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BLACKFOOT MAKES THE BIG SHIFT

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Montana is known for its beautiful mountain vistas, its massive state parks and its rugged individualism. Here, the Blackfoot Telecommunications Group is living up to the reputation of its hometown, Missoula, a once-distant outpost that sent the first Congresswoman to Washington — 30 years before women were given the right to vote.

The parent company of Blackfoot Telephone Cooperative, founded in 1954, also is proving that it's ahead of its time in moving to an optical Ethernet backbone network, even though it meant installing fiber deep into a service territory that covers 22 exchanges outside Missoula and includes 17,000 access lines spread over 6500 miles of mountains and canyons.

Blackfoot officials started talking about moving away from its traditional ATM/TDM infrastructure about three years ago, about the same time that such discussions were heating up at telcos nationwide. The difference in Blackfoot's case is that the talking was quickly translated into action. Last year, the company began swapping out its Nortel remote TDM switches and replacing them with a MetaSwitch softswitch and Occam Networks' IP-based BLC 6000 System broadband loop carrier systems. Thus far, nine remote switches have been replaced in a systematic transformation of this rural network.

The transformation happened not only because it's a new technology but because the economic environment for rural telcos is changing in a significant way.

"This company has been very forward looking in recognizing that our subsidies have gone away," said Dave Martin, director of technology for Blackfoot Telephone. "Competition continues to encroach, and our traditional funding mechanisms are gone. We knew we had to learn to do it cheaper in order to compete and survive."

In fact, even among vendors whose livelihood is tied directly to independents, Blackfoot tends to stand out.

"They have a vision that is clearly leading edge," said Russ Sharer, vice president of sales and marketing for Occam. "We work with more than 100 independent operating companies, and they are as visionary and aggressive as anyone."

Unlike other independents that have deployed softswitches, Blackfoot isn't using its new architecture to deliver voice-over-IP service in the traditional sense. Instead, the company is pushing to get high-speed Internet access via DSL to a large portion of its rural population — so far it passes 96% — and to create an infrastructure that is more cost-effective going forward. For voice customers, the service remains the same. Individual subscribers get DSL and traditional voice via a copper loop, but all TDM traffic is converted to IP as it hits the broadband loop carrier (BLC) system. The remote terminals are connected to host digital terminals at the central office and then to the MetaSwitch softswitch architecture. The entire network, other than copper drops, is IP/Ethernet over optical.

“If you believe that all services will drive to the cheapest, most efficient type of network, and you want to deliver any service, you have to move to an IP network,” said Martin, who joined Blackfoot from Lawrence Livermore Laboratories. “Our philosophy was to offer any service at any place. We recognized that in an architecture like this and a network like this, it takes several years to make the transition. First, we had to agree on a philosophy, plan a design and then plan the elements one at a time.”

The first, most critical step, Martin said, was making sure Blackfoot's fiber penetration was deep enough to sustain the new architecture.

“We had embarked on pushing fiber further out anyway,” he said. “We needed enough fiber to do an IP WAN.”

The next step — developing a request for proposal (RFP) and working with potential equipment vendors — took Blackfoot off the traditional telco path. Because of its anxiousness to move to an IP environment, even compared with traditionally aggressive rural carriers, Blackfoot wasn't able to work with its existing vendors to upgrade their systems or change network elements as necessary. Instead, the company shifted to a completely new set of equipment partners.

“Three years ago, ATM was still king,” Martin said. “There was certainly dissension about moving to IP from other rural telcos and certainly from our vendors. Our traditional vendors just really resisted that perspective, and hence, after the end of three years, none of them will exist in our network. It's nothing against them, really, but we chose others because those others were ready when we were ready.”

The RFP for IP-centric BLC systems went out in early 2003, and Blackfoot got three responses from IP-centric vendors as well as others from companies that hadn't yet gone in that direction. Blackfoot chose Occam in the fall of 2003 “because Occam had a graceful, simple solution much more in line with what IP was intended to do,” Martin said.

The two companies have since developed a mutually beneficial relationship.

Blackfoot's determination to move to a more streamlined architecture helped Occam develop its latest feature — emergency stand-alone capabilities that build switching into the Occam 6000 (see story on page 32). A new blade with a call agent enables autonomous local connections when the connection to the centrally located softswitch isn't available.

“Dave was part of the vision behind us doing it,” Occam's Sharer said. “He provided a lot of emphasis and gave us design guidelines and things he'd like to see.”

The stand-alone capabilities are critical, Martin said, because of the nature of the rugged terrain over which Blackfoot's fiber-optic network runs.

"One of the real challenges we faced was the geography," he said. "We have a lot of valleys, and we do have some areas where there are point-to-point systems, or folded rings. We weren't able to get every remote location on a self-healing ring, for protection. About 50% is on a ring."

The Nortel remote switches Blackfoot deployed have stand-alone capabilities, and now, as those switches are decommissioned, its Occam BLCs will have the same capability.

"We are in field trials now with Blackfoot, and the feature has general availability in July," Sharer said.

The choice of a softswitch vendor was a methodical process for Martin, who had an interest in softswitches dating back to the first Softswitch Consortium meeting in Chicago in 1999. The telcos softswitch RFP went out in mid-2004, and Blackfoot spent eight months reviewing the results.

"We don't have the resources to run lab trials," Martin said. "We did have very clear technical criteria. Again, our philosophy here is a decentralized switching fabric is the future, so to the extent that the different vendors shared the philosophy, they gained points."

MetaSwitch met those criteria and survived the scrutiny of a 10-person committee that carefully reviewed each aspect of the softswitch requirements, Martin said.

Mimicking the industry's current thought process, Blackfoot's initial goals are economic, Martin said, even though longer term, it has major new service ambitions.

"We had network assets that were reaching the end of their depreciation cycle and were going to be replaced anyway," he said. It simply made more sense to replace them with the next generation architecture.

The switch to delivering services using Ethernet delivers economic advantages in multiple ways, including operation expenses and performance.

"We've done a number of studies on this, in addition to the study commissioned by the Metro Ethernet Forum that showed that just switching to Ethernet-delivered services resulted in a 23% savings in operating costs," said Andy Randall, vice president of marketing at MetaSwitch. "That is only going to increase as investment in equipment is all IP- and Ethernet-based. Legacy Sonet equipment and TDM-based network boxes are not going to be able to keep up with the kind of cost performance we see out of Ethernet and 10-Gig Ethernet."

Blackfoot already is seeing a difference in performance.

"We are already experiencing restrictions on, for instance, DSL on our traditional network that we don't experience on our IP network," Martin said.

Rural telephone companies, in particular, stand to benefit from a move to IP/Ethernet because the engineering talent to support those networks is readily available and less costly than ATM/Sonet specialists, Occam's Sharer added.

"I don't think that's a problem for Blackfoot because the area they live in is very popular, but it is an issue for other rural telcos," he said.

The area in which Blackfoot operates is becoming more attractive all the time to vacationers, especially around Missoula. The city itself, which is home to the University of Montana, is served by Qwest Communications and by the CLEC and wireless arm of Blackfoot Telecommunications Group, operating as Blackfoot Communications. The parent company also operates Blackfoot.net Internet Services and TeleSphere, a back-office software company that developed customer care, plant management and billing system software for the other Blackfoot companies and is now marketing that product nationally.

"The CLEC was formed in 1996," Martin said. "The company has always been looking ahead."

What looms over the horizon now are new service possibilities, including IP video, IP Centrex and the full range of other services that open up in the IP and Ethernet environment.

"Our end users at this point won't notice a difference in the network because they are still getting their traditional voice service," he said. "But that changes with time. Our technicians are beginning to understand how to support IP services in an environment that is more comfortable for them. We expect to roll out an IP Centrex product. We also have an in-house technology center where we bring Chamber of Commerce members to let them try things out. Right now we have multiple SIP-based phones over just about any media."

Blackfoot also is running an internal test of ADSL2+.

"We have the Occam cards in-house right now," Martin said. "The only real issue there is modem availability."

The company is not yet planning to deliver video service, in part because it can't make the business case for standard video, he said.

"We don't have that much cable competition here — Montana has the highest satellite penetration in the country," Martin said. Hoping to play off of its local presence, though, Blackfoot is exploring a video-on-demand service for local content, such as football games and town council meetings.

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