Simplifying Interbuilding Fiber Networks

A new high-density, flexible-subgroup cable designed to run between buildings simplifies installations, improves signal integrity and increases ease of service.

Bandwidth demand continues to skyrocket on multibuilding campuses such as hospitals, corporate centers, government facilities, universities and large apartment complexes. To support high-speed data requirements – for example, transferring radiology image files, offering massive online courses or adopting cloud-based services – owners are deploying high-count fiber backbones. However, they don't always know what their future needs will be or which functions will be located in each building. Thus, they require systems that are easily accessible and reconfigurable to suit current and future needs.

"These types of fiber installations are becoming very popular because everyone is certain of two things: First, supporting the typical user means accommodating higher bandwidth demands. Second, changes in the network configuration are inevitable," says Dr. Ian Timmins, vice president of engineering for enterprise connectivity products at Optical Cable Corporation (OCC).

Timmins explains that in most current situations, campus networks are based on high-count fiber optic backbone cabling systems. Architectures with fiber counts of 144 and 288 are not uncommon, and installations with even higher numbers are emerging.

Unfortunately, high-fiber-count cables with large outside diameters are inflexible and hard to manage and install. This poses the risk of broken fibers and jeopardizes the success of a system. In addition, connectivity devices make use of stacks of splice trays that feed adapter plates with extremely high fiber counts – and this can make an infrastructure very challenging to service. Executing moves, adds and changes becomes a complex and difficult task.

According to OCC, conventional solutions intended to overcome this challenge may result in too many connectors in the communications channel. This increases attenuation (optical loss), leading to decreased bandwidth and degradation in signal integrity. Manipulating stacks of splice trays to access a single fiber can disrupt an entire network every time service is performed. Ultimately, this can make a conventional network architecture prone to disruptions, increased maintenance costs and premature system overhauls.

High-count cables with large diameters tend to be inflexible and hard to manage and install.

A BLADE-LIKE APPROACH

OCC's Blade Solution, its newest addition to the Procyon family of high-density connectivity and structured cabling solutions, offers a different approach. The Blade provides flexible cable subgroups that keep installers from damaging fiber during the installation process as well as a connectivity system that provides easy access

> Interbuilding fiber should be easily reconfigurable so that functions can be moved and new applications can be added to meet tomorrow's needs.

to every fiber in the system without disrupting peripheral fibers during servicing. As Timmins explains, this "splice-centric" fiber network solution is designed for building-to-building applications, incorporating a blade-like splicing system along with OCC's HC-Series cable, a proprietary high-count indoor/outdoor fiber optic cable.

Timmins says, "The OCC Blade Solution, in combination with OCC's HC cable, uses an 'in-line flow' of individual fiber groups that provides slack storage, splicing and access to industry-standard couplers, all in a form factor that can be easily accessed from either the front or back of the rack-mount chassis and wall-mount enclosures. The real benefit is that fiber subgroups can be accessed independently of all other subgroups, as there is no arbitrary stack of splice trays located behind a wall of adapter plates." This means an installer can easily pull out any one module without disturbing the other subgroups in the patch panel.

The Blade system can be coupled with OCC's distinctive HC-Series cable, a flexible, high-density, riser-rated, rugged fiber cable with a very small diameter. Each of its tight-buffered fiber units consists of 12 fibers encapsulated by a matrix material and surrounded by a tightly bound buffer material, which makes it very rugged. Because each fiber unit is 2 millimeters in diameter, the cable as a whole is relatively small though it contains a lot of fibers. Timmins says the HC-Series cable is not the only cable that can be used with the Blade, but because it has very flexible subgroups, it is extremely durable and hard to break.

"The conception of the HC-Series cable was a high-fiber-count, small-diameter cable, reducing the outer cable diameter by 20 percent or more compared with similar cables," explains Michael Stover, OCC senior engineer. "The cable is extremely rugged, with good mechanical (crush and flex) and environmental characteristics. Unlike traditional ribbonized cables, the HC cable has no preferential bend, making it ultra-flexible for tight bends and much easier to work with and splice. Each of the 12 tight-buffered fiber units can be easily routed into the Blade enclosures for splicing or can be terminated with MTP or MPO connectors for patching."

Timmins adds that OCC envisions reconfigurable campus backbones. The owner of a campus with an Ethernet backbone might want to add a distributed antenna system in the future and would need high-speed, high-quality links with very few connectors in the channel. It could replace the Blade adapter plates at a future time with whatever it needed, satisfying today's needs while leaving the door open for video surveillance or other high-bandwidth applications in the future.

The Blade system can directly integrate with existing networks or passive optical LANs – in fact, because the chassis come in several sizes and can be rack-mounted or wall-mounted, the system makes it easy to deploy passive optical LANs on a macro scale across multiple buildings. According to Timmins, "You patch into the network with jumpers from the switch right into this system. That will provide the highest-quality channel performance from building to building to fulfill both current and future infrastructure needs." ❖

For more information, see www.occfiber.com.