



Making the Case for FTTH with PON Fiber Test Systems

Although industry consensus is that the long-term solution for high-capacity broadband services and “Gigabit cities” is fiber optics, recent studies show that Europe is lagging behind other regions in the world. With 20 million homes connected via FTTH at the end of 2013, Europe is behind many of the world’s major economies such as Japan (25M), the U.S. (35M), and China (37M).

In this case study, we profile a major European service provider who has worked with Viavi Solutions to reduce some of the cost challenges associated with FTTH deployment for consumers and businesses alike.

The Challenge

FTTH network construction is costly and passive optical networks (PON) bring new challenges to a service provider by multiplying significantly the number of optical connections or “touch points” in the network while raising the bar for quality of service and fiber performance. These issues faced the European provider:

Improper fiber handling — field services reported that most fiber-related issues resulted from improper installation and poor fiber-handling practices. It was critical that each fiber strand be accurately installed, spliced, and connectorized for the FTTH network to meet performance criteria. The fiber had to undergo end-to-end testing before being offered to customers. However, the limited availability of a skilled workforce to deploy FTTH networks was a major issue, particularly for last-mile fiber deployment.

Effective service provisioning — once fiber was installed, the service would be provided by installing an optical network terminal (ONT) in the premise. The service activation could be effected immediately or, more often, several weeks or months after the fibers were installed. The challenge for the operator was to be sure that the fiber installation was still functional over a period of time. The same issue occurs when the subscriber leaves the premise. It can take a while before new occupants subscribe to an FTTH service.

Case Study

Find-and-fix is expensive — when a subscriber complained of poor quality or service interruption, the provider could analyze information provided by an ONT on the status of operation. However, if the ONT was no longer visible to the management system, a customer-care agent could not know if an issue came from the ONT or the fiber network. A field dispatch and/or truck roll was necessary for root-cause analysis, increasing the time to find-and-fix and customer satisfaction.



The Solution

The provider required a solution that could resolve these three challenges. Working with Viavi, the two teams devised a solution that could certify the quality of the fiber installation, accelerate service provision, and reduce the mean time to repair.

The provider selected the Viavi ONMSi Optical Network Monitoring System for PON. ONMSi can automatically test fiber and detect and locate fiber faults centrally without having to dispatch technicians into the field. By placing remote optical test units (OTUs) at different central office locations, the system is able to certify the fiber installation, enable fiber test for provisioning, and reduce the time needed to understand customer faults.

The OTU included an optical time domain reflectometer (OTDR) and an optical switch to connect to multiple fiber paths. A single OTU can test up to 32 000 homes passed.

Technicians installing fiber could initiate tests directly from their mobile phones. The system tested installation and returned a pass or fail result according to the provider's acceptance test criteria. By documenting all the test data, the system ensured the traceability of the installation. The test data was also used to update the network inventory database for outside plant field records.

For new customers, the customer care center used ONMSi for provisioning to test if the fiber was ready for service before they committed to a service delivery time.

For customer care support, when a fault was reported, the service center could use ONMSi to immediately check if the fiber had been damaged. Appropriate actions could then be triggered immediately, saving time and truck rolls. Service interruptions were minimized, improving customer satisfaction.

Results

With ONMSi deployed, the service provider observed these results:

- Ensured certification of the fiber installation to the fiber installation performance baseline; before the system, fiber tests were not standardized or documented or simply not performed
- Tracking of the actual progress and the performance of the subcontractor deploying the network; the report given by ONMSi showed the number of homes passed per period of time and the number of tests needed before installation is accepted
- Improved new customer delivery commitments by showing the actual status of the fiber at the customer premise and what actions needed to be accomplished for full FTTH service delivery
- Improved service level agreements during civil engineering work by other companies; ONMSi constantly monitored the fiber plant to check for damage; the provider was able to respond immediately to any fiber break or cable outage and accelerate any compensation claims
- A better quality of service by effectively diagnosing the root cause of customer complaints; the provider knew if they had to dispatch a fiber team or to simply replace the ONT

This provider is currently looking to monetize the FTTH network further by offering fiber services to a larger number of business services.

Viavi Solutions for FTTH Deployments

To most effectively install and maintain FTTH, ONMSi software controls OTU hardware components typically deployed at central offices. These OTUs are equipped with both an OTDR and an optical switch. A web-enabled software application provides access for multiple system users with SMS and e-mail notifications, SNMP and web services for integrating with other systems, reporting, and analytics.

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