HANDOVER OF TAIL LOCAL LEASED CIRCUITS UNDER SCHEDULE 7B OF SINGAPORE TELECOMMUNICATIONS LIMITED'S REFERENCE INTERCONNECTION OFFER

Submission by the StarHub Ltd to the Info-communications Development Authority of Singapore

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General

StarHub supports IDA's view that the handover of n x 64 kbps circuits to FBOs by SingTel at the interface standard of V.35 is economically and technically inefficient.

IDA had recognized that local leased circuits ("LLC") are an essential service in the telecommunications market and had therefore required SingTel to provide a mandated wholesale LLC service under SingTel's Reference Interconnection Offer ("RIO"). Further, it is clear that IDA has intended for the Wholesale Local Leased Circuits (Tail Circuits) Service ("TLLC") to be available on a long term basis.

Therefore, it is imperative that the FBOs' costs in acquiring TLLCs is not increased unnecessarily such as to render their own LLC prices uncompetitive.

This necessitates that IDA takes a critical view of the solutions proposed by SingTel and requires SingTel to offer the most economically and technically efficient mode of handover to FBOs for the TLLC service.

In this respect, StarHub believes that a handover at the Groomed G.703 interface standard will be more efficient than SingTel's proposed direct handover via 2-pair copper wire.

Direct Handover Configuration

IDA's consultation paper states that SingTel currently uses Tellabs 8100 equipment to provide LLC services, and that FBOs may have to install Tellabs 8100 node and relevant Tellabs proprietary interfaces to enable SingTel to handover the TLLCs.

No other information is provided in relation to exactly how SingTel intends to handover the TLLCs, the type of equipment that FBOs will need to invest in (Tellabs 8100 is a family of equipment) and how such equipment will need to interface with SingTel's own equipment. This had made evaluation of the Direct Handover Configuration difficult.

StarHub has, however, met with representatives of Tellabs, to gather information on the Tellabs 8100 equipment. Even after our meeting with Tellabs, StarHub believes that the Direct Handover Configuration raises certain concerns :

a) <u>Compatibility of FBOs' present equipment with Tellabs 8100</u>

Adding new components to a network poses significant risks. Compatibility between the new and existing equipment can only be confirmed after extensive tests. As StarHub has had no experience using Tellabs 8100 equipment, we are therefore unable to confirm that

this equipment is compatible with our present equipment. It is possible that use of the Tellabs equipment can impact on the quality or range of services that StarHub can offer. Furthermore, the use of proprietary standards may restrict the deployment of services in the future.

Further, while StarHub acknowledges that most equipment can be "made compatible" with each other, this normally entails some amount of customization. Again, without the ability to carry out tests, it is not possible to determine whether such customization is required and the costs associated with such customization.

b) Cost of Tellabs equipment will be expensive

As FBOs will only be purchasing the Tellabs equipment for purposes of TLLC handover, FBOs will not be purchasing significant numbers of such equipment. Therefore, FBOs will likely not be able to enjoy "bulk" discounts. This will translate to much higher prices for FBOs compared to the prices which SingTel pays. Clearly, this puts FBOs at an immediate competitive disadvantage vis-a-vis SingTel since this drives up the costs for the FBOs.

Further, other than equipment costs, FBOs will also need to invest in maintenance, spares as well as a Network Management System. FBOs will also need to incur costs for training personnel to handle the new equipment. IDA would note that such costs will be much higher for FBOs like StarHub who do not deploy Tellabs equipment extensively.

Based on the estimated costs provided to StarHub, we believe that the overall costs (capex and opex) of adopting the Direct Handover Configuration will increase substantially for FBOs. StarHub is prepared to share our cost estimates with IDA if required.

c) Space savings may not be significant

IDA has identified that the V.35 interface standard for handover gives rise to inefficient use of co-location space. However, StarHub submits that the Direct Handover Configuration will also not result in space savings.

Based on StarHub's understanding of the Tellabs 8100 equipment, it is likely that almost one full additional rack is required to house the Tellabs 8100 equipment (including the Tellabs 8100 subrack, battery and rectifier).

Given the uncertainty of compatibility of equipment and costs highlighted above, FBOs will continue to deploy their "proven" equipment for the G.703 interface standard (currently for circuits > 1536 kbps). Therefore, although there may no longer be a need for a separate intermediary NTU with the Direct Handover Configuration, the proposed Tellabs 8100 equipment will still need to be deployed in addition to the FBOs present equipment (for G.703 handover).

Under such circumstances, the Tellabs equipment will merely replace the intermediary NTUs and hence it is likely that more space will be required at SingTel's Exchange Buildings if this Configuration is adopted.

d) <u>No clear demarcation of responsibility</u>

As the handover point is via 2 pairs of copper wires running proprietary protocol, it is as yet unclear where the demarcation point between the two networks (SingTel's and the FBO's) is. Such demarcation is important for fault management/handling as it will demarcate the responsibilities of each operator.

StarHub's Proposal

Given the great amount of uncertainty and the higher costs associated with the proposed Direct Handover Configuration, StarHub would strongly urge IDA to consider requiring SingTel to handover TLLCs at the Groomed G.703 interface standard. This means that SingTel must groom the child circuits into a Channelised E1 circuit before handing off to each FBO. Please refer to the attached diagram.

StarHub submits that this mode of handover addresses all of IDA's concerns in terms of :

a) Imposition of unnecessary and unjustified costs on Requesting Licensees – FBOs can deploy existing equipment which readily accepts the G.703 interface standard.

b) Inefficient use of co-location space at SingTel's Exchange Buildings – FBOs will be able to use the same equipment for all TLLCs and not just for circuits with speeds greater than 1536 kbps.

c) Technical deficiency of the V.35 interface standard for carrier-to-carrier connection – There is no need for additional network elements which can result in more points of failure. There will also not be any interoperability issues since the G.703 interface standard is widely used and accepted. StarHub further submits that as the Channelised

E1 only contains the TLLC for one FBO, troubleshooting and fault management will be more easily undertaken by each operator.

d) Discriminatory behaviour - IDA would note that currently, under SingTel's commercial "Digiplus" service, SingTel grooms the tail circuits onto a 1984kbps trunk and hands over the 1984kbps trunk to FBOs at the G.703 interface standard. SingTel should therefore not be allowed to act in a discriminatory manner under the RIO.

Conclusion

StarHub believes that the Direct Handover Configuration will not adequately address IDA's concerns raised in its consultation paper. We believe that this configuration will result in substantially higher costs for FBOs, the requirement for more co-location space and even greater technical inefficiency.

StarHub therefore proposes that IDA require SingTel to handover TLLCs at the Groomed G.703 interface standard. We submit that this mode of handover addresses all of IDA's concerns in terms of economic and technical efficiency.

Co-Location at SingTel Exchange

Handover of Tail LLCs under RIO (Groomed Ch. E1 Handover)