

The Digital Economy Bill – Public Written Evidence – James Steven Moore

23rd October 2016

Introduction

This supplemental submission is to raise for consideration one of the greatest challenges of building networks that use broadband access; how regulation could mitigate challenges, enhance market efficiency and the return on investment.

My background

I have worked for 19 years in the telecommunications industry, my relevant experience is:-

- Independent consultant working with major global communications service providers and vendors on the evolution to cloud services and software defined networks.
- Head of Marketing BT Global Services, BT Connect (Network Services).
- BT Retail, Major Business, Head of Broadband.
- Specialist sales for network services.

A more details summary is available at: <https://uk.linkedin.com/in/moorejs>

Background and Discussion

This submission relates to PART 1, ACCESS TO DIGITAL SERVICES - 1 Universal service broadband obligations of the Digital Economy Bill.

Over the last decade, broadband access connections (ADSL, FTTC, and FTTP) have become the dominant access service used by businesses. For new networks, enterprises are opting for broadband access connections at 80% to 95% of sites and a 1Gbps to 10Gbps dedicated connections, like BT Openreach's Ethernet Access Direct, at a few key sites.

For some organisations and many applications, the technical quality of service (bandwidth, delay, packet loss and jitter) of public internet based services is simply not good enough. It can be considered the pure internet is not good enough for 20% of business requirements. By using sophisticated applications performance management and optimisation techniques with multiple broadband access connections about 5% of requirements cannot be met by using the internet.

Thus, enterprise customers use private network services that use broadband access connections to network services that do not involve the internet and therefore offer higher performance guarantees. These private network services are usually IP VPN's, in some markets there are also Ethernet VPN's. In the UK, BT's IP VPN service is called IP Connect, it uses a BT Wholesales service which in turn is based on BT Openreach Broadband access connections. Other communications service providers (CSP's) like AT&T, Orange Business Services, Verizon Business and Vodafone use the same services.

A key enabler for domestic and international businesses operating in the UK is coverage. Even where a small percentage of sites cannot get broadband access connections, the business case can be adversely affected – the costs of satisfactory alternatives like BT Openreach's Ethernet Access

Direct are prohibitive. To give a view on how important the access costs are, they account for about half the cost and price of a network.

The House of Commons Culture, Media and Sport Committee Second Report of Session 2016–17 report on Establishing world-class connectivity throughout the UK, expressed concern that the BDUK programme failed to encourage competition. So, looking forward, it can be envisaged that government policy may stimulate the growth of other Broadband access providers like City Fibre, Gigaclear and Virgin.

In markets where broadband access connections are provided by many operators, they create price competition and service innovation. However, they can also create their own local monopoly as it may not be viable for more than one Broadband access provider to operate. This creates challenges for domestic and international CSP's seeking to offer a complete service to their customers: -

- To build the geographic coverage needed to reach all customer sites, may require using connections from many different broadband access providers.
- Broadband access providers may not offer the connectivity products CSP's need to build their private network services.
- When connecting networks together from different providers, the costs can be the limiting factor.

These challenges can prevent the end businesses customer getting the network connectivity services the need to run their businesses. They can also increase costs, reduce market efficiency.

I would suggest a key priority is standardisation of Network to Network Interfaces (NNI's) and External Network to Network Interfaces (ENNI's) for all UK communications service providers. These allow communications service providers to connect their networks at the different layers of the business, from the network data plane through lifecycle orchestration of services. Today, standardisation is limited, so there is considerable customisation and unnecessary cost. The Metro Ethernet Forum is making significant strides to develop industry standard External Network to Network Interface (ENNI's), see: <https://www.mef.net/third-network/lifecycle-service-orchestration> and the standard (MEF 55) [https://www.mef.net/Assets/Technical Specifications/PDF/MEF 55.pdf](https://www.mef.net/Assets/Technical%20Specifications/PDF/MEF%2055.pdf). Interestingly, you will see the major equipment vendors and US CSP's are involved, they understand the issue. The UK CSP's are not. Can I suggest that by making it hard to connect to their networks, they limit competition. Local islands of control. Local islands of profit.

Looking to the future, our networks are going through a rapid evolution; they are becoming software defined networks. This is like the evolution from tradition mobile phones to smart phones. Today there are early deployments of "Overlay Software Defined Networks" where the network end points are programmed by a controller without understanding of or interaction with the transport network. In the next three to five years, deployments are expected of "Underlay Software Defined Networks". In these networks the controller is aware of and can programme the entire application delivery chain from the content provider server to end user including the underlying transport network. This includes the broadband access connection.

Let's bring that to life. Imagine that you have just chosen your favourite 16K video of Prime Minister's Questions to watch on your TV:-). The video is played on your TV in perfect quality, without the wheel of wait. This is only possible through Software Defined Networking controlling the entire application delivery chain including the underlying transport network. In summary, without end to end control you will get the wheel of wait, with end to end control, no wheel of wait.

To make software defined networks a reality, standardisation of external network to network interfaces and life cycle orchestration from the customer, through the communication service provider, to their broadband access provider's domain is going to be key.

Recommendations:

Consider whether the The Digital Economy Bill should include provisions that enable the regulator can require all broadband access providers to:-

- Offer wholesale broadband access connections on which other Communications Service Providers can build their own private network services. I would suggest these wholesale products should have a standard minimum feature set defined by the regulator. They should be offered at both layer 2 (Ethernet) allowing the CSP's to offer their own layer 3 (IP) services.
- Use standard External Network to Network interfaces, I would suggest the Metro Ethernet Forum's MEF 55 standard would be a good place to start.