National
Broadband
Network

Product Description

NBN Co Ethernet Bitstream Service

WBA 2.2 DRAFT

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Bringing broadband to life

NBN Co Limited

Product Description - NBN Co Ethernet Bitstream Service - WBA 2.2 Draft

This document applies to a Wholesale Broadband Agreement if the Head Terms are WBA 2.2 Draft.

2.2

NBN Co Networks: Fibre, Wireless, FTTB and FTTN

Version	Description	Effective Date
2.0	Issued on 9 December 2013	Execution Date
2.1	Medium Business Phase 1(b) notified on 13 March 2014	30 April 2014
2.2	Higher traffic class 1 & 4 CVC speed tiers notified on 29 August 2014	15 October 2014
2.3	NEBS supplied by means of the NBN Co FTTB Network published on 19 December 2014	Execution Date
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Environment

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Introduction

This document describes the NBN Co Ethernet Bitstream Service (NEBS) which NBN Co supplies to its customers. The NEBS:

- is an Ethernet-based Layer 2 virtual connection that carries traffic between a UNI used to serve a Premises and a POI;

- is supplied by means of the NBN Co Fibre Network, the NBN Co FTTB Network, the NBN Co FTTN Network or the NBN Co Wireless Network;

- enables Customer or its Downstream Customers to supply a Carriage Service or Content Service to a Premises; and

- comprises 4 Product Components and a number of optional Product Features which customers may elect to order depending on which NBN Co Network the NEBS is supplied over:

Type	Product Component / Product Feature	NBN Co Network
Product Components (required)	NNI; CVC; AVC; UNI	Fibre, FTTB, FTTN and Wireless
Product Features (optional)	Multicast (Multicast Domain, Multicast AVC); Enhanced Fault Rectification Service; UNI-V and AVC TC-1 bundle; Battery Backup Service	Fibre

The AVC and UNI Product Components are supplied as a bundle. NBN Co supplies the AVC to Customer on condition that Customer also acquires a UNI in conjunction with that AVC.

Further details of the Product Components and Product Features of the NEBS are described in:

- Part A and Part B of this Product Description;

- the Product Technical Specification for the NBN Co Ethernet Bitstream Service for the NEBS supplied by means of the NBN Co Fibre Network and the NBN Co Wireless Network; and

- the Product Technical Specification for the NBN Co Ethernet Bitstream Service - FTTB/FTTN for the NEBS supplied by means of the NBN Co FTTB Network and the NBN Co FTTN Network.

The Charges payable for the NEBS are set out in the Price List.

NEBS Product Description Roadmap

A roadmap describing the structure of this Product Description follows for the assistance of Customer.

Part A: Core components

Part A describes the four core Product Components of the NEBS which Customer must order.

Part B: Optional components and features

Part B describes the optional Product Features of the NEBS which Customer may elect to order.

Part C: General conditions of supply

Part C sets out general conditions which apply to the supply of the NEBS to Customer.

Part A: Core components

1 Network-Network Interface (NNI)

This section 1 *describes the NNI. Customer must order an NNI for each CSA where NBN Co supplies the NEBS to Customer. Customer connects its network to the NBN Co Network at the POI where the NNI is located.*

1.1 NNI description

(a)   A **Network-Network Interface** or **NNI** is the interface at a POI where Customer traffic is handed over to the NBN Co Network.

(b)   The NNI is the point of handover for all CVCs associated with that NNI.

(c)   The **NNI Bearer** is the physical interface between the Customer switch and the NBN Co Network.

(d)   An NNI Bearer must be configured as a member of an **NNI Group** which is a logical interface comprising one or more NNI Bearers supplied by NBN Co to Customer.

1.2 NNI Bearer

The physical interface options for the NNI Bearer are:

NNI Bearer profile	NBN Co Network
1000BaseLX	Fibre, FTTB, FTTN and Wireless
10GBaseLR	Fibre, FTTB, FTTN and Wireless
1000BaseEX	Fibre, FTTB, FTTN and Wireless
10GBaseER	Fibre, FTTB, FTTN and Wireless

1.3 NNI Group

(a)   An NNI Bearer can only be configured as a member of an NNI Group if its interface rate is the same as the interface rate of the NNI Group.

(b)   Each NNI Bearer must be configured with a logical single or diverse chassis redundancy mode, together forming an NNI Group.

(c)   Single chassis is the only redundancy mode available for an NNI Group comprised of a single NNI Bearer.

(d)   If Customer selects single chassis as the redundancy mode for an NNI Group:

(i)   each NNI Bearer in that NNI Group will be connected to the same chassis; and

(ii)   the NNI will operate as a single, unprotected interface.

(e)   Each NNI Bearer in an NNI Group where Customer selects diverse chassis as the redundancy mode will be connected across a pair of chassis.

(f)   Once an NNI Group is activated, the redundancy mode of that NNI Group cannot be reconfigured.

2 Connectivity Virtual Circuit (CVC)

This section 2 describes the CVC. Customer must order a CVC for each CSA where NBN Co supplies the NEBS to Customer. The size of the CVC that Customer requires is at the discretion of Customer.

2.1 CVC description

(a)   A **Connectivity Virtual Circuit** or **CVC** is Ethernet-based Layer 2 virtual capacity on the NBN Co Network used to carry Customer traffic between multiple AVCs in a CSA on an aggregated basis and the NNI at the POI serving that CSA.

(b)   NBN Co will make the CVC available in traffic class 1 (**CVC TC-1**), traffic class 2 (**CVC TC-2**) and traffic class 4 (**CVC TC-4**).

(c)   Customer may order a CVC TC-4 or a CVC TC-1 or a CVC TC-2, or any combination of the three, in any of the bandwidth profiles set out in sections 2.2, 2.3 and 2.4.

2.2 CVC TC-4

The CVC TC-4 bandwidth profiles are:

CVC TC-4 symmetrical Mbps (CIR)	NBN Co Network
0	Fibre, FTTB, FTTN and Wireless
100	Fibre, FTTB, FTTN and Wireless
150	Fibre, FTTB, FTTN and Wireless
200	Fibre, FTTB, FTTN and Wireless
250	Fibre, FTTB, FTTN and Wireless
300	Fibre, FTTB, FTTN and Wireless
400	Fibre, FTTB, FTTN and Wireless
500	Fibre, FTTB, FTTN and Wireless
600	Fibre, FTTB, FTTN and Wireless
700	Fibre, FTTB, FTTN and Wireless
800	Fibre, FTTB, FTTN and Wireless
900	Fibre, FTTB, FTTN and Wireless
1000	Fibre, FTTB, FTTN and Wireless
1100	Fibre, FTTB, FTTN and Wireless
1200	Fibre, FTTB, FTTN and Wireless
1300	Fibre, FTTB, FTTN and Wireless
1400	Fibre, FTTB, FTTN and Wireless
1500	Fibre, FTTB, FTTN and Wireless
1600	Fibre, FTTB, FTTN and Wireless
1700	Fibre, FTTB, FTTN and Wireless
1800	Fibre, FTTB, FTTN and Wireless
1900	Fibre, FTTB, FTTN and Wireless

CVC TC-4 symmetrical Mbps (CIR)	NBN Co Network
2000	Fibre, FTTB, FTTN and Wireless
3000	Fibre, FTTB, FTTN and Wireless
4000	Fibre, FTTB, FTTN and Wireless
5000	Fibre, FTTB, FTTN and Wireless
6000	Fibre, FTTB, FTTN and Wireless
7000	Fibre, FTTB, FTTN and Wireless
8000	Fibre, FTTB, FTTN and Wireless
9000	Fibre, FTTB, FTTN and Wireless
10,000	Fibre, FTTB, FTTN and Wireless

2.3   CVC TC-1

The CVC TC-1 bandwidth profiles are:

CVC TC-1 symmetrical Mbps (CIR)	NBN Co Network
0	Fibre, FTTB, FTTN and Wireless
5	Fibre, FTTB, FTTN and Wireless
10	Fibre, FTTB, FTTN and Wireless
20	Fibre, FTTB, FTTN and Wireless
50	Fibre, FTTB, FTTN and Wireless
100	Fibre, FTTB, FTTN and Wireless
150	Fibre, FTTB, FTTN and Wireless
200	Fibre, FTTB, FTTN and Wireless
250	Fibre, FTTB, FTTN and Wireless
300	Fibre, FTTB, FTTN and Wireless
400	Fibre, FTTB, FTTN and Wireless
500	Fibre, FTTB, FTTN and Wireless

2.4 CVC TC-2

The CVC TC-2 bandwidth profiles are:

CVC TC-2 symmetrical Mbps (CIR)	NBN Co Network
50	Fibre, FTTB, FTTN and Wireless
100	Fibre, FTTB, FTTN and Wireless
150	Fibre, FTTB, FTTN and Wireless
200	Fibre, FTTB, FTTN and Wireless
250	Fibre, FTTB, FTTN and Wireless
300	Fibre, FTTB, FTTN and Wireless
400	Fibre, FTTB, FTTN and Wireless
500	Fibre, FTTB, FTTN and Wireless
600	Fibre, FTTB, FTTN and Wireless
700	Fibre, FTTB, FTTN and Wireless
800	Fibre, FTTB, FTTN and Wireless
900	Fibre, FTTB, FTTN and Wireless
1000	Fibre, FTTB, FTTN and Wireless

3 Access Virtual Circuit (AVC)

This section 3 *describes the AVC. Customer must order an AVC for each Premises where NBN Co supplies the NEBS to Customer.*

3.1 AVC description

(a) An **Access Virtual Circuit** or **AVC** is an Ethernet-based Layer 2 virtual connection on the NBN Co Fibre Network, the NBN Co FTTB Network, the NBN Co FTTN Network or the NBN Co Wireless Network that carries Customer traffic to and from a UNI used to serve a Premises.

(b) An AVC must be ordered by Customer for each Premises to which the NEBS will be supplied.

(c) NBN Co will make the AVC available in traffic class 4 (**AVC TC-4**) and Customer may elect to partition traffic using traffic class 1 (**AVC TC-1**) or traffic class 2 (**AVC TC-2**), or both.

(d) Customer must order an AVC TC-4, and may additionally elect to order one AVC TC-1 or one AVC TC-2, or both, in any of the bandwidth profiles set out in sections 3.2, 3.3 and 3.4.

(e) NBN Co will map one AVC TC-4 to any UNI used to serve the relevant Premises and will not map more than one AVC TC-4 to the same UNI.

3.2 AVC TC-4

(a)   The AVC TC-4 bandwidth profiles for the NEBS supplied by means of the NBN Co Fibre Network or NBN Co Wireless Network are:

AVC TC-4 downstream Mbps (PIR)	AVC TC-4 upstream Mbps (PIR)	NBN Co Network
12	1	Fibre and Wireless
25	5	Fibre and Wireless
25	10	Fibre
50	20	Fibre
100	40	Fibre
250	100	Fibre
500	200	Fibre
1000	400	Fibre

Note: To be read subject to sections 4.3 and 8.1.2 of the Product Technical Specification for the NBN Co Ethernet Bitstream Service.

(b)   Subject to sections 3.2(c) to 3.2(e), the AVC TC-4 bandwidth profiles for the NEBS supplied by means of the NBN Co FTTB Network or NBN Co FTTN Network are:

AVC TC-4 downstream Mbps (PIR)	AVC TC-4 upstream Mbps (PIR)	NBN Co Network
12	1	FTTB and FTTN
25	5	FTTB and FTTN
25	5 - 10*	FTTB and FTTN
25 - 50*	5 - 20*	FTTB and FTTN
25 - 100*	5 - 40*	FTTB and FTTN

*** Note:* Where the bandwidth profile is expressed as a range, the range shows the maximum PIR which may be achieved at the NBN Co Network Boundary for the relevant bandwidth profile. The PIR can fall anywhere in the range for the relevant bandwidth profile in respect of a particular AVC TC-4 used to serve a Premises (they are not minimum-maximum PIR ranges).

Important: To be read subject to (1) the description of how the PIR for these bandwidth profiles is to be interpreted in section 12 below; and (2) sections 4.3, 5.1 and 5.3.3 of the *Product Technical Specification for the NBN Co Ethernet Bitstream Service - FTTB/FTTN*.

(c)   Subject to section 3.2(d), during the Co-existence Period, the PIR (and the lower end of any PIR range) at the UNI for each AVC TC-4 bandwidth profile will be:

NBN Co Network	Bandwidth Profiles	AVC TC-4 downstream Mbps (PIR)	AVC TC-4 upstream Mbps (PIR)
FTTB	All bandwidth profiles other than 12 Mbps downstream and 1 Mbps upstream	25	5
FTTN	All bandwidth profiles	12	1

(d)   If the PIR at the UNI used to serve a Premises located in the footprint of the NBN Co FTTB Network or NBN Co FTTN Network is not capable of supporting the provision of an AVC TC-4 bandwidth profile at the UNI of:

(i)   where the NEBS is supplied by means of the NBN Co FTTB Network:

(A)   12 Mbps downstream and 1 Mbps upstream for that bandwidth profile; or

(B)   25 Mbps downstream and 5 Mbps upstream for all bandwidth profiles other than 12 Mbps downstream and 1 Mbps upstream; or

(ii)   where the NEBS is supplied by means of the NBN Co FTTN Network:

(A)   during the Co-existence Period, 12 Mbps downstream and 1 Mbps upstream; and

(B)   otherwise:

(1)   12 Mbps downstream and 1 Mbps upstream for that bandwidth profile; or

(2)   25 Mbps downstream and 5 Mbps upstream for all bandwidth profiles other than 12 Mbps downstream and 1 Mbps upstream,

then:

(iii)   NBN Co will designate that Remediation is required in respect of the Premises; and

(iv)   until Remediation for the Premises is completed, the downstream PIR and upstream PIR at the UNI used to serve the Premises may be significantly less than the downstream PIR and upstream PIR of the bandwidth profile ordered by Customer in respect of the Premises.

(e)   Where an Ordered Product supplied by means of the NBN Co FTTB Network or NBN Co FTTN Network has been placed into a Repair Profile in accordance with the NBN Co Operations Manual, the downstream PIR and upstream PIR at the UNI may be significantly less than the downstream PIR and upstream PIR of the bandwidth profile ordered by Customer in respect of the Ordered Product.

3.3 AVC TC-1

(a)   The AVC TC-1 bandwidth profiles are:

AVC TC-1 symmetrical Mbps (CIR)	NBN Co Network
0	Fibre, FTTB, FTTN and Wireless
0.15	Fibre, FTTB, FTTN and Wireless
0.3	Fibre, FTTB and FTTN
0.5	Fibre, FTTB and FTTN
1	Fibre, FTTB and FTTN
2	Fibre, FTTB and FTTN
5	Fibre, FTTB and FTTN

(b)   The AVC TC-1 Data Transfer Rate will be included in the overall AVC TC-4 Data Transfer Rate except where the AVC TC-1 is mapped to the UNI-V in the case of the NEBS supplied by means of the NBN Co Fibre Network.

(c)   Where available, Customer may acquire both an AVC TC-1 mapped to the UNI-D and an additional AVC TC-1 mapped to the UNI-V where the NEBS is supplied by means of the NBN Co Fibre Network.   See section 7 in Part B for more information.

3.4 AVC TC-2

(a)   The AVC TC-2 bandwidth profiles are:

AVC TC-2 symmetrical Mbps (CIR)	NBN Co Network
5	Fibre, FTTB and FTTN
10	Fibre, FTTB and FTTN
20	Fibre, FTTB and FTTN
30	Fibre
40	Fibre

(b)   The AVC TC-2 Data Transfer Rate will be included in the overall AVC TC-4 Data Transfer Rate.

3.5 CIR

Without limiting section 12.1, if the Line Rate of an Ordered Product supplied by means of the NBN Co FTTB Network or NBN Co FTTN Network is not capable of supporting the provision of all AVC TC-1 and AVC TC-2 bandwidth profiles ordered by Customer in respect of that Ordered Product (see the rule in section 5.1.1.3.3 of the Product Technical Specification for the NBN Co Ethernet Bitstream Service - FTTB/FTTN), then, for both AVC TC-1 and AVC TC-2:

(a)   the actual Information Rate experienced by Customer, Downstream Customer or the relevant End User, may each be significantly less than the downstream CIR and upstream CIR of the bandwidth profile ordered by Customer in respect of the relevant Ordered Product; and

(b) the Frame Delay, Frame Delay Variation and Frame Loss of the relevant Ordered Product may each be significantly worse than the Performance Objectives specified in section 13.5 of the Service Levels Schedule.

3.6 Third party interference

(a) An Interference Event caused by the equipment or network of a third party may prejudice the integrity or cause a deterioration of the operation or performance of a NEBS Ordered Product supplied by means of the NBN Co FTTB Network or NBN Co FTTN Network.

(b) If an Interference Event caused by the equipment or network of a third party occurs, NBN Co will undertake Interference Mitigation.

(c) Until NBN Co can mitigate the effects of an Interference Event caused by the equipment or network of a third party, the affected Ordered Product may not operate in accordance with this Product Description or the Product Technical Specification for the NBN Co Ethernet Bitstream Service - FTTB/FTTN.

4 User Network Interface (UNI)

This section 4 describes the UNI which must be ordered in conjunction with the AVC for each Premises where NBN Co supplies the NEBS to Customer.

4.1 UNI description

(a) The **User Network Interface** or **UNI** is a physical port to which NBN Co supplies the NEBS in respect of a Premises. The type of UNI depends on the type of Premises and the NBN Co Network used to serve the relevant Premises:

Type of UNI	Port	Location of UNI port	Number of available ports on NTD	NBN Co Network	Type of Premises
UNI-D	Ethernet	NTD	4	Fibre and Wireless	All Premises
UNI-V	Analogue	NTD	2	Fibre	All Premises
UNI-DSL	xDSL	Jumper Cable termination on the Customer Side MDF	N/A (there is no NTD)	FTTB	All Premises
				FTTN	Premises at an MDU Site
UNI-DSL	xDSL	Telecommunications Outlet or, if present, Passive NTD*	N/A (there is no NTD)	FTTN	Premises not at an MDU Site

(b) Access to and use of a UNI used to serve a Premises is subject to any availability rules set out in the NBN Co Operations Manual.

4.2 NEBS supplied by means of NBN Co Fibre Network or NBN Co Wireless Network

Where the NEBS is supplied by means of the NBN Co Fibre Network or NBN Co Wireless Network:

(a) the type and number of UNIs available at a Premises depends on:

(i)   whether a Premises is located in the footprint of the NBN Co Fibre Network or the NBN Co Wireless Network; and

(ii)   the number of NTDs which NBN Co has installed at that Premises;

(b)   the UNI-D has an electrical interface and will not be made available with an optical interface as part of the NEBS;

(c)   the UNI-V is an optional feature of the NEBS supplied by means of the NBN Co Fibre Network and incorporates an analogue telephone adaptor for the supply of telephony services to a Premises. See section 7 in Part B for more information; and

(d)   it is a condition of supply of an AVC TC-4 that Customer also acquire a UNI-D in conjunction with that AVC TC-4 for each Premises at which the NEBS will be supplied.

4.3   NEBS supplied by means of NBN Co FTTB Network or NBN Co FTTN Network

Where the NEBS is supplied by means of the NBN Co FTTB Network or the NBN Co FTTN Network:

(a)   the UNI-DSL comprises a single xDSL port and is a fully independent interface; and

(b)   it is a condition of supply of an AVC TC-4 that Customer also acquire a UNI-DSL in conjunction with that AVC TC-4 for each Premises at which the NEBS will be supplied.

4.4   UNI mappings and AVC bandwidth profiles

The UNI mappings and AVC bandwidth profiles available for those UNI mappings are:

NBN Co Network	AVC	UNI mapping	Available bandwidth profiles	Ref
Fibre	AVC TC-4	UNI-D	All bandwidth profiles	Section 3.2(a)
	AVC TC-1	UNI-D (default)	All bandwidth profiles	Section 3.3(a)
		UNI-V (optional)	0.15 Mbps AVC TC-1 only	Section 7
	AVC TC-2	UNI-D	All bandwidth profiles	Section 3.4
FTTB and FTTN	AVC TC-4	UNI-DSL	All bandwidth profiles	Section 3.2(b)
	AVC TC-1	UNI-DSL	All bandwidth profiles	Section 3.3(a)
	AVC TC-2	UNI-DSL	5, 10 and 20 Mbps AVC TC-2 only	Section 3.4
Wireless	AVC TC-4	UNI-D	All bandwidth profiles	Section 3.2(a)
	AVC TC-1	UNI-D	0.15 Mbps AVC TC-1 only	Section 3.3(a)

Part B: Optional components and features

5   Multicast

This section 5 *describes the optional Multicast feature of the NEBS designed for delivering audio-visual and other content such as Internet Protocol Television (IPTV) simultaneously to multiple End Users. The Multicast feature is only available for the NEBS supplied by means of the NBN Co Fibre Network.*

5.1   Description

(a)   Multicast allows Customer to supply uni-directional data once at the NNI which is then replicated over the NBN Co Fibre Network to be delivered simultaneously to multiple NTDs (**Multicast**).

(b)   Multicast is an optional Product Feature of the AVC and CVC Product Components of the NEBS supplied by means of the NBN Co Fibre Network.   NBN Co will only make Multicast available by supplying:

(i)   the CVC in the multicast traffic class (**Multicast Domain**); and

(ii)   the AVC in the multicast traffic class (**Multicast AVC**).

(c)   In addition to the core components described in Part A of this document, Customer must also acquire:

(i)   a Multicast Domain for each CSA; and

(ii)   a Multicast AVC in respect of each Premises within that CSA,

where Customer wishes to offer the Multicast feature.

(d)   NBN Co will use the AVC TC-4 and CVC TC-4 supplied to Customer in respect of a Premises to transfer upstream traffic related to the supply of Multicast to Customer at that Premises.

5.2   Multicast Domain

(a)   The Multicast Domain bandwidth profiles are:

Multicast Domain downstream Mbps (CIR)	Multicast Domain upstream Mbps (CIR)
100	0
200	0
300	0
400	0
500	0
600	0
700	0
800	0
900	0
1000	0

(b) NBN Co will only supply one Multicast Domain to Customer at each CSA.

(c) Customer must configure one or more Media Streams for each Multicast Domain.

(d) A Media Stream may include any audio-visual and other content which is suitable for distribution using the Multicast Components considering the product performance and functionality of the Multicast Components.

(e) The Multicast Domain dimension must be at least the sum of all Media Streams that Customer wishes to offer in that Multicast Domain.

(f) The configured peak bandwidth value for each Media Stream must be between the minimum and maximum values (inclusive) and can be defined in increments of 0.1 Mbps:

Media Stream	Configured peak bandwidth value (Mbps)
Minimum value	2.5
Maximum value	20

(g) The supply of data to Downstream Customers and End Users through a Media Stream may be interrupted if the data throughput of the Media Stream exceeds the configured peak bandwidth value of that Media Stream. Customer is responsible for provisioning each Media Stream with a configured peak bandwidth value.

5.3 Multicast Access Virtual Circuit (Multicast AVC)

(a) The Multicast AVC bandwidth profiles are:

Multicast AVC downstream Mbps (CIR)	Multicast AVC upstream Mbps (CIR)
5	0
20	0
30	0
40	0
50	0

(b) NBN Co will map the Multicast AVC and the AVC TC-4 supplied to Customer to the same UNI-D at a Premises.

(c) NBN Co will not map more than one Multicast AVC to the same UNI-D.

6 Enhanced Fault Rectification Service

This section 6 describes the optional Enhanced Fault Rectification Service available for the NEBS supplied by means of the NBN Co Fibre Network, NBN Co FTTB Network and NBN Co FTTN Network.

(a) The **Enhanced Fault Rectification Service** is an optional Product Feature of the NEBS supplied by means of the NBN Co Fibre Network, NBN Co FTTB Network and NBN Co FTTN Network which provides Customer with enhanced Service Levels for the rectification of End User Faults which affect a NEBS Ordered Product supplied by means of the NBN Co Fibre Network, NBN Co FTTB Network and NBN Co FTTN Network (as the case may be).

(b) The Enhanced Fault Rectification Service options are:

Enhanced Fault Rectification Service option	Service Level
Enhanced-12	See section 6.1 of the Service Levels Schedule
Enhanced-12 (24/7)	See section 6.1 of the Service Levels Schedule
Enhanced-8	See section 6.1 of the Service Levels Schedule
Enhanced-8 (24/7)	See section 6.1 of the Service Levels Schedule

(c) Customer must not use, and warrants to NBN Co that it will not use, the Enhanced Fault Rectification Service where Customer or any Downstream Customer uses a Customer Product or Downstream Product as an input to provide Priority Assistance, or otherwise in connection with, a Downstream Priority Assistance Service.

(d) If Customer proposes to use the Enhanced Fault Rectification Service in respect of any Customer Product or Downstream Customer Product that is a Downstream Priority Assistance Service, then Customer must:

(i) submit a Modify Order in accordance with the NBN Co Operations Manual, which identifies that the Access Components supplied to Customer will no longer be used to supply a Downstream Priority Assistance Service;

(ii) cease using (or procure that Downstream Customer ceases using) that Customer Product or Downstream Product as a Downstream Priority Assistance Service from the time that the Modify Order is Complete; and

(iii) notify NBN Co in accordance with section 9.2(d) and the NBN Co Operations Manual.

(e) If Customer uses the Enhanced Fault Rectification Service in respect of a Customer Product or Downstream Product, and proposes to use that Customer Product or Downstream Product as a Downstream Priority Assistance Service, then Customer must first submit a Modify Order in accordance with the NBN Co Operations Manual to remove the Enhanced Fault Rectification Service.

7 UNI-V and AVC TC-1 bundle

This section 7 describes the optional UNI-V and AVC TC-1 bundle which is a feature of the NEBS designed for voice services over the NEBS. The UNI-V and AVC TC-1 bundle is only available where the NEBS is

supplied by means of the NBN Co Fibre Network and Customer has also acquired an AVC TC-4 and UNI-D bundle.

7.1 Description

(a)   The UNI-V is an optional Product Feature of the NEBS supplied by means of the NBN Co Fibre Network which provides Customer with access to an analogue telephony interface on the NTD (where available) for the purpose of migrating legacy telephone services.

(b)   Customer may elect to order a 0.15 Mbps AVC TC-1 which is mapped to the UNI-V (where available) if the NEBS is supplied by means of the NBN Co Fibre Network, and if Customer so elects, it is a condition of supply of the AVC TC-1 that Customer acquire a UNI-V in conjunction with that AVC TC-1.

(c)   The 0.15 Mbps AVC TC-1 will be supplied through a separate AVC and not included in the overall AVC TC-4 Data Transfer Rate where it is mapped to the UNI-V.

(d)   Further detail of the UNI-V is outlined in section 4 in Part A.

7.2 Configuration of UNI-V parameters

(a)   Customer must ensure that the UNI-V parameters for any UNI-V it acquires are configured in accordance with the [Product Technical Specification for the NBN Co Ethernet Bitstream Service](#) and certified through On-boarding.

(b)   Customer must not, without the prior written approval of NBN Co, modify the configuration (including the configuration dial-plan), or process for downloading the configuration, of the UNI-V parameters from those certified through On-boarding.

8   Battery Backup Service

This section 8 describes the Battery Backup Service which is an optional feature available for the NEBS supplied by means of the NBN Co Fibre Network.

(a)   The Battery Backup Service provides battery backup functionality for a UNI port at a Premises in the event of mains power failure which affects the NTD.

(b)   NBN Co will make the Battery Backup Service available for each UNI port where the NEBS is supplied by means of the NBN Co Fibre Network.

(c)   Customer must obtain and retain the Informed Consent of the relevant Designated End User when making a selection to:

(i)   not receive the Battery Backup Service in respect of a UNI during the OBB Transition Period; and

(ii)   either receive or not receive the Battery Backup Service in respect of a UNI after the OBB Transition Period.

(d)   Where NBN Co supplies the Battery Backup Service to Customer, the responsibilities of NBN Co and Customer in relation to the battery which supports the Battery Backup Service are:

Responsible party	Obligation
NBN Co	Supply and install the First Battery
	Notify Customer in accordance with any processes set out in the NBN Co Operations Manual if the NTD generates a Battery Missing Alarm or a Replace Battery Alarm
	Give to Customer the First Battery Credit in accordance with the Price List
Customer	Maintain, or arrange for the maintenance of, the First Battery
	Supply, install and maintain (or arrange for the supply, installation and maintenance of) all replacement batteries
	Comply with NBN Co's directions, technical specifications and processes in relation to the maintenance of the First Battery and supply, installation and maintenance of replacement batteries
	Notify the Designated End User of any Battery Missing Alarm or Replace Battery Alarm notified to Customer by NBN Co in accordance with the NBN Co Operations Manual

Note: the responsible party is liable for the cost of performing its obligations set out in this section 8(d).

Part C: General conditions of supply

9 CSG and Priority Assistance

This section 9 sets out the circumstances where the NEBS can be used to supply a Downstream Priority Assistance Service or Downstream CSG Service.

9.1 Overview

Downstream service	NBN Co Fibre Network NBN Co FTTB Network NBN Co FTTN Network	NBN Co Wireless Network
Downstream Priority Assistance Service	✓	✗

9.2 Downstream Priority Assistance Services

(a) Customer may use the NEBS supplied by means of the NBN Co Fibre Network, NBN Co FTTB Network or NBN Co FTTN Network as an input into the supply of a Downstream Priority Assistance Service only where:

  (i) Customer has given NBN Co prior notice of this use in accordance with the NBN Co Operations Manual; and

  (ii) the Battery Backup Service is supplied with the relevant NEBS Ordered Product where the NEBS is supplied by means of the NBN Co Fibre Network.

(b) Customer must not use AVC TC-4 to supply a Downstream Priority Assistance Service.

(c) Customer warrants to NBN Co that a Designated End User has advised Customer or Downstream Customer that they are eligible for Priority Assistance at the time Customer places an order for the Access Components that will be used to supply a Downstream Priority Assistance Service over the NBN Co Fibre Network, NBN Co FTTB Network or NBN Co FTTN Network.

(d) Customer must notify NBN Co as soon as reasonably practicable, and in any event within 5 Business Days, after it first becomes aware of any Access Components which were ordered to supply a Downstream Priority Assistance Service but are not being used to provide a Downstream Priority Assistance Service over the NBN Co Fibre Network, NBN Co FTTB Network or NBN Co FTTN Network.

(e) Customer must, on request by NBN Co, conduct an audit of Downstream Priority Assistance Services where NBN Co considers, acting reasonably, that there is a breach of a warranty given by Customer under section 9.2(c).

9.3 NEBS supplied over the NBN Co Wireless Network

(a) Customer must not use, and warrants to NBN Co that it will not use, the NEBS supplied by means of the NBN Co Wireless Network, or permit any Downstream Customer to use a Customer Product which relies on the NEBS supplied by means of the NBN Co Wireless Network as an input, to supply a:

(i)   Downstream CSG Service (including standard telephone services that are subject to customer service guarantees for the purposes of the TCPSS Act); or

(ii)   Downstream Priority Assistance Service.

10   General obligations

This section 10 sets out some general obligations of NBN Co and Customer which apply in connection with the supply of the NEBS.

10.1   Hand back obligations

(a)   Customer must start providing a Customer Product that relies on those Access Components as an input within 4 weeks after the commencement of supply by NBN Co to Customer of the Access Components.

(b)   Customer must place a disconnection order for Access Components as soon as practicable after it has ceased, or proposes to cease, supplying a Customer Product that relies on the Access Components as an input for a continuous period of more than 4 weeks.

(c)   If Customer fails to comply with sections 10.1(a) or 10.1(b), NBN Co may disconnect those Access Components (including any associated Multicast AVC) in accordance with clause F9.2(d) of the Head Terms by giving 5 Business Days' notice to Customer.

10.2   Interconnection and network supply chain

(a)   The diagram below depicts an example of the NEBS as one part of the overall network supply chain:
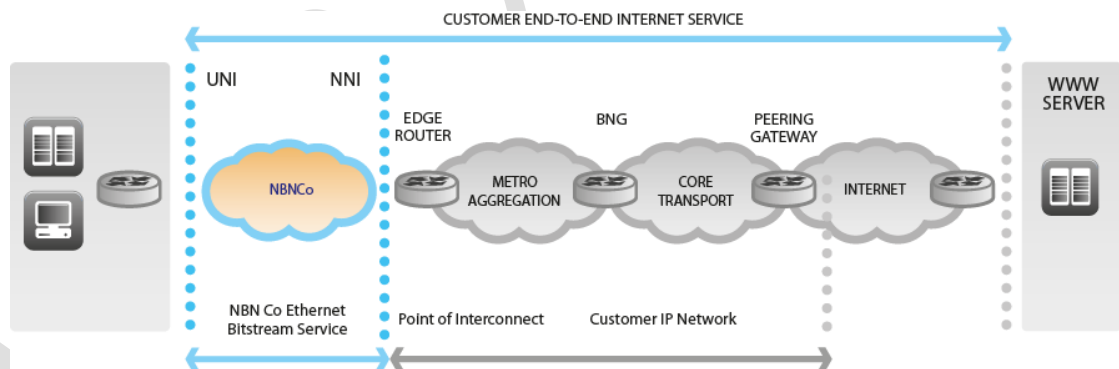
(b)   Customer is responsible for:

(i)   ordering sufficient capacity across the relevant Product Components and Product Features of the NEBS to meet its own capacity requirements in respect of the supply of Customer Products to its Downstream Customers; and

(ii)   separately acquiring, operating and maintaining all connections made to the Customer-side of the NNI.

10.3   End User Equipment and installation activities

(a)   Customer is responsible for supplying and installing all End User Equipment required for the supply of the NEBS.

(b) The NBN Co Operations Manual sets out the terms on which NBN Co will perform any Professional Splitter Installation or install Voiceband Continuity requested by Customer in respect of a Premises served by the NBN Co FTTB Network or NBN Co FTTN Network. Professional Splitter Installation and Voiceband Continuity are not Product Components or Product Features of any Product.

11 NBN Co Network architecture and NEBS boundaries

This section 11 describes the structure of the NBN Co Fibre Network and NBN Co Wireless Network and the boundaries of the NEBS.

11.1 NBN Co Network architecture

(a) In the NBN Co Fibre Network, NBN Co FTTB Network and NBN Co FTTN Network each:

  (i) Premises at which the NEBS is available is located within an Access Distribution Area (or ADA);

  (ii) ADA is located within a Serving Area Module (or SAM);

  (iii) SAM is located in a Fixed line Serving Area (or FSA); and

  (iv) FSA is located within a Connectivity Serving Area (or CSA).

(b) In the NBN Co Wireless Network each:

  (i) Premises at which the NEBS is available is located within a Wireless Serving Area (or WSA); and

  (ii) WSA is located within a Connectivity Serving Area (or CSA).

(c) In the NBN Co Network each:

  (i) CSA is served by one POI; and

  (ii) POI may serve one or more CSAs.

(d) Details of the FSA or WSA, CSA and POI serving a Premises are available to Customer on request.

11.2 NEBS boundaries

The NEBS carries traffic in respect of a Premises over the NBN Co Fibre Network, NBN Co FTTB Network, NBN Co FTTN Network or NBN Co Wireless Network between the following boundaries:

(a) the UNI used to serve that Premises; and

(b) the NNI that serves the Premises.

11.3 NEBS Exclusions

The NEBS does not include:

(a) facilities access;

(b) any backhaul transmission, cross connects or cabling from the Customer-side of the NNI;

(c)   a Pre-existing Carrier Side MDF or Customer Side MDF or any remediation work required to a Pre-existing Carrier Side MDF or Customer Side MDF;

(d)   any Common MDU Site Equipment, any in-premises or in-building wiring or cabling that may be required or installed between a UNI used to serve a Premises and any internal wall plate within that Premises;

(e)   any content or applications, including IP transit, Internet gateway connection, any other Customer equipment, BGP routing, soft switching infrastructure and all international connectivity associated with the supply of the NEBS;

(f)   any other end user equipment, such as modems, personal computers, network attached storage solutions, central splitters, in-line splitters and any equipment necessary to receive or interact with multicast data; or

(g)   Voiceband Continuity.

11.4   Power Outages

NBN Co does not currently utilise any battery backup functionality or power resilience system in connection with the NEBS supplied by means of the NBN Co FTTB Network or NBN Co FTTN Network. As a consequence, NBN Co may not be able to supply the NEBS supplied by means of the NBN Co FTTB Network or NBN Co FTTN Network in the event of a Power Outage at an MDU Site or affecting any NBN Co Equipment located at that MDU Site or affecting an NBN Co Node or any other active equipment that forms part of the NBN Co FTTB Network or NBN Co FTTN Network and is not located within a telecommunications facility (such as a facility in which a POI Site or Aggregation Node Site is located).

11.5   Co-existence Period

NBN Co will disable Downstream Power Back-off in respect of an NBN Co Node when NBN Co is satisfied that Downstream Power Back-off is no longer required in respect of that part of the NBN Co FTTB Network or NBN Co FTTN Network (as the case may be). The Co-existence Period for Ordered Products supplied by means of that NBN Co Node will cease at such time.

12   Speeds, performance and availability

12.1   Speeds of Ordered Products

(a)   References to download and upload speeds (PIR and CIR) in this Product Description, including where expressed as a range, are to the maximum data throughput that the NBN Co Network is designed to make available to Customer at the UNI used to serve the relevant Premises, and not the minimum data throughput. For example, where the PIR is expressed as a range for a particular bandwidth profile:

   (i)   the maximum data throughput at the UNI used to serve the relevant Premises may peak anywhere in that range; and

   (ii)   may reach a PIR within that range only once during a 24 hour period.

(b)   The speeds actually experienced by Customer, Downstream Customers and End Users will vary and depend upon a number of factors including:

   (i)   the contention ratios that are determined by Customer;

(ii)   the equipment that is used by Customer, Downstream Customers and End Users (which can also affect the speeds experienced at the UNI used to serve the relevant Premises in respect of products supplied to End Users and end users of Other NBN Co Customers);

(iii)   the nature and quality of the Customer Product or Downstream Product acquired by Downstream Customers;

(iv)   in the case of PIR only, the number of simultaneous end users being served by the NBN Co Network;

(v)   interference caused by the equipment or network of any third party;

(vi)   any service interference during a Co-Existence Period in respect of an NBN Co Node or any external electrical noise from a source that is not under the control of NBN Co;

(vii)   the quality of any existing Line, bridge-taps, Pre-Existing Carrier Side MDF, Customer Side MDF and in-building cabling used to serve the relevant Premises;

(viii)   whether an Ordered Product supplied by means of the NBN Co FTTB Network or NBN Co FTTN Network has been placed into a Repair Profile; and

(ix)   the nature, quality and length of the connection to, and signal reception (including any interference with in building cabling) at, the relevant Premises.

12.2   Performance of Ordered Products

Where the NEBS is supplied by means of the NBN Co FTTB Network or NBN Co FTTN Network only, the performance (including stability) actually experienced by Customer, Downstream Customers and End Users will vary and depend upon the factors listed in section 12.1(b).

12.3   Interference Mitigation

On and from the implementation of Interference Mitigation, Customer, Downstream Customers and End Users may experience speeds and/or performance significantly less than prior to the relevant Interference Event occurring.

12.4   Availability of supply of Product

Notwithstanding anything else in this Product Description, the supply of the NEBS by NBN Co to Customer is subject to the availability of each of the NEBS Product Components and Product Features at the time at which Customer places an order.