Addendum to Bitstream VDSL2

Introduction of the Proximus CPE type A-modem 4

Approved by the BIPT on 22/09/2021

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1 Purpose of the addendum

Proximus proposes to add a new Proximus modem, i.e. the CPE type "A-modem 4", to the Bitstream VDSL2 reference offer. The A-modem 4 can be used by the End-Users on the Proximus VDSL2 network and is compliant with the Bitstream **Single VLAN, Shared VLAN and Dedicated VLAN** Ethernet Transport. Note that the current CPE type A-modem, called "A-modem 3" in this addendum, is only compatible with Bitstream Shared VLAN and Bitstream Dedicated VLAN Transport options.
In time, probably in the 2nd quarter of 2022, the A-modem 3 will not be sold anymore.

The present addendum describes the impact of offering this new CPE type A-modem 4 on the Proximus regulated offers (cf. section "Scope" below).

2 Dependencies with other addenda

Reference is made to the addendum to Bitstream VDSL2 / Fiber GPON "Extension of the Ethernet transport with Single VLAN" approved by BIPT on 12/02/2021.

3 Scope of this addendum

This addendum is only applicable to the **Bitstream VDSL2 services** as described in the Bitstream xDSL reference offer.

4 Planning

The present addendum has been submitted for approval to the BIPT in order to become effective as from 02/11/2021 ([1]).

5 Description

The VDSL2 A-modem is intended for use in a two-box configuration where this A-modem acts as bridge between the WAN and a second device (OLO-box) offering local services.

Due to the introduction of a third Ethernet Transport option "Bitstream Single VLAN" (cf above section 2), Proximus has specified a configuration interoperable with its Bitstream VDSL2 Single VLAN services. A new CPE type A-modem 4 has therefore been specifically developed for Proximus wholesale customers.

The specific settings for this new modem are listed hereafter in section 7 with the updated Technical Specifications of Bitstream services over Ethernet, delivered by the IP-DSLAM platform, and covering the technology VDSL2.

[1] Proximus might postpone this in order to guarantee the quality of the deliverables. The exact date will be communicated as soon as it is known by Proximus.

6 Operational Impact

6.1 Ordering and provisioning process

This addendum has no impact on the ordering and provisioning processes. The communication flows to order the new CPE type A-modem 4 remain unchanged compared with the current A-modem 3.

6.2 Pricing

This addendum has no impact on the current pricing conditions as defined in the reference offer for Bitstream xDSL services.

Proximus can already today reasonably take the sound assumption that the pricing conditions of the new CPE type A-modem 4 will be similar to those currently applicable to the A-modem 3. The full details will be mentioned in due time in the "VDSL2 Customer Premise Equipment & Accessories Order Form" which is available on the wholesale personal page under the section Bitstream VDSL2 CPE.

7 Impact on the regulated offers

Adaptation on 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 yellow).

These adaptations refer to the prevailing version of the Bitstream xDSL reference offer communicated to the BIPT on 01/07/2021. (This version 3 of the Bitstream xDSL reference offer will soon be published on the Proximus website, at https://www.proximus.be/wholesale/en/id_bitstream_xdsl/public/access/regulated-services/bitstream-xdsl.html).

- Annex 2C: Technical Specifications

The current chapter 12.4 is split in two sub-sections:

- 12.4.1 Technical description of the Proximus CPE type A-modem 3
- 12.4.2 Technical description of the Proximus CPE type A-modem 4

Here is the updated version of the chapter 12.4:

12.4 Technical description of the Proximus CPE type A-modem

12.4.1 CPE type A-modem 3

This VDSL2 A-Modem is specifically developed for Proximus. It is intended for use in a two-box configuration where this A-modem acts as bridge between the WAN and a second device (OLO-box) offering local services.

The A-modem offers the following features:

- DSL/WAN Interface:
  - ADSL/2/+
  - VDSL2
  - DSM (Vectoring)
- Interface LAN :
  - 4x Gigabit Ethernet
- IP & routing
  - Pure pass-through (bridging)
  - O&M: remote management via TR181 (= next gen TR69)
- Branding

- No branding

12.4.1.1 Configuration of the A-modem 3 for the Bitstream VDSL2 offer with Shared VLAN

Proximus has specified for this modem a configuration interoperable with its Bitstream VDSL2 service with Shared VLANs. The specific settings for this modem are listed hereafter.

12.4.1.1.1 Specific configuration

Transparent L2 bridging for 4 Ethernet services with Layer 2 QoS.

The VLAN 20 is used by Proximus for remote management. This will allow Proximus to upgrade the Firmware including the VDSL2 datapump of the A-modem.

The TR-069 parameters are configured so that the TR-069 client of the CPE contacts the Proximus TR-069 ACS server via the management VLAN (VLAN 20).

12.4.1.1.2 Firmware upgrades

VDSL2 technology is currently a work in progress. Since the VDSL2 data pump is expected to evolve after the product launch, Proximus will possibly upgrade remotely the firmware of this specific NGHGW modem, after its installation at End-User site.

The firmware upgrade will preserve the settings of the A-modem.

Until interoperability of the VDSL2 technology, the OLO may not modify the firmware of this modem.

12.4.1.2 Configuration of the A-modem 3 for the Bitstream VDSL2 offer with Dedicated VLAN

Proximus has specified for this modem a firmware interoperable with its Bitstream VDSL2 service with Dedicated VLANs. The specific settings for this modem are listed hereafter.

12.4.1.2.1 Specific configuration

The VDSL2 modem connects transparently the VLANs between the VDSL2 line and the customer CPE. The interface with the CPE is 1Gbit/s and is in trunked mode (IEEE 802.1Q).

VLAN20 or VLAN 4090 are used for remote management and firmware upgrade.

12.4.1.2.2 Limitations

Known limitations in the A-modem configuration for "Dedicated VLAN":

Known limitations related to IEEE L2CP transparency using the A-modem for "Dedicated VLAN"[2]:

	DA Ethernet	A-mod Upstream
Pause Frames	01-80-c2-00-00-01	Blocked
LACP/LAMP	01-80-c2-00-00-02	Policed[8]
802.3 ah	01-80-c2-00-00-02	Policed[8]
Port authentication	01-80-c2-00-00-03	Policed[8]
E-LMI	01-80-c2-00-00-07	Policed[8]
LLDP	01-80-c2-00-00-0E	Policed[8]
MMRP	01-80-c2-00-00-20	Policed[8]
MVRP	01-80-c2-00-00-21	Policed[8]

Table 1: Known limitations in the a-modem configuration for "Dedicated VLAN"

- Transparency of the types of IEEE L2CP frames as listed in the table above has been validated upon Destination MAC address of the L2CP frame but not on any other field of the L2CP frame.
- MAC learning in the CPE limits to 4000 the number of learned MAC addresses. However, MAC-learning capabilities for all users within the network are not unlimited. Therefore, Beneficiary shall contact Proximus if it has the intention to exceed the 256 MAC addresses limitation.
- Some "C-VLANs" are blocked in the modem:
    - The Local Management VLAN which is set to VLAN tag 4091
    - The Remote Management VLAN which the Beneficiary can choose to:
        - Configure to be either VLAN 20 or VLAN 4090 leaving the other VLAN to be configured transparently

          or

        - Disable to configure both VLAN 20 and VLAN 4090 so that they are transparently transported.

[8] Tested on firmware version 10.5.L.4.AW.

12.4.1.2.3 Firmware upgrades

VDSL2 technology is currently a work in progress. Since the VDSL2 data pump is expected to evolve after the product launch, an upgrade of the firmware of this specific VDSL2 modem, after its installation at End-User site, or remotely via VLAN 20 or VLAN 4090, is possible. Only the data pump part of the firmware will be modified.

Since all VLANs (also the management VLAN (VLAN 20 or VLAN 4090) of the VDSL2 modem) are transparently transported to the OAL and further to the OLO network, Proximus cannot perform this firmware upgrade.

The detailed procedure is provided on the Beneficiary's ShareSpace.

12.4.1.3 Configuration of the A-modem 3 for the Bitstream VDSL2 offer with Single VLAN

It is not foreseen to use the Proximus CPE type A-modem 3 in combination with Bitstream VDSL2 Single VLAN. Proximus does not and will not provide support for this combination.

~~Proximus has specified for this modem a configuration interoperable with its Bitstream VDSL2 Single VLAN service. The specific settings for this modem are listed hereafter.~~

~~Specific configuration~~

~~Transparent L2 bridging for Ethernet services with Layer 2 QoS.~~

~~The VLAN 20 is used by Proximus for remote management. This will allow Proximus to upgrade the Firmware including the VDSL2 datapump of the A-modem.~~

~~The TR-069 parameters are configured so that the TR-069 client of the CPE contacts the Proximus TR-069 ACS server via the management VLAN (VLAN 20).~~

~~Firmware upgrades~~

~~VDSL2 technology is currently a work in progress. Since the VDSL2 data pump is expected to evolve after the product launch, Proximus will possibly upgrade remotely the firmware of this specific NGHGW modem, after its installation at End-User site.~~

~~The firmware upgrade will preserve the settings of the A-modem.~~

~~Until interoperability of the VDSL2 technology, the OLO may not modify the firmware of this modem.~~

12.4.2 CPE type A-modem 4

This VDSL2 A-modem is specifically developed for Proximus. It is intended for use in a two-box configuration where this A-modem acts as bridge between the WAN and a second device (OLO-box) offering local services.

The A-modem offers the following features:

- DSL/WAN Interface:
  - ADSL/2/+
  - VDSL2 (17 and 35Mhz compliant)
  - DSM (Vectoring)
- Interface LAN :
  - 1x Gigabit Ethernet LAN
  - 1x Gigabit Ethernet SUPPORT
- IP & routing
  - Pure pass-through (bridging)
  - O&M: remote management via TR181 (= next gen TR69)
- Branding
  - No branding
- The device will be managed through a GUI in the cloud application

12.4.2.1 Configuration of the A-modem 4 for the Bitstream VDSL2 offer with Shared VLAN

Proximus has specified for this modem a configuration interoperable with its Bitstream VDSL2 service with Shared VLANs. The specific settings for this modem are listed hereafter.

12.4.2.1.1 Specific configuration

Transparent L2 bridging for 4 Ethernet services with Layer 2 QoS.

The VLAN 20 is used by Proximus for remote management. This will allow Proximus to upgrade the Firmware including the VDSL2 datapump of the A-modem.

The TR-069 parameters are configured so that the TR-069 client of the CPE contacts the Proximus TR-069 ACS server via the management VLAN (VLAN 20).

12.4.2.1.2 Firmware upgrades

VDSL2 technology is still evolving. Since the VDSL2 data pump is expected to evolve after the product launch, Proximus will possibly upgrade remotely the firmware of this specific NGHGW modem, after its installation at End-User site.

The firmware upgrade will preserve the settings of the A-modem.

The OLO may not modify the firmware of this modem.

12.4.2.2 Configuration of the A-modem 4 for the Bitstream VDSL2 offer with Dedicated VLAN

Proximus has specified for this modem a firmware interoperable with its Bitstream VDSL2 service with Dedicated VLANs. The specific settings for this modem are listed hereafter.

12.4.2.2.1 Specific configuration

The VDSL2 modem connects transparently the VLANs between the VDSL2 line and the customer CPE. The interface with the CPE is 1Gbit/s and is in trunked mode (IEEE 802.1Q).

VLAN20 or VLAN 4090 are used for remote management and firmware upgrade.

12.4.2.2.2 Limitations

Known limitations in the A-modem configuration for "Dedicated VLAN":

Known limitations related to IEEE L2CP transparency using the A-modem for "Dedicated VLAN"[1]:

	DA Ethernet	A-mod Upstream
Pause Frames	01-80-c2-00-00-01	blocked
LACP/LAMP	01-80-c2-00-00-02	Policed [7]
802.3 ah	01-80-c2-00-00-02	Policed [7]
Port authentication	01-80-c2-00-00-03	Policed [7]
E-LMI	01-80-c2-00-00-07	Policed [7]
LLDP	01-80-c2-00-00-0E	Policed [7]
MMRP	01-80-c2-00-00-20	Policed [7]
MVRP	01-80-c2-00-00-21	Policed [7]

Table 9: **Known limitations in the A-modem configuration for "Dedicated VLAN"**

- Transparency of the types of IEEE L2CP frames as listed in the table above has been validated upon Destination MAC address of the L2CP frame but not on any other field of the L2CP frame.
- MAC learning in the CPE limits to 4000 the number of learned MAC addresses. However, MAC-learning capabilities for all users within the network are not unlimited. Therefore, Beneficiary shall contact Proximus if it has the intention to exceed the 256 MAC addresses limitation.
- Some "C-VLANs" are blocked in the modem:

[1] Tested on firmware version 10.5.L.4.AW

- The Local Management VLAN which is set to VLAN tag 4091
- The Remote Management VLAN which the Beneficiary can choose to:
  - Configure to be either VLAN 20 or VLAN 4090 leaving the other VLAN to be configured transparently

    or

  - Disable to configure both VLAN 20 and VLAN 4090 so that they are transparently transported.

12.4.2.2.3 Firmware upgrades

VDSL2 technology is currently a work in progress. Since the VDSL2 data pump is expected to evolve after the product launch, an upgrade of the firmware of this specific VDSL2 modem, after its installation at End-User site, or remotely via VLAN 20 or VLAN 4090, is possible. Only the data pump part of the firmware will be modified.

Since all VLANs (also the management VLAN (VLAN 20 or VLAN 4090) of the VDSL2 modem) are transparently transported to the OAL and further to the OLO network, Proximus cannot perform this firmware upgrade.

The detailed procedure is provided on the Beneficiary's ShareSpace.

12.4.2.3 Configuration of the A-modem 4 for the Bitstream VDSL2 offer with Single VLAN

Proximus has specified for this modem a configuration interoperable with its Bitstream VDSL2 Single VLAN service. The specific settings for this modem are listed hereafter.

12.4.2.3.1 Specific configuration

Transparent L2 bridging for Ethernet services with Layer 2 QoS.

The VLAN 20 is used by Proximus for remote management. This will allow Proximus to upgrade the Firmware including the VDSL2 datapump of the A-modem.

The TR-069 parameters are configured so that the TR-069 client of the CPE contacts the Proximus TR-069 ACS server via the management VLAN (VLAN 20).

12.4.2.3.2 Firmware upgrades

VDSL2 technology is still evolving. Since the VDSL2 data pump is expected to evolve after the product launch, Proximus will possibly upgrade remotely the firmware of this specific NGHGW modem, after its installation at End-User site.

The firmware upgrade will preserve the settings of the A-modem.

The OLO may not modify the firmware of this modem.

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