



20 November 2012

Info-communications Development Authority of Singapore
10 Pasir Panjang Road
#10-01 Mapletree Business City
Singapore 117438

Attention: Ms Aileen Chia
Deputy Director-General (Telecoms & Post)

Dear Ms Chia

CONSULTATION ON INTERCONNECTION OFFER FOR THE PROVISION OF SERVICES ON THE NEXT GENERATION NATIONWIDE BROADBAND NETWORK – NETWORK COMPANY PROPOSED CO-LOCATION SPACE & SERVICE IN NEW CO-LOCATION ROOM

1. Singapore Telecommunications Ltd (**SingTel**) is pleased to respond to the Info-communications Development Authority of Singapore (**IDA**) request for comments on OpenNet Pte Ltd's (**OpenNet**) proposed Schedule 12C dated 30 October 2012 (**Consultation**).
2. SingTel submits herein its comments to the Consultation in the attached Annex A.
3. Please do not hesitate to contact us if you have any queries.

Yours sincerely

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Vice President
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Annex A: SingTel’s Comments on OpenNet’s Proposed Co-Location Space & Service in New Co-Location Room

No.	Schedule reference	Clause reference	SingTel’s comments and recommendations
1	Sch 12C	General	<p>We note that OpenNet has not made available the list of items that OpenNet is proposing to charge for services offered in Schedule 12C (Charging Items) for consultation. We submit that Requesting Licensees should be given the opportunity to comment and provide feedback to the IDA on the reasonableness of the proposed Charging Items.</p>
2	Sch 12C	1.2	<p>OpenNet’s proposed Schedule 12C has not clearly stated whether Requesting Licensees are required to pay for any cooling facilities such as XDV solutions at the Co-Location Space.</p> <p>We note that no supplementary cooling service is required in Schedule 12C and the Requesting Licensee may install Co-Location Equipment of up to 3kW heat load. Therefore it follows that no cooling facilities are necessary and the Requesting Licensee should not be required to pay for extra cooling or pay for the installation or operation of any localised cooling solution as long as its Co-Location Equipment does not exceed 3kW heat load per rack.</p>
3	Sch 12C	Clause 3 General (including 3.1, 3.2, 3.4, 3.5, 3.8)	<p>OpenNet has not only proposed to reject the provision of Co-Location Space where space is still available, but has also proposed to unilaterally take-back Co-Location Space that has already been obtained by, and provisioned to, a Requesting Licensee.</p> <p>These proposed measures contravene OpenNet’s obligations to offer Mandated Services pursuant to the NetCo Interconnection Code 2009 (NetCo Code), and must be rejected by the IDA.</p> <p>Section 2.4 of the NetCo Code states that: <i>“The Licensee may not refuse to provide Mandated Services requested by a person entitled to obtain Mandated Services except where...”</i></p> <p>Section 2.7 of the NetCo Code states that: <i>“The Licensee may not unreasonably restrict the manner in which a <u>Qualifying Person</u> may utilise</i></p>

No.	Schedule reference	Clause reference	SingTel's comments and recommendations
			<p><i>Mandated Services.”</i></p> <p>Furthermore, OpenNet’s proposal offers neither opportunity for both parties to jointly verify the Requesting Licensee’s requirements nor any alternatives for the Requesting Licensee whose request for Co-Location Space is rejected or is forced to relinquish the Co-Location Space it has already acquired.</p> <p>Section 2.5 of the NetCo Code states that: <i>“Where the Licensee cannot offer Co-location Services due to space limitations or for any other legitimate reason, the Licensee shall take reasonable measures to find an alternative solution.”</i></p> <p>It is OpenNet’s obligation under the NetCo Code to provide Co-Location Services as requested by a Requesting Licensee and, where OpenNet is unable to offer Co-location Space due to space limitations, an alternative solution. It is not acceptable for OpenNet to circumvent these regulatory obligations by:</p> <ul style="list-style-type: none"> (a) limiting a Requesting Licensee’s planning and equipment expansion for providing services on the Next Gen NBN by rejecting the Requesting Licensee’s requests for Co-Location Space where space is available; and (b) terminating the lease of Co-Location Space that has already been acquired and paid for by a Requesting Licensee on the grounds of space limitations. <p>The IDA should dismiss such proposals that are inconsistent with the NetCo Code.</p> <p>Instead of imposing constraints on the provision of Co-Location Space to Requesting Licensees, SingTel submits that it is OpenNet’s responsibility to undertake the necessary resource planning in advance so as to ensure that Co-location Space is available to meet demand. Where Co-Location Space is unavailable, OpenNet must make alternatives available in accordance with Section 2.5 of the NetCo Code. .</p> <p>[Start Confidential][End Confidential]</p> <p>Given the uncertainty faced by a Requesting Licensee in obtaining the Co-Location Space it has requested, and OpenNet’s track record in ensuring the availability of Co-Location Space, it is imperative that OpenNet be required to offer alternative means of access to its network other than Co-Location, such as Requesting</p>

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			<p>Licenses deploying their own fibre cables to access OpenNet's network. Fibre access serves as an alternative to Co-Location which would alleviate the scarcity of Co-location Space.</p> <p>OpenNet should not restrict supply of Co-Location Space in the ICO, yet at the same time offer no alternatives to Co-Location in the ICO. In the event that the IDA agrees that Co-Location Space is a scarce resource that requires control measures to manage its efficient use, SingTel submits that in addition to the imposition of control measures, OpenNet must also offer alternative solutions to Co-Location in the ICO so that a Requesting Licensee may choose the most appropriate method for it to access OpenNet's network. A Requesting Licensee that deploys its own fibre cable to access OpenNet's network would reduce its reliance on and requirement for OpenNet's Co-Location Space thereby alleviating any purported space constraints. In addition, more space would be available for other Requesting Licensees who choose to co-locate at the OpenNet Co-Location Space to access OpenNet's network.</p> <p>Further, conditions that may unreasonably affect a Requesting Licensee's rights to obtain, and continue obtaining, Mandated Services should only be instituted by the IDA, and not by OpenNet, in order to ensure non-discriminatory treatment across all Requesting Licensees. OpenNet should not have the right to decide and regulate the provision of Ancillary Mandated Services to Requesting Licensees, including unilaterally taking-back Co-Location Space that has already been provisioned to a Requesting Licensee by giving the Requesting Licensee only ten (10) Business Days' notice.</p> <p>[Start Confidential][End Confidential]</p> <p>In light of the above, SingTel submits that in the event that the IDA does not reject OpenNet's proposed measures to regulate and restrict the provision of Co-Location Space, OpenNet must:</p> <ol style="list-style-type: none"> a) offer alternative means to access OpenNet's network under the ICO (eg fibre access); b) obtain IDA's approval prior to taking any action to regulate or restrict the availability of Co-Location Space or to take-back Co-Location Space; c) specify clearly in the ICO fair and transparent criteria for the assessment of whether a Requesting Licensee's request would be granted, to ensure non-discriminatory treatment; d) provide the Requesting Licensee opportunity to respond and provide further justification on its request.

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			<p>Where the Requesting Licensee does not agree with OpenNet's decision to deny, limit or retract a license of Co-Location Space to the Requesting Licensee, the parties shall refer the matter to the IDA for resolution;</p> <p>e) allow a longer window for the activation of active equipment. Thirty (30) Business Days for activation of active equipment is insufficient. Requesting Licensees should be allowed to request for Co-location Space for a reasonable number of OLTs to cater for capacity planning and demand for at least the following six (6) months in advance, on a per CO basis. This would ensure that RLs have sufficient Co-location Space to cater for:</p> <ul style="list-style-type: none"> (i) forecast growth; (ii) any sudden surge in demand; and (iii) the lead-time for the subsequent request for additional Co-location Space and commissioning of additional OLT, which may take up to forty-eight (48) Business Days; <p>f) where OpenNet takes-back unused Co-Location Space, compensate the affected Requesting Licensee for cost incurred in acquiring that Co-Location Space (including the amount the Requesting Licensee paid for Project Study, Site Preparation and Professional Structural Engineer certification) and in reconfiguring and removing its equipment; and</p> <p>g) bear all costs for the recovery and reinstatement of the Co-location Space and not seek to pass on such cost to the next Requesting Licensee who is allocated that space.</p> <p>Further, OpenNet's proposed definition of "unused Co-Location Space" is "Co-Location Space allocated to Requesting Licensee in which no active equipment has been activated for more than thirty (30) Business Days after the final site inspection". This definition is far too narrow. The Co-Location Space may be used to house FDF racks, which are not active equipment. OpenNet should not have the right to take back such allocated Co-Location Space.</p>
4	Sch 12C	3.2	<p>Similar to our comments in point 3 above (on clause 3 in general), OpenNet should specify clearly the criteria for not fulfilling the Requesting Licensee's request for Co-Location Space. Where OpenNet does not</p>

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			<p>fulfil the Requesting Licensee's request, OpenNet should propose reasonable alternatives.</p> <p>SingTel submits that OpenNet should not have a right to determine the type of equipment that the Requesting Licensee wishes to co-locate in the Co-Location Space. The Requesting Licensee has sole discretion over the design and configuration of its network within the OpenNet Co-Location Space and the equipment it deems necessary for the Requesting Licensee to receive Mandated Services and for connection to the Requesting Licensee's own network, be it OLTs, FDFs, routers, DWDM or power equipment. OpenNet must allocate Co-location Space for various types of equipment on a non-discriminatory and non-preferential basis.</p>
5	Sch 12C	3.4	<p>Without prejudice to our comments in point 3 above (on clause 3 in general):</p> <p><u>Clause 3.4(c):</u></p> <p>A Requesting Licensee's Co-Location Space requirements within the new Co-Location Room should be considered independently of the Co-Location Space it has acquired within the existing Co-Location Room. For example, FDFs and power equipment hosted in the new Co-Location Room is independent of the Requesting Licensee's network deployment within the existing Co-Location Room. Moreover, the Requesting Licensee has sole discretion over the design and configuration of its network within both the existing and new Co-Location Rooms. As such, the provision of information in relation to the manner and level of utilization of the Requesting Licensee's Co-Location Space and Co-Location Equipment within in the existing Co-Location Room is unnecessary for the assessment of a request for Co-Location Space in the new Co-Location Room and should be removed.</p> <p>Without prejudice to the above, in the event the IDA decides not to reject OpenNet's proposed measures to regulate the provision of Co-Location Space, SingTel submits that such regulation and assessments of utilization should be applied independently to each Co-Location Room, instead of across both Co-Location Rooms, and should not be applied to requests for Co-Location Space for the purpose of hosting FDF and power racks in the new Co-Location Room. Furthermore, the definition of "utilisation" should be defined more clearly to ensure a level playing field across all Requesting Licensees e.g. in the case of OLT equipment, proportion of used and active OLT ports instead of filled subscriber capacity.</p>

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			<p><u>Clause 3.4(g):</u></p> <p>The 3 kW heat load limit per rack proposed by OpenNet is not future proof. New developments in OLT equipment and IP routers require higher power density. For example, the recent trend for OLT equipment is to have 16 PON ports per line card. Vendors are already offering or beginning to offer such OLT equipment which consumes 2.2 kW per OLT. Given that Requesting Licensees are currently hosting 2 OLTs per rack in order to optimise space, each OLT rack will consume 4.4 kW, higher than the 3 kW heat load limit proposed by OpenNet. In addition, a high density aggregation router would typically consume 5 kW.</p> <p>As such, SingTel submits that OpenNet's offer for Co-Location Space in Schedule 12C is not future proof. OpenNet must offer Co-Location Space that not only meets Requesting Licensees' current needs, but also caters for future growth and developments.</p> <p><u>Clause 3.4(i):</u></p> <p>OpenNet has not clearly stated what it means by "not more than one (1) type and quantity of the Transmission Tie Cable required". OpenNet must remove any constraints on the Transmission Tie Cable that may be requested by Requesting Licensees unless there are valid technical restrictions on the installation of Transmission Tie Cables that are beyond OpenNet's control.</p> <p>[Start Confidential][End Confidential]</p>
6	Sch 12C	3.5(A)(d) 3.5(B)(b)	<p>Similar to our comments on clause 3.4(c) above, OpenNet should not be entitled to reject requests for Co-Location Space based on the grounds stated in these clauses. At a minimum, requests for Co-Location Space for the purpose of hosting FDF and power racks in the new Co-Location Room should not be rejected on such grounds, since such equipment is independent of the Requesting Licensee's network deployment in the existing Co-Location Room.</p> <p>In the event the IDA decides not to reject OpenNet's proposed measures to regulate the provision of Co-Location Space, SingTel submits that such rejection should only be based on assessment of utilization for space that has already been allocated to the Requesting Licensee in the new Co-Location Room, and not</p>

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			across both Co-Location Rooms.
7	Sch 12C	3.8	Similar to our comments in point 3 above (on clause 3 in general), in the event that the IDA does not reject OpenNet's proposed measures to regulate and restrict the provision of Co-Location Space, OpenNet should offer ready alternative solutions upfront in the ICO.
8	Sch 12C	7.5, 7.6	The 2 clauses are repetitive.
9	Sch 12C	7.12	<p>SingTel proposes that in addition to the information listed, OpenNet shall provide a description of the activity that OpenNet is planning to carry out in the Co-Location Room during the interruption to Co-Location Service.</p> <p>For the avoidance of doubt, 7.12(c) should refer to the start and end timings for the period of unavailability of the Co-Location Service, and not of the duration of OpenNet's planned activity in the Co-Location Room, which may not coincide.</p>
10	Sch 12C	8.1	<p>It is confusing to use "Transmission Tie Cable" to refer to both the cable used to connect Requesting Licensee's FDF at the Co-Location Space to OpenNet's FDF in the Central Office, as well as the cable used for the purpose of connecting the Requesting Licensee's equipment between the two (2) Co-Location Rooms. The purpose, end-points and responsibilities of OpenNet and the Requesting Licensee are different for the two (2) types of cables. A separate term such as "cross connection cable" should be defined for the latter. For the purposes of this submission, SingTel shall refer to the latter as the "cross connection cable" to avoid confusion.</p> <p>Given that the purpose of the cross connection cable is essentially for connection between Requesting Licensee's Co-Location Equipment, and both ends of the cross connection cable are terminated at the Requesting Licensee's FDFs, SingTel submits that it is reasonable and logical for the Requesting Licensee to provide and own the cross connection cable, and perform the splicing for the cross connection cable at its own FDFs. OpenNet shall be responsible only for the installation of the cross connection cable between the Co-Location Rooms.</p>
11	Sch 12C	8.2	Please refer to our comments in point 1 above in relation to the charges applicable for the cross connection

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			<p>cable.</p> <p>It is unclear what are the applicable charges for the cross connection. Given SingTel's proposal that OpenNet shall be responsible only for the installation of the cross connection cable, the only applicable charges to be imposed by OpenNet, without prejudice to OpenNet's offer to provide the first 96F cross connection cable free of charge, shall be the one-time charges for the installation of the cross connection cable.</p> <p>OpenNet should specify the procedure and mechanism for Requesting Licensees to request for installation of additional cross connection cables.</p>
12	Sch 12C	8.3	<p>OpenNet must provide the Requesting Licensee the necessary supporting services, including the cross connection cable, so that the Requesting Licensee can utilise the Co-Location Space it has acquired in the new Co-Location Room. OpenNet should not have the right to cease the provision of a cross connection cable after it is provisioned, as the cross connection cable may be carrying active connections to end-users. Any termination of the cross connection cable should only be in the event the license to the relevant Co-Location Space in the new Co-Location Room is terminated, in accordance with clause 11 of Schedule 12C.</p> <p>As such, this clause should be deleted.</p>
13	Sch 12C	9.2	<p>With reference to clause 11.6, the Requesting Licensee should have the right to terminate by giving one (1) months' written notice to OpenNet after the initial two (2) year term, without incurring early termination charges.</p>
14	Sch 12C	11.7(b)	<p>Clause 11.7(b) is unnecessary and should be deleted.</p> <p>The Requesting Licensee should not have to provide a letter of authorization to OpenNet for the removal of the Requesting Licensee's own equipment. Further, this event occurs only when the license of the Co-Location Service has expired or been terminated.</p>
15	Sch 12C	11.10	<p>This clause should be removed as it introduces ambiguity and uncertainty to the termination of a license of Co-Location Space. OpenNet should not be permitted to choose to terminate cross connection cables and Transmission Tie Cables at its discretion, as this may result in discriminatory treatment between different</p>

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			<p>Requesting Licensees in the event of termination of the license of Co-Location Space.</p> <p>It is also unclear whether the Requesting Licensee would still be required to continue to pay for the Co-Location Space, and whether all "Transmission Tie Cables", including those connecting the new Co-Location Room to OpenNet's FDF, are removed in such circumstances.</p>
16	Sch 12C	12.5, 12.6	Please refer to our comments in relation to clause 11.7(b) above.
17	Annex 12D-1	General	<p>OpenNet's proposed specifications for the new Co-Location Room are unreasonably restrictive and have not taken into consideration the co-location requirements of Requesting Licensees, including those existing requirements as reflected in OpenNet's existing Customised Agreements for co-location. Given that OpenNet has been operating co-location service for several years and is currently providing for such co-location requirements in Customised Agreements to Requesting Licensees, OpenNet would no doubt be aware of the co-location requirements of Requesting Licensees. It is not acceptable or practical for OpenNet to propose specifications for the new Co-Location Room that do not even cater to the existing needs of Requesting Licensees.</p>
18	Annex 12D-1	1.1.2	<p>OpenNet's proposal is unreasonably restrictive. It is untenable for OpenNet to propose a new Schedule for Co-Location that does not take into consideration the requirements from existing Requesting Licensees, but instead prohibits existing Requesting Licensees from acquiring similar services as those that are currently being provided to them.</p> <p>SingTel's existing FDF racks are 750mm wide. OpenNet's proposal does not cater for the hosting of such rack size.</p> <p>Given that OpenNet is already aware of requirements for such a rack width, and the depth, not width of the racks, is important for the optimisation of air flow, OpenNet should make allowance for various rack widths, but at a minimum, allow racks that are 750mm wide.</p> <p>We propose that clause 1.1.2 be amended to include:</p> <p>(c) 750 mm (width) by less than or equal to 1000mm (depth) by less than or equal to 2200mm (height)</p>

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			racks.
19	Annex 12D-1	1.5.2	<p>Similar to our comments in points 17 and 18 above, OpenNet should cater for the existing co-location requirements of Requesting Licensees in this new Schedule 12C and continue to offer in the new Co-Location Room the co-location services that are currently being provided to Requesting Licensees.</p> <p>SingTel's rectifier (which is currently hosted in the existing Co-Location Room) requires 63 amp 3-phase AC power. OpenNet has instead proposed to offer only 16 amp circuit breaker for AC power in the new Co-Location Room. This is unacceptable, as it effectively prohibits a Requesting Licensee from installing its own rectifier and compels Requesting Licensees to purchase DC power from OpenNet in the new Co-Location Room.</p> <p>Consistent with SingTel's requirements for power that is currently provided under a Customised Agreement between SingTel and OpenNet, OpenNet should offer to provide 63 amp 3-phase AC power that is metered. The 3-phase AC power consumption shall be metered and charged based on the electricity tariff with a reasonable mark-up e.g. 10%.</p> <p>OpenNet should also offer to provide 16 amp AC power on a metered basis or on a per hour basis for Requesting Licensees to operate its testing equipment in order to conduct testing on its Co-Location Equipment and the Layer 1 Services from time to time within the Co-Location Room.</p> <p>A similar usage-based charging methodology for DC power should also be adopted where feasible. For instance, the charges for DC power may be broken down into two (2) separate components: a charge for the breaker (which is derived from the capex and opex cost for the rectifier) and a metered charge for actual or average power usage. The current charging methodology based on fused ampere only does not necessarily reflect actual power usage and is too costly for the hosting of high density Next Gen NBN equipment.</p> <p>In addition, there should be no restrictions on the number of DC dual power supply for each rack.</p>
20	Annex 12D-1	1.5.3	<p><u>Clauses 1.5.3(i) and (ii):</u></p> <p>OpenNet's proposed requirements are unreasonably restrictive. There exist no reasonable technical impediments to require such restrictions. SingTel submits that it is up to the Requesting Licensees to design</p>

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			<p>its power distribution for its racks. Accordingly, the IDA should dismiss OpenNet's proposed restrictions.</p> <p>With respect to clause 1.5.3(ii), taking the example where a Requesting Licensee's rack requires 40 amp of DC power, the Requesting Licensee should only be required to pay for 40 amp of DC power (and not an additional 40 amp for the redundant power feed) and be allowed to use up to a total of 40 amp of DC at any one time between the dual power feeds.</p> <p><u>Clause 1.5.3(iii):</u></p> <p>Please refer to our comments above in relation to clause 3.4(g) of Schedule 12C. The 3 kW heat load limit per rack proposed by OpenNet is not future proof.</p>
21	Annex 12E-1	4.6.5	<p>OpenNet has proposed that "all Hoisting and Lifting work shall be carried out in the presence of the Site Supervisor and a certified Lifting Supervisor who shall be provided by the Requesting Licensee's appointed subcontractors."</p> <p>We note that OpenNet has omitted to define the terms "Site Supervisor" and "Lifting Supervisor". OpenNet should provide more clarity on its requirements.</p>
22	Schedule 18		<p>The definition of "Ancillary Mandated Service" should be expanded to include Schedule 12C.</p>