

Woodstock Goes All Out with Fiber

Minnesota operator uses Tellabs GPON solutions for an aggressive upgrade.

By M.J. Richter

In rural Minnesota, Ken Knuth divides his time between raising horses and delivering advanced communications services to area residents and businesses. On one recent morning, he helped a mare get through a difficult delivery and then turned to another complex task: continuing the buildout of a FTTH network that can deliver access speeds of up to 75 Mbps.

Woodstock Telephone Co., where Knuth is owner and president, decided that FTTH was essential for staying ahead of both his customers' bandwidth needs and the competition. With 1,300 access lines serving an operating territory of 450 square miles in southwestern Minnesota, the independent operating company provides Internet and voice services to subscribers in 5 neighboring communities and the surrounding rural areas.

Knuth said many of his customers are farmers who use the Internet for applications such as checking commodity prices, buying equipment, plowing their fields along GPS-defined grids and using software to measure crop yields in real time.

From the Node to the Home

Woodstock initially responded to the bandwidth demand by deploying FTTN in some exchanges, "putting in a couple cabinets a year, burying 5 to 8 miles of fiber here and there," Knuth said.

Although that shortened the copper loops, they still couldn't muster more than 512 Kbps. Worse, a lot of that copper, which Woodstock had installed in 1976, was near exhaustion. The piecemeal FTTN strategy wasn't working, and it wasn't economical.

"The copper had all gotten wet anyway," Knuth said.

About 3 years ago, Knuth decided to shift to a FTTH architecture. At the time, Woodstock's network consisted of a 5E switch in Ruthton, Minn., with fiber links to Tellabs® 1000 Multiservice Access Series DLCs in the towns of Garvin, Holland, Russell and Woodstock. Copper loops ran from the DLCs to customer premises.

Until very recently, Woodstock's fiber backbone was an ATM-based SONET OC-12 ring serving 4 of the 5 towns, with Garvin tied in via DS1/DS3 connections leased from Qwest Communications.



Woodstock delivers up to 75 Mbps via fiber to homes.

Preparing for the Future

Woodstock first replaced the 5E switch with a softswitch that can provide SIP-based voice service. Then Knuth began to look for a future-ready access platform that could support services such as IPTV and video on demand. Knuth also wanted a proven vendor with the staying power to continue evolving that platform.

The problem within the access-equipment market, Knuth said, is that “Company A comes out with a good product but, a year later, Company B leapfrogs them. Company A is not big enough and well-enough established to do the research or spend the research dollars to keep up with Company B or to leapfrog them.”

Knuth chose the Tellabs® 1150 Multiservice Access Platform (MSAP) with integrated SIP interface and GPON line modules for a FTTH solution. The choice was based partly on Knuth’s decades of experience with Tellabs equipment and his expectations of the vendor’s staying power.

The Tellabs 1150 MSAP’s non-blocking architecture was another key factor. With its 720-Gbps backplane, 44 Gbps to every multiservice card slot and 10-Gigabit Ethernet uplink capabilities, the Tellabs 1150 MSAP has the scalability to help Woodstock stay ahead of customers’ bandwidth requirements. Knuth expects that in a few years, many customers will want to boost their access speeds to 40 Mbps or 50 Mbps.

Woodstock has deployed 3 Tellabs 1150 MSAPs in a ring and plans to add a fourth. Eventually it will install a fifth Tellabs 1150 MSAP in a point-to-point connection off the ring. Although the ring now supports GigE transport, Knuth said Woodstock likely will ramp that up to 10 Gbps to handle all the IP traffic among the 5 exchanges.

Desktop Fiber Eventually

Knuth also likes the Tellabs 1150 MSAP’s GPON line module because “that’s the latest technology, and that’s what we use.”

Woodstock has no immediate plans to take fiber all the way to the desktop, but Knuth said he may consider that application within the next several years. “That would be an advantage because you could put a splitter in a business system, put in indoor ONTs and run fiber right to the desktop.”

“70/80/90” BENEFITS

With the Tellabs® 1150 Multiservice Access Platform (MSAP), Woodstock Telephone now has the option to take fiber all the way to customers’ desktops. That’s because Tellabs has converged FTTH software with the Tellabs 1150 MSAP to make it function as a GPON OLT.

Combined with the deployment of new indoor ONTs such as the Tellabs® 1600-704, that adds up to an opportunity for Woodstock to deliver not only residential triple-play services, but also highly secure FTTH applications for commercial customers.

“An FTTH application would really make Woodstock stand out from the competition because other vendors and operators can’t offer that,” said Ken Berniklau, Tellabs product manager. “In the process, Woodstock could leverage its existing investment in the Tellabs 1150 platform to create additional revenue streams and simultaneously reduce costs. There’s no need to maintain multiple systems.”

He cites business models that quantify the “70/80/90” benefits of offering an FTTH application based on the Tellabs 1150 platform, compared with an Active Ethernet solution: 70% less CapEx, 80% lower power requirements and 90% less physical space.

In keeping with its long-term perspective, Woodstock also will be the first non-government customer to field-trial the new Tellabs® 1600-704 Indoor GPON ONT, which features 4 1-G Ethernet ports and 2 voice ports. Because many rural networks will not move to VoIP in the near future, the voice ports make the GPON ONT an ideal solution.

Although Woodstock customers haven’t asked for FTTH service yet, Knuth said the indoor ONT would enable his company to deliver the service when banks and other commercial customers are ready for it. In addition, he expects the smart home, with appliances wired for remote control, to be “quite an application in the future,” and one that clearly depends on an indoor ONT.

“We’re seeing a lot of development in that area, so we’re trying to get everything inside.” ■

ATM: Asynchronous Transfer Mode

CapEx: Capital Expenses

DLC: Digital Loop Carrier

DSL: Digital Subscriber Line

FTTH: Fiber to the Home

FTTN: Fiber to the Node

GigE: Gigabit Ethernet

GPON: Gigabit Passive Optical Network

GPS: Global Positioning System

IP: Internet Protocol

IPTV: Internet Protocol Television

VoIP: Voice over Internet Protocol

OLT: Optical Line Terminal

ONT: Optical Network Terminal

PON: Passive Optical Network

SIP: Session Initiation Protocol

SONET: Synchronous Optical Networking