Strategic Planning for Access Layer Broadband Network Upgrades

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Abstract

In today's world service operators are not fighting as much for brand new customers anymore just because the penetration of various services delivered by the operators is slowly reaching its relative maximum. Thus, the major goal of the service operators today is to "steal" customers from their competitors by providing discounts for bundled services, and try to lock customers with a contract offering discounted or free services for a certain period of time in return.

In order to stay competitive in such environment an operator has to offer as many service as possible – data, video, voice and wireless, if possible – which is commonly referred to as a triple-play or a quarto-play. The bundle of all services puts a significant pressure on the access layer networks of the operators becoming the main "bottleneck" in the communication line between a customer and the internet or content provider. Furthermore, current DSL and HFC access layer networks already cannot accommodate the requirements of some of the applications and services.

This project is focusing on the analysis of three main options that telecom and cable operators may choose in the search of a "bigger pipe" – Fiber-to-the-Curb, Fiber-to-the-Home and wireless broadband access layer networks – and to understand which options would be the most cost effective and at the same time meet the growing bandwidth requirements in the next couple of years, as well as have potential to accommodate future applications with higher bandwidth requirements.

Based on the completed number of case studies reviewing various access layer network options for both, telecom and cable operators, it has been identified that all service operators will have to start the transition to a Fiber-to-the-Home type of topology in the next five to seven years. Although, Fiber-to-the-Curb can accommodate current bandwidth requirements, further enhancement of such networks may turn out to be a more costly procedure then an all fiber network. For cable operators' HFC access layer networks with much higher capacity the transition to Fiber-to-the-Home will still be required to meet future bandwidth growth requirements. However, the higher bandwidth available through a coax cable will give cable operators more time for the transition. While, telecom operators will require to start the transition to a Fiber-to-the-Home access layer network much sooner.

Although, wireless broadband is seen by many as a remedy for all access layer network problems, it is incapable of delivering sufficient bandwidth to support full spectrum of triple-play services. Attempts to increase the bandwidth of a wireless broadband network to a required minimum result in a higher then for any other solution cost of deployment. Nevertheless, wireless broadband networks can be a perfect solution for remote areas with low population density providing for the delivery of triple-play services in their basic form.