



## Customer Interface Publication: CIP040

### **KCOM Group Limited WHOLESALE FIBRELINE LOCAL ACCESS SERVICE DESCRIPTION AND TECHNICAL CHARACTERISTICS**

Issue: Version 3.0

October 2024

The information in this Customer Interface Publication (CIP) is provided in accordance with the requirements of the Radio Equipment and Telecommunications Terminal Equipment Regulations 2000 (Statutory Instrument 2000 No. 730) to publish (in accordance with the EC Radio and Telecommunications Terminal Equipment Directive 99/5/EC<sup>1</sup>) technical characteristics of interfaces used to connect to a Public Electronic Communications Network (PECN).

Users of this document should not rely solely on the information in this document but should carry out their own tests to satisfy themselves that terminal equipment will work with the PECN provided by KCOM Group Limited.

This CIP does not form a part of any contract with KCOM's customers or suppliers. KCOM shall have no liability in contract, tort or otherwise for any loss or damage, howsoever arising from use of, or reliance upon, the information in this document by any person.

This CIP document does not give or imply any license to any intellectual property rights belonging to KCOM or others.

© KCOM Group Limited

37 Carr Lane  
Hull  
HU1 3RE

---

<sup>1</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31999L0005&from=EN>



## Contents

1	INTRODUCTION.....	4
2	SERVICE OPERATION.....	4
2.1	Service availability .....	6
2.2	VLAN assignment and operation.....	6
2.2.1	FTTP Estate .....	6
2.2.2	FTTC Estate .....	7
2.3	CP VLAN tags.....	7
2.3.1	FTTP Estate .....	7
2.4	Downstream traffic management .....	7
2.4.1	FTTP Estate .....	7
2.4.2	FTTC Estate .....	8
2.5	Upstream traffic management.....	8
2.5.1	FTTP Estate .....	8
2.5.2	FTTC Estate .....	9
2.6	Maximum frame size.....	9
2.7	Frame duplication .....	9
2.8	Transparency of the Service. ....	9
3	INTERFACES.....	9
3.1	End customer interface .....	9
3.1.1	Fibre delivered Service .....	9
3.1.2	Fibre Service EU.....	9
3.1.3	Fibre Service active ONT .....	10
3.1.4	Copper VDSL2 Services .....	10
3.1.5	DSL operation.....	11
3.1.6	Line rates.....	11
3.1.7	Data throughput rates .....	11
3.2	CP Equipment interface .....	12
3.3	KCOM Ancillary Services .....	12
3.3.1	Ancillary Services Co-location.....	12
3.3.2	Ancillary Services Internal Cable Connect .....	12
3.3.3	Ancillary Services Backhaul Options .....	13
3.4	Distant WFLLA.....	13
3.5	Ethernet configuration.....	14
3.5.1	Frame sizes .....	14
3.5.2	Transparency.....	14
3.5.3	Multicast .....	14
3.5.4	Frame replication. ....	14



3.5.5	Intermediate Agent/DHCP Relay Agent .....	14
3.6	Quality and class of Service.....	14
4	SERVICE DATA RATES .....	15
5	KCOM ONT .....	15
5.1	ONT Technical Specification .....	15
5.1.1	ONT size.....	16
5.1.2	ONT positioning requirements .....	16
5.1.3	Power supply .....	16
5.1.4	Battery Backup Unit .....	16
5.1.5	Ethernet ports .....	16
5.1.6	Electrical safety.....	16
6	END USER (EU) TERMINAL EQUIPMENT OPTIONS.....	17
6.1	Fibre to the premises (FTTP) option .....	17
6.2	Fibre To The Cabinet (FTTC) option .....	17
7	SAFETY & EMC INFORMATION .....	17
7.1	Safety .....	17
7.2	EMC .....	17
7.3	Environmental.....	17
8	AVAILABILITY .....	18
9	GLOSSARY .....	18
10	REFERENCES.....	21
11	HISTORY .....	22

## 1 INTRODUCTION

This customer interface publication (CIP) has been created to describe and detail the technology to provide the KCOM Wholesale FibreLine Local Access service (WFLLA). The Service can be provided:

- using CP Equipment located within a KCOM Exchange Site or;
- as a Distant WFLLA product delivered to CP Equipment located anywhere on the KCOM network

KCOM wholesale, the wholesale division of KCOM Group Limited provides this service to Communications Providers (CPs), enabling the delivery of their broadband services between the CP Equipment and the service specific equipment within the EU Site. References to KCOM within this document refer to KCOM wholesale, unless otherwise stated.

Terms and abbreviations used in this document are included in section 9 of this document, in the Reference Offer for the Provision of Ancillary Services and in the Reference Offer for the provision of KCOM Wholesale FibreLine Local Access.

Changes to the technical architecture and network interfaces that affect the correct working of the Service will be published by KCOM Group Limited within documents published on the KCOM website.

This Service may be subject to change due to changes in the UK industry standards and specification forums. It may also be impacted by a change in regulatory requirements applicable to these specifications.

Enquiries relating to the technical content of this document and the availability of other publications should be directed to:

FAO KCOM wholesale sales  
KCOM Group Limited  
37 Carr Lane  
Kingston upon Hull. HU1 3RE

Telephone: 01482 602100  
E-mail: wholesalesales@kcom.com

## 2 SERVICE OPERATION

The service is shown in concept form below. There are two fundamental access interfaces required for the Communications Provider (CP) and four main components. CP Equipment location options are shown as:

*Figure 2-* Location within KCOM Exchange Sites requiring Ancillary Services

*Figure 2-2* Location at a CP Site in the Hull Area [Distant WFLLA option]<sup>2</sup>

<sup>2</sup> Note that the CP Site in the Hull Area can be an Exchange Site



The interfaces are an Ethernet interface to the CP Equipment and a customer delivery Fibre EU Access Interface Port (FEUP). In addition, the CP also needs to request, rent and maintain

- a) Virtual Cable Connect between each OLT, or DSLAM where FTTC is to be supported, and the Layer 2 Aggregation plus either
  - i) Ancillary Services or
  - ii) Distant WFLLA or
  - iii) a combination of these, for instance utilising an Exchange Site under Ancillary Services as a CP Site connected with other Exchange Sites by Distant WFLLA;
- b) Location within KCOM Exchanges contracted under the Reference Offer for Ancillary Services [see Figure 2.1]
  - i) KCOM Co-location Services;
  - ii) Internal Cable Connect between the Layer 2 Aggregation equipment and the CP Equipment;
  - iii) Backhaul, either
    - (1) Exterior Cable Connect to a CP chamber within 100m of the Exchange Site curtilage; or
    - (2) ECAS circuit from the Exchange Site to the CP's nominated Point of Handover within the Hull Area
- c) a Distant WFLLA Service [see Figure 2.2]
  - i) Local Access Backhaul Service circuit from the Layer 2 Aggregation to the CP's nominated Point of Handover within the Hull Area

The network equipment employed by KCOM provides Services for multiple CPs but has a physical limit on the capacity equal to the installed base of each system.

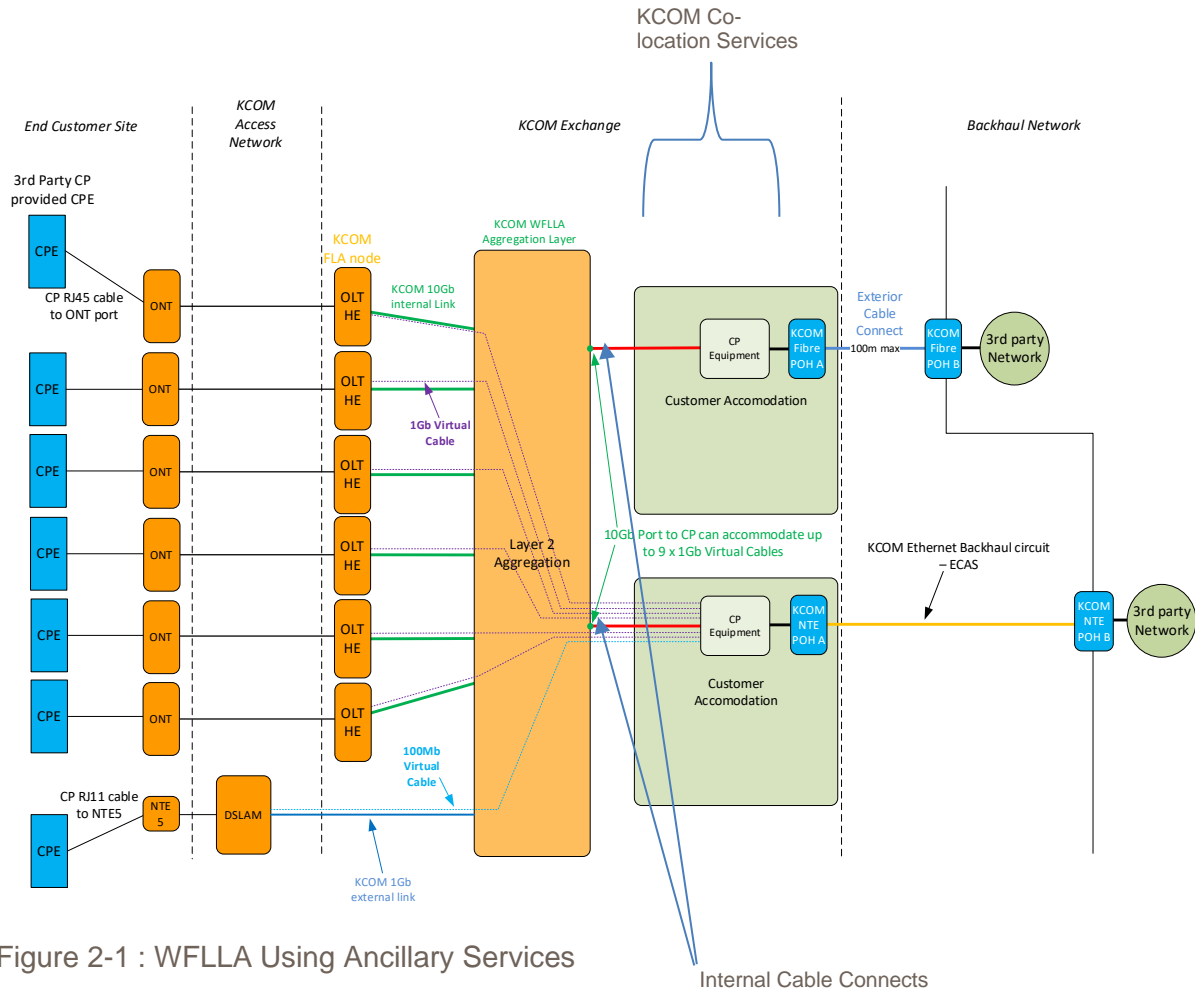


Figure 2-1 : WFLLA Using Ancillary Services

Internal Cable Connects

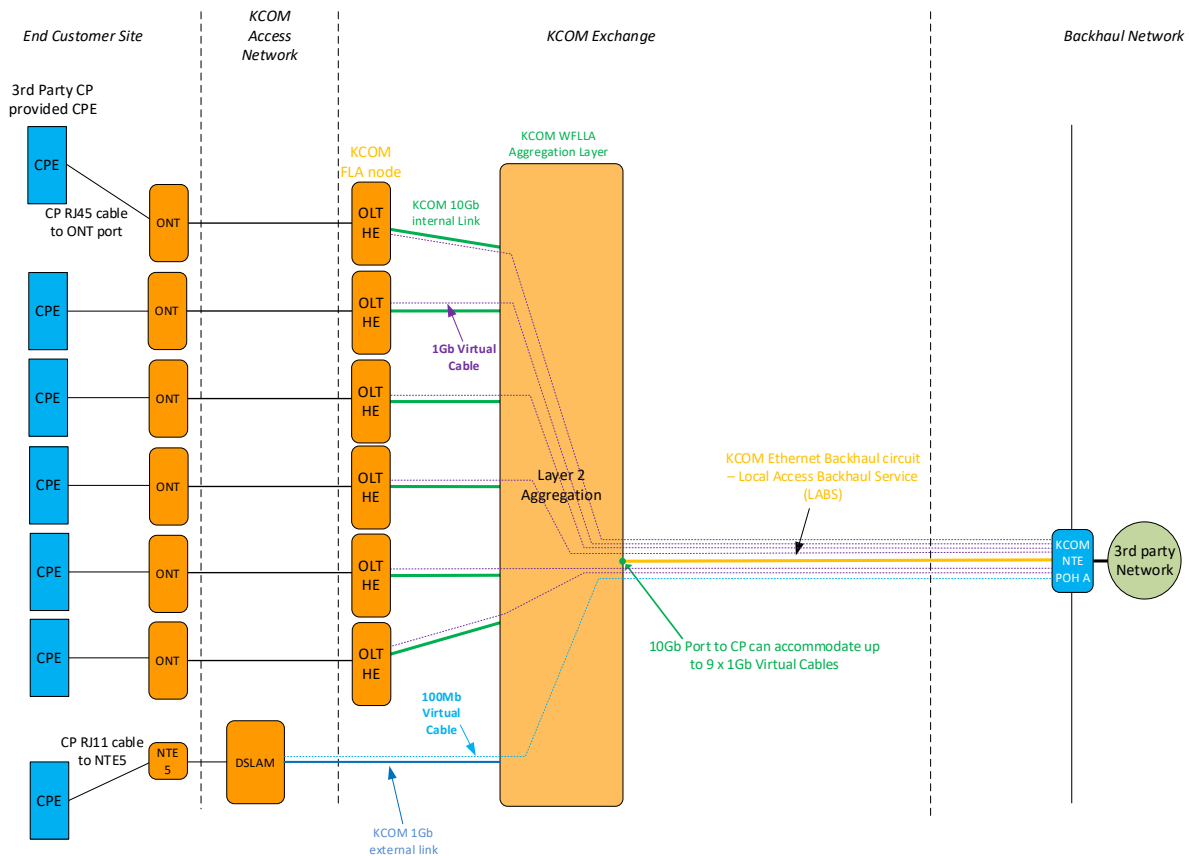


Figure 2-2 : Distant WFLA

### 2.1 Service availability

The Service is designed as an ‘always on’ as per standard industry terminology. A shared VLAN is designed to carry data communications traffic.

The Service is available where ONT port capacity is available at the location requested and an order for that capacity is not already in flight.

### 2.2 VLAN assignment and operation

#### 2.2.1 FTTP Estate

This Service provides a 1-1 Double tagged VLAN structure across to each CP per OLT.

KCOM will allocate a dedicated outer VLAN tag for each CP per Virtual Cable Connect per OLT, for which KCOM will then allocate an inner tag per EU that is built across that OLT.

Each VLAN tag will use Ether type 0x8100.

We will allocate a maximum of 4000 inner VLAN tags per outer VLAN instance, per CP, reserving the remaining inner tags out of the possible 4094 for future use.

The Service is built as a 1-1 Mapping across each OLT. For each EU an intermediate agent function is applied by the OLT for each flow.



Each flow will adopt the local chassis ACI headers which are specified by KCOM, adhering to relevant standards.

The consuming CP will be able to specify an alphanumerical ARI value which is 'up to' 16 characters / digits, this must be specified at the point of provisioning.

The access node will aggregate all of the EUs into a single LAG group and forward the traffic to a Layer 2 Aggregation via the systems network interface. Internal links [see Figures 2.1 and 2.2] will have 10Gbps interfaces.

### **2.2.2 FTTC Estate**

This Service provides a N-1 Single tagged VLAN structure across to each CP per Virtual Cable Connect per DSLAM.

KCOM will allocate a dedicated outer VLAN tag for each CP per Virtual Cable Connect per DSLAM.

Each VLAN tag will use Ether type 0x8100.

The Service is built as a N-1 Mapping across each DSLAM. For each EU an Intermediate Agent function is applied by the DSLAM for each interface.

Each interface will adopt the local chassis ACI headers which are specified by KCOM adhering to relevant standards.

The consuming CP will be able to specify an alphanumerical ARI value which is 'up to' 16 characters / digits; this must be specified at the point of provisioning.

The access node will aggregate all of the EUs into a single trunk and forward the traffic to a L2S via the systems network interface. Maximum available trunk links are subject to survey and approval from KCOM.

## **2.3 CP VLAN tags**

### **2.3.1 FTTP Estate**

If a CP sends a Tagged frame into the ONT UNI interface the frame will not be forwarded but blocked.

#### **2.3.1.1 FTTC Estate**

KCOM can provide functionality for the VDSL PTM interface to accept either tagged or untagged frames.

Modem interop is carried out on a best endeavours basis due to legacy technology involved in delivery.

## **2.4 Downstream traffic management**

### **2.4.1 FTTP Estate**

A dual rate colour blind traffic manager is applied on the access platform to restrict the consuming CP's EU to the Product Rate.

This is delivered as a CIR + EIR where the EIR can be consumed up to the Product Rate.



The traffic management is generally applied on the Service access node within the EU s' feeding exchange, but KCOM may also enforce this on the ONT in conjunction with this. In this case the traffic management is applied on the UNI interface.

In any instance it is expected for this product that a dual rate colour blind policer will be utilized to enforce the CIR and the published EIR bandwidth [Product Rate].

The rates will be defined in the product definition for the specific traffic profile that's being used by the consuming CP.

All traffic management is handled as FIFO and will drop traffic exceeding the EIR. It is KCOM's expectation that the consuming CP will manage the EU's D/S traffic before it enters the network's point of interconnect.

Each EU connection is policed on the Input interface in either direction. In the downstream direction for each Peak rate speed a Committed Rate CIR and a Peak rate PIR are applied to each individual connection in line with Industry practise.

The burst size for each CIR (CBS) is a ratio of 1/1024 of the CIR.

Example:

For a Product Rate of 100Mbps it has a CIR of 35Mbps and a PIR of 100Mbps. CBS would be 35000 bits and PBS 111000 bits.

Policers act on the full packet except for the IFG.

The CP is expected to shape traffic in the downstream direction to avoid excessive packet loss. As the Service is FIFO over subscription will be policed before any queuing takes place.

#### **2.4.2 FTTC Estate**

No additional traffic management will be performed on the DSLAM, speeds will be dependent on the maximum achievable DSL line rates.

### **2.5 Upstream traffic management**

#### **2.5.1 FTTP Estate**

KCOM will enforce upstream traffic management to meet the Product Rate bandwidth of the Service taken as close to the EU Interface as possible.

This may be applied on the UNI interface as well as using Bandwidth allocation in the traffic containers as per the relevant PON technology being used to deliver the Service.

Traffic containers using DBA are used to manage the CIR and EIR.

In any instance it is expected that a dual rate colour blind policer will be utilized to enforce the CIR and EIR [Product Rate] bandwidth.

The rates will be defined in the product definition for the specific traffic profile that's being used by the consuming CP.

All traffic management is handled as FIFO and will drop traffic exceeding the EIR.

Due to the nature of the Service the CP is expected to shape the traffic in the upstream direction to match the bandwidth of the Service selected.



KCOM will police the traffic on ingress to the product levels on a FIFO basis.

KCOM will transmit the data to the ENNI on a FIFO basis, however, KCOM will shape and police the traffic upstream into the ENNI. Therefore, the CP must consider the impact of the shaping at this point on their users' traffic.

### 2.5.2 FTTC Estate

No additional traffic management will be performed on the DSLAM, speeds will be dependent on the maximum achievable DSL line rates.

### 2.6 Maximum frame size

The maximum frame size is 1530 bytes for ethernet.

### 2.7 Frame duplication

Standard ethernet bridging rules apply and are enforced.

Reflected traffic with source MAC address unchanged must not be transmitted to the KCOM network Service components in either direction.

### 2.8 Transparency of the Service.

The Service accepts valid ethernet frames except for:

1. Physical layer signalling not deigned to be transmitted on this Service such as auto negotiation.
2. Slow Protocols – includes LACP.
3. IEEE 802.3x PAUSE
4. IEEE 802.1X Authentication
5. LLF and ULLF

## 3 INTERFACES

There are two interfaces - End user (EU) and the ethernet Network to Network Interface (ENNI).

### 3.1 End customer interface

The following CP EU Access physical interfaces are available:

- Fibre1000 BaseTx. This is presented for all connections as an electrical RJ45 8 wire interfaces. This adheres to the industry standard IEEE802.3ab standard for Gigabit ethernet.  
The Port will be configured for auto negotiation as default, if it is a requirement to change this for any reason this must be raised at the point of order.
- Copper: A standard NTE 5A Master socket.

#### 3.1.1 Fibre delivered Service

The interface is located on the KCOM ONT sited on the EU premises. The Network Termination Point (NTP) demarcation is the port interface on the KCOM equipment.

#### 3.1.2 Fibre Service EU

The EU connection is a port on the fibre connected Optical Network Termination (ONT) device. This is a 1000 Base TX port presented as an RJ45 type 8 wire connection. The WFLLA Services will be delivered over a single ethernet port on the KCOM ONT. This port can support multiple Services on a FIFO basis as OTT Services. The ONT has a combined maximum capability of 1Gbps throughput.



As a single port is used, the physical limit of the port in 1000 Base-TX mode will apply.

The Service connections are terminated by Optical Network Termination equipment (ONT) installed on the EU premises. The NTP is the designated customer port on the user side of the ONT for a given CP. Exceptionally, in multi-unit accommodation, termination may be onto a central switch from which landlord owned cabling will distribute Service to the EU.

The ONT port assigned to an CP may not be the same port on each ONT requested.

### 3.1.3 Fibre Service active ONT

The ONT and PSU will require a vertical surface, such as a wall, with the environmental conditions as per a normal residential or office location. The ONT will require a customer supplied 240V A.C. at a Nominal 2A supply to be available within 2.0m of the ONT location. A standard IEC 13A lead will be supplied or Plug top Power Supply Unit (PSU) will be fitted as part of the Installation. A clear 10cm radius is required in the plane of the surface of the power socket faceplate.

Connection between the EU port and the EU equipment is the responsibility of the customer, and the port to be used will be identified on the EU handover document. The ethernet interface characteristics are in accordance with the KCOM Customer Interface Publication KCH CIP 016 [2] (available from <https://www.kcom.com/wholesale/products/service-information/technical-interface-information/>).

The physical plug for connection should conform to ETS 300 001 § 8.2 (GB) [6]

### 3.1.4 Copper VDSL2 Services

There is one variant of the VDSL2 Service:

- CP supplied CPE

The KCOM copper line is delivered to the customer on an NTE5A Master box as a British Standard 6312 431A or 631A Plug / Socket interface. This will be supplied and installed by KCOM. This NTE remains KCOM property and acts as the point of demarcation.

It is the responsibility of the EU to provide an appropriate xDSL filter and attach it correctly to the line and then attach the EU provided VDSL2 compatible CPE which shall comply with the published KCOM ANFP specification and this CIP to function correctly with this Service.

The VDSL2 service is an overlay Service and can only be operated in conjunction with an active voice service, such as the KCOM Wholesale Line Rental service and can only be supplied where a KCOM copper delivery service is available.

The KCOM copper line delivery can only support one VDSL2 service per line pair.

KCOM VDSL2 Service will be automatically ceased should the copper voice service be cancelled or removed.



### 3.1.5 DSL operation

The Service is configured to only operate in VDSL2 mode and ADSL fall back is not supported.

The Service operates to the published NICC KCOM (KCH) ANFP document. KCOM does not operate Dynamic Line management systems outside of the standard Adaptive line rate systems provided for in the standard operation of the VDSL2 protocols.

As standard the Downstream Noise margin operated by KCOM is 6dB on all DSL products. This is for Line stability and reduced fault management due to the short loop lengths operated on most of the KCOM physical plant where VDSL2 is available.

### 3.1.6 Line rates

The KCOM VDSL2 Service supports VDSL2 line rates as below.

Service	Downstream rate	Upstream rate
VDSL2 G.993.2	Maximum 80Mbits/s	Maximum 20Mbits/s

The Service supplied is based upon the distance between the DSLAM and the EU. This variance is due to the physical operation of the VDSL2 technology.

The line rate is the VDSL2 protocol reported line rate and needs to be reflected in the CP configured payload shaping for optimal transmission of the EU data.

### 3.1.7 Data throughput rates

The VDSL2 protocol requires the inclusion of packet overheads to operate correctly to transport ethernet frames and payloads.

The packet overheads include

- A 4 byte per frame routing overhead required by KCOM.
- The DSL and Point to Point Protocol (PPP) overheads required to operate the Service.

These overheads impact the actual data rates available to the EU.

The scale of this impact depends on the size of the payload packets being transmitted. The ratio of the payload size to the number of packets impacts the total capacity throughput.

For example, number of packets transmitted and therefore overheads required is double at 64k frame sizes than at 128k frame sizes.

The CP should carefully consider how this impacts the Service available to them in the onward products they wish to deliver using this Service.

The available payload data throughput rates will always be less than the line rate due to the use of the VDSL2 and ethernet protocols to transmit the payload data. The CP should consider how these and the other Service factors should be used in setting any downstream or upstream shapers within the CP network.



### 3.2 CP Equipment interface

Each KCOM Exchange Site to which the CP requests connectivity will initially have either one or more 10Gbps interfaces assigned on a Layer 2 Aggregation to meet minimum aggregated throughput requirements.

For capacity management the CP is allowed a single 10Gbps port.

Each 10Gbps interface is capable of transporting up to nine 1Gbps Virtual Cable Connect paths.

The interface is a single 10Gbps port on a single interface card. The 10Gbps port is 10000Base-LR single mode only.

All the connections above require connection from the port on the Layer 2 Aggregation to the CP Point of Handover which can be to CP Equipment within the KCOM Exchange via Ancillary Services or to a nominated Point of Handover within the Hull Area if using Distant WFLLA.

### 3.3 KCOM Ancillary Services

These Services are available through KCOM's Reference Offer for the Provision of Ancillary Services.

#### 3.3.1 Ancillary Services Co-location

The KCOM Ancillary Services Co-location Service is designed to provide the required CP location within the KCOM Exchange for the Handover Point A to the CP equipment.

This product consists of a 600x600 rack space with non-resilient 240V AC power. The product provides for a cooling factor and connectivity. Details are in the Ancillary Service Price List.

The CP shall refer to the KCOM Reference Offer for the Provision of Ancillary Services for the equipment that can be fitted in the space.

#### 3.3.2 Ancillary Services Internal Cable Connect

The CP will need to provide the locations and interface types when ordering the Internal Cable Connect products. The interface is the connector on the KCOM Internal Cable Connect.

The CP can provide an interface panel or an equipment interface id for the connections. A KCOM Patch Panel will be fitted in the CP KCOM Ancillary Services rack for the specific delivery type (Fibre / Copper). The CP is responsible for ensuring space is available for the panel to be fitted.

The Connector type is LC as standard but other types may be available on request. Access is required to the rack for fitting and testing of the connections. The ethernet interface characteristics are in accordance with the KCOM Customer Interface Publication KCH CIP 016 [2] (available from <https://www.kcom.com/wholesale/products/service-information/technical-interface-information/>).



Other interfaces may be available by negotiation. The connection is presented according to the following IETF specifications:

RFC 791[3]	IETF document: Internet Protocol DARPA Internet Program Protocol Specification
RFC 826[4]	IETF document: An Ethernet Address Resolution Protocol -- or -- Converting Network Protocol Addresses to 48.bit Ethernet Address for Transmission on Ethernet Hardware
RFC 1042[5]	IETF document: A Standard for the Transmission of IP Datagrams over IEEE 802 Networks

### 3.3.3 Ancillary Services Backhaul Options

There are two Backhaul options.

- KCOM Exterior Cable Connect
- KCOM Ethernet Connect Access Service (ECAS) service.

#### 3.3.3.1 KCOM Exterior Cable Connect

The KCOM Exterior Cable Connect product provides for a CP to connect the KCOM Access Connect Product to the CP's own fibre network.

KCOM will provide a costed option to connect between the CP's KCOM Ancillary Services Co-location Hostel and a passive footway box in the public domain.

The CP will provide a length of cable at the Point of Handover sufficient to be pulled through to, and spliced within, KCOM's cable chamber in the KCOM Exchange.

#### 3.3.3.2 KCOM Ethernet ECAS service

An Ethernet Connect Access Service (ECAS) service must be ordered under the Reference Offer for the Provision of Leased Line and Ethernet Services.

The ethernet interface characteristics are in accordance with the KCOM Customer Interface Publication KCH CIP 016 [2] available from

<https://www.kcom.com/wholesale/products/service-information/technical-interface-information/>.

### 3.4 Distant WFLLA

An aggregated FTTP 'Local Access Backhaul Service' (LABS) circuit will be fitted by KCOM to connect the Exchange with the CP Site.

The interface is located on a Fibre Leased Line NTE sited on the CP premises or POI. The NTP demarcation is the port interface on the KCOM Equipment.

This is presented as a 10Gbps interface 1310 SMF dual fibre working LC connector as per the CIP 045 specification for LABS.



The NTE will require a 19" rack mount with the environmental conditions as provided for in the Manufacturer specification. These are advised on request.

The NTE will require a customer supplied 240V A.C., at a Nominal 5A, supply to be available within 3m of the NTE location. A standard IEC 13A lead will be supplied.

Connection between the NTP and the EU Equipment is the responsibility of the CP.

The ethernet interface characteristics are in accordance with the KCOM Customer Interface Publication KCH CIP 016 [2](available from <https://www.kcom.com/wholesale/products/service-information/technical-interface-information/> ). The IP is presented according to the IETF specifications in 3.3.2.

### **3.5 Ethernet configuration**

#### **3.5.1 Frame sizes**

The KCOM product supports a maximum frame size of 1530 bytes as industry standard. (pre-amble and Inter Frame Gap excluded).

#### **3.5.2 Transparency**

The Service is transparent to all valid ethernet frames except for:

- Slow Protocols – the group of protocols that provide Service operation including 802.3ah OAM and LACP.
- 802.1X authentication
- Any physical layer signalling such as LLF or auto negotiation.
- 803.2x PAUSE.

#### **3.5.3 Multicast**

No multicast replication or handling is provided.

Multi MAC address shall ensure that IP group addresses are unique in the lower 23 bits as per UK industry practice.

#### **3.5.4 Frame replication.**

The CP shall obey ethernet bridging rules. Frames sent from the KCOM Network shall not be transmitted back into the KCOM Network without the source MAC being altered. This applies in all directions.

#### **3.5.5 Intermediate Agent/DHCP Relay Agent**

PPPoE intermediate agent (IA) and DHCP Relay (Option 82) are supported. Both options allow for the Agent Remote ID to be defined on a per subscriber basis. The Agent Circuit ID (ACI) is set per OLT and is presented as eight alphanumeric digits, followed by the logical loop ID of the connected subscriber.

### **3.6 Quality and class of Service.**

The KCOM Service provides a strict FIFO Service within the boundaries of the requested Service. The CP is expected to control all queuing and control mechanisms at both ends of the connection.



The CP shall prioritise the traffic flows and connection capacity at both ends of the interface as strict policing is used to manage the capacity to allow for equal operation between all users.

The KCOM COS is set on the KCOM VLAN transport tag across the KCOM Network for the Service. This is of equal weight as to the other traffic for the Service. Voice traffic services and system management are given a higher priority.

## 4 SERVICE DATA RATES

The Service is provided to the EU over fibre GPON technology conforming to the KCOM Customer Interface specified in CIP 016 [8].

Publication KCH CIP021 [7], Technical Characteristics of the ADSL interface, Paragraph 5. (available from [Technical interface information | KCOM](#) ).

The Copper VDSL2 Service is provided to the EU over VDSL2 copper technology conforming to ITU-T 992.3.

Service data rate is based on Service selected as part of the order process.

The broadband network path is shared and so the Service will be contended to the maxima determined by the CP. Lower Service data rates may on occasion result, due to deployment conditions such as fault related congestion within the KCOM Network. KCOM will take all reasonable steps to minimize such occurrences.

## 5 KCOM ONT

The fibre derived Exchange Line service consists of an active Optical Network Termination unit (ONT) supplied, fitted and operated by KCOM. The ONT is a mains electrically powered, 230V 50-60Hz unit that terminates the fibre connection in the customer premise.

There are a number of variants of the ONT, but all are of similar size and shape.

### 5.1 ONT Technical Specification

The current four ethernet / two voice (4GE+2V) ONT consists of:

- One ATA providing up to 2 independent numbered, same provider, Analogue copper interfaces / lines with either two BT601A (4GE+2VA) or two wire RJ11 interfaces (4GE+2VR).
- 1 Gbps ethernet Layer 2 Aggregation.
- Up to 4 10/100/1000 Base-T Ethernet Data Interfaces.

The voice ports are not further described in this document.

Other ONT types are in use or may be introduced and KCOM reserves the right to change any of the specifications at any time with reasonable notice.

The ONT contains a laser transmitter compliant to appropriate standards for installation in a domestic environment. [7]



### 5.1.1 ONT size

The dimensions of the unit currently fitted are (H x W x D) as fitted vertically on a wall:  
4GE+2VA: up to 200mm x 160mm x 36mm.

Different variants have differing styles and shapes.

### 5.1.2 ONT positioning requirements

As an active unit, the ONT needs to be fitted to a fixed surface such as a wall or vertical surface and within 1m of a domestic indoor main power socket. The KCOM fitting engineer will have final decision as to the suitability of the customer location.

Where the current PSTN Master socket is not co located then the KCOM fitting engineer will wire to the master socket, were reasonably practical and technically possible.

### 5.1.3 Power supply

The ONT is powered via a low voltage single feed including the capability for a battery backup unit in-line with the low voltage supply line.

The mains PSU is suitable for use with a normal UK indoor domestic 230V (AC) supply.

The units should only be used in-conjunction with the KCOM power units.

For the 4GE+2VA unit:

- Mains supply – 100 to 240V AC 50-60Hz
- ONT input supply – 11-14V DC, 1.1 Amp

Power consumption:

- Minimum 5.2W, Maximum 14W Average 7.6W

### 5.1.4 Battery Backup Unit

The Service is not supplied with a Battery Backup Unit. Should the CP require Power resilience they need to provide this capability.

### 5.1.5 Ethernet ports

The ONT has

- Four 100/1000 Base-T Ethernet data ports.
- Data transfer at wire speed to the 1 Gbps limit of the ONT.
- Auto-Negotiation
- MDI/MDIX auto sensing

### 5.1.6 Electrical safety

The ONTs supplied are compliant with BS EN 60950-1 Information Technology equipment.

## 6 END USER (EU) TERMINAL EQUIPMENT OPTIONS

### 6.1 Fibre to the premises (FTTP) option

The minimum recommended terminal equipment performance specification is: ITU-T G.992.1 Annex G [13]

For lines capable of Service at ITU-T G.992.5 Annex A [14], terminal equipment must be capable of operation to this specification or optimal stable Service delivery rates may not be achieved.

An example of typical EU terminal equipment to enable successful inter-working with the Service is an ethernet PPPoE capable or RFC bridge CPE connected to a personal computer (PC).

KCOM is not responsible for the provision or operation of any EU equipment, PC operating systems, drivers and any associated software.

### 6.2 Fibre To The Cabinet (FTTC) option

The minimum terminal equipment performance specification is: ITU-T G.993.1 However with this due to be superseded in a few years, a minimum recommendation is G993.2 VDSL2.

For lines capable of Service at ITU-T G.993.2 terminal equipment must be capable of operation to this specification or optimal stable Service delivery rates may not be achieved.

The ANFP for the Service is NICC ND1604.

KCOM is not responsible for the provision or operation of any EU equipment, PC operating systems, drivers and any associated software.

## 7 SAFETY & EMC INFORMATION

### 7.1 Safety

Where the CP Customer Interface is presented in optical presentation this is classified as a class 1 laser product as defined in the laser safety product standards BS EN 60825- 1/2 [17].

The 10/100Mbps interfaces are classified as unexposed as defined in CENELEC Reports/ETSI Guide ROBT-002/EG 201 212.[18]

### 7.2 EMC

The network equipment and network terminating equipment related to the provision of the interface comply with the current EMC regulations.

Whilst predominantly intended to be installed in commercial and light industrial environments, this does not preclude the Customer Interface or EU NTEs being installed in other environments e.g. industrial.

### 7.3 Environmental

This Service and the supplied equipment are designed to be hosted in a residential or



office location. It must be protected from environmental conditions outside of these norms.

## 8 AVAILABILITY

All Service delivery will be FTTP as a default product except where external limitations prevent deployment of fibre, where the Service will be supplied via FTTC.

## 9 GLOSSARY

ACI	Agent Circuit Identifier
ACS	Auto-configuration Server
ARI	Agent Remote Identifier
ANFP	Access Network Frequency Plan
CBS	Committed Burst Size
CIR	Committed Information Rate
CP	Communications Provider
COS	Class of Service
DBA	Dynamic Bandwidth Allocation
DSL	Digital Synchronous Line
EU	End User
EIR	Excess Information Rate
EMC	Electromagnetic Compatibility
ENNI	Ethernet Network to Network Interface
IETF	Internet Engineering Task Force
FEUP	Fibre End User Port
FIFO	First In First Out
FTTC	Fibre To The Cabinet
FTTP	Fibre To The Premise
GPON	Gigabit Passive Optical Network
Hull Area	The area defined as the 'Licensed Area' in the licence granted on 30 November 1987 under section 7 of the Telecommunications Act 1984 to Kingston upon Hull City Council and Kingston Communications (Hull) plc
IFG	Inter-Frame Gap
IP	Internet Protocol
ISP	Internet Service Provider
ITU-T	International Telecommunications Union – Telecom Standardisation
KCH	KCOM Group Limited, formerly KCOM Group PLC & previously Kingston Communications (HULL) PLC



KCOM	KCOM Group Ltd
LACP	Link Aggregation Control Protocol
LAG	Link Aggregation Group
LC	Lucent Connector
L2TP	Layer 2 Tunnelling Protocol
LLC	Logical Link Control
LLF	Link Loss Forwarding
MAC	Media Access Control
MDI / MDIX	Medium-dependent interface / Medium-dependent Interface crossover
NGA	Next Generation Access
NTE	Network Terminating Equipment
NTP	Network Termination Point
OLT	Optical Line Terminator
ONT	Optical Network Termination
PBS	Peak Burst Size
PC	Personal Computer
PECN	Public Electronic Communications Network
PIR	Peak Information Rate
POI	Point of Interconnect
PPP	Point to Point Protocol
Product Rate	Contracted Download / Upload Speed as specified in the Price Manual
Price Manual	Document available at <a href="#">Wholesale FibreLine Local Access</a>
PSTN	Public Switched Telephone Network
PSU	Power Supply Unit
PTM	Packet Transfer Mode
PTO	Public Telecommunications Operator
PVC	Permanent Virtual Circuit
RFC	Request For Comment – IETF Publications
RJ11	Registered Jack Type 11
RJ45	Registered Jack Type 45
Service	Supply of Virtual Cable Connect, Local Access Backhaul Services, WFLLA FTTC and WFLLA FTTP as described in the WFLLA Schedules
SLA	Service Level Agreement
SNAP	Subnetwork Attachment Point
SPN	Service Provider Network
UBR	(ATM) Unspecified Bit Rate
ULLF	User Link Loss Forwarding
UNI	(ATM) User Network interface
VDSL2	Very-high-bit-rate Digital Subscriber Line
VCI	(ATM) Virtual Channel Identifier
VC Mux	Virtual Channel Multiplexing



Virtual Cable Connect	1Gbps VLAN connecting an OLT to the Layer 2 Aggregation
VPI	(ATM) Virtual Path Identifier
WFLLA	Wholesale Fibre Line Local Access

## 10 REFERENCES

[1]	IEEE 802.3	Information technology—Telecommunications and information exchange between systems—Local and metropolitan area networks—Specific requirements—Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications	1988
[2]	KCH CIP 016	Technical Characteristics of the 10Mbit/s and 100Mbit/s digital leased line	
[3]	RFC 791	Internet Protocol DARPA Internet Program Protocol Specification	
[4]	RFC 826	An Ethernet Address Resolution Protocol -- or -- Converting Network Protocol Addresses to 48.bit Ethernet Address for Transmission on Ethernet Hardware	
[5]	RFC 1042	A Standard for the Transmission of IP Datagrams over IEEE 802 Networks.	
[6]	ETS 300 001 § 8.2 (GB)	Attachments to Public Switched Telephone Network (PSTN); general requirements for equipment connected to an analogue subscriber interface in the PSTN	1997
[7]	KCH CIP 021	Technical Characteristics of the ADSL Interface	
[8]	KCH CIP 001	Technical characteristics of the Single Analogue Line Interface	
[9]	RFC 2364	PPP Over AAL5	
[10]	RFC 2516	A Method for Transmitting PPP Over Ethernet (PPPoE)	
[11]	RFC 2865	Remote Authentication Dial in User Service (RADIUS)	
[12]	RFC 2866	RADIUS Accounting	
[13]	ITU-T G.992.1 Annex G	Asymmetric digital subscriber line (ADSL) transceivers	02/07/1999
[14]	ITU-T G.992.5 Annex A	Asymmetric digital subscriber line (ADSL) transceivers – Extended bandwidth ADSL2 (ADSL2plus)	Jan-09
[15]	RFC 1661	IETF: The Point-to-Point Protocol (PPP)	
[16]	RFC 1994	IETF: PPP Challenge Handshake Authentication Protocol (CHAP)	
[17]	BS EN 60825-1/2	[17] Safety of laser products – Part 1: Equipment classification and requirements	2007
[18]	ROBT-002/EG 201 212	Electrical Safety; Classification of interfaces for equipment to be connected to telecommunications networks	1998

Reference [1] may be obtained through <https://www.ieee802.org/>

References [13] and [14] may be obtained from: <http://www.itu.int/>



References [2],[7] and [8] may be found at: [Technical interface information | KCOM](#)

References [6] and [18] may be found at:  
<http://www.etsi.org/WebSite/Standards/Standard.aspx>

References [3], [4], [5], [9], [10], [11], [12], [15] and [16] may be found at:  
<https://www.ietf.org/rfc.html>

Reference 17 may be obtained through  
<https://landingpage.bsigroup.com/LandingPage/Undated?UPI=00000000030113905>

## 11 HISTORY

Date	Issue	Comments	Author
18/10/2017	1.1	Version 1. New document to support new interface	D&D TSO KCOM GROUP Limited
01/05/2022	2.0	Version 2.0 Revision to accommodate Distant WFLLA per OFCOM direction	D & D KCOM Wholesale & Networks, KCOM Group Ltd
15/10/2024	3.0	Version 3.0 Revision to add section 3.5.5	D & A KCOM Wholesale & Networks, KCOM Group Ltd