

ANNEX F

SERVICE SCHEDULE - L3 VPN SERVICE

NUCLEUS CONNECT PTE. LTD.
INTERCONNECTION OFFER (ICO) AGREEMENT
SERVICE SCHEDULE – L3 VPN SERVICE

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1. INTRODUCTION

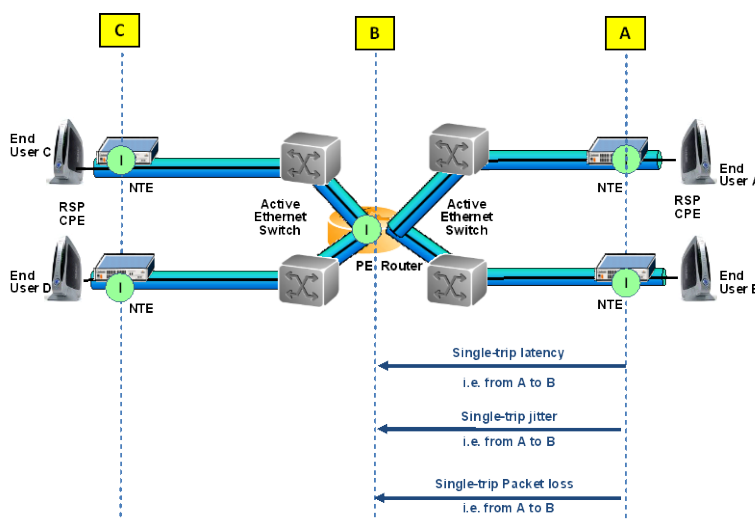
- 1.1 This Service Schedule sets out the terms and conditions under which Nucleus Connect will provide the service known as L3 VPN Service (as defined below) to the Contracting QP.
- 1.2 This Service Schedule comprises the following:
- (a) the provisions herein;
 - (b) subject to paragraph 6, the General Service Terms and Conditions and the following Appendices:
 - (i) Appendix 1: Provisioning Timeframe;
 - (ii) Appendix 2: Service Level Guarantees; and
 - (c) Orders submitted by the Contracting QP in relation to this Service Schedule.
- 1.3 In the event of any inconsistency or conflict between the provisions herein, the General Service Terms and Conditions and Orders submitted by the Contracting QP in relation to this Service Schedule, the order of precedence shall be as follows:
- (a) the provisions herein;
 - (b) Orders submitted by the Contracting QP in relation to this Service Schedule; and
 - (c) the General Service Terms and Conditions.
- 1.4 The Master ICO Agreement, including the Annexes, shall apply unless and to the extent amended or supplemented by the provisions of this Service Schedule.
- 1.5 In this Service Schedule, a reference to a paragraph, unless stated otherwise, is to a paragraph of this Service Schedule.

2. DEFINITIONS AND INTERPRETATION

- 2.1 Unless otherwise defined herein this Service Schedule, all terms and expressions used herein will be construed to have the same meanings as found in the Master ICO Agreement and General Service Terms and Conditions. Where a term or expression is defined specifically in this Service Schedule herein, the provisions herein shall prevail.
- 2.2 In this Service Schedule:

Class of Service or CoS	means any of the following class of service: <ul style="list-style-type: none">(a) Class A Real Time (Class A);(b) Class B Near Real Time (Class B); or(c) Class C Mission Critical (Class C), each of which is prescribed QoS parameters as set out in the table in paragraph 4.2(c);
Committed Information Rate (CIR)	means the minimum bandwidth that Nucleus Connect guarantees over the A-B segment of the diagram in the definition of "QoS", for each L3 VPN Connection;
Downlink	means bandwidth in the downstream direction (from Aggregation Network to the End-User);

L3 VPN Connection	means a layer 3 connection that allows End-Users to establish multipoint-to-multipoint connections;
L3 VPN Service	means L3 VPN Connection and/or L3 VPN Service Port;
L3 VPN Service Port	means the physical port whereby L3 VPN Connection will be delivered to the End-User;
L3 VPN Virtual Routing Domain	means a layer 3 Virtual Private Network (VPN) whereby any L3 VPN Connection can communicate with any L3 VPN Connection of the same virtual routing domain. Each L3 VPN Virtual Routing Domain shall be configured with a Class of Service and only L3 VPN Connection of the same Class of Service can join this L3 VPN Virtual Routing Domain. Only unicast IP traffic will be carried in this L3 VPN Virtual Routing Domain. For the avoidance of doubt, the L3 VPN Virtual Routing Domain created under this Service Schedule has its own pricing, terms and conditions, and is different from the L3 Virtual Routing Domain under the Service Schedule for L3 Virtual Routing Domain Setup Service;
Peak Information Rate (PIR)	means the maximum bandwidth that a L3 VPN Connection can reach over the A-B segment of the diagram in the definition of “QoS”, in the absence of any sort of traffic aggregation, congestion or multiplexing;
Quality of Service or (QoS)	means the service levels committed for ensuring delivery of services over the A-B-A segment of the diagram below, measured by Latency and Packet Loss as set out in the table in paragraph 4.2(c);



- Service Port ID means an identification number assigned by Nucleus Connect to a L3 VPN Service Port that has been provisioned for the Contracting QP;
- Symmetrical means equal bandwidth for Uplink and Downlink (between the End-User and the Aggregation Network); and
- Uplink means bandwidth in the upstream direction (from the End-User to the Aggregation Network).

3. COMMENCEMENT

This Service Schedule shall commence with effect from the date that the Contracting QP first places an Order to take up a L3 VPN Service, in accordance with the General Service Terms and Conditions.

4. SERVICE REQUIREMENTS

4.1 The Contracting QP shall place one (1) Order for each L3 VPN Connection. For example, if the Contracting QP wishes to take up two (2) L3 VPN Connections, the Contracting QP shall submit two (2) separate Orders.

4.2 When placing an Order for an L3 VPN Connection, the Contracting QP shall be required to:

- (a) Specify one (1) L3 VPN Service Port type and the address of the installation location. The L3 VPN Service Port may be new or then existing and if the latter, the Contracting QP shall be required to specify the Service Port IDs in respect of such L3 VPN Service Port. The L3 VPN Service Port type is either Fast Ethernet ("**FE Service Port**") or Gigabit Ethernet ("**GE Service Port**").

For FE Service Port(s), each L3 VPN Connection will have a Symmetrical PIR of 100Mbps.

For GE Service Port(s), each L3 VPN Connection will have a Symmetrical PIR of 1Gbps.

- (b) Specify the following Network protocol options:

- (i) either IPv4 or IPv6;
- (ii) either static routing or dynamic routing; and
- (iii) L3 VPN Virtual Routing Domain.

- (c) Subscribe to only one (1) Class of Service for such L3 VPN Connection and indicate the total Symmetrical CIR it wishes to purchase in blocks of 5Mbps, provided that:

- (i) the Symmetrical CIR for such Class of Service shall be no more than 100Mbps for FE Service Port, and 1Gbps for GE Service Port;
- (ii) such Class of Service shall have a minimum Symmetrical CIR of 25Mbps; and
- (iii) where there are multiple L3 VPN Connections sharing the same L3 VPN Service Port, the aggregate Symmetrical CIR for such L3 VPN

Connections shall be no more than 100Mbps for FE Service Port, and 1Gbps for GE Service Port.

The Contracting QP may subsequently from time to time, increase or decrease the Symmetrical CIR of the Class of Service subscribed for such L3 VPN Connection, in blocks of 5Mbps, provided that sub-paragraphs (i) to (iii) above are complied with. Such increase or decrease of Symmetrical CIR shall constitute a Modification for which the Contracting QP shall be required to submit an Order pursuant to and in accordance with the General Service Terms and Conditions.

The table below sets out the performance parameters of the Classes of Services for L3 VPN Connection.

Class Of Service		Latency	Packet Loss
Class A Real Time		14ms	0.025%
Class B Near Real Time		22ms	0.050%
Class C Mission Critical		28ms	0.10%

- 4.3 If the Contracting QP injects traffic into any L3 VPN Connection which exceeds the Symmetrical CIR purchased for such L3 VPN Connection pursuant to paragraph 4.2(c), the Contracting QP acknowledges and agrees that notwithstanding that Nucleus Connect will endeavour to deliver such excess traffic, such delivery is not guaranteed. For the avoidance of doubt, the Contracting QP shall not be able to inject traffic into any L3 VPN Connection which exceeds the PIR as set out in paragraph 4.2(a).
- 4.4 Only one Class of Service is supported per L3 VPN Connection. A L3 VPN Service Port can support multiple L3 VPN Connections of the same or different Classes of Service. In the case of multiple L3 VPN Connections sharing the same L3 VPN Service Port, the maximum number of VLANs that can be configured per L3 VPN Service Port is sixteen (16).
- 4.5 In relation to any L3 VPN Service taken up by the Contracting QP, if the Contracting QP wishes to:
- (a) change the then existing L3 VPN Service Port type in respect of such L3 VPN Service (from FE Service Port to GE Service Port or vice versa);
 - (b) change the Class of Service for the then existing L3 VPN Virtual Routing Domain; and/or
 - (c) change the routing entries and/or requires support for routing entries in excess of 200 for the then existing L3 VPN Virtual Routing Domain,

each such event shall constitute a Modification for which the Contracting QP shall be required to submit an Order pursuant to and in accordance with the General Service Terms and Conditions.

- 4.6 The Contracting QP must adhere to Nucleus Connect's QoS tagging scheme when sending or receiving data traffic through any L3 VPN Connection from the relevant L3

VPN Service Port(s). Such QoS tagging scheme requires the use of priority bit value 5 for Class A, priority bit value 4 for Class B and priority bit value 2 for Class C.

4.7 If, in relation to an Order to take up a L3 VPN Service, the installation location required is a Non-Residential Premises and the Contracting QP indicates to Nucleus Connect in such Order that it does not require OpenNet to provide the fibre and in-building cabling between the FTTB Node and the 1st TP for the relevant Non-Residential Building, the Contracting QP shall be responsible for the supply and maintenance of such fibre and in-building cabling. In such event, the Contracting QP acknowledges and agrees that:

- (a) the Contracting QP shall bear the following charges:
 - (i) ON Charges, except those ON Charges which would be subject to paragraph 4.7(a)(iii), which have been incurred by Nucleus Connect, or which Nucleus Connect has committed to incur, in connection therewith;
 - (ii) any Third Party Charges which have been incurred by Nucleus Connect, or which Nucleus Connect has committed to incur, in connection therewith; and
 - (iii) any other third party charges, OpenNet's charges and/or ON Charges agreed pursuant to paragraph 5.2 or 6.3 of the General Service Terms and Conditions which have been incurred by Nucleus Connect, or which Nucleus Connect has committed to incur, in connection therewith;
- (b) the Contracting QP shall provide fibre and in-building cabling from the FTTB Node and up to and including the 1st TP that is of a quality that is fit-for-purpose; and
- (c) the Contracting QP shall make such fibre and in-building cabling from the FTTB Node and up to and including the 1st TP, available and ready for Nucleus Connect's use at least three (3) Business Days before the RFS Date in respect of such L3 VPN Service.

For the avoidance of doubt, if the Contracting QP fails to comply with sub-paragraphs (b) and (c) above and due to such failure, Nucleus Connect is not able to provision and activate such L3 VPN Service by the scheduled RFS Date, the Contracting QP shall not be entitled to make any claim under Appendix 1 of the General Service Terms and Conditions, and Nucleus Connect shall be entitled to commence charging the Contracting QP the Monthly Recurring NC Charges set out in paragraph 5.1 on such scheduled RFS Date (and not the delayed date that such L3 VPN Service is in fact activated).

5. CHARGES

The Charges set out in this paragraph 5 are the rates payable by the Contracting QP on a L3 VPN Connection and a L3 VPN Service Port basis.

5.1 Monthly Recurring NC Charges

Nucleus Connect will commence charging the Contracting QP the Monthly Recurring NC Charges specified below on the RFS Date.

L3 VPN Connection	Monthly Recurring NC Charge
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		First 25Mbps	Next 5Mbps
Class of Service	Real Time	\$244	\$48.80
	Near Real Time	\$208	\$41.60
	Mission Critical	\$161	\$32.20

Per L3 VPN Service Port		Monthly Recurring NC Charge
FE (100Mbps) Service Port		
	Non-Residential Premise	\$100
GE (1Gbps) Service Port	Non-Residential Premise	\$600

5.2 One-Time Charges

The Charges set out below are non-refundable once they are imposed on the Contracting QP by Nucleus Connect in the manner specified below. In addition, depending on when the relevant action is preferred by the Contracting QP to be undertaken by Nucleus Connect, the following multiplier factor will be applied to the NC Charges set out below. For the avoidance of doubt, the multiplier factor to be applied shall be one (1) unless the Contracting QP requests that the relevant action be undertaken by Nucleus Connect on off-working hours during Business Day(s) or on non Business Day(s).

	Period	Time		Multiplier Factor
Business Day	Monday to Friday	Working Hours	9.00am to 5.00pm	1
	Monday to Friday	Off-working hours	Before 9am and after 5.00pm	1.5
Non-Business day	Saturday, Sundays and Public Holidays	Throughout		2

(a) Cancellation Charge

Upon any Cancellation of any Order, the following Charges shall be imposed on the Contracting QP:

- (i) an NC Charge of \$50 if Cancellation happens before Nucleus Connect's acknowledgement of its receipt of the Order or an NC Charge of an amount equal to the applicable NC Charges set out in paragraph 5.2 if Cancellation happens after Nucleus Connect's acknowledgement of its receipt of the Order;
- (ii) ON Charges, except those ON Charges which would be subject to paragraph 5.2(a)(iv), which have been incurred by Nucleus Connect, or which Nucleus Connect has committed to incur, at the time of such Cancellation;

- (iii) any Third Party Charges which have been incurred by Nucleus Connect, or which Nucleus Connect has committed to incur, at the time of such Cancellation; and
- (iv) any other third party charges, OpenNet’s charges and/or ON Charges agreed pursuant to paragraph 5.2 or 6.3 of the General Service Terms and Conditions which have been incurred by Nucleus Connect, or which Nucleus Connect has committed to incur, at the time of such Cancellation.

(b) Installation Charge

- (i) Upon the installation of a L3 VPN Connection by Nucleus Connect, the following Charges shall be imposed on the Contracting QP on a per L3 VPN Service Port basis:
 - (a) the following NC Charges (the following NC Charges shall be multiplied by 2 if Express SAP applies for the L3 VPN Service):

Description		One-Time Charges
Installation Charge	Non-Residential Premise	\$350
Installation of environmental hardened NTE (at the request of the Contracting QP for Service Port at Non-Residential Premises)		\$500
Per L3 VPN Virtual Routing Domain Setup Charge. Applicable only for the first time set up of the L3 VPN Virtual Routing Domain.		\$1,000 per Virtual Routing Domain. Applicable only for the first time set up of the L3 VPN Virtual Routing Domain

(b) (Intentionally Deleted)

(ii) Patching Charge in the NC CO and Co-location Space

- (a) A Patching Charge in addition to the Installation Charge will be imposed if Nucleus Connect is required to provide Patching Services. Nucleus Connect may be required to provide Patching Services where the installation address is located at the Co-location Space or the NC CO. This will be charged at \$40 per patch point.
- (b) This Patching Service will be provided by Nucleus Connect if required. The Contracting QP will be required to submit a separate Order for this Patching Service.

(c) Modification Charge

The NC Charges set out below shall be imposed on the Contracting QP upon the submission of a Modification Order by the Contracting QP:

- (i) where such Modification Order relates to the L3 VPN Connection or L3 VPN Service Port, \$200; or
- (ii) where such Modification Order relates to L3 VPN Virtual Routing Domain, \$750.

(d) Maintenance or Repair

- (i) Nucleus Connect will charge for every onsite visit or joint investigation, according to the length of time spent by Nucleus Connect's representative during such onsite visit or joint investigation respectively, if such onsite visit or joint investigation is requested by the Contracting QP or any Authorised MOE Personnel. There will be a minimum charge of \$400 per onsite visit or joint investigation (as the case may be) up to the first two hours. Subsequent hour blocks are charged at \$200 per hour.

However, if Nucleus Connect decides in its sole discretion that Nucleus Connect and/or its contractors (including OpenNet) need(s) to be onsite to assess the service impact and/or perform the necessary fault rectification, Nucleus Connect will charge a fixed charge of \$400 per onsite visit or joint investigation.

- (ii) The No Fault Found Charge referred to in the General Service Terms and Conditions is \$350 per Fault report.

(e) Disconnection

Upon a disconnection of a L3 VPN Service by reason of suspension pursuant to the ICO Agreement, an NC Charge of \$300 shall be imposed on the Contracting QP.

(f) Deactivation

Upon the Deactivation of a L3 VPN Service, the following Charges shall be imposed on the Contracting QP:

- (i) the following NC Charges:

Description	Charges
Deactivation Charge	\$300
Early Termination Charge	100% of remaining contract value

- (ii) ON Charges, except those ON Charges which would be subject to paragraph 5.2(f)(iv), which have been incurred by Nucleus Connect, or which Nucleus Connect has committed to incur, at the time of such Deactivation;
- (iii) any Third Party Charges which have been incurred by Nucleus Connect, or which Nucleus Connect has committed to incur, at the time of such Deactivation; and

- (iv) any other third party charges, OpenNet's charges and/or ON Charges agreed pursuant to paragraph 5.2 or 6.3 of the General Service Terms and Conditions which have been incurred by Nucleus Connect, or which Nucleus Connect has committed to incur, at the time of such Deactivation.

Application Form

Layer 3 VPN Service (L3 VPN)



ATTN: NUCLEUS CONNECT, ORDER DESK
 FACSIMILE NO. : (65) 6808 2820
 EMAIL: orderdesk@nucleusconnect.com

Business Customer Information

Company Details	Authorised Officer Particulars
Name of Firm/Company as in RCB:	Name of Authorised Officer as in NRIC/PASSPORT/FIN*. Please underline surname. (Dr/Mr/Miss/Mrs/Mdm):_
Registered Address as in RCB:	NRIC/PASSPORT/FIN* No. of Authorised Officer (Dr/Mr/Miss/Mrs/Mdm):
	E-mail of Authorized Officer:
Main Office Contact No.:	Designation:
Main Office Fax No.:	Contact No. (Office):_
Business Registration Number (BRN):	Contact No. (Fax):
Account Information (For New Accounts, please refer to www.nucleusconnect.com for instruction to sign up Nucleus Connect's Services)	<input type="checkbox"/> Account Number:
Customer Reference ID : (This ID is issued by customer for their internal reference of the service that is set out in this application form)	

Billing Details (If different from Business Customer Information)

Company Name:	Billing Address :_
City & Postal Code:	Country:
Contact Person Name (Billing):	Customer Contact Number :
Customer Fax Number:	E-mail:

* Please select where appropriate

Customer Technical Contact

Installation Contact (for service delivery)	Operations/Technical Contact (after service delivery)
Name:	Name:
Telephone (O):	Telephone (O):
Mobile:	Mobile:
Email:	Email:
Notification Mode: 24 Hours Daily <input type="checkbox"/> Office Hours (9am-5pm, Mon-Fri) <input type="checkbox"/>	Notification Mode: 24 Hours Daily <input type="checkbox"/> Office Hours (9am-5pm, Mon-Fri) <input type="checkbox"/>

L3 VPN Service Port

<input type="checkbox"/> New Order <input type="checkbox"/> Modification <input type="checkbox"/> Deactivation <input type="checkbox"/> Others (Please specify): _____		
Existing Service Port ID (Mandatory field unless New Order): _____		
<input type="checkbox"/> Fast Ethernet UTP (100Mbps) <input type="checkbox"/> Gigabit Ethernet UTP (1Gbps) <input type="checkbox"/> Environmental hardened NTE is required	<input type="checkbox"/> Residential <input type="checkbox"/> Non-Residential <input type="checkbox"/> Non-Building Address Point (NBAP)	
Service Port Installation Location	Address:	Postal Code:
Installation Location not within a addressable room(e.g NBAP, Non-residential)	GPS Co-ordinate: Elevation above floor:	Description:
Site Contact:	Name:	Contact number:

Application Form

Layer 3 VPN Service (L3 VPN)



Instruction		
Class of Services option: <ul style="list-style-type: none"> Class A (Real Time), Class B (Near Real Time), Class C (Mission Critical) and Class D (Best Effort) 	L3 VPN Connection option: <ul style="list-style-type: none"> Only 1 Class of Service per L3 VPN Connection Minimum subscription of 25Mbps per L3 VPN Service Port Total subscribed bandwidth per connection is in blocks of 5Mbps 	L3 VPN Domain: <ul style="list-style-type: none"> Only 1 "New", "Modification" or "Deactivation" of L3 VPN Virtual Routing Domain per Application form Only 1 Class of Service per L3 VPN Virtual Routing Domain

L3 VPN Virtual Routing Domain Information		
<input type="checkbox"/> New Class of Service : _____ <input type="checkbox"/> IP v4 <input type="checkbox"/> IP v6	<input type="checkbox"/> Modification Existing L3VPN Domain ID: _____ Class of Service : _____	<input type="checkbox"/> Deactivation

L3 VPN Connection Configuration				
L3VPN Domain ID	L3VPN Connection Service ID	Class of Service, CIR Bandwidth	Dynamic routing information (BGP Configuration)	Static Routing information PE: Provider Equipment CE: Customer Equipment
<input type="checkbox"/> New <input type="checkbox"/> Existing Domain ID: _____	<input type="checkbox"/> New <input type="checkbox"/> Modification <input type="checkbox"/> Deactivation <input type="checkbox"/> Existing Connection ID: _____	<input type="checkbox"/> Class A <input type="checkbox"/> Class B <input type="checkbox"/> Class C <input type="checkbox"/> Class D Bandwidth : _____ VLAN : _____	<input type="checkbox"/> BGP ASN: _____ <input type="checkbox"/> MD5 Password: _____ <input type="checkbox"/> Prefix1: _____ <input type="checkbox"/> Prefix2: _____ <input type="checkbox"/> Additional Attachment: _____	PE-CE IP Subnet: _____ CE LAN IP Subnet : _____ <input type="checkbox"/> Additional Attachment: _____

Contract Period	
Minimum Term ^[b]	<input type="checkbox"/> 12 months <input type="checkbox"/> Others (Please specify): _____
Customer requested RFS Date [^]	
OpenNet Appointment Date ^[o]	Date: _____ Slot: AM <input type="checkbox"/> PM <input type="checkbox"/>
Nucleus Connect Appointment Date ^{**#}	Date: _____ Slot: AM <input type="checkbox"/> PM <input type="checkbox"/> EVENING [®] (After 5pm) <input type="checkbox"/>

Additional Information
Requires OpenNet to provide the fibre and in-building cabling between the FTTB Node and 1 st TP for the Non-Residential Building: <u>Yes/No*</u>
Others:

[^] Subject to agreement, resource availability and confirmation by Nucleus Connect.
^[b] If Minimum Term is not specified, the Contracting QP shall be deemed to have selected 12 months.
^[o] Timeslot is not available on weekends and public holidays
[#] NC Multiplier factor / OpenNet Onsite Charges shall apply accordingly.
^[o] OpenNet appointment is required if there is a installation of a termination point

** When there is a termination point installation, Nucleus Connect's appointment shall be no more than 3 Business Days after OpenNet's appointment date.

Customer Signature		
We hereby agree to subscribe to the above mentioned services on the terms and subject to the conditions contained in the Master ICO Agreement and the Service Schedule for the abovementioned services, which terms and conditions shall apply upon Nucleus Connect's acceptance of this application. We certify that all information provided by us herein are true, correct and complete. Further, we agree that any cancellation of the abovementioned services may result in a charge to us at Nucleus Connect's prevailing rates.		
<u>Signature of Authorised Officer</u>	<u>Date</u>	<u>Company Stamp</u>
For Nucleus Connect Use		

Application Form

Layer 3 VPN Service (L3 VPN)



<input type="checkbox"/> Application Rejected:	Reason for rejection:	
<input type="checkbox"/> Application Accepted	Service ID/s: _____	Work Order No.: _____
No. of pages attached (Excluding application forms): _____	Approval code:	Processed by (Name, Contact, Signature and Date)