Overcoming Speed Bumps on the Road to Fiber

Transitioning to fiber may pose a number of installation challenges, but they're easily outweighed by the need for symmetrical broadband.

By Michael Sumitra / *ADTRAN*

I finally ditched my current internet provider after enduring months of outages, laggy video calls, kids' virtual learning dropping mid-class, and multiple hours lost to support calls and resets of my modem. I decided to take the plunge and go on a full-fiber diet.

However, my recent experience of having fiber internet installed at home made me realize the complexity and challenges of installing broadband. It required four visits from four technicians – one who marked out the utilities, one who trenched the fiber, one who installed the Wi-Fi gateway, and one who provisioned service. Each visit involved a truck roll.

This story is probably an echo of many customers' experiences getting high-speed broadband connections. Yet the demand for broadband and gigabit continues to grow, and it is an essential utility for the way people now work, play and communicate – virtually.

THE FIBER SUPER CYCLE

At the end of 2020, the U.S. had 54 million homes passed by fiber-to-the-home (FTTH) networks. This is expected to grow by 20 to 26 million additional homes passed by the end of the decade – a 40 to 50 percent increase – driven by rural broadband initiatives such as the Rural Digital Opportunity Fund (RDOF).

In Europe, a similar super cycle of FTTH buildouts is happening, driven by the EU goal to become a "Gigabit Society" by 2025 and the European Economic Communications Code,

which provides incentives for fiber network investments. The U.K. has been rolling out full-fiber networks, reached 6 million FTTH connections by the end of 2020, and is expected to reach 27-plus million by 2026 – a growth of more than 500 percent. More than half of these connections (15.7 million) will come from alternative network operators. Germany, with 6 million FTTH connections, and Italy, with 12 million FTTH connections, also have ambitious growth targets: 34 million (700-plus percent growth) and 26 million (200-plus percent growth), respectively.

THE PEOPLE PROBLEM

The biggest challenge service providers face is a shortage of skilled resources. This is a result of the parallel growth activities driven by a mix of government initiatives and an influx of private equity and infrastructure funds into FTTH projects. From network planners to fiber installers to network ops technicians, the communications industry faces a major shortage of people. In addition, growth targets and deadlines set by countries to bridge the digital divide seem not only ambitious but also, for some, unrealistic.

The industry is waking up to this reality of skills shortage and the implication for network buildouts. A letter submitted by the largest communications associations in the U.S. urged the Biden administration and Congress to invest in workforce development, stating, "The U.S.

currently faces a shortfall of skilled workers needed to deploy broadband across the country, to win the race to 5G, and to ensure robust fiber, mobile, and fixed wireless networks."

It will take a few years to start easing the industrywide shortage in skills. In this highly competitive market, service providers need to adopt new strategies that encompass partnerships, next-generation access technology, and innovations in remote management, automation and self-healing technologies.

AUGMENT FOR SUCCESS

With a finite number of skilled resources, competition for people in the communications industry is intense. There are more job openings than people to fill them, and incentives such as signing bonuses, free on-job training and higher hourly rates are becoming the norm, resulting in rising labor costs and slimmer profit margins.

One approach is to work with partners that have extensive histories of rural broadband rollouts to augment the workforce with the right set of skilled resources. Take advantage of short-term consulting services to assist in network design and planning or get strategic planning advice from a "virtual" CTO on long-term technology and network architecture decisions. This allows for cost-effectively offloading design and network engineering to industry experts, allowing service providers to invest in developing current staff to deliver great customer experiences.

FUTURE-READY ACCESS

It's sometimes difficult to make a strong business case for extending broadband to rural locations because of the difficult terrain, harsh weather, low population densities and unpredictable power situations.

Remote optical line termination (OLT) systems are purpose-built for rural environments and provide the ideal solution to speed broadband expansion at lower costs. These low-port count, weather-hardened, sealed systems streamline FTTH deployments by eliminating time required for constructing cabinets and obtaining zoning permits or pole attachment rights. With integrated cooling and remote power options, remote OLTs offer an approach to rural FTTH that's low-cost and simple to deploy and maintain.

An additional option now available is remote OLTs with built-in combo PON technology, which combines existing gigabit passive optical networking (GPON) and next-generation symmetric 10-gigabit PON (XGS-PON) on the same optical distribution. Combo PON allows service providers to upgrade capacity at the turn of a dial in their network operations centers, eliminating truck rolls. Combo PON future-proofs a network.

AUTOMATION, CLOUD, SELF-CARE

Back to my situation at home: Everything was going great with my fiber connection, and I was the envy of my nonfiber neighbors for a whole week. But come Monday morning, my screaming-fast fiber internet disappeared. I called my provider, which initially could not understand why the internet was not working but finally figured out that my account had been canceled after a week. The tech who activated my service had not closed the work request.

Suffice to say, my problem was fixed, *and* I had a fifth visit from a tech (another truck roll), who came just to verify that everything was working right and close the work request. I'm back on my fiber diet but left with this puzzling question: Couldn't much of this process be automated?

If this was my experience in an urban area, in a rural environment with a shortage of skilled field technicians, and households in hard-to-reach areas, relying on manual intervention can stall or completely grind network rollouts to a halt.

Next-generation, cloud-based subscriber insight and management tools are key to simplifying and automating the subscriber activation process. It's possible to ship customers their residential gateways and remotely activate, monitor, configure and even troubleshoot these devices. This cuts truck rolls, eliminates manual intervention, and delivers a great subscriber experience.

In addition, intuitive self-service apps allow subscribers to set up and manage their Wi-Fi networks. When network issues arise, subscribers or remote technicians can use analytics from the app to troubleshoot issues.

A NETWORK ON AUTOPILOT

They say the best trouble ticket is the one that never happens. Trouble ticket resolution, with or without truck rolls, accounts for an average of 61 percent of operational expenses. Being able to anticipate and proactively address network and customer issues before they happen is the goal.

Now, advances in artificial intelligence (AI) and machine learning (ML) concepts allow service providers to transform networks into dynamic, programmable environments that are predictive, proactive and automated. Using data collected from across a network, AI and ML systems can correlate events, anticipate network issues, and automatically intervene and correct issues before they become noticeable to subscribers. This is a network on autopilot: It runs without much human intervention and can configure, monitor and maintain itself independently.

"A"CING THE PEOPLE PROBLEM

Bridging the digital divide has the potential to be delayed or stalled because of a lack of skilled resources. By adopting a strategy focused on the four "A's" – Augment (staff), Access (future-proof), Automate and Autopilot (AI/ML) – service providers overcome the speed bumps on the road to successfully bridging the digital divide.

Oh! There's a happy ending to my story. Having eaten humble pie, I'm back on a screaming-fast fiber diet and convinced firmly that fiber is the way to go. ❖

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