



## NTS COMMUNICATIONS BUILDS NEXT GENERATION PON

### CASE STUDY

#### SITUATION

After helping design and build passive optical networks (PON) for 10 towns since 1999, Vince Smith has learned a thing or two about fiber to the premises (FTTP) projects. By the time he was hired in 2003 by Texas-based NTS Communications as an outside plant engineer, Smith had acquired good experience with different architectures as well as with products from different vendors. Just four or five years of experience made Smith an “old hand” in the business—and a valuable part of the NTS business plan for delivering POTS, cable TV and high-speed Ethernet services to residential and business customers in west Texas.

Before joining NTS, Smith's first PON design utilized two fibers in a cascaded architecture with 1x8 splitters in outside plant enclosures serving 1x4 and 1x8 splitters in access terminals near homes. Even as his PON designs migrated to one-fiber systems for projects in successive towns, splitters were still deployed in the outside plant in a cascaded, not centralized, manner.

On the upside, each of Smith's cascaded systems still operates well as far as service delivery. Yet these early-generation systems have shown certain limitations. For instance, the distributed splitting of signals in cascaded PONs requires fully populated shelves of optical line terminal (OLT) cards. Without a 100% take rate, the cascaded PON architecture leaves many OLT cards only partially utilized. Cascaded systems, which can show poor overall loss measurements, also tend to make testing and troubleshooting more difficult and time consuming.

There is always opportunity for improvement. Once Smith joined NTS, he was on the hunt for ideas for building a better fiber distribution network for FTTP applications.



## A MOMENT OF DISCOVERY

Wandering the floor of the FTTH Council conference in New Orleans, Smith noticed several vendors pitching a new approach to PONs that centralizes splitters. The premise of this centralized architecture was simple—make it easy and cost-effective to add subscribers. With this architecture of fewer splices, fewer splitters and more connectors, activating service in the field requires only mating of connectors at the centralized cabinet.

This centralized architecture features 1x32 splitters to mirror port capacity of OLT cards. With no splitters at access terminals, OLT ports in the headend are only activated as subscribers are added. This ensures optimum utilization of expensive OLT cards. In addition, capital requirements are reduced with the centralized architecture because OLT cards are purchased in tandem with subscriber growth.

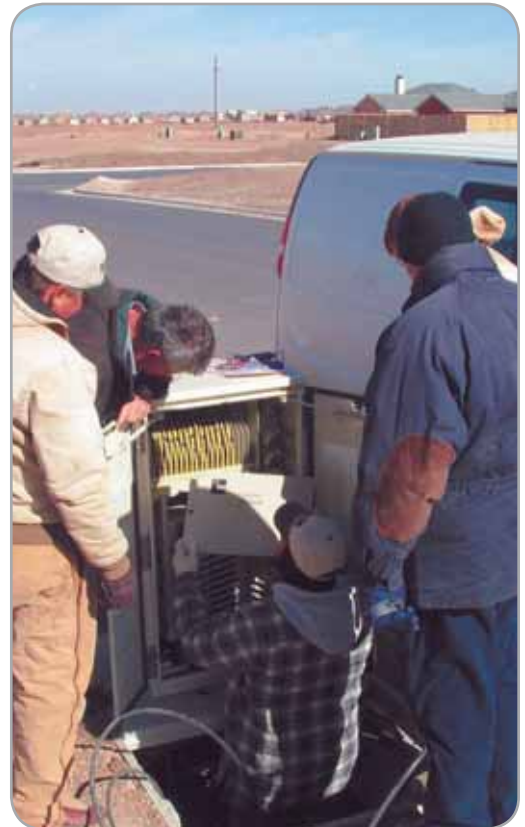
Still, the question remained on which vendor showing the new architecture with centralized 1x32 splitters offered the best solution. What Smith found in the ADC booth at the FTTP Council show caught his attention.

## FTTP SOLUTION DESIGNED FROM THE GROUND UP

What Smith saw at the FTTH Council show and has since used for the NTS Communications PON was the ADC OmniReach™ Fiber Distribution Hub (FDH). This outside plant cabinet is designed specifically for FTTP applications with features that directly impact the reliability, functionality and operational cost of the network. These features include robust 1x32 splitters, strain relief for output pigtails and single fiber access.

“The set-up inside the cabinet really set it (ADC’s OmniReach solution) apart from others,” said Smith. “The way cables are managed, the easy access to fibers, the physical protection for cables—it did not seem like products were just thrown together in a cabinet. The distribution field, routing and slack storage areas, fiber entrance and exit points—everything looked to me like it was designed to work together. Other solutions appeared cobbled together,” said Smith.

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A technician removes the cover for the feeder and distribution cable splice module within the OmniReach fiber distribution hub (FDH).

Specifically, ADC's OmniReach FDH includes proper cable management in a cabinet designed specifically for activation and maintenance activity in the PON.

**Access.** Preterminated, 1x32 output connectors are stored in a designated "parking lot." Dust caps protect fiber end faces from contaminants until connectors are removed from the parking lot for mating of connectors at service activation. With access to individually removable adapters, the OmniReach FDH ensures activation and maintenance is conducted without damaging fibers.

**Patch cord routing.** Clearly defined routing paths for patch cords reduce human errors that can cause outages. Intuitive and functional cable routing is a design for the long-term.

**Protection.** Integral bend radius protection increases the service life of fibers by reducing the chance for macrobends and microbends within the cabinet. Radius protected slack managers ensure that extra patch cord lengths can be safely stored. These seemingly minor details of cable protection greatly increase the long-term reliability of the network and reduce the service calls that drive up operating costs.

"Centralizing splitters in the (ADC) cabinet has made a very friendly work environment for our technicians," said Smith. "Adding customers is very self-explanatory and so far our crews are very pleased. Plus, we have the least expensive solution in terms of electronics," said Smith, referring to his ability to turn-up OLT cards and add 1x32 splitters in unison with subscriber activations. "We find it a plus all the way around."

## Conclusion

For the entire NTS Communications team, actions speak louder than words. "There really isn't a whole lot to say. It (The OmniReach Solution) is reasonably priced. It works great. And we feel comfortable that ADC will deliver on reliability and longevity," said Smith.

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Shown with the handhole mounting option for storing slack cable, this OmniReach FDH was shipped with a 216-position fiber distribution panel and a 1x32 splitter module with splitter outputs routed to the parking lot within the cabinet.

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