

COMMENTS OF STARHUB LTD ON NIMS IDP2: INDUSTRY DIALOGUE ON ADOPTION OF NIMS STANDARDS

Executive Summary:

StarHub welcomes the opportunity to comment on this matter. StarHub agrees with the Authority that it is necessary to clarify the intended status of the NIMS CF STB standard. StarHub's position on this matter is as follows:

- ➔ **“Outcomes Based Approach”**. This approach is likely to generate a range of operational and implementation issues, as disputes will inevitably arise between RSPs over technical compatibility issues. Under this approach it is unclear: (a) how compatibility disputes will be resolved between RSPs; and (b) which RSP will be responsible for amending its STB / network in the event of technical compatibility issues arising.
- ➔ **“Mandatory Adoption Approach”**. This approach has the advantage of minimizing market fragmentation. But in order for this approach to work, it will be necessary for the Authority to: (a) mandate that the NIMS CF STB standard applies to all IPTV RSPs who will be using the Next-Gen NBN; and (b) issue a moratorium preventing the Next-Gen NBN from being used by IPTV RSPs until after the NIMS CF STB standard is finalized (a step necessary to ensure that the NIMS CF STB standard is followed).
- ➔ **“Industry Opt-In Approach”**. If it is not possible to adopt steps (a) and (b) for the “Mandatory Adoption Approach”, StarHub would support the “Industry Opt-in Approach”.

1. IDA and MDA invite views and comments on whether the NIMS CF STB would result in cost savings for an IPTV RSP. Where possible, please provide relevant cost figures supporting your views and comments.

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2. IDA and MDA note from industry feedback that current developments in IPTV standards are still nascent. Therefore, IDA and MDA invite views and comments on the feasibility, benefits and risks of a standards-based approach to accelerating the development of a vibrant NIMS Ecosystem.

In general, StarHub considers that a standard-based approach would facilitate the development of NIMS Ecosystem in the long term, provided appropriate standards are adopted.

- ➔ **Benefits of a standards-based approach:** If an appropriate standard is adopted, a standards-based approach could help to minimize fragmentation in the ecosystem. A standards-based approach might also result in increased efficiencies, as entities within the ecosystem could work towards a guided focus on the design and deployment of their services or products.
 - ➔ **Risks of a standards-based approach:** If the wrong standard is adopted, this could lead to a restricted choice of vendors, to limited functionality of services, and to higher cost structures for industry players (and ultimately customers). This would reduce the overall competitiveness and growth of the market.
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3. IDA and MDA invite views and comments on how the proposed areas of standardisation will impact the way IPTV RSPs differentiate their NIMS CF STBs, for example by including optional features as a way to attract new subscribers. Would there be an increase in promotions offering free rental of NIMS CF STBs to encourage end-users to switch STBs?

The manner in which IPTV RSPs differentiate their NIMS CF STBs will fundamentally depend on the manner in which the standard is introduced. For example, if a high-level or “Opt-In” standard is introduced, RSPs would have a wide scope to differentiate their STBs with unique applications or services. However, this differentiation could create some fragmentation of the market. Conversely, if a detailed and “Mandatory” standard is introduced, there will be limited scope for differentiation, but less market fragmentation.

We do not believe that the degree of standardization would – in and of itself – impact on “*promotions offering free rental of NIMS CF STB*”. The prevalence of promotions will be driven by more fundamental issues, such as the degree of competition in the market, the degree of Government support for Project NIMS, and the cost structures faced by operators.

4. IDA and MDA invite views and comments on whether the current approach to standardisation in Singapore should be applied to the Next Gen NBN, taking into consideration the open architecture of the Next Gen NBN. In particular, do you agree with IDA’s preliminary assessment that there is a need to provide greater clarity on standards relating to the host layers of the network?

StarHub respectfully believes that it is important to establish a definition of “host layers”. In particular we would welcome the Authority’s views on what are the equivalent of transport, session, presentation, and application layers in an IPTV system. The various IPTV standards have all defined protocols and specifications such as Service Discovery, Live Media Broadcast, Content on Demand, Declarative and Procedural Application Environments, etc. In order to ensure interoperability,

there is a need to mandate a core set of protocols and specifications. However, it is important to be mindful that over-dictating any standards will undermine the ability for the RSPs to create innovative services. We are therefore of the view that the standardization approach should seek to specify a minimum set of protocols and specifications to fulfill the “basic features”, but leaving open the specifications needed for optional and operator-specific features.

We would also note that, with the continuous advancement in chipset capabilities, STBs are increasingly able to support rich open source Operating Systems such as Linux and Androids, which eliminate the need for proprietary embedded operating systems such as VxWorks, OS21, or WinCE. Unlike traditional middlewares such as Open TV or Mediaroom, the use of such open source Operating Systems on the STBs already presents itself as an “open and standardized platform” allowing developers to create applications using a variety of tools, be it C/C++, Java, HTML/Javascript.

5. IDA and MDA invite views and comments on whether the proposed standardisation efforts should be focused on the IPTV RSPs operating on the Next Gen NBN. Should the proposed standardisation approach similarly apply to future network infrastructure?

StarHub strongly submits that the proposed standardization efforts should only be focused on IPTV RSPs operating on the Next Gen NBN. Clearly, given the uncertainties that exist as to what “future network infrastructure” might conceivably exist, we do not believe that the proposed standardization approach should apply to future network infrastructure.

6. IDA and MDA invite views and comments on whether the timeline for achieving the Immediate Goal facilitates the implementation plans of IPTV RSPs

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7. IDA and MDA invite views and comments on any other options that may be considered to achieve standardisation of IPTV Standards.

In considering ways to achieve standardization of IPTV standards, StarHub would encourage the Authority to consider non-regulatory mechanisms. The Authority might want to consider such options as:

- ➔ Facilitating the development of Government services that could be accessed through NIMS CF STBs;

- ➔ Encouraging the take-up of NIMS CF STBs through vouchers or subsidies to customers; and
 - ➔ Creating tax (or other) incentives for operators to develop applications and services for NIMS CF STBs.
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8. IDA and MDA invite views and comments on the feasibility and the benefits and risks of issuing an outcome-based direction. How could such risks be mitigated and/or avoided? Will the inability to capture all players in the NIMS Ecosystem with the outcome-based direction poses a significant problem?

StarHub would respectfully submit that the risks involved in an “Outcome-Based” approach are likely to outweigh the benefits, given the high degree of uncertainty surrounding this approach. For example:

- a) It is possible that two RSPs might both only comply with elements of the functional requirements.¹ In this scenario, when disputes arise between these two RSPs, it is unclear which operator would need to adjust its service in order to be compatible with the other’s service.
- b) It is possible that two RSPs might both only comply with elements of the functional requirements. When a third RSP enters the market, it may well face difficulties in identifying which RSP’s standards to follow, so as to achieve technical compatibility.
- c) Under an “Outcome-Based” approach, the degree of compulsion to comply with the functional requirements is unclear. For example, a large operator (with an expensive network) might not comply with some elements of the functional requirements, and might have a dispute with a small operator (with an inexpensive network) which complies with all of the functional requirements. In this scenario – when it is far more costly for the large operator to amend its network than it is for the small operator – it is unclear which operator would have to adjust its network / STB in order to be compatible with the other.
- d) It is unclear how disputes between operators would be resolved. For example, is it intended that the Authority would act in a quasi-judicial role, determining which RSP has failed to comply with the functional requirements, and mandating compliance? If this is the case, the difference

¹ This assumes that the functional requirements exist to provide a point of reference for the parties. In the absence of the functional requirements, incompatibility issues would be considerably harder to resolve.

between the outcome-based approach and the “Mandated” approach might be limited. Or is it intended that parties will use “commercial negotiations” to resolve disputes, without the Authority’s involvement? In this case, the outcome-based approach may have the same results as the “Opt-In” approach.

Given these issues, StarHub would not support an “Outcome-Based” approach.

9. IDA and MDA invite views and comments on the feasibility and the benefits and risks of adopting the industry opt-in approach. What are some of the factors which would encourage industry players to opt-in? What are some of the reasons why some IPTV RSPs might prefer not to adopt the recommended standards? How could such risks be mitigated and/or avoided?

In the absence of a “Mandated Approach” (see below), we believe that an “Opt-In” approach would be the best option to facilitate the development of IPTV standardization.

As IDA will be aware, IPTV standards are evolving. There is still some uncertainty as to which standard(s) will ultimately prevail on a global basis. In this situation, an “Opt-In” approach would provide IPTV RSPs the freedom to choose the most suitable standards for their businesses.

IPTV RSPs will be driven by the economics of their business as to whether they “Opt-In” or not. If the NIMS CF STB follows a widely-adopted and commercially deployed standard, this will encourage “Opt-In” (as it will give operators a degree of certainty as to their future cost structure and technology path). If the Government facilitates the development of Government services that can work through the NIMS CF STBs, this will encourage “Opt-In” (as it will potentially make the NIMS CF STBs more attractive to customers). Encouraging the take-up of NIMS CF STBs through vouchers or subsidies would also help to spark customer demand, thereby encouraging “Opt-In”. The Government also has the option of using tax incentives (or other incentives, such as lower licence fees) to encourage RSPs to “Opt-In” to the NIMS CF STB standard.

IPTV RSPs will be less likely to “Opt-In” if they believe the NIMS CF STB will: (i) increase their cost structure; (ii) reduce ability to innovate or to introduce new services; (iii) give an uncertain or restricted path of technology innovation; or (iv) potentially mean that their standards change without their agreement.

10. IDA and MDA invite views and comments on the benefits and risks of prescribing the standards for IPTV services provided over the Next Gen NBN.

The Authority's document correctly highlights the benefits and risks of prescribing IPTV standards. Such an approach would certainly help to reduce market fragmentation, and ensure ease-of-use for customers. However, prescribing standards does carry an element of risk, particularly as IPTV standards are evolving, and there is still uncertainty as to which standard(s) will ultimately prevail. In prescribing the standards for IPTV services, there is a risk that the Authority will lock Singapore into an inappropriate standard, ultimately resulting in higher charges and lower functionality for customers.

It is also unclear how the Authority would go about prescribing standards for IPTV services. IPTV services have already been launched in Singapore, using proprietary standards. It is unclear whether the Authority would mandate that - if such services are to be deployed over the Next Gen NBN - operators must abandon their proprietary standards and adopt the CF STB standard. However, unless the Authority takes this approach, the Authority is effectively exempting existing IPTV operators from the standards, significantly undermining the benefits of prescribed IPTV standards. By exempting existing IPTV operators, the effect would be to propagate non-compliant STBs and increase the burden on new IPTV operators, thereby stifling the growth of IPTV services.

In addition, the Authority's document suggests that the NIMS CF STB standard might not be finalized until Q1 2011. It is entirely possible that existing RSPs might seek to launch IPTV services over the Next Gen NBN (using proprietary standards) before the NIMS CF STB standards are finalized. Again it is unclear whether the Authority will prevent this outcome. StarHub submits that if the Authority intends to mandate standards for IPTV services, the Authority will need to ensure that:

- ➔ The mandate applies to all existing and new IPTV RSPs using the Next Gen NBN; and
- ➔ A moratorium is issued to prevent the Next-Gen NBN from being used by IPTV RSPs until after the NIMS CF STB standard is finalized (thereby ensuring that the NIMS CF STB standard will be followed, and avoiding RSPs from launching IPTV services on the Next-Gen NBN using proprietary standards).

11. IDA and MDA invite views and comments on the proposed approach to mandate adoption of standards based on the basic functions and the technical specifications which will be applied to the NIMS CF STB. What would be the likely costs of implementing these standardised basic functions? If an operator already owns infrastructure, how much of the existing components are likely to be reusable?



In line with our comments on Question 4, we agree that a minimum set of protocols and specifications will be required to fulfill the “basic feature” of the set-top box. This is likely to include areas such as Media Formats, Service Discovery and Selection, as well as a basic layer application environment. We are unable to comment of the costs of the implementation at this point until we have more clarity on the selected standards.

On the issue of reusability, we would highlight that an IPTV platform would be a “green-field” system to StarHub. As such, very few existing components could be reused in a new IPTV platform.

12. IDA and MDA invite views and comments on the likely scenarios in which IPTV RSPs may seek waivers from parts or all of the Mandated Standards.

StarHub would suggest that caution is needed in the granting waivers from all or part of the Mandated Standards. If the Authority determines that the NIMS CF STB standard is to be “Opt-In” or “Outcome-Based”, the standards should not be mandated. Similarly, if the NIMS CF STB standard is to be is to be “Mandatory”, granting waivers would defeat the purpose of mandating the standard.

13. IDA and MDA invite views and comments on what additional industry efforts are needed to foster the growth of the IPTV RSPs within the NIMS Ecosystem and what would be various roles that the industry can participate in?

[Confidential]