DECISION ISSUED BY THE
INFO-COMMUNICATIONS DEVELOPMENT AUTHORITY OF SINGAPORE

REVISION OF TECHNICAL SPECIFICATIONS FOR LINE TERMINAL EQUIPMENT

29 October 2013

REVISION OF TECHNICAL SPECIFICATIONS FOR LINE TERMINAL EQUIPMENT

INTRODUCTION

1. The revision of Technical Specifications for Line Terminal Equipment has been completed with the assistance of a Special Working Group ("SWG") of the IDA Telecommunications Standards Advisory Committee ("TSAC"), as part of TSAC's efforts to streamline standards for moving legacy services to Internet Protocol ("IP") based networks.

2. The TSAC SWG proposed to re-issue 5 revised Technical Specifications for connection of Terminal Equipment ("TE"), and withdraw 11 other existing Technical/Reference Specifications, where there was no further need for equipment suppliers to bring in new models of such equipment, or support user-network interfaces based on these Specifications.

3. It was followed by an IDA public consultation on 24 July 2013, to seek further views on the applicability of the revised IDA Technical Specifications:

    a. Technical Specification for Terminal Equipment connected to the Network Terminating Equipment ("NTE") or the Public Switched Telephone Network ("PSTN") for access to voice band services ("IDA TS PSTN" Issue 2)

    b. Technical Specification for Terminal Equipment connected to the Integrated Services Digital Network ("ISDN") ("IDA TS ISDN" Issue 2)

    c. Technical Specification for Cable Modems ("CM") connected to High-Speed Data-Over-Cable-Systems ("IDA TS CM" Issue 2)

    d. Technical Specification for Asymmetrical Digital Subscriber Line ("ADSL") Modems ("IDA TS ADSL" Issue 2)

    e. Technical Specification for Terminal Equipment connected to 2 Mbit/s, 34 Mbit/s and 140 Mbit/s Digital Line Lines ("IDA TS DLCN" Issue 2)

4. At the close of IDA's public consultation on 16 August 2013, comments were received from one respondent: StarHub Ltd.

5. IDA wishes to thank the respondent for the feedback. IDA has reviewed the comments received. This document discusses the issues raised during the consultation and sets out the decision. This document also summarises the changes being made as a result of the revision, and amendments carried out to provide clarity of requirements as requested by the respondent.

IDA RESPONSES TO COMMENTS RECEIVED

<u>Compatibility with the revised PSTN requirements</u>

6. Respondent raised the following concerns:

a. Existing Media Terminal Adaptor ("MTA") equipment could not support the revised service tones in the PSTN (Table 1 of the draft IDA TS PSTN Issue 2, June 2013).

b. Changes to the ringing tone may result in compatibility issues with fax machines currently available in the market.

c. Revision to services tones may result in equipment having different periodicities for the ringing, the busy and the waiting tones, giving rise to customer confusion.

7. IDA clarifies that no changes are required to be made to the MTA as the underlying services tones of Table 1 are taken from the existing PSTN requirements. They remain alongside the minimum service tones defined for the NTE. The revision is intended to give equipment suppliers and service providers the flexibility in providing various types of NTE that present basic PSTN requirements to the analogue TE when the TE is connected via an NTE to access voice band services over the Internet or IP network. For clarity, Table 1 has been replaced with Table 1a: Ringing Signal and Service Tones from the PSTN; and Table 1b: Ringing Signal and Service Tones from the NTE. The TE shall be capable of working with the ringing signal and service tones of Table 1a from PSTN as well as Table 1b from NTE.

8. IDA believes that compatibility issues with fax machines should not arise as clause 8 of the IDA TS PSTN remains unchanged, which defines the automatic answering requirement to be incorporated in fax machines, regardless of whether the fax communication is via the PSTN or the IP network.

9. IDA is of the view that as long as there is a standardised dial tone to signal network availability, regardless of whether consumers are PSTN or NTE users, differences in the periodicity of other service tones, or variations in other service tones, will not pose any concern.

<u>Consistency of the revised PSTN requirements</u>

10. Respondent cited inconsistency between line currents defined for the PSTN and the NTE, and recommended that an equal or a greater than a minimum value should suffice. IDA clarifies that the range of line currents designed for the PSTN and the NTE are meant to be flexible and sufficiently wide to take into account that the former has been planned for line loops of about 6 km while the latter may be planned for line loops shorter than 500 m. Nevertheless, the TE should be capable of working within both ranges of line currents, coming from the PSTN or the NTE.

11. Respondent recommended that the level of ringing voltage indicated in clause 6.2.1.4 of the IDA TS PSTN be replaced with a lower level that could be supported by existing network equipment for voice services. IDA clarifies that this clause is meant for verifying the robustness of TE for ability to withstand higher ringing voltages. The lower ringing voltage supported by the PSTN, has been specified in Table 1 of the existing TS PSTN.

Changes being made as a result of the revision

12. Changes made as a result of this revision, amendments carried out to provide clarity of requirements, and assessment of any impact to equipment suppliers and service providers, are summarised below.

#	Outcome of the Revision of Technical Specifications for Line Terminal Equipment	Clarification of Requirements
1	Re-issue a Technical Specification for Terminal Equipment (TE) connected to the Network Terminating Equipment (NTE) or the Public Switched Telephone Network (PSTN) for access to voice band services (IDA TS PSTN Issue 2, Oct 13). This Specification allows equipment suppliers and service providers the flexibility to provide various types of NTE that present the minimum PSTN requirements to the analogue TE when the TE is connected via an NTE to access voice services over the Internet or IP network.	The finalised IDA TS PSTN Issue 2 shall supersede the IDA TS PSTN Issue 1. The IDA TS PSTN Issue 2 sets out the applicable NTE requirements alongside the PSTN requirements for interworking with analogue TE. Equipment suppliers need not upgrade existing analogue TE, and also should be able to bring in new TE capable of interworking with the PSTN or the NTE in terms of loop signalling, ringing signal and service tones.
2	Re-issue a Technical Specification for Terminal Equipment connected to the Integrated Services Digital Network (ISDN) (IDA TS ISDN Issue 2, Oct 13). This Specification streamlines the physical Layer 1 requirements for ISDN Basic Access (BA) and Primary Rate Access (PRA), and consolidates the data link Layer 2 and the network Layer 3 requirements to enable mapping of ISDN Layer 2 and Layer 3 signalling protocols with Access Network (AN) protocols of the Next Generation Networks (NGNs).	The finalised IDA TS ISDN Issue 2 shall supersede the IDA TS ISDN BA Issue 1 and TS ISDN PRA Issue 1. The IDA TS ISDN Issue 2 has incorporated StarHub's updates on ISDN implementation options and guide to the recognised information elements in Annex A.1 and A.2 of the TS. These options are software selections made available to existing implementations.
3	Re-issue a Technical Specification for Cable Modems (CM) connected to High-Speed Data-Over-Cable-Systems (IDA TS CM Issue 2, Oct 13). This Specification streamlines requirements for CM of the 2nd or 3rd generation Data Over Cable Service Interface Specifications (based on ITU-T Rec. J.122 and J.222.1 to J.222.3 – DOCSIS 2.0 and 3.0 equivalents). The Specification also includes an Annex A for requirements of the IPCablecom Media Terminal Adapter (MTA) to be integrated with the CM to deliver PSTN services (based on the latest ITU-T Rec. J.173).	The finalised IDA TS CM Issue 2 shall supersede the IDA TS CM Issue 1. The IDA TS CM Issue 2 has incorporated provisioning requirements for delivering real-time services over Cable Access Television (CATV) to the new Annex A, based on ITU-T Rec. J167.

#	Outcome of the Revision of Technical Specifications for Line Terminal Equipment	Clarification of Requirements
4	Re-issue a Technical Specification for Asymmetrical Digital Subscriber Line (ADSL) Modems (IDA TS ADSL Issue 2, Oct 13). The Specification streamlines the requirements for the 2nd generation Asymmetric Digital Subscriber Line (ADSL) modems – ADSL2/ADSL2+, based on the latest ITU-T Rec. G.992.3 and G.992.5. Implementation of the functional requirements conforming to ITU-T Rec. G.992.3/G.992.5 may be verified, using the Broadband Forum TR-105 (2011).	The finalised IDA TS ADSL Issue 2 shall supersede the IDA TS ADSL Issue 1.
5	Re-issue a Technical Specification for Terminal Equipment connected to 2 Mbit/s, 34 Mbit/s and 140 Mbit/s Digital Line Lines (IDA TS DLCN Issue 2, Oct 13). The Specification streamlines and harmonises the network interface requirements for 2, 34 and 140 Mbit/s digital leased lines, based on relevant sections of ITU-T Rec. G.703 and ETSI Standards.	The finalised IDA TS DLCN Issue 2 shall supersede the IDA TS DLCN Issue 1. As digital leased line connections do not require any protocol to be exchanged at the network for call establishment and release, users may determine their use of circuit timing and data structure.
6	Withdraw the Technical Specification for Analogue Calling Line Identity Presentation (ACLIP) Facility for connection to Public Switch Telephone Network (IDA TS ACLIP).	The requirements for ACLIP have been incorporated into Annex G of the IDATS PSTN Issue 2. Therefore, no impact would be caused as a result of the withdrawal.
7	Annex J and K of the IDA TS PSTN on requirements for Input Procedure for Sending Alphanumeric Characters; and Short Message Service have been deleted.	These Annexes of the IDA TS PSTN are no longer applicable as operators have ceased to offer these services.
8	Withdraw the Technical Specification for connecting to the Broadband Integrated Services Digital Network (IDA TS BISDN)	Equipment suppliers need not refer to these Specifications as they cease to supply new models of such equipment. No upgrading of existing models will also be required as operators will require faulty equipment to be replaced with the exact model. Therefore, no impact would be caused as a result of the withdrawal.
9	Withdraw the Reference Specification for B-ISDN User-Network-Interface Physical Layer (IDA RS BISDN1); and the Reference Specification for B-ISDN User-Network-Interface (UNI) - Signalling for Basic Call/Connection Control (IDA RS BISDN2)	Same as item 8 above

#	Outcome of the Revision of Technical Specifications for Line Terminal Equipment	Clarification of Requirements
10	Withdraw the Reference Specification for Cable Modems (CM) (IDA RS CM1)	Equipment suppliers need not refer to this Specification as the support for CM requirements according to the DOCSIS 1.0 standard is no longer required.
11	Withdraw the Reference Specification for Cable Modems (CM) connected to the Radio Frequency Interface of the High-speed Data-Over-Cable Systems (DOCSIS 2.0) (IDA RS CM3)	The CM requirements according to the DOCISIS 2.0 standard have been incorporated into the IDA TS CM issue 2. Existing models of DOCSIS 1.1 and 2.0 CM deployed will not be affected as revision is a streamline of standards for the support of DOCSIS 2.0 and DOCSIS 3.0 with DOCSIS 1.1 backward compatibility.
12	Withdraw the Reference Specification for Multimedia Terminal Adaptor (MTA) (IDA RS MTA)	The MTA requirements have been incorporated into the IDA TS CM issue 2 as Annex A, based on the latest ITU-T Rec. J.173. No upgrading of existing MTAs (standalone or embedded in the CM) is required.
13	Withdraw the Reference Specification for High bit rate Digital Subscriber Line (HDSL) Modems (IDA RS HDSL)	Equipment suppliers need not refer to this Specification as the support for HDSL is no longer required.
14	Withdraw the Reference Specification for Single-pair High-Speed Digital Subscriber Line (SHDSL) Transceivers (IDA RS SHDSL)	Equipment suppliers need not refer to this Specification as the support for SHDSL is no longer required.
15	Withdraw the Reference Specification for Very-High-Speed Digital Subscriber Line (VDSL) System (IDA RS VDSL)	Equipment suppliers need not refer to this Specification as the support for VDSL is no longer required.
16	Withdraw the Reference Specification for connection of Terminal Equipment to the X.25 Packet Switch Public Data Network (PSPDN) (IDA RS PDN1)	Equipment suppliers need not refer to this Specification as the support for X.25 packet switching is no longer required.

Lead time for implementing the revised Technical Specifications

13. Respondent requested for an extension of the lead time from 6 to 12 months to be given to equipment suppliers/dealers for implementing the revised Technical Specifications as a 6-month period may be too short a time for them to introduce the necessary upgrades to ensure compliance.

14. Considering that minimum changes are required to be made, IDA believes that a 6-month lead time should be adequate for equipment suppliers to implement the

5 revised Technical Specifications for the purpose of equipment registration with IDA.

SUMMARY OF IDA'S DECISION

15. IDA has considered the comments received and incorporated the necessary changes, and hereby issues the following 5 revised IDA Technical Specifications on **29 October 2013**:

    a. Technical Specification for Terminal Equipment connected to the Network Terminating Equipment or the Public Switched Telephone Network for access to voice band services (IDA TS PSTN Issue 2)

    b. Technical Specification for Terminal Equipment connected to the Integrated Services Digital Network (IDA TS ISDN Issue 2)

    c. Technical Specification for Cable Modems connected to High-Speed Data-Over-Cable-Systems (IDA TS CM Issue 2)

    d. Technical Specification for Asymmetrical Digital Subscriber Line Modems (IDA TS ADSL Issue 2)

    e. Technical Specification for Terminal Equipment connected to 2 Mbit/s, 34 Mbit/s and 140 Mbit/s Digital Line Lines (IDA TS DLCN Issue 2)

16. As reference to the following IDA Technical/Reference Specifications is no longer required for equipment registration with IDA, or for supporting existing network services, IDA hereby withdraws these Technical/Reference Specifications on **29 October 2013**:

    a. Technical Specification for Analogue Calling Line Identity Presentation Facility for connection to Public Switch Telephone Network (IDA TS ACLIP)

    b. Technical Specification for connecting to the Broadband Integrated Services Digital Network (IDA TS BISDN)

    c. Reference Specification for B-ISDN User-Network-Interface Physical Layer (IDA RS BISDN1)

    d. Reference Specification for B-ISDN User-Network-Interface (UNI) - Signalling for Basic Call/Connection Control (IDA RS BISDN2)

    e. Reference Specification for Cable Modems (IDA RS CM1)

    f. Reference Specification for Cable Modems connected to the Radio Frequency Interface of the High-speed Data-Over-Cable Systems (DOCSIS 2.0) (IDA RS CM3)

    g. Reference Specification for Multimedia Terminal Adaptor (IDA RS MTA)

    h. Reference Specification for High bit rate Digital Subscriber Line Modems (IDA RS HDSL)

i. Reference Specification for Single-pair High-Speed Digital Subscriber Line Transceivers (IDA RS SHDSL)

j. the Reference Specification for Very-High-Speed Digital Subscriber Line System (IDA RS VDSL)

k. Reference Specification for connection of Terminal Equipment to the X.25 Packet Switch Public Data Network (PSPDN) (IDA RS PDN1)

17. A 6-month lead time exists from the publication of the 5 revised IDA Technical Specifications listed in paragraph 5 above. This 6-month period allows equipment suppliers to implement these revised Technical Specifications accordingly, for the purpose of equipment registration with IDA. As such, equipment suppliers shall only be required to ensure compliance with these 5 revised IDA Technical Specifications, where relevant, with effect from **2 May 2014.**