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Openreach Services delivered over Fibre To The Premises (FTTP)

Consultation Document

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DOCUMENT DESCRIPTION

Openreach is requesting input from Communications Providers on the anticipated requirements and potential demand for Services delivered over Fibre To The Premises at Greenfield sites.

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1 Introduction to this consultation

Openreach's objective is to develop efficient and effective products and services that meet the needs of Communications Providers (CPs) and their end users. We aim to do this whilst balancing the demands on our organisation, recovering our costs and making a financial return on our investments.

As an industry, we are seeing requests from land developers of large residential Greenfield sites for 'fibred homes', leading to the need for the development of services over networks based on Fibre To The Premises (FTTP) delivery which has major implications for end user experience, end user services and significantly for the end user viewpoint.

Having undertaken some preliminary analysis of the deployment of FTTP and the associated development of wholesale services to be delivered over FTTP networks, Openreach intends to deploy FTTP at Greenfield sites (of sufficient viability) across the UK. Openreach therefore wishes to engage with and receive input from the wider telecoms industry to identify the possible characteristics of such services, *and the potential levels of demand*. As well as the requests from developers in the UK, the potential for FTTP delivered services has been recognised throughout the world, and is also addressed in Ofcom's consultation regarding Next Generation Access. Openreach considers that now is an appropriate time to start developing service offerings to Greenfield sites utilising FTTP.

As such, Openreach currently intends to offer and enable FTTP delivered products at Ebbsfleet in Q2 2008. Ebbsfleet is a Greenfield site currently under development by Land Securities [www.landsecurities.com]. Ebbsfleet is expected to have around 10,000 End User premises and up to 9 million sq. ft. of commercial offices, retail, leisure and community facilities.

Following initial delivery at Ebbsfleet, Openreach anticipates that a planned rollout will be carried out to other Greenfield sites across the UK. According to research, approximately 246,000 new residential and business premises are built every year. It is anticipated that over time, FTTP will be the access architecture of choice for 200,000 of these premises.

Because of the nature of FTTP delivered services, Openreach is taking the opportunity to consult with CPs as to the type of service(s) CPs would expect to see developed to address the needs of End Users served by FTTP. FTTP delivered services are expected to be offered to both Residential and Small Business/Home Worker End Users. It is not intended that these replace services currently delivered to larger businesses over point to point fibre, though it is recognised that some larger businesses may prefer to use them.

Once FTTP has been approved for installation at a site, it is intended to be Openreach policy NOT to provide copper to that site. This will impact on the ability to provide existing copper-based services to that site.

1.1 Background

In this document Openreach is seeking the views of Industry regarding the potential for new products, at Greenfield sites delivered over FTTP which would allow CPs to provide both voice and data services to End Users.

Gigabit Passive Optical Networks (GPON) will be used for the FTTP infrastructure due to their inherent cost advantages, ease of service provision and configuration/reconfiguration, and support for multiple CP connectivity to each End User.

FTTP will offer a significant improvement in the bandwidth of services available to End Users, which will provide the ability for CPs to develop new products to drive a new generation of End User applications. FTTP delivered services are also expected to provide a significant improvement in customer experience, notably due to the far superior reliability of FTTP and quality of service characteristics.

GPON supports a maximum of 2.488Gbit/s downstream and 1.244Gbit/s upstream. It provides a shared infrastructure connecting up to 32 End Users over a single fibre to the serving exchange. In this configuration, shared equally, it would support a maximum downstream constant bit rate of up to 70Mbit/s and up to 35Mbit/s upstream.

Openreach also has in development a related product 'Fibre Integrated Reception System' (IRS). This product is based on a PON infrastructure and offers one way Broadcast delivery of Digital TV/Radio to End

Users at Greenfield sites. This product will be the subject of a subsequent Industry Consultation planned during April 2007.

1.2 Overview

Openreach would expect to provide FTTP-delivered services at prices which take into account the need to recover costs incurred (including that of the underlying fibre infrastructure) with a reasonable return on investment. This consultation asks, among other issues, for feedback from CPs on what they would be prepared to pay for specific products, so that Openreach is able to determine whether such prices could support the costs (and reasonable return on investment) Openreach will need to incur to provide such products.

Figure 1 shows a schematic of the Openreach proposed solution for guidance. The FTTP architecture consists of a shared fibre infrastructure based on a 32 way split passive optical network (PON) terminating in the End User premises at an Optical Network Termination unit (ONT) presenting four Ethernet interfaces (RJ45). The ONT is intended to support up to two CPs providing service to an End User – two Ethernet ports per CP, one for Data and one for Voice. The CP interface is anticipated to be a Gigabit Ethernet port presented at the local serving exchange or further back in the network at a point offering connection to a larger catchment of End Users.

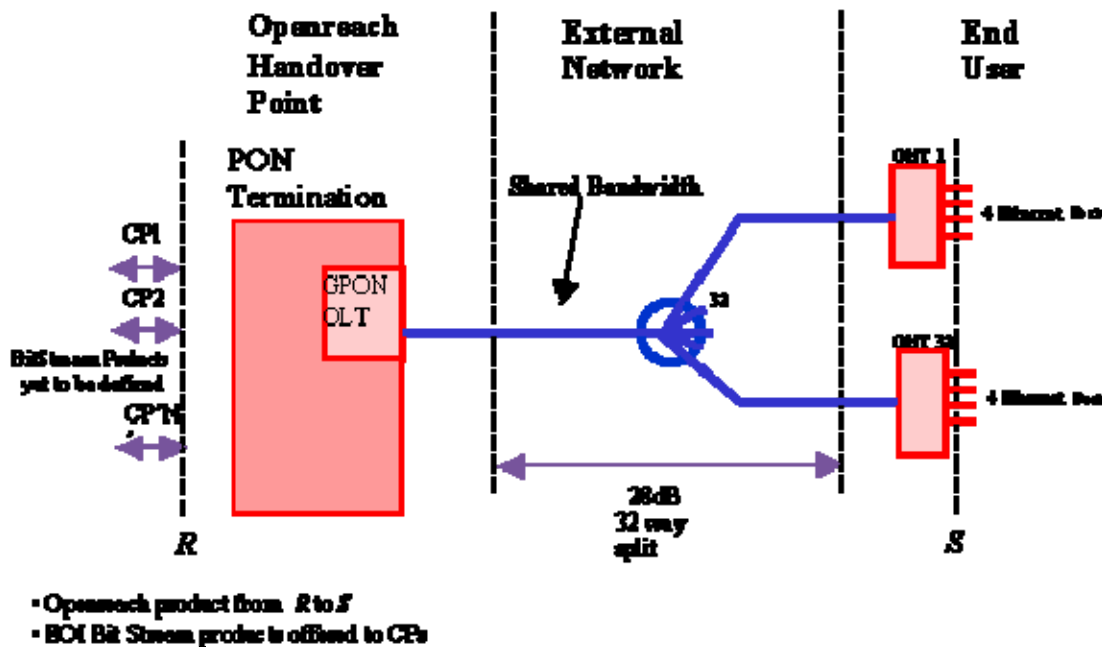


Figure 1. Fibre to the Premises GPON Architecture

In the process leading up to this consultation, Openreach has developed the concept of three products delivered by means of FTTP:

1) Generic Ethernet Access (GEA) Product

The GEA Product will be bought by a CP to allow connection to an End User. A separate GEA will be required for each End User the CP wishes to serve. Initially up to two GEAs may be configured to each End User.

The provision of a GEA in itself will not allow a CP to provide service to an End User. In order to do this, a CP would also need to purchase in addition to the GEA either a *GEA Data Product* or a *GEA Voice Enablement Product*, or both. The GEA Data and GEA Voice Enablement Products will be realised by a number of managed Virtual LANs (VLANs) from a CP to an End User.

The ONT will present four Ethernet ports to the End User, anticipated to be 1G/100M/10M autosensing.

Openreach would like to understand from CPs which Ethernet presentation would be preferred at the ONT.

2) GEA Data Product (GEA-DP)

The GEA-DP will provide a single (2 way) data channel from the CP interface to an End User and will need to be bought in conjunction with a GEA. GEA-DPs will be bought by a CP. Only a single GEA-DP can be bought per GEA. The GEA-DP can be used by the CP to deliver one or more services to an End User e.g. IPTV, broadband, voice etc.

The GEA-DP will be configurable to provide a clear 2 way (uncontended) channel between the CP interface and an End User. This channel will be configured as a single managed (Primary) VLAN, providing a statistical bandwidth guarantee with characteristics appropriate for delay tolerant services.

Openreach considers that there will be a number of product variants available, with different bursting and sustained upstream/downstream bit rates.

Bursting bit rates

Openreach is considering a range of bursting options:-

- Downstream: from 50Mbit/s (base) up to the limit of the GPON/ONT
- Upstream: from 5Mbit/s (base) up to the limit of the GPON/ONT

Openreach wishes to understand from CPs if the above bursting option meets their need, and any additional information regarding the propensity to pay for higher bursting speeds.

Sustained bit rates

A base offering is being considered to provide a sustained 10Mbit/s downstream, and 2Mbit/s upstream capability. Openreach would like to understand from CPs:-

- what proportion of the End User population they feel would have all their needs met by this offering
- what additional downstream/upstream bit rate options would be required, by what proportions of the End User population, and any additional information regarding the propensity to pay for higher sustainable speeds.
- alternative QoS characteristics required for the Primary VLAN
- the preferred characteristics of the Ethernet traffic
- if more than one VLAN would be needed within the GEA-DP - if so how many - and the QoS characteristics and downstream/upstream bit rates required
- what CPs would be prepared to pay and what pricing sensitivities they envisage in respect of this product.

Clear channels provided between a CP interface and an End User will be protected from any bursting traffic to/from another End User on that GPON.

3) GEA Voice Enablement Product (GEA-VEP)

The GEA-VEP would provide a single (2 way) voice enabled channel from a CP interface to an End User and would need to be bought in conjunction with a GEA. GEA-VEPs will be bought by a CP. One or more GEA-VEPs can be bought per GEA. Openreach wish to understand from CPs how many GEA-VEPs will be required to be configured over a single GEA.

The GEA-VEP product would provide guaranteed bandwidth with low delay and jitter appropriate for real time voice services to enable a CP to construct an End User service. The GEA-VEP itself would not include any voice functionality. This would be the responsibility of the CP. Telephone numbering will also be the responsibility of the CP.

A range of channel bandwidths is envisaged to meet the needs of the CP offering, ranging from lower cost voice services exploiting compressed codecs, through to high quality voice using wide band codecs or video telephony services. Openreach wish to understand from CPs what requirements they have for the provision of voice services over FTTP,

The connectivity of a standard analogue telephone (if required) would be achieved by connecting the instrument through an Analogue Telephone Adapter (ATA), matched to a CP's Call Server. The ATA would be provided by the CP.

Openreach wishes to understand CPs' views regarding this approach to voice services and any implementation details which would infer requirements upon the GEA-VEP or GEA Product.

CP Connectivity

CP connectivity is anticipated to be via Gigabit Ethernet. Connectivity options will be developed for handoff at both the local serving exchange and an exchange deeper in the network, recognising that as volumes of End Users and bandwidths provided to each End User increase, the move is likely to be towards remote connectivity, due to economic drivers.

Openreach wish to understand if CPs would prefer to connect locally or remotely, and under what circumstances this may change.

Multiple CP connectivity to a single End User

It is envisaged that End Users may want to take services from more than one CP. Initially, Openreach intend to offer End Users the option to simultaneously take services from up to two CPs. This will give End Users the option to mix and match services, for example taking voice service(s) from one CP, and a data service from another.

When an End User wants to take services from more than one CP, each CP will need to buy the GEA product. In addition, each CP will need to buy the extra products (GEA-DP &/or GEA-VEP) needed to support the Service(s) required by that End User.

The Openreach policy for an FTTP build will be to deploy an optical distribution network with the aim of no future changes, i.e. 'Fit and Forget'. End Users will not have the opportunity to receive additional FTTP feeds into their premises. This does not apply to standard point to point fibre based products from Openreach, which will be unaffected.

Openreach intends developing migration processes to protect End Users from unsolicited migration attempts.

Example of services delivered to an End User

Openreach FTTP Solution

For Greenfield sites

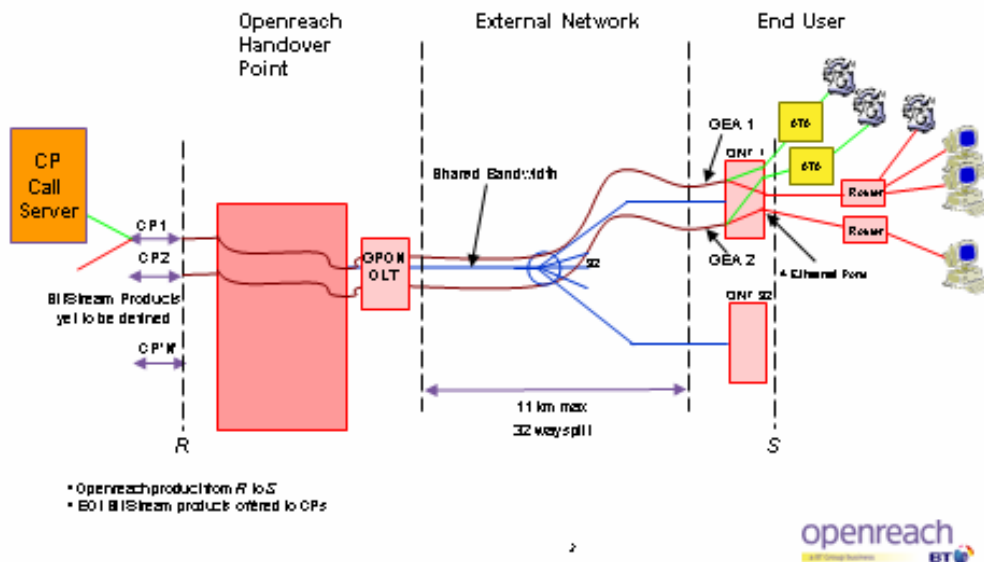


Figure 2. Example Services delivered over FTTP

Customer Premises

The Optical Network Termination will be the NTE for the Openreach products. The ONT is expected to support 4 Ethernet ports. ONTs will initially be internally mounted units. It is anticipated that in some future scenarios, external ONTs will be available.

The ONT requires 240V locally provided mains power. Provision will be made as a chargeable option for battery backup of the ONT to be provided on installation. Maintenance of this battery during service lifetime will be the responsibility of the End User.

Pricing

All products will have a connection charge, and ongoing rental charge. Pricing details are to be developed, although the base product is currently anticipated to be priced at a level reasonably consistent with today's comparable copper-delivered combined voice/broadband offering.

Unsupported products

It is proposed that the following Openreach products will not be available over the FTTP GPON infrastructure:-

- LLU (all variants)
- Wholesale Line Rental (all variants)

It is recognised that the non availability of these products will affect a CPs ability to provide legacy (copper-based) services to End Users at that site. It is anticipated that alternative (similar) products could be delivered over FTTP, but these will need to be developed by CPs. CPs are thus encouraged to respond to this consultation document to assist in the development of suitable services over FTTP for End Users.

Timescales

Services are expected to be available from Q2 2008. Trials are expected to be available to CPs from Q3 2007. These trials will support the proving of the technology, the business models to be implemented, and enable CPs to test their service offerings.

CPs should express their interest in their participation with these trials, although it must be noted that in the event of a significant number of CPs expressing an interest, Openreach reserves the right to select triallists based upon agreed criteria.

1.3 Strategic Context

Openreach will review inputs to the consultation to assess whether there is reasonable demand for products of the type outlined in paragraph 1.2 above and whether the requirements of such products allow for appropriate cost recovery, return on investment and can be resourced by Openreach. If so, Openreach would aim to address such market demand.

Openreach will also need to take account of any required standards in place for such products and its legal and regulatory obligations (including the Universal Service Obligation) to maintain the proper and effective functioning of its network at all times.

1.4 Guidance

This consultative document necessarily focuses on the technical realisation of various options, but associated issues are also highlighted. In its request for feedback from CPs, Openreach wishes the following specific aspects to be addressed:

- whether they consider this is an appropriate juncture for development of such services
- what comments they may have on the key attributes and technical issues associated with the proposal
- forecasts of likely take up over the next 10 years of the base and any enhanced (higher speed) products, broken down in the following manner:
 - o Residential and Small Business/Home Worker customers at Ebbsfleet
 - o Residential and Small Business/Home Worker customers at other Greenfield sites across the UK
 - o assumptions made and how those might affect the forecasts provided
 - o views on availability in different geographic regions.
- legal and regulatory considerations.

Openreach will continue its research in parallel with the consultation exercise and currently intends to make a decision on how to progress during May 2007, subject (amongst other issues) to the feedback from this consultation exercise and Openreach's ongoing research. Please contact your CBM if you wish to hold bilateral discussions with Openreach.

Any services subsequently launched by Openreach are intended to be provided on an 'Equivalence of Inputs' basis as provided under the Undertakings given to Ofcom by BT pursuant to the Enterprise Act 2002.'

We request that all responses are submitted by Monday 30th April 2007.

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This document is uncontrolled once printed. All comments and change requests should be directed to the author.

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