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FTTH Distribution Segment Enables Advanced Services to Move Forward

Introduction

Deploying a fiber-to-the-home (FTTH) network equipped with factory-terminated drop cables and system hardware lowers labor costs and reduces subscriber connection time by at least 50 percent. This is great news for service providers, but it is yesterday's news.

More recently, the FTTH distribution segment has built upon this technological foundation in order to further increase revenue, reduce deployment cost, reduce re-work cost and reduce equipment cost when passing homes with fiber. In the terminal distribution system, as it's become known, the distribution cable is tagged in the factory at customer-specified terminal locations. The tapped strands are also preterminated in the factory instead of in the field. Consequently, the hours of field labor time required to make the distribution segment operable have been eliminated. Instead of terminating each distribution strand in the field with a fusion splice machine, they have already been terminated in the confines of a quality-driven ISO 9001 factory.

The placement of the aerial or in-ground terminal distribution system differs little, if at all, from standard cable installation practices. Instead of requiring the two-step field installation process of preparing and splicing the pigtails at the terminals, homes are already passed when the terminal distribution system is placed. Profitability, reliability and simplicity are key attributes of the terminal distribution system that influence the network operator's advanced services business model. This claim will be quantified later.

But first, we will briefly show where the terminal distribution system fits into the FTTH network, whether a point-to-multipoint (PON) or point-to-point access architecture is utilized. Then we will discuss the product attributes of the terminal distribution system. Finally, we will quantify the value of the terminal distribution system to the network operator in order to support the claim that profitability, reliability and simplicity influence the success of providing advanced services. We will conclude with a brief recap of our claim and why the claim matters.

Reference Point – Segments of the FTTH Access Network

Figure 1 illustrates the segments that comprise an FTTH access network, which delivers crisp voice, video and high-speed data signals over a distance of 20 km (12.4 miles) or more.

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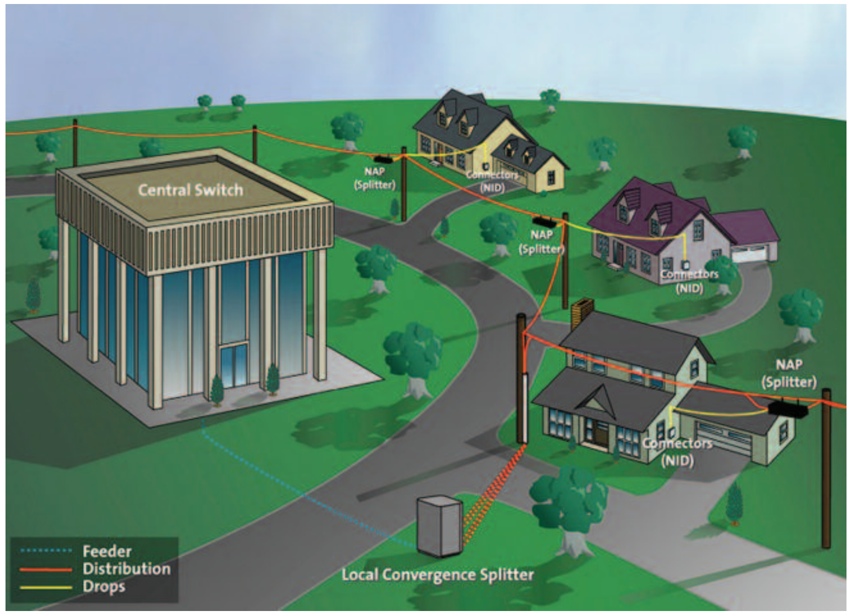

Figure 1 – FTTH Access Network

The segment shown in red is the distribution cable containing a dedicated fiber for each residence in the serving area from the centralized splitter cabinet. The segment shown in yellow is the drop cable which also contains a single fiber per residence. As we alluded to, there has been no change in the preferred method of joining the distribution strand to the drop strand outside the terminal. The terminal distribution system change lies in the fact that fibers destined for a certain cluster of homes no longer need to be terminated in the field prior to being coupled into the upstream side of the terminal connector, which is located inside the terminal. While both methods work well, distribution segment installation time and methodology significantly impact the outcome of the advanced services investment.

OK, Show Me the Terminal Distribution System

Now we will discuss the two classes of the terminal distribution system, a class containing a factory-attached tether as shown in Figure 2, and another class featuring a factory-attached, connectorized tether as shown in Figure 3. Both classes can be deployed in aerial or in-ground applications due to outstanding optical performance over time and temperature in the outside plant environment.

Figure 2 – Factory-Attached Tether with MultiPort Terminal

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Figure 3 – Factory-Attached Connectorized Tether

In Figure 2, a flexible tap point joins a tether cable, typically containing 4, 8 or 12 fibers, to the distribution cable, which can package up to 144 fibers. The other end of the tether cable features a completely sealed, multiport terminal containing up to 12 single-fiber connector ports. The terminal can also be added in the field as needed. In this scenario, the factory-preterminated strands inside the tether cable would simply be inserted inside the hardened connector ports of the terminal after it has been placed.

In situations where subscriber turn-up may be difficult to time, connecting the tether cable in the field only when needed is the better solution (see Figure 3). This class of the terminal distribution systems contains a multifiber connector receptacle. The tether cable has already been factory terminated with a hardened, multifiber connector plug. The terminal end of the tether cable has also been preterminated with a multiport terminal that significantly cuts down the time required to connect the subscriber.

Ordering both classes is quite straightforward. Determine where, how many and what type of terminals are needed in the distribution cable segment. Determine how many homes need to be served by each terminal factoring in unforeseen events such as new home construction. Determine where slack cable needs to be placed and what type of cable (all-dielectric or figure-8) to use. The values for these parameters are then entered via an online configurator. Then, when the system is received, it is paid out in a clearly specified direction. That's it; homes are then passed with fiber.

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