Telecommunication Policies for Broadband Access Networks

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Abstract

The two main challenges for the access networks are the increasing bandwidth demand and mobility trends. The "triple play" services required (Internet, telephone and TV services) lead to a great increase in bandwidth demand. However, the existing access networks are not able to support this increase, and the capacity to delivery broadband services remain as a challenge ("last mile problem"). The access network remains a bottleneck in terms of the bandwidth and service quality it affords the end user. Besides the bandwidth, other great challenge to access networks is the mobility and the user need to have internet access anywhere and anytime. Then, the increasing demand of "quad-play" (also known as quadruple-play) services, including video, voice, data and mobility, have created new challenges to the modern broadband wireless/wired access networks. This document proposes a techno-economic model to support the new requirements of fixed and nomadic users.

Keywords: *Access Networks, Broadband Access Technologies, Techno-economic cost model.*

1. Introduction

The increasing demand of quadruple-play services, including video, voice, data and mobility, has created new challenges to the modern broadband wireless/wired access networks [1]. Moreover, with the proliferation of broadband applications, the need for comprehensive broadband infrastructure becomes critical [2]. The “triple play” services (Internet, telephone and TV services), lead to a great increase in bandwidth demand. However, the existing access networks are not able to support this increase and the capacity to deliver broadband services remains a challenge ("last mile problem"). The access network remains a bottleneck in terms of the bandwidth and service quality it affords the end user. Besides the bandwidth, other great challenge to access networks is the mobility and the user needs to have internet access anywhere and anytime. The mobility of the end-user will also introduce an unprecedented volatility to the network architecture [3;4]. Nomadicity causes end-users to pop up and disappear at different locations in the network. All this will require fundamental changes to the operations of access networks, the functionality of network nodes, and the architecture itself. Then, the increasing demand of “quad-play” (also known as quadruple-play) services, including video, voice, data and mobility, have created new challenges to the modern broadband wireless/wired access networks.

Broadband in the OECD is still dominated by DSL (Digital Subscriber Line) but there is an obvious trend emerging to upgrade last-mile access networks to support the new services requirements [5]. To address these network requirements, many carriers in emerging markets will have to move from legacy platforms toward next-generation solutions with a combination of wireless and wireline technologies, such as worldwide interoperability for microwave access (WiMAX), IP-Ethernet, new forms of DSL technology and fiber.

In this context, several broadband access technologies are being deployed to address the bandwidth bottleneck for the "last mile," the connection of homes and small businesses to this infrastructure. There are many competing technologies which can provide the bandwidth required to deliver broadband services, but each technology has its limits in terms of bandwidth, reliability, cost or coverage [6]. Some of the most important last-mile solutions include xDSL, HFC, FTTH, PLC, Satellite, and the fixed broadband wireless access network.