



Request from BT for an exemption from its Undertakings under the Enterprise Act 2002 related to Wavestream National

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Consultation

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Section 1

Summary

- 1.1 The objective of this Consultation is to seek views from interested parties on BT's request for an exemption for its Wavestream National product from the undertakings that it gave to Ofcom under section 154 of the Enterprise Act ("the Undertakings").
- 1.2 Since the Undertakings were agreed five years ago, BT has delivered over eighty percent of its Undertakings obligations and the level of service that it provides to its competitors (in accordance with the Undertakings) has improved. Residential and business consumers have benefited from greater availability and choice of services - including broadband, bundled services, and business connectivity services based on Ethernet. However, BT has faced challenges in delivering equivalence for one of its specialist products, Wavestream National.
- 1.3 Wavestream National provides connectivity between any two end user sites, UK-wide, based on Dense Wavelength Division Multiplexing ("DWDM") technology. Each wavelength enables point-to-point transmission speeds up to 10 Gbit/s and can carry multiple protocols. Once the end-to-end connection is set up, users can easily buy additional wavelengths. BT usually sells Wavestream National to large corporations, particularly in the IT, finance, media and public sectors, for high bandwidth applications such as internal network build, data centre connectivity and disaster recovery.
- 1.4 Depending on the customer requirements and network availability, BT delivers Wavestream National over two different architectures: a) point-to-point or dedicated-fibre infrastructure; and b) shared-fibre infrastructure. The former provides a dedicated fibre link between the end-customer premises, whilst the latter multiplexes wavelengths over BT's shared core network.
- 1.5 Under the terms of the Undertakings BT and Ofcom are required to agree the action to be taken in respect of products and services which fall under Section 5.46.2 (including Wavestream). The original Undertakings gave BT and Ofcom until 21 January 2006 to review these products and determine the arrangements relating to them. This period has subsequently been extended on a number of occasions and most recently was extended until 31 December 2008, when Ofcom granted BT an exemption to the Undertakings regarding Wavestream National.
- 1.6 Specifically, BT was exempted from
 - a. providing a shared infrastructure solution on an EOI basis until 31 Dec 2010 when a product was expected to have been launched on BT's 21st Century Network (21CN)¹ and consumed for new supply starting from the Ready For Service ("RFS") date of 1 January 2011;
 - b. migration of existing customers onto the EOI solution until the end of 2015 (Installed Base Migration Complete ("IBMC")), subject to a review of both scope and duration of the exemption every two years starting from 2012; and

¹ 21CN refers to BT's Next Generation Network (NGN) plan. NGNs deliver convergence between the traditional public switched telephone networks and the new data networks. For more details see <http://stakeholders.ofcom.org.uk/consultations/ngndevelopments/>

- c. providing equivalence of inputs ("EOI") for the dedicated end-to-end solution on an ongoing basis, subject to a review every two years starting from 2012.

- 1.7 BT has now requested an ongoing exemption from providing the shared infrastructure on an EOI basis. The technical standards on which BT is basing its input product are still at an early stage of development and consequently end user demand for such services has yet to emerge. The costs for BT downstream to consume an upstream EOI input are also likely to be significant. BT therefore considers that it would not be proportionate to require it to consume an EOI upstream input, particularly as there is no evidence of competitive harm at present.
- 1.8 We are proposing to grant the exemption to BT, subject to us being able to review the appropriateness of the proposed exemption following Ofcom's next relevant market review which includes the Wavestream National product. We recognise that today BT's competitors have a number of options for supplying services similar to BT's Wavestream National. We also accept that services based on the technology BT has been developing for its upstream EOI input into Wavestream National are still evolving and end user demand has yet to emerge. While to date we have not yet carried out a formal review of the relevant markets to enable us to assess the competitive state of the market which includes Wavestream National services, we will be launching a review of the business connectivity market shortly.
- 1.9 In addition, whilst the current proposed exemption primarily concerns the shared infrastructure product, we are also proposing to align the exemption review process for both the dedicated and shared infrastructure products². In essence, we propose that, rather than reviewing the appropriateness of the exemption relating to the dedicated product every two years starting from 2012, that the review of both exemptions can be undertaken simultaneously following the conclusion of Ofcom's next relevant market review. Ofcom plans to initiate its review of the business connectivity market during 2011.
- 1.10 We have also sought a firm commitment from Openreach to continue the development of an upstream input that allows its wholesale customers to develop downstream solutions which address broadly the same end user needs as BT's Wavestream National product. This upstream input would be based on Optical Transport Network (OTN) technology. Openreach has confirmed that it is willing to formalise this commitment to industry as part of the Openreach Industry Commitments agreed in September 2009³. If this exemption is granted, Openreach has confirmed to us that it would work towards having this solution ready on a commercial basis by 31 December 2011.

² Note that we already granted an exemption on an on-going basis for the dedicated version with the only difference that is subject to a review every two years, the first such review to take place before the end of 2012.

³ "Re-prioritising BT's remaining Undertakings commitments on information systems separation", Ofcom, 11 Sept 2009, <http://stakeholders.ofcom.org.uk/binaries/consultations/btundertakings/statement/statement.pdf>

Section 2

Introduction and Background

- 2.1 On 22 September 2005 BT offered, and Ofcom accepted, a set of undertakings pursuant to section 154 of the Enterprise Act ("the Undertakings"). The Undertakings addressed issues that had been raised by Ofcom as it considered whether to refer certain markets to the Competition Commission in relation to the provision of fixed telecommunications. The Undertakings were accepted by Ofcom in lieu of making such a reference at that time. Ofcom's reasons for accepting the Undertakings, together with the Undertakings themselves, are set out in full in the document entitled *Final statements on the Strategic Review of Telecommunications, and undertakings in lieu of a reference under the Enterprise Act 2002*⁴.
- 2.2 The Undertakings included mechanisms to allow for variations to be agreed by BT and Ofcom and for BT to request exemptions from the Undertakings. Since the acceptance of the Undertakings, BT has branded its Access Services division, as referred to in the Undertakings, as Openreach. Therefore, this document refers to Openreach throughout.

Wavestream product

- 2.3 BT's Wavestream is a BT Global Services (BT GS) product based on DWDM technology. It is provided to end users who require very high bandwidth services with exacting standards, e.g. predictable and very short delays, fixed bandwidth, resilience, etc. A Wavestream system provides a connection between two end user sites and is capable of supporting up to 32 individual wavelengths. Each single wavelength then provides a very high bandwidth connection (up to 10 Gbit/s). Turning up additional wavelengths once a system is installed can be done very quickly and at relatively low incremental cost. The Wavestream product includes Network Terminating Equipment ("NTE") that allows a number of different protocols to be supported, including Ethernet, Synchronous Digital Hierarchy ("SDH") and data-centre specific applications.
- 2.4 BT's portfolio consists of three Wavestream products, differentiated on a distance basis:
- Wavestream Connect (WC) for connections up to 35Km;
- Wavestream Regional (WR) for connections up to 70 Km;
- Wavestream National (WN) for connections of above 70Km.
- 2.5 BT sells Wavestream National usually to large corporations, particularly in the IT, finance, media and public sectors, for high bandwidth applications such as internal network build, data centre connectivity and disaster recovery. To fulfil the demanding reliability requirements of such applications, BT offers resilience and protection options as part of the product and a fast fault response with a 5-hour target clearance.
- 2.6 BT specifies that there are two different customer requirements that Wavestream National supports. Some of the solutions that customers run over Wavestream have

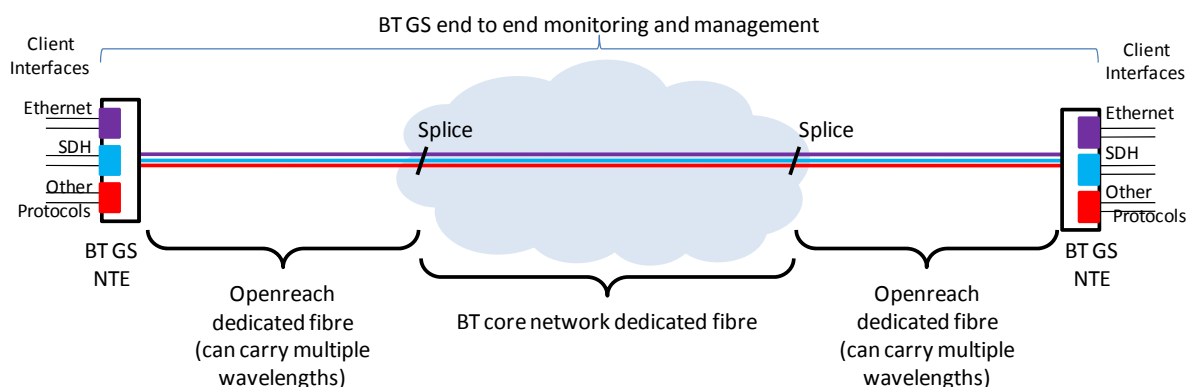
⁴ http://www.ofcom.org.uk/consult/condocs/statement_tsr/

certain strict performance and security requirements. This means some customers demand a dedicated, point-to-point solution. Other customer requirements can be supported over a shared network infrastructure, where this is available. This has resulted in two different network infrastructures being developed:

- Point-to-point, also known as dedicated-fibre architecture
- Shared-fibre architecture

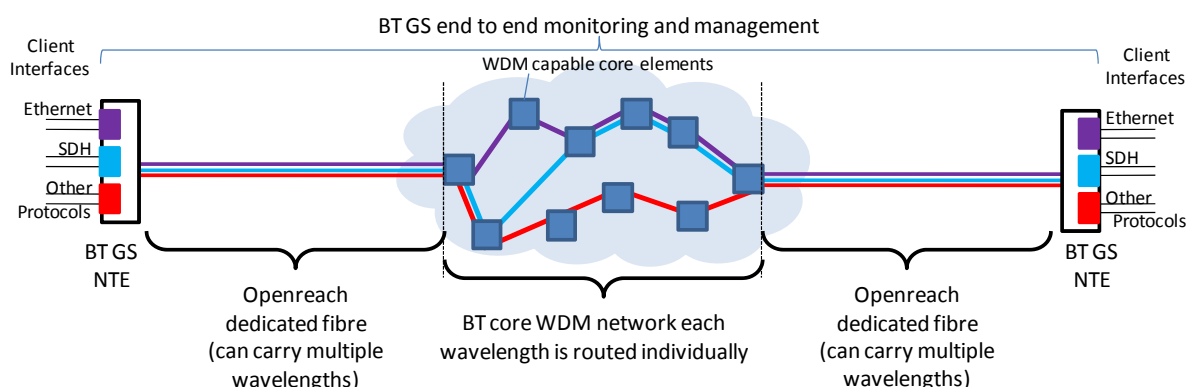
2.7 The point-to-point architecture is depicted in Figure 1. It is sometimes referred to as Wavestream Regional overlength/extended and it consists of a point-to-point fibre connecting each of the customer's locations to the nearest BT core node. These backhaul fibres are then directly connected (via a fibre splice) to a dedicated fibre that connects across the BT core network, giving the customer an end-to-end dedicated fibre.

Figure 1 Point-to-point infrastructure architecture



2.8 Figure 2 below shows the shared infrastructure architecture: a point-to-point fibre connects each of the customer's locations to the nearest BT core node. Each separate wavelength is then routed individually across the shared BT core network infrastructure – different paths may be taken by each wavelength. In BT's current implementation of the shared infrastructure, the NTE and core network WDM equipment use proprietary interfaces that do not fully conform to industry standards. Moreover, the equipment used to supply the current shared infrastructure is no longer supplied or developed. Therefore, BT is now supporting new requirements for Wavestream National using only the point-to-point approach, even though some of these customers' requirements could theoretically be met with a shared infrastructure solution. In 2008, BT proposed to develop an EOI based shared infrastructure solution on its 21CN, using equipment based on international standards. Its basic architecture was expected to be the same as that shown in Figure 2 below.

Figure 2 Shared infrastructure architecture



The exemption process

- 2.9 At the time the Undertakings were formulated it was realised that in the interest of reaching a conclusion in a timely manner, to ensure that the benefits of the Undertakings could be felt by consumers as quickly as possible, it would be inappropriate to consider each of BT's products individually to decide whether EOI should apply in each case. Instead, a mechanism was included within the Undertakings to place general requirements on BT regarding the provision of products on an EOI basis, and to allow for exemptions from this requirement where appropriate. This Consultation includes one such request, for the Wavestream National product.
- 2.10 The possibility of there being products and/or services about which a decision would need to be made with respect to EOI was recognised and anticipated in the Undertakings. Section 5.46 of the Undertakings not only sets out the general principle of when EOI will apply (at 5.46.1) but also sets out a list of products to which EOI will not apply (at 5.46.1(a) – (i)). In addition, Section 5.46.2 envisaged that there were products which would exist at the date when the Undertakings came into force (22 September 2005) and which Openreach would supply, but concerning which Ofcom and BT would have to subsequently agree whether or not EOI should apply, or whether the product should be withdrawn from supply by BT. Such products include Wavestream services.
- 2.11 Under the terms of the Undertakings BT and Ofcom are required to agree the action to be taken in respect of products and services which fall under Section 5.46.2. The original Undertakings gave BT and Ofcom until 21 January 2006 to review these products and determine the arrangements relating to them. This period has subsequently been extended on a number of occasions and most recently was extended until 31 December 2008⁵ to allow a decision on Wavestream National to be made.
- 2.12 Ofcom consulted on a request from BT for exemption for Wavestream in October 2006⁶, in December 2007⁷ and again in September 2008⁸. In December 2008⁹,

⁵ <http://stakeholders.ofcom.org.uk/binaries/telecoms/policy/bt/var15.pdf>

⁶ <http://www.ofcom.org.uk/consult/condocs/btrequests/>

⁷ <http://stakeholders.ofcom.org.uk/binaries/consultations/wavestream/summary/wavestream.pdf>

⁸ <http://stakeholders.ofcom.org.uk/binaries/consultations/eoi/summary/eoi.pdf>

⁹ <http://stakeholders.ofcom.org.uk/binaries/telecoms/policy/bt/wavestream1208.pdf>

Ofcom granted the latest exemption to BT on Wavestream National (see below for details).

- 2.13 BT has now submitted a further exemption request for Wavestream National, which is discussed in this Consultation. In this document, we present BT's exemption request for Wavestream National, along with Ofcom's reasoning for proposing to agree to the request. Ofcom is seeking views from interested parties on this request.

Previous exemptions

- 2.14 In October 2006, Ofcom issued a consultation¹⁰ related to thirteen requests for exemptions made by BT, including the Wavestream product portfolio. Based on responses to that consultation, Ofcom did not agree to the requested exemption in relation to Wavestream products.
- 2.15 During 2007 BT submitted a new exemption request in relation to the Wavestream product. We consulted on that request in December 2007. Ofcom proposed:
- for Wavestream Connect and Wavestream Regional, an exemption until 31 December 2008 to allow BT to move the supply of Wavestream Connect and Wavestream Regional onto Openreach provided EOI products and until 31 December 2010 to allow the migration of the installed base
 - an exemption for Wavestream National to run until 31 December 2010 by which time it would be reviewed.
- 2.16 Based on responses to that consultation, in our statement of 20 May 2008 we agreed to the exemption in relation to Wavestream Connect and Wavestream Regional but did not grant the exemption on Wavestream National because the issue needed further consultation in light of new information submitted by BT in relation to that product.
- 2.17 The current EOI inputs to BT's Wavestream Connect and Wavestream Regional products are the Openreach Optical Spectrum Access (OSA) and Optical Spectrum Extended Access (OSEA). The former offers connections of up to 35 Km radial distance, the latter of up to 70 Km. OSA and OSEA offer point-to-point high speed data circuits using DWDM technology. Customers are able to specify the type of interfaces that they need to interconnect and these can be a mix of Ethernet, Fibre Channel, traditional SDH, and other data interfaces. Depending on the type of service interface fitted, each wavelength can be configured to support different protocols and carry separate data traffic. This enables a combination of protocols to operate simultaneously over an OSA or OSEA system.

The latest exemption granted in December 2008

- 2.18 In September 2008, we published a further Consultation where Ofcom presented BT's updated exemption request for Wavestream National, along with Ofcom's reasoning for proposing to agree to the request.
- 2.19 In the updated request BT explained that Wavestream National can be supplied by using two different infrastructures according to the customers' needs: 1) dedicated

¹⁰ <http://www.ofcom.org.uk/consult/condocs/btrequests/>

point-to-point infrastructure; and 2) shared infrastructure (see figures 1 and 2 above for details).

- 2.20 The issue with the dedicated solution was that these circuits use a fibre splice to interconnect the access fibre to the core fibre (see vertical dotted lines in Figure 1). This type of interconnection does not make use of active equipment, i.e. there is no handover point between access/backhaul and core. For this reason, it was not possible for BT to split the architecture and consume an equivalent input for the access segment.
- 2.21 On the shared infrastructure, BT had the problem that the NTE and core network WDM equipment use proprietary interfaces that do not fully conform to industry standards. The equipment used to supply the shared infrastructure approach is no longer supplied or developed by the manufacturer. BT currently supports new supply of Wavestream National using the point-to-point approach, even though some of the customers' requirements could theoretically be met with a shared infrastructure solution.
- 2.22 BT therefore proposed to develop an EOI based shared infrastructure solution on 21CN, using equipment based on international standards. The architecture would therefore be the same as that shown in Figure 2, with the important difference that standard rather than proprietary equipment would be used.
- 2.23 In December 2008, after consulting with industry, Ofcom granted BT the following:

For the shared infrastructure solution:

1. Exemption from providing a shared infrastructure solution on an EOI basis until 31 Dec 2010 when a 21CN product can be launched¹¹. (RFS date of 1 January 2011).
2. Exemption from completing the migration of existing customers onto the EOI solution until 2015 (BMC). The precise duration and scope of this exemption would be regularly reviewed, the first review to take place before the end of 2012 and thereafter every two years

For the end-to-end dedicated fibre solution:

3. Exemption from EOI on an ongoing basis. The duration of this exemption will be regularly reviewed, the first review to take place before the end of 2012 and thereafter every two years. Should Ofcom and BT fail to reach agreement on continuation of the exemption after such a review, the non-EOI product would have to be withdrawn to avoid a breach of the Undertakings.
- 2.24 At the time we were negotiating the previous exemption, we were concerned that if BT migrated all its customers' Wavestream National services to the dedicated infrastructure, it would *de-facto* avoid having to move those services to EOI provision in due course. We therefore added a clause to the exemption that required qualifying shared infrastructure circuits that had been migrated by BT to the dedicated circuit solution as a consequence of insufficient core network capacity and/or equipment

¹¹ The RFS date was set on the basis that BT could develop an EOI product based on its 21CN Next Generation Network by that time.

supplier limitations, to then be migrated to the new EOI 21CN-based shared infrastructure that was to have been made available from 1 January 2011.

- 2.25 The solution proposed by BT to meet the RFS date of 1 January 2011 consisted of the following plan: *“Openreach will support the new supply of BTGS Wavestream National business from 31 December 2010 with appropriate input products, available on a Eol basis. Openreach will provide new input products on an Eol basis to CP¹² customers, who will be restricted from using to build or extend core networks or where the intent is to replicate a core network”*¹³

The process for considering BT's requests

- 2.26 The Enterprise Act requires that Ofcom should “have regard to the need to achieve as comprehensive a solution as is reasonable and practicable to the adverse effect on competition”. Ofcom's competition concerns were set out in its *Strategic Review of Telecommunications Phase 2 Consultation Document*¹⁴. In considering the case for agreeing to variations to, or exemptions from, the Undertakings, Ofcom must consider whether this comprehensive solution is materially and negatively affected by the variations and exemptions in question.
- 2.27 Section 155 of the Enterprise Act 2002 requires that Ofcom consults where it proposes to amend the Undertakings in a material respect. However, Ofcom does not consider that the variation and exemption contained herein would alter the Undertakings in a material respect.
- 2.28 We do not consider the request to exempt Openreach from the requirement to provide an input into Wavestream National on the basis of EOI to be material. Indeed, the Undertakings provide for a mechanism to exempt products on the basis that it is not reasonably practicable for Openreach to provide inputs on a EOI basis. In particular, with this exemption request, BT seeks Ofcom's agreement under Section 5.46.2 of the Undertakings that, in accordance with section 5.46.1(c), it is not reasonably practicable for Openreach to provide the inputs into Wavestream National on an EOI basis.
- 2.29 Furthermore, Ofcom does not consider that the exemption discussed in this Consultation will have a negative impact on the comprehensive solution which the Undertakings aim to achieve. In reaching this preliminary view, Ofcom has considered the following factors where appropriate:
- whether there would be, or would likely be, harm to customers of BT, consumers of BT and other communications providers and the wider public in general if the variation or exemption was accepted or not accepted due to, for instance, a reduction in effective competition or disruption to the services customers receive;
 - whether there would be demand from communications providers (other than BT) for an EOI product to which the exemption relates; and
 - the length of time for which the exemption will be granted and whether the amount of resource that would be needed to accelerate development of an EOI

¹² Communication Provider

¹³ Page 22 of December 2008 Statement

¹⁴ http://www.ofcom.org.uk/consult/condocs/telecoms_p2/

product is warranted balanced against other resource requirements (i.e. proportionality).

- 2.30 Whilst Ofcom is not obliged to consult on non-material changes to the Undertakings, we stated in our statement *Requests from BT for specified exemptions and agreements to its Undertakings under the Enterprise Act 2002 – part 1*¹⁵ that we would decide whether or not to consult on any such changes in the future on a case-by-case basis. We also consider it is appropriate to consult on the exemption request for Wavestream National because we have consulted on Wavestream products previously and said in our previous statements that we would publish further information once BT had reviewed options to provide EOI products on its 21CN¹⁶.
- 2.31 Although Section 155 of the Enterprise Act does not apply in this instance, Ofcom notes that the period stipulated for consultation in the Enterprise Act is a minimum of 15 days. It is Ofcom's view that in this instance, given the scope of this Consultation document, a four week consultation is appropriate. Following on from this Consultation, Ofcom intends to publish a statement by the end of the year.
- 2.32 Ofcom is proposing to agree to the proposed exemption request from BT. Ofcom's reasons for this position are explained in Section 3. Ofcom invites comments on this approach. The envisaged scope of the proposed exemption is set out in BT's submission contained in Annex 5 to this document. The proposed legal wording of the agreement to the exemption and the variation is contained within Annex 6. This document has been drafted to reflect Ofcom's position prior to the Consultation and will be updated as necessary for the statement to reflect any changes made as a result of considering stakeholder comments.

¹⁵ <http://stakeholders.ofcom.org.uk/binaries/telecoms/policy/bt/statement.pdf>

¹⁶ <http://www.ofcom.org.uk/telecoms/btundertakings/exemptionsandvariations/wavestreampath.pdf>

Section 3

BT's request

Introduction

- 3.1 In this section we describe BT's position and set out BT's reasoning for requesting a further exemption on Wavestream National. Ofcom's response to BT's request is then discussed in Section 4.
- 3.2 The full text of BT's exemption request is reproduced in Annex 5 and the proposed legal wording of the exemption is set out in Annex 6. Respondents are strongly recommended to consider the text in Annex 5 and Annex 6 before answering the consultation question.

BT's exemption request related to Wavestream National

- 3.3 The exemption request submitted by BT (see Annex 5) concerns an exemption from EOI on an ongoing basis for both Wavestream National shared fibre and Wavestream National dedicated infrastructure.
- 3.4 It is important to note that Ofcom already granted an ongoing exemption for the dedicated version. As set out in our previous statement¹⁷, BT is exempted from providing an EOI solution for the dedicated end-to-end Wavestream National on an ongoing basis. However, the exemption is subject to a review every two years, the first to take place by the end of 2012. BT is therefore asking not to be subject to this biennial review process.
- 3.5 Further, should the exemption proceed as proposed, Openreach would commit to formalising the development of an upstream input that allows its wholesale customers to develop downstream solutions which address broadly the same end user needs as BT's Wavestream National product, by adding such a product to their published Product Portfolio Roadmap¹⁸. This commitment would subsequently be covered by the Openreach Industry Commitments (OICs) offered to industry in September 2009, and be subject to existing change control processes¹⁹.
- 3.6 Set out below are the reasons for which BT is seeking the proposed exemption. We first discuss the reasons why BT does not consider it feasible or proportionate to offer a shared infrastructure product on an EOI basis. We then discuss the consequential impact of the proposed exemption on the current exemption relating to the dedicated infrastructure product.

BT's request – Wavestream National shared infrastructure

- 3.7 Ofcom's understanding of BT's rationale for requesting a further exemption is fourfold:

¹⁷ <http://stakeholders.ofcom.org.uk/binaries/telecoms/policy/bt/wavestream1208.pdf>

¹⁸ Openreach Product Portfolio Roadmap can be found at <http://www.openreach.co.uk/orpg/products/products.do>

¹⁹ The change control process is defined in the Ofcom September 2009 statement. See <http://stakeholders.ofcom.org.uk/consultations/btundertakings/statement>

1. **No evidence of competitive harm:** BT argues that there is no competition failure to address in this product market. According to BT's analysis, the high bandwidth DWDM optical market is competitive with at least eight other operators providing services similar to Wavestream National. It asserts that BT Global Services has low sales volumes, low market share and faces considerable competition.
2. **Lack of firm demand in the past two years for an EOI product:** BT argues that there has been a lack of demand from Openreach's customers for an EOI product to Wavestream National. Despite this absence of demand, Openreach believes that demand for high bandwidth optical wavelength of this type could emerge over time. For this reason, it is willing to commit to industry to provide the service, albeit to a timescale that aligns better with vendor development roadmaps.
3. **Openreach delay due to supply and technical reasons:** Openreach will not be able to launch an EOI input in time for its committed milestone of 31 December 2010. The development of the technical solution has several internal and external dependencies detailed below which make it difficult to predict a later RFS date with certainty.
4. **Disproportionate cost for BT Global Services (BT GS):** BT GS, which currently provides Wavestream National, would have to incur significant systems development costs to "consume" an EOI input from Openreach. BT argues that this would likely result in end users having to pay higher prices to receive the same services they receive today and may ultimately result in BT GS withdrawing the product from this market.

3.8 The following paragraphs discuss further the above reasons. In particular, they provide more information on BT's motivation for requesting the exemption and are based on documents submitted by BT to Ofcom in confidence.

No evidence of competition harm

- 3.9 BT argues that there is no evidence of a competition problem in this market and quotes examples of Communication Providers (CPs) who provide what it considers to be directly competing services. According to BT's analysis, there are at least eight different competitors who provide similar optical high bandwidth products, i.e. GEO Networks, COLT, H20, Verizon, C&W, Vitesse, Global Crossing and Virgin Media. BT estimates its own share of the market is lower than 30% per cent..
- 3.10 In response to a request from Ofcom, BT submitted information on the proportion of bids won by BT over the last two years or so. Wavestream National often forms part of a wider bid, and there are no bids exclusively based on Wavestream National solutions. For those bids which include Wavestream National, BT reported that in 2008-09 it won less than [X] per cent of the total new business and less than [X] per cent in 2009-2010. BT submits that these figures suggest a high degree of competitive activity and substantial presence of alternative providers in the optical high bandwidth market.

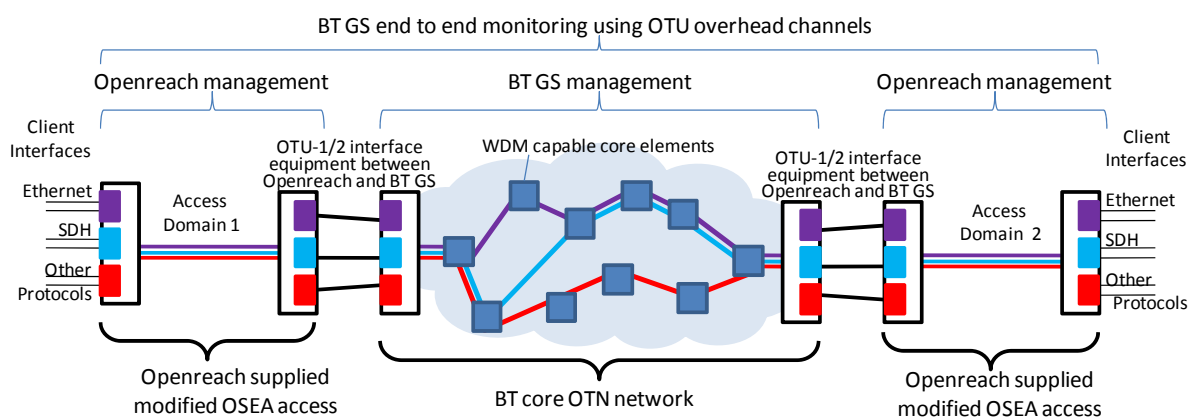
Lack of commercial demand to date

- 3.11 BT is concerned that Openreach's costs of developing the EOI product at this stage are high and are not backed by clear demand for the product.
- 3.12 In particular, BT argued that although Openreach has canvassed communications providers, there is no demonstrable demand from them for an EOI input product for CP products similar to Wavestream National.

Openreach delay in the EOI development

- 3.13 When submitting its exemption request in 2008, BT proposed to develop the new EOI compliant Wavestream National solution on the basis of the Optical Transport Network (OTN) standard. The solution proposed by BT is outlined in the network diagram of Figure 3.

Figure 3 OTN based solution



- 3.14 The input product proposed by Openreach at the time had the following technical characteristics:
- Based on the Optical Transport Network (OTN) standard as defined by the ITU-T²⁰, and therefore required the development of OTU1 (2.5 Gbit/s) and OTU2 (10 Gbit/s) interfaces; and
 - Built as an extension of the existing Openreach Optical Spectrum Access products OSEA (Optical Spectrum Access Extended reach) for the access domain.
- 3.15 It is important to note that the Openreach EOI product would not provide an end-to-end connection service. It would only provide the access tails, labelled “Access Domain 1” and “Access Domain 2” in the above figure. The CP buying this optical input would then need to interconnect the product to its own or another provider’s core network to establish the end-to-end connection.
- 3.16 BT GS’ Wavestream National product, as an end-to-end service, could therefore:
- Use the 21CN architecture as the shared OTN core domain (the part illustrated in the middle of the diagram); and
 - Use a client interface to map the client’s optical signal onto the shared 21CN domain at OTU1 (2.5 Gbit/s) and OTU2 (10 Gbit/s) rates.

²⁰ ITU Standard [G.709](#) is commonly called Optical Transport Network (OTN). It is defined as set of Optical Network Elements connected by optical fibre links, able to provide functionality of transport, multiplexing, switching, management, supervision and survivability of optical channels carrying client signals. OTN is currently offered in three rates: OTU1 i.e. 2.5 Gbit/s, OTU2 i.e. 10 Gbit/s and OTU3 i.e. 43 Gbit/s) with two more under development OTU0 i.e. 1G bit/s and OTU4 i.e. 100 Gbit/s)

- 3.17 The Openreach solution based on the OTN standard was considered to have a number of benefits. In particular:
- a. **Interoperability:** the solution would be based on an open standard, and hence BT expected that there would be interoperability between the client interfaces, the Openreach network equipment and the core transport networks²¹. The OTN standard allows the usage of different transport protocols (such as Synchronous Digital Hierarchy (SDH), Ethernet and data centre specific protocols like Fibre channel and the IBM ESCON protocol) across the same network. The OTN is able to convey these standards transparently, meaning that the architecture can rely on an EOI interface deployed between the BT access and the CP core network²²;
 - b. **Transparency of Openreach network to CP's client overheads:** OTN would allow the CP to manage their customer-sited NTE and deliver timing transparency based on standardised protocols;
 - c. **Reduced deployment costs:** with OTN the in-station cabling between the core and the access boundary can be significantly reduced i.e. the fibre hand-off is per wavelength rather than per client interface²³.
- 3.18 In Openreach's plans, the timeline for development of the EOI product, i.e. RFS date of 1 January 2011, assumed that the supplier solution would be available, the network upgrades would be in place and the associated CP and BT downstream demand would exist. However, BT reports that a number of internal and external dependencies have significantly slowed down the development progress and that Openreach is now unable to meet its obligation. BT's explanations of the reasons for this delay are set out in more detail below.
- a. There has been a delay in the development of the software upgrades required to offer OTU interfaces. In particular, the initial development was intended for single operator end-to-end networks and was not suitable for Openreach's specific needs that required exposing access interfaces at points of interconnection with other CPs' networks. The initial development supported the use of OTN as a networking solution and further development was required to manage OTUs as a service.
 - b. The software in the initial releases had some important security issues, as it exposed Openreach IP addresses and Openreach-specific forward routing information to other CPs. The design was hence required to switch off the exposure of those routing details at the CP interface.
 - c. The software upgrades provided must pass BT Conformance Testing. At the moment, Openreach is testing a software release which would enable the deployment of OTU1 (2.5 Gbit/s) interfaces in an automatic fashion, but would require the manual provision of OTU2 interfaces (10 Gbit/s). The tests have, however, identified a number of defects and the completion date for these to be fixed is yet unknown.

²¹ For example based on G.709 standard.

²² Note that however, the OTN standard cannot currently support all protocols, e.g. 10GB Fibre Channel and 10GB Fast Ethernet are not yet supported. They may be supported by suppliers through bespoke extensions to the standard and may mean that inter-working between different suppliers is not possible

²³ For instance this allows a 8x reduction of cabling with Gigabit Ethernet.

- d. Once the software is ready, Openreach is then required to perform a number of further steps, i.e. software deployment, NTE and network management upgrade, BT Operational Support System ("OSS") update, migration of existing OSEA customers on separate servers (or software upgrade for them), and operational readiness tests.

3.19 For all the reasons set out above, BT states that Openreach will not be able to develop the OTU interfaces in time to meet the 1 January 2011 RFS date. Furthermore, BT argues that given the number of internal and external dependencies involved, it is difficult to forecast a firm date by which the product would be ready for implementation.

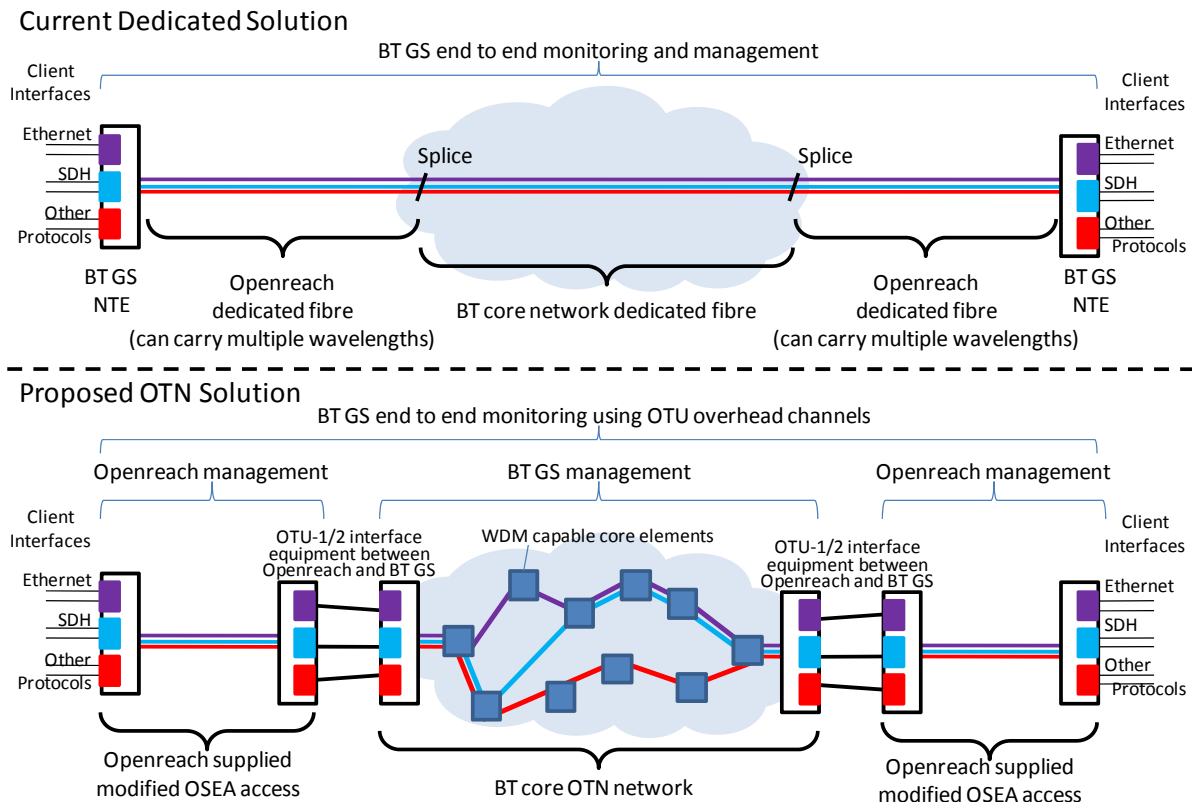
High consumption costs for BT Global Services

- 3.20 BT has requested that its GS division should not be required to consume an upstream EOI product for Wavestream National. It bases its argument on the costs it estimates that GS would have to incur in order to consume the EOI product, which it claims could not be recovered over a reasonable time in the market for the end-to-end service.
- 3.21 GS currently provisions Wavestream National services using a fibre solution comprising dedicated end-to-end capacity via fibre spliced directly from the Openreach backhaul network to BT's core network.
- 3.22 Since 2008, when Ofcom and BT negotiated the previous exemption for Wavestream National Shared infrastructure, BT has carried out more detailed scoping work to understand the developments and associated costs that GS would need to incur to consume an upstream EOI input from Openreach. BT estimates that the total cost that GS would need to incur is [X].
- 3.23 In 2008 BT expected to be able to use their 21CN to deliver Wavestream National (using shared infrastructure). It had based its plan on the assumption that its 21CN network would include the development of operational support systems ("OSS") that would enable the management of the optical layer of the network to the quality required for Wavestream end users who have very exacting requirements. BT has told us that the changes in its 21CN programme meant that developments for BT GS' consumption of Openreach's EOI input for Wavestream National became effectively standalone, necessitating separate funding.
- 3.24 BT GS has now estimated that the development costs for this additional OSS functionality will be significantly higher than previously anticipated. These costs include a) the development costs for OSS to manage the system and handle the sales and ordering process; b) all the new software and hardware to report faults, collect alarms, maintain inventory, test, diagnostic and repair the fault; c) the cost of designing the process; and d) testing.
- 3.25 We have sought to better understand the reason why the OSS costs would be so high, particularly when compared to BT GS's previous developments to support Wavestream Connect and Regional based on an OSEA input from Openreach. BT has explained that the reason why the OSEA based development costs were lower is essentially because Openreach provides the end-to-end network management and therefore BT GS does not need to replicate that capability. In other words, the OSEA products BT GS consumes are more akin to "resale" where fault monitoring, provisioning and repair are undertaken by Openreach. In contrast, in the case of Wavestream National, Openreach would be providing two access tails with BT GS

providing the core connectivity between those access points. The end-to-end network management capability would therefore have to be undertaken by BT GS in order to be able to offer the end customer the high level of service availability they expect. In addition, the systems which BT GS uses would need to be upgraded to manage network components using OTN standards, which, we understand from BT, are not currently supported by those systems.

- 3.26 BT has calculated that its estimated development costs listed above would represent more than 57% per cent of BT GS' 2009/2010 revenues from Wavestream National. Assuming their market share remains at similar levels over the next few years, BT believes that cost recovery through higher prices would be very difficult to justify²⁴.
- 3.27 BT argues further that because of the development costs associated with consuming an upstream EOI input from Openreach, as well as additional development costs that Openreach would incur, it is likely that the cost of services to end users will increase. The reason for BT's expected cost increase is that currently BT GS uses a fibre solution comprising dedicated end-to-end capacity via fibre spliced directly from the Openreach backhaul network through BT's core network. As shown in the top diagram of Figure 4, in this solution there is no equipment between the customer located NTEs. Moving to a solution that would use Openreach's proposed new EOI input access segments introduces two sets of interfaces, where the Openreach access segments meet the BT core network (bottom diagram of Figure 4). This extra equipment coupled with the additional development costs for BT GS (such as, for example, OSS costs) are likely to increase the cost of the end-to-end solution substantially.

Figure 4 WN current infrastructure vs. WN consuming EOI



²⁴ According to BT GS, development costs would represent around 20% per cent of the total anticipated Wavestream National revenues over a three year period.

Openreach's plans in light of the delays in the product

- 3.28 Despite the technical challenges Openreach has faced in the development of the product, Openreach nevertheless considers it desirable to continue its development of this product (subject to the agreed Openreach Industry Commitments change control processes) and intends to progress its plans regardless of whether or not BT's downstream divisions are required to consume this as an input into Wavestream National. This is because some of Openreach's wholesale customers have indicated interest and may have demand for such a product in the future. Should the exemption proceed as proposed, Openreach would then be willing to formalise this commitment to industry, by making this development part of the OICs that it offered in September 2009²⁵ in the context of the Variation agreed with Ofcom at the time. The September 2009 Variation allowed for a reprioritisation of BT's remaining systems separation milestones in return for a set of new higher priority developments requested by Openreach's customers. These developments are known as the OICs.

²⁵ <http://stakeholders.ofcom.org.uk/consultations/btundertakings/statement/>

Section 4

Ofcom's reasoning in response to BT's request

Introduction

- 4.1 In this section, Ofcom sets out its position in respect of BT's request for exemption from its Undertakings under the Enterprise Act and our reasons for adopting this position. Ofcom, through this Consultation, invites comments on the described proposals from interested stakeholders.
- 4.2 The reasoning Ofcom puts forward in this section in respect of the proposals is based on the information available to Ofcom at the time of publication and Ofcom reserves the right to change its position with respect to the proposals as a result of the consultation process or any other information that comes to light during the Consultation. Any such change will be fully explained in the subsequent statement due for publication by the end of the year. The legal wording in Annex 6 reflects Ofcom's current position in respect of the requests.
- 4.3 The Enterprise Act requires that Ofcom should "have regard to the need to achieve as comprehensive a solution as is reasonable and practicable to the adverse effect on competition". Ofcom's competition concerns were set out in its *Strategic Review of Telecommunications Phase 2 Consultation Document*²⁶. In considering the case for agreeing to variations and/or exemptions from the Undertakings, Ofcom must consider whether this solution is materially and negatively affected by the variations/exemptions in question. Ofcom does not consider that the exemption contained herein would alter the Undertakings in a material respect were it to be agreed. We explain our reasoning in relation to these considerations below.

Ofcom position on the requested exemption – shared infrastructure

- 4.4 This section sets out Ofcom's rationale for proposing to grant an exemption to BT from providing a shared infrastructure solution on an EOI basis and, consequently, allowing BT's installed customer base to continue to be supported on the legacy Wavestream National infrastructure. We are further proposing that the exemption is subject to a review which may be undertaken following the next relevant market review.
- 4.5 Ofcom proposes to grant the exemption for the following reasons:
- a. Our discussions with CPs which provide WDM solutions indicate that a CP can generally fulfil end user requirements using either its own fibre or dark fibre from a third party to connect end user sites to its core network. We understand that in situations where neither of these possibilities may be practicable, a CP is currently able to use Openreach's existing OSA and OSEA products instead. Openreach's proposed new input product for Wavestream National would use OTN technical standards. We further understand that CPs expect end user demand for WDM solutions based on OTN standards to emerge in the next two years or so, and that CPs may

²⁶ http://www.ofcom.org.uk/consult/condocs/telecoms_p2/

therefore prefer to use this new product when it becomes available instead of the existing OSA and OSEA products in order to "future-proof" new installations. The proposed OTN-based product therefore appears to address a future need perceived by CPs rather than an actual current end user demand.

- b.** Taking into account also that the cost to BT of enabling its downstream divisions to consume Openreach's proposed input to the shared infrastructure product is likely to be substantial, we do not consider that it would be proportionate to continue to require BT's downstream division to do so from 1st January 2011.
 - c.** We have no reasonable basis at present on which to determine a more suitable future date by which to require RFS and IBMC dates.
- 4.6 We therefore propose to exempt BT from this requirement subject to future review. We note that failure to grant the exemption may result in consumer harm, as BT GS effectively would have to withdraw these products.
- 4.7 We recognise that there is nevertheless significant interest in the industry in the future potential for OTN technology, and therefore welcome Openreach's commitment to continue to develop its product.

No evidence of competitive harm

- 4.8 BT argues that there is no evidence of a competition problem in this market and that BT itself faces a high degree of competition. It quotes examples of providers who compete directly with it by deploying their own infrastructure.
- 4.9 We recognise that today CPs have a number of options for providing WDM solutions. For instance, they can use their own fibre or fibre from a third party to connect end user sites to their core network. There could be circumstances, however, where those solutions cannot be employed. In those cases CPs may be able to use Openreach's existing OSA and OSEA products to do so instead.
- 4.10 We are also aware, however, that some CPs have considered deploying an OTN-based solution instead of the existing OSA and OSEA products. Informal views we have gathered from the industry so far suggest that any significant end user demand for WDM services with OTU interfaces is unlikely to emerge in the next 18 months. We understand that these CPs would be keen to use end-to-end OTN in order to future-proof new installations and be able to market the new solution when end user demand emerges. The proposed OTN-based product therefore appears to address a future need perceived by CPs rather than an actual current end user demand.
- 4.11 Moreover, the specific design of WDM services presented to end users in the form of OTU interfaces²⁷, which appears to be a key element of Openreach's product proposal for an EOI input to Wavestream National, does not appear to constitute a significant part of the market's current requirement, and we consider that it is not

²⁷ Note that industry at the moment is considering two main possible designs. One employs OTU interfaces deployed at end user sites, the other employs OTU interfaces at handover points between the CP and Openreach's network sites.

likely to until OTN technology matures further. We do not know whether the market will develop to require such interfaces and, if so, when.

- 4.12 We therefore consider that it would not be proportionate for us to require BT GS to invest in consuming this new product on the basis of a prospective market opportunity that is still uncertain.
- 4.13 We note that we have not conducted a market analysis of high bandwidth optical products, i.e. WDM-based products. In the latest Business Connectivity Market Review (BCMR)²⁸, we had concluded that WDM-based retail services were not part of either the Alternative Interface ("AI") or the Traditional Interface ("TI") markets. This conclusion was based on three main considerations: a) TI and AI circuits cannot provide all the functionality of a WDM circuit, e.g. capacity increase at low incremental cost; b) WDM circuits are likely to be priced at a premium under competitive conditions; and c) lack of supply-side substitution possibilities.
- 4.14 To date we have not carried out a formal review of the relevant markets. We set out in paragraph 3.52 our approach to formally reviewing these services within the next BCMR.

Proportionality of the regulatory requirement

- 4.15 BT's main concern is that a requirement on BT downstream to consume an upstream EOI input from Openreach will be disproportionate and likely to lead to an increase in end user costs.
- 4.16 As set out above, BT states that its downstream division would have to spend [X] in development costs which it considers to be disproportionate to the connectivity revenues it generates from this market. These costs correspond to about 57% per cent of Wavestream National 2009-2010 revenues and they are necessary to enable BT GS to develop end-to-end management of the sales, ordering, fulfilment, billing, provisioning and design processes, as well as the end-to-end management and monitoring of the service at the optical layer to meet the exacting requirements of its Wavestream National end users.
- 4.17 While we have seen BT GS's costs estimates, we have not been able to determine whether the cost estimates provided are likely to prove accurate and representative of an efficient implementation. Nevertheless, we consider that BT's investment in enabling BT GS to consume the EOI product is likely to be substantial. We currently consider it likely, therefore, that if BT GS were to consume Openreach's proposed EOI input in producing Wavestream National, there could be a material increase in the price it would have to charge end users.
- 4.18 We consider that, absent any evidence of a competition problem, it would not be reasonable or proportionate for Ofcom to require BT to offer Wavestream National on an EOI basis. We acknowledge that Ofcom has not carried out a comprehensive review of the Wavestream National market so we cannot conclude on this question. For this reason, we consider that it would be appropriate to review this exemption once we gather and analyse the necessary data within the relevant market analysis process (see below on the review process).

²⁸ <http://stakeholders.ofcom.org.uk/consultations/bcmr/>

No basis to estimate future RFS and IBMC dates

- 4.19 As set out in 3.13-19, Openreach submits that the requirement to provide a shared infrastructure solution on an EOI basis by 31 December 2010 is not feasible for technical and supply reasons. We recognise that the technical standards for a solution (ITU-T G.709 OTN standards) have only been agreed very recently²⁹ and some aspects are still under development³⁰. Equipment providers are now only able to support a sub-set of G.709 functionality. Additional functionality will be released over the next few years. This means that it is likely that there will be ongoing inter-working issues between OTN vendors for several years. Until equipment vendors support a common set of functionality, it is likely that there will be a reduced set of end-to-end service features, compared with those available if a single vendor of equipment was used. The proposed Openreach EOI product would need to interoperate with other CPs' interfaces and it is very likely that CPs would use equipment from different suppliers.
- 4.20 Given the evolving nature of the technology, there has been a knock-on impact on BT's ability to deliver the required solution to the timescales required for BT to meet the 1 January 2011 timetable as agreed under the 2008 exemption. This has been further complicated by the fact that the solution required by Openreach is not one commonly required by other telecommunications providers in the UK or internationally as Openreach needs to be able to "expose" OTU interfaces to third party operators. Further, once the technical solution conforms to Openreach's requirements, Openreach will need to undertake further implementation work to ensure this solution is ready to be offered on a commercial basis.
- 4.21 Given the reasons set out above, it is not reasonable for Ofcom to impose suitable dates by which to Openreach is required to develop the product and BT GS to consume it and then to migrate the existing customer base.

Review of Wavestream National – shared infrastructure

- 4.22 We are conscious that that this is now the fourth time we are considering Wavestream National under the Undertakings since the initial 2006 consultation and expect that stakeholders are looking for a final resolution to this issue that will enable them to plan with more certainty.
- 4.23 During 2011 we plan to commence our review of the Business Connectivity Market (BCMR). As part of the BCMR, we will be collecting data to support our assessment of whether there are competition issues across the range of relevant markets and if so, what remedies might be required to address such competition concerns.
- 4.24 We are proposing that as part of the BCMR we collect the necessary data that will enable us to conclude whether there is evidence of a competition issue in the Wavestream National market and what remedies might be required to address this. We therefore consider that a decision on what would be a proportionate response to addressing any potential competition concerns in this market is best taken in the context of our next BCMR.
- 4.25 Consequently, we propose granting BT an ongoing exemption from providing the Wavestream National shared infrastructure solution on an EOI basis until we can review this approach following conclusion of our market review. In this specific

²⁹ December 2009 <http://www.itu.int/rec/T-REC-G.709/e>

³⁰ For example the ODU-0 for GbE client support and ODU-flex for flexible client bandwidth support.

instance, if, in the next BCMR, we find BT to have SMP in a retail market or relevant upstream market which includes national Wavestream services, this exemption would be reviewed. In the absence of an SMP finding, the exemption would stand.

Ofcom position on the requested exemption – dedicated infrastructure

- 4.26 Whilst the proposed exemption primarily concerns the shared infrastructure product, BT has also asked to be relieved from the biennial review process for the dedicated infrastructure as required by the exemption agreed in December 2008.
- 4.27 As set out in the above, we have proposed to review the shared infrastructure exemption following the next relevant market review. We further propose to align the exemption review process for the dedicated and shared infrastructure products. In essence, we propose that, rather than a review every two years relating to the dedicated fibre product starting from 2012, that the review of the appropriateness of the exemption for both the solutions is undertaken simultaneously following the conclusion of Ofcom's next relevant market review. At this point, Ofcom and BT would agree whether EOI should apply to either or both these two products. In case we fail to agree, BT will have to withdraw the Wavestream National product from the market (see legal text in Annex 6).
- 4.28 We consider that it would be reasonable to align the review process for both the dedicated and shared infrastructure for the reasons explained below.
- 4.29 As set out in section 2, in 2008 BT requested and Ofcom granted an exemption for the point-to-point dedicated solution on the basis that there is no active equipment between access and core, and the backhaul fibre provided by Openreach and the core fibre provided by BT are spliced together to form the connection. To create an EOI product from Openreach, the circuit would need to be split into sections and active equipment would need to be inserted resulting in the same approach as the shared infrastructure. Such an arrangement would not meet the strict security requirements that some customers have.
- 4.30 Ofcom then considered it appropriate to review the application of this exemption to ensure that a) the dedicated solution was only used when the EOI shared infrastructure solution could not be used (once available) to meet customers' demand, and b) to consider whether future technology developments mean that at some future point the EOI shared infrastructure could meet all customers' requirements.
- 4.31 In addition, Ofcom agreed that the new supply of Wavestream National could be temporarily hosted onto the dedicated infrastructure as a consequence of insufficient core network capacity and/or equipment supplier limitations relating to the shared infrastructure product, with the agreement that those new circuits would then be migrated to the new EOI 21CN based shared infrastructure that was expected to be available from 31 December 2010.
- 4.32 The exemption relating to the dedicated solution was therefore tied closely to the exemption relating to the shared infrastructure product. Any change in the development plan for an EOI shared solution would impact on Ofcom's decision with regard to the dedicated infrastructure.

- 4.33 Consequently, we consider that the exemptions relating to both these technical solutions should be reviewed together. Given that we are proposing that the appropriate trigger point for a review of the exemption for the shared Wavestream National product is at the point at which we conclude the next relevant market review, we consider it appropriate to conclude on this matter for both exemptions at this review point.

Openreach Industry Commitment

- 4.34 As CPs have indicated interest in using an OTN-based product in the future, Openreach intends to continue the development of this product and is willing to formalise this as a firm commitment to industry as part of the Openreach Industry Commitments agreed in September 2009. At present, and not allowing for any contingency, Openreach's best estimate for when an OTN-based solution could be ready on a commercial basis is 31 December 2011. For Openreach customers wishing to avail themselves of this product, Openreach's proposed commitment affords them the certainty that the product will be developed albeit not to a legally binding timetable as would be the case if the commitment was enshrined in the Undertakings.

Ofcom's conclusion on BT's request

- 4.35 For the reasons set out above, Ofcom is minded to agree to BT's request, subject to review following the next relevant market review. We further note that on the basis that BT is not able to consume an EOI product in the foreseeable future, we consider there is potential for consumer harm if BT was forced to withdraw the product.
- 4.36 The request will result in an ongoing exemption to BT from having to provide Wavestream National products based on shared and dedicated infrastructures using EOI inputs. If BT is found to have SMP in the next relevant market review, the exemption will be reviewed following its completion.
- 4.37 We recognise that there is nevertheless significant interest in the industry in the future potential for OTN technology, and therefore welcome Openreach's commitment to continue to develop its product. Subject to the exemption being agreed, Openreach's commitment to develop an upstream EOI solution, whilst not enshrined in the Undertakings, will be formalised as a firm industry commitment as part of Openreach Industry Commitments.

Question 1: Do you agree with our proposal to grant the proposed exemption subject to review following the next relevant market review and with our reasons for proposing to do so? If you do not, please explain why and provide any supporting evidence.

Annex 1

Responding to this consultation

How to respond

- A1.1 Ofcom invites written views and comments on the issues raised in this document, to be made **by 5pm on 3 November**.
- A1.2 Ofcom strongly prefers to receive responses using the online web form at <http://stakeholders.ofcom.org.uk/consultations/bt-wavestream/howtorespond/form>, as this helps us to process the responses quickly and efficiently. We would also be grateful if you could assist us by completing a response cover sheet (see Annex 3), to indicate whether or not there are confidentiality issues. This response coversheet is incorporated into the online web form questionnaire.
- A1.3 For larger consultation responses - particularly those with supporting charts, tables or other data - please email WNConsultation@ofcom.org.uk attaching your response in Microsoft Word format, together with a consultation response coversheet.
- A1.4 Responses may alternatively be posted or faxed to the address below, marked with the title of the consultation.
- Valeria Baiamonte
Floor 4
Competition Group
Riverside House
2A Southwark Bridge Road
London SE1 9HA
- Fax: 020 7981 4109
- A1.5 Note that we do not need a hard copy in addition to an electronic version. Ofcom will acknowledge receipt of responses if they are submitted using the online web form but not otherwise.
- A1.6 It would be helpful if your response could include direct answers to the questions asked in this document, which are listed together at Annex X. It would also help if you can explain why you hold your views and how Ofcom's proposals would impact on you.

Confidentiality

- A1.7 We believe it is important for everyone interested in an issue to see the views expressed by consultation respondents. We will therefore usually publish all responses on our website, www.ofcom.org.uk, ideally on receipt. If you think your response should be kept confidential, can you please specify what part or whether all of your response should be kept confidential, and specify why. Please also place such parts in a separate annex.
- A1.8 If someone asks us to keep part or all of a response confidential, we will treat this request seriously and will try to respect this. But sometimes we will need to publish

all responses, including those that are marked as confidential, in order to meet legal obligations.

- A1.9 Please also note that copyright and all other intellectual property in responses will be assumed to be licensed to Ofcom to use. Ofcom's approach on intellectual property rights is explained further on its website at <http://www.ofcom.org.uk/about/account/disclaimer/>

Next steps

- A1.10 Following the end of the consultation period, Ofcom intends to publish a statement by the end of this year
- A1.11 Please note that you can register to receive free mail Updates alerting you to the publications of relevant Ofcom documents. For more details please see: http://www.ofcom.org.uk/static/subscribe/select_list.htm

Ofcom's consultation processes

- A1.12 Ofcom seeks to ensure that responding to a consultation is easy as possible. For more information please see our consultation principles in Annex 2.
- A1.13 If you have any comments or suggestions on how Ofcom conducts its consultations, please call our consultation helpdesk on 020 7981 3003 or e-mail us at consult@ofcom.org.uk . We would particularly welcome thoughts on how Ofcom could more effectively seek the views of those groups or individuals, such as small businesses or particular types of residential consumers, who are less likely to give their opinions through a formal consultation.
- A1.14 If you would like to discuss these issues or Ofcom's consultation processes more generally you can alternatively contact Vicki Nash, Director Scotland, who is Ofcom's consultation champion:

Vicki Nash
Ofcom
Sutherland House
149 St. Vincent Street
Glasgow G2 5NW

Tel: 0141 229 7401
Fax: 0141 229 7433

Email vicki.nash@ofcom.org.uk

Annex 2

Ofcom's consultation principles

A2.1 Ofcom has published the following seven principles that it will follow for each public written consultation:

Before the consultation

A2.2 Where possible, we will hold informal talks with people and organisations before announcing a big consultation to find out whether we are thinking in the right direction. If we do not have enough time to do this, we will hold an open meeting to explain our proposals shortly after announcing the consultation.

During the consultation

A2.3 We will be clear about who we are consulting, why, on what questions and for how long.

A2.4 We will make the consultation document as short and simple as possible with a summary of no more than two pages. We will try to make it as easy as possible to give us a written response. If the consultation is complicated, we may provide a shortened Plain English Guide for smaller organisations or individuals who would otherwise not be able to spare the time to share their views.

A2.5 We will consult for up to 10 weeks depending on the potential impact of our proposals.

A2.6 A person within Ofcom will be in charge of making sure we follow our own guidelines and reach out to the largest number of people and organisations interested in the outcome of our decisions. Ofcom's 'Consultation Champion' will also be the main person to contact with views on the way we run our consultations.

A2.7 If we are not able to follow one of these principles, we will explain why.

After the consultation

A2.8 We think it is important for everyone interested in an issue to see the views of others during a consultation. We would usually publish all the responses we have received on our website. In our statement, we will give reasons for our decisions and will give an account of how the views of those concerned helped shape those decisions.

Annex 3

Consultation response cover sheet

- A3.1 In the interests of transparency and good regulatory practice, we will publish all consultation responses in full on our website, www.ofcom.org.uk.
- A3.2 We have produced a coversheet for responses (see below) and would be very grateful if you could send one with your response (this is incorporated into the online web form if you respond in this way). This will speed up our processing of responses, and help to maintain confidentiality where appropriate.
- A3.3 The quality of consultation can be enhanced by publishing responses before the consultation period closes. In particular, this can help those individuals and organisations with limited resources or familiarity with the issues to respond in a more informed way. Therefore Ofcom would encourage respondents to complete their coversheet in a way that allows Ofcom to publish their responses upon receipt, rather than waiting until the consultation period has ended.
- A3.4 We strongly prefer to receive responses via the online web form which incorporates the coversheet. If you are responding via email, post or fax you can download an electronic copy of this coversheet in Word or RTF format from the 'Consultations' section of our website at www.ofcom.org.uk/consult/.
- A3.5 Please put any parts of your response you consider should be kept confidential in a separate annex to your response and include your reasons why this part of your response should not be published. This can include information such as your personal background and experience. If you want your name, address, other contact details, or job title to remain confidential, please provide them in your cover sheet only, so that we don't have to edit your response.

Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title:

To (Ofcom contact):

Name of respondent:

Representing (self or organisation/s):

Address (if not received by email):

CONFIDENTIALITY

Please tick below what part of your response you consider is confidential, giving your reasons why

Nothing

☐

Name/contact details/job title

☐

Whole response

☐

Organisation

☐

Part of the response

☐

If there is no separate annex, which parts?

If you want part of your response, your name or your organisation not to be published, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response that Ofcom can publish. However, in supplying this response, I understand that Ofcom may need to publish all responses, including those which are marked as confidential, in order to meet legal obligations. If I have sent my response by email, Ofcom can disregard any standard e-mail text about not disclosing email contents and attachments.

Ofcom seeks to publish responses on receipt. If your response is non-confidential (in whole or in part), and you would prefer us to publish your response only once the consultation has ended, please tick here.

☐

Name

Signed (if hard copy)

Annex 4

Consultation questions

Question 1: Do you agree with our proposal to grant the proposed exemption subject to review following the next relevant market review and with our reasons for proposing to do so? If you do not, please explain why and provide any supporting evidence.

Annex 5

BT's exemption request

BT's Undertakings under the Enterprise Act 2002:

Request for agreement for Equivalence of Inputs (Eol) to not apply to Wavestream National

PRODUCT: WAVESTREAM NATIONAL

Legal basis: 5.46.1 (c)

1. Product description and reasons for request

This document requests a permanent exemption in relation to Wavestream National, which is currently subject to an exemption agreement published in the Ofcom statement of 4 December 2008 (see <http://stakeholders.ofcom.org.uk/binaries/telecoms/policy/bt/wavestream1208.pdf>). BT believes that the existing commitment to a Ready For Service (RFS) date of 1 January 2011 in relation to Openreach inputs to the BT Global Services' Wavestream National (shared-fibre) services is no longer justified, and that it would be a disproportionate burden on BT to insist on compliance with the existing agreement. The existing agreement should be set aside and replaced with a permanent exemption.

Product description

Wavestream products are retail wavelength-based services offering managed, unprotected and protected, point-to-point services. This request is in relation to these longer Wavestream circuits which are in excess of 70km radial distance (referred to here as "Wavestream National services"). Shorter Wavestream Connect and Regional services were covered in a separate request and exemption agreed with Ofcom on 20 May 2008.

The proposed exemption

We believe the existing exemption agreement should be set aside and a permanent disapplication of Eol be agreed in relation to Wavestream National.

This proposal is on the basis that Openreach remains committed to the development of an Optical Spectrum Services product which could be used as an input to support Communications Providers' (CPs) longer distance optical products. If the proposed exemption is agreed with Ofcom, Openreach commits to developing such a product within the context of the commercial and regulatory framework established in September 2009 referred to as the Openreach Industry Commitments.

Our view is that any future regulatory obligation with regard to Wavestream National downstream of Openreach should arise solely from a finding of Significant Market Power (SMP) in a market review according to section 84 of the Communications Act 2003: on the basis of current knowledge the next appropriate review would be that of Business Connectivity (BCMR).

This exemption request seeks a permanent exemption to enable Openreach to:

- ☐ Continue to support new BT Global Services supply of Wavestream National services utilising shared-fibre delivery, without making similar services available externally, i.e. without having to consume an Eol input from Openreach.
- ☐ Continue to support the installed base of Wavestream National services utilising shared-fibre delivery, without making similar services available externally.

- ☐ Continue to support on an enduring basis both the installed base and new BT Global Services supply of Wavestream National services utilising dedicated-fibre or shared-fibre delivery, without making similar services available externally.

Justification for permanent exemption

It would be impracticable and disproportionate to require Openreach to provide a new input product by the 31 December 2010 RFS date, and for BTGS to consume such a product in its Wavestream National service for the reasons summarised below.

1. **Absence of need to address competitive failure:** The new input product that Openreach is currently obliged to develop would be in a similar market area to one in which BT does not have SMP (>1Gbit/s AISBO). This indicates that there is already a competitive market in the provision of high bandwidth access services. (Wavestream National offers dedicated 2.5Gbit/s and 10Gbit/s services.)
2. **Absence of committed external demand for the new Openreach product:** Openreach has had no indication of firm demand from any external Communications Provider (CP). A couple of CPs have said that they are interested, but they have to date been unable to provide firm demand or timescales.
3. **BTGS has low sales volumes, low market share and faces considerable competition:** BT Global Services Wavestream National product offers high bandwidth point-to-point/ring/chain topology data services in markets in which BT has a low market share and corresponding revenues. There is considerable competition in the market concerned, with the public web sites of other CPs confirming their offerings in high bandwidth DWDM optical solutions. BT's analysis of its bid information confirms that several significant-sized competitors have successfully won business from BT in this product area in the last 18 months.
4. **Cost to enable BTGS consumption of the Eol product would be a disproportionate burden:** We have provided Ofcom with a commercially confidential estimate of the cost for BTGS to develop systems to consume the new Openreach product on Eol terms which includes design, changes to OSS, and testing. Additional costs to migrate the existing services have not yet been factored in, and any downtime of these existing networks can be disruptive and costly to manage. The development costs, provided confidentially to Ofcom, would represent around 20% of the total anticipated Wavestream National revenues over a three year period. Given the low expected annual revenues for Wavestream National - and the very small number of new customers who would be the first to consume the BTGS service based on the new Openreach inputs - BTGS firmly believe that the estimated investment is not commercially justifiable or desirable. Since BTGS would have no real choice but to pass on the development costs to its potential customers. BTGS would effectively find itself uncompetitive to the detriment of overall competition and customer choice. An unwelcome consequence of a regulatory framework whose intent is pro-competitive.

2. Legal basis, scope and duration

Basis

Sub-paragraph (c) of section 5.46.1 of the Undertakings allows Ofcom and BT to agree that Eol does not apply to any product where Ofcom agrees it is not required for reasons of practicability or otherwise.

Scope

The scope of the exemption that we are requesting is specifically in relation to Wavestream National only - other variants of Wavestream will continue to be subject to separate exemptions.

Duration

The application of 5.46.1 (c) to Wavestream National should be permanent. We note that Ofcom may believe that some form of review mechanism is desirable but we do not believe it is necessary to make permanence conditional on the outcome of a future market review (the appropriate next one due being the BCMR). Any obligation on BT arising from formal market reviews would take the form of regulatory remedies to address a specific market failure. In the absence of such evidence of market failure and the absence of evidence that a permanent exemption would cause competitive harm, we believe that the exemption should be permanent.

3. Identification of the products involved

Current Wavestream National services have been delivered using two methodologies. The prevailing methodology used to be a shared-fibre approach to extend reach using wavelengths derived from a pre-existing core Dense Wavelength Division Multiplexing (DWDM) network. This approach requires an NTE at each customer premise extended over dedicated fibre and connecting directly to the existing DWDM electronics at BT's core nodes. There are capacity limitations with the pre-existing core DWDM Network and its technology support. Since there is no suitable additional equipment available to be purchased, this has restricted more recent deployments using this approach.

As a result of these limitations, most recent delivery of these longer distance circuits has deployed the same methodology as employed for shorter distance (Regional) Wavestream services, i.e. a dedicated fibre route and terminal NTEs using intermediate amplifier electronics to obtain the extended reach capacity. Additionally, specific customer requirements for resilience and security mean that many customers insist upon dedicated rather than shared capacity. It is therefore expected that there will be a continuing need for both approaches, i.e. shared and dedicated fibre Wavestream National Services.

4. Description of the solution proposed

There is currently no Eol input into retail Wavestream National, and we propose that this should continue permanently.

Openreach product development

It should also be noted that, although high level designs have been completed, and low level design work on both Openreach and BT Operate systems has commenced for the new Openreach input products, due to the complexity of the design, a critical issue has arisen on delivery and testing of the Operational Support Systems (OSS) for the OTU management capability, which has yet to be resolved. These delays mean that there is a clear risk to the 31st December delivery date of OTU1 & OTU2 interfaces. The potential for delay was communicated to CPs in September 2010. Openreach has done all it can to resolve these problems, but further work will be needed before a truly fit for purpose product set is available. Openreach estimates that this may take some time to resolve and currently anticipates that the launch of OTU interface capability will be later in 2011.

However, despite the lack of firm current demand Openreach believes that demand for high bandwidth optical wavelength access circuits may emerge, but that, taking account of market trends, material demand is unlikely to appear for between 12 and 18 months.

Given the practical issues involved in developing the product, the current demand position and wider changing industry requirements Openreach and BT believe that it would be more practical to treat this development within the Openreach Industry Commitments approach agreed in September 2009 rather than as an individual product specific regulatory agreement, with an indicative delivery date of 31st December 2011. The delivery of the product set would, however, be subject to the existing agreed Openreach Industry Commitments change control process.

BT Global Services product

The current Wavestream National products will continue to be constructed as they are today, with no EoI input from Openreach. Existing customers will be able to continue to use the service they receive today, with no need to change the product or the way in which it is constructed or managed within BT. New customer supply can be provided using the same construction as existing Wavestream National services.

5. Justification for the exemption and impact on CPs

As described above in Section 1 our key arguments for requesting a permanent exemption coupled with a revised approach to the Openreach product development are:

- ☐ Lack of firm demand for Openreach products
- ☐ Disproportionate costs to develop capability for BT Global Services to consume an Openreach input.

We believe that the high level of competition in the market for high bandwidth National optical services even without the Openreach access product is such that a permanent exemption would have no appreciable adverse impact on competition or prices. In fact we believe that if BT was to continue to pursue the course laid out in the current agreement that there is a real risk that BT Global Services would have to exit the market because of the inability to fully recover their costs. This unwelcome consequence would actually reduce competitive choice.

BT Group plc
22nd September 2010

Annex 6

Proposed legal wording for agreement of the exemption

WHEREAS:

- (a) BT has offered and Ofcom has accepted Undertakings pursuant to the Enterprise Act 2002, which took effect on 22 September 2005 (the "Undertakings");
- (b) Access Services (AS) as referred to in the Undertakings has been established as Openreach since 22 January 2006.
- (c) On 4 December 2008, Ofcom published a statement setting out exemptions and agreements among others in relation to Wavestream National services;
- (d) On [XX] 2010 Ofcom published a consultation document outlining a further request by BT for an exemption in relation Wavestream National and invited representations about its proposals; and
- (e) Ofcom having received responses to the consultation document and having considered every such representation duly made to it in respect of the proposals has decided to agree to this exemption request.

NOW THEREFORE:

Ofcom and BT hereby agree that:

1. This agreement supersedes the exemption agreement between BT and Ofcom dated 4 December 2008 in relation to Wavestream National services which is hereby revoked.
2. Section 5.46.1 (c) shall apply with respect to AS inputs into both BT Global Services' Wavestream National (shared-fibre) services and BT Global Services' Wavestream National (dedicated-fibre) services subject to paragraph 3 below.
3. The exemptions in paragraph 2 may be subject to a review following the next market review of the markets which includes the BT Global Services' Wavestream National (shared fibre) services and the BT Global Services' Wavestream National (dedicated fibre) services according to section 84 Communications Act 2003.

If such a review occurs, then, following its conclusion, Ofcom and BT will agree either that:

- (i) section 5.46.1(c) shall continue to apply with respect to AS inputs into either or both of the services described above; or
- (ii) Equivalence of Inputs will be required with respect to AS inputs into either or both of the services described above, on appropriate and reasonable RFS and IBMC dates to be agreed between Ofcom and BT; or

- (iii) either or both of the services described above shall be withdrawn from sale or supply by BT on appropriate and reasonable dates to be agreed between BT and Ofcom.

If no agreement is reached between Ofcom and BT with respect to subparagraphs (i) or (ii), then sub-paragraph (iii) shall apply.

Definitions and interpretation

4. In this Agreement:

"Wavestream National" circuits mean all Wavestream circuits of a radial distance in excess of 70km, irrespective of design solution, including services as currently configured and such wavelength, speed or interface upgrades as included as options for those services in the product specification published by BT on its website or elsewhere from time to time.

5. Words or expressions in this Agreement have the same meaning as in the Undertakings.

6. References in this Agreement to section numbers are references to section numbers in the Undertakings.

7. For the avoidance of doubt, where it is herein agreed that the requirements of section 5.46.1 do not apply:

(a) information that would otherwise fall within the definition of Commercial Information, shall only do so if it relates to SMP Products.

(b) the requirement to provide the particular product or service by means of EOI systems and processes will also not apply and existing processes and systems may continue to be used. Such usage of existing processes and systems may continue beyond the dates that trigger systems separation obligations under sections 5.44, 5.45 and 8.5 of the Undertakings. However, this does not affect BT's obligations under sections 5.44, 5.45 and 8.5 of the Undertakings.

Signed for and on behalf of British Telecommunications plc

Signature _____

Name _____

Position _____

Date _____

Signed for and on behalf of Ofcom

Signature _____

Name _____

Position _____

Date _____