CORNING

Hyperscale Data Center Installation Race

A side-by-side comparison of preterminated and spliced solutions

The Customer

Successful hyperscale data center operators know how to build efficient, reliable facilities for today and add square-foot capacity as needed for tomorrow. In 2020, an operator in Canada – whose name is withheld here to honor its security protocols – was constructing a new building right next to an existing one to nearly double its computing power and network and storage capacity. Corning won the bid for high-density fiber optic cabling and hardware to connect the buildings. Winning the labor bid was Litewave Communications Inc., a fiber optic construction company with more than 20 years of industry experience.

The project's timing brought some complications, mainly a public health pandemic and its ripple effect on labor, transportation, and supply chain, but one time-related factor really worked in the customer's favor: Corning was deep in the product development process for EDGE™ Rapid Connect Solutions, the industry's first preterminated solution designed specifically for high-fiber-count connectivity between data halls and buildings.

Since this hyperscale operator is a believer in the benefits of Corning's customer-driven innovation model, and Litewave is one of Corning's NPIs (Network of Preferred Installers), the capacity addition in Canada presented an opportunity to try out the new EDGE™ Rapid Connect Solution side by side with the planned traditional installation for a true comparison on the customer's site.

The Challenge

Typically, 3,456-fiber trunks are pulled between the hyperscale data center's individual buildings then fusion spliced to the optical fibers within each one – a time-consuming proposition from beginning to end that requires tremendous skill on the technicians' part. As much as data center operators appreciate the craft of experienced fiber optic techs, they especially value having as few installers in their data center as possible and only for as long as absolutely necessary.

This challenge was at the heart of the new EDGE Rapid Connect Solution, which gives installers all of the benefits of factory-quality plug-and-play connectivity at the 3,456-fiber trunk scale – without installers needing any specialized training on how to install preterminated products.

Every data center expansion brings its own additional challenges, and the new building in Canada was no exception. It was a true construction site, so installers needed to work in alignment with safety protocols and, as with any construction site, around other trades such as electrical, drywall, and HVAC to get job the done.

It was one thing for Corning's engineers to conclude in the lab that EDGE Rapid Connect Trunks could be installed up to 70% faster than it would take some of the industry's best installers to fusion splice 3,456-fiber cables; it is another matter to see whether the time savings hold true on a construction site.

The Solution

A Corning representative was on-site with a stopwatch in one hand and a notebook in the other as Litewave's technicians started pulling cable off reels to connect the buildings. There were multiple cable routes between the buildings, but in one of them, Lightwave pulled eight runs of 3,456-fiber bulk cable to both buildings, splicing them within Corning's Optical Splice Enclosures (OSEs) to 864-fiber pigtails in the existing building and 288-fiber pigtails in the new one. That was the traditional installation.

> *"The pulling grip is an engineering marvel, it's flexible, easy to pull, and simple to remove."*
>
> – Steve Jenkins, Data Center Foreman, Litewave Communications

For the field trial, the same crew pulled two 3,456-fiber EDGE Rapid Connect Indoor/Outdoor Transport Trunks through the same type of 4-in duct along the same cable route. Lightwave's techs removed the reduced-diameter pulling grips on each end and revealed a new innovation from Corning and US Conec: 24-fiber Fast-Track MTP® Connectors, a staggering 144 of them in each 2-in grip.

So instead of getting out sharp blades on each end of the cable run to open the jacket and prepare fibers for splicing, the installers easily plugged the new Fast-Track MTP Connectors into EDGE Rapid Connect Enclosures in both buildings, then mated the incoming trunks with 24-fiber to 12-fiber MTP EDGE trunks for distribution throughout the facilities.

"EDGE Rapid Connect is another tool in our tool kit to give data center operators the on-time delivery and service excellence that Litewave is known for."

– Gerard Cocks, Vice President of Operations, Litewave Communications

Corning EDGE™ Rapid Connect Solution

- Increased speed of deployment; install trunk cables between data centers up to 69-70% faster
- Smaller-profile Fast-Track MTP Connector = smaller pulling grips = maximized pathway investments; one 4-in conduit fits three trunks with the 2-in grip
- More consistent results with factory connectorization; .35 dB insertion loss per mated pair
- No special training or equipment; waterproof grip is MaxCell® innerduct compatible & handles up to 600 lbs pulling tension
- Greener deployment vs. splicing; eliminates cable scrap and other consumables

Key Findings: Canada Hyperscale Data Center Field Trial

- EDGE Rapid Connect Solution saves time; ~5 hours to connect 3,456-fiber trunk to four 864-fiber trunks / ~8 hours to 12 288-fiber cables
- Splicing adds significantly to the project clock; 3x longer than preterminated patches
- Pulling, plugging in, & testing the two runs = 45% faster overall vs. splicing
- Due to flexibility, indoor/outdoor cable was easier to pull than outdoor cable; it took 10 techs 8 hours to pull eight 3456-fiber outdoor bulk cables
- The challenge of stripping back the furcation on the 864-fiber cable took ~5 hours

The Impact

The conclusions were striking. According to the clock and a detailed analysis, it was 69% faster for Lightwave to install, patch, and test the two 3,456-fiber preterminated trunks as compared to two links of the traditionally spliced 3,456-fiber bulk cable. Most of the time savings was at the splicing stage as expected; two-thirds of the typical installation's time was dedicated to furcation and splicing.

These findings are particularly reliable because the field trial was a true head-to-head comparison. It's not just that the location was the same with identical construction-site peculiarities; EDGE™ Rapid Connect Solution faced off against the traditional spliced deployment at the same time – so the dueling installations were subject to the exact same climate in terms of personnel, all of the present-moment logistical challenges ... and even the actual weather.

Industry Awards

2022 Cabling Innovators Awards Gold Honoree

2022 Data Centre Solutions Award: Data Centre Physical Connectivity Innovation of the Year

"Our relationship with Corning as a Preferred Installer helps Litewave ensure that our crews are equipped with the latest knowledge and techniques to handle anything. The EDGE Rapid Connect field trial gave us hands-on access to Corning's latest data center innovation – and the chance to give feedback before the solution's release."

– Dave Mackenzie, President and Founder, Litewave Communications

Let Corning help design an EDGE™ Rapid Connect Solution that is right for you! Contact us at SDR@Corning.com

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