CONSULTATION PAPER ON EMBEDDED SIM TECHNOLOGY

Submission by StarHub Mobile Pte Ltd to the Infocomm Media Development Authority

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Introduction:

1.   StarHub Mobile Pte Ltd ("**StarHub**") thanks the Infocomm Media Development Authority of Singapore (the "**Authority**") for the opportunity to comment on its consultation paper on eSIM technologies and the proposed eSIM regulatory framework in Singapore.

2.   StarHub has been working closely with its vendors to review the implementation of eSIM technologies in Singapore. We recognise the benefits of the technology, and the potential service improvements it may provide for consumers. However, like any new technology, there will be associated risks, and these must be carefully considered and managed.

3.   As general points, we would note the following:

➢ The market for eSIMs is nascent (both globally and in Singapore). If the Authority's goal is to grow the market, it should explore supporting eSIM and helping to establish viable business cases to be implemented in Singapore. It is essential that the Authority adopt a light-handed regulatory approach, and minimise costly regulations on the players in the eSIM ecosystem. Excessive regulation from the outset will significantly hamper growth and dampen innovation in this market.

➢ The technology for eSIMs is constantly evolving. The standards for this technology will be set at a global level, involving discussions between major mobile network operators ("**MNOs**"), vendors and device makers. We note that GSMA is at the forefront of this. In our view, Singapore will primarily be a standards-taker, and the Authority should not impose Singapore-specific technological requirements that may: (1) cause conflicts with overseas standards; and (2) negatively impact the growth of the eSIM market in Singapore.

4.   StarHub's detailed responses to the Authority's questions are attached below. We sincerely appreciate the Authority's consideration of our comments.

StarHub's Comments:

No SIM-Lock Policy

> **Question 1: IMDA would like to seek views and comments on the policy principle of extending the No SIM-lock policy to eSIM devices.**

5.   In implementing a "No SIM-lock" policy for eSIMs, it will be necessary to follow the SIM-locking policy that is implemented today for standard mobile services. For example, the Authority has stated that, for standard mobile services, SIM-locking can be implemented where the devices are rented (not sold). An equivalent approach should be taken with regard to eSIMs.

6.   Nevertheless, we can see cases for eSIMs implementation, where issues will arise as to who the actual "customer" is. For example, a global car manufacturer sells cars which are pre-loaded with eSIMs. The car manufacturer partners with an overseas MNO for global connectivity. The overseas MNO then implements arrangements with a specific MNO in Singapore to allow the car's eSIM to operate in Singapore. In this case, who should be allowed to request to switch MNOs? The car manufacturer, the overseas MNO or the car owner?

7.   It may not always be realistic for the Authority to ensure that end-user (i.e., the actual device user) always have the right to change their service providers. Nevertheless, there does need to be minimum licensing obligations imposed on the connectivity providers in the eSIM value-chain, to ensure that the issues set out above can be addressed.

> **Question 2: IMDA would like to seek views and comments on the application of the No SIM-lock policy on Consumer devices (e.g., mobile phones, tablets and wearables (such as smart watches and fitness trackers)) where they are eSIM-enabled**

8.   Please see our comments to Question 1 above. There are circumstances today where SIM-lock is allowed for standard mobile services (e.g. rented devices). This policy should continue in an eSIM environment.

> **Question 3: For M2M devices, IMDA would like to seek views and comments on placing the onus on mobile operators to facilitate switching of mobile operator profiles where consumer and enterprise end users request to switch mobile operators.**

9.   We agree that there could be situations where the M2M customer may choose to stay with a single MNO for a long-term period. Allowing a long-term contract could also provide corporate customers with significant price savings, especially for bulk tender contracts.

10.   However, it is unclear what the Authority is proposing in terms of "flexibility" in its application of the "No SIM-lock" policy. In the car manufacturing example highlighted above, is the Authority suggesting that, if an individual car owner wants to change networks, the MNOs should facilitate this (even if the new MNO does not have a contractual arrangement with the car manufacturer or the overseas MNO)? There may be practical issues associated

with some forms of porting; and so the responsibilities of the local MNOs – "to facilitate" porting, must be clarified in detail.

eSIM Technology

> **Question 4: IMDA would like to seek views and comments on the adoption of GSMA specifications for eSIM devices that are to be sold and used in Singapore to facilitate the deployment of OTA Remote Provisioning functionality.**

11.   We note that eSIM technology is constantly evolving. However, based on current developments, the GSMA standard is likely to be the internationally established standard to follow.

12.   Nonetheless, there is a risk that operators or device manufacturers may develop their own proprietary eSIM standards. If these alternative standards proliferate, they could become standalone "walled gardens". This could result in inter-operability issues, and to a fragmented ecosystem, which would negatively impact consumers and operators alike.

13.   If the GSMA standard is to be adopted in Singapore, we would then respectfully suggest the following:

➢ New eSIM devices coming into the market should only be type-approved based on the GSMA standards. This ensures that "incompatible" devices do not flourish in the market.

➢ MNOs providing eSIMs should also be required to work with partners who are GSMA SAS accredited. This ensures that the specifications and equipment used by the eSIM providers in Singapore are technically compatible.

> **Question 5: IMDA would like to seek views and comments on whether IMDA should require the mobile operators to adopt the GSMA SAS and ISO 27001 standards and secure the compliance of Relevant Providers in the eSIM OTA Remote Provisioning supply chain with the above-mentioned standards in the provisioning of eSIMs.**

14.   We note that ISO 27001 is a generic standard, not specific to the industry. Auditors for this standard may not have the specific expertise needed for the telecoms sector. Furthermore, if the Authority imposes ISO 27001 as a requirement on all operators in the eSIM value chain, this would create significant additional (and ongoing) costs on the industry, and could deter the roll-out of eSIM technologies.

15.   Given that eSIM technologies are at their nascent stage, we would disagree with the imposition of such heavy-handed regulatory requirements. The surest way to disincentivise investment in a particular service is to heavily regulate it from the outset. We do not believe that this is the Authority's intent for eSIM services.

16.   We would also highlight that:

- There are other alternative security standards being implemented today, such as PCI DSS certification. It may not be necessary to specify that ISO 27001 is the only applicable standard.

- The MNOs may potentially outsource the operations of an eSIM platform to external vendors. In such a situation, with the infrastructure being fully managed by a third party, any onus to comply with additional security requirements should lie on the third party directly. As highlighted above, our recommendation is that MNOs providing eSIM services should be required to work with vendors who are GSMA SAS accredited.

Question 6: Are there security gaps that GSMA SAS and ISO 27001 do not address, and if so, how should these gaps be plugged to facilitate trust and security in the provisioning of eSIMs, particularly in safeguarding the OTA profile management process.

17.   We would raise the following points which may be unique to a Singapore context:

- There may be situations where some MNOs (or mobile virtual network operators) in Singapore do not support eSIM services (this could be a commercial choice). Customers may therefore not be able to choose any operator they want.

- It is important to understand how the eSIM provisioning process will integrate with the mobile number portability ("**MNP**") process. In particular, the MNP database provider may need to implement changes to its systems to facilitate inter-operator porting of eSIMs.

18.   From an overall eSIM standards perspective, we believe that the GSMA standards are likely to be the globally accepted and adopted standard. Given the nascent stage of the eSIM market, these standards will have to be constantly reviewed and amended taking into consideration technological advancements and changes in the market. We would caution against the Authority seeking to implement Singapore-specific requirements on a globally-based standard, as this could create incompatibilities (especially given the fast-moving nature of these standards).

19.   It would be an unfortunate outcome if Singapore-specific standards result in:

- Players in Singapore being unable to adopt the latest eSIM specifications; or

- The rollout of eSIMs in Singapore being deterred altogether.

eSIM Business and Operating Models

Question 7: IMDA would like to seek views and comments on which eSIM provisioning model is best suited for mobile operator's needs, and why.

20.   Given the current small market size, our current view is that the fully outsourced model would be preferred. An advantage of having an outsourced partner is that the partner will be responsible for ensuring their systems keep pace with the evolving GSMA standards. Nonetheless, this may change when the market evolves and the technology changes.

21.   Importantly, we do not believe that the Authority should intervene to mandate specific operational models. Given the nascent stage of the market, this should be left up to the industry to decide, based on what makes the most commercial sense.

> **Question 8: Do you see any further developments on the eSIM provisioning models, such as opportunities for business to vertically integrate and additional opportunities for third parties to participate in the eSIM ecosystem?**

22.   As noted, the eSIM market is nascent, and there are significant uncertainties over how eSIMs will be implemented (both locally and globally). We would recommend against the Authority setting any unique or bespoke obligations on eSIM provisioning. Such arrangements are likely to impose additional costs on customers and discourage the establishment of a viable eSIM ecosystem.

> **Question 9: Given the changes to the SIM landscape, do you see any value capture opportunities for Singapore in relation to eSIM developments and adoption? These could be from a manufacturing or cyber-security function, for example.**

23.   Singapore will be a standards-taker in the global eSIM ecosystem. As the market is nascent, we are unable to provide further comments on this question. But again, we would caution against setting obligations on MNOs in regard to manufacturing or cyber-security, given the costs such obligations can create.

> **Question 10: As eSIM technology is still relatively nascent with few mass market devices using such technology, what additional support is required to encourage the development of the eSIM provisioning ecosystem in Singapore, in particular the OTA profile management function?**

24.   The eSIM market in Singapore (and globally) is small, and standards are moving very quickly. If the Authority is interested in facilitating the ecosystem, we would suggest that it help establish viable business cases for the implementation of eSIMs in Singapore. For example, the Authority could promote the use of eSIMs in Government contracts; or offset some of the costs the MNOs would face in implementing eSIMs.

25.   In addition, the Authority should not be imposing high regulatory costs on this industry as it will significantly deter growth and innovation.

> **Question 11: What would be the benefits and concerns for mobile operators to engage one trusted third party to provide services in support of OTA Remote Provisioning in Singapore, similar to the existing number porting arrangement.**

26.   We would be agreeable to engage a trusted third party if it is truly independent. However, there needs to be a viable business model in place, and specific requirements imposed on the third party to:

➢ Avoid the creation of a monopoly situation, or a situation where costs continue to escalate at the expense of consumers and operators in the market.

➢ Stay current with the evolving technologies for its systems. This is necessary to ensure that systems in Singapore are aligned with globally recognised standards.

27.   If the OTA Remote Provisioning in Singapore is managed by a third party, we respectfully submit that any security requirements should be imposed on this third party directly.

> **Question 12: Given the wide variety of applications for eSIM M2M devices, IMDA would like to seek views and comments on the proposed licensing framework and the proposed licence conditions for Consumer and M2M devices that are enabled with eSIM technology**

28.   At the minimum, Services-based Operator licensing should be imposed on the operators in the eSIM supply chain.

29.   In addition, while we note that the Authority may be less concerned with devices that are not built to support mobility, the eSIM itself would invariably support mobility (as this is innate to the mobile networks). Minimum licensing requirements will be needed to ensure oversight, and prevent abuse.

30.   In addition, the technology standards adopted for eSIMs should be standardised via type approval. Inter-operability concerns would arise if eSIM devices adopting other proprietary standards are brought into Singapore.

> **Question 13: To the extent where they are relevant, do you agree that the codes of practice, guidelines and consumer protection measures established by IMDA for the provision of mobile services should remain applicable to the operators who offer telecommunication services for the use of eSIM-enabled Consumer devices?**

31.   In general, we are agreeable to this comment. However, there are specific consumer-related provisions that may not be applicable to enterprise-type services. For example, the imposition of data roaming caps for M2M SIMs meant for roaming purposes, or number porting for M2M numbers.

32.   Existing regulations should therefore be imposed in a practical manner, depending on the specific circumstance of the service.

Conclusion:

33.   In summary, StarHub's key points are as follows:

➢ The eSIM market today is nascent. The Authority should encourage the market by supporting eSIM and helping to establish viable business cases to be implemented in Singapore. The Authority should also adopt a light-touch regulatory approach and refrain from imposing significant additional regulatory costs on the market. Otherwise, this will significantly deter growth and innovation.

➢ eSIMs technology is still evolving and being discussed at the global stage. As Singapore will be a standards-taker, the Authority should not seek to impose Singapore-specific requirements that could conflict with overseas standards, and end-up adversely impacting the growth of the eSIM market in Singapore.

34.   StarHub is grateful for the opportunity to comment on this matter and we appreciate the Authority's consideration of our comments.