

Optical Access Solution Based On WDM-PON And Low-Loss Fiber

MARKET OPPORTUNITY

In the access part of the optical network service data rates will continue to increase. Next generation video applications like 3D-TV and UHD-TV are recent examples in the residential space of technologies that will drive increasing data rates. In order to maximize revenues and to shorten pay-back times for advanced access infrastructure projects, next generation access networks will need to serve several market segments. According to the FTTH business guide published by FTTH Council Europe these segments comprise residential, business, carrier and public sector applications.

The need to support these multiple segments, with diverse service priorities, places multiple demands on advanced access networks:

- Equal down/upstream bandwidth (demanded by business and carrier services)
- Scalable architecture (to allow individual user bandwidth upgrade)
- Secure architecture (demanded by business customers)
- Simple, low cost technical solutions (to allow pricing that enables maximum take-up of subscription in the residential market)

More cutting-edge technical solutions will be required in the future in order to address all these requirements in the access network.

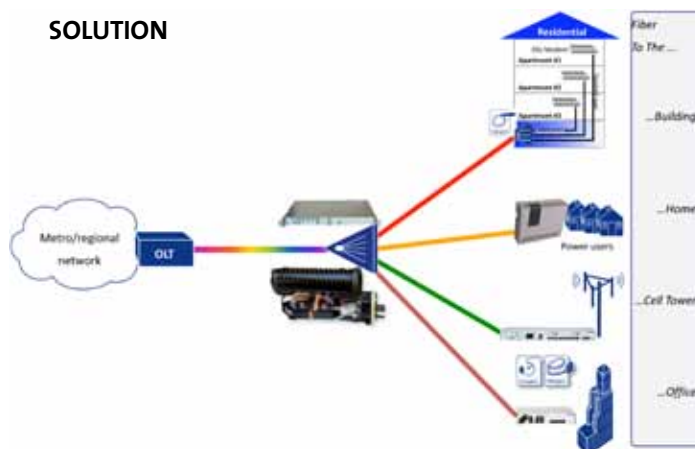
CHALLENGES

Multiple network architectures and technologies are deployed in the access space:

- Fiber to the Curb and Building with VDSL connectivity to residential subscribers
- Fiber to the Home using GPON and EPON aggregation technologies
- Fiber to the Building and Office using point to point architectures for connecting enterprises and business customers
- Fiber to the Cell Tower for connecting mobile network base stations

In order to decrease operational expenditure network operators increasingly desire architectures that need fewer sites housing active equipment.

SOLUTION



This ADVA FSP next-generation optical access solution supports a large variety of applications and different customer segments. It uses passive CWDM optical transport for connecting customers to a central office based optical line terminal. Customers are served over a point-to-multi-point fiber infrastructure, using a point-to-point wavelength-based logical connection. Highest security requirements are met since customer data streams are separated on the lowest physical level. Bandwidth and data format can differ per user. Hence a flexible service delivery is supported.

Traffic is managed by allocation of different wavelengths to the various termination points. Several end customer conditions are supported through a variety of termination options: DSL access multiplexer backhaul in FTTC and FTTB residential service environments, FTTH networking unit connectivity, Carrier Ethernet access connectivity in business and mobile network backhaul scenarios.

There are two options for placing the CWDM multiplexer/demultiplexer at a remote node: The first option is using a shelf-based product for environmentally controlled environments. The second option is using outdoor-hardened closures, which could be deployed in manholes or mounted at poles.

Expenditure can be further reduced by increasing the area of coverage from each central office. A low-loss G.652.D optical fiber, such as Corning's SMF-28e+® LL or SMF-28® Ultra, with ~10% lower attenuation across the CWDM spectrum, enables increased area of coverage of up to 20%. This extended coverage may allow the connection of all subscribers in a region from a smaller number of central offices, thus reducing the operational costs of managing and maintaining. It may also allow greater sharing of the active equipment between more subscribers, reducing the capital costs of purchasing active equipment and the operational costs of powering and operating them. In addition to low-loss, SMF-28 Ultra also features improved macrobending performance in excess of G.657.A1, enabling design of smaller cables that are more suitable for installation in crowded ducts and capable of tighter coiling to allow smaller and more aesthetic cabinets and closures.

BENEFITS

- Scalable, transparent and secure service delivery through point-to-point connectivity between individual end customers and service provider point-of-presence
- Energy efficient solution due to reduction of active equipment in the field
 - Reduced OPEX due to single platform for residential, business and carrier applications in access and backhaul networks
 - Reduced CAPEX/OPEX through increased central office coverage enabled by low loss single-mode fiber
- Flexible solution for fiber-to-the-curb/building/office/cell tower topologies
- Flexible passive CWDM multiplexer/demultiplexer options including outside plant integration
- Open standards based solution (CWDM ITU-T G.694.2)