Product Specification

Wholesale Ethernet

Version: 1.6
11/08/2025

Version History

Version	Date	Notes	Author	Reviewer
1.6	06.08.2025	- Added Adtran 632v ONT - Added Passive Services section - Updated document presentation	Jason Prince	Bernice Hill

Controlled document - Distribute cautiously

Table of Contents

1 Gigaclear Product Overview

Gigaclear provides pure fibre broadband access service to homes and businesses in predominantly rural communities, offering ultrafast connectivity with symmetric speeds from 30Mbps up to 1000Mbps.

The Wholesale Ethernet product has been developed by Gigaclear to provide partners with ultrafast services for the 'last mile' reach into areas of the country where Gigaclear has built networks.

The customer last mile services are delivered as fibre-based Point-to-Point or PON (Passive Optical Network) services offering 30Mbps to 1Gbps symmetrically, as a Layer 2 service delivered back to partner networks over Network-to-Network Interfaces (NNIs) through one of our two Data Centre locations at Telehouse North2 (THN2) and Equinix Slough (LD7).

The Wholesale service provides a tunnelled Layer 2 service between the customer property, across the Gigaclear network to the Partner network, with the Gigaclear network termination at the customer premises being the Gigaclear NTE. The wholesale partner provides the Layer 3 service to the customer (IP address, routing, transit etc.), including the CPE.

Gigaclear has two service families detailed in the Wholesale Pricelist:

- Contended Ethernet services for Residential use with a standard SLA
- Contended Ethernet services for Business use with standard and enhanced SLA options.

Wholesale partners may request other services, and each request will be reviewed against a business plan to assess its commercial viability.

2 Network Technical Specification

This section of the document outlines the Technical Specifications with relation to the Networking Infrastructure. It covers the layout of the Gigaclear network, how the Wholesale Ethernet service can be delivered and technical configuration requirements.

2.1 Network to Network Interface (NNI) Sizing and Delivery

There is currently one bandwidth of Network-to-Network Interface (NNI) available to partner networks: 10Gb. This is delivered as a 10Gbase-LR single mode fibre connection. The Gigaclear Core has been developed with much greater capacity in mind and, when needed, we may be able to support bandwidths greater than 10Gb. We may support EtherChannel/bonded connections of 10Gb if LACP is used to manage the EtherChannel. Please discuss your requirements with the network team if you need bandwidths greater than 10Gb.

NNI connectivity is currently available from the following Gigaclear Data Centre locations:

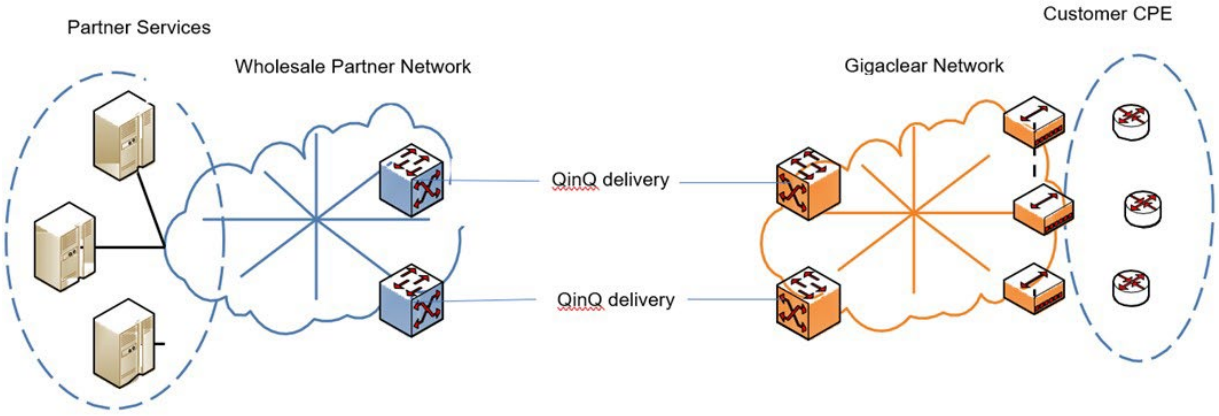
- Telehouse North 2, London
- Equinix LD7, Slough

When ordering the active Ethernet circuits, you should ensure that an adequate MTU is available. An MTU of 1600 is a minimum you should configure on your NNI interface and an MTU of 2000 is recommended to cater for some of the features offered over a Wholesale Ethernet NNI with Gigaclear.

2.2 NNI Services

There is currently a single NNI service offered over the Gigaclear Wholesale Ethernet product, which is an ELine.
Layer 2 – E-Line

Single E-Line services presenting a Layer 2 connection from the customer site or point in the Gigaclear Core can be delivered to the partner via either of the NNI connections. These circuits will be delivered as a QinQ packet (VLAN definitions are in section 2.4), and partners will need to handle this type of frame.



2.3 NNI Partner Control

Gigaclear endeavours to give our partners as much control as possible within the network to ensure that connections can run through a chosen NNI without Gigaclear getting involved. To support this, we have developed a method for NNI and product identification.

2.4 VLAN Identification

To segregate the services offered by Gigaclear and to ensure that partners have control over the circuits delivered, we have developed a method for both service specification and NNI selection.

This method is based on an “S” (or outer) VLAN with a “C” (or inner) VLAN behind it in the frames sent to the partner network over the NNI circuits.

- The S/outer VLAN will be used to define the service family and the NNI over which a circuit is built (e.g. Residential, Business, Enterprise)
- The C/inner VLAN will be used to identify an individual customer link

A range of 3 “S” VLANs will be automatically assigned by Gigaclear to identify service families over a specific NNI with a customer. The “C” VLANs will then be automatically assigned per order by our internal systems, from the range 2 to 4088.

The following tables are examples of full “S” and “C” VLAN definitions for a partner taking the three NNI connection types from Gigaclear:

Code	Service Family	NNI	S-VLAN	C-VLAN
WR	**Wholesale Residential**	GIGA-LD7-CUST-01	4011	2-408862
WB	**Wholesale Business**	GIGA-LD7-CUST-01	4012	2-408862
WE	**Wholesale Enterprise**	GIGA-LD7-CUST-01	4013	2-408862

i.e. the S-VLAN would be different for this customer based on the service classification ordered by the wholesale partner.

Code	Service Family	NNI	S-VLAN	C-VLAN
WR	**Wholesale Residential**	GIGA-LD7-CUST-02	4014	2-408863
WB	**Wholesale Business**	GIGA-LD7-CUST-03	4015	2-40882
WE	**Wholesale Enterprise**	GIGA-LD7-CUST-04	4016	2-40882

Different customers will have different S and C tags, and each is allocated on demand as you order services. It is the combination of S and C tags that will be unique, i.e. in the above example CUST-03 and CUST-04 have a common C-VLAN of 2 but each has a different S tag, ensuring uniqueness.

Code	Service Family	NNI	S-VLAN	C-VLAN
WR	**Wholesale Residential**	GIGA-THN2-CUST-01	4017	2-40884
WR	**Wholesale Residential**	GIGA-THN2-CUST-01	4017	2-40885

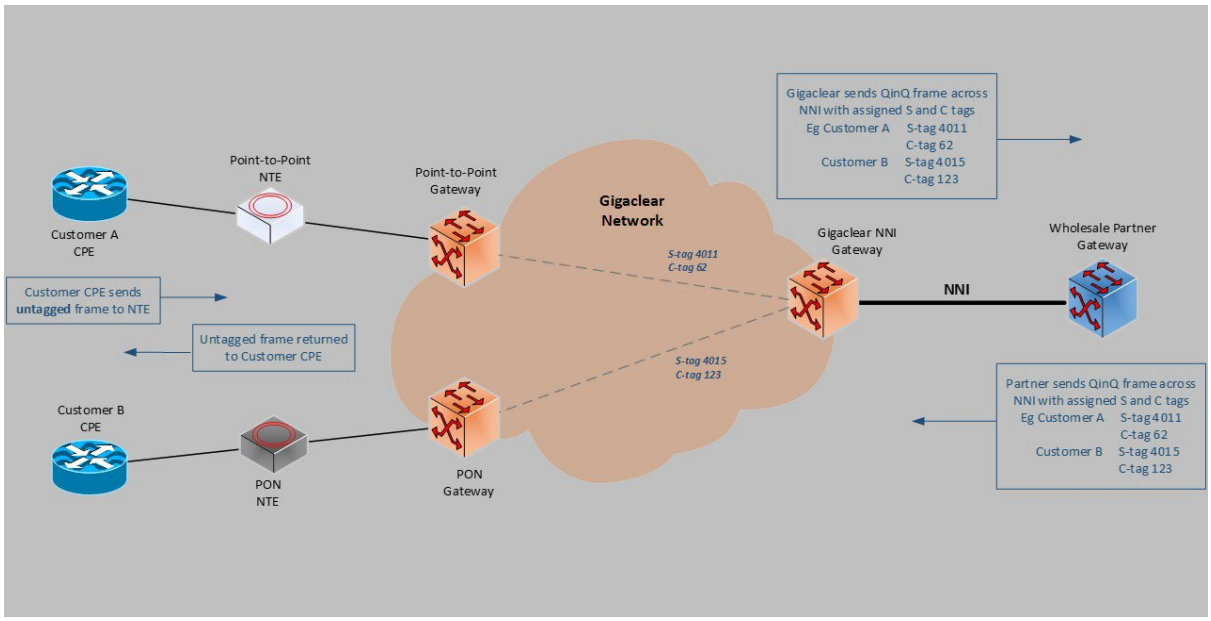
WR	**Wholesale Residential**	GIGA-THN2-CUST-01	4017	2-40886

Each residential customer has a common S-VLAN but a different C-VLAN, thus ensuring uniqueness. I.e. no two customers will ever have the same S and C tags, and each of your customers will always present as a single customer in a QinQ tag pair.

When an order is placed over a certain NNI we will assign the “S” and “C” VLANs automatically within our system based on the service family ordered, ensuring that the E-Line circuit is delivered where the partner requires it.

The Layer 2 frames handed over to the partner over the NNI connection will still have these two VLAN tags on them and the partner should work with them or strip them off, as required; that is, the frames will arrive at the partner equipment double tagged.

During the on-boarding process for the partner the VLAN allocations will be defined and presented to the wholesaler.



Important:
The wholesale partner is responsible for adhering to the NNI specification in this document. The only device to connect to the NNI must be the Partner QinQ termination device. Loop testing must NOT be performed on the Gigaclear Network, as this will disrupt services for other customers. Breaking these rules will result in Gigaclear shutting down the NNI termination point facing the individual NNI partner.

2.5 NNI Interface Specifications

The NNI specification used by Gigaclear is shown below for the physical and logical connectivity required over the NNI connections.

	Network Parameters	Description
Connectivity Type	Ten Gigabit Ethernet	10GBase-LR single mode fibre
Encapsulation	802.11ad QinQ	Ethertype 0x8100
MTU	2000 on NNI interface	Gigaclear supports MTU to 1500 for end customer services (frame size 1514)

2.6 Cross-Connect Specifications and Ordering of NNI Ports

The cross-connect should be ordered by the Wholesale Partner at the appropriate Data Centre using the following details to locate the Gigaclear cabinets.

Please email network-team@gigaclear.com to tell us when your NNI will be installed. A member of the Networks team will then contact you to arrange the commissioning and configuration of the NNI, including providing port/cabinet/ODF references and a Letter of Authority (LOA) permitting the cross connect installation.

Data Centre	Address	Port Termination
Telehouse North 2	Coriander Avenue, London E14 2AA	Single Mode LR 1310nm 10km
LD7 Slough	1 Banbury Avenue, Slough Trading Estate Slough, Berkshire SL1 4LH	Single Mode LR 1310nm 10km

Note:
Gigaclear will provide details of the patch panel and port to use in the LOA document.

3 Gigaclear NTE/ONT Specifications

The NTE/ONT installed by Gigaclear terminates the fibre from the Gigaclear cabinet and presents the customer with a single copper RJ45 Gigabit Ethernet port.

The Wholesale customer receives all network addressing and routing from the wholesale Partner. The Gigaclear service is a pure layer-2 service only.

The type of NTE/ONT deployed depends on the technology used by Gigaclear to deliver the service. The technologies currently in use are Point-to-Point (PtP) and Passive Optical Network (PON).

3.1 NTE/ONT Interface Specifications

Alongside the NNI standards, there is a separate interface standard for the NTE/ONT. This is the same for both the Point-to-Point NTE and PON ONT.

The interface specification for the current NTE/ONT is shown below.

Description	Network Parameters	
Connectivity Type	Gigabit Ethernet	Copper (RJ45)
Negotiation	Auto	
Encapsulation	Gigabit Ethernet	Untagged
MTU Size	1500 Bytes	

3.2 Point to Point (PtP) NTE

3.2.1 PtP NTE Physical Specification

The Gigaclear NTE (currently a DKT unit) terminates the fibre from the Gigaclear cabinet and presents the customer with a single copper RJ45 Gigabit Ethernet port (LAN1 on the DKT unit). The Gigabit Ethernet port is set to auto-negotiate. Whilst the unit has multiple RJ45 ports, only LAN1 will be enabled.

Note:
The Wholesale Partner is responsible for providing and installing a separate CPE which must be connected to the Gigaclear NTE.

Gigaclear NTE	Specification
Model	DKT 79741
Type	NTE (Network Terminating Equipment)
Input	Fibre G657.A1/SC-UPC
Output	Ethernet 10/100/1000 Mbps
Dimensions (inc. mounting plate)	88x88x65mm
Weight	300g
Power Supply	5V DC via UK 240V adapter
Power Dissipation	<4W
Operating Temperature	0 - 40C
Storage Temperature	0 - 70C

3.2.2 PtP NTE Connection

The NTE will be powered up on installation, via its power adapter.

Connect the wholesale service CPE to the LAN1 socket of the NTE, with at least CAT5e compliant Ethernet cable. Only LAN1 is currently in use/enabled. The Wholesale customer receives all network addressing and routing from the wholesale Partner.

3.2.3 PtP NTE Service Check

NTE unit side - POWER and WAN lights should be lit solid green for active Gigaclear connection, WAN flashes on activity.

Note:

The NTE may take around 5 minutes to initialise and update firmware on first connection.

Side Panel LEDs		
LED	**Status**	**Indication**
POWER	Solid Green	ON
WAN	Solid Green	Link Up
	Flashing Green	Link UP, Activity

Ethernet Interface LEDs		
LED	**Status**	**Indication**
LEFT	Solid Green	1000Mbps
	Off	10/100Mbps
RIGHT	Solid Yellow	Link UP, Activity
	Flashing Yellow	Link Up, Activity
	Off	No Link

3.3 Passive Optical Network (PON) ONT

3.3.1 PON ONT Physical Specification

The Gigaclear ONT (currently two models of Adtran unit) terminates the fibre from the Gigaclear cabinet and presents the customer with a copper RJ45 Gigabit Ethernet port (The 10GE Port on the Adtran unit) for connection of the Wholesale partner CPE.

The 10GE port is set to auto-negotiate, and while it is capable of negotiating at 10000Mbps the data rate will be limited to the service provided.

Note:
The unit has several RJ45 and RJ11 ports but only the 10GE port will be enabled for connection of the CPE. The Wholesale Customer receives all network addressing and routing from the Wholesale Partner.

Gigaclear ONT	Specification
Model	Adtran 622v
Type	10GE XGS-PON ONT with VoIP
Input	Fibre G657.A1/SC-APC
Output	Ethernet 10/100/1000/10000 Mbps (CAT5e compliant)
Dimensions (inc. mounting plate)	134.5 x 155.6 x 35.5 mm
Weight	300g
Power Supply	12V DC via UK 240V adapter
Power Dissipation	<18W
Operating Temperature	0 - 40C
Storage Temperature	-40 - 70C

Gigaclear ONT	Specification
Model	Adtran 632v
Type	10GbE/2.5GbE XGS-PON ONT with VoIP
Input	Fibre G657.A1/SC-APC
Output	Ethernet 10/100/1000/10000 Mbps (CAT5e compliant)
Dimensions (inc. mounting plate)	134.5 x 155.6 x 35.5 mm
Weight	300g
Power Supply	12V DC via UK 240V adapter
Power Dissipation	<18W
Operating Temperature	0 - 40C
Storage Temperature	-40 - 70C

3.3.2 PON ONT Connection

Note:
The Wholesale Partner is responsible for providing and installing a separate CPE which must be connected to the Gigaclear ONT.
Only the 10GE port is enabled on the ONT and must be used for connection to the CPE

The Gigaclear engineer will install the ONT onto a wall mounted fibre tray unit. The fibre and power cables connect to the ONT through the cable entry point at the base of the fibre tray.

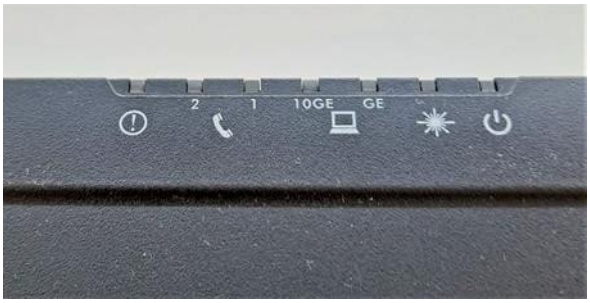
To connect the Wholesale Partner CPE to the ONT:

1. Remove the cover of the fibre tray.
2. Unscrew the two screws either side of the fibre tray and lift the cover away from the unit.
3. At the base of the ONT you will see the ethernet ports. Feed a cat6 ethernet cable through the fibre tray and connect it to the 10GE port on the ONT.
4. Take care not to press the ON/OFF button on the ONT and refit the fibre tray cover.

3.3.3 PON ONT Service Check

On the ONT, the Power and PON lights should be lit solid green for an active Gigaclear connection.
The 10GE light flashes on activity.
LEDs 1 and 2 ( ) are not applicable.

Note:
The ONT may take around 5 minutes to initialise and update firmware on first connection.



LED	Status	Indication
POWER	OFF	No Power
	Solid Green	ON, Normal Operation
	Flashing Green	Unit powering up
PON	Solid Green	ONT ranged and in service
	Flashing Green (fast)	ONT synchronizing
	Flashing Green (slow)	ONT ranged but no service
	Red	DOWN - Loss of fibre/Loss of Service
10GE	OFF	No ethernet connectivity
	Solid Green	Ethernet Up, no activity
	Flashing Green	Ethernet Up, activity
Alarm/Update	Solid Green	Software upgrade in progress
	Flashing Green	Software download in progress
	Red	ONT UP and operational – software upgrade failed

4 Passive Services

Important:
Use of Gigaclear ducts, chambers, poles and street cabinets are subject to survey, availability, local planning and permitting considerations.

Gigaclear network architecture and design relies upon use of existing third-party physical infrastructure where possible. For example, Openreach PIA infrastructure is used extensively for both overhead and underground network deployment. As such, Gigaclear does not often own contiguous, end-to-end physical passive infrastructure to support the FTTP network.

Gigaclear deploys its own physical infrastructure where it is determined to be most efficient or effective to serve end customers.

Gigaclear Wholesale Passive Services allow you to access Gigaclear infrastructure where feasible and where required under public funded network deployment.

The passive services provided are:

- Duct Access
- Dark Fibre Access
- Cabinet Access

Note:
Please refer to the Gigaclear Wholesale Pricelist for more information on Passive Services available.

Information For Current Partners

Orders for passive services can be placed through the Gigaclear Wholesale portal

https://wholesale.gigaclear.com/login

For any queries contact wholesale@gigaclear.com.

For alternative passive services that may be required, please complete section 1 & 2 of the Statement of Requirements form Information For Current Partners and send to wholesale@gigaclear.com

---

Contact

Gigaclear Office

Building One
Abingdon Business Park
Wyndyke Furlong
Abingdon
OX14 1UQ

Tel: 01865 591100

Web: gigaclear.com

Email: wholesale@gigaclear.com