

Chapter IV

Next Generation Access Networks and their Regulatory Implications

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ABSTRACT

The deployment of Next Generation Access networks (NGAs) is likely to have a significant impact on the telecommunications' value chain and, consequently, on the necessary regulatory remedies. In particular, unlike existing telephone networks, NGAs present regulators with a dilemma, in so far as the possibility of regulatory intervention after network deployment (negatively) affects investment incentives for such a deployment. We review the current discussion surrounding NGAs and discuss some of the main regulatory challenges it presents.

INTRODUCTION

Next Generation Networks are slowly but increasingly being used at the core of the public switched telephone network (PSTN). A Next Generation Network (NGN) is, according to the ITU, “a packet-based network able to provide services including Telecommunication Services”, i.e. a multi-service (voice, data, video or other media)

network based on packet-switching (as opposed to the traditional circuit-switching of the PSTN networks). But whilst the core network has been (or will be) replaced by a Next Generation Network, able to carry all those services, the access network has lagged slightly behind.

As network operators deploy (or consider deploying) such Next Generation Access networks (NGAs), several interesting questions have to

be raised. From an operator's perspective, it is important to understand how NGAs affect the value chain, for instance, by uncoupling service provision from specific network infrastructure requirements. In particular, vertical integration in the presence of NGAs appears to be a less sensible strategy than it is under existing telephone networks.

From a regulatory perspective, NGAs are likely to be an economic bottleneck and, as such, regulatory intervention may be warranted. However, a dilemma presents itself: unlike current telephone networks, NGAs do not exist yet. It is natural to expect that the possibility of regulatory intervention after network deployment (negatively) affects operators' incentives to deploy them in the first place.

This paper is a survey of NGAs and their main regulatory implications. OFCOM, the UK telecommunications regulator, is (arguably) the institution which has given this topic more thought. Hence, it should not be surprising that we refer to its documents extensively. Additionally, the paper was written with a view to increasing awareness of the importance of NGAs in the telecommunications sector and, inevitably, to the regulatory challenges it presents. As such, we deliberately refrain from advocating a specific course of action, as we believe the discussion is still at the beginning.

WHAT IS A NEXT GENERATION ACCESS NETWORK?

An access network, commonly referred to as the local loop, is the part of the telecommunications network which connects the subscriber to the local exchange, where switching equipment is installed. Traditionally, access networks consisted of copper wire connections used solely for telephone services. Recently, these copper wire connections have proved to be good carriers for additional services such as broadband connections.

Most broadband connections provided by telephone operators are xDSL connections. xDSL is a broadband technology which uses existing copper wired telephone networks to carry data traffic. The provision of xDSL services requires the network operator to install additional equipment in an exchange, so that voice traffic is separated from data traffic (they travel together along the copper-based access network). Data traffic is sent to the DSLAM (Digital Subscriber Line Access Multiplexer), the entry point in the IP network, which concentrates subscriber lines and their respective traffic.

By far the most popular type of xDSL is ADSL, which provides more capacity downstream (from the network to the subscriber) than it does upstream (from the subscriber to the network). The problem with xDSL is that not all existing copper wired subscribers can benefit from it in the same way. The analysis of several xDSL products, such as ADSL2, ADSL2+, VDSL, HDSL¹ or SDSL², highlights a trade-off between maximum download speed and local loop length. For some types of xDSL (e.g. VDSL), that length is very small (up to 1.5Km), but can deliver maximum download (52Mbps) and upload (16Mbps) speeds which are much faster than ADSL. These speeds make the provision of triple play services – three communications services (voice, data and television) over a single broadband connection – a real possibility. For instance, OFCOM (2007) suggests that 25Mbps would be sufficient to carry simultaneous multiple HDTV³ channels, broadband internet and voice services.

Copper-based networks are investing in ADSL2+ deployment, which allows speeds up to 24Mbps. However, several factors such as the length, quality and dimensions of the copper cable and various other noise-contributing factors limit the overall availability of such speeds⁴. This suggests that offering triple play services through ADSL2+ may face significant limitations.

There does not appear to exist, as of yet, a good definition of a NGA – such a definition

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