Pulse Broadband: Making Rural Fiber Work

By Mitch Shapiro

In August, nearly 1,500 funding applications were submitted to NTIA and RUS for broadband infrastructure projects. Among these were two that aim to combine a unique mix of technical and business innovations to bring FTTP networks to very low density rural areas--in one case less than 5 premises per mile.

The projects, submitted by two rural electric co-operatives (RECs), employ the technology and services of Pulse Broadband, whose Chief Strategic Officer is Dave Pangrac, the subject of an interview in this issue of FTTH Prism, and a central player in the early development of the hybrid fiber coaxial (HFC) architecture.

Having planted the technical seeds that enabled cable networks to evolve from one-way TV distribution to broadband Internet and triple-play services, Pangrac and Pulse CTO Don Gall intend their latest innovations to sprout FTTP networks across rural America. And they see the nation's RECs as key partners in this endeavor.

Sharing this vision is Pulse's business management team, headed by CEO Bill Shreffler, who previously served as president of two mid-sized cable operators and Senior VP, Operations for Charter Communication's Midwest division. Under Shreffler's leadership, Pulse offers utilities a menu of management support services, up to and including turnkey operations of the telecommunications business delivered on their FTTP networks. This summer, Pulse acquired Pangrac Consulting, linking its business management services to Pangrac's technology expertise, including a patented FTTP architecture, which has been deployed in over 30 locations by a number of cable operators during the past three years.

While many stimulus projects targeting rural areas are based on wireless access, the experience of one of Pulse's first customers, located in a hilly and heavily forested area, serves as a reminder that wireless faces significant technical challenges and that fiber is the gold standard when it comes to building future-ready broadband infrastructure.

Ralls County Electric Co-op (RCEC) serves roughly 6,000 electric meters via 1,400 miles of plant in Northeast Missouri. That's an average of just 4.3 meters per plant mile, a far cry from the typical densities considered economically viable for FTTP deployments. But general manager and CEO Dan Strode is confident that, with a mix of stimulus loans and grants and Pulse technology and services, its FTTP network will be a wise—and even transformative--investment for RCEC and the communities it serves.

RCEC is taking on its FTTP investment with some experience under its belt. According to Strode, his utility has already deployed wireless using 2.4 GHz and 900 MHz spectrum, and found it wanting. Only a third of customers registering for the wireless service, he says, could actually receive it. And among those, he adds, some ended up losing service over time due to tree growth. Strode also cited technical obsolescence as an issue with wireless, while others have pointed to higher-than expected operating costs as a related problem. And while RCEC has also sold WildBlue satellite broadband

service, Strode says its technical performance and price-value equation also falls well short of what many homes and business want in a broadband service.

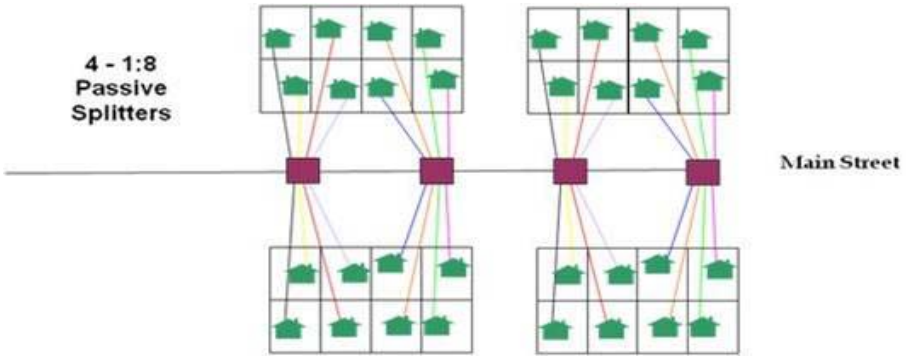
Strode says a survey of co-op members showed 94% support for the FTTP project and a broad willingness to pay the roughly $40 per month now charged for a sub-Mbps wireless service for a 20 Mbps symmetrical fiber-delivered broadband service.

Though eager to find a more robust solution than wireless, RCEC management is also aware of the co-op's limited resources and expertise. These limits were made painfully clear, Strode suggests, when he and other RCEC representatives visited a municipal fiber project as part of their ongoing effort to evaluate network options. After seeing what was involved, he and his team concluded that "we can't do this on our own." For a small rural co-op, he says, the cost, learning curves and extra management responsibilities were simply too daunting. At least until someone introduced him to Pulse.

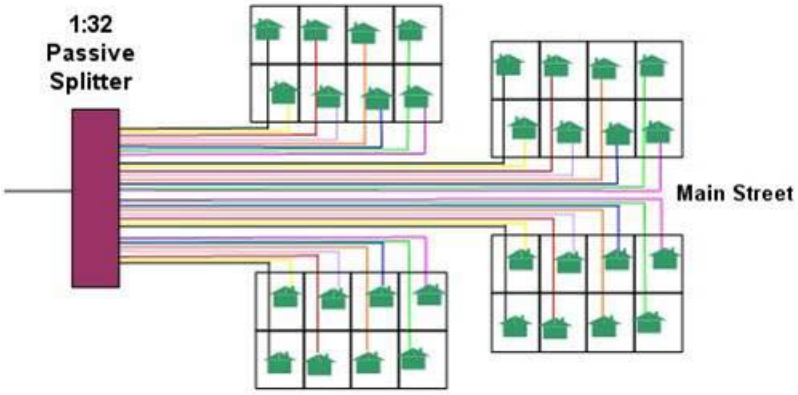
Pulse's offering is specifically designed to address the issues of cost, expertise, resources, business models and risk facing RECs and other utilities that serve America's small towns and rural areas. It includes:

- A unique and patented "distributed tap" architecture that significantly reduces capital costs relative to traditional FTTH architectures without sacrificing capacity. The architecture, which takes fiber to "taps" that then extend single fiber drops to each home, enables co-ops to build drops only to those members who subscribe to telecom services, which further reduces upfront capital costs. And because it uses only 4-8 fibers from the node, the Pulse architecture reduces splicing costs in cases of fiber cuts. (see diagrams below).

Pulse FTTP Architecture



Conventional FTTP Design



- A full and flexible menu of management services that can be customized to suit the resources and preferences of utility management. This can range from preliminary network design to construction management to turnkey operation of a utility's telecom business, which will be the case for RCEC, at least for the first few years.

- Technology, business arrangements and management systems that support a truly "open access" network and make it operationally and economically attractive for large video, internet, telephone and application providers (e.g., cloud computing, tele-health) to offer services to REC members. Pulse is currently in discussions with a number of providers about this open-access model, which Strode describes as "a perfect fit for rural areas," since "it relieves [RECs] of having to learn multiple new businesses," and reduces capital and operating costs. It also increases customer choice, which is likely to boost satisfaction and penetration. And it is also consistent with stimulus-funding requirements regarding nondiscrimination and interconnection, including a provision that favors projects that exceed these minimum requirements. Initially, the Pulse network will support an unlimited number of voice providers, up to 8 ISPs and two video providers, with plans to expand this capability in the future.

- Assistance in preparing an application for RUS/NTIA funding, access to which can reduce costs significantly, allowing utilities to push fiber to even lower density areas, as is the case for RCEC's planned network. On that score, Strode has high praise for Pulse, noting that a DC consulting firm that has reviewed many stimulus applications described RCEC's as "the best grant application they'd seen."

According to Strode, Pulse's ability to deliver this full range of services is the key to success for a rural utility like RCEC, which not only lacks broadband access, but is also seriously constrained when it comes to the expertise needed to build and manage a fiber network and broadband business. So far in their working relationship, says Strode, Pulse has "delivered everything they told us they would do before or on schedule, and mostly

before." In addition, he says, the relationship has been "extremely enjoyable," and one he hopes and expects will be long-lasting.

As Strode notes, RECs also bring important assets to their relationship with Pulse, including rights of way (ROW) and utility poles. As too many wired and wireless projects have found, problems and delays in obtaining access to ROW and poles owned by other entities can slow deployment, increase costs and, in some cases, have contributed to a project's failure. Having these assets "in-house" goes a long way toward reducing this element of project risk.

Another valuable asset co-ops bring to the partnership is their close ties to local businesses, organizations and households, since their members are both customers and owners. This unique element of REC management is reflected in a long history of support for economic development in their service areas.

Talking with Strode, it's clear that he's already thinking about how to use the FTTP network to improve the economy and quality of life in RCEC's service area. This attitude is reflected in the utility's commitment to invest 10% of the network's free cash flow to support local economic development.

Like many rural residents, Strode is well aware of the lack of access to education and healthcare services in rural areas and the value of communication in helping to bridge these gaps. Among the examples he cites are some he and his family have experienced directly, including his son's lack of access to pre-med classes not available in his rural school district, and the fact that his father's life was once saved thanks to ready access to a communication link with a St. Louis trauma center.

Other examples of how Strode expects the FTTP network to benefit his community include an expansion of home-based businesses, allowing lawyers and others to telework from home (RCEC's service area includes vacation areas currently lacking broadband access), increasing access to top-flight teachers and classwork in local schools and homes, and linking doctors offices and community clinics to hospitals and specialists with skills and resources not available in RCEC's service area. The network is also expected to deliver security services and, eventually, to be used by RCEC to support a range of "smart grid" functionalities that will improve its energy and operating efficiency, and some of whose costs will be eligible for support from energy-related funding programs.

Noting that, like RCEC, "a lot of co-ops tried to get into broadband early" but didn't find the success they'd hoped for, Strode is eager to help other RECs benefit from his experience.

With the help of Pulse technology and services, financial support from the stimulus program, and the backing of a motivated co-op membership, Strode intends to demonstrate that: 1) the economics of rural fiber can work, even in areas with less than 5 premises per mile and; 2) FTTP networks can help revitalize America's rural

communities by boosting local economies and improving access to high-quality healthcare, education and other services.

That strikes me as the kind of infrastructure project the broadband stimulus should be all about.

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Mitch Shapiro is the founder of Rural Fiber Works, a service that helps utilities revitalize rural communities by linking cost-effective FTTP deployments with planning that leverages fiber's power to support economic development and improved access to health, education and other essential services. In 2008 he co-authored with David Chaffee *The Municipal and Utility Guidebook to Bringing Broadband Fiber Optics to Your Community*. He can be reached at mitch@ruralfiberworks.com or 760-753-2890.