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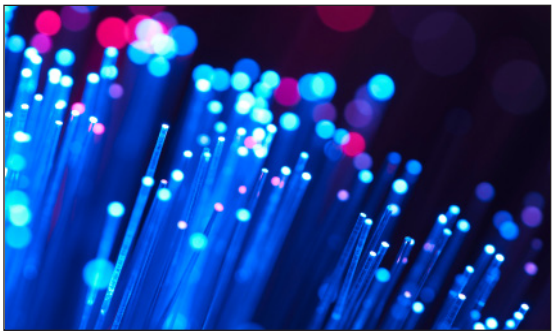
Driving Down the Cost of Fiber

By Becky Bracken



Fiber is the future, but it's a major hassle. Fiber is expensive, fragile, requires real estate, permits and takes time to deploy. But fiber is more important than ever. The delivery of LTE wireless services will require fiber-fed towers. And as demand for data and the next generation of Communications and Entertainment (COMET) services continues to explode, wireless networks will have trouble keeping pace.

"Fiber is the only medium that truly future proofs a network," fiber management company Clearfield, Inc. President and CEO, Cheri Beranek says. "While we believe in a heterogeneous network because there is no one-size-fits-all solution, every solution, whether it is wireless or wireline, needs some fiber in the network in order to prevent performance degradation."

Hybrid networks

On the wireline side, FTTH is not necessarily needed to deliver ultra-broadband connections. AT&T's U-verse is a good example of how hybrid fiber and copper networks can be successful.

"AT&T's U-verse service is delivered with fiber-fed DSLAMs," Erik M. Keith, principal analyst, Fixed Access Infrastructure Current Analysis, Inc. says. "AT&T's services are competitive with cable operators, although as the broadband bandwidth war escalates, AT&T will find it harder to match the 100 Mbps--let alone the 300 Mbps services--offered by Comcast, whereas Verizon, with its FiOS network, is much better positioned to compete with Comcast and Cablevision in this respect."

"In the telco operator world, fiber-fed DSLAMs, especially in combination with VDSL2 vectoring, bonding, or in Fiber-to-the-building (FTTB) deployments, the subscriber can still be connected via the existing copper plant, and receive 'fiber-speed' connections thanks to these new and still-evolving copper enhancement solutions," Keith adds.

On the cable operator side, there are many technologies that enable 'fiber-speed' connections, including DOCSIS 3.0 channel bonding, service group reduction and utilizing higher RF spectrum. But all of these are essentially complementary to fiber, not replacements for it.

Fiber's stigma

It seems fiber is here to stay. But the good news is that fiber isn't the fragile, expensive, time consuming affair it used to be. First, Keith says operators who have just bitten the bullet and rolled out the fiber have been pleasantly surprised with operational savings sooner than expected. Other developments offer the promise of reduced deployment costs and headaches.

"We believe ROI analysis will prove that a full-fiber network can be cost-justified in many environments," Beranek says. For other environments, incremental fiber deployments are a better idea so that deployment can be aligned with subscriber take-rates and revenues.

"When we got into fiber, we looked around and found that there's a stigma about fiber to the premises," Vince Tyson, the general manager of Plateau Telephone in New Mexico says. "The general philosophy was that it's expensive, and I started to question that. In order to be cost effective, we looked at the fiber and said, 'O.K., how can we build it like copper?' Now, clearly there are some differences.

Splicing, for example, has to be done differently. And of course, the economics are different, but by and large I would say that today's fiber networks have a lot more in common with the copper network than some of the earlier fiber networks."

Pushable fiber

Clearfield has developed a new "Pushable Fiber" deployment solution that slashes the cost of fiber deployment. One example of where pushable fiber is a good option is when conduit is maxed out or "exhausted."

"In these environments, the ability to run a demarcation extension or deliver additional (or new) fiber can become an expensive affair," Baranek says. When the pathway is full, the traditional option is to bore additional pathways for new conduit. Facility easements must be obtained which can take some time, requiring the best of negotiating skills with property and/or city officials. Even before the cost of core boring begins, engineering time is required to evaluate whether the structural integrity of the floor would be compromised in the building. Add the cost of pipe, couplers, and metals along with skilled manpower labor rates and too often, environments that truly require additional bandwidth and connectivity can't justify the return on the investment and the project is scrapped. This is exactly the environment that one of our clients, an OSP construction manager of an independent telephone company faced while addressing a job request from a wireless provider."

The job request involved the delivery of twelve single-mode fibers to a cell tower sitting on top of a 14-story hotel. This goal was to provide backhaul services to relieve cell traffic congestion for each of the carriers' traffic at this location. The price tag for a traditional fiber installment at this location was $15,000 and at least a week of work.

"Using a push-pull placement method, the rigid construction and small footprint of 10mm ruggedized microduct allowed for its placement into the exhausted duct, Baranek adds. "A total of 700 feet of duct was placed through 14 floors of the hotel with multiple 90 degree turns, and ELB junction transitioning 1/1/4" to 2' duct was passed utilizing two pull locations. The first pull location involved a 90 degree turn through which 350 feet of microduct was passed. In addition, the small footprint of the microduct allowed for it to be easily transported to the top floor allowing gravity to assist in the installation. The placement of the ruggedized microduct was completed within two hours. The 12 fibers were pushed into place in a total of 35 minutes."

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Total costs, including materials was $3,000--about 20 percent of the estimate for traditional methods.

Keith says there are plenty of other innovations on the horizon working to drive down the cost of fiber deployment.

"Israeli-based TeliSwitch Solutions debuted a new PON automated optical distribution frame (PON-AODF), which enables dynamic changing of split ratios in PONs in order to adapt to service penetration and meet evolving bandwidth service requirements," Keith says. "Also, one part of the fiber network that doesn't get talked about much is the in-home or in-building wiring. This is especially critical for multi-dwelling units such as condos and apartments. Several years ago, plastic optical fiber (POF) started getting some mind share, as it is much less expensive, is less fragile than glass fiber, and can be bent more easily in order to fit into constrained spaces, or make 'hard' turns, like, 90-degree bends."

Solutions like these are good news for network operators faced with shrinking revenues and skyrocketing demands for data bandwidth. Fiber is the future. There's no denying that. The good news is that there is hope to relieve a bit of the hassle, headache—and price tag—of doing the job right.

FTTH: Next gen network for the next gen economy

Much is being made in the midst of the economic doldrums being felt particularly across the EU and U.S. about creating an economy built to drive the next generation of industry and the delivery of next-generation ComIT solutions to both consumers and enterprise. The deployment of fiber and next generation network technology is precisely what will provide the lifeblood of future economies. Innovation is more than a slogan for politicians, innovation is real, and happening, at the network level.

The largest of the Channel Islands in the U.K., Jersey and it's telco operator, JT Global are betting that ubiquitous fiber will continue to drive the island's large financial industry. The island potentially has the answer to the future of economic development: Can prosperity be driven by broadband?

At a recent European conference focused on FTTH, Dr Peter Cochrane, an industry technology and operational veteran with more than 40 years of experience, referred to Jersey in his keynote speech: "Optical Fibre is the only viable choice on any cost, economic, operations and facility, for any future economy. Jersey is punching well above its weight here and putting the Channel Islands on the map by ensuring that businesses and people can benefit from new digital services ahead of the UK and Europe. JT's fibre-to the-home roll out and Next Generation Network technology make the Island an ideal example of how each country in Europe should be progressing, and as the keynote at the FTTH Conference. I was pleased to highlight Jersey as the leading light."

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North America continues to be the leader in FTTH deployment with more than 8 million North American homes with all-fiber connections,and FTTH now being offered to 19.3 million homes on the continent, according to the Fiber to the Home (FTTH) Council of the Americas.

"The notion that the upgrade to FTTH can be a catalyst for economic development is precisely what is driving this enormous interest in high-speed fiber we are seeing at the community level across North America," said Heather Burnett Gold, President of the FTTH Council Americas. "Civic leaders in communities of all sizes have a sense that more bandwidth means more opportunities for economic progress."