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Modern Fiber Networks Demand Density, Modularity and Cable Management

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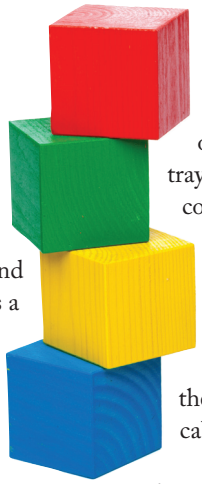
As we emerge from the pandemic, we find ourselves in an environment that has dramatically changed. White-collar workers, having adapted to shutdowns using teleconferencing apps, find themselves at a crossroads as to whether or not they need to return to offices. Schools contemplate "hybrid" learning models that have students learning from home a day or two each week, while tens of thousands of parents opt for homeschooling. Meanwhile, state populations shift as consumers realize they can live closer to the lifestyle they desire, while staying connected from the new location.

The challenge to service providers remains to build networks that provide bandwidth when and where needed. Increasingly, the primary tool to meet this challenge is fiber. With this continued move to more fiber, it is imperative that deployments embody a solid strategy based on flexible, well thought out fiber connectivity solutions.

The "building block" approach



Every network facility is different making cable management solutions unique to each facility. There is a need, however, to have all parts of the network perform in the same way, thereby assuring consistent QoS. To achieve these objectives, a fiber management system should be modular, making it easily configurable and adaptable to create a solution that meets a specific network need.

The ideal fiber management system should start with a diverse portfolio of basic building blocks; medium to high-density, Layer 1 modules that provide functionality for a given application. Depending on operational needs, the following modules should be available:

- Patch and splice
- Pre-terminated cable
- MPO
- Splitters and TAPs
- Customized wavelength division multiplexers (xWDM)

To match the needs of a deployment, modules should have the ability to have total front access (TFA). Ideally complete flexibility can be achieved with symmetrical modules that can be installed either in the forward or reverse positions. Additionally, modules must have the ability to support Base-8, Base-12 and Base-24 architectures. Standard connectors such as LC or SC should be the norm while introducing higher density connectors as required for the network application. Ideal solutions allow various modules to be deployed side-by-side, configuring a custom solution as needed for a particular application.

Building out the deployment with a versatile chassis portfolio

Having an array of available modules is only part of a complete fiber solution. Deployment of these devices must be accomplished in a dense, organized and expandable manner. Therefore, a well thought out chassis system with common modules is equally critical.

Consider the diverse locations that fiber is being deployed. Fiber builds begin at a headend. Here, the main need is a flexible high-density system coupled with simple fiber management. Typical deployments will be in standard racks or cabinets. Fiber is best managed with tray routing features that ensure connection security as well as deployment flexibility. Density and growth may dictate that chassis size be larger than 1RU, so availability of 2RU and 4RU versions will ensure that deployments of all sizes can be accommodated in the headend or within a hub collapse cabinet environment.

As the fiber extends out to commercial and residential sites, a variety of deployment challenges may arise. In the OSP, fiber may run through enclosures, terminate in a telco closet or be placed in myriad other environments. Here, there may be a need to route fibers entirely from the front or rear of a chassis. Shelves must allow for securing and protecting fibers in either, or both, locations.

Of course, some deployments may not require the capacity provided by even a 1RU chassis. In this case, modules should have the capability to function as a stand-alone network element.