

Steven Tas
Vice-President Regulatory



together
with



Contact: Wim De Rynck
Tel: +32 (0)2 202 92 64
Onze ref.: OA09-0913-OUT
Bijlage : 1
Vertrouwelijk

BIPT
De Heer E. Van Heesvelde
Voorzitter van de Raad
Ellipse Building - Gebouw C
Koning Albert II laan, 35
B-1030 Brussel

Brussel, 29 september 2009

Betreft: Addendum to BRUO Annex C Technical Specifications regarding VDSL 2

Geachte Heer Van Heesvelde,

In bijlage voegen wij de meest recente versie van het "*Addendum to BRUO Annex C Technical Specifications regarding VDSL 2*". Deze aanpassing (van 28 september 2009) werd opgesteld naar aanleiding van het voornemen van Belgacom om een hogere bandbreedte te gebruiken voor de doorgifte van VDSL2 over haar netwerk, namelijk de "17 Mhz band". Daarnaast werden ook de regels inzake de zogenaamde "*Upstream Power Back Off*" ("UPBO") aangepast.

Belgacom wenst hierbij uw aandacht te vestigen op het feit dat de zogenaamde "Custom UPBO" parameters op dit ogenblik nog niet volledig gevalideerd zijn, en er dienaangaande door Belgacom nog testen zullen worden uitgevoerd. Belgacom voorziet om de definitieve validatie in de loop van het goedkeuringsproces van het BRUO Addendum te kunnen doorvoeren. Het spreekt voor zich dat niet kan uitgesloten worden dat deze validatie er in voorkomend geval kan toe leiden dat het huidige voorstel met betrekking tot de UPBO nog dient aangepast te worden.

We hopen op een spoedige goedkeuring van bijgevoegd Addendum met het oog op een inwerkingtreding tegen eind maart 2010. In dit opzicht stelt Belgacom voor om een vergadering te plannen met uw diensten waarbij Belgacom bijgevoegd Addendum verder kan toelichten. Onze medewerkers nemen hiervoor contact op met uw diensten.

Hoogachtend,

Group Regulatory Affairs Division
Tel: +32 (0)2 202 88 99
Fax: +32 (0)2 202 85 33

Addendum to BRUO Annex C Technical Specifications regarding VDSL2

Addendum of 28 September 2009

1. Introduction

The current addendum updates the rules regarding the deployment of VDSL2 in the local loop and subloop in the BRUO Technical Specifications (Annex C of the BRUO offer).

For the purpose of references and insertions of sections this addendum refers to "**BRUO_Annex C_Technical_Specifications_Unofficial version coordinated by Belgacom.doc**" document that is a merged version of the official BRUO Annex C Technical Specifications, version 14 March 2006, taking into account the addenda of 12 October 2006 (related to ADSL2 Annex M), 16 July 2007 (related to ADSL2 Annex L), 7 August 2007 (related to the Inquiry Tool) and 24 October 2007 (related to VDSL2).

The present addendum has been submitted for verification to the BIPT in order to become effective as of 22 March 2010.

2. Modifications to “§5. Common technical specifications for the equipment to be connected to the loop or sub-loop”

Within “5.1 VDSL2” an insertion shall be done in following text

VDSL2 as defined in sections 6.13 (VDSL2 from LEX), 10.6 (VDSL2 from LDC) or 10.7 (VDSL2 from KVD) shall respect following deployment rules:

Upstream bands U1 and U2 may not be used in situations where UPBO mechanism may fail to protect upstream transmission of other VDSL2 lines.

As written below:

VDSL2 as defined in sections 6.13 (VDSL2 from LEX), 10.6 (VDSL2 from LDC) or 10.7 (VDSL2 from KVD) shall respect following deployment rules:

VDSL2 partitioning of the frequency spectrum into non-overlapping frequency bands, each of which is allocated for either upstream or downstream transmission shall respect the 998 or 998ADE17 band plans defined in annex B of ITU-T Recommendation G.993.2 and its amendment 1.

This implies that limit mask B8-1, B8-2, B8-3, B8-4, B8-5, B8-6, B8-7, B8-10, B8-11 and B8-12 of table B-3 of ITU-T Recommendation G.993.2 amendment 1 are allowed for transmission.

When spectral compatibility with VDSL systems in the same cables is needed, it shall be possible to limit downstream transmit PSD level in order not to exceed -61dBm/Hz in template value (or -57.5 in peak values as defined in G.993.2)

VDSL2 Upstream Power Back Off, as defined in §7.2.1.3 of ITU-T Recommendation G.993.2, shall be applied for upstream bands U1 and U2. Depending of the equipment location one of following set of a and b parameters shall be used:

UPBO parameter set	U1		U2	
	A	B	A	B
ETSI-D	47,3	26,21	54	17,36
Custom BGC	54,5	19,7	53,2	14,6
Mix	47,3	26,21	53,2	14,6

Note

At the time of writing the addendum to BRUO that includes above UPBO parameter sets:

- The ETSI-D parameter set corresponds to the UPBO that is applied to all VDSL2 and VDSL1 lines. This parameter set was inherited from the VDSL1 deployment.
- At the launch of VDSL1 the operator had to select an UPBO model amongst a set of pre-defined model. At that time ETSI-D parameter set was probably the best choice to match deployment conditions in terms of noise and loop length in BGC access network.
- VDSL2 introduce the possibility to customize the parameters of the UPBO. The Custom BGC parameter set is expected to better match deployment conditions in terms of noise and loop length in BGC access network.
- Tests and trial could indicate that the lines with Custom BGC UPBO risk impacting negatively lines with ETSI-D UPBO if deployed in the same cables. To avoid such interferences, all lines that have a common injection point in the access network (e.g. same KVD) must use the same UPBO parameter set. Because migration scenarios have not been studied yet, the equipments must support all parameter sets.

- The Mix UPBO parameter sets take benefit that the upstream band U2 is actually not activated for current VDSL2 lines in Belgacom access network. By mixing ETSI-D parameters in band U1 and Custom BGC parameter in band U2, future line profiles could thus benefit from a better UPBO optimisation in the band U2 without impact the existing lines that still use ETSI-D in the band U1.

Upstream bands U1 and U2 may not be used in situations where UPBO mechanism may fail to protect upstream transmission of other VDSL2 lines.

3. Modifications to "6. Technical specifications for the equipment to be connected to the raw copper loop"

The text of section "6.13 VDSL2" shall be replaced with following text:

VDSL2 systems complying with recommendation ITU-T G.993.2 main body and annex B shall be allowed for use on local loop from LEX in any of the following situations

- Loops are directly connected to the LEX without any KVD.
- Loops are connected to a specific KVD wherefore it has been estimated that over 90% of the customers behind the KVD could get same services over VDSL2 from the LEX as from the KVD.

When allowed, VDSL2 systems for use on local loop from LEX shall respect the deployment rules as defined in section 5.1.

4. Modifications to the current section "10. Sub-loop unbundling"

The text of section "10.6 Remote VDSL2 from LDC" shall be replaced with following text:

VDSL2 systems complying with recommendation ITU-T G.993.2 main body and annex B shall be allowed for use on local loop from LDC in any of the following situations

- Loops are directly connected to the LDC without any KVD.
- Loops are connected to a specific KVD wherefore it has been estimated that over 90% of the customers behind the KVD could get same services over VDSL2 from the LDC as from the KVD.

When allowed, VDSL2 systems for use on local loop from LDC shall respect the deployment rules as defined in section 5.1.

The text of section "10.7 Remote VDSL2 from KVD" shall be replaced with following text:

VDSL2 systems complying with recommendation ITU-T G.993.2 main body and annex B shall be allowed for use on local loop from KVD when KVD is present and the KVD does not qualify for VDSL2 delivery from LEX or LDC.

VDSL2 systems complying with recommendation ITU-T G.993.2 main body and annex B shall be allowed for use on local loop from KVD (as defined in §9.3.2) under the condition it respects following rules:

- Respect of the deployment rules as defined in section 5.1.
- When spectral compatibility with ADSL or ADSL2+ systems in the same cables is needed, it shall be possible to apply Downstream Power Back Off (DPBO) as defined into ITU-T G.997.1 §7.3.1.2.13 and described further in this document.

To perform Downstream Power Back Off, the VDSL2 systems shall limit the downstream power spectral density below the RESULTMASKds PSD mask defined in ITU-T G.997.1 §7.3.1.2.13 and Appendix II.

The parameters of the method described in ITU-T G.997.1 to compute RESULTDMASKds shall be as follows:

- Assumed VDSL2 PSD mask (DPBOPSDMASKds) shall fit under at least one of the 998 LIMIT Masks listed in Table B-3 of G.993.2
- Assumed exchange PSD mask (DPBOEPSD) shall fit under the ADSL2+ Limit PSD mask defined in G.992.5 annex A.1.3.
- E-side electrical length (DPBOESEL) shall be set to the attenuation value at 300 kHz of the path with minimal attenuation between the LEX, or LDC when present, and the KVD, or it shall be selected out of a set of discrete values depending of that attenuation. Below a table is provided defining discrete DPBOESEL values in function of KVD attenuation at 300kHz The KVD attenuation shall be provided by Belgacom when necessary.
- E-side cable model (DPBOESCM) shall use following values
 - DPBOESCMA = 0,109375
 - DPBOESCMB = 1,48828125
 - DPBOESCMC = 0,24609375
- Minimum usable signal (DPBOMUS) shall not exceed -95dBm/Hz.
- It shall be possible to limit the Minimum Usable Frequency (MUF) to not go below 552 kHz.
- DPBO span minimum frequency (DPBOFMIN) is set to 138kHz
- DPBO span maximum frequency (DPBOFMAX) is set to 1104 kHz when spectral compatibility with ADSL or ADSL2 is needed or to 2208 kHz when spectral compatibility with ADSL2+ is needed.

Following table defines DPBOSEL in function of KVD attenuation at 300kHz:

KVD Attenuation @ 300kHz	DPBOSEL
[0..1[	no DPBO
[1 .. 3[	2
[3 .. 5[	4
[5 .. 7[	6
[7 .. 9[	8
[9 .. 11[	10
[11 .. 13[	12
[13 .. 16[	14
[16 .. 20[	18
[20 .. 24[	22
[24 .. 28[	26
[28 .. 32[	30
[32 .. 36[	34
[36 .. 40[	38
[40 .. 45[	42
[45 .. 51[	48
[51 .. 57[	54
[57 .. 63[	60
[63 .. Inf[	66

Table: DPBOSEL discrete values

DUJEUX Françoise (STR/REG)

From: RightFax E-mail Gateway [id972470@belgacom.be]
Posted At: 29 September 2009 13:25
Conversation: Your fax has been successfully sent to To Whom It May Concern at 022268841. RE: OA09-0913-OUT
Posted To: Inbox
Subject: Your fax has been successfully sent to To Whom It May Concern at 022268841. RE: OA09-0913-OUT

Y

