



Service Definition

Internet Service

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1 Overview

1.1 Introduction

This Service Definition describes Nexium’s Internet Service from the customer’s perspective. In this document the product is described in terms of an overview, service specification, service levels, orderable service options and technical specifications.

The details included below describe standard aspects of Nexium’s Internet Service. Specific customer requirements may vary, and therefore any service offering (including aspects such as price and performance guarantees) will require contractual agreement.

1.2 Product Overview

The Internet product enables customers to access dedicated Internet connectivity using scalable, high availability managed broadband services and is provided as a managed Internet solution.

This product is attractive to customers that require access to high speed Internet as well as Internet Service Providers that share high capacity Internet bandwidth among multiple users.

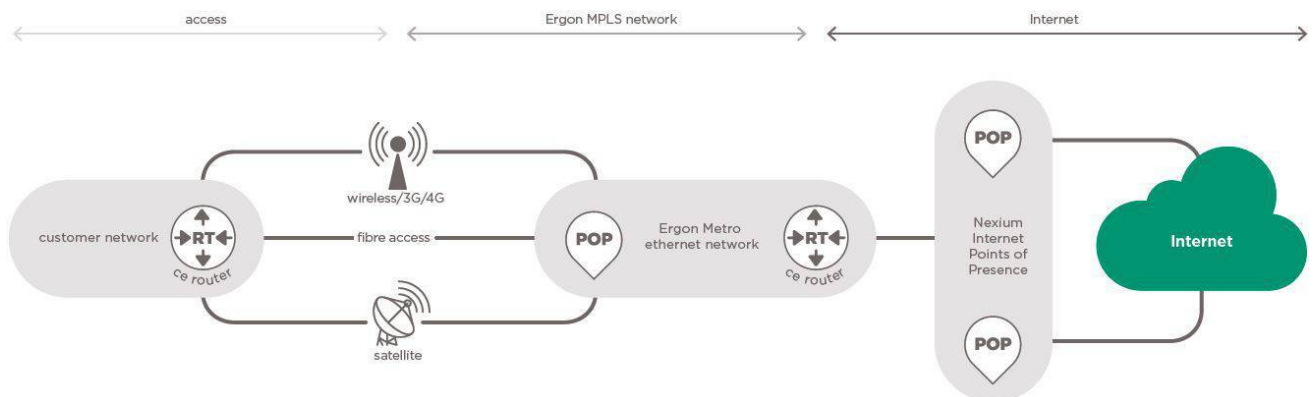
Nexium’s Internet product incorporates the following standard features:

- Dedicated access to Nexium’s Internet PoPs, that interconnects to Tier 1 national Internet backbone networks.
- High performance, flexible broadband access options, starting at 1 Mbps and scalable up to 1 Gbps on a single service.
- Fully managed service, incorporating reporting of historical usage and performance statistics.
- Customer Support provided by Nexium’s 24x7 regional Network Operations Centre.
- Static or BGP routing options, with transparent access to upstream DNS services

2 Service Specification

As shown in the diagram below, a customer is provided with Internet access at a user Network Interface (UNI), a standard Ethernet interface to the customer’s equipment. A customer’s Internet Service consists of two components:

- Internet Service capacity provided from a Nexium Internet Point of Presence (PoP), which provides a point of high capacity interconnection to the Internet.
- A Nexium E-Line service access service, which provides an Ethernet Virtual Circuit (EVC) to connect the UNI to Nexium’s Internet PoP.



2.1 Service Options

Dynamic routing is provided via BGP (using either full or partial Internet tables), or via static routing. There are three service options that can be implemented, dependent on the customer's routing and peering requirements. These options are summarised in the table below.

Routing Option	Routing Features	Customer Requirements
Dynamic Dual Attach (DDA)	<ul style="list-style-type: none"> Internet PoP Router Redundancy Upstream Internet Redundancy 	<ul style="list-style-type: none"> Registered IP address range – owned or registered by the customer. Minimum of /24 (Class C) address range. Registered Autonomous System (AS) number.
Dynamic Single Attach (DSA)	<ul style="list-style-type: none"> Upstream Internet Redundancy 	<ul style="list-style-type: none"> Registered IP address range – owned or registered by the customer. Minimum of /24 (Class C) address range. Registered Autonomous System (AS) number.
Static Single Attach (SSA)	<ul style="list-style-type: none"> Upstream Internet Redundancy 	<ul style="list-style-type: none"> Nexium assigns public IP address to customer.

Other redundancy options, such as diverse access services, can be accommodated through customisations of the basic offerings.

2.2 Access Service

The Internet service may be available over a range of existing access methods offered and/or supported by Nexium, including:

- Fibre
- Radio / microwave
- Fixed wireless,
- External 3G/4G and DSL

National Broadband Network (NBN) services, including FTTx and Hybrid-Fibre Coaxial services, Fixed Wireless and Satellite (SkyMuster™) services (note – a Fair Use Policy applies to NBN Satellite services).

A customer accesses the Internet Service at the UNI. The physical interface is provided as a designated Ethernet port on a Nexium customer edge (CE) switch. This switch is provided and maintained by Nexium.

Supported physical interfaces include twisted pair, and short- or long-wavelength optical fibre according to IEEE 802.3 standards. The logical interface is provided at the UNI using IEEE 802.1Q tagged Ethernet frames. Nexium provides the customer with a VLAN identifier (VLAN ID) for the service during activation. Incorrectly tagged or untagged frames are not transported.

2.3 Bandwidth Profile

The service bandwidth is specified using a Committed Information Rate (CIR). The CIR is the rate in bps of ingress service frames that Nexium delivers between its Internet Tier 1 connection and the customer UNI, and meets the service performance objectives.

The service bandwidth profile is specified using the parameters shown in the tables below.

Service Type	Minimum CIR	Above Minimum CIR
E-Line Access	1 Mbps	<ul style="list-style-type: none"> < 10 Mbps: Increments of 1 Mbps to 10 Mbps < 100 Mbps: Increments of 10 Mbps to 1000 Mbps > 100 Mbps: Increments of 50 Mbps to 1000 Mbps

2.4 Quality of Service

Nexium supports a single traffic class, known as Bulk Data, on its Internet Service. The supported service performance levels for this class are defined in the table below.

Traffic Class	Application Guidelines	Supported Service Levels			
		Throughput	Delay	Loss	Jitter
Bulk Data	Large file-transfers, electronic mail transfer.	Yes	Yes	Yes	No

3 Service Levels

Service Levels¹ determine the quality characteristics of the Services. Service levels are described in terms of individual metrics, as outlined in the tables below. Specific customer requirements may vary, and therefore any service offering (including aspects such as price and performance guarantees) will require contractual agreement.

Services that utilise external infrastructure such as NBN and upstream Internet providers will be subject to separate Service Level Agreements that can affect the overall level of support provided by Nexium. This information should be discussed between the customer and Nexium Account Manager and acknowledged in a specific agreement for each service.

3.1 Target Service Levels

The Service Level Tables below also include Target Service Levels for some metrics.

3.2 Severity Level Definitions

Some of the Service Level metrics include reference to Severity Levels, being the severity designation assigned to Incidents. The Severity Levels are defined as follows:

Severity Level 1 – A total loss of a service element or error rate that renders the service unavailable, or any fault that poses a hazard to the safety of the customer’s or supplier’s personnel, or the general public.

Severity Level 2 – a partial loss of a service element component; or a reduction in link traffic carrying capacity (degradation), Service still usable but impaired.

Severity Level 3 – anomalies in transmission performance; or any non-service affecting alarms.

Severity Level 4 – indicates all other reasonable problems or requests.

A customer may request that an incident be treated as a higher Severity Level if the customer reasonably believes that the business impact of the incident is greater than the Severity Level classification assigned.

¹ Service Level targets are for Nexium managed services only. External services such as 3G/4G, DSL, NBN and satellite services are subject to service levels provided by the relevant provider.

3.3 Service Availability

Metric: Service Availability	
Metric Definition	<p>Measures the availability of each Service.</p> <p>“Available” in relation to the Service means that the Service is accessible to the customer, and able to transmit customer data across the Nexium service, as measured at the Measurement Point specified below. The service is considered unavailable when the Nexium Operational Support System point to point service agent reports unavailability.</p> <p>Availability is measured on a per service basis.</p>
Measurement Period	24x7
Target Service Level	99.95% for service delivery within or between Regional Centres or Brisbane
Applicable Rebate	TBA
Measurement Methodology	
Measurement Point	Measured from the User Network Interface i.e. the customer's connection at the Nexium Customer Edge switch.
Calculation	$\text{Actual Availability \%} = \left[\frac{(\text{Actual Hours Available} + \text{Excusable Downtime})}{\text{Available Hours}} \right] * 100$ <p>Where:</p> <p>Actual Hours Available means the amount of time within the Available Hours that the Service was actually Available.</p> <ul style="list-style-type: none"> • Downtime will commence on notice from customer. • Completion of downtime will be based on NOC advising customer service is restored. <p>Excusable Downtime means the aggregate time within the Available Hours that the Service is not Available due to:</p> <ul style="list-style-type: none"> • any Scheduled Downtime; and • any other excusable event under the Customer contract. Includes in the first instance Force Majeure, compliance with laws / direction of a Regulator, Customer or End User caused outages and suspensions as an alternative to right of termination. <p>Available Hours means 24 hours, 7 days a week every day of the year.</p>
Period of Calculation	Calculated on a calendar monthly basis
Frequency of Measurement	A service response measurement is taken every 5 minutes.
Data Source	Measured using Nexium's Operational Support System.
Reporting Responsibility	Network Operations Centre

Reporting Frequency	Monthly – to be provided within 10 Business Days of the end of the relevant calendar month.
Reporting Requirements	<ul style="list-style-type: none"> • Reports to be provided in soft copy • All relevant support data required to verify the Service Level calculations to be provided or made available in an acceptable format • Reports to include the information set out in the “Calculation” section, details of actual performance against Minimum Service Level (in graphic representation where possible), details of outages, causal analysis and remedial and preventative actions.

3.4 Service Latency

Metric: Service Latency	
Metric Definition	Measures the latency of the Service by measuring User Network Interface to Internet Tier 1 Interconnection delay. Latency is reported for a Service on a one way basis.
Measurement Period	24 x 7
Target Service Level	< 70 ms
Applicable Rebate	N/A
Measurement Methodology	
Measurement point	Between Nexium Internet PoP and customer User Network Interfaces.
Calculation	The average of the all sample measurements over the period of calculation.
Period of Calculation	Calculated on a calendar monthly basis.
Frequency of Measurement	Measured at 5 minute intervals.
Data Source	Measured using Nexium’s Operational Support System.
Measurement responsibility	Network Operations Centre
Reporting Frequency	As Reasonably required.
Reporting Requirements	<ul style="list-style-type: none"> • Reports to be provided in soft copy • All relevant support data required to verify the Service Level calculations to be provided or made available in an acceptable format • Reports to be provided on an as required basis. Details of causal analysis and remedial and preventative actions to be provided.

3.5 Service Utilisation

Metric: Service Utilisation	
Metric Definition	Measures the actual bandwidth utilisation of the Internet Service, reported in graphical format.
Measurement Period	24 x 7.
Target Service Level	N/A
Applicable Rebate	N/A

Measurement Methodology	
Measurement point	Between Nexium Internet Tier 1 Interconnection and customer User Network Interfaces.
Calculation	Service Utilisation means the actual utilisation measured over the Measurement Period.
Period of Calculation	Calculated on a calendar monthly basis.
Frequency of Measurement	Utilisation measured at 5 minute intervals.
Data Source	Measured using Nexium's Operational Support System.
Measurement responsibility	Network Operations Centre
Reporting Frequency	As Reasonably required.
Reporting Requirements	<ul style="list-style-type: none"> • Reports to be provided in soft copy • All relevant support data required to verify the Service Level calculations to be provided or made available in an acceptable format • Reports to be provided on an as required basis Details of causal analysis and remedial and preventative actions to be provided.

3.6 Packet Loss

Metric: Packet Loss	
Metric Definition	Measures the percentage of CIR compliant packets lost as a percentage of the total number of CIR compliant packets sent between the Internet Tier 1 Interconnection and the customer User Network Interface.
Measurement Period	24 x 7
Target Service Level	< 1%
Applicable Rebate	N/A
Measurement Methodology	
Measurement point	Between Nexium Internet PoP and customer User Network Interfaces.
Calculation	$\text{Packet Loss \%} = \frac{\sum \text{Test packets lost}}{\sum \text{Test packets sent}} * 100$ <p>as determined on the average of all measurements over the period of calculation.</p>
Period of Calculation	Calculated on a calendar monthly basis.
Frequency of Measurement	Packet Loss measured at 5 minute intervals.
Data Source	Measured using Nexium's Operational Support System.
Measurement responsibility	Network Operations Centre

Reporting Frequency	As Reasonably required.
Reporting Requirements	<ul style="list-style-type: none"> • Reports to be provided in soft copy • All relevant support data required to verify the Service Level calculations to be provided or made available in an acceptable format. • Reports to be provided on an as required basis. Details of causal analysis and remedial and preventative actions to be provided.

4 Support Service Levels

4.1 Problem Management

Metric: Incident Management				
Metric Definition	Measures the successful completion of problem response, resolution and communication processes for each problem. Problem management measures the percentage of Problems where response and resolution targets were met and communication processes followed. Problem Management targets are a function of the severity of the problem.			
Measurement Period	24 x 7			
Target Service Levels				
		Response (By Telephone)	Restoration (Excludes reasonable travel time to site from closest concentration of the applicable personnel, ie: Rockhampton, Townsville, Toowoomba for Regional Centres)	Communication Updates
	Severity Level 1	95% within 30 minutes	95% within 4 hours	Every 30 minutes
	Severity Level 2	95% within 30 minutes	95% within 8 hours	Every 60 minutes
	Severity Level 3	95% within 30 minutes	95% within 5 business days	Once per day
	Severity Level 4	95% within 1 business day (e-mail or telephone response)	95% within 10 business days or as otherwise agreed	Weekly notification of outstanding problems
	Faults that are a result of a fibre cut by the Supplier or the Supplier's Personnel - 12 hours (excluding reasonable travel times from Townsville / Rockhampton / Toowoomba to the relevant site)			
	Faults that are a result of a fibre cut by any person other than the Supplier or the Supplier's Personnel: - Force Majeure conditions apply and the Supplier will use best endeavours to restore.			
Applicable Rebate	N/A			
Measurement Methodology				
Measurement points	N/A			
Calculation	N/A			

Period of Calculation	Calculated on a per incident basis
Frequency of Measurement	Monthly
Data Source	Nexium Fault Management System.
Measurement responsibility	Network Operations Centre
Reporting Frequency	Monthly – to be provided within 10 Business Days of the end of the relevant calendar month.
Reporting Requirements	<ul style="list-style-type: none"> • Reports to be provided in soft copy • All relevant support data required to verify the Service Level calculations to be provided or made available in an acceptable format • Reports to include, details of actual performance against Target Service Level (in graphic representation where possible), details of causal analysis and remedial and preventative actions to be provided.

4.2 Change Management

Metric: Change Management	
Metric Definition	<p>Measures successful completion of operational change activities.</p> <p>Successful completion means a change that has been completed or backed out in accordance with the agreed change window and process and that does not introduce unforeseen problems subsequent to implementation of the change.</p>
Scheduled Hours	N/A
Minimum Service Level	95% of changes successfully completed in accordance with scheduled change window.
Target Service Level	98% of changes successfully completed in accordance with scheduled change window.
Applicable Rebate	N/A
Measurement Methodology	
Measurement point	N/A
Calculation	$\% = \text{Successful Changes} / \text{Total Changes} \times 100$
Period of Calculation	Measured for each change.
Frequency of Measurement	Monthly
Data Source	Change Management tracking data base and related records.
Measurement responsibility	Network Operations Centre
Reporting Frequency	Monthly – to be provided within 10 Business Days of the end of the relevant calendar month.
Reporting Requirements	<p>Reports to be provided in soft copy</p> <p>All relevant support data required to verify the Service Level calculations to be provided or made available in an acceptable format, including number and reason for planned outage.</p>

5 Technical Specifications ²

E-Line service technical specifications are based on the Metro Ethernet Forum's Specifications MEF 1, MEF 4 and MEF 5.

5.1 UNI Specification

UNI Attribute	Description	Parameter
Physical Medium	The Ethernet physical media utilised by the customer. Note Nexium will provision services only to the customer UNI.	Interface Options: <ul style="list-style-type: none"> • 100Base-TX Category 5 UTP • 1000Base-SX Multimode optical fibre • 1000Base-LX Single mode or multimode optical fibre • 1000Base-T Category 5 UTP
Interface Speed	The speed of the Ethernet interface.	100 Mbps or 1000 Mbps
Maximum Frame Size	The maximum Ethernet frame size supported at the UNI	1522 bytes, including 802.1Q header, and excluding header preamble.
Mode	The Ethernet mode.	Full duplex
MAC Layer	The Ethernet MAC Standard.	IEEE 802.3-2002
MAC Addresses per UNI	The number of customer MAC addresses supported per UNI.	Maximum per 8 per EVC.
Service Multiplexing	The UNI can support multiple EVCs.	Yes.
Service ID		Nexium defined.
VLAN ID/EVC Map	The mapping of each customer VLAN to the EVC.	Each assigned VLAN maps to a unique EVC.
Number of EVCs per UNI.		Maximum of 8 for 100 Mbps UNI Maximum of 20 for 1000 Mbps per UNI
Bundling	More than one customer VLAN can map to an EVC at the UNI.	No
All-to-One Bundling	All customer VLANs must map to a single EVC at the UNI.	No
Ingress Bandwidth Profile per Ingress UNI	A bandwidth profile is applied to all ingress Service Frames at the UNI.	No
Ingress Bandwidth Profile per EVC	A bandwidth profile is applied to all ingress Service Frames for an EVC at the UNI.	No
Ingress Bandwidth Profile per CoS Identifier	A bandwidth profile is applied to all ingress Service Frames with a specific Class of Service Identifier.	Yes

² Technical specifications and performance targets are for Nexium managed services only. External services such as 3G/4G, DSL, NBN and satellite services are subject to service levels provided by the relevant provider.

5.2 EVC Technical Specification

EVC Attribute	Description	Parameter
EVC Type		Point-to-point
VLAN ID Preservation	The VLAN ID of customer traffic is preserved between UNIs.	Yes Nexium to define VLAN ID at service initiation.
Quality of Service (QoS)	Supported service performance levels	Conditional on the following: In-profile (within CIR) traffic classes will be preserved as Bulk Data. EIR conformant traffic will be sent as Best Effort. Traffic exceeding EIR will be dropped.
Unicast Service Frame Delivery	Frames with a unicast destination MAC address.	Deliver unconditionally.
Multicast Service Frame Delivery	Frames with a multicast destination MAC address.	Deliver unconditionally.
Broadcast Service Frame Delivery	Frames with a broadcast destination MAC address.	Deliver conditionally. Condition: Frame does not violate broadcast storm control levels.
Layer 2 Control Protocols	Frames used in Layer 2 control plane, e.g., Spanning Tree Protocol.	Discard all.

5.3 IP Technical Specification

IP Attribute	Description	Parameter
IP WAN Subnet.	IP WAN Subnet between the Nexium Internet router and customer router.	Nexium allocates a Public IP Address for the WAN Address. •
Additional Public IP Addresses.	Additional Public IP addresses permitted and routable on the Internet.	Public IP Address Options: • Registered IP address range owned or registered by the customer. Minimum netmask of 24 bits. • Optionally Nexium can assign Public IP address ranges based on customers requirements.
Private IP Addresses.	Private IP addresses as specified in RFC1918	Discard all
IP Multicast and Experimental Addresses.	Class D (224.0.0.0 – 239.255.255.255) and Class E addresses (240.0.0.0 – 254.255.255.255)	Discard all
IP Routing Protocol.	The protocol used to route IP packets.	IP Routing Protocol Options: • Border Gateway Protocol (BGP) version 4. • Static Routing.
IP Routing Table Options.	The IP routing table options available for BGP.	IP Routing Table Options: • Full BGP Routing Table. • Partial BGP Routing Table. • BGP Default Route.
Registered BGP Autonomous System (AS) Number.	The registered BGP AS number presented to the customer as specified in RFC1930.	BGP peering to the customer's registered AS numbers will be permitted.
Private BGP Autonomous System (AS) Number.	Private BGP AS numbers reserved by the Internet Assigned Numbers Authority (IANA) as	BGP peering to private AS numbers is not permitted.

IP Attribute	Description	Parameter
	specified in RFC1930.	
Maximum Transmission Unit (MTU).	The maximum IP packet size supported at the UNI	1500 bytes.