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The Flexible Architecture Series:
Connectorization in the MDU



The Flexible Architecture Series: **Connectorization** in the MDU



The most important aspect of any strategy for delivering fiber-based broadband services to residential subscribers is the construction of a flexible and reliable fiber network at the lowest possible cost. Within the residential market, Multiple Dwelling Units (MDUs) represent an enormous opportunity for service providers. However, with their conduits and wide variety of layouts, they also present some unique challenges, requiring service providers to spend a great deal of time in planning and installing the fiber infrastructure.

A "plug-and-play" approach, based on the use of connectors rather than splicing, enables service providers to address these MDU challenges cost-effectively and relatively quickly. A connectorization strategy significantly reduces the amount of splicing equipment and the number of splices and technicians required to install the fiber network and turn up services.

Lucrative MDU Market Demands Fast Fiber Build-outs

MDUs come in all shapes and sizes, from towering high-rises to garden-style apartment complexes. They include apartments, condominiums and town homes, and many incorporate multi-tenant units (MTUs), or commercial blocks or towers, within their structures. Studies conducted by RVA Market Research & Consulting, based in Tulsa, OK, reveal that one-quarter to one-third of U.S. residents, half of European residents and more than 75 percent of Latin American and Asian residents live in MDUs—a total of 670 million living units worldwide. Not surprisingly, service providers everywhere are targeting this lucrative market segment, and they know that if they are to capture market share, they must move quickly to build next-generation fiber networks.

However, in addition to grappling with diverse architectural challenges, carriers must resolve other MDU issues as well. For example, how much time will they need to install the network? Building owners and tenants will not tolerate much disruption, so service providers must get in, install the fiber network and get out as quickly as possible. How much building access will they need to deploy the network? Each type of MDU structure has a limited amount of physical space in which installers can work.

Clearly, service providers need installation and service turn-up strategies designed to save time and money, both during construction and in the long term. Many carriers have discovered that using connectors, rather than splicing, is essential to the rapid, cost-effective construction of next-generation fiber networks in MDUs.

Connectors Speed Up Network Installation

In the MDU environment, connectors accelerate network construction, thereby making installation less expensive for the service provider and less intrusive for building owners and tenants. The key to a plug-and-play strategy is the multi-fiber push-on (MPO) connector, which can mate several fibers and terminations together with a snap. A typical MPO connector has 12 fibers, so each snap effectively eliminates the need to splice 12 individual fibers. Further, because a factory-installed MPO connector has already been tested in the factory, there is no need for reliability testing during installation. By contrast, a splicing approach requires technicians to test each splice between the fiber distribution terminal (FDT) and the fiber distribution hub (FDH) for reliability.

A splicing technician typically needs an hour to splice 12 fibers. The labor costs, combined with the capital-equipment costs of splicing machines and the installation time required, make connectorization a far more cost-effective approach.

One MDU Fiber Network, Two Different Strategies

To see how connectors can speed up network installation in an MDU, it is helpful to compare splicing and connectorization approaches in a large high-rise MDU with 23 floors and 15 units per floor. In a stub-pull configuration, a 432-fiber indoor fiber distribution hub (FDH) with three 144-fiber stubs is located on the lower level. On each of the above floors, a fiber distribution terminal (FDT) routes 12 or 24 fibers down to the indoor FDH where a technician splices them in. In this example, the technician splices 432 fibers between the FDH and the FDTs. From the FDT on each floor, an individual fiber drop routed to an optical network terminal (ONT) at each residential unit delivers service. Here, 345 individual drop cables would run from the FDTs to the ONTs, creating another potential splice point because it is not possible to predict the exact length of each drop.

Using a loop-through configuration in the same building, with a 432-fiber indoor FDH on the lower level, installers would pull several 72-fiber (or larger) distribution cables between the FDH and the FDTs on higher floors. On each floor, a technician routes one of the cables through the FDT, opens it, opens two of the 12-fiber ribbons and routes 15 individual fibers to the splice tray in the FDT. In this example, the technician would splice 345 fibers between the FDH and the FDTs. Again, 345 individual drop cables would run from the FDTs to the ONTs, creating a potential splice point. Per-splice costs are higher in this configuration because the splicing technician must spend additional time routing cables through the FDT and opening them.

Creating the same MDU fiber infrastructure by using MPO connectors between the indoor FDH and the FDTs offers several advantages over splicing. This time, the indoor FDH has built-in 12-fiber MPO connectors, and

an MPO connector is mounted on the stub of each FDT. Technicians can easily plug each connection from every floor into the FDH. Installing fiber in an MDU is a simple matter of mounting the enclosures and making plug-and-play connections with the cables. There is no need to set up, strip and clean fibers, align a splice, fuse the fibers or apply a splice protector or sleeve. Installers only have to clean and plug in the connectors.

To make the fiber installation even easier and faster, a connectorized plug-and-play system includes a built-in fiber spool on the FDT to accommodate the varying distances between each FDT and the FDH. The spool holds up to 500 feet of fiber cable, thereby allowing installers to spool out the cable to the FDH and simply plug it in. They do not need to cut cables to length, have slack storage or deal with cable storage during the installation. The spool pays out exactly as much cable as is needed and stores its own slack, up to 200 feet. Installers can lock down the box containing the spool with a shroud to cover and protect the excess fiber. The only splice required in the connectorized approach is to connect the feeder cable to the FDH.

Connectors Open the Door to Success in the MDU Market

Capturing a share of the enormous global MDU market is crucial to service providers' efforts to satisfy the growing demand for fiber-based bandwidth and thereby improve their competitive positions and strengthen their margins. Yet the MDU market segment, with its broad range of architectures and the time and cost pressures of installing next-generation fiber networks, presents service providers with some difficult challenges. However, by adopting a connectorization strategy in their MDU network build-outs, they can:

- Reduce the time required to plan the installation, because of the greater flexibility provided by connectors
- Minimize the number of splices and splice technicians required for the installation
- Reduce the amount of hardware needed, by eliminating splice cases
- Use a smaller installation team, with most tasks requiring only one to two people
- Eliminate the complexity of the installation by utilizing features such as slack storage, connector parking and splice-management
- Reduce overall installation costs to achieve a higher—and faster—return on capital investment
- Accelerate the installation process and begin delivering revenue-generating services more quickly

In short, connectors now enable service providers around the world to move more quickly into the lucrative MDU market with next-generation fiber networks that ensure long-term competitive success.



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