford, Bowstreet in Portsmouth and iCOMS in Nashua, were either bought

out, moved from the state or went out of business. Vits Network, a large and promising NH Internet access provider for businesses, disappeared in 2001.

However, many NH telecom experts say 2005 marks a turning point for the industry. Low unemployment and a favorable quality of life helped to keep telecom workers in the state during the downturn, while a revitalized economy is attracting new talent.

Some in the industry say that the break-up of Cabletron may have been the biggest factor in the current telecom boom, as new companies drew talent from the former Rochester company to develop their own cutting-edge technology and services.

Downturn Development

Many of today's top NH telecom companies hit their formative stride during the tech bust of 2000-2001 and were able to take advantage of the flagging market.

"You hate to see the economy do as poorly as it did in the early part of the decade, but it was a benefit for us," says Brown of Pannaway. "When we started, many vendors that sold computer and telecom equipment were going out of business, which allowed us to purchase critical parts for pennies on the dollar. This allowed us to ramp up with much less capital than it would have normally taken us."

George Kassas started Cedar Point Communications in Derry, which develops, markets and sells VoIP switching gear, with a focus on cable operators, in September 2000. "When we began, there were two of us. Now we have more than 140 employees and more than \$70 million in private funding. Part of this comes from being able to buy equipment at a great price."

However, Kassas says, having a large pool of talent in the state helped as well.

"When Cabletron split up, there was a wealth of human capital in this state. There was a lot of high-powered talent looking to channel their energy into new endeavors. Luckily, there were enough enterprises in the state to keep them here, which was a benefit to our growth and for other telecom-based companies."

Brown says that another advantage has been the influx of talent from other states, especially from Massachusetts.

"Many came to work at Cabletron, but the real story is that many stayed after Cabletron,"

says Brown, who was a 10-year employee there. "You cannot underestimate the effect that these people's IP knowledge has brought to New Hampshire's telecom space."

Another bastion of telecom knowledge is tucked away at the University of NH in the school's InterOperability Laboratory (IOL). For 17 years, it has been one of the top testing grounds for networking and data communications products.

According to the school, it is the only full-scale, nonprofit test lab in the world dedicated to fostering cooperation and understanding within the data communications industry, while at the same time providing hands-on experience to future engineers.

Trent Waterhouse, vice president of marketing for Aprisma Management Technologies in Portsmouth, points out that the NH InterOperability Laboratory has one of the most advanced telecom testing programs in the world. "The largest ISPs, Lucent and Alcatel, are testing their products at UNH, which is incredible because these are programs one would think would be in the Silicon Valley or in Europe," he says. "They have the equipment and manpower to make sure that things work smoothly."

One of IOL's recent endeavors is the testing for Phase II of the IPv6 Ready program.

IPv6 is the backbone of Internet2, which is an advanced research-based information network primarily used by universities and research facilities. It is considered in the IP world to be the next major step in Internet advancement.

"The things that they are doing at UNH are amazing," Brown of Pannaway says. "They're really advancing telecom on an international level."

Furious Five Years

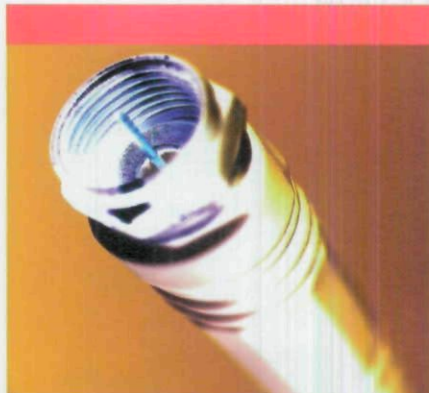
Waterhouse says that industry talk at the turn of the Millennium involved improving the speed of Internet access.

He says that, early on, the question was always "How can I acquire more content?"

"Back then, though, nobody was looking at how big concepts such as voice-over-Internet protocol, or VoIP, would be. It is the same thing with video on demand or faster Internet access. Now it is called the 'triple play' of service," Waterhouse says.

What makes VoIP appealing is that it allows a person to make telephone calls to anyone with a regular phone number, whether it is a landline or cellular, using a computer network over the Internet.

"With companies like Vonage making an impact in the VoIP market, it has really



Speeding Up Rural Internet Access

While the telecommunications industry continues to innovate at a rapid pace, some rural communities in NH wonder if they will have access to the new technology.

Jim Roche, president and CEO of the Business and Industry Association of NH in Concord, says that the lack of affordable, high-speed Internet access is an impediment to economic efforts in the northern and western parts of the state. "At three roundtables I've gone to, I had businesses complain that their only options for fast online connectivity was through T1 lines, which were cost-prohibitive for many companies," he says.

Telecom companies are beginning to extend services beyond the southern tier. Lightship Telecom provides T1 service to most parts of the state. "Overall, the market has been very good to us because much of New Hampshire has sophisticated data needs," says Ranier Gawlick, executive vice president of marketing and customer relations for Lightship Telecom in Nashua.

However, he says there are always supply and demand concerns. "If someone from Littleton wanted a T1 line, it would be more expensive than in other places, so we're looking at developing ADSL opportunities for those customers where T1 is too expensive or otherwise inappropriate," he says.

Lightship's ADSL service costs about \$200 a month versus a T1 line, which averages \$500 a month. However, Gawlick says there are drawbacks to ADSL. The quality is slightly less than that of T1 and Verizon prioritizes repairs to T1 lines over ADSL. "They guarantee fixing T1 in four hours, where with ADSL, it is 72. That's a big difference for companies," he says.

However, Erle Pierce, vice president for government and public affairs for Verizon-NH in Manchester, says there has been an effort to increase access to affordable high-speed Internet in rural areas. "(The lack of Internet access) may have been the story three years ago, but there are now many options for rural customers," he says.

Pierce says a Web site, technologynh.com, lists all the high-speed providers in the state by town as well as services that cost less than \$100 a month. "We have 121 central offices in the state, with DSL available in 96 of them. High-speed Internet is actually very prevalent."

Pierce says that the problem is not supply, but demand. "In the northern part, there's been less of a pick up," he says. "It doesn't make sense for companies to invest in areas where it is not wanted."

In March, the state released the Northern NH Telecommunications Master Plan, developed by 20 telecom and economic development experts. The group will use the plan to fund, implement and improve a web of infrastructure projects in rural areas. The report is available at www.ruralnh.org. ■



changed the telecom landscape," Waterhouse says. "You'll see more companies get on board, especially the bigger companies. Many of them are now scrambling."

Brown of Pannaway says providing triple-play services is the primary focus of the telecom industry.

"This is the combination of voice, video and data over one line. More specifically, it is the ability to provide more in a competitive environment. With such radical jumps in telecommunication, the needs jump as well."



Meanwhile, video on demand and "all-you-can-eat Internet," as Waterhouse and others refer to ultra-fast Internet, are becoming increasingly popular as these services become available.

"I think where you see the push to provide these services is within the cable industry," Waterhouse says. "In New Hampshire, and in New England in general, Comcast has really invested capital in expanding its ability to provide services to its customers, especially in more rural parts of the state. Add to it that Comcast now provides land-based phone service and is really making a push in the state, it is presenting a challenge to Verizon."

Kassas, executive vice president of Cedar Point, says that Comcast is doing a good job of bringing triple-play services to the state.

"Of the service providers, Comcast has done a lot to make telecom, for the consumer, competitive," says Kassas. "By introducing telecom service, they've increased the level of choice for consumers and businesses."

While the big names in telecom may be Verizon and Comcast, the independent phone companies in the state have seen the trends and are working to capitalize on them.

"With all the advancements that have gone on just in the past couple of years, the independent companies know they have to move away from

traditional land-line services and provide triple play products to satisfy their current customer base," Brown says.

Granite State Telephone in Weare, one of the oldest phone companies in the nation, services seven rural NH communities. It has been increasing the scope of its services to remain competitive. The company provides business and consumer-based Internet service as well as Web hosting throughout southern NH and southern Maine through its GSInet brand.

"I've been here for 34 years and I've never seen telecom change so quickly as I have now," says Bill Stafford, chief operating officer for Granite State Telephone and GSInet. "To last as long as we have, you're required to be a progressive company when it comes to staying on top of technology and consumer trends. This is especially true now, considering that the cable companies and Verizon have really ramped things up."

Stafford says that while his company has no competition for its land-line dial-tone telephone service, the company's leadership knows that a percentage of their customers, especially businesses, want to know that telecom advancements will be available to them. "Today, not being up on what the next wave of telecom services are is the best way to become a former telephone company," he says.

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"Fiber optics provides the consumer with a major amount of bandwidth. FTTP is the phone company's way of building out from its phone systems and competing with the cable companies," Waterhouse says.

Stafford is excited about FTTP and says that Granite State Telephone will experiment with it within a year.

"Currently, we have what is called 'fiber to the curb,' where all of our customers are within 8,000 feet of a fiber optic line. The prospects of FTTP are unreal. Right now, our top DSL service delivers data at five megabits per second (Mbps). With FTTP, we will be able to deliver services at 100 Mbps and beyond, which is inconceivably fast right now. However, when you consider the amount of bandwidth required for HDTV, video on demand, VoIP, all-you-can eat Internet, and any additional telecom services that may come down the road, that number does not seem so far-fetched."

Verizon-NH is also excited by the opportunities presented by FTTP, says Erle Pierce, who is vice president for government and public affairs.

"Verizon has begun to experiment with this technology with pilot programs in some southern New Hampshire towns starting this year, so we are definitely excited about the prospects of fiber to the premises," Pierce says. "Having the capacity to provide HDTV to multiple household televisions cannot be

done now because coaxial cable does not have the capacity to handle such large streams. FTTP will be able to do this, while still providing voice and data services."

Ranier Gawlick, executive vice president of marketing and customer relations for Lightship Telecom in Nashua, says that the advancements in telecom from even three years ago have been astounding. "The concept of voice-over-Internet protocol was just in its formative stages. Not many people thought it would become as sought-after as it has. Now, it is all that the telecom industry talks about."

However, Gawlick says, it takes a large amount of broadband space to provide these services. Lightship provides high-speed T1 and DSL lines for businesses throughout parts of New England. "As businesses be-



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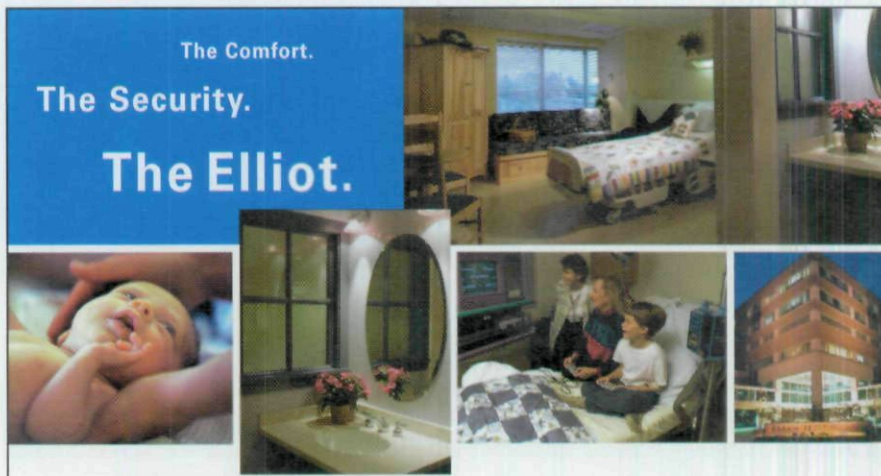
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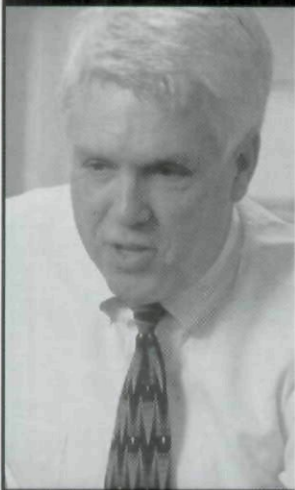
Lahey Cardiology at The Medical Center, cardiologists left to right: Dinesh Kalra, MD; Steven Schwartz, MD, FACC; Christopher Pyne, MD; and Wendi Cardeiro, MD.

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come more sophisticated, they realize that they need the ability to transmit more voice, data and video over their systems."

Merger Mania

As the market for telecom services becomes more competitive, providers are feeling the pressure to invest more in resources. This inevitably means mergers and acquisitions on a national level.

There have been numerous high-profile mergers of multinational telecom companies. Within the last year, Sprint acquired wireless carrier Nextel Communications. SBC, a "baby Bell" company that sprang from the 1984 divestiture of AT&T from its local telephone operations, came full circle by purchasing AT&T. In addition, long-distance carrier MCI, after spurning overtures from Qwest, may accept an acquisition offer from Verizon. What were seven local AT&T based companies 20 years ago have dropped to four.

"Two of them, Verizon and SBC, are in dominant positions and the other two, Bell South and Qwest are much more vulnerable. It is not inconceivable that there are more mergers on the horizon," Gawlick says.

Waterhouse says it is possible that Verizon could buy out Bell South, SBC could buy out the financially troubled Qwest, or Qwest and Bell South could merge. "However, those scenarios may raise the eyebrows of anti-trust regulators," he says.

What impact will these mergers and acquisitions have on NH customers? According to Kassas, Verizon's merger, in the short-term, will help telecom consumers in NH.

"As a society, we demanded lower prices per minute for phone calls and Verizon responded. Twenty years ago, it was 25 to 30 cents per minute to make a long-distance call. Now, in many cases, it is less than a penny. The competition came from cable and cellular phone service, not other phone companies," Kassas says. "The system works best when federal regulators do their homework to evaluate adverse impacts. However, an even more adverse impact comes when the government does too much regulation of the telecom industry. The free markets are doing fine right now."

U.S. Sen. John Sununu, a member of the Senate Commerce, Science and Transportation committee, believes that regulation should be uniform across the country.

"Currently, the states have varying degrees of regulation and many of the laws on the federal level go as far back as the turn of the last century. Telecom is an ever-changing national and international industry and to



change with it, the U.S. needs a clear, consistent and limited telecommunications framework," he says.

Competition not only comes from the likes of Comcast or the cell phone industry. They are also coming from competing local exchange carriers, or CLECs, like Lightship Telecom.

Since the passage of the 1996 Telecommunications Act, which allowed for competition within local phone service markets, CLECs have been able to compete in NH because of access to unbundled network elements and the availability of telecom services at wholesale prices from incumbent local exchange carriers, or ILECs. ILECs are telephone companies that were in existence before 1996.

Lightship Telecom, as a CLEC, is able to make its service available through lines established by ILECs. For example, Lightship, according to Gawlick, can co-locate with Verizon switches. "We are available in Keene, Lebanon, Hanover, Laconia, and the seacoast, as well as in northern Massachusetts," he says.

Kassas says that between the CLECs, the independent phone companies and Comcast, there is plenty of competition for Verizon, creating lower prices – an opinion seconded by Sen. Sununu.

"The recent mergers will create players with a national presence that will be able to provide voice, video and data in a comprehensive way," Sununu says. "It is likely to expand the number of choices, which I believe will increase retail competition and choices for customers."

However, in the long term, some are concerned that too much consolidation will be a bad thing for consumers.

"Right now, the cable companies are investing in the technology that will drive triple play services, which is motivation for the telephone companies to innovate," Brown of Pannaway says. "However, if there is too much consolidation, regulators may have to step in. For the time being, however, Verizon has been a good steward."

Petr Brym, the director of UNH's Telecommunications and Client Services Department, says there needs to be a smoother transition when these acquisitions take place.

"The mergers so far ... have been mostly disruptive and only somewhat helpful," Brym says. "In the long term, (I) hope for and expect improved services as the

mergers capitalize on the best of what each of the merged organizations brings to the table."

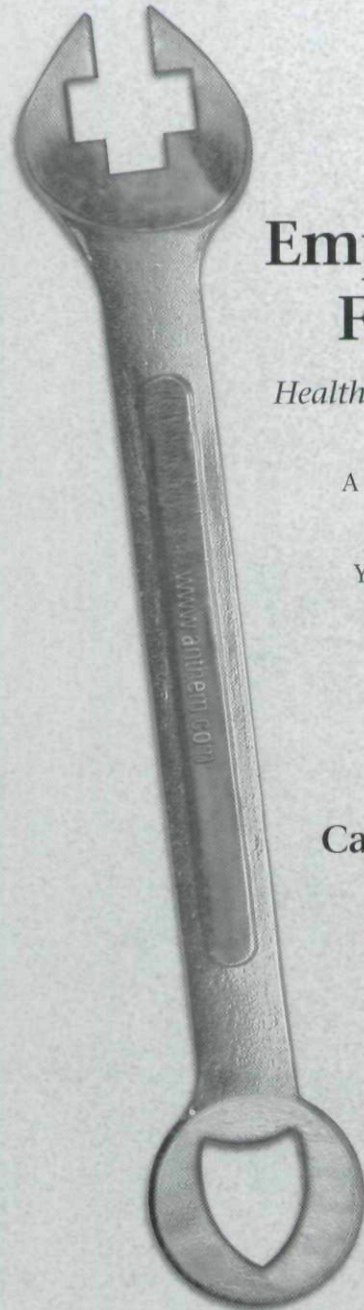


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NH's Telecom Landscape

It's not just national companies that are involved in mergers and acquisitions. They are also occurring at the local level.

Aprisma, a mainstay in NH's post-Cabletron world of telecom, was purchased in February by Concord Communications Inc. in Marlborough, Mass.

However, according to Jack Blaeser, president and CEO of Concord Communications, Aprisma will continue to operate as a separate business unit.

Aprisma is indicative of the growing market for NH companies in the telecom field. "The market for ancillary telecom businesses in the state is a strong one," Waterhouse says. "We work with 23 of the 24 Internet service providers and we're closing in on number 24." The company's relationships include five of the six companies involved in recent mergers – the exception being Nextel.

Waterhouse says Aprisma does much of its business on a national level and actively works with universities and municipalities.

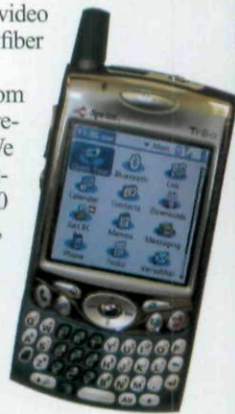
"One of our clients is Arizona State University in Tempe, Arizona, and one of their projects, in response to the controversy over the use of stem cells, is to build synthetic ones by taking information from fetuses and embryos," he says. "ASU uses our software, in conjunction with the school's high bandwidth and high-performance grid computers to make it happen."

Waterhouse says Aprisma's software is also being applied in a Texas city's wireless electric grid to inform the city of power failures before the electric company even knows. "This is valuable information for a business," he says.

Pannaway has developed a way to increase the speed of copper-wire transmissions to near-fiber optic speed.

"If you are in some outlying areas in this country, copper connects from your home to the phone company, which is markedly slower," Brown says. "Our hardware can deliver VoIP, broadband data and video at a speed comparable to fiber optic cable."

The Portsmouth telecom company is reaping the rewards of its technology. "We are primarily aimed at working with the more than 1,300 independent local carriers, which represents 20 million lines. We are doing a lot of business in the Mid-west of the country, because there are more independent companies there," Brown says. ■



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