



Addendum to WBA VDSL2

Introduction of the vectoring zones 6&7

Approved by BIPT on 28/06/2018
Sensitivity: **Unrestricted**

Table of contents

1. Purpose	3
2. Dependencies with other addenda.....	3
3. Scope and planning	3
4. Prerequisites.....	3
5. Vectoring general principle and new deployment rules	4
6. New vectoring provisioning & repair profiles	6
7. DLM process	8
8. List of new line profiles.....	9
9. Ordering and provisioning process	9
10. Other operational impacts	10
10.1 E-tools.....	10
10.1.1 XDSL availability tool (web interface)	10
10.1.2 XDSL availability tool (XML interface)	10
10.2 Delivery, repair & e-troubleshooting	10
10.3 TBF	10
10.4 DLM	10
10.5 Pricing	10
11. Adaptation on WBA documents	11

1. Purpose

VDSL2 coverage progressively increased and reached by end October 2017 an effective service coverage of 94 % ⁽¹⁾.

The present addendum further extends the VDSL2 coverage by opening the **new vectoring zones 6 & 7**.

2. Dependencies with other addenda

Different addenda related to this addendum have previously been approved by the BIPT:

- Addendum to BRUO & BROBA, “ADSL from ROP in non-BO-nets” (approved by the BIPT on 08/02/2015)
- All addenda on the subject of Vectoring and DLM.

3. Scope and planning

The purpose of the present addendum is to address the impacts on the WBA VDSL2 reference offer of the opening of the new vectoring zones 6 and 7 (including DLM).

This addendum is applicable to the WBA VDSL2 services with shared and with dedicated VLAN, as described in the WBA VDSL2 reference offer.

The present addendum has been communicated to the BIPT in order to become effective as from **22 October 2018** ².

4. Prerequisites

The use of the new vectoring zones 6 and 7 requires certain conditions to be fulfilled:

1. The activation of the new vectoring zones 6 and 7 is only possible on ROPs that provide “ADSL from ROP” connectivity or have been activated for VDSL2 vectoring in the frequency band between 1,1 MHz and 2,2 MHz or between 552 kHz and 2,2 MHz.
2. Only vector compliant modems (e.g. the NGHGW+, A-Modem and OLO-CPEs) support the new vectoring zones 6 and 7. All other modems, including certified vector friendly modems, will synchronize on a fall-back line profile (e.g. the Sagemcom F@ST 3464).

¹ Cf the “Network transformation outlook 2017-2022” document which is published on the Proximus Wholesale website.

² Proximus might postpone this date in order to guarantee the quality of the deliverables

5. Vectoring general principle and new deployment rules

Reminder: the principle of vectoring is to cancel the cross-talk (FEXT) between different VDSL2 lines present in the same copper binder by injecting an anti-signal on each crosstalk-impaired VDSL2 line of the bundle. With no interference, each vectored VDSL2 line can operate at higher-speeds, downstream and upstream, as if it was the only line in the binder.

As from 22/10/2018,² Proximus also targets to activate VDSL2 provisioning *downstream* speeds on vectored lines to reach a:

- Downstream Maximum Net Data Rate of **11 Mbps** in the 2,2 MHz vectoring zone 6
- Downstream Maximum Net Data Rate of **13 Mbps** in the 1,1 MHz vectoring zone 6
- Downstream Maximum Net Data Rate of **13 Mbps** in the 552 kHz vectoring zone 6
- Downstream Maximum Net Data Rate of **8 Mbps** in the 2,2 MHz vectoring zone 7
- Downstream Maximum Net Data Rate of **8 Mbps** in the 1,1 MHz vectoring zone 7
- Downstream Maximum Net Data Rate of **8 Mbps** in the 552 kHz vectoring zone 7

As from 22/10/2018,² Proximus targets to activate VDSL2 provisioning *upstream* speeds on vectored lines to reach an:

- Upstream Maximum Net Data Rate of **1,5 Mbps** in the vectoring zones 6
- Upstream Maximum Net Data Rate of **1,5 Mbps** in the vectoring zones 7

The **new provisioning rules, applicable for all new VDSL2 lines** provisioned as from 22/10/2018 onwards, are summarized in the table below:

Zone	Legacy VDSL2		Vectoring from 2,2MHz		Vectoring from 1,1MHz		Vectoring from 552kHz	
	Len (m)	Att (dB)	Len (*) (m)	Att (dB)	Len (*) (m)	Att (dB)	Len (*) (m)	Att (dB)
1	400	0,4	900	0,4	900	0,5	900	0,5
2	700	0,7	1200	0,7	1200	0,7	1200	0,8
3	1000	1	1700	1	1800	1,1	1900	1,15
4	1400	1,4	2300	1,4	2300	1,4	2300	1,4
5	1600	1,6	2700	1,6	2700	1,6	2700	1,6
6	-	-	3000	2,1	3000	2,1	3000	2,3
7	-	-	3000	2,8	3000	2,8	3000	2,8

(*) Both criteria, length and attenuation, must be fulfilled to assign a specific Line Profile but for vectoring the “length” values are set very high as attenuation and not distance is the main criterion for vectored lines, meaning that for most vectored loops loop attenuation will be the sole criterion for the Line Profile selection. Therefore for vectored zones, the distances are set to a value which is much higher than the actual distance.

6. New vectoring provisioning & repair profiles

New WBA VDSL2 lines eligible for vectoring and fulfilling the vectoring deployment rules as described in this addendum will get the new **vectoring line profile**, communicated through the standard line profile communication process (XML BGCOUT12).

In case of perturbation on the vectored line itself or on neighbouring lines, the vectoring provisioning line profile can be downgraded to one of the associated vectoring repair profiles defined for each vectoring zone.

The table below shows which are the main profiles applicable for each zone.

Table explanation:

Each cell contains 3 values:

- Left value: indicator for 2,2MHz vectoring
- Center value: indicator for 1,1MHz vectoring
- Right value: indicator for 552 kHz vectoring

Possible indicator values:

- "P": Provisioning profile
- "R": Repair profile
- "-": Not usable in the concerned zone

Downstream Max Net Data	Upstream Max Net Data Rate	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6	Zone 7
70 Mbps	30 Mbps	P/P/P	-/-/-	-/-/-	-/-/-	-/-/-	-/-/-	-/-/-
70 Mbps	20 Mbps	R/R/R	-/-/-	-/-/-	-/-/-	-/-/-	-/-/-	-/-/-
70 Mbps	15 Mbps	R/R/R	-/-/-	-/-/-	-/-/-	-/-/-	-/-/-	-/-/-
50 Mbps	15 Mbps	R/R/R	P/P/P	-/-/-	-/-/-	-/-/-	-/-/-	-/-/-
50 Mbps	10 Mbps	R/R/R	R/R/R	-/-/-	-/-/-	-/-/-	-/-/-	-/-/-
50 Mbps	6 Mbps	R/R/R	R/R/R	-/-/-	-/-/-	-/-/-	-/-/-	-/-/-
50 Mbps	5 Mbps	R/R/R	R/R/R	-/-/-	-/-/-	-/-/-	-/-/-	-/-/-
30 Mbps	10 Mbps	R/R/R	R/R/R	P/P/P	-/-/-	-/-/-	-/-/-	-/-/-
30 Mbps	5 Mbps	R/R/R	R/R/R	R/R/R	-/-/-	-/-/-	-/-/-	-/-/-
30 Mbps	3 Mbps	R/R/R	R/R/R	R/R/R	-/-/-	-/-/-	-/-/-	-/-/-
25 Mbps	2 Mbps	-/-/ R	-/-/ R	-/-/ R	-/-/ P	-/-/ -	-/-/ -	-/-/ -
22 Mbps	2 Mbps	-/ R/ R	-/ R/ R	-/ R/ R	-/ P/ R	-/-/ -	-/-/ -	-/-/ -
20 Mbps	3 Mbps	R/R/R	R/R/R	R/R/R	-/-/ -	-/-/ -	-/-/ -	-/-/ -
20 Mbps	1,5 Mbps	-/-/ R	-/-/ R	-/-/ R	-/-/ R	-/-/ P	-/-/ -	-/-/ -
18 Mbps	2 Mbps	R/R/R	R/R/R	R/R/R	P/R/R	-/-/ -	-/-/ -	-/-/ -
18 Mbps	1,5 Mbps	-/ R/ R	-/ R/ R	-/ R/ R	-/ R/ R	-/ P/ R	-/-/ -	-/-/ -
16,5 Mbps	2 Mbps	R/R/R	R/R/R	R/R/R	R/R/R	-/-/ -	-/-/ -	-/-/ -
14,5 Mbps	2 Mbps	R/R/R	R/R/R	R/R/R	R/R/R	-/-/ -	-/-/ -	-/-/ -
13 Mbps ⁽³⁾	1,5 Mbps	-/-/ -	-/-/ -	-/-/ -	R/R/R	-/ R/ R	-/ P/ P	-/-/ -
12 Mbps	1,5 Mbps	R/R/R	R/R/R	R/R/R	R/R/R	P/R/R	-/ R/ R	-/-/ -
11 Mbps ⁽³⁾	1,5 Mbps	-/-/ -	-/-/ -	-/-/ -	R/R/R	R/R/R	P/R/R	-/-/ -
8 Mbps ⁽³⁾	1,5 Mbps	-/-/ -	-/-/ -	-/-/ -	R/R/R	R/R/R	R/R/R	P/P/P
6 Mbps ⁽³⁾	1,5 Mbps	-/-/ -	-/-/ -	-/-/ -	-/-/ -	-/-/ -	R/R/R	R/R/R

7. DLM process

The purpose of the present addendum is also to apply the DLM process on the vectoring profiles created for the newly defined “vectoring zones 6 and 7”.

The DLM (Dynamic Line Management) process for the new vectoring zones is identical to the DLM process applicable for the existing vectoring zones as already explained in previously approved addenda.

Although engineering design is not entirely finished yet, Proximus can already today reasonably take the assumption that these new profiles might deliver speeds of up to:

- In the “2,2MHz vectoring zone 6” of up to **30 Mbps Downstream** and up to **2 Mbps Upstream**,
- in the “2,2MHz vectoring zone 7” of up to **30 Mbps Downstream** and up to **2 Mbps Upstream**
- in the “1,1MHz vectoring zone 6” of up to **30 Mbps Downstream** and up to **2 Mbps Upstream**,
- in the “1,1MHz vectoring zone 7” of up to **30 Mbps Downstream** and up to **2 Mbps Upstream**,
- in the “552kHz vectoring zone 6” of up to **30 Mbps Downstream** and up to **2 Mbps Upstream**,
- in the “552kHz vectoring zone 7” of up to **30 Mbps Downstream** and up to **2 Mbps Upstream**.

on VDSL2 lines which fulfill the conditions described in the chapter “prerequisites”.

³ These profiles can only be assigned if the conditions described in the chapter “Prerequisites” are fulfilled.

8. List of new line profiles

Although engineering design is not entirely finished yet, Proximus can already today reasonably present you the definition of **12 new line profiles in scope of the present addendum which will be available as from 22/10/2018**⁴ for VDSL2-lines which fulfill the conditions described in the chapter “Prerequisites”.

LP	Upstream Max Net Data Rate	Upstream Max Bit Rate	Downstream Max Net Data Rate	Downstream Max Bit Rate
LP343	2000	n/a	13000	n/a
LP344	1500	n/a	13000	n/a
LP345	1000	n/a	13000	n/a
LP346	800	n/a	13000	n/a
LP347	2000	n/a	8000	n/a
LP348	1500	n/a	8000	n/a
LP349	1000	n/a	8000	n/a
LP350	800	n/a	8000	n/a
LP351	2000	n/a	6000	n/a
LP352	1500	n/a	6000	n/a
LP353	1000	n/a	6000	n/a
LP354	800	n/a	6000	n/a

The definitive number and parameters of the new line profiles will be communicated by Proximus **at the latest 6 weeks before the launch date of the service.**

9. Ordering and provisioning process

The new provisioning line profiles do not have any impact on the ordering process, nor on the **communication flows** during ordering and provisioning of new WBA VDSL2 lines: no new XML, no new action type, and no new fields in the XML messages.

More specifically the communication of the new Vectoring Provisioning Line Profiles will be performed through the XML BGCOUT9, BGCOUT10 & BGCOUT12 messages.

⁴ Proximus might postpone this date in order to guarantee the quality of the deliverables

10. Other operational impacts

10.1 E-tools

10.1.1 XDSL availability tool (web interface)

The XDSL availability tool will provide the maximum downstream/upstream Maximum Net Data rate associated with the new vectoring provisioning line profile on a specific address or existing line by returning the new maximum downstream/upstream Maximum Net Data rate (see above the summary table with the new deployment rules).

10.1.2 XDSL availability tool (XML interface)

The (new) maximum upstream and downstream Maximum Net Data rate (where applicable) will be returned in the same way as today in the XML-pre-qualification response.

The new DLM line profiles **do not have any impact on the XDSL availability tool (web interface and XML interface)**.

10.2 Delivery, repair & e-troubleshooting

The new line profiles will be delivered under the same conditions as the WBA VDSL2 product. The repair & e-troubleshooting procedures remain unchanged.

10.3 TBF

The communication of the new line profiles through the TBF XML remains unchanged. Launching a TBF on a line configured with a DLM profile does not change the applied DLM profile unless there are transmission quality errors and/or stability problems after the resynchronisation in which case the corresponding provisioning profile will be reconfigured as first step.

10.4 DLM

Proximus will as from 22/10/2018⁵ combine the effect of DLM and vectoring on VDSL2 lines located in Vectoring zones 6 and 7 which fulfill the criteria as described in the chapter "Prerequisites".

10.5 Pricing

No impact on WBA-VDSL2 pricing.

⁵ Proximus might postpone this date in order to guarantee the quality of the deliverables

11. Adaptation on WBA documents

The sections of the WBA offer documents which are impacted by this addendum are indicated in the subsequent paragraphs (changes are highlighted in turquoise). Those adaptations refer to the consolidated version of the WBA VDSL2 reference offer (version 15), published on the Proximus website, at http://www.proximuswholesale.be/en/id_wba_vdsl2/public/access/regulated-services/wba-vdsl-2.html.

WBA Main Body

In section 4.12. "VDSL2 deployment rules" a new paragraph is added after paragraph 72, and the tables applicable to End-User lines connected to a vectored ROP must be updated with the following values :

73. The use of the vectoring zones 6 and 7 requires certain conditions to be fulfilled:
- The activation of the vectoring zones 6 and 7 is only possible on ROPs that provide "ADSL from ROP" connectivity or have been activated for VDSL2 vectoring in the frequency band between 1,1 MHz and 2,2 MHz or between 552 kHz and 2,2 MHz.
 - Only vector compliant modems (e.g. the NGHGW+, A-Modem and certified OLO-CPEs) will support the new vectoring zones 6 and 7. All other modems, including certified vector friendly modems will synchronize on a fall-back line profile. (e.g. the Sagemcom F@ST 3464).

For VDSL2 End-User lines connected to a vectored ROP with 2,2 MHz Vectoring activated:

Att _{Loop} [dB]	Length _{Loop} ⁶ [m]	Line Profile name	Indicative distance
<0,4	<900	LP040	<400m
<0,7	<1.200	LP085	<700m
<1	<1.700	LP135	<1.000m
<1,4	<2.300	LP196	<1.400m
<1,6	<2.700	LP225	<1.600m
<2,1	<3.000	LP229	<2.100m
<2,8	<3.000	LP348	<2.800m
<0,6	<600	LP275	<600m
<0,6	<600	LP288	<600m
<1	<1.000	LP329	<1.000m

⁶ Both criteria, length and attenuation, must be fulfilled to assign a specific Line Profile but for 552 KhZ, 1,1 MHz vectoring and 2,2 MHz vectoring the "Length_{loop}" values are set very high as attenuation and not distance is the main criterion for vectored lines. As a rule of thumb the copper cable distance between a ROP and the Living Unit is 1.000 m for 1 dB attenuation. E.g. 1,6 dB attenuation reflects an indicative distance of 1.600m.

For VDSL2 End-User lines connected to a vectored homogenized ROP with 1,1 MHz Vectoring activated (*)

Att _{Loop} [dB]	Length _{Loop} ⁵ [m]	Line Profile name	Indicative distance
<0,5	<900	LP040	<400m
<0,7	<1.200	LP085	<700m
<1,1	<1.800	LP135	<1.000m
<1,4	<2.300	LP172	<1.400m
<1,6	<2.700	LP197	<1.600m
<2,1	<3.000	LP344	<2.100m
<2,8	<3.000	LP348	<2.800m
<0,6	<600	LP275	<600m
<0,6	<600	LP288	<600m
<1	<1.000	LP329	<1.000m

(*) "These deployment rules are only applicable for new lines provisioned as from 01/07/2017 onwards on ROPs that became activated for 1,1 MHz Vectoring."

For VDSL2 End-User lines connected to a vectored homogenized ROP with 552 kHz Vectoring activated (*)

Att _{Loop} [dB]	Length _{Loop} ⁵ [m]	Line Profile name	Indicative distance
<0,5	<900	LP040	<400m
<0,8	<1.200	LP085	<700m
<1,15	<1.900	LP135	<1.000m
<1,4	<2.300	LP160	<1.400m
<1,6	<2.700	LP185	<1.600m
<2,3	<3.000	LP344	<2.300m
<2,8	<3.000	LP348	<2.800m
<0,6	<600	LP275	<600m
<0,6	<600	LP288	<600m
<1	<1.000	LP329	<1.000m

(*) "These deployment rules are only applicable for new lines provisioned as from 20/02/2018 onwards on homogenized ROPs that might already be activated for 1,1 MHz Vectoring."

In section 4.14. "Vectoring" paragraph 83 is modified as follows :

Vectoring line profiles will be activated on vectored ROPs for VDSL2 End-User lines equipped with a (whitelisted) vector-compliant CPE and fulfilling the deployment rules as defined in the section "VDSL2 deployment rules" of the present document. The lines equipped with a (whitelisted) vector-friendly CPE will keep their active line profile **except for the vectoring zones 6 and 7 which requires a (whitelisted) vector-compliant CPE.** Lines **while lines** equipped with a CPE which is not at least vector friendly **and lines in the vectoring zones 6 and 7 not equipped with a vector-compliant CPE** will keep a fall-back

profile/mode (see section ‘Special conditions in connection with Repair’ of the Annex 3 – Planning & Operations of the present WBA VDSL2 offer).

WBA VDSL2, Annex 2: “Technical specifications”

In section 7.2 “DSL profiles at uni (Layer1)” the new list of line profiles as defined in the chapter 8 of the present assendum must be added to the current table.


Section 11.1 “Possible modems” is modified as follows :

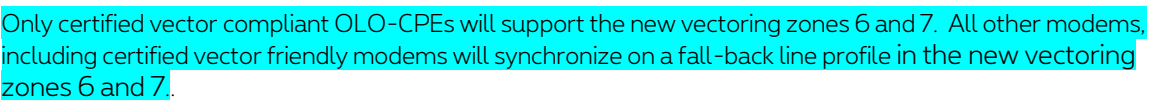
The modem used by the End-User must be in conformity with the applicable standardization and must be interoperable with the Proximus network. The Beneficiary has two options:

- The Beneficiary can use a standard modem (called Proximus CPE) offered by Proximus. This modem is supported on the Proximus network and may be installed at End-User side in combination with the WBA VDSL2 service. Proximus offers the following types of Proximus CPE:
 - The Sagemcom F@ST 3464 configured by SAGEMCOM for the WBA VDSL2 service. The technical description of this Proximus CPE is detailed in section “Technical Description of the Proximus CPE type Sagemcom”. Proximus has discontinued the delivery of this type of modem.
 - The Next Generation Home Gateway (NGHGW CPE) and the NGHGW+ CPE are intended for use in a one-box configuration. The technical description of this Proximus CPE is detailed in section “Technical description of the Proximus CPE type NGHGW and NGHGW+”.
 - Note that Proximus will no longer sell the current NGHGW once the NGHGW+ CPE is launched.
 - The Access Modem (also called A-modem) intended for use in a two-box configuration. The technical description of this Proximus CPE is detailed in section “Technical description of the Proximus CPE type A-Modem”
- The Beneficiary can use its own modem (called OLO CPE) that will operate in a similar manner as a standard Proximus CPE. In this case, specific Roles and Responsibilities apply. They are described in Annex 7: Roles & Responsibilities throughout the OLO CPE lifecycle.
- Only vector compliant modems (e.g. the NGHGW+, A-Modem and whitelisted OLO-CPEs) will support the new vectoring zones 6 and 7. All other modems, including certified vector friendly modems will synchronize on a fall-back line profile in the new vectoring zones 6 and 7. (e.g. the Sagemcom F@ST 3464).

WBA VDSL2, Annex 7: “Roles & Responsibilities throughout the OLO CPE lifecycle”

In section 5.2.4 “Spectrum Management (No harm to the network)” a footnote is added :

When an individual line is identified as being a potential disturber in accordance with the criteria set above, Proximus has the right to put this line in a Basic Connectivity Profile, or another specific profile to limit the risk of disturbance. Proximus will inform the OLO of such an action. For situations where a line is considered as potential disturber because it is very unstable, the line can be monitored in Basic Connectivity Profile, and the TBF must be re-launched by the OLO to retest the line. Following the TBF result, necessary repair actions shall be undertaken by OLO (line profile downgrade, physical repair ...). If the line continues to be “very unstable” for 5 working days, even with the Basic Connectivity Profile, the line can be disabled or the OLO shall install a Proximus CPE or another whitelisted OLO CPE  to be used instead of (or with) the OLO CPE either in a One Box or a Two box (preferred solution) model. Proximus highly recommends that any OLO CPE is able to operate in a One Box or a Two Box Model.

1.  Only certified vector compliant OLO-CPEs will support the new vectoring zones 6 and 7. All other modems, including certified vector friendly modems will synchronize on a fall-back line profile in the new vectoring zones 6 and 7.

*** End of the document ***