ASCENT
Communication Technology

FTTB+EoC:
A Cost Effective Last Mile Network Architecture

Competitive Analysis

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New Business Opportunity - expanding the reach of fiber networks

Considerable investment has been made in fiber based access networks serving communities with high data rate broadband connections over the past years and is still going on. These FTTX operators compete with incumbent Telco (DSL) and cable (DOCSIS) service providers for broadband and video services. On the broadcast side of the business, the competition includes next to Telco and cable offerings DTH services like satellite and DVB-T. Fierce competition amongst the service providers generates pressure on subscription rates which need to be compensated by the increase in subscriber growth and differentiation in service offerings to ensure reasonable payback time for infrastructure investment into the fiber network.

In many cases, operators have an opportunity to add a residential or business network segment which fits to their local presence and service offerings but need to justify the investment case in such an extension. At this stage a thorough analysis of the different options for the last mile while taking into account existing infrastructure and investment in the buildings is crucial.

This situation is typical for city carriers or utilities having deployed core fiber infrastructure in the city or region they serve and come across an opportunity to add a significant number of residential customers in multi dwelling units (MDUs) with an existing one way or two way coax infrastructure designed to distribute cable TV or satellite signals to the individual apartments.

Cost effective approach utilizing the existing last mile coax infrastructure

In case of a service provider operating a FTTH network and offering triple play services into a new service area with existing coax building infrastructure and broadcast services, three basic options are available:

Extending the **FTTH** network and overbuild the existing coax infrastructure is the organic approach. The operator can leverage the headend and optical network infrastructure by extending the existing plant and can differentiate by symmetric, unmatched data rates other network architectures cannot offer today. The installation of a second building infrastructure can generate significant costs if not a roadblock at all: The building owner needs to be convinced to invest or alternatively the operator would need to participate in the investment. Assuming that cable or satellite broadcast and video services are already in place, the operator needs to deploy a CPE device in every apartment even for TV services only. This requires considerable investment into CPE equipment independent from the penetration rate of broadband services

Building a parallel **DOCSIS** headend and serve the area concerned with cable TV and broadband through the existing building infrastructure solves the issue with the additional costs for building infrastructure and CPE devices but requires significant investment into a DOCSIS headend (CMTS) which is a major issue at low penetration rates and / or low number of broadband data subscribers. If the existing coax network is already two-way network capable the investment into active access network equipment such as nodes and amplifiers is justifiable on a per subscriber base because it is

a shared network. In a one-way network a return channel upgrade and most probably further segmentation is required. The downside is the limited data rate in a shared network and the bottleneck in the upstream data rate which is about four times lower than for the downstream signal. A major concern from the operations point of view is the fact that two independent headends for the FTTH and the DOCSIS part of the network need to be managed, operated and maintained.

Deploying FTTB/**EoC** architecture leverages the benefits of both, the existing FTTX infrastructure with its IP headend and video overlay, and the use of the existing coax building infrastructure. The FTTH headend and management systems combined with the existing video overlay can be extended to deliver the signals to the building or curb delivering symmetric 1,25 Gbps to the transceiver or ONU in the EoC node or hub. The EoC node can be equipped with up to four EoC masters and distributes the signals through the existing coax cables to the wall outlet. TV signal can be received without additional CPE; an EoC client is required to use the broadband data service only. The EoC architecture is based on international standards resulting in access and CPE equipment costs similar or lower compared to the other architectures. This makes FTTB / EoC a unique solution which is fast to deploy and delivers return on investment even at low data customer penetration.

	FTTH		DOCSIS		EoC	
Data Rate	1 Gbps symmetric	+++	800 Mbps asymmetric, shared	+	1,25 Gbps symmetric, shared	++
TV / Video	Existing CATV overlay	+++	Existing cable TV distribution	+++	Existing CATV overlay	+++
Installation Costs / Building	Need to overbuild coax network	- - -	Use of existing coax network, 2-way necessary	++	Use of existing coax network, 2- and 1-way possible	+++
Access Network Upgrade Costs	Optical passives only	+++	Nodes & Amps for segmentation	+	EoC Node / Hub for segmentation	++
Headend Upgrade Costs	Extension of existing FTTH headend	+++	Building of separate DOCSIS headend	- - -	Extension of existing Data Switch, Router or FTTH headend	+++
OSS /BSS & Service Provisioning	Use of existing management systems	+++	Parallel operation of two independent systems management systems	- - -	Use of existing management systems	+++
CPE costs	CATV receiver per subscriber	+	Shared CATV receiver	+++	Shared CATV receiver	+++

At a Glance

Key Challenges

FTTX operators considering to extend their network reach into areas with residential customers in multi dwelling units with an existing one way or two ways coax infrastructure need optimize the business case taking into account the existing infrastructure in the buildings.

The Solution

Deploying Ascent Communication Technology's FTTB/**EoC** architecture leverages the benefits of both, the existing FTTX infrastructure with its IP headend and video overlay, and the use of the existing coax building infrastructure.

The Benefits

FTTB / EoC is a solution which is fast to deploy and delivers return on investment even at low data customer penetration at fast time to market.

Ascent Communication Technology Products

Next-Generation Network has growing customer demand for VoD, HD channels, IPTV, High Speed Data, and VoIP services. To stay competitive, operators need a network solution that can maximize their existing infrastructure, and at the same time has the flexibility to scale up for higher bandwidth next-generation services. ACT HFC, FTTX and IPTV network solution has just the answer with a comprehensive product portfolio. Products have been designed with today and tomorrow networks in mind, with ease of technology migration and network upgrade. ACT products cover technologies from HFC Deep fiber, RFoG, to FTTX (Active Ethernet, PON, PON+EoC).

About Ascent Communication Technology

Ascent Communication Technology (ACT) is a global supplier of access network solutions and services for broadband and CATV operators using or deploying HFC and/or FTTH network infrastructures. With its extended expertise in product design and development for optical transport solutions for traditional HFC, RFoG, point to point (P2P) and point to multipoint (P2MP) Gigabit Ethernet next generation networks, ACT is serving MSOs in all geographic regions with its quality supply chain and scalable contract manufacturer partners.

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