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G.983.2

Amendment 1

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SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

Digital sections and digital line system – Optical line systems for local and access networks

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ONT management and control interface specification for B-PON

Amendment 1

ITU-T Recommendation G.983.2 (2002) – Amendment 1

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ITU-T Recommendation G.983.2

ONT management and control interface specification for B-PON

Amendment 1

Summary

This amendment provides additional (optional) features to ITU-T Rec. G.983.2 (2002). These modifications provide additional means for ease of product identification, provide information on level of security supported by ONT, provide DS3 Circuit Emulation Service (CES) support, provide access to current performance monitoring data, and provide additional features to support POTS.

Source

Amendment 1 to ITU-T Recommendation G.983.2 (2002) was prepared by ITU-T Study Group 15 (2001-2004) and approved under the WTSA Resolution 1 procedure on 16 March 2003.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementors are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database.

CONTENTS

ITU-T Recommendation G.983.2

ONT management and control interface specification for B-PON

Amendment 1

1) Scope

The intent of this amendment is to expand ITU-T Rec. G.983.2 [1] to include additional information and functionality. Additional attributes are added to various managed entities described in ITU-T Rec. G.983.2 [1] to enhance product identification, to provide information regarding enhanced security, to provide DS3 Circuit Emulation Service (CES) support, to provide access to current performance monitoring data, and to provide support for additional POTS features.

2) References

Add the following reference:

[1] ITU-T Recommendation G.983.2 (2002), *ONT management and control interface specification for B-PON*.

3) Abbreviations

Add the following abbreviations:

AES Advanced Encryption Standard

CLEI Common Language Equipment Identification

POTS Plain Old Telephone Service

4) Add support for generic vendor equipment codes, OMCC version information, and enhanced security information

4.1) $ONT_{B\text{-}PON}$ managed entity

Add the following attributes to the end of the attribute list in clause 7.1.1/G.983.2:

Equipment id: This attribute may be used to identify the specific type of ONT. In North America, this may be used for the equipment CLEI code. (R) (optional) (20 bytes).

OMCC version: This attribute is used to identify the specific version of the OMCC protocol being used by the ONT. This is used to allow the OLT to manage a network with ONTs that support different OMCC versions. Valid values include 0x00 (2000 version) and 0x01 (2002 revised version). Future versions will be added sequentially. Default value is 0x00. (R) (optional) (1 byte).

Vendor product code: This attribute is used to provide a vendor-specific product code for the ONT. (R) (optional) (2 bytes).

Security capability: This attribute is used to advertise the advanced security modes of the ONT. The following codepoints are defined:

0: No extra security features are supported;

1: AES encryption of the downstream payload is supported;

2..255: Reserved for future use.

(R) (optional) (1 byte).

SecurityMode: This attribute is used to select the advanced security mode for the ONT. Note that all secure VPs in an ONT must use the same security mode at any time. The following codepoints are defined:

0: Churning algorithm will be used;

1: AES algorithm will be used;

2..255: Reserved for future use.

(R, W) (optional) (1 byte).

4.2) Subscriber line card managed entity

Add the following attribute to the end of the attribute list in clause 7.1.3/G.983.2:

Equipment id: This attribute may be used to identify the vendor's specific type of line card. This attribute applies only to line cards that do not have integrated interfaces. In North America, this may be used for the equipment CLEI code. (R) (optional) (20 bytes).

4.3) PON IF line card managed entity

Add the following attribute to the end of the attribute list in clause 7.1.6/G.983.2:

Equipment id: This attribute may be used to identify the vendor's specific type of PON interface card. This attribute applies only to PON interface cards that do not have integrated interfaces. In North America, this may be used for the equipment CLEI code. (R) (optional) (20 bytes).

5) Add attributes to physical path termination point POTS UNI managed entity

For ONTs that support POTs interfaces, there are some additional configurations that are not supported by the current model. To support these, ITU-T Rec. G.983.2 requires additional attributes on the Physical Path Termination Point POTS UNI managed entity.

Add the following attributes to the end of the attribute list in clause 7.3.26/G.983.2:

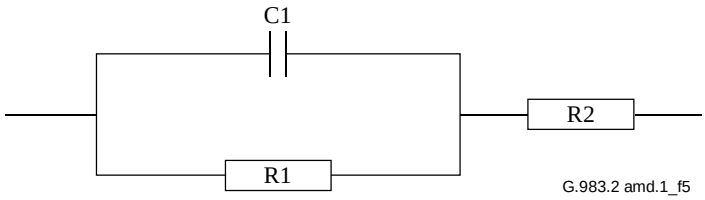
Impedance: This attribute allows the impedance for the Physical Path Termination Point POTS UNI to be configured by the user. Valid values include 600 Ohm Impedance (value 0x00) and 900 Ohm Impedance (value 0x01). In addition, the following parameter sets are valid (see also Annex C of [App. I-1] in Bibliography):

value 0x02: C1 = 150 nF, R1 = 750 Ohm, R2 = 270 Ohm;

value 0x03: C1 = 115 nF, R1 = 820 Ohm, R2 = 220 Ohm;

value 0x04: C1 = 230 nF, R1 = 1050 Ohm, R2 = 320 Ohm,

where C1, R1, and R2 are related as shown below. (R,W) (optional) (1 byte).



Transmission path: This attribute allows for setting the Physical Path Termination Point POTS UNI to be put in either full-time or part-time on-hook transmission mode. Valid values include full-time on-hook transmission (value 0x00) and part-time on-hook transmission (value 0x01). (R,W) (optional) (1 byte).

Rx gain: This attribute provides a gain value for the received signal. Valid values are –12 dB to +6 dB in 0.1 dB increments. (value –120 to +60, 0 = 0 dB gain, –120 = –12.0 dB, etc.). (R,W) (optional) (1 byte).

Tx gain: This attribute provides a gain value for the transmit signal. Valid values are –6 dB to +12 dB in 0.1 dB increments. (value –60 to +120, 0 = 0 dB gain, 60 = +6.0 dB, etc.). (R,W) (optional) (1 byte).

6) Add back pressure operation to priority $Queue_{B\text{-}PON}$

Back pressure is defined as a mechanism for backward flow control. The back pressure signal is sent backward and causes the customer terminal to temporarily suspend sending data. *To support back pressure operation, add the attributes below to the end of the attribute list for the Priority* $Queue_{B\text{-}PON}$ *managed entity described in clause 7.5.1/G.983.2*:

Back pressure operation: This attribute is used to activate (enable: value 0x00) or deactivate (disable: value 0x01) the functions of Back Pressure operation. Default value is 0x00. (R, W) (mandatory) (2 bytes).

Back pressure time: This attribute indicates the time duration in which the customer terminal temporarily suspends sending data. This attribute presents the duration in microseconds. This attribute can be used as a pause time for Ether UNI. Values: 0x00000000 to 0xFFFFFFFF. Upon autonomous instantiation, the value 0x00000000 is used. (R, W) (mandatory) (4 bytes).

Back pressure occur queue threshold: This attribute identifies the threshold size of this queue to start sending Back Pressure signal. (R, W) (mandatory) (2 bytes).

Back pressure clear queue threshold: This attribute identifies the threshold size of this queue to stop sending Back Pressure signal. (R, W) (mandatory) (2 bytes).

7) Add DS3/E3 CES support to Physical Path Termination Point CES UNI

The existing Physical Path Termination Point CES UNI covers primarily DS1 CES attributes. The modifications listed in this clause provide support for DS3 and E3 CES.

7.1) Modify framing attribute

Rename the "Framing" *attribute in clause 7.3.3/G.983.2 to* "DS1Framing".

7.2) Modify encoding attribute

Modify "Encoding" *attribute in clause 7.3.3/G.983.2 as indicated below:*

Encoding: This attribute denotes the encoding scheme required. Valid values are "B8ZS" (value 0x00), "AMI" (value 0x01), "HDB3" (0x02) and "B3ZS" (0x03). Upon autonomous instantiation, the value 0x00 is used. (R, W) (1 byte) (mandatory).

7.3) Add LineType attribute

Add the following attribute to the end of the attribute list in clause 7.3.3/G.983.2:

LineType: This attribute denotes the line type used in the application for DS3 or E3 interfaces. Valid values are:

0x00, Other;

0x01, ds3m23;

0x02, ds3syntran;

0x03, ds3CbitParity;

0x04, ds3ClearChannel;

0x05, e3Framed;

0x06, e3plcp.

(R, W) (mandatory for DS3 and E3 interfaces, not applicable to other interfaces) (1 byte).

7.4) Modify LineLength attribute

Modify the description for the "LineLength" *attribute in clause 7.3.3/G.983.2 and the associated Table 6e/G.983.2 as indicated below:*

LineLength: This attribute provides the length of the twisted pair cable from the physicalPathTTP of type "DS1" interface to the DSX1 cross-connect point or the length of the DS3 cable from the physicalPathTTP of type "DS3" to the DSX3 cross-connect point. Valid values are given in Table 6e. Upon autonomous instantiation for DS1 interfaces, the value 0x00 is used for non-power feed type DS1, and the value 0x06 is used for power feed type DS1. Upon autonomous instantiation for DS3 interfaces, the value 0x0F is used. (R, W) (1 byte) (optional).

Table 6e/G.983.2 – Valid values for LineLength attribute

Value	Power Feed	Line Length
0x00	Non-power feed type DS1	0-33.5 m (0-110 ft)
0x01	Non-power feed type DS1	33.5-67.1 m (110-220 ft)
0x02	Non-power feed type DS1	67.1-100.6 m (220-330 ft)
0x03	Non-power feed type DS1	100.6-134.1 m (330-440 ft)
0x04	Non-power feed type DS1	132.1-167.6 m (440-550 ft)
0x05	Non-power feed type DS1	167.6-201.2 m (550-660 ft)
0x06	Power feed type DS1 (Wet-T1), short haul	0-40.5 m (0-133 ft)
0x07	Power feed type DS1 (Wet-T1), short haul	40.5-81.1 m (133-266 ft)
0x08	Power feed type DS1 (Wet-T1), short haul	81.1-121.6 m (266-399 ft)
0x09	Power feed type DS1 (Wet-T1), short haul	121.6-162.5 m (399-533 ft)
0x0A	Power feed type DS1 (Wet-T1), short haul	162.5-199.6 m (533-655 ft)
0x0B	Power feed type DS1 (Wet-T1), long haul	0 db
0x0C	Power feed type DS1 (Wet-T1), long haul	7.5 db
0x0D	Power feed type DS1 (Wet-T1), long haul	15 db
0x0E	Power feed type DS1 (Wet-T1), long haul	22.5 db
0x0F	DS3 power feed	0-68.5 m (0-225 ft)
0x10	DS3 power feed	68.5-137.1 m (226-450 ft)

8) Add "Get current data" capability

When troubleshooting a problem, it is often valuable to have access to the "current data" on the ONT. The "Get current data" action provides the ability to look at the counters on the ONT in real-time.

8.1) Add "Get current data" action to all managed entities that gather statistical and performance information

Add the following action to the "Actions" *section for each managed entity that collects statistical and performance information. For backwards-compatibility, support of this action is optional:*

Get current data: This action returns the *current* value of one or more actual counters associated with performance monitoring attributes and the value of the Interval End Time attribute representing the interval in which the request is made. The values in the specific counters are reset at the end of the interval.

NOTE – "Get" returns the statistical data stored in the attribute values; "Get current data" returns the real-time value of the actual counters associated with those attributes.

Support of this action is optional.

8.2) Add "Get current data" action to list of OMCI message types

Add the following entry to Table 20/G.983.2:

MT	Type	Purpose	AK	Inc MIB data sync.
28	Get current data	Get current counter value associated with one or more attributes of a managed entity	yes	no

8.3) Attribute mask for "Get current data" and "Get current data response"

Add "Get current data" *and* "Get current data response" *to the list of actions in clause II.1.4/G.983.2 that use the attribute mask described by Table II.1/G.983.2.*

8.4) Message layout for "Get current data" and "Get current data response"

Add message layouts for "Get current data" *and* "Get current data response" *to clause II.2/G.983.2.*

8.4.1) Get current data

Field	Byte	8	7	6	5	4	3	2	1	Comments
Transaction identifier	6-7									
Message type	8	0	1	0						DB = 0, AR = 1, AK = 0 bits 5-1: action = get current data
Device identifier type	9	0	0	0	0	1	0	1	0	OMCI = 0x0A
Message identifier	10									Entity class
	11									msb entity instance
	12									lsb entity instance
Message contents	13									msb attribute mask
	14									lsb attribute mask
	15-45	0	0	0	0	0	0	0	0	padding

8.4.2) Get current data response

Field	Byte	8	7	6	5	4	3	2	1	Comments
Transaction identifier	6-7									
Message type	8	0	0	1						DB = 0, AR = 0, AK = 1 bits 5-1: action = get current data
Device identifier type	9	0	0	0	0	1	0	1	0	OMCI = 0x0A
Message identifier	10									Entity class
	11									msb entity instance
	12									lsb entity instance
Message contents	13	0	0	0	0	x	x	x	x	result, reason 0000 = command processed successfully 0001 = command processing error 0010 = command not supported 0011 = parameter error 0100 = unknown managed entity 0101 = unknown managed entity instance 0110 = device busy 1001 = attribute(s) failed or unknown
	14									msb attribute mask
	15									lsb attribute mask
	16									Attribute value of first attribute included (size depending on the type of attribute)
										…
										Attribute value of last attribute included (size depending on the type of attribute)
	xx-41	0	0	0	0	0	0	0	0	padding
	42									"optional attribute" mask (attributes 1-8), used with "1001" encoding: 0 = default 1 = unsupported attribute
	43									"optional attribute" mask (attributes 9-16), used with "1001" encoding: 0 = default 1 = unsupported attribute

9) Modify length of cell rate attributes

All attributes related to cell rates currently are shown as 2 bytes. This is not sufficient. *Change length of attributes related to cell rates from 2 bytes to 4 bytes.*

10) Appendix V

Add a new reference to Bibliography:

[App. I-1] ETSI TS 101 270-1 V1.2.1 (1999), *Transmission and Multiplexing (TM); Access transmission systems on metallic access cables; Very high speed Digital Subscriber Line (VDSL); Part 1: Functional requirements*.

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