



SIN 480

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Suppliers' Information Note

For The BT Network

Openreach Ethernet Backhaul Direct (EBD) Service & Interface Description

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1. Introduction

This Suppliers' Information Note (SIN) describes the Ethernet Backhaul Direct (EBD) product supplied by Openreach. This product will inter-work between a Communications Provider's (CP) Point of Presence (PoP) located in a designated Openreach Access Serving Node (ASN) BT Local Exchange (using a licensed facility in the BT exchange), and a CP's core network PoP located in the designated Openreach Handover Point (OHP) as described in the Ethernet Backhaul Direct Product Handbook and ordered under the Ethernet Backhaul Direct schedule of the Connectivity Services contract terms and conditions.

Note that previously handover was also available in the CP's own site, accessed using a Bulk Transport Link (BTL). This option is no longer available for new supply.

Any specific technology mentioned in this document is current as of today, however it may be subject to change in the future. Should the specification of the interface be changed, this will be notified by a new issue of this SIN. Openreach reserves the right to adapt technology to deliver EBD as new developments are made. All services are delivered over an uncontended transmission path.

This SIN should be read in conjunction with SIN 360^[6], "Ethernet Customer Interfaces: Interface Characteristics", SIN 481 "Bulk Transport Link", the Ethernet Backhaul Direct product handbook and the Bulk Transport Link product handbook.

2. Service Outline

2.1 General

Ethernet Backhaul Direct (EBD) is an Openreach product that offers permanently connected, point-to-point high speed data circuits that provide a secure and un-contended backhaul service for Communications Providers (CPs).

This service will operate between a Communications Provider's (CP) Point of Presence (PoP) located in a designated Openreach Access Serving Node (ASN) BT Local Exchange (using a licensed facility in the BT exchange), and a CP's core network PoP located in either the designated Openreach Handover Point (OHP) or, historically, in the CP's own site, accessed using a Bulk Transport Link.

The Bulk Transport Link (BTL) was separately purchased and supplied, effectively extending the Openreach network to the CP's site. It provided the connection between the OHP and the CP's site, when it was not located in a BT building, up to a radial distance of 35Km from the OHP. BTL was designed to support multiple Ethernet Backhaul Direct services. Please refer to the Ethernet Backhaul Direct Bulk product handbook and SIN 481^[6] for further details.

Ethernet Backhaul Direct is available from a number of ASN (BT Local Exchange) locations across the UK. The list of allowable EBD ordering sites and those anticipated to be live in a rolling time period is available via the Openreach web site:

<https://www.openreach.co.uk/orpg/home/products/ethernetservices/ethernetbackhauldirect/ebd.do>.

The Ethernet Backhaul Direct service has no distance related elements (i.e. neither a radial or route distance limit nor distance related price component) between an ASN and its designated OHP(s). The reach of each service is governed by its ASN to OHP parenting. Details of the Access Serving Node (ASN) to Openreach Handover Point (OHP) parenting are available via the link above.

Where an ASN and OHP are co-located (i.e. in the same building) EBD is not an applicable connection.

Ethernet Backhaul Direct services are offered at fixed Ethernet bandwidths of 1Gbit/s and 10Gbit/s only on an uncontended basis. Customer presentation is described in section 2.3.

Refer to the Ethernet Backhaul Direct product handbook for details of available Resilience Options.

A schematic of the Ethernet Backhaul Direct service is shown Figure 1.

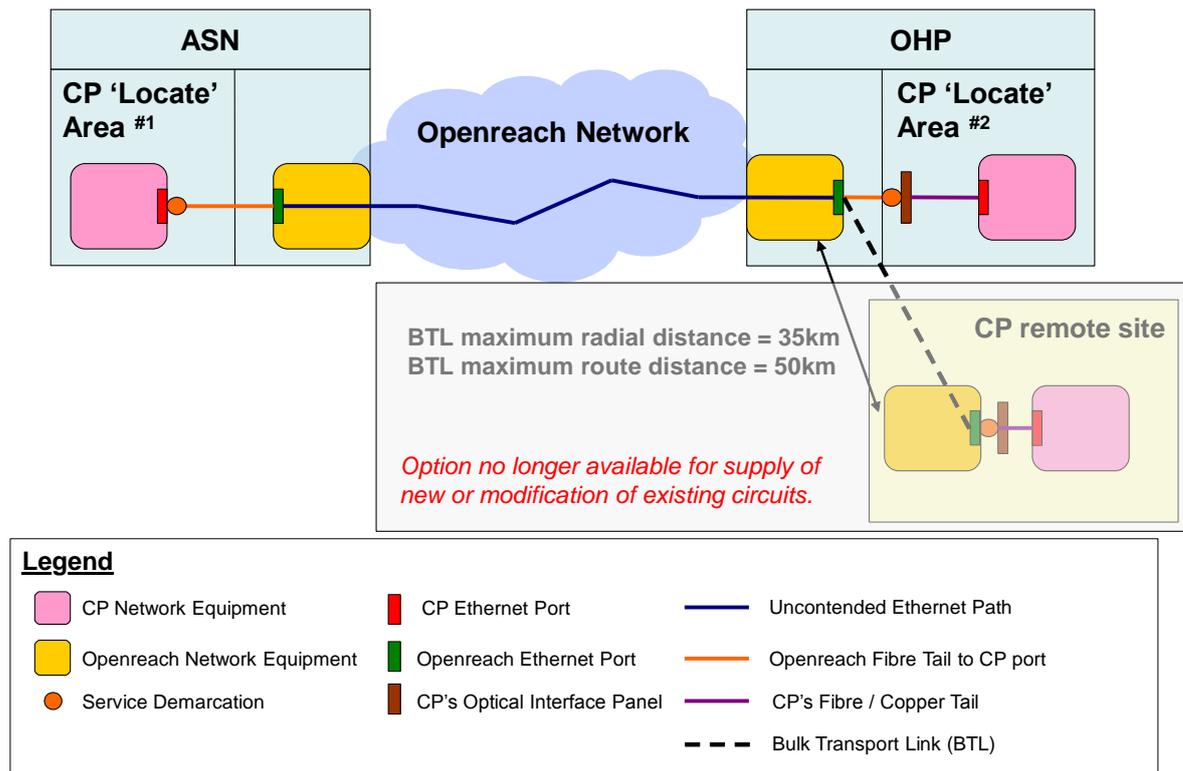


Figure 1. Typical EBD service configuration

Note 1. Figure 1 shows CP's identified interface as both a direct port connection and an interface panel, both of which are customer options.

2.2 CP's Identified Interface for Ethernet Backhaul Direct termination

Service demarcation will be between the CP's identified interfaces in CP areas of an ASN or OHP site. For remote CP PoP sites accessed via a Bulk Transport Link please refer to SIN 481 and the Bulk Transport Link product handbook.

The identified interface could be either (to be captured during order request):

1. CP owned and provided Interface Panel
2. CP owned and provided equipment interface (Ethernet port)

The interface is the Circuit Terminating Point (CTP), i.e. the connector on the end of the Openreach fibre tail.

Note: the options listed above are for EBD services existing between an ASN and OHP. If the EBD service endpoint is at a CP site via a Bulk Transport Link then the Circuit Termination Point is at the customer interface of the BTL at the CP's site. Refer to SIN 481 and the Bulk Transport Link product handbook.

Only the following physical optical interface connector types are supported for the CP provided identified interface for EBD products:

- FC/PC (Fibre Connector / Physical Contact)
- LC (Lucent Connector)
- SC (Subscriber Connector)

The physical interface must be specified on the order request. Any conversion of interfaces is the CP's responsibility, i.e. the CP must provide interface converters on its card or at the interface panel, if necessary. Openreach engineers must be provided with access to the identified interface point (whether that is an interface panel or the CP's actual interface card itself) for both fulfilment and assurance purposes.

If the EBD service endpoint is at a CP site via a Bulk Transport Link then FC/PC is the only supported interface type. Refer to SIN 481 and the Bulk Transport Link product handbook.

Note 1. Angle Polished Connectors such as SC/APC and LC/APC are NOT supported.

Note 2. Where a multimode fibre interface is chosen, i.e. 1000Base-SX Ethernet interface, transmission performance can only be guaranteed if 50µm core fibre is used between the CP equipment (CP Ethernet port) and the Openreach/Customer interface.

2.3 Ethernet Interfaces

The Ethernet interfaces available for the Ethernet Backhaul Direct products are shown in Table 1. These interfaces will be used for the Openreach Ethernet port, see Figure 1.

The Ethernet interfaces conform to the IEEE 802.3^[1] Ethernet framing and supports the transport of untagged, and tagged frames conforming to 802.1q^[2] or IEEE 802.1ad^[7] encapsulations.

Note 1. CP equipment must have Auto-negotiation enabled on Gigabit Ethernet interfaces.

2.3.1 Transmission

Customers can, if required, use spanning tree packets (IEEE 802.1d^[3], IEEE 802.1s^[4] or IEEE 802.1w^[5] control packets) across the Ethernet interface. The BT network will not participate with the spanning tree protocol, but will transport spanning tree BPDU (Bridge Protocol Data Units) unchanged between customer sites.

The access speeds currently supported are listed in Table 1.

Ethernet interface (valid for EBD services that terminate at an OHP)	Fibre Type	Subject To Survey (Due to distance limitations)
1000Base-LX (Gigabit Ethernet - IEEE 802.3[1])	Single- Mode	No
1000Base-SX (Gigabit Ethernet - IEEE 802.3[1])	Multimode	Yes
10GBase-LR (10Gig Ethernet LAN PHY - IEEE 802.3[1])	Single- mode	No

Table 1. Network Interfaces

Note 1. Please refer to SIN 360^[6] for detailed Ethernet interface specifications.

2.3.2 Gigabit Ethernet Frame Length

The service is capable of supporting IEEE 802.3 frames of 2000 bytes in length, as well as being capable of transporting Jumbo frames of up to 9000 bytes in length to maintain compatibility with a large number of vendor proprietary frame tagging formats. Service Performance however cannot be guaranteed when transporting Jumbo frames as they are not covered by the IEEE Ethernet standards. The frames are transported in both directions, full duplex, at wire-speed.

2.3.3 10 Gigabit Ethernet Frame Length and transparency

The service is capable of supporting IEEE 802.3 frames of 2000 bytes in length, as well as being capable of transporting Jumbo frames of up to 9000 bytes in length to maintain compatibility with a large number of vendor proprietary frame tagging formats. Service Performance however cannot be guaranteed when transporting Jumbo frames as they are not covered by the IEEE Ethernet standards. The frames are transported in both directions, full duplex, at wire-speed.

IPG (Inter Packet Gap) is transported in addition to the Ethernet Frame. 10G Ethernet WAN PHY interface is not supported by this service.

2.4 Ethernet Backhaul Direct product features

Table 2. outlines the features supported by the Ethernet Backhaul Direct product.

Product	Ethernet Interface	Product Speed	Link Loss Forwarding
EBD 1000	GigE	1Gbit/s	Yes
EBD 10000	10GigE LAN PHY	10Gbit/s	Yes

Table 2. Product Feature Support

Note 1. MAC Address learning is not supported on the Ethernet Backhaul Direct product.

3. References

[1]	IEEE 802.3: CSMA/CD access method and physical layer specifications, 2005
[2]	IEEE 802.1q, VLAN tagging of Ethernet frames, 1998
[3]	IEEE 802.1d, Media Access Control (MAC) Bridges
[4]	IEEE 802.1s, Virtual Bridged Local Area Networks – Amendment 3: MSTP
[5]	IEEE 802.1w, Media Access Control (MAC) Bridges – Rapid reconfiguration
[6]	SIN 360, Ethernet Customer Interfaces, Interface characteristics, http://www.btplc.com/sinet/
[7]	IEEE 802.3ad, IEEE standards for Link Aggregation (LAG)
[8]	IEEE 802.3ah, IEEE amendment , 2004
[9]	SIN 481, Bulk Transport Link. www.sinet.bt.com

[10]	Ethernet Backhaul Direct product handbook. https://www.openreach.co.uk/orpg/home/products/ethernetservices/ethernetbackhauldirect/ebd.do
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4. **Further Information**

For enquiries concerning connection availability between particular sites and for further product information about this service please visit the website at www.openreach.co.uk or contact your Openreach Customer Business Manager or BT Account Manager.

For further information or copies of referenced sources, please see document sources at <http://www.btplc.com/sinet/>

5. **Abbreviations**

BT	British Telecommunications plc
CD	Collision Detection
CP	Communications Provider
CPE	Customer Premises Equipment
CSMA	Carrier Sense Multiple Access
FC / PC	Fibre Connector / Physical Contact
GE	Gigabit Ethernet
IEC	International Electrotechnical Commission
IEEE	Institute of Electronic and Electrical Engineers [USA]
IPR	Intellectual Property Right
LAN	Local Area Network
LC	Lucent Connector
MAC	Medium Access Control
MSAN	Multi Service Access Node
MSTP	Multiple Spanning Tree Protocol
MTU	Maximum Transmission Unit
NTP	Network Terminating Point
SC	Subscriber Connector
SIN	Suppliers' Information Note [BT]
TBC	To Be Confirmed
UK	United Kingdom
VLAN	Virtual Local Area Network

6. **Document History**

Issue	Date	Revision changes
Issue 1.0	22 April 2008	First issue.
Issue 2.0	June 2010	Introduction of 10Gbit/s option
Issue 2.1	July 2015	Change SINet site references from http://www.sinet.bt.com to http://www.btplc.com/sinet/ Change to the url for the Ethernet Backhaul Direct product handbook.
Issue 2.2	July 2017	Updated clarity on BTL availability associated with EBD.

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