



Addendum to Bitstream VDSL2

# Vectoring from LEX & LDC

Approved by BIPT on 23/02/2022

## Table of contents

1. Purpose.....	3
2. Scope.....	3
3. Planning .....	3
4. Vectoring general principle and proposed new enhancements .....	4
4.1 Introduction of vectoring from LEX & LDC.....	4
5. DLM process .....	4
6. List of line profiles .....	4
7. Ordering and provisioning process .....	5
8. E-Tools.....	5
9. Pricing .....	5
10. Adaptation on the Bitstream xDSL documents .....	6

## 1. Purpose

The present addendum further improves the VDSL2 performance by the introduction of vectoring from LEX & LDC. In a first phase this will be limited to 2,2 MHz vectoring only. The activation of vectoring in the ADSL frequencies below 2,2 MHz might follow in a later phase. This will be communicated in due time.

The purpose of the present addendum is to address the impacts on the Bitstream VDSL2 reference offer of the introduction of this enhancement.

## 2. Scope

This addendum is applicable to the Bitstream VDSL2 services with Shared, Dedicated and Single VLAN, as described in the Bitstream VDSL2 reference offer.

## 3. Planning

The present addendum has been communicated to the BIPT in order to enable a progressive roll-out of vectoring from LEX & LDC **as from 19 July 2022**<sup>1</sup>. A limited TFT (technical field trial) will continue in Q1 and Q2 2022.

The planning of the roll-out will depend on the outcome of the TFT and will be published in due time (i.e. minimum one month in advance) on the secured part of the Proximus wholesale website.

<sup>1</sup> Proximus might postpone this date in order to guarantee the quality of the deliverables.

## 4. Vectoring general principle and proposed new enhancements

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.

Currently only VDSL2 lines delivered from a ROP (and not connected to a LEX or an LDC) can benefit from the increased performance of vectoring.

As from 19 July 2022, Proximus targets to improve the performance of the VDSL2 lines delivered from a LEX or an LDC (i.e. not from a ROP), gradually for up to about 200 LEXes/LDCs.

### 4.1 Introduction of vectoring from LEX & LDC

The deployment of vectoring in ROPs across the Proximus fixed network has led to the situation where nowadays about 99,5% of the ROPs is vectored in one of the 3 possible vectoring levels (2,2 MHz, 1,1 MHz or 552 kHz). Today vectoring is not activated on LEX / LDC, meaning that VDSL2 lines connected to a LEX or LDC without passing through a ROP cannot benefit from the increased performance of vectoring. To remedy this situation, the goal of this proposed enhancement is to gradually activate vectoring on up to about 200 LEXes and LDCs outside the FTTH and Mantra+ zones as from mid 2022. To achieve this new ambition, the selected LEXes and LDCs will need to be equipped with the new IP-DSLAM MX-6 equipment which is already deployed in new ROPs since mid 2020. Next to vectoring, this new MX-6 equipment also offers the possibility to have 384 vectored ports (iso 192).

## 5. DLM process

The purpose of the present addendum is also to apply the current DLM process on the newly vectored lines on a LEX or LDC.

## 6. List of line profiles

No new line profiles have to be created in the framework of the present addendum. The new deployment rules applicable with the introduction of this proposed enhancement will re-use the existing speeds and line profiles as defined in the prevailing version of the Bitstream VDSL2 reference offer.

## 7. Ordering and provisioning process

The changes proposed in the framework of the present addendum don't have any impact on the ordering process, nor on the communication flows during ordering and provisioning of new Bitstream VDSL2 lines.

## 8. E-Tools

The changes proposed in the framework of the present addendum don't have any impact on the WSO pre-check tools (WSO GUI and SOA ordering interfaces).

## 9. Pricing

The changes proposed in the framework of the present addendum don't have any impact on the pricing conditions of the Bitstream VDSL2.

## 10. Adaptation on the Bitstream xDSL documents

The sections of the Bitstream xDSL offer documents which are impacted by this addendum are indicated in the subsequent paragraphs (changes are highlighted in blue). Those adaptations refer to the consolidated version of the Bitstream xDSL reference offer (version MSO & Servicing), published on the Proximus website, at

[https://www.proximus.be/wholesale/en/id\\_bitstream\\_xdsl/public/access/regulated-services/bitstream-xdsl.html](https://www.proximus.be/wholesale/en/id_bitstream_xdsl/public/access/regulated-services/bitstream-xdsl.html).

Preliminary remark: changes related to the finalization of the TITAN roll-out and the introduction of the MX-6 card (RDLT-G) in the network are also mentioned below.

### Main Body

## 4. Description of the Bitstream ADSL, Reach Extended ADSL2, ADSL2+ and VDSL2 services in scope of the present offer

### 4.1. Introduction

19. The present offer is offered with Ethernet transport. The Ethernet transport is done over the Ethane or the TITAN network, the latter replacing gradually the former. Unless otherwise specified, the terms “Ethernet aggregation network” and “Aggregation network” refer to both the aggregation network on Ethane and the aggregation network on TITAN. During the transition period from Ethane to TITAN, some Proximus LEXs are connected to the TITAN network, while others are still connected to the Ethane network. All services described in the present document can be offered on both Ethane and TITAN (depending on the availability), except for the Single VLAN service which is only available on TITAN.

31. In some local nets where a building (LEX or LDC) is phased out but also on selected ROPs in non Building Outphasing networks, the NDLT-G/RDLT-G card (also known as the vectoring or “multi-DSL” card) is also used to provide “ADSL from ROP” connectivity. Due to the incompatibility with the NDLT-G/RDLT-G card or the ROP having 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, some Bitstream services are not supported as from the ROP and are de facto not available on ROPs with ADSL(2+) activated:

- Bitstream ADSL(2+) With Voice + ISDN;
- Some special VLAN configurations;
- Bitstream ADSL2+ for ROPs for which VDSL2 vectoring in the frequency band between 1,1 MHz and 2,2 MHz is activated;
- Bitstream ADSL for ROPs for which VDSL2 vectoring in the frequency band between 552 kHz and 2,2 MHz is activated.

The list of ROPs planned to be activated for ADSL(2+) is available on the Operator Personal Page of the CWS secured website.

The list of ROPs planned to be activated with VDSL2 vectoring in the frequency band between 1,1 MHz and 2,2 MHz and for VDSL2 vectoring in the frequency band between 552 kHz and 2,2 MHz is also published on the same location.

In a later phase, VDSL2 vectoring in the frequency band between 1,1 MHz and 2,2 MHz and VDSL2 vectoring in the frequency band between 552 kHz and 2,2 MHz might also be applied in LEX/LDC.

## 4.3 Activation of the Bitstream ADSL, Reach Extended ADSL2 or ADSL2+ on a specific End-User line

### 4.3.1 General

70. Some Bitstream services are not supported as from the ROP due to the incompatibility with the “multi service” NDLT-G/RDLT-G card or the ROP having 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:

- Bitstream ADSL(2+) With Voice + ISDN
- Some special dedicated VLAN configurations
- Bitstream ADSL2+ on ROPs for which VDSL2 vectoring in the frequency band between 1,1 MHz and 2,2 MHz is activated
- Bitstream ADSL on ROPs for which VDSL2 vectoring in the frequency band between 552 kHz and 2,2 MHz is activated

71. Proximus will gradually activate VDSL2 vectoring in the frequency band between 552 kHz and 2,2 MHz for ROPs of which all Living Units of its copper distribution area are in reach of VDSL2 from that ROP. Activation of “VDSL2 vectoring in the frequency band between 1,1 MHz and 2,2 MHz” limits the provision of Bitstream services to Bitstream ADSL and Reach Extended ADSL2 from the ROP. Activation of “VDSL2 vectoring in the frequency band between 552 kHz and 2,2 MHz” limits the provision of Bitstream services to Bitstream Reach Extended ADSL2 from the ROP.

The list of ROPs for which “VDSL2 vectoring in the frequency band between 1,1 MHz and 2,2 MHz” or between 552 kHz and 2,2 MHz is activated is available on the Operator Personal Page of the CWS secured website. [Later, when this is applicable to LEX/LDC, the information will be shared on the same location.](#)

### 4.4.7 VDSL2 deployment rules

125. The improved deployment rules for symmetrical VDSL2 line profiles up to 1,4dB require certain conditions to be fulfilled:

- The improved deployment rules for symmetrical VDSL2 line profiles are only available on vectored ROPs/LEXes/LDCs.
- Only vector compliant modems (e.g. the NGHGW+, A-Modem and certified OLO-CPEs) will support the new symmetric vectored zones. All other modems, including certified vector friendly modems, will synchronize following the deployment rules of the existing symmetric legacy zones or on a fall-back line profile when the attenuation is above 1,0dB or the length is above 1.000m (e.g. the Sagemcom F@ST 3464).

For VDSL2 End-User lines connected to a non-vectored LEX or LDC or connected to a non-vectored ROP:  
[table stays as-is]

For VDSL2 End-User lines connected to a vectored ROP/LEX/LDC with 2,2 MHz Vectoring activated:  
[table stays as-is]

### 4.4.9 Vectoring

136. Vectoring Line Profiles will be activated on vectored ROPs/LEXes/LDCs 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 as well as the symmetric vectored zones, which require a (whitelisted) vector-compliant CPE. 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 as well as symmetric VDSL2 lines not equipped with a vector-compliant CPE beyond the deployment rules for the symmetric legacy zone 2 (i.e. with an attenuation between 1,0 and 1,4dB) will keep a fall-back profile/mode (see section “Special conditions in connection with Repair” of the Annex “Planning & Operations” of the present reference offer).

## 8 Termination of the voice subscription of the Bitstream with voice service

150. In case of a Bitstream with ISDN voice service where both Proximus and the Beneficiary provide services to an End-User, Proximus may deactivate the ISDN voice service in order to replace it by an equivalent ISDN solution configured on a separate copper pair. In that case, Proximus will ensure that the service on the high bandwidth remains in service and that the Bitstream configuration in the Proximus network remains unchanged (same copper pair and same line card position). Note however that the Bitstream with ISDN voice service is gradually being phased out as among others it is incompatible with the IP-DSLAM NDLT-G/RDLT-G line cards and will have to be completed by 30/09/2022.

### Annex 2C Technical specifications

## 1 Scope

Unless otherwise specified, the terms “Ethernet aggregation network” and “Aggregation network” refer to both the aggregation network on Ethane and the aggregation network on TITAN, the latter gradually replacing the former. During the transition period from Ethane to TITAN, some Proximus LEXs are connected to the TITAN network, while others are still connected to the Ethane network. All services described in the present document can be offered on both Ethane and TITAN (depending on the availability), except for the Single VLAN service<sup>2</sup> which is only available on TITAN.

\*\*\* End of the document \*\*\*