

## Suppliers' Trial Information Note

*For The Openreach Network*

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# 1Gbps Street Access Trial Product

## Service & Interface Description

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## FIGURES

FIGURE 1. SIMPLIFIED NETWORK DIAGRAM

## 1. Introduction

The information contained in this STIN relates to the trial of a 1Gbps Street Access Service. The publication of this STIN does not commit Openreach to a commercial launch of any new/changed service, nor does it commit Openreach to the particular implementation described within this document. Should Openreach decide to commence a roll-out of the trialled Service the matters pertaining to this STIN will be reflected in an update to the relevant Suppliers Information Notes (SINs) and the publication of the necessary Service Provider Information Notes (SPINs).

It should be noted that the information contained within this STIN might be subject to change due to either the results of BT testing, or due to feedback from trial participants. Please check with the <https://www.openreach.co.uk/orpg/home/helpandsupport/sins/sins.do> site to ensure you have the latest version of this document.

Further information regarding the trial and pilot network test and Proof of Concept facilities can be obtained by contacting your Openreach Sales and Relationship Manager.

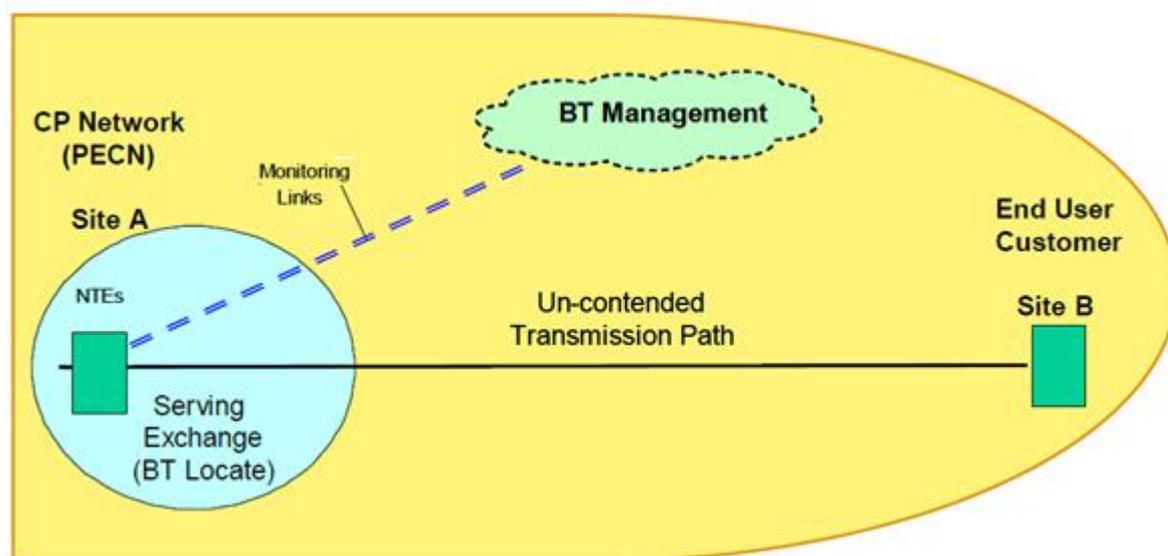
## 2. Service Outline

### 2.1 General

The 1000M Street Access service operates at a speed of 1000 Mbps in full duplex mode between sites.

A schematic of the 1000M Street Access service is shown in Figure 1. Site A is usually a Openreach Exchange end, Site B is usually housed in street furniture.

Figure 1



It is envisaged that CPs / customers will use this service for the interconnection of Gigabit Ethernet between street furniture mounted devices and a BT exchange.

## 3. Interface Descriptions

### **3.1 General**

Gigabit Ethernet conforms to the IEEE 802.3 standard. Autoneg is enabled at both ends. Local end presentation to the customer is via single or multimode dual LC optical presentation.

### **3.2 Optical Connector (Headend NTE)**

The interface is the Network Termination Point (NTP), i.e. the point of connection on the Openreach Network Terminating Equipment (NTE) for connecting Customer Premise Equipment (CPE) or CP equipment.

The Interface consists of a Dual LC type 1000BaseSX or LX fibre interface port. The CP / customer provides the fibre patch connectors between NTE and CP equipment/CPE. The maximum fibre length between the NTE and CP equipment/CPE is 220 metres for 850nm multi-mode ports if 62.5/125 micron optical patch cords are used. For 1310nm single-mode ports, the maximum fibre length is 10 kilometres when a 9/125 micron optical patch cable is used.

The LC type interface are as specified in the Gigabit Ethernet IEEE802.x specification. Attention is drawn to the Intellectual Property Rights (IPRs) set out in the preface of this agreed International standard. It is the responsibility of the supplier of the CP equipment or CPE to ensure that they have the necessary rights from the owner of the IPR.

### **3.3 Connector Type (Remote NTE)**

The remote end is an RJ45 handover 1000BaseT only.

### **3.4 Transmission**

Note: The definition of frame length includes the 4-byte CRC but does not include any preamble.

The NTE is capable of transporting IEEE 802.1q[2] VLAN-tagged frames of 1522 bytes in length, as well as being capable of transporting frames of up to 1548 bytes in length to maintain compatibility with a large number of vendor proprietary frame tagging formats. The NTE can transport frames in both directions simultaneously (full duplex) at wire-speed without frame loss or error.

The NTE does not have the capability to intercept and/or view 'customer data'.

### **3.5 Network Link Loss Forwarding**

When a break is detected on the Openreach network link, the customer side connection at the local end only will be forced hard down (i.e. light will not emanate towards the customer from the port). This continues until such time as the network break is repaired. There is no User-User Link Loss Forwarding (Fault propagation) option or network link loss forwarding at the remote end (Street Furniture located NTE end).

### **3.6 Ethernet traffic**

The Street Access 1000Mbps service is capable of transmitting frames conforming to IEEE 802.3 [2] with frame sizes from 64 bytes to a maximum of 2000 bytes. This is to maintain compatibility with a number of frame tagging formats, including VLAN tagging as specified in 802.1Q [4].

The service is transparent to VLAN tags and will forward VLAN tagged frames in the same way as standard (untagged) frames.

## **4. Environmental Specifications**

### **4.1 General**

The temperature and humidity range of the environment used to house the 1U Head end NTE must not exceed the following:

- Ambient housing temperature: 0°C to +40°C
- Relative humidity 5% to 95% (non-condensing)
- Variable Fan speed cooling

The dimensions of the 1U headend NTE are 443mm x 44.4mm x 220mm (W x H x D) Weight 5.6 kg.

The Temperature and humidity range of the environment used to house the street furniture mini-NTE must not exceed the following:

- Ambient housing temperature: -15°C to +40°C
- Relative humidity 5% to 100% (including condensing)
- IP67 rated once the installation is finalised with all connectors installed
- ETSI300 019 class 3.5
- Passive Cooling
- The dimensions of the remote NTE are 100mm x 145mm x 65mm (W x H x D) Weight 0.75 kg.

NOTE: The remote NTE must be housed within Street Furniture – to protect from exposure to direct sunlight.

## **5. Power Supply & Installation**

### **5.1 General**

By placing an order with Openreach the customer has accepted the conditions placed by Openreach in relation to providing power, as defined below.

In relation to powering of equipment, the customer must comply with the requirements of BS7671 [1] and the details given within the “DC Power Planning and Installation Guide for WES-BES Products’ document.

#### **5.1.1 Headend NTE**

The Openreach Head end 1U NTE is locally powered and offers AC or DC power options. The CP will be required to provide either dual local 50Hz AC supply in the form of standard 13A power socket(s); or dual -50 V DC power distributions and Earth connections, with all wiring colour schemes conforming to BS7671. It will be the customer’s responsibility to ensure that the power supplies are fused and safe for Openreach to use. These should be in close proximity to the NTE installation location.

#### **5.1.2 Remote end NTE**

The Openreach Mini-NTE is locally powered in the street furniture via an AC to DC converter that must provide 20-28V DC, and the maximum load is 0.4A, SELV source only.

For the Trial product Openreach are providing a DC power supply (PSU) which the CP is responsible for installing prior to installation of the remote NTE

In the future it is proposed that the CP will be responsible providing appropriate PSU for the remote NTE.

## **5.2 Installation and Testing**

### **5.2.1 Headend NTE**

In addition to the NTE powering requirements (i.e. AC or DC power as defined below) , a spare 50 Hz AC mains supply 13A socket should also be provided in close proximity to the NTEs’ to power BT test equipment during both initial commissioning and subsequent maintenance support activities. A 50 Hz mains supply 13A socket should also be provided in close proximity to the NTE for the management router.

### **5.3 AC Power connection – Head end NTE only**

AC power connection between Openreach 1U Head end NTE equipment and the power socket will be made using a power lead fitted with a standard 13A plug. The NTE itself has dual power supply units internally, and requires two AC mains supply sockets running off the same phase.

For most installations, this will require two mains connections for each NTE provided, and the consumption of the Openreach NTE in this managed service arrangement will typically be 63W per NTE. An additional AC mains supply socket will be required for the management router.

### **5.4 DC Power Connection – Head end NTE only**

The DC in-Line (Molex) connector is specified as the standard method of connecting DC power by Openreach, and represents the “Demarcation Point” between Openreach and the customer. At its site the customer is required to provide suitable power and earth connection to, and be responsible for the supply, wiring and labelling to, the demarcation point. Openreach will not supply or install the DC distribution system as part of the standard Ethernet installation.

#### **5.4.1 Customer-provided wiring up to the Openreach specified In-Line Connector**

Wiring, MCB isolation or fuse (i.e. C type MCB or Cartridge Fuse) must be provided by the customer, up to and including the DC in-line connector, as per BT’s requirements stated within the DC Power Planning and Installation Guide for WES-BES Products document with respect to;

- i. Correctly rated MCB/Fuse (6A),
- ii. Correct labelling of wiring and MCB/fuse positions compliant with BS 7671 [7]
- iii. Correct size of cable for required voltage drop at required maximum current
- iv. Separately fused isolatable A & B power supplies, as detailed in the ‘AC/DC Power Planning and Installation Guide’ document

An additional AC mains supply socket will be required for the management router. Currently the management router is AC powered only.

#### **5.5 DC Power Connection – Remote End NTE used in street furniture only**

The remote end NTE is locally powered in the street furniture via an AC to DC converter that must provide 20-28V DC, and the maximum load is 0.4A SELV source only.

The applicable wire gauge for the DC feed is 2.5–0.75 sq. mm or 14–18 AWG. The earthing lead (ground wire) used on the mini-NTE must be a minimum of 16 sq. mm or 6 AWG.

The DC feed input should be protected by a 4.0 A to 5.0 A externally-mounted fast-acting fuse or equivalent.

### **6. Synchronisation**

The 1000M street Access service will transport a clock input through the network to produce a matching clock output at the other end of the service. Providing and maintaining the timing source is the CP’s responsibility. The service supports;

- Synchronisation at the Physical layer, ITU-T G.8261 [4]
- Supports clock requirements as specified in ITU-T G.8262 [5]
- Supports messaging requirements as specified in ITU-T G.8264 [6]
- Multiple timing domains on the NTE are not supported

On a SyncE enabled service one additional frame per second will be sent with the customer traffic on the same remote end access port to provide information on the status of the synchronisation.

#### **6.1 Timing Input Options**

The customer traffic port is the only supported Synchronisation Input option. The first input should be fed by the customer in to circuit 1 (upper card slot – port 1). A backup timing feed (if the customer

wishes to provide it) should be fed into the lower card slot – port 1. The Synchronisation output will be on the traffic on all circuits on the remote NTE (RJ45 output).

## 7. References

### Standards:

[1]	IEEE 802.3	Standards specification for Ethernet, physical communication in a local area network (LAN)
[2]	IEEE 802.1Q	Standard that supports virtual LANs (VLANs) on an IEEE 802.3 Ethernet network
[3]	ETS 300 019	European standard for Environmental Engineering (EE); Environmental Conditions and Environmental Tests for Telecommunications Equipment
[4]	ITU-T G.8261	ITU standard for Timing and Synchronization Aspects in <a href="#">Packet Networks</a>
[5]	ITU-T G.8262	ITU standard relating to Requirements for timing devices used in synchronizing network equipment that uses synchronous Ethernet
[6]	ITU-T G.8264	ITU standard for Distribution of timing information through packet networks and initially focuses on Ethernet networks.

### British Standards:

[7]	BS 7671	(IET Wiring Regulations) sets the standards for electrical installation
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For information on where to obtain these referenced documents, please see the document sources list at <https://www.openreach.co.uk/orpg/home/helpandsupport/sins/sins.do>

## 8. Abbreviations

AWG	American Wire Gauge – standardised wire gauge for electrical conductors
CP	Customer Premise
CPE	Customer Premise Equipment
IPR	Intellectual Property Rights
RJ45	Registered Jack 45 – data jack that can be used for Ethernet connectivity
MCB	Miniature Circuit Breaker

NTE	Network Terminal Equipment.
NTP	Network Time Protocol
LC	Lucent Connector – Miniaturised version of SC connector with 1.25mm ferrule
SELV	Safety Extra Low Voltage ( $\leq 60V$ DC)
SIN	Suppliers Information Note
STIN	Suppliers Trial Information Note (BT Publication)
VLAN	Virtual Local Area Network

## 9. History

<b>Issue</b>	<b>Date</b>	<b>Changes</b>
Issue 1.0	August 2018	First issue
Issue 1.1	August 2020	Changes to branding, from BT to Openreach including changes to reflect new Openreach SIN site and Openreach SIN email address
Issue 1.1	July 2021	Annual Review – no changes required – issue remains unchanged.

**-END-**