



Customer Interface Publication: CIP034

Ethernet Assured Service Description and Technical Characteristics

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Introduction

The KCOM Ethernet Assured Service (EAS) is described in this publication.

Specifications detailed below are current as of date of publication of this document and may be subject to change in the future. Changes to the technical architecture and network interfaces that affect the correct working of the service will be published by KCOM in documents made available from the address below. If the changes impact on this document then it will be updated. It should be noted that KCOM reserves the right to alter and adapt where required as new specifications are determined. The service delivers an un-contented Ethernet Point to Aggregation service it may be delivered over differing architecture depending on the product specification and required aggregation capability.

The use of Industry standard terms does not give or imply any direct or indirect compatibility between users of those terms and are for ease of customer reference only.

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Service Availability

KCOM's Ethernet Assured Service (EAS) is available within the Hull Area (OLA) as defined by OFCOM. It may also be available on request in the East Yorkshire Expansion area that is covered by KCOM's network but that is subject to survey and availability.

The maximum radial distance between any customer site and the KCOM Points of Presence is 10 km or as where defined by the OLA boundary. A standard maximum distance is up to 15 km based on a measured fibre distance. Extended distances may be available based upon survey results.

The transmission path for this service is fully contained within the KCOM infrastructure and plant. Alternate network delivery is not available.

EAS will support a CP in offering a Business Impact level III service that can be assured to Communications and Electronics Security Group (CESG) level 3–3–4. IL3 is not guaranteed by KCOM in the provision of this service. The accreditation is the responsibility of the customer. This includes any site security requirements at the customer end location.

Note: The above classifications are under review by **NCSC** (Partially replaced CESG) and will be updated as required.

Service Description

KCOM EAS is an Ethernet based Virtual Private Network (VPN). It comprises of:

- Layer 2 Access Circuits between End User premises and KCOM Points of Presence
- Layer 2 Aggregated Access Circuit(s) between a Communication Providers (CP) Interconnection Point and KCOM Points of Presence
- Ethernet Virtual Connections (EVC) that provide an uncontended permanent connection between Aggregated Access Circuits and Access Circuits.

The service terminates on a Network Termination Equipment (NTU) installed on the customer premises / CP interconnection point. The Network Termination Point (NTP) is the customer/end user side of the NTU, called the Access Port.

The Access Port at End User sites has interface speed options of 100Mbps and 1000Mbps.

The Access Port at the CP's Interconnection Point has interface speed options of 1000Mbps and 10000Mbps.

The EVCs have bandwidth options ranging from 2Mbps to 1000Mbps.

The total ordered EVC bandwidth on each Aggregate Access must not exceed the bandwidth of the Access Port.

There are three resilience options available. These are selectable on a site-by-site basis. For purposes of illustration the options below show three example networks where the same resilience type is used throughout.

Option A - The Active / Standby service is shown in concept form below in Figure 1.

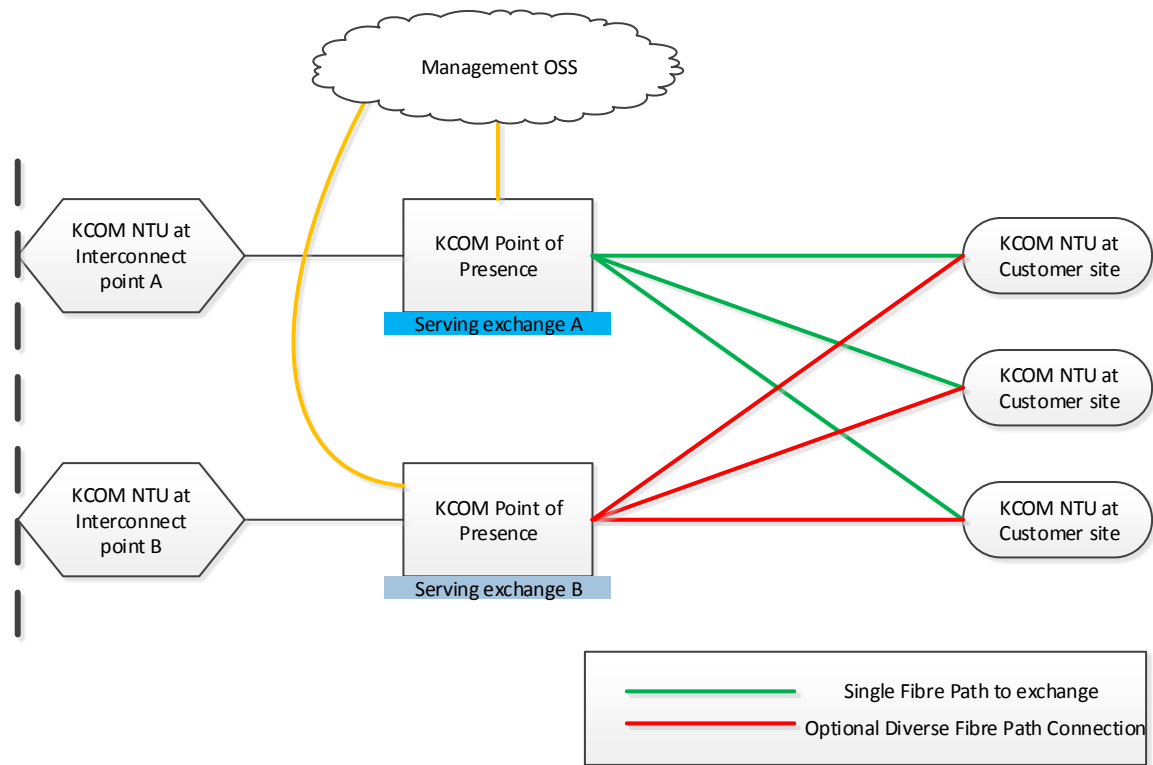


Figure 1

This option allows for a single active EVC with a secondary resilient EVC. In this option all active EVC will be live on the Aggregated Access Bearer at CP Interconnect Point A, should a failure occur the EVCs on the Aggregated Access bearer at CP Interconnect Point B will be made live.

Where a diverse circuit is purchased the routing of the service will avoid the primary path wherever possible.

Option B - The Active / Active service is shown in concept form below in Figure 2.

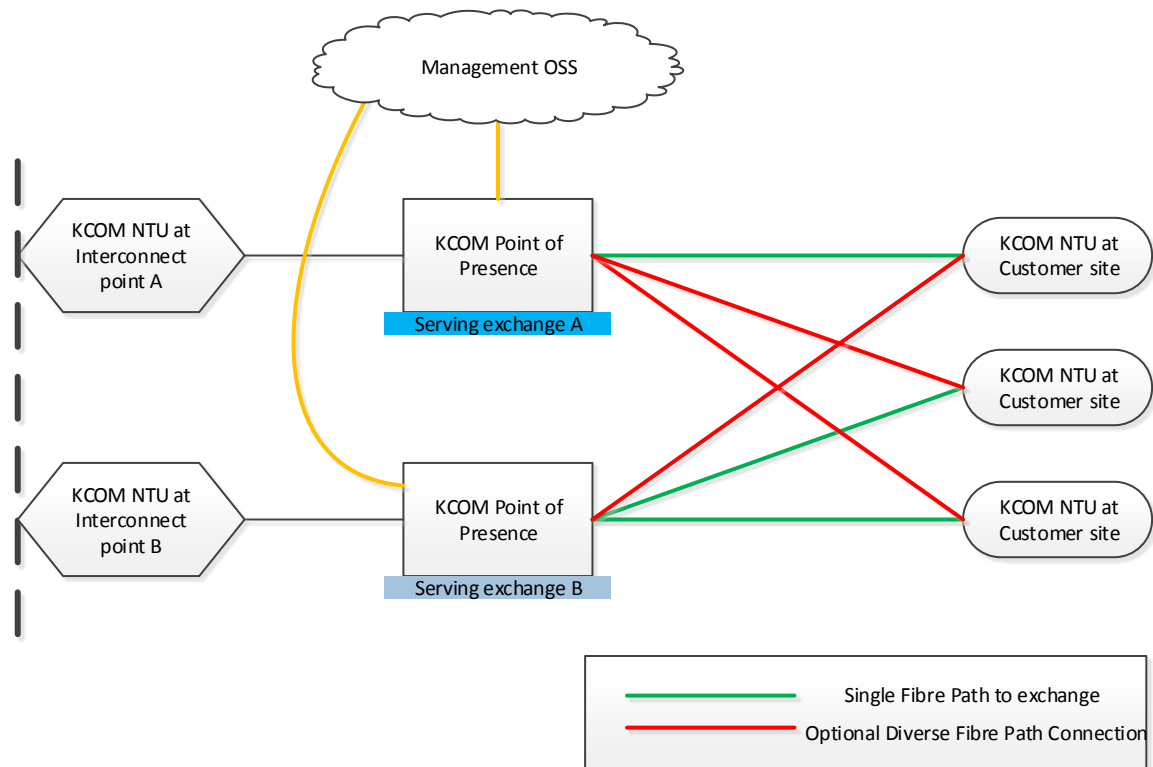


Figure 2

This option allows for an active EVC between an End User site and CP Interconnection Point A with a secondary resilient EVC between an End User site and CP Interconnection Point B. In this option all EVCs will be active at the same time.

Where a diverse circuit is purchased the routing of the service will avoid the primary path wherever possible.

Option C - The Single service is shown in concept form below in Figure 3.

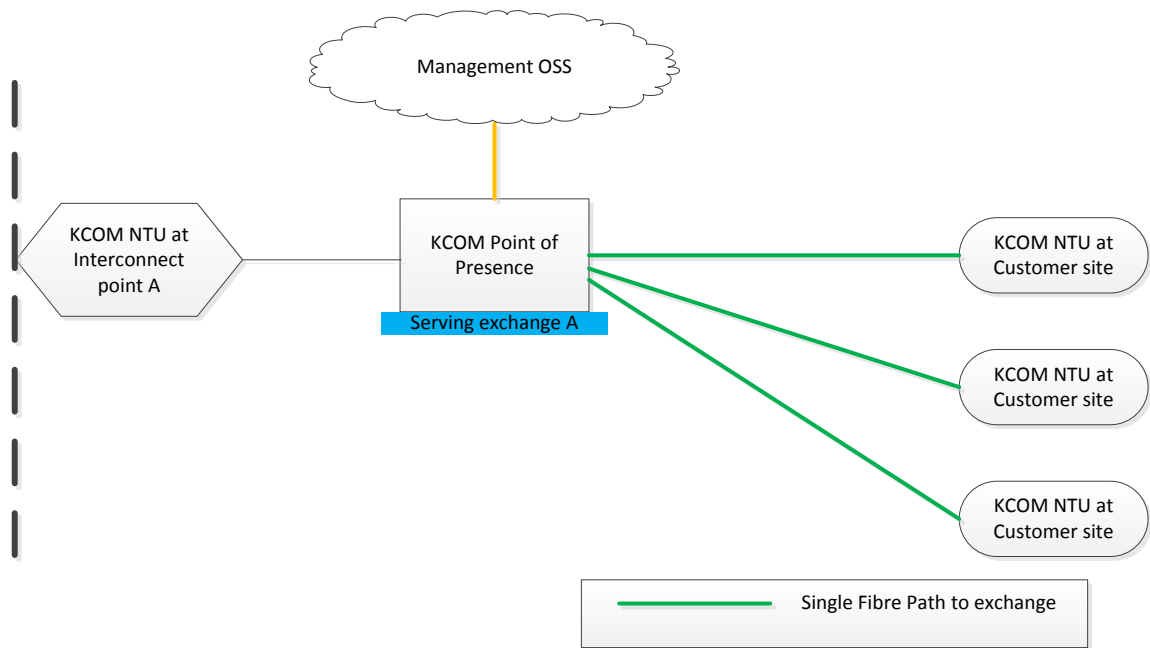


Figure 3

This option has a single EVC from each End User site to CP Interconnect Point A

Interface Specifications

General

Access Port Speed	EAS 100Mbps	EAS1000Mbps	EAS10000Mbps
Interface option(s)	100 BaseTX	1000 BaseLX (SMF) 1000 BaseSX (MMF) 1000 BaseTX (RJ45)	10000 BaseLX (SMF)
Connector	RJ45	Dual LC (Fibre) RJ45 (Copper)	Dual LC (Fibre)

Connection of customer equipment to the Access Port is the responsibility of the customer. The interface on the customer equipment must conform to IEEE 802.3 and support Full Duplex operation.

For fibre interfaces 1000BaseLX uses single mode fibre and 1000BaseSX uses multimode fibre.

In standard delivery the Access Port will require the customer equipment to be set to Auto-Negotiate. The NTU will advertise its configured speed and duplex settings and will reject any customer settings not advertised by Auto-Negotiation.

On request, to maintain compatibility with certain older equipment, the Auto-Negotiation can be turned off for 100Mbps services but the customer equipment will need to be set to the appropriate speed and Full Duplex. Half duplex is not supported in any configuration.

When Auto-Negotiation is set on the NTU unit, the NTU will attempt to compensate for the use of the incorrect cable type (straight or crossed) by using its MDI/MDI-X capability. However if Auto-Negotiation has been requested to be switched off, then the MDI/MDI-X is automatically disabled so the customer shall ensure the correct cable is used.

For Fibre Connection the interface presentation is LC/PC.to IEC 61754-20:2012.

Maximum cabling distance from customer equipment to Access Port

For copper using standard Category 5E cabling, the supported limit is 100 meters of actual cable length including all patch leads and panels.

For 62.5/125 multimode fibre the limit is 200 meters.

For 50/125 multimode fibre the limit is 500 meters.

For single mode cable this limit is 10000 meters based on the 1000BaseLX standard dB loss per meter.

Access Port on Aggregate Access Bearers

The traffic is transferred in an IEEE802.1q tagged format at the Access Port. The customer must configure their interface to match the allocated VLAN structure of the configuration so that the correct IEEE802.1q VLANs are used to encapsulate in the correct tag. Failure will result in the traffic being dropped or incorrectly delivered.

The VLAN range used will be allocated by KCOM.

Frame Characteristics

The EAS product transmits IEEE 802.3 Ethernet frames with a maximum size of 2000 Bytes as specified in IEEE 802.3 and as amended by 802.3as. The service is compatible with IEEE 802.1q for the use of VLAN tagging.

The service is transparent to VLAN tags and transmits them in the same method as untagged frames.

Frame Transparency Restrictions

All Ethernet frames are forwarded to the other end except the following list of exceptions: Transmission or forwarding of Auto-Negotiation messages is not supported.

Transmission or forwarding of pause or flow control frames is not supported.

Transmission or forwarding of EFM OAM PDU frames is not supported as per IEEE 802.3 standards. These are blocked at ingress.

Link Loss Forwarding

This feature is not offered on this service. Customers should use alternate methods of link status checking.

Service Operational Characteristics

Environmental

The environmental conditions of the area used to contain the NTU must remain at all times within the limitations specified below.

- All Modes - Operating and non-operating.
- Temperature: All modes: 0 to 40 degrees Celsius.
- Humidity: All modes: 0 to 90% non-condensing.

At all times the heat sinks and ventilation grills must remain clear and unobstructed. The heat sinks shall not be in contact with any other surface or object at any time.

Power

The NTU is locally powered and is offered with AC power as standard. There is an option for DC powered versions. This option must be requested at time of order.

The NTU is locally powered and all supplies must be closely located to the NTU installation location. For AC power, the customer will be required to supply standard 50Hz AC power via Single (option for Dual) 13Amp power sockets or for DC dual -48V power connections and Earth Connection. All wiring must conform to BS7671 IEEE Wiring Regulations. It is the full responsibility of the customer to ensure that the power supplies

are compliant to all applicable regulations and are marked, fully rated and fused correctly and safe for KCOM use.

During the installation and any testing in life a spare mains 50Hz AC 13 Amp power socket is required

Safety & EMC Information

Safety

Where the 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.

The 10/100Mbps interfaces are classified as unexposed as defined in CENELEC Reports/ETSI Guide ROBT-002/EG 2o1 212.

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 NTUs being installed in other environments e.g. industrial.

References and Standards

Reference	Title	Date
BS7671 (BSI)	IEE Wiring Regulations. 17th edition. Requirements for Electrical installations.	2011
BS EN 60825-1/2 (BSI)	Safety of laser products. Equipment classification and requirement.	2014
IEEE 802.3	IEEE Standard for Ethernet.	2012
IEEE802.1d	IEEE Standard for Local and metropolitan area networks. Media Access Control Bridges	2004-11
IEEE 802.1Q	IEEE Standard for Local and metropolitan area networks. Media Access Control (MAC) Bridges and Virtual Bridges	2012
IEEE 802.3ah/D		
IEC 61754-20	Fibre optic interconnecting devices and passive components - Fibre optic connector interfaces - Part 20: Type LC connector family	2012

Glossary / Abbreviations

Definitions of Terms Used:	
Term (e.g. abbreviation or technical term)	Explanation
XXBaseX	Base specifications are used to describe interface types as per IEEE 802.1 to allow for different system interconnection. i.e. 1000BASETX is an Ethernet 1000Mbit/s over RJ45 Copper 8 wire.
AC	Alternating Current. Electrical supply type.
Access Circuit	This is a circuit or virtual circuit that may be delivered over the internet or by physical bearer (Ethernet over Fibre, etc.) The Bearer circuit may contain a number of Virtual circuits.
BSI	British Standards Institute
CP	Communications Provider. (Providers of Electronic Communication Services)
DC	Direct Current. Electrical supply type.
EFM	Ethernet Facility Management.
End User	The primary end user of the service.
EVC	MEF Ethernet Virtual Circuit.
Ethernet	IEEE 802.3 Ethernet standard including interface specifications, framing and transmission.
EMC	Electromagnetic Compatibility
ETSI	European Telecommunications Standards Institute
NTP	Network Terminating Point
NTU	Network Terminating Unit
OAM	Operations, Administration, & Maintenance
MEF	Metro Ethernet Forum. An industry standards body.
MDI/MDI-X	Medium Independent Interface / Medium Independent Interface – Crossover. A Feature of many standards this is the specification of the physical cable handover between interfaces. Commonly used to describe the individual cabling pairings.
PDU	Protocol Data Unit

PSN	Public Services Network, The government sponsored network for interconnection of UK government departments, public bodies and commercial services platforms.
PATS	Publically Available Telephone Service
PDU	Packet Data Unit
VLAN	Virtual Local Area Network
VLAN TAG	Virtual Local Area Network 802.3 Ethernet Header field used to identify the specific VLAN in use for the attached Ethernet frame payload. See IEEE802.1Q specification.

History

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07/07/17	1.02	New version updated	KCOM