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Amendment 1
Corrigendum 1
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SERIES G: TRANSMISSION SYSTEMS AND MEDIA, DIGITAL SYSTEMS AND NETWORKS

Digital sections and digital line system – Access networks

Very high speed digital subscriber line transceivers 2 (VDSL2)

Amendment 1

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CAUTION !

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Corrigendum 1 to ITU-T Recommendation G.993.2 Amendment 1

Very high speed digital subscriber line transceivers 2 (VDSL2)

Abstract

This is draft text for Corrigendum 1 to G.993.2 Amendment 1. It includes the following:

- revise Table 11-26 according to Issue 11.2.7
- revise Table 11-27 according to Issues 11.2.8 and 11.2.9
- revise the text in the paragraph immediately following Table 11-28 in §11.2.3.11 according to Issue 11.3.4
- revise Table 12-5 in §12.3.2.1.1 according to Issue 12.2.3.2
- revise §13.2.2 according to Issue 13.2.1
- add new §9.9 – Delay variation

Summary

This corrigendum to G.993.2 Amendment 1 corrects errors in Tables 11-26, 11-27 and 12-5, §11.2.3.11 and §13.2.2, and adds a new §9.9 on delay variation.

1. Revise Table 11-26/G.993.2 as follows:

Table 11-26/G.993.2 – PMD Test Parameter Read responses sent by the responding VTU

Name	Length (octets)	Octet number	Content
Single Read ACK	~~Parameter-dependent~~42 (see NOTE 1)	2	81_{16} (NOTE 2)
		3 ~~+~~to 42	octets for the test parameters arranged for the single read format
Multiple Read ACK	12	2	82_{16} (NOTE 2)
		3 to 12	octets for the test parameters arranged for the multiple read format
NACK	2	2	80_{16} (NOTE 2)
Block Read ACK	Parameter-dependent (see NOTE 1)	2	84_{16} (NOTE 2)
		3 +	octets for the test parameters arranged for the block read format
NOTE 1 – Message length equals 2 octets plus the length shown in Table 11-27. NOTE 2 – All other values for octet number 2 are reserved by the ITU-T.			

2. Revise Table 11-27/G.993.2 as follows:

Table 11-27/G.993.2 – PMD test parameter ID values and length of responses

Test parameter ID (NOTE)	Test parameter name	Length for Single Read (octets)	Length for Multiple Read (octets)	Length for Block Read or Vector Block Read (octets)	Length for Scalar Read (octets)	Support
01_{16}	Channel transfer function Hlog(*f*) per sub-carrier group	N/A	4	2 + (stop sub-carrier group index − start sub-carrier group index + 1) × 2	N/A	Mandatory
03_{16}	Quiet line noise PSD QLN(*f*) per sub-carrier group	N/A	3	2 + (stop sub-carrier group index − start sub-carrier group index + 1)	N/A	Mandatory
04_{16}	Signal-to-noise ratio SNR*(f)* per sub-carrier group	N/A	3	2 + (stop sub-carrier group index − start sub-carrier group index + 1)	N/A	Mandatory
21_{16}	Loop attenuation LATN	2×5	N/A	N/A	~~2 +~~ 2×5	Mandatory
22_{16}	Signal attenuation SATN	2×5	N/A	N/A	~~2 +~~ 2×5	Mandatory
23_{16}	Signal-to-noise ratio margin SNRM & SNRM-pb	2×6	N/A	N/A	~~2 +~~ 2×6	Mandatory

Test parameter ID (NOTE)	Test parameter name	Length for Single Read (octets)	Length for Multiple Read (octets)	Length for Block Read or Vector Block Read (octets)	Length for Scalar Read (octets)	Support
24_{16}	Attainable net data rate ATTNDR	4	N/A	N/A	~~2 +~~ 4	Mandatory
25_{16}	Near-end actual aggregate transmit power ACTATP	2	N/A	N/A	~~2 +~~ 2	Mandatory
26_{16}	Far-end actual aggregate transmit power ACTATP	2	N/A	N/A	~~2 +~~ 2	Mandatory
27_{16}	Far-end actual impulse noise protection INP_act	N/A	N/A	N/A	~~2 +~~ 2	Optional
NOTE – all other Test parameter ID values are reserved by the ITU-T.						

3. Revise the text in the paragraph immediately following Table 11-28 in §11.2.3.11 as follows:

A Scalar Read command shall be used to retrieve a single test parameter. Support of this read command is optional. The ID of the test parameter to retrieve shall be indicated in the third octet of the read command as specified in Table 11-25. In response to a Scalar Read command, the VTU shall send the value of the test parameter if this command and the test parameter are supported by the VTU; otherwise the VTU shall send a NACK. The format of the octets for each parameter value shall be as described in §11.4.1. Values formatted as multiple octets shall be mapped to the response in order of most significant to least significant octet. The format of the LATN, SATN and SNRM shall be identical to the format used in Single Read Command. The Far-end actual impulse noise protection (ID=27_{16}) shall include two 1-octet values and be sent in the order shown in Table 11-28.1. For a disabled bearer (see Table 12-45, Mapped configurations of downstream bearer channels and TPS-TC types field), the VTU-R shall set the corresponding octet to ZERO. The VTU-O shall ignore this octet.~~The value FF_{16} shall be used to indicate the disabled bearers.~~

4. Revise Table 12-5, as follows:

Table 12-5/G.993.2 – VTU-O CL message NPar(3) bit definitions

G.994.1 SPar(2) Bit	Definition of NPar(3) bits
Profiles	Each valid profile is represented by one bit in a field of 8 bits. The valid profiles are: 8a, 8b, 8c, 8d, 12a, 12b, 17a and 30a. Each profile supported by the VTU-O is indicated by setting its corresponding bit to ONE.
Bands	For a given band plan as defined in the regional annexes, this NPar(3) field

Upstream	shall include all of the upstream bands in ascending order starting at f_2 (as shown in Figure A-1, Table B-1, Figure C-17~~-1~~) and ending at the highest band required for the highest frequency profile for which support is indicated. Up to four upstream bands may be defined. Each band shall be defined by a start sub-carrier index and stop sub-carrier index using 13 bits per index value. The sub-carrier indices shall represent 4.3125 kHz sub-carrier spacing. Adjacent upstream bands shall be coded as separate bands.
Bands Downstream	For a given band plan as defined in the regional annexes, this NPar(3) field shall include all of the downstream bands in ascending order starting at f_1 (as shown in Figure A-1, Table B-1, Figure C-17~~-1~~) and ending at the highest band required for the highest frequency profile for which support is indicated. Up to four downstream bands may be defined. Each band shall be defined by a start sub-carrier index and stop sub-carrier index using 13 bits per index value. The sub-carrier indices shall represent 4.3125 kHz sub-carrier spacing. Adjacent downstream bands shall be coded as separate bands.
RFI Bands	This NPar(3) shall indicate in ascending order the start sub-carrier index and stop sub-carrier index for each RFI band in which the transmit PSD is to be reduced below −80 dBm/Hz. Each index is represented by 13 bits. Up to 16 RFI bands may be defined. The sub-carrier indices shall represent 4.3125 kHz sub-carrier spacing.
Initial IDFT Size ($2N$)	This NPar(3) indicates the initial downstream IDFT size that the VTU-O shall use at the beginning of the Channel Discovery phase, encoded as a number from 7 to 13 representing n, where IDFTsize $2N = 2^n$
CE Lengths	This NPar(3) is a field of 15 bits representing the valid CE lengths: $2N/32$, $3N/32$, $4N/32$, …, $16N/32$ inclusive. For each CE length that the VTU-O can support, the corresponding bit shall be set to ONE. The bit corresponding to $5N/32$ shall always be set to ONE.
Annex A US0	A parameter block of 5 octets encoding the Annex A US0 capabilities. This block shall be coded as follows: - Bits 1-6 of octet 1 and bits 1-4 of octet 2 shall be individually set to ONE to indicate support by a VTU-O of the corresponding Annex A US0 masks EU-32 through EU-128. - Bits 1-6 of octet 3 and bits 1-4 of octet 4 shall be individually set to ONE to indicate support by the VTU-O of the corresponding Annex A US0 masks ADLU-32 through ADLU-128. - Bit 1 of octet 5 shall be set to ONE to indicate that all supported Annex A US0 masks are also supported by the VTU-O for profile 12b. This bit may be set to ONE if profile 12b is supported. - Bit 2 of octet 5 shall be set to ONE to indicate that all supported Annex A US0 masks are also supported by the VTU-O for profile 17a. This bit may be set to ONE if profile 17a is supported.
Annex B US0	A parameter block of 2 octets encoding the Annex B US0 capabilities. This block shall be coded as follows: - Bits 1-3 of octet 1 shall be individually set to ONE to indicate support of the corresponding Annex B US0 masks by the VTU-O. - Bit 1 of octet 2 shall be set to ONE to indicate that all supported Annex B US0 masks are also supported by the VTU-O for profile 12b. This bit may be set to ONE if profile 12b is supported.

	- Bit 2 of octet 2 shall be set to ONE to indicate that all supported Annex B US0 masks are also supported by the VTU-O for profile 17a. This bit may be set to ONE if profile 17a is supported.
Annex C US0	A parameter block of 3 octets encoding the Annex C US0 capabilities. This block shall be coded as follows: - Bits 1-2 of octet 1 shall be individually set to ONE to indicate the support of the corresponding Annex C US0 Type(b) masks by the VTU-O. - Bits 1-2 of octet 2 shall be individually set to ONE to indicate the support of the corresponding Annex C US0 Type(co) masks by the VTU-O. - Bit 1 of octet 3 shall be set to ONE to indicate that all supported Annex C US0 masks are also supported by the VTU-O in the profile 12b. This bit may be set to ONE if profile 12b is supported. - Bit 2 of octet 3 shall be set to ONE to indicate that all supported Annex C US0 masks are also supported by the VTU-O in the profile 17a. This bit may be set to ONE if profile 17a is supported.

5. Revise §13.2.2 as follows:

13.2.2 Parameters controlling the OLR procedures

The list of parameters controlling OLR procedure Type 3 is presented in Table 13-3.

Table 13-3/G.993.2 –Control parameters controlling the OLR procedures

Parameter	Definition
RA-USNRM *RA-UTIME*	The rate adaptation upshift noise margin and time interval (defined in ITU-T Rec. G.997.1 [4]). The parameter can be different for the VTU-O (*RA-USNRMus* and *RA-UTIMEus*) and the VTU-R (*RA-UTIMEds*, *RA-USNRMds*). VTU-O: configured through CO-MIB. VTU-R: configured through CO-MIB and communicated to the VTU-R during initialization (O-MSG 1). The valid values for *RA-USNRMus* and *RA-USNRMds* are values between 0 and 31.0 dB in steps of 0.1 dB. The valid values for *RA-UTIMEus* and *RA-UTIMEds* are values between 0 to 16383 s in steps of 1 s.

RA-DSNRM *RA-DTIME*	The rate adaptation downshift noise margin and time interval (defined in ITU-T Rec. G.997.1 [4]). The parameter can be different for the VTU-O (*RA-DSNRMus* and *RA-DTIMEus*) and the VTU-R (*RA-DTIMEds*, *RA-DSNRMds*). VTU-O: configured through the CO-MIB. VTU-R: configured through the CO-MIB and communicated to the VTU-R during initialization (O-MSG 1). The valid values for RA-DSNRMus and RA-DSNRMds are values between 0 and 31.0 dB in steps of 0.1 dB. The valid values for RA-DTIMEus and RA-DTIMEds are values between 0 to 16383 s in steps of 1 s.
~~DV_p~~	~~The delay variation occurring in an OLR on latency path *p*.~~ ~~It is defined here as~~ ~~$DV_p = \lvert (delay_p\_H * L_p\_H - delay_p\_L * L_p\_L) / L_p\_H \rvert$~~ ~~where Lp_L is the lower value of L_p in an OLR procedure~~ ~~Lp_H is the higher value of L_p in an OLR procedure~~ ~~$delay_p$_L = the actual delay in ms in the steady state corresponding with Lp_L~~ ~~$delay_p$_H = the actual delay in ms in the steady state corresponding with Lp_H~~ ~~The delay variation DV_n of bearer channel #n shall always be set to the value of DV_p of the underlying PMS-TC path function (see Annex K)~~
$DVmax_n$	The maximum allowed value for the delay variation DV_n of bearer channel #n It ranges from 0.1 to 25.4 in steps of 0.1 ms The value 25.5 indicates that no delay variation bound is imposed. The parameter can be different for the VTU-O and the VTU-R. VTU-O: configured through the CO-MIB. VTU-R: configured through the CO-MIB and communicated to the VTU-R during initialization (O-TPS).

6. Add new §9.9 – Delay variation, as follows:

9.9 Delay variation

The delay variation occurring in an OLR on latency path *p*.

It is defined here as:

$$DV_p = \lvert (delay_p\_H \times L_p\_H - delay_p\_L \times L_p\_L) / L_p\_H \rvert$$

where L_p_L is the lower value of L_p in an OLR procedure

L_p_H is the higher value of L_p in an OLR procedure

$delay_p\_L$ = the actual delay in ms in the steady state corresponding with L_p_L

$delay_p\_H$ = the actual delay in ms in the steady state corresponding with L_p_H

The delay variation DV_n of bearer channel #n shall always be set to the value of DV_p of the underlying PMS-TC path function (see Annex K).