

**SERVICE SCHEDULE - PROVIDER BACKBONE ETHERNET VIRTUAL
CONNECTION
(PB-EVC)**

NUCLEUS CONNECT PTE. LTD.

INTERCONNECTION OFFER (ICO) AGREEMENT

**SERVICE SCHEDULE – PROVIDER BACKBONE ETHERNET VIRTUAL CONNECTION
(PB-EVC)**

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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 PB-EVC (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

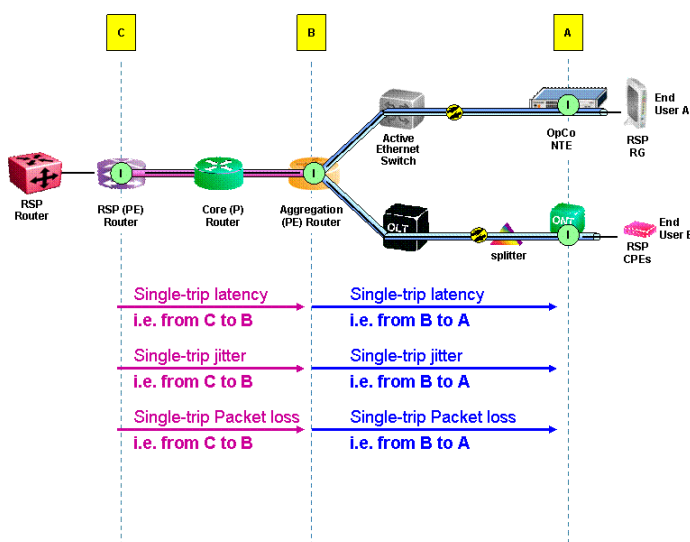
- 2.1 Unless otherwise defined herein this Service Schedule, all terms and expressions used herein will be construed to have the same meanings as found in the Master ICO Agreement and the General Service Terms and Conditions. Where a term or expression is defined specifically in this Service Schedule 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); (c) Class C Mission Critical (Class C); or (d) Class D Best Effort (Class D), 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 B-C segment of the diagram in the definition of “QoS” for each PB-EVC;
Downlink	means bandwidth in the downstream direction (from the Core Network to the Aggregation Network);

Latency means the one-way delay in packet delivery as a result of physical distance, and the Active Network components from the Aggregation to the Core Layer;

Quality of Service or (QoS) means the service levels committed for ensuring delivery of services over the B-C segment of the diagram below, measured by Jitter, Latency and Packet Loss as set out in the table in paragraph 4.2 (c);



Service Port means the physical port which the Contracting QP's or End-User's equipment shall interface to the Nucleus Connect Active Network either at Core or Aggregation Layer for the purpose of multiplexing Ethernet Virtual Connections;

Service Port ID means an identification number assigned by Nucleus Connect to a QP-EVPL Service Port that has been provisioned for the Contracting QP;

Symmetrical means equal bandwidth for Uplink and Downlink (between the Core and the Aggregation Network); and

Uplink means bandwidth in the upstream direction (from the Aggregation Network to the Core 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 PB-EVC, in accordance with the General Service Terms and Conditions.

4. SERVICE REQUIREMENTS

- 4.1 The Contracting QP shall place one (1) Order for each PB-EVC. For example, if the Contracting QP wishes to take up two (2) PB-EVCs, the Contracting QP shall submit two (2) separate Orders.

4.2 When placing an Order for a PB-EVC, the Contracting QP shall be required to:

- (a) Specify one (1) Service Port ID of the QP-EVPL Service Port and the OpenNet CO within Nucleus Connect's Aggregation Network. The QP-EVPL Service Port must be located at NC CO.
- (b) Specify the following Network protocol options:
 - (i) Layer 2 VLAN (IEEE 802.1q and IEEE Q-in-Q);
 - (ii) either IPv4 or IPv6; and
 - (iii) either static routing or dynamic routing,

provided that the availability of sub-paragraphs (ii) and (iii) above are subject to the Contracting QP having taken up and completed the L3 Virtual Routing Domain Setup Service, which is an Ancillary Mandated Service provided by Nucleus Connect.

The Contracting QP can order multiple PB-EVCs from the same OpenNet CO to same or different NC CO(s). The routing of traffic for the PB-EVCs will be based on the above Network protocol chosen by the Contracting QP.

- (c) Subscribe to only one (1) Class of Service for such PB-EVC and indicate the Symmetrical CIR it wishes to purchase in blocks of 250Mbps, provided that:
 - (i) the minimum Symmetrical CIR for such Class of Service shall be 250Mbps; and
 - (ii) the maximum Symmetrical CIR for such Class of Service shall be 10Gbps.

The Contracting QP may subsequently from time to time, increase or decrease the Symmetrical CIR of the Class of Service subscribed for such PB-EVC, in blocks of 250Mbps, provided that sub-paragraphs (i) and (ii) 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 tables below show the performance parameters of each Class of Service. For the avoidance of doubt, only one (1) Class of Service is supported per PB-EVC.

Class Of Service	Jitter	Latency	Packet Loss
Class A Real Time	0.5ms	1ms	0.1%
Class B Near Real Time	0.5ms	3ms	0.1%
Class C Mission Critical	2ms	5ms	0.05%
Class D Best Effort	Best Effort	10ms	Best Effort

- (d) Specify whether it requires to have multiple services (C-VLAN) within the same PB-EVC. If so, the Contracting QP shall also specify the bandwidth allocation for each C-VLAN, which shall be in blocks of 1Mbps.

- 4.3 If the Contracting QP injects traffic into any PB-EVC which exceeds the Symmetrical CIR purchased for such PB-EVC pursuant to paragraph 4.2(c), the excess traffic will not be delivered.
- 4.4 The Contracting QP must adhere to Nucleus Connect's QoS tagging scheme when sending or receiving data traffic through any PB-EVC from the relevant 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, priority bit value 2 for Class C and priority bit value 1 for Class D.

5. CHARGES

The charges set out in this paragraph 5 are the rates payable by the Contracting QP on a per PB-EVC 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.

PB-EVC		Committed Information Rate Monthly Recurring NC Charge (per 250Mbps)
Class of Service	Real Time	\$1,700
	Near Real Time	\$1,450
	Mission Critical	\$1,125
	Best Effort	\$875

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 an Order relating to PB-EVC by the Contracting QP, 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 as 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

Upon the installation of a PB-EVC by Nucleus Connect, a one-time NC Charge of \$1,500 shall be imposed on the Contracting QP on a per PB-EVC basis.

(c) Modification Charge

A NC Charge of \$200 shall be imposed on the Contracting QP upon the submission of a Modification Order by the Contracting QP.

(d) Maintenance or Repair

- (i) Nucleus Connect will charge for every onsite visit or joint investigation requested by the Contracting QP, 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. There will be a minimum charge of \$800 per onsite visit or joint investigation (as the case may be) up to the first two hours. Subsequent hour blocks are charged at \$400 per hour.
- (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 PB-EVC by reason of suspension pursuant to the ICO Agreement, a NC Charge of \$150 shall be imposed on the Contracting QP.

(f) Deactivation

Upon the Deactivation of a PB-EVC, the following Charges shall be imposed on the Contracting QP.

- (i) the following NC Charges

Description	Charges
Deactivation Charge	\$150
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.

6. CHANGES FROM THE GENERAL SERVICE TERMS AND CONDITIONS

6.1 Paragraph 9.10 of the General Service Terms and Conditions

The tables in paragraph 9.10 of the General Service Terms and Conditions shall be deleted in their entirety and replaced with the following table:

Specific MTTR per Month	Reduction in Monthly Recurring Charge per affected circuit
≤ 3 hours	No Compensation
> 3 hours but ≤ 5 hours	10%
> 5 hours but ≤ 10 hours	20%
> 10 hours	30%

Application Form

Provider Backbone Ethernet Virtual Connection Service (PB-EVC)



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"/>

Instruction

(1) Total subscribed bandwidth must be in blocks of 250Mbps; (2) Multiple services (VLAN) within the same PB-EVC can be allocated bandwidth in block(s) of 1Mbps; (3) Only one Class of Service Per PB-EVC; (4) QP must complete the L3 Virtual Routing Domain Setup Service if Layer3 IP V4 or IP V6 is selected.

PB-EVC Configuration

Type of Order	<input type="checkbox"/> New <input type="checkbox"/> Modification <input type="checkbox"/> Deactivation <input type="checkbox"/> Existing PB-EVC ID: _____
Network protocol options	<input type="checkbox"/> L2 VLAN IEEE802.1q <input type="checkbox"/> L2 VLAN IEEE q-in-q <input type="checkbox"/> Layer 3 IPV4 <input type="checkbox"/> Layer 3 IPV6
Class Of Service	<input type="checkbox"/> Class A (Real Time) <input type="checkbox"/> Class B (Near Real Time) <input type="checkbox"/> Class C (Mission Critical) <input type="checkbox"/> Class D (Best Effort)
Total CIR Bandwidth subscribed	Bandwidth: _____
Service Destinations	<input type="checkbox"/> QP-EVPL Service Port ID: _____ <input type="checkbox"/> Aggregation Layer CO: _____

Application Form

Provider Backbone Ethernet Virtual Connection Service (PB-EVC)



Layer 2 Information (VLAN Bandwidth allocation)			
Bandwidth: _____ VLAN: _____	Bandwidth: _____ VLAN: _____	Bandwidth: _____ VLAN: _____	Bandwidth: _____ VLAN: _____
Bandwidth: _____ VLAN: _____	Bandwidth: _____ VLAN: _____	Bandwidth: _____ VLAN: _____	Bandwidth: _____ VLAN: _____
Layer 3 Routing Information			
Dynamic routing information -BGP Configuration (Please use additional attachment if more space is needed)		Static Routing information	
<input type="checkbox"/> Virtual Routing Domain ID: _____ Bandwidth: _____ VLAN: _____ <input type="checkbox"/> BGP ASN: _____ <input type="checkbox"/> MD5 Password: _____	<input type="checkbox"/> Prefix1: _____ <input type="checkbox"/> Prefix2: _____ <input type="checkbox"/> Prefix3: _____ <input type="checkbox"/> Prefix4: _____ <input type="checkbox"/> Additional Attachment: _____	<input type="checkbox"/> Virtual Routing Domain ID: _____ Bandwidth: _____ VLAN: _____ <input type="checkbox"/> IP Routes1: _____ <input type="checkbox"/> IP Routes2: _____ <input type="checkbox"/> IP Routes3: _____ <input type="checkbox"/> Additional Attachment: _____	
<input type="checkbox"/> Virtual Routing Domain ID: _____ Bandwidth: _____ VLAN: _____ <input type="checkbox"/> BGP ASN: _____ <input type="checkbox"/> MD5 Password: _____	<input type="checkbox"/> Prefix1: _____ <input type="checkbox"/> Prefix2: _____ <input type="checkbox"/> Prefix3: _____ <input type="checkbox"/> Prefix4: _____ <input type="checkbox"/> Additional Attachment: _____	<input type="checkbox"/> Virtual Routing Domain ID: _____ Bandwidth: _____ VLAN: _____ <input type="checkbox"/> IP Routes1: _____ <input type="checkbox"/> IP Routes2: _____ <input type="checkbox"/> IP Routes3: _____ <input type="checkbox"/> Additional Attachment: _____	
Contract Period			
Minimum Term [®]	<input type="checkbox"/> 12 months <input type="checkbox"/> Others (Please specify): _____		
Customer requested RFS date [^]	_____		
Additional Information			

[^] Subject to agreement, resource availability and confirmation by Nucleus Connect.

[®] If Minimum Term is not specified, the Contracting QP shall be deemed to have selected 12 months.

Customer Signature		
We hereby agree to subscribe to the abovementioned 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.		
Signature of Authorised Officer	Date	Company Stamp
For Nucleus Connect Use		
<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) _____