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7 October 2011

Ms Aileen Chia  
Deputy Director-General (Telecoms & Post)  
Infocomm Development Authority of Singapore  
10 Pasir Panjang Road  
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Singapore 117438

By email: IDA\_ILO@IDA.GOV.SG

Dear Ms Chia

**PUBLIC CONSULTATION ON GUIDELINES FOR THE PROVISIONING OF COAXIAL CABLE HOME NETWORKING SOLUTIONS**

1. We refer to the above public consultation document issued by the Authority on 2 September 2011.
2. StarHub Ltd is grateful for the opportunity to comment on the guidelines for the provisioning of coaxial cable home networking solutions. Enclosed is our response to the consultation.
3. Please do not hesitate to contact me, should anything in this letter require clarification or elaboration.

Yours sincerely  
For and on behalf of  
**StarHub Ltd**

A handwritten signature in black ink, appearing to be "TG" with a long horizontal stroke extending to the right.

Tim Goodchild  
Head (Government & Strategic Affairs)

Encl.

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**PUBLIC CONSULTATION ON THE  
GUIDELINES FOR THE PROVISIONING OF COAXIAL CABLE  
HOME NETWORKING SOLUTIONS**

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

**7 October 2011**

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## **Statement of Interest**

StarHub Ltd is a Facilities Based Operator (FBO) in Singapore, having been awarded a licence to provide public basic telecommunication services (PBTS) by the Telecommunications Authority of Singapore (TAS) (the predecessor to IDA) on 5 May 1998.

Nucleus Connect Pte Ltd, a wholly-owned subsidiary of StarHub Ltd, incorporated on 14 April 2009, is the appointed Operating Company of the Next Generation Nationwide Broadband Network.

StarHub Mobile Pte Ltd is a wholly-owned subsidiary of StarHub Ltd. StarHub Mobile Pte Ltd was issued a licence to provide public cellular mobile telephone services (PCMTS) by the TAS on 5 May 1998. StarHub launched its commercial PBTS and PCMTS services on 1 April 2000.

StarHub Ltd acquired CyberWay (now StarHub Internet Pte Ltd) for the provision of Public Internet Access Services in Singapore on 21 January 1999.

In July 2002, StarHub Ltd completed a merger with Singapore Cable Vision to form StarHub Cable Vision Ltd. StarHub Cable Vision Ltd holds a FBO licence and offers broadband and cable TV services.

StarHub Online Pte Ltd is a wholly-owned subsidiary of StarHub Ltd. StarHub Online Pte Ltd was issued a licence to provide Public Internet Access Services in Singapore on 22 February 2005.

This submission represents the views of the StarHub group of companies, namely, StarHub Ltd, StarHub Mobile Pte Ltd, StarHub Internet Pte Ltd, StarHub Online Pte Ltd and StarHub Cable Vision Ltd.

## 1. Introduction

StarHub welcomes the opportunity to provide comments to the Authority's public consultation on the guidelines for the provisioning of coaxial cable home networking (CCHN) solution. StarHub is a Broadband Coaxial System (BCS) operator providing cable TV, broadband and voice services over the BCS to customers.

StarHub has carefully reviewed the proposed guidelines and has the following key concerns:

- i. It is unclear how the proposed guidelines will be governed and will operate. It appears that compliance with the guidelines is not compulsory;
- ii. The proposed guidelines are inadequate as there is lack of clarity in some key areas with regard to the implementation of CCHN solution;
- iii. The proposed guidelines appear to be one-sided, as they place a significant risk and burden on the BCS operator should any problem arise from the installation of CCHN solution by Solution Providers. The guidelines do not take into proper account the accrued rights of the BCS operator, if its network or services are adversely damaged or disrupted by a Solution Provider;
- iv. Compliance with the CCHN Reference Specification is only voluntary. It is unclear what action the Authority and BCS operator can take if CCHN equipment which does not comply with the CCHN Reference Specification is sold in the market.
- v. Customers will bear the brunt of poor or disrupted services, if the rules of engagement are not properly enforced.

The Authority will recognise that any improper installation of CCHN solution by a Solution Provider will significantly affect the BCS operator's operation and provision of services over the BCS and end-users subscribing to those services.

StarHub submits that the proposed guidelines are critically important and need to be carefully formulated and enforced. It is necessary for all relevant stakeholders to comply with the guidelines. It is also necessary for the guidelines to provide clarity and to address all the issues and concerns arising from the implementation of a CCHN solution. This will ensure that the implementation of CCHN solution will not pose unnecessary problems to BCS operators, Solution Providers and end-users.

StarHub's specific comments on the proposed guidelines are set out in the following section.

## 2. Specific Responses

### 1. Introduction

#### Clause 1.2

StarHub has grave concerns over the lack of clarity as to how the guidelines will be governed and will operate. The proposed guidelines state that processes, procedures and workmanship practices should be observed by Solution Providers providing CCHN solution. In the event that any requirements in the guidelines are not observed by any Solution Provider, the Authority may require the Solution Provider to completely uninstall the CCHN solution and reinstate the in-home coaxial cable system to its original condition and/or to remove/replace any CCHN equipment which it has deployed.

The Authority will recognise that any improper installation of a CCHN solution by a Solution Provider will significantly affect a BCS operator's operation and provision of services over the BCS and end-users subscribing to those services. The burden should not be on the BCS operator to expend resources and costs to resolve any issue with end-users as a result of a Solution Provider not observing the guidelines during the provisioning of CCHN solution.

StarHub submits that merely requiring Solution Providers to uninstall non-compliant CCHN solution would not be effective in ensuring that Solution Providers take a serious view of the guidelines. In order to prevent unnecessary hardship to BCS Operators and end-users, the guidelines should stipulate that compliance with the guidelines is compulsory and that any failure to do so could, in addition to uninstall CCHN solution, result in an enforcement action by the Authority (e.g. a financial penalty or directed remedies).

StarHub also submits that the guidelines must make clear the requirement that there should not be any service disruption (except during installation of the isolation filter by the Solution Provider) to existing services that are provided over the BCS. The guidelines must also be unequivocal in requiring that there will be no tampering or damage to BCS cables (e.g. micro-injuries, cable cut), as it will impact the provision of services by the BCS operator.

## 2. Installation Guidelines

### **Suitability of Home Configurations and Minimum Conditions for Deployment of CCHN Solution**

#### Clause 2.2.1

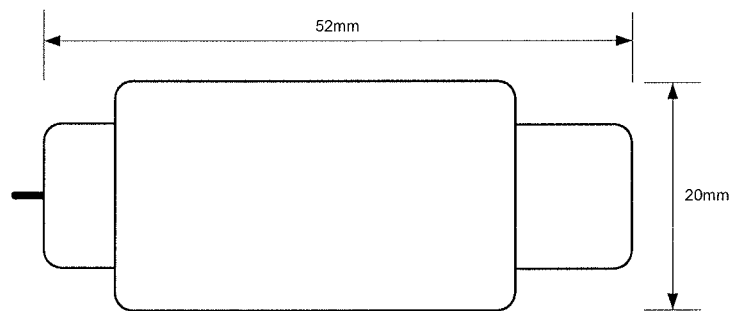
The proposed guidelines set out two typical layouts of in-home coaxial cable systems that are suitable for installation of CCHN solution. StarHub is very concerned with the second layout which allows the isolation filter to be installed within the home premise. StarHub highlight the following concerns with regard to the installation of isolation filter:

- i. The distribution tap acts as a common point for signal distribution to home units. An isolation filter installed at the distribution tap will ensure that: (a) there is proper network separation between different home units; and (b) there is proper isolation between the CCHN solution and cable services.
- ii. Installing the isolation filter at the distribution tap will prevent interference from the CCHN equipment to other home units (served by the distribution tap) not using the CCHN solution.
- iii. When the isolation filter is installed at the distribution tap, it provides a clear demarcation point and facilitates ease of service provisioning, fault restoration and resolution of disputes between a BCS operator and Solution Provider. This will enable the BCS operator and Solution Provider to be more responsive to customers' service needs and complaints.
- iv. There is no standardized configuration of the BCS in the home premise. An installer may not be able to identify the splitter where the main cable is split. Therefore, to avoid any potential problem caused by improper installation in the home premise, the isolation filter should be installed at the distribution tap where it can be easily identified and accessed.
- v. A splitter box within the home may have space constraints and may not be easily accessible. Therefore, improper installation will affect cable services.

Given the concerns, StarHub strongly submits that it is critically important that the isolation filter is only installed at the distribution tap. This will prevent interference to other end-users who are not using CCHN solution and ensure that a BCS operator and/or Solution Providers are able to respond to customers' service needs and complaints effectively and promptly.

StarHub would highlight that a BCS operator must not be placed at a disadvantage when providing services to the customers. It would be unreasonable and inequitable that a BCS operator is made to bear additional burden and resources to resolve end-user complaints, or be wrongfully perceived by end-users as the party responsible for providing unsatisfactory services, as a result of Solution Providers' implementation of CCHN solution. The proposal for the isolation filter to be installed within the home premise, would create significant problems, and should not be included in the guidelines.

Where the installation of an isolation filter is required at the distribution tap, StarHub would highlight that the overall length & diameter of the isolation filter (see diagram below) should not exceed 52mm and 20mm respectively. This is to ensure that future work in the distribution tap will not be impeded by the isolation filter. The F port (Male & Female) of the isolation filter should also comply with the technical specifications as set out in the COPIF.



#### Clause 2.2.2 and 2.2.3

StarHub submits that Solutions Providers should not be given the discretion whether to adhere to the requirements in clause 2.2.2 and 2.2.3 or otherwise. It is important that the Authority mandates Solution Providers comply with these requirements given the material adverse implications it can cause to a BCS operator and customers' enjoyment of uninterrupted services.

#### Clause 2.2.5

Clause 2.2.5 states that Solution Providers should conduct a thorough inspection of the BCS system within the customer's home and verify its condition. Generally, the inspection should minimally include the following aspects:

- (a) Coaxial distribution riser;
- (b) Coaxial distribution tap box in the riser;
- (c) Coaxial splitter box housing the coaxial splitter (if applicable);

(d) Layout of BCS in home; and

(e) TV outlets in home.

StarHub would clarify that the coaxial distribution riser, coaxial distribution tap box in the riser and coaxial splitter box housing the first coaxial splitter (if applicable) are located outside the customer's home. StarHub submits that the Authority should clarify in writing in the guidelines that the inspection of these facilities must require the presence of the BCS operator, who has control over the access to these facilities and has maintained these facilities, to ensure that no existing infrastructure would be damaged and no services to customers would be disrupted or adversely affected.

#### Clause 2.2.6

StarHub would emphasize that in situations where the condition of the in-home coaxial cable system does not meet the requirements specified in section 13.2 (Performance Requirements for Systems Operating between 5 MHz to 824 MHz) of the COPIF, the Solution Providers must not proceed with the installation of CCHN Solution, and should inform the end-user that the in-home coaxial cable system is not suitable for such installation. Any resultant damage caused to existing infrastructure must be the responsibility of the Solution Provider.

#### Clause 2.2.7

StarHub submits that proper documentary records should also be made available to the BCS operator when the BCS operator encounters complaints from customers on damage or disruption to cable services caused by the installation of CCHN solution. This is with a view to mitigate adverse end-user service experience caused by the Solution Provider's installation. Without these records, it will be extremely difficult (and time-consuming) for the BCS operator to trace the cause of the problem facing the customer.

### **General Setup Process**

#### Clause 2.3.1

StarHub submits that the written consent of end-users must be properly crafted to highlight true and practical consequences and concerns. The written consent should be made available to the BCS operator when the BCS operator encounters complaints from end-users on cable services caused by the installation of CCHN solution. In addition to the conditions set out in clause 2.3.1(a), (b), (c), the end-user must be made aware in writing that any relocation of the CCHN equipment, or to any other premise other than the initial installation location, may cause adverse interference to existing and new cable services. The end-user must be obligated to inform the Solution Provider to remove the isolation filter should the end-user terminate the use of CCHN solution or



move to a new premise, so that the end-user in the current premise will not be prevented from enjoying cable services over the frequency band.

#### Clause 2.3.2

It is unclear what the Authority means in this section by “relevant owner of the in-home coaxial cables”. If the Authority is referring to the BCS operator, StarHub requests that the guidelines clarify further on the matters which Solution Providers would require consent from a BCS operator prior to installation of CCHN solution.

StarHub also submits that for completeness, the clause should require Solution Providers to obtain consent from any party who “built, owns, operates and/or maintains the in-home co-axial cables (if different from the home owner)”.

#### Clause 2.3.3

Given the serious implications that any improper installation of CCHN solution would cause to a BCS operator and adverse disruption to end-user’s enjoyment of cable services, StarHub submit that Solution Providers must ensure that the installation of CCHN solution is only carried out by fit qualified persons, failing which they must be held responsible for any damage or loss arising.

#### Clause 2.3.4 and 2.3.5

Clause 2.3.4 states that *“Solution Providers should ensure that they, and any persons whom they engage, do not cause any damage or degradation to the existing coaxial cable services when carrying out the installation activities for the CCHN Solution.”*

Clause 2.3.5 states that *“Solution Providers should ensure that all CCHN equipment used, including the isolation filters, conform to the requirements set out in the IDA RS CCHN. Solution Providers should ensure that the isolation filter is properly installed at or between the coaxial distribution tap (leading to the in-home coaxial cable distribution) and the coaxial splitter, prior to the installation of the coaxial home network adaptors. Where access to the distribution tap box is required for purposes of installing the isolation filter, Solution providers should observe the procedure set out in Section 3 of these Guidelines.”*

StarHub would highlight that it is unclear what will be the consequences (and the recourse available for a BCS operator) should a Solution Provider fail to comply with above requirements and the IDA RS CCHN (the latter states that compliance is voluntary). As the impact to the BCS operator can be significant, StarHub would strongly submit that it is necessary to ensure that Solution Providers take a serious view of (and comply with) the guidelines and IDA RS CCHN, and that any failure to do so results in an enforcement action by the Authority. A Solution Provider should also be required to uninstall the CCHN solution, in the event that it causes interference to cable

services and/or when access to the distribution tap box has not been authorised by the BCS operator.

StarHub would also point out that in the IDA RS CCHN, the isolation filter requirements have specified signal attenuation up to 85MHz. StarHub submits that the attenuation should only be allowed to 75MHz, as StarHub has cable transmission signals beyond 75MHz. End-users would be deprived from enjoying cable services if the signal attenuation exceeds 75MHz.

#### Clause 2.3.6

Clause 2.3.6 states that *“Solution Providers should install coaxial home network adaptors at the identified TV outlets and ensure that all coaxial connectors are properly secured and tightened to avoid possible ingress or leakage of signals”*.

As noted in our comments on clause 2.3.1, it is important for Solution Providers to expressly inform the end-user in writing, when seeking consent for installation, that the CCHN equipment should not be re-located to any other location within the home or to any other premise, failing which this may cause adverse interference and disruption to cable services.

#### Clause 2.3.7

Clause 2.3.7 states that *“Additional coaxial splitters may be required for re-configuration of the BCS that is used for existing coaxial services.”*

StarHub submits that it is important for Solution Providers to ensure that such installations will still conform to the requirements specified in Section 13.2 of the COPIF so that there will be no degradation to cable services.

#### Clause 2.3.8, 2.3.9 and 2.3.10

As noted earlier, it is necessary for the guidelines to ensure that Solution Providers take a serious view of (and comply with) these requirements, and that any failure to do so results in an enforcement action by the Authority. Also, where it is necessary to resolve the interference through the removal of CCHN solution, the BCS operator should have the right to remove the CCHN solution and make good the cables services, and to charge the Solution Provider for doing so.

#### Clause 2.3.11

Proper documentation should be made available to the BCS operator when the BCS operator is required to resolve any interference complaint with its customers and/or Solution Providers. This is important, to ensure that customers do not bear the brunt of poor service caused by the Solution Provider.

#### Clause 2.3.12

StarHub would point out that if there is any interference to cable services, customers are also likely to contact the BCS operator. Therefore, it is necessary to establish fault investigation and resolution arrangements between the BCS operator and Solution providers for the implementation of CCHN solution.

#### Clause 2.3.13

The Authority will recognise the serious implications to a BCS operator's cable services when interference from a CCHN solution arises. End-users will expect a quick resolution to the affected cable services. As noted earlier, it is necessary to ensure that Solution Providers take a serious view of (and comply with) these requirements, and that any failure to do so results in an enforcement action by the Authority. Also, where it is necessary to resolve the interference through the removal of CCHN solution, the BCS operator should have the right to remove the CCHN solution and make good the cables services, and to charge the Solution Provider for doing so.

### **3. Responsibilities of BCS Operators and Grant of Access to BCS Facilities**

#### **General Obligations**

##### Clause 3.1.1

StarHub is very concerned that with this clause which appears to be one-sided and gives the CCHN solution a higher priority than cable services. StarHub notes that clause 1.2 allows for some service disruption to cable services when the CCHN solution is being installed, while clause 3.1.1 requires the BCS operator to ensure that there is no service disruption or degradation to the CCHN solution.

StarHub respectfully submits that there may be cases where service disruption would be inevitable arising from installation, upgrading or maintenance works to the BCS. StarHub envisages that some form of operational arrangements with the Solution Providers would have to be established. A BCS operator's installation, upgrading or maintenance works to serve customers should not be impeded as a result of the CCHN solution put in place by Solution Providers. A BCS operator should also have the right to remove the CCHN solution, in the event that there is unauthorised access or interference to cable services caused by the CCHN solution.

## **Grant of Access to Facilities Managed or Controlled by BCS Operators in Common Areas**

### Clause 3.2.2

It is unclear what the Authority meant by *“For the purposes of Section 3.2.1, the BCS Operator should not impose any requirements or conditions, save in relation to the grant of physical access to the BCS Facilities (e.g. the unlocking and locking of the co-axial tap box or co-axial splitter box) or the related on-site attendance for such purposes”*.

StarHub would envisage that the installation of CCHN solution would not only involve physical access to BCS facilities. It is important for other on-going and detailed working arrangements between the BCS operator and Solution Providers to be established. For example it would be necessary to cover co-ordination between parties if there are installation, upgrading and maintenance works to BCS facilities, investigation of interference caused by CCHN solution and resolution of complaints from end-users. Where a BCS operator needs to incur resources to support the installation of CCHN solution, or to resolve issues caused by CCHN solution, the BCS operator should be entitled to recover the costs from the Solution Providers. StarHub submits that it will be necessary for the parties to enter into commercial arrangements to govern these areas.

## **4. Resolution of Disputes**

StarHub submits that the proposed procedures are inadequate. It is also unclear what will happen if a BCS operator and a Solution Provider are unable to resolve a dispute on interference.

StarHub expects that each party should co-operate in a reasonable manner with the other party in relation to any joint investigation. Upon conclusion of the joint investigation, the interfering party shall take action to remove and correct the source of interference. If the interfering party is a Solution Provider, and it does not take action to remove and correct the source of the interference, the BCS operator must be able to take such rectification action as is necessary to remove the interference.

In addition, if the interference caused by the CCHN solution cannot be resolved, StarHub would expect that the existing cable services of a BCS operator would take priority and that the CCHN solution be required to be uninstalled or rectified.

## Appendix B – Post Installation Verification Process

### **TV channels (CNR and Signal Level Measurements Table)**

Under clause 1(c), a Solution Provider is required to ensure that the deviations for CNR and video signal levels from the standards specified in COPIF are no more than 4 dB respectively.

StarHub has grave concerns that a 4dB deviation is allowed, as this would impact a BCS operator's provisioning of cable services and pose issues for end-users. StarHub submits that after the installation of the CCHN solution, it is necessary for Solution Providers to still comply with minimum requirements stipulated in Section 13 of the COPIF (i.e. a minimum of 47dB for CNR and 0 dBmV for video signal levels).

### **Quality of Experience for Cable Broadband Services (where applicable)**

Under clause 3(b), a Solution Provider is required to ensure that:

- i. Deviation in the measured throughput before and after installation is no more than 10% of the measured throughput before the installation; and
- ii. Deviation in packet drops before and after installation is no more than 10% of the measured packet drops before installation.

StarHub is very concerned with the proposed 10% deviation allowed in measured throughput speeds and packet drops. StarHub would expect the impact to throughput to be kept to the minimum. StarHub also submits that there should be no deviation in packet drop as such deviation will impact cable services. A BCS operator should not be placed at a disadvantage and penalized in provision of cable services to end-users as a result of the installation of CCHN solution.

### 3. Conclusion

StarHub welcomes the opportunity to provide comments to the Authority's public consultation on the guidelines for the provisioning of CCHN solution.

StarHub has reviewed proposed guidelines and would highlight the following:

- i. It is unclear how the proposed guidelines will be governed and will operate. It also appears that compliance with the guidelines is not compulsory;
- ii. The proposed guidelines are inadequate as there is a lack of clarity in some key areas with regard to the implementation of CCHN solution;
- iii. The proposed guidelines appear to be one-sided, as they place a significant risk and burden on the BCS operator should any problem arise from the installation of CCHN solution by Solution Providers. The guidelines do not take into proper account, the accrued rights of the BCS operator, if its network or services are adversely damaged or disrupted by a Solution Provider;
- iv. Compliance with the CCHN Reference Specification is only voluntary. It is unclear what action the Authority and BCS operator can take if CCHN equipment which does not comply with the CCHN Reference Specification is sold in the market.
- v. Customers will bear the brunt of poor or disrupted services, if the rules of engagement are not properly enforced.

The Authority will recognise that any improper installation of CCHN solution by a Solution Provider would significantly affect the BCS operator's operation and provision of services over the BCS and end-users subscribing to those services. Damage caused to a BCS operator's infrastructure would also affect its accrued rights. Therefore, it is critically important that the proposed guidelines are carefully formulated, and have sufficient penal sanctions for non-compliance and be enforced. It is necessary for all relevant stakeholders to comply with the guidelines, and for the guidelines to provide clarity and to address all the issues that may arise from the implementation of the CCHN solution. This will ensure that the implementation of CCHN solutions will not pose unnecessary problems on BCS operators, Solution Providers and end-users.

StarHub is grateful for the opportunity to comment on this matter. In the event that submissions from other parties, particularly potential Solution Providers, raises new issues or is likely to affect responses given by StarHub under this submission, we would appreciate it if we could be afforded the opportunity to comment further on the matter.

StarHub Ltd  
7 October 2011