# Connecting DAS over PON

Demand for higher wireless data throughput and denser wireless networks is driving the installation of distributed antenna systems (DAS) as well as small cells and Wi-Fi systems. But without existing fiber from the central office, deploying these devices can be a time consuming and expensive proposition. At the same time, competition among network operators is increasingly driving broadband access solutions such as fiber-to-the-home (FTTH) as network operators seek to deliver up to and beyond one gigabyte per second of broadband service. But the business model for these networks is problematic because a large investment is required to reach a few initial customers. Leveraging broadband access networks for connecting DAS or other access terminals solves problems for both wireline network providers and wireless service providers.

## Challenges

Network operators have spent billions building out FTTH networks using passive optical networking (PON) technology. As of January 2015, providers had delivered FTTH to 25 percent of homes in North America and will spend some $18 billion building out these networks between 2013 and 2018, but the take rate for services so far is only about 11 percent. These networks have spare fiber in them due to initial overbuilding and the relatively low take rates. Even at maximum take rates, FTTH networks are expected to have at least one spare fiber per fiber service terminal. As a result, network operators have available network infrastructure that they would like to better monetize.

Wireless service providers are looking to deliver higher data rates throughout their networks by deploying DAS, small cells, and Wi-Fi systems. By deploying these access devices in the wireless network, service providers can reduce the number of macro cells deployed, make better use of spectrum resources, and deliver improved services to customers. The problem is that these wireless access devices require fiber connections from a centralized location, such as a Central Office, and the cost of deploying fiber networks for this purpose significantly worsens the business case for the network operator and takes too long to deploy in keeping pace with wireless subscriber usage demands.

## Solution: DAS over PON

Running DAS for wireless coverage and capacity over existing PON installations addresses both challenges: fixed network operators can better monetize the available fiber in their PON networks, and wireless service providers can leverage an existing fiber network for faster and less costly service deployments.

There are two models for deploying DAS over PON. The first is for the fixed network operator to lease dark fiber to the DAS provider. In this case, the DAS provider is responsible for connecting and deploying the fiber. The alternative is for the fixed network operator to lease access to the PON infrastructure as a managed service, in which case the wireline provider deploys and connects the network. Both business models will be adopted, but a connectorized network makes it more likely that the DAS provider will do the deployment because connecting the network becomes a plug-and-play matter. Rather than requiring specialized fiber-splicing skills, a connectorized network allows wireless service providers to use standard field technicians to connect the DAS to fiber.

## CommScope leads the way

CommScope's long history with both DAS and PON deployments makes it an ideal partner for integrating DAS over PON. Whether making it simpler and more cost-effective to deploy PON networks or integrating DAS into a PON network for outdoor wireless service distribution, CommScope leads the way in flexibility, performance, and value.

## CommScope PON and DAS solutions

CommScope offers a full range of PON and DAS solutions that are well-suited for integrating fixed and wireless services.

### FlexWave® DAS host units

FlexWave digital DAS is used to extend wireless services throughout a campus or buildings, and throughout urban and suburban areas. It is the market's most flexible, scalable and complete solution for addressing coverage and capacity needs for current and emerging wireless networks. It provides edge-to-edge bandwidth and multi-band flexibility.

FlexWave DAS can be designed to suit any shape property/campus or geographic area. Unlike any other solution available, the FlexWave systems may be cascaded to provide overall system growth in buildings or geographic location. If the property or wireless needs change, the system can change as well. FlexWave's system modularity of main components and its field-upgrade ability make it one of the most attractive cost-optimized solution on the market.

The FlexWave DAS Host Unit is NEBS Level 3 certified, a requirement for collocation with fixed wireline assets in a Central Office. Housing the Host Units in the same location as the PON network equipment provides ease of access to fiber at installation for a quicker time to deployment, utilizes existing real estate and simplifies ongoing network site management by accessing the wireless services at the same location.

### FlexWave Prism remote units

CommScope's FlexWave Prism is a compact radio head for macro coverage that supports up to eight frequencies delivering high-performance coverage with end-to-end management. Based on patented technology and CommScope's 20-year leadership in DAS technology, FlexWave Prism offers mobile operators a small, light, and flexible solution for extending macro network coverage for all licensed mobile services.

The FlexWave Prism system is ideal for enhancing wireless services in cities, suburbs, canyons, tunnels, along coasts and roadways, campuses, stadiums, large enterprise, MDUs and other public areas. It is available in four different cabinet sizes so mobile operators can future-proof their deployments and scale their investment by purchasing a larger cabinet and adding more frequencies when needed.

## NG4access Optical Distribution Frame (ODF) platform

NG4access ODF is an optical ODF, universal chassis, adapter pack, and cabled module solution set that delivers equal front and rear technician access, the ability to mix-and-match fiber connector types within each frame chassis, and industry-leading termination density. The NG4access ODF features a host of CommScope innovations and sets new standards for managing high density fiber and cabling in the central office, head end and data center.

## Fiber Distribution Hubs

CommScope's family of Fiber Distribution Hub 3000 (FDH) solutions reflects our expertise in hub distribution management with innovative products that ensure cable management, bend radius protection at every point in the hub application. High-density fiber hubs, clear routing paths, slack storage solutions, easy connector access and simplified integration of optical components all optimize the value of the optical network.

## MultiPort Service Terminals

The MultiPort Service Terminal (MST) incorporates hardened connector technology that is designed to withstand the rugged outside plant environment.

## CWDM Modules

CWDM modules enable technicians to separate out up to 16 individual wavelengths per fiber, making it possible to connect up to four DAS remote units with a single fiber.

**FlexWave Prism DAS co-located in the telecom right-of-way**

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Everyone communicates. It's the essence of the human experience. *How* we communicate is evolving. Technology is reshaping the way we live, learn and thrive. The epicenter of this transformation is the network—our passion. Our experts are rethinking the purpose, role and usage of networks to help our customers increase bandwidth, expand capacity, enhance efficiency, speed deployment and simplify migration. From remote cell sites to massive sports arenas, from busy airports to state-of-the-art data centers—we provide the essential expertise and vital infrastructure your business needs to succeed. The world's most advanced networks rely on CommScope connectivity.

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