Combined Response of EE, Three and MBNL

Business Connectivity Market Review

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1. Executive summary

- We welcome Ofcom's call for inputs at the start of its Business Connectivity Market review, and the willingness to gauge which issues are deemed most important by users of business connectivity services, early in the review process.

- There has been a significant increase in the volumes of data carried over mobile networks over the last few years and growth is expected to continue at a rapid rate. Mobile operators are responding to this challenge by continually upgrading their backhaul capacity, but the capacity requirements continue to increase. The availability of cost effective mobile backhaul is key to the future development of the market.

- Ofcom's main objective is to promote the interests of consumers, where appropriate, by promoting competition. A key enabler of competition in mobile backhaul is the regulation of wholesale inputs, such as Ethernet Access Direct (EAD), where an operator has significant market power (SMP). However, the availability of regulated EAD products has not delivered effective competition in mobile backhaul.

- The current market review provides an opportunity for Ofcom to promote competition at the deepest level where it is sustainable, even if it involves some sacrifice of static economies of scale and scope.

- Three, EE and MBNL support a change in the regulatory model to one focused on deeper infrastructure competition. In our view Ofcom can foster effective competition in mobile backhaul in two ways:

    - **Encouraging deeper interconnection with Openreach** – this would encourage BT's rivals to unbundle a sufficient number of Openreach exchanges needed to compete with BT's scale and scope;

    - **Imposing passive remedies** – regulated access to Openreach's physical network – in particular, dark fibre – would allow more extensive competition along more of the value chain.

- Communications Providers (CPs) are currently prevented from accessing Openreach's passive infrastructure (e.g. dark fibre or physical infrastructure) for wholesale leased lines. The availability of passive products would promote competition and investment in Ethernet networks and provide an efficient means to allow CPs to expand their network into new geographic areas.

- Greater competition in backhaul provision, created through passive remedies, would increase innovation by allowing CPs to configure and deploy their own equipment to better suit their customer's needs. The availability of better quality products in the market would also put pressure on all operators (including Openreach) to innovate, driving greater dynamic efficiency.

2. Introduction

This document provides a combined response to Ofcom's Call for Inputs with respect to the Business Connectivity Market Review (BCMR). EE and Hutchison 3G UK (Three) jointly purchase leased lines through their joint venture Mobile Broadband Network Limited (MBNL).

MBNL operates a shared radio access network (RAN) for its shareholders. EE and Three operate their own core networks, retain their own access spectrum licences and compete at the retail level. As such, MBNL is a significant purchaser of mobile backhaul services for the shared RAN to link radio base station sites to the respective core networks. BT Wholesale (BTW) is a major supplier of such backhaul services.

The response represents the mutually agreed position of EE, Three, and MBNL. The response focuses on a number of key points covered in the following sections:

- Section 3 outlines the key reasons behind MBNL's need to purchase Managed Ethernet Access Service (MEAS) from BT Wholesale;
- Section 4 sets out the main challenges that exist in the provision of backhaul services;
- Section 5 explains the need to encourage greater competition in mobile backhaul; and
- Sections 6 and 7 consider the benefits of deeper interconnection with Openreach and passive remedies respectively.

At this early stage of the process, we do not have definitive views on a number of topics and for this reason we have not commented on all questions within the consultation. We look forward to further, more detailed discussions, throughout the market review.

3. The need to purchase MEAS for national mobile backhaul

MBNL purchases MEAS from BTW. MEAS provides transmission capacity from thousands of radio sites to the respective core networks of Three and EE. [✂]

The end-to-end MEAS product enables aggregated traffic from multiple sites to be efficiently managed and carried across BT's 21CN network to the Mobile Switching Centres (MSCs). The traffic carried across BTW's 21CN network can thus be efficiently managed and multiple overheads and peak capacity requirements do not need to be reserved across the whole of BTW's network for each site. It is not efficient, or potentially even feasible, to purchase individual point to point lines for each site all the way back to the mobile operators' core networks.

4. Statement of the problem

In the previous BCMR we made a case for a separate review of mobile backhaul as a stand-alone market. We reasoned that the nature of mobile backhaul requires the connection of a large number of geographically diverse sites to mobile network operators' core networks. This means that the nature of the bundled product and the conditions of competition in which it is purchased are very different to the rest of the 'Alternative Interface' (AI) market, from which inputs to the MEAS product are sourced.

We consider that these specific conditions have become more acute since the last BCMR. The roll out of 4G and the significant increase in demand for data mean that the capacity constraints in the mobile backhaul market have become more severe. These challenges are not sufficiently addressed when mobile backhaul is aggregated with enterprise connectivity products within the wider BCMR. Instead the challenges in the mobile

backhaul market could be addressed more effectively through a separately defined market focussed on mobile backhaul. We would welcome the opportunity to meet and discuss this with Ofcom.

The following sections outline the key challenges that exist in the mobile backhaul market.

4.1 Lack of effective competition in mobile backhaul

As Ofcom is aware, volumes of data carried over mobile networks have increased significantly over the past few years. In particular, smartphone take-up in the UK is now at 51%. The roll out of 4G, with the faster data speeds it offers end users, increases the consumption of data per user. As a result, the 2013 update of Ofcom's Infrastructure Report shows that data traffic carried by UK mobile networks went up by 50% between June 2012 and June 2013.

Mobile operators are responding to this challenge by continually upgrading their backhaul capacity. [✂]

[✂]

In the last BCMR, Ofcom concluded that there are no barriers preventing other operators from replicating BTW's MEAS product. Ofcom took the view that Ethernet mobile backhaul should be included in the wholesale AISBO markets. It found no SMP provider of AI trunk and core conveyance. In its view, any provider can then source regulated AISBO Ethernet circuits from Openreach and self-provide their core networks in order to provide an alternative MEAS product in competition with BTW.[1]

In MBNL's experience, this view does not reflect the reality of the market. The availability of regulated EAD products is not sufficient to ensure effective competition in mobile backhaul.

The largest single cost item in mobile backhaul is the cost of the local EAD tails linking thousands of base stations to the core transmission network. Openreach makes available two versions of EAD:

- **Local Access (LA) circuits** – which connect a cell site to the nearest BT Exchange that has fibre, without the provision of any main link fibre between Openreach exchanges;
- **Non Local Access (LA) circuits** – which are more costly because they involve several "hops" and hence provision of a main link between Openreach exchanges.

Mobile operators require an end-to-end nationwide service that can connect thousands of geographically dispersed mobile stations to the core network. In order to provide a competitive mobile backhaul product, other providers must incur similar costs to BTW. This means that they need to be able to use the lower cost LA EAD circuits to the same extent as BTW.

For other operators to do this, they need to unbundle Openreach exchanges that are close to MBNL's base stations. However, unbundling an exchange requires significant investment in backhaul, equipment and accommodation. This will only be economically viable where the volume of traffic and the cost savings from LA circuits are sufficient to justify the cost of unbundling the exchange.

Due to the ubiquity of its 21CN network and economies of scale and scope from large volumes of traffic, BTW is able to source a greater proportion of LA circuits from Openreach. BTW can justify unbundling a larger number of Openreach exchanges to pick

[1] Business Connectivity Market Review Statement (28 March 2013), paragraph 7.157

up LLU services, NGA services and mobile backhaul traffic. This gives it a cost advantage that rivals are unable to match.

[✂]

4.2 Lack of innovation and quality issues

The consultation highlights increased concerns amongst CPs with respect to the quality of BT's Ethernet service.[2] MBNL shares these concerns in respect of BTW.

The market reality is that BTW faces weak competitive pressures to improve product quality and innovate as it would in a truly competitive environment. The current quality and pace of innovation in mobile backhaul does not "keep up" with customers' demands.

One important example relates to the provision of Synchronous Ethernet (SyncE). SyncE is a technology that enables timing information to be co-ordinated across a mobile network. Synchronisation is an essential feature of radio networks, because it ensures that spectrum capacity is used effectively in the RAN and that hand-over is feasible between different radio cells. SyncE is the current international benchmark standard for providing this capability.

MBNL first asked BT to develop SyncE technology in cooperation with MBNL in 2008. However, BT's roadmap is slow and the introduction of SyncE has been perpetually delayed. [✂]

The delay in BT's roll-out of SyncE has also potentially stifled the ability of other CPs to provide SyncE technology. As detailed above, a number of CPs have the capability to offer a solution that allows timing synchronisation. However their network reach capabilities are limited, requiring them to source Openreach local tails to provide effective national capacity. This means that the limitations of BT's network restrict other CPs ability to deploy this synchronised timing service, as they are obliged to use a mix of their own product and BT's limited products, in certain geographical locations.

This is not an isolated example of BT's lack of innovation. [✂].

In the past, Ofcom has treated these issues as isolated problems with BTW's mobile backhaul product and has offered to facilitate commercial discussions[3]. In our view, these issues indicate that there is lack of competitive pressure on BTW. BTW's technical capability is not keeping pace with the requirements of mobile networks.

4.3 BT's charging structure

The main elements of cost in the provision of leased lines are the capital costs of ducts, fibre and equipment. This physical infrastructure is very costly and constitutes a large proportion of the capital expenditure of the access network. In general, costs in the access network are determined by the number of subscribers and do not vary significantly with capacity. The marginal cost of adding capacity when the underlying infrastructure is in place is relatively low.

In contrast, BTW's mobile backhaul prices are bandwidth dependent. In order to increase backhaul capacity, mobile operators need to negotiate additional charges for "new" backhaul products which are essentially software upgrades or minimal capital expenditure at either end of the link.

BT's pricing structure creates a significant capacity constraint on operators at a time when demand for mobile data is increasing at an unprecedented rate. In order to remove this constraint it is important to decouple the link between ongoing costs and increased bandwidth requirements. This can be achieved by replacing the capacity based charging

[2] Paragraph 1.18

[3] Business Connectivity Market Review Statement , paragraph 12.161

structure (e.g. BT's traditional pricing for MEAS) with a single one-off capital cost (which would not need to be paid again as the bandwidth increases) and a low, recurring, operational cost (when compared to traditional Ethernet pricing).

[✂]

4.4 Increased calls for "universal" mobile coverage

The current Government has expressed a clear desire to reduce the number of partial and complete 'not-spots' in mobile coverage. Government recognises the large gap in provision of fibre backhaul needed to support growth in mobile coverage, namely:

"*More bandwidth will be required as the traffic over fixed and wireless networks continues to rise. […] The need to achieve balanced growth across the country and between rural and urban locations (and super connected cities) has implications for the bandwidth required across the country. Geographical coverage becomes as relevant as population coverage. Debate will continue in a fixed context as to how close to the customer is fibre deployed. A second element of the fibre debate is backhaul for the mobile networks and how far availability (or lack of it) of backhaul acts as a constraint on their ability to deliver services more widely*."[4]

Extending mobile coverage, especially in rural areas, requires the availability of cost effective backhaul solutions. We are pleased that Ofcom recognises the importance of coverage, for example:

"[Ofcom's] first key [regulatory] challenge is to help to address the unevenness in performance and availability that affects some consumers…For mobile, a strong picture overall masks a need for improvements in quality of service and fails to reflect the reality of partial or total not spots for both voice and data, particularly in rural areas. We are acting to address these where we can, with extensive coverage obligations for 4G and supporting infrastructure sharing, which reduces partial not spots. But the principal role here – in areas beyond market deployment – is for Government. The UK Government is indeed intervening to increase fixed coverage and reduce mobile not spots – initiatives Ofcom fully supports."[5]

This review of the business connectivity market provides an opportunity for Ofcom to assess the extent to which regulation could help address current mobile "not spots" and bring coverage to remote rural locations. Of particular relevance is the question of whether the introduction of passive access to Openreach's ducts and dark fibre capacity could extend the geographic reach of existing networks and help achieve the Government's objectives.

5. Encouraging greater competition in mobile backhaul

Ofcom's main objective is to promote the interests of consumers, where appropriate, by promoting competition. A key enabler of competition in mobile backhaul is the regulation of wholesale inputs (e.g. EAD) where an operator has significant market power (SMP). However, the availability of regulated EAD products has not delivered effective competition in mobile backhaul. [✂]

The time is ripe for Ofcom to take a fresh view of the state of the market and put in place appropriate measures that will allow competition to emerge, potentially by regulating further upstream in the value chain. In effect, the current regulatory model is prioritising allocative efficiency at the expense of competition, which drives dynamic efficiency.

[4] Digital communications infrastructure strategy scenario workshop – background, DCMS, 25 April 2014.

[5] Understanding the forthcoming three year telecommunications regulatory landscape, Ed Richards speech, 30 April 2014.

In the presence of economies of scale and scope in the local access network, allocative efficiency may best be served by having a single supplier of local access (i.e. Openreach) and enabling other operators to access that network at regulated prices. This is Ofcom's current regulatory model.

In the mobile backhaul market, however, there is good reason to doubt that the current regulatory model is serving consumers well. We haven't seen the same level of entry as we have in retail broadband for example. The current market review provides an opportunity for Ofcom to promote competition at the deepest level where it is sustainable, even if it involves some sacrifice of static economies of scale and scope.

Indeed, Ofcom's policy is to promote competition at the deepest level where it is sustainable and efficient. For instance, Ofcom's Final Statement on the Strategic Review of Telecommunications explains that:

"we believe that competition based upon infrastructure tends to give greatest benefits in terms of the mix of lower prices and faster innovation that consumers and businesses want"[6]

EE, Three and MBNL support a change in the regulatory model to one focused on deeper infrastructure competition. In our view Ofcom can foster effective competition in mobile backhaul in two ways:

- **Encouraging deeper interconnection with Openreach** – this would encourage BTW's rivals to unbundle a sufficient number of Openreach exchanges needed to compete with BTW's scale and scope;

- **Imposing passive remedies** – regulated access to Openreach's physical network – in particular, dark fibre – would allow more extensive competition along more of the value chain.

6. Benefits of deeper interconnection with Openreach

As explained in section 4, mobile backhaul providers are unable to compete effectively with BTW on the basis of Openreach's regulated active products. BTW's scale and scope allows it to unbundle more Openreach exchanges than any other mobile backhaul provider. In effect, BTW's MEAS product benefits from a higher proportion of lower cost LA circuits.

We invite Ofcom to consider innovative ways to address this issue in the current market review. We have no definitive views at this stage, but the key is to allow BTW's rivals to achieve greater economies of scale and scope to expand the coverage of their networks.

One possibility may be to limit the number of Openreach exchanges at which operators must connect in order to pick up the lower cost EAD circuits. This could be achieved by grouping exchanges in low demand areas and nominating one as a parent from which EAD circuits would be available, thereby increasing the average length of a LA circuit.

7. Benefits of passive remedies

We welcome Ofcom's intention to again consider the case for passive remedies in business connectivity markets.

Passive remedies such as Local Loop Unbundling (LLU) have transformed the residential broadband market and are rightly regarded as one of Ofcom's most successful policy measures. LLU allows suppliers to compete with BT based upon the deepest level of alternative infrastructure, offering the greatest scope for innovation short of providing their own access network. LLU provides an excellent example of how a passive product can

[6] Final statements on the Strategic Review of Telecommunications, and undertakings in lieu of a reference under the Enterprise Act 2002 Statement, Paragraph 4.4

"kick start" competition and deliver substantial benefits, over and above BT's active wholesale products.

In our view, the ability to access or lease ducts and dark fibre capacity from Openreach for the purposes of business connectivity is likely to provide substantial long term benefits for consumers in the UK. The following sections outline the key benefits that passive remedies could deliver over and above those that are available in relation to active remedies.

We acknowledge that passive remedies pose practical challenges. These include the impact on BT's cost recovery, their co-existence with the existing suite of Openreach active products and the static costs of having more than one supplier providing Ethernet services over the local access network. We look forward to Ofcom's assessment of their relative benefits and disadvantages in the current market review.

Ofcom's consideration of passive remedies is particularly relevant in light of the new European Directive that will introduce a right for telecoms providers and utilities to access each other's passive infrastructure for the purposes of rolling out high-speed broadband networks. At present, Ofcom can only impose infrastructure sharing or other remedies on SMP providers – infrastructure networks owned by power companies and water utilities fall outside its remit. MBNL and its shareholders look forward to Ofcom's assessment of the implications of these legal provisions in the current market review.

7.1 Increased upstream competition

[✂]. The availability of passive products would promote competition and investment in Ethernet networks and provide an efficient means to allow CPs to expand their network into new geographic areas.
In particular, passive remedies would significantly reduce the cost of building new infrastructure. This would reduce barriers to entry in the local access network (the economic bottleneck) and facilitate more effective competition throughout the value chain.

The largest single cost item in mobile backhaul is the cost of the local EAD tails. Passive remedies would encourage more providers to compete with BTW in the provision of a cost effective, nationwide end-to-end mobile backhaul product, by reducing costs and lowering barriers to entry in that network segment. [✂]

7.2 Incentivise innovation

As Ofcom has concluded in previous reviews, innovation cannot be imposed on a market as a regulatory requirement[7]. Currently, Openreach and BTW dictate the pace of innovation in mobile backhaul. The current arrangements mean that operators are dependent on BT upgrading capacity. This means each operators ability to upgrade to the latest technologies is constrained by the speed at which BT is able to upgrade.

In particular, Openreach makes new developments available to all operators simultaneously, which undermines their incentive to compete and differentiate themselves through innovation. In turn, due to lack of competition, BTW has little incentive to innovate and provide a better mobile backhaul product. Greater competition in backhaul provision, created through passive remedies, would increase innovation by allowing operators to deploy their own equipment and innovate in the electronics layer. BT's rivals would be free to configure their equipment to better suit their customer's needs. The availability of better quality products in the market would put pressure on all operators, including Openreach, to innovate.

Importantly, the availability of passive remedies would also alleviate the risk around BT product development and the dependency that mobile radio networks have on that

[7] Ofcom, Final Statement on the Strategic Review of Telecommunications, 22 September 2005, at paragraph 3.11

development. [✂]. The competitive constraint created by passive remedies would potentially lead to higher capacity mobile backhaul products, which in turn would lead to better mobile speeds and an enhanced user experience to the benefit of UK consumers.

In addition, MBNL still currently lacks an end-to-end connectivity SyncE solution due to BT's slow product development. Passive remedies would incentivise competing providers to develop their own SyncE based products, creating greater competitive pressure for BT to deliver MNO customers' requirements.

7.3 Demand responsive price structures

The current capacity based pricing structure means that operators incur additional connection and operational costs in upgrading their network capacity to GigE. This creates a significant capacity constraint on operators. There is a clear need to decouple the link between price and increased bandwidth requirements in order to remove this constraint.

Passive remedies would allow CPs to operate in markets (product and geographic) that are currently not open to competition, and introduce innovative and flexible pricing which responds to the demands of the relevant market.

More generally, with Openreach's current price structure, higher bandwidth services make a greater contribution to common costs than lower bandwidth services. The reason is that the tariff gradient increases with bandwidth at a faster rate than the gradient of marginal cost in relation to bandwidth. Ofcom has traditionally approved this charging structure on the basis that it is likely to be efficient in principle.

Ofcom's key concern with the introduction of passive remedies relates to the ability of CPs to use passive remedies selectively, and target those BT services providing the greatest contribution to common costs – particularly high bandwidth services in dense traffic areas. Ofcom was concerned with the possibility that BT may rebalance its tariffs to the detriment of consumers of low bandwidth services.

We recognise that passive remedies could potentially lead to BT reallocating its common costs between services. Ofcom has used long run incremental costs, plus an equi-proportionate mark-up, for the recovery of common costs in several price controls. By contrast, as explained above, BT currently recovers a greater proportion of its common costs from high bandwidth services compared to low bandwidth services. Common costs have been excluded entirely in recent assessments of Mobile Termination Rates (MTR) in order to promote competition, particularly for smaller network operators. In our view, there should be no presumption that BT's current pricing structure is efficient in principle and we look forward to an explanation by Ofcom as to why a different approach to common cost recovery would be appropriate for BCMR.

In addition, we note that Ofcom seems to rely on distributional factors in weighting impacts on consumers of low versus high bandwidth services. In other contexts, Ofcom has specifically stated that dealing with equity concerns is not the role of the regulator, who should be more concerned with promoting competition and efficiency. Specifically, in the 2011 MTR review (and in the subsequent appeal processes) Ofcom argued that promoting equity should not be its primary concern when setting charge controls and that charge controls were "a highly inefficient tool" for pursuing "social" outcomes[8]. Whilst there may not necessarily be a direct read across between these regulatory decisions, we consider that there is a need for consistency in regulatory assessments.

One of the key questions in this review concerns the extent to which BT's current charging structure may be in the interests of consumers and should be protected. We look forward to an explanation as to why BT's pricing structure, in its current form, would be considered efficient.

[8] Paragraphs A3.272-3 of Ofcom's "Wholesale mobile voice call termination" Statement, published 15 March 2011

7.4 Improved network efficiencies

In addition, requiring BT to offer access to unlit fibre to other network operators would allow other operators greater control over the infrastructure elements of the network and make the aggregation of capacity more efficient.