Addendum to BROTSoLL NGLL

NGLL – new profiles up to 100Gbps

Date	**Approved by BIPT on 17/03/2026**
Sensitivity	**Unrestricted**

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1. Purpose of the addendum

The present addendum introduces new high bandwidth profiles to the BROTSoLL NGLL reference offer, from 20Gbps up to 100Gbps, and updates the CPE information in the offer.

The profiles from 20Gbps to 50Gbps will be available for Customer-sited Aggregation Points and End-User sites. The 100Gbps profile will only be available for Aggregation Points (Customer-sited and Proximus-sited).

Regarding the CPEs, the following adaptations will be integrated in the offer:

- On Aggregation Points there is no CPE installed anymore.
- Update of the CPE models on End-user sites: to Oneaccess1647 for 1Gbps, Oneaccess1651 for 10Gbps & Cisco NCS 540 for 100 Gbps

The present addendum is communicated to the BIPT in order to update the BROTSoLL NGLL reference offer as of 01/04/2026 to reflect these changes.

2. Scope & planning

This addendum is applicable to the Proximus Reference Offer for Terminating Segment of Leased Lines (BROTSoLL), limited to the Next Generation Leased Line (NGLL).

The present addendum is communicated to the BIPT to enter into application as of[1]

- 01/04/2026 for the 100Gbps Proximus-sited and 100Gbps Customer-sited Aggregation Point
- 19/10/2026 for the 20 Gbps, 30 Gbps, 40 Gbps and 50 Gbps Customer-sited Aggregation Point and End-User sites

3. Pricing

The prices of the new profiles End-User sites and Customer-sited Aggregation Points) can be found in the table below.

[1] Proximus might postpone these dates in order to guarantee the quality of the deliverables.

Bandwidth (symmetrical)	End-User sites Monthly rental charge	Customer-sited aggregation Monthly rental charge
20 Gbps	2.781 €	2.531 €
30 Gbps	3.629 €	3.379 €
40 Gbps	4.231 €	3.981 €
50 Gbps	4.697 €	4.447 €
100 Gbps	Not available	5.897 €

For Proximus-sited Aggregation Points the prices are:

Bandwidth (symmetrical)	Monthly rental charge
1 Gbps	16.5€ + 0.17€/m
10 Gbps	82.5€ + 0.17€/m
100 Gbps	381.7€ + 0.17€/m

The volume and duration discounts as described in the NGLL Pricing Annex 4 are also applicable for these new profiles.

Data & Voice QoS are available with following prices:

Bandwidth (symmetrical)	Best Effort + Data QoS Monthly rental charge	Best Effort + Data QoS + 750M Voice QoS Monthly rental charge
20 Gbps	20,80 €	60,90 €
30 Gbps	20,80 €	60,90 €
40 Gbps	20,80 €	60,90 €
50 Gbps	20,80 €	60,90 €
100 Gbps	20,80 €	60,90 €

4. Impact on the regulated offers

4.1 Adaptations to the BROTSoLL NGLL documents

The sections of the NGLL Reference Offer documents that are impacted by this addendum are indicated in the subsequent paragraphs (changes are highlighted in blue).

These adaptations refer to version 7 of the BROTSoLL NGLL Reference Offer (version approved by BIPT on 06/09/2024).

BROTSoLL - Main Body

14.6.1 Repair

In case of failure to comply with the Service Restoration Time:

• For End-User Sites, the penalties are calculated as a percentage of the total monthly fee payable for the NGLL connectivity solution on the site concerned (Access Line & managed CPE). The percentages are listed in Table 20.
• For OLO Aggregation Points, the penalties are calculated as a percentage of the total monthly fee payable for all End-User Sites, connected to the concerned OLO Aggregation Point (Access Line~~& managed CPE~~). The percentages are listed in Table 20.
• The penalties may not exceed 75% of the monthly fee for the NGLL connectivity solution (Access Line & managed CPE).
• Payment of the penalties can be claimed within three months as of the end of the month in question.

Table 20: penalty scheme for NGLL Service Restoration Time for Severity 1 Incidents, expressed as a percentage of the Monthly Connectivity Fee

End-User Sites *OAP with standard configuration*	*OAP with MC-LAG configuration*
> 5 hours → 5%	> 2 hours → 5%
> 10 hours → 10%	> 4 hours → 10%
> 24 hours → 25%	> 24 hours → 25%

14.6.2 Availability

In case of failure to comply with the Annual Site Availability:

• For End-User Sites, the penalties are calculated as a percentage of the total annual fee payable for the NGLL connectivity solution on the Site concerned (Access Line & managed CPE). The percentages are listed in Table 21.

• For OLO Aggregation Points, the penalties are calculated as a percentage of the total monthly fee payable for all End-User Sites, connected to the concerned OLO Aggregation Point (Access Line ~~& managed CPE~~). The percentages are listed in Table 21.

• The penalties may not exceed 5% of the annual fee for the NGLL connectivity solution (Access Line & managed CPE).

• Payment of the penalties can be claimed within three months as of the end of the year in question.

Table 21: Penalty scheme for NGLL Service Availability, expressed as a percentage of the Annual Connectivity Fee

End-User Sites *OAP with standard configuration*	*End-User Sites* *with standard+ configuration*	*OAP with MC-LAG configuration*
< 99.90% → 1,5%	< 99.95% → 1,5%	< 99.99% → 1,5%
< 99.70% → 5%	< 99.85% → 5%	< 99.97% → 5%

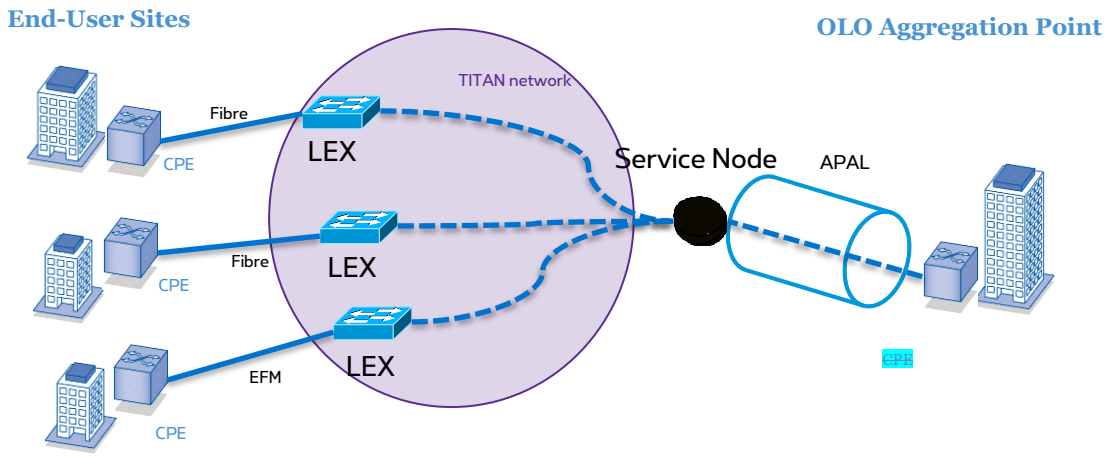
8.1 NGLL Service

NGLL is an Ethernet (Layer2) connectivity service, based on Ethernet over MPLS. Proximus proposes the access technology Ethernet over copper (EFM) and fiber-based Gigabit Ethernet, ~~and~~ 10 Gigabit Ethernet and 100 Gigabit Ethernet.

Note that new EFM lines cannot be ordered anymore as of 01/01/2025.

The NGLL service connects 1 or more End-User Sites to 1 OLO Aggregation Point or a LAG of 2 OLO Aggregation Points. The connectivity service is transported over the Proximus TITAN network. Figure 1 schematically depicts the NGLL service.

Figure 1: Schematic of the NGLL Service, connecting several End-User Sites over fiber or EFM to one OLO Aggregation Point via the APAL



8.1.1 The OLO Aggregation Point

The OLO Aggregation Point can be either an OLO PoP (called "Customer sited") or an OLO colocation (called "Proximus sited"), and is always connected on fiber, using a 1 Gigabit, ~~or~~ 10 Gigabit Ethernet or 100 Gigabit Ethernet Access Line, called the Aggregation Point Access Line (APAL). The OLO Aggregation Point is connected to the Service Node of the Service Area (not to a LEX). Per Service Area there are 2 Service Nodes.

The traffic of all End-User Sites will be delivered on the OLO Aggregation Point Access Line.

It is possible to automatically bypass a failing Service Node by deviating all traffic via a second Service Node which is present in each of the 5 Service Areas, by means of the LACP protocol, aka "multichassis LAG". In case of a multichassis LAG APAL (MC-LAG), this LAG will consist of two fiber links, each to a different Service Node router in the same or a different Service Area. One of these links will be working, the other will be stand-by. This solution is described in detail in Annex 5 "NGLL Technical Specifications".

8.1.4 NGLL available Bandwidth Profiles

The OLO Aggregation Point is always connected over Fiber. Table 1 lists the available bandwidth profiles and access technologies.

Table 1: Available bandwidth and access technologies for OLO Aggregation Point

Bandwidth	*Access technology*
100Mbps	Fiber
200Mbps	Fiber
300Mbps	Fiber
400Mbps	Fiber
500Mbps	Fiber
600Mbps	Fiber
700Mbps	Fiber
800Mbps	Fiber
900Mbps	Fiber
1Gbps	Fiber
2Gbps	Fiber
3Gbps	Fiber
4Gbps	Fiber
5Gbps	Fiber
6Gbps	Fiber
7Gbps	Fiber
8Gbps	Fiber
9Gbps	Fiber
10Gbps	Fiber
20Gbps	Fiber
30Gbps	Fiber
40Gbps	Fiber
50Gbps	Fiber
100Gbps	Fiber

End-User Sites can be connected over Copper (using EFM technology) or over fiber. Table 2 lists the available bandwidth profiles and access technologies.

Note that new EFM lines cannot be ordered anymore as of 01/01/2025.

Table 2: Available bandwidth and access technologies for End-User Site

Bandwidth	*Access technology*
2Mbps	Copper or Fiber
4Mbps	Copper or Fiber
6Mbps	Copper or Fiber
8Mbps	Copper or Fiber
10Mbps	Copper or Fiber
20Mbps	Copper or Fiber
30Mbps	Fiber
40Mbps	Fiber
50Mbps	Fiber
60Mbps	Fiber
70Mbps	Fiber
80Mbps	Fiber
90Mbps	Fiber
100Mbps	Fiber
200Mbps	Fiber
300Mbps	Fiber
400Mbps	Fiber
500Mbps	Fiber
600Mbps	Fiber
700Mbps	Fiber
800Mbps	Fiber
900Mbps	Fiber
1Gbps	Fiber
2Gbps	Fiber
3Gbps	Fiber
4Gbps	Fiber
5Gbps	Fiber
6Gbps	Fiber
7Gbps	Fiber
8Gbps	Fiber
9Gbps	Fiber
10Gbps	Fiber
20Gbps	Fiber
30Gbps	Fiber
40Gbps	Fiber
50Gbps	Fiber

11.2 NGLL

The termination point of the NGLL End-user site is the Gigabit,~~or~~ 10 Gigabit or 100 Gigabit interface of the Proximus CPE switch. This CPE is provided by Proximus and is part of the NGLL offer.

BROTSoLL – Annex 4 NGLL Pricing

In section 1.3 "Rental fee", paragraph 1.3.1 OLO Aggregation point & 1.3.2 "End-User-site"
In section 6 "Pricing QoS (Quality of Service)", paragraph 6.3."QoS rental"

1.3.1 OLO Aggregation point

1.3.1.1 Aggregation point Customer-sited (outside Proximus building)

Table 3: Monthly Rental Charges for NGLL Customer-Sited Aggregation Points on Ethernet Fiber Access Non-secured

Bandwidth	***Monthly Rental Charge***
100 Mbps	368,05 €
200 Mbps	472,63 €
300 Mbps	542,82 €
400 Mbps	594,63 €
500 Mbps	627,00 €
600 Mbps	666,00 €
700 Mbps	705,00 €
800 Mbps	743,25 €
900 Mbps	782,25 €
1 Gbps	821,25 €
2 Gbps	1.118,00 €
3 Gbps	1.201,50 €
4 Gbps	1.273,00 €
5 Gbps	1.356,00 €
6 Gbps	1.425,00 €
7 Gbps	1.510,00 €
8 Gbps	1.614,50 €
9 Gbps	1.668,00 €
10 Gbps	1.753,00 €
20 Gbps	2.531,00 €
30 Gbps	3.379,00 €
40 Gbps	3.981,00 €
50 Gbps	4.447,00 €
100 Gbps	5.897,00 €

1.3..1.2 OLO Aggregation point PXS-sited (in colocation at Service PoP)

- **Enquiry fee**: 112€
- Cable&Cable tray ~~and CPE~~ as described in section 3:
  - **Installation fee:** 6,74€ per meter (with a minimum invoice equivalent to 20 meters)
  - **Monthly rental**:
    - For 1 Gbps: 0,17 € per meter + 16,5€ ~~(CPE included)~~
    - For 10 Gbps: 0.17 € per meter + 82,5€ ~~(CPE included)~~
    - For 100 Gbps: 0.17 € per meter + 381,7€

    (with a minimum invoice equivalent to 5 meters)
- **Small Building Works**: case by case if necessary.

1.3.2 End-User site

The Monthly Rental Charge of End-User Sites is independent from the chosen OLO Aggregation Point.

1.3.2.1 NGLL Service - End-User site Fiber

Table 4: Monthly Rental Charges for NGLL Service - End-User Sites on Ethernet Fiber Access Non-secured

Bandwidth	
2 Mbps	145.00 €
4 Mbps	182.00 €
6 Mbps	218.00€
8 Mbps	244,50 €
10 Mbps	268,11 €
20 Mbps	301,98 €
30 Mbps	313,95 €
40 Mbps	326,89 €
50 Mbps	338,87 €
60 Mbps	348,95 €
70 Mbps	359,98 €
80 Mbps	363,12 €
90 Mbps	365,40 €
100 Mbps	368,05 €
200 Mbps	472,63 €
300 Mbps	542,82 €
400 Mbps	594,63 €
500 Mbps	627,00 €
600 Mbps	666,00 €
700 Mbps	705,00 €
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6 Gbps	1.425,00 €
7 Gbps	1.510,00 €
8 Gbps	1.614,50 €
9 Gbps	1.668,00 €
10 Gbps	1.753,00 €
20 Gbps	2.781,00 €
30 Gbps	3.629,00 €
40 Gbps	4.231,00 €
50 Gbps	4.697,00 €

3.2 Rental fee

The rental fee of the CPE on the End-User Site is included in the NGLL rental fee. ~~both for the OLO aggregation point and for End-User Sites~~.

6. Pricing QoS (Quality of Service)

6.3 QoS rental

For each bandwidth the Beneficiary can order either no QoS at all (for which no fee is due), Data QoS, or Data + Voice QoS, where the amount of Voice QoS is expressed as a percentage of the total Bandwidth. The implementation of Data QoS and Voice QoS is described in Annex 5 "Technical Specifications".

Table 5 lists the pricing for the different QoS profiles.

The Monthly Rental Charge listed in this table, when applicable, must be added to the NGLL rental fee, described in section 1.3. The discounts described in section 1.4 do not apply on the QoS pricing.

Table 5: NGLL QoS pricing

Bandwidth	*Data QoS*	*Data + 10% Voice QoS*	*Data + 25% Voice QoS*	*Data + 50% Voice QoS*	*Data + 75% Voice QoS*	*Data + 750Mbps Voice QoS*
2 Mbps	0,84 €	1,01 €	1,27 €	1,70 €	2,13 €	#N/A
4 Mbps	1,68 €	2,02 €	2,54 €	3,40 €	4,26 €	#N/A
6 Mbps	2,52 €	3,04 €	3,81 €	5,10 €	6,39 €	#N/A
8 Mbps	3,36 €	4,05 €	5,08 €	6,80 €	8,52 €	#N/A
10 Mbps	4,20 €	5,06 €	6,35 €	8,50 €	10,65 €	#N/A
20 Mbps	4,60 €	6,32 €	8,90 €	13,20 €	13,70 €	#N/A
30 Mbps	5,00 €	7,58 €	11,45 €	14,10 €	14,85 €	#N/A
40 Mbps	5,40 €	8,84 €	14,00 €	15,00 €	16,00 €	#N/A
50 Mbps	5,80 €	10,10 €	14,65 €	15,90 €	17,15 €	#N/A
60 Mbps	6,20 €	11,36 €	15,30 €	16,80 €	18,30 €	#N/A
70 Mbps	6,60 €	12,62 €	15,95 €	17,70 €	19,45 €	#N/A
80 Mbps	7,00 €	13,88 €	16,60 €	18,60 €	20,60 €	#N/A
90 Mbps	7,40 €	15,14 €	17,25 €	19,50 €	21,75 €	#N/A
100 Mbps	7,80 €	16,40 €	17,90 €	20,40 €	22,90 €	#N/A
200 Mbps	9,80 €	19,40 €	22,40 €	27,40 €	29,90 €	#N/A

300 Mbps	11,80 €	22,40 €	26,90 €	31,90 €	35,65 €	#N/A
400 Mbps	13,80 €	25,40 €	31,40 €	36,40 €	41,40 €	#N/A
500 Mbps	15,80 €	28,40 €	34,65 €	40,90 €	47,15 €	#N/A
600 Mbps	16,80 €	30,40 €	36,90 €	44,40 €	51,90 €	#N/A
700 Mbps	17,80 €	32,40 €	39,15 €	47,90 €	55,65 €	#N/A
800 Mbps	18,80 €	34,40 €	41,40 €	51,40 €	57,40 €	#N/A
900 Mbps	19,80 €	36,40 €	43,65 €	54,90 €	59,15 €	#N/A
1 Gbps	20,80 €	38,40 €	45,90 €	58,40 €	#N/A	60,90 €
2 Gbps	20,80 €	43,40 €	58,40 €	#N/A	#N/A	60,90 €
3 Gbps	20,80 €	48,40 €	#N/A	#N/A	#N/A	60,90 €
4 Gbps	20,80 €	53,40 €	#N/A	#N/A	#N/A	60,90 €
5 Gbps	20,80 €	58,40 €	#N/A	#N/A	#N/A	60,90 €
6 Gbps	20,80 €	59,40 €	#N/A	#N/A	#N/A	60,90 €
7 Gbps	20,80 €	60,40 €	#N/A	#N/A	#N/A	60,90 €
8 Gbps	20,80 €	#N/A	#N/A	#N/A	#N/A	60,90 €
9 Gbps	20,80 €	#N/A	#N/A	#N/A	#N/A	60,90 €
10 Gbps	20,80 €	#N/A	#N/A	#N/A	#N/A	60,90 €
20 Gbps	20,80 €	#N/A	#N/A	#N/A	#N/A	60,90
30 Gbps	20,80 €	#N/A	#N/A	#N/A	#N/A	60,90
40 Gbps	20,80 €	#N/A	#N/A	#N/A	#N/A	60,90
50 Gbps	20,80 €	#N/A	#N/A	#N/A	#N/A	60,90
100 Gbps	20,80 €	#N/A	#N/A	#N/A	#N/A	60,90

BROTSoLL Annex 5 - Technical specifications

2.1 NGLL Service

NGLL is an Ethernet (Layer2) connectivity service, based on Ethernet over MPLS. Proximus proposes the access technology Ethernet over copper (EFM) and fiber-based Gigabit Ethernet, ~~and~~ 10 Gigabit Ethernet and 100 Gigabit Ethernet.

Note that new EFM lines cannot be ordered anymore as of 01/01/2025.

The NGLL service connects 1 or more End-User Sites to 1 OLO Aggregation Point or a LAG of 2 OLO Aggregation Points. The connectivity service is transported over the Proximus TITAN network. Figure 1 schematically depicts the NGLL service.

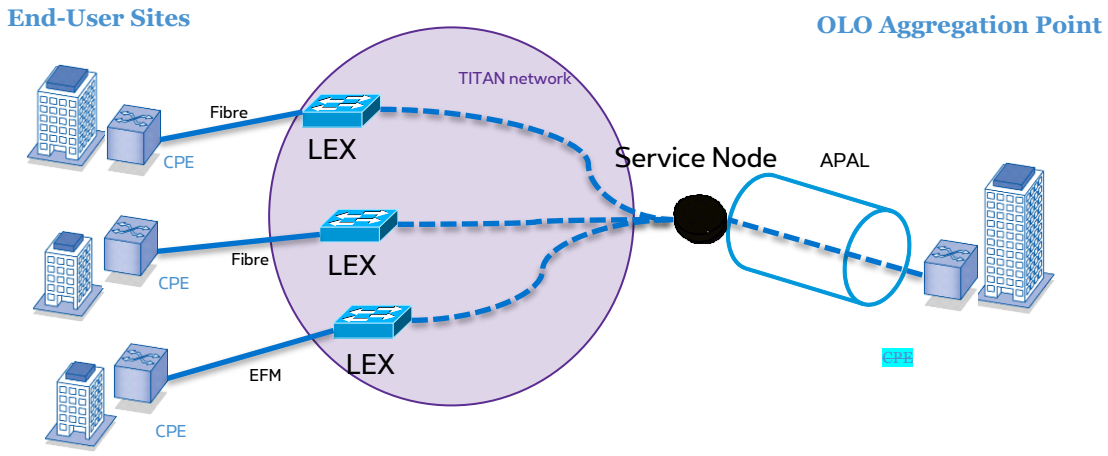

Figure 2: Schematic of the NGLL Service, connecting several End-User Sites over fiber or EFM to one OLO Aggregation Point via the APAL

2.1.1.1 OLO Aggregation Point

The OLO Aggregation Point is connected to a Proximus Service Node using a Gigabit Ethernet, ~~or~~ 10Gigabit Ethernet or 100 Gigabit Ethernet access line over fiber optic, called Aggregation Point Access Line (APAL).

The traffic of all End-User Sites will be delivered on the OLO Aggregation Point Access Line ~~and is demarcated by a Proximus managed CPE switch, which makes entirely part of the service~~. The physical interface to the Beneficiary~~, on the CPE switch,~~ can be copper or fiber and must work in QinQ.

The Aggregation Point device of the OLO must work in QinQ.

2.1.2.1 Ethernet on fiber access technology

The Ethernet on fiber access is a high-speed data transfer service, offering interface speed options from 10Mbps to 10Gbps between the site and the TITAN network, regardless of the distance between them. Traffic shaping increases granularity, allowing for bandwidth profiles from 2Mbps up to 100Gbps (up to 50Gbps for End-User sites) in smaller bandwidth steps.

The Ethernet access service is based on the Proximus fiber optic infrastructure. This is a comprehensive service which includes the network infrastructure.

2.1.1.3 NGLL connections

NGLL presents an Ethernet interface to Beneficiaries, simplifying the LAN/WAN boundary for Service Providers and Beneficiaries, and enabling rapid and flexible service provisioning, as the service bandwidth is not directly tied to the physical interface.

A unique VLAN-id identifies the End-User Site at the Aggregation Point level. This is the so-called S-tag or outer tag at the Aggregation Point level.
The End-User Site works in dot1Q and the VLAN tags (VLAN ids and p-bit) sent by a specific End-User Site are received unchanged at the OLO Aggregation Point switch as C-tags, under the S-tag, identifying the specific End-User Site. Both S-tags and C-tags can be freely chosen by the Beneficiary, within limitations mentioned further under section 2.1.4.

Figure 2 shows an example set-up with two End-User Sites.

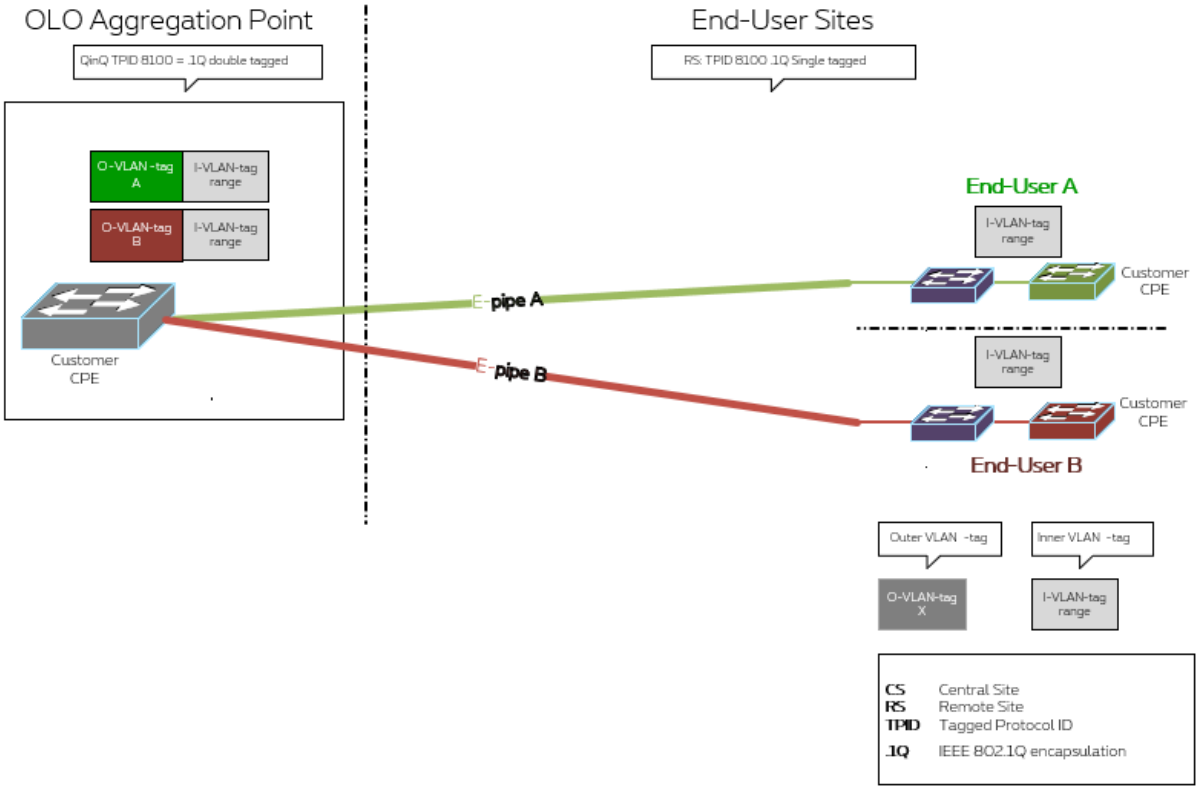

Figure 3: VLAN tagging within the NGLL solution

2.1.3 Overall shaping of traffic

The overall Ethernet flows on End-User and Aggregation Point access technology are shaped to a value, ordered by the Beneficiary, and further called the bandwidth profile.

- 2Mbps to 10Mbps: 2Mbps steps (2,4,6,8,10)
- 10Mbps to 100Mbps: 10Mbps steps (10,…90, 100)
- 100Mbps to 1Gbps: steps of 100Mbps
- 1Gbps to 10Gbps: steps of 1Gbps
- 10Gbps to 50Gbps: steps of 10Gbps
- 50Gbps to 100Gbps: step of 50Gbps

There is no limitation to the data volume that can be transferred.

2.1.4 VLAN limitations

Max 1000 S-tags @ Aggregation Point in range [2,4000], to be allocated by the Beneficiary and configured by Proximus and Beneficiary. VLAN id 999, 1002, 1003, 1004, 1005 and > 4000 are reserved and cannot be used by the Aggregation Point ~~CPE~~.

Max 1000 C-tags @ End-User Site in range [2,4000], to be allocated by the Beneficiary and configured by Proximus (in CPE switch) and Beneficiary. VLAN id 999, 1002, 1003, 1004, 1005 and > 4000 are reserved and cannot be used by the End-User.

The Beneficiary can request, under his own responsibility, to use S-tag or C-tag 1, but this is not recommended by Proximus and this is against the good usage rules recommended by Cisco.

In case of problems due to the usage of VLAN 1 by a Beneficiary, Proximus cannot be held responsible for the outage.

2.1.6.3 Multichassis LAG APAL

It is possible to automatically bypass a failing Service Node by deviating all traffic via another Service Node in one of the 5 Service Areas, by means of the LACP protocol, aka "multichassis LAG". In case of a multichassis LAG APAL (MC-LAG), this LAG will consist of two fibre links, each to a different Service Node router in the same or a different Service Area. One of these links will be working, the other will be stand-by.

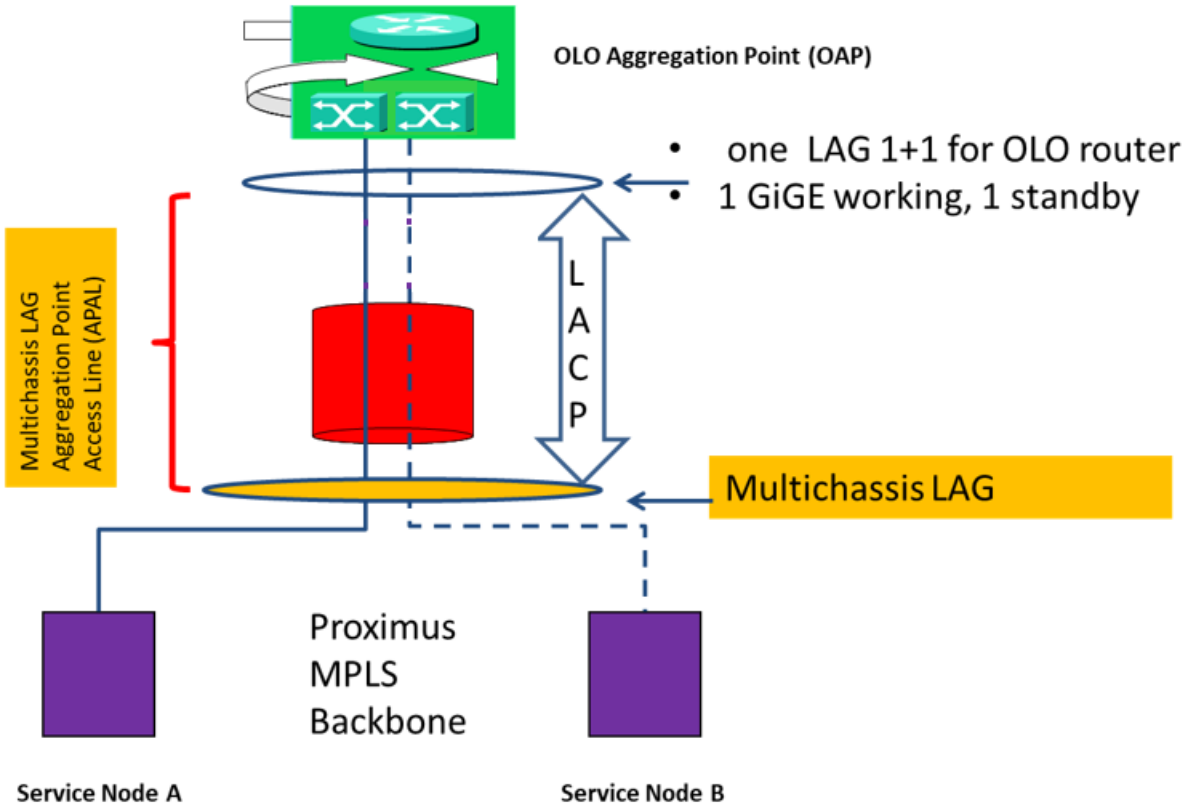

Figure 4: schematic of the NGLL MC-LAG APAL solution

The LACP protocol, to be configured on the LAG at OLO Aggregation Point ~~device~~, is peered by both Service Node routers, one in each of the two Service Nodes in the Proximus MPLS Backbone. This LACP protocol will make one link "working" and the other link "stand-by" and switches the connections, coming from the End-User Sites, to the working link.

MC-LAG adds node-level redundancy to the normal link-level redundancy that a LAG provides.

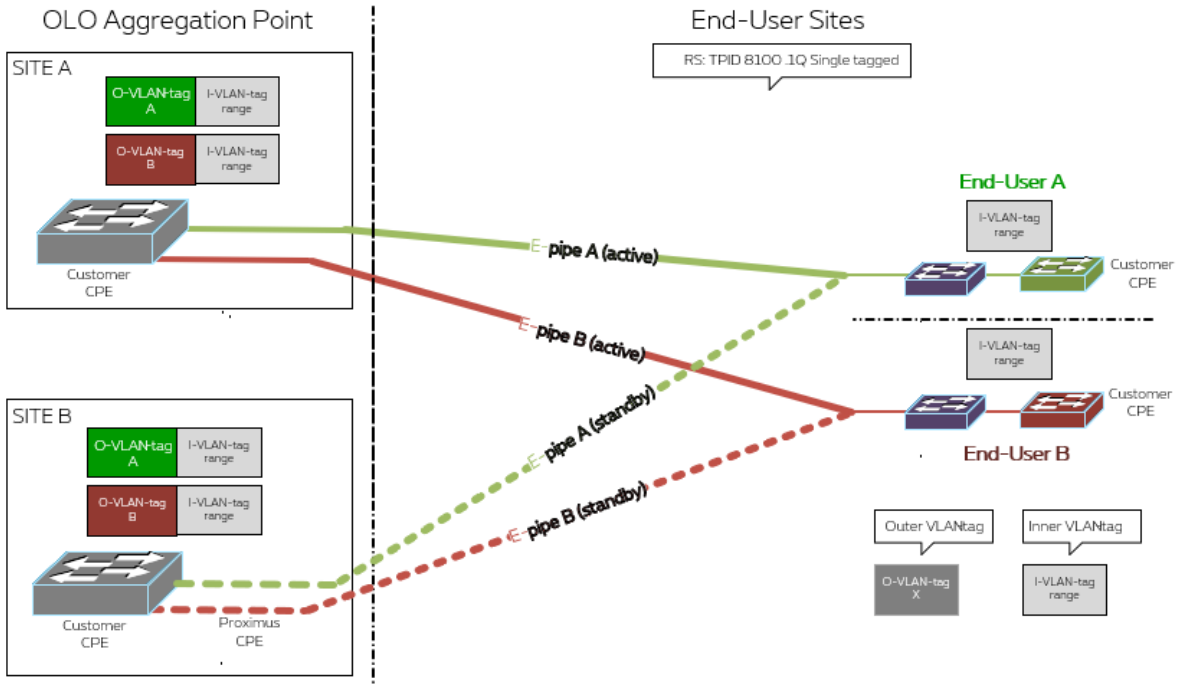

Figure 5: VLAN tagging in an MC-LAG set-up. The Customer CPE can be either one device or two separate devices

2.2.5 ~~Multichassis LAG~~

~~In the case of a multichassis LAG (MC-LAG) set-up two CPEs make up the demarcation point between the Beneficiary and Proximus.~~

~~Both CPEs are :~~
~~• configured transparant for LACP, so that LACP is peered by the SRs and not by the CPEs.~~
~~• interconnected by a trunk, allowing Proximus to manage also the CPE on the link in stand-by mode, via the working link and corresponding CPE.~~

2.2 CPE (Customer Premises Equipment)

2.2.1 Demarcation point

The connectivity access lines are installed & configured by Proximus, including the "demarcation" CPE, typically a switch. The Beneficiary can install and configure his own CPE (e.g.: an IPVPN router) behind the Proximus switch.
• The current demarcation CPE on ~~the Aggregation Point and~~ End-User Sites is a Proximus-managed switch.
• Traffic is delivered to the End-User via one customer-facing port (10BaseT RJ45, or 100BaseT RJ45, or 1000BaseT RJ45), or optical LC connector.

2.2.2 CPE types

As availability of CPEs can change in the future the currently proposed model can be replaced in the future with an equivalent model. These CPEs will be used today :

- ~~- OLO aggregation point Customer-sited or Proximus-sited : o Up to 1Gbps: - OneAccess 1646: Gigabit RJ45 port or SFP Gigabit Ethernet (multimode or single-mode); AC power~~
- ~~o For 10Gbps: - ASR-920-12CZ-A/D - LAN: SFP 10Gigabit Ethernet (multimode or single-mode); AC or DC power~~
- ~~- OLO aggregation point Proximus-sited : o Up to 1Gbps: - OneAccess 1646: Gigabit RJ45 port or SFP Gigabit Ethernet (single-mode); AC power~~
- ~~o For 10Gbps: - ASR-920-12CZ-A/D - LAN: SFP 10Gigabit Ethernet (single-mode); AC or DC power~~
- - End-User sites :
- o Up to 1Gbps: OneAccess 1646~~7~~: Gigabit RJ45 port or SFP Gigabit Ethernet (multimode or single-mode); AC power
- o For 10Gbps: ▪ OneAccess 1651 ~~ASR-920-12CZ-A/D~~ - LAN: SFP 10Gigabit Ethernet (multimode or single-mode); AC ~~or DC~~ power
- o For 100Gbps: Cisco NCS540 – LAN SFP 100Gigabit Ethernet (single-mode)

Disclaimer: further tests are required to validate that the used CPEs support extreme configurations such as e.g. 50% Voice QoS on a 1 Gbps or more than 750Mbps Voice QoS on a 10 or 100 Gbps NGLL-line.

2.2.4 Protocol limitations

The service is intended for transport of IP packets by Ethernet frames (IPoE). Some protocols outside of this IPoE framework do not transparently pass. Table 3 summarizes the transparency test results for the different NGLL CPEs.

The lists provided are indicative and non-exhaustive.

Transparency of the types of L2CP frames as listed in the table has been validated upon Destination MAC address of the L2CP frame[2]~~[1]~~.

Beneficiary has the opportunity to request on a project mode basis for ad hoc testing to check the transparency of any specific protocol in the context of NGLL.

~~[1] Lab validation has been performed on the following CPE image versions:~~
- ~~Cisco ME3400: Cisco IOS 12.2.60 EZ 11 – Metro Access (release date 05/06/2017)~~
- ~~Cisco ASR920: Cisco ASR 920 Series IOS XE UNIVERSAL-NO PAYLOAD ENCRYPTION 3.18.0.SP – Metro Access Service License (release date 29/06/2016)~~
- ~~OneAccess 1646: TDRE14.002.793 (release date 08/09/2017)~~

Table 4: summary of transparency results for NGLL CPEs

	DA Ethernet / DA IP	*~~Cisco ME3400~~*	*~~Cisco ASR920~~*	*OneAccess 16467*	*OneAccess 1651*	*Cisco NCS540*
Control frames			-			
IGMP		~~Discard~~	~~Forward~~	Forward	Forward	to be tested
IEEE L2CP Frames			-			
STP IEEE	01-80-c2-00-00-00	~~Policed~~[2]	~~Policed~~[2]	Forward	Forward	to be tested
Pause Frames	01-80-c2-00-00-01	~~Discard~~	~~Discard~~	Discard	Discard	to be tested
LACP/LAMP	01-80-c2-00-00-02	~~Discard~~	~~Discard~~	Forward	Forward	to be tested
802.3 ah	01-80-c2-00-00-02	~~Discard~~	~~Discard~~	Discard	Discard	to be tested
Port authentication	01-80-c2-00-00-03	~~Discard~~	~~Policed~~[2]	Forward	Forward	to be tested
E-LMI	01-80-c2-00-00-07	~~Discard~~	~~Policed~~[2]	Forward	Forward	to be tested
LLDP	01-80-c2-00-00-0E	~~Policed~~[2]	~~Policed~~[2]	Forward	Forward	to be tested
MMRP	01-80-c2-00-00-20	~~Forward~~	~~Forward~~	Forward	Forward	to be tested
MVRP	01-80-c2-00-00-21	~~Forward~~	~~Forward~~	Forward	Forward	to be tested
Cisco L2CP frames			-			
CDP	01-00-0c-cc-cc-cc	~~Policed~~[2]	~~Policed~~[2]	Forward	Forward	to be tested
PVSTP+	01-00-0c-cc-cc-cd	~~Policed~~[2]	~~Policed~~[2]	Forward	Forward	to be tested

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