



Proximus Reference Offer for Bitstream Access

Covering the technology Fiber GPON

Main Body

Communicated to the Belgian Institute for Postal services and Telecommunications on 14/12/2018
Our reference: MSO & Servicing version



This offer is made by Proximus PLC under Belgian Public Law, a Belgian autonomous public enterprise organized under the Law of March 21, 1991, with registered office at B-1030 Brussels, 27 Boulevard du Roi Albert II, VAT BE 0202 239 951 Brussels Register of Legal Entities, exercising its activities under the commercial name Proximus and referred to as "Proximus" in all the documents that are part of this offer.

The present offer has been elaborated based on Proximus' best knowledge to date. As Fiber GPON is a new technology and not all technical and commercial decisions have been taken already, the offer and any information therein is subject to change or further clarification at any time.

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1 Glossary

- **Bitstream xDSL services:** services delivered in the scope of the regulated Proximus Reference Offer for Wholesale Broadband Access, covering the ADSL, Reach Extended ADSL2, ADSL2+, SDSL and VDSL2 access technologies, referring in this document to the Shared VLAN type.
- **BDFO:** Building Distribution Frame Optical. Generic term for the various boxes used by Proximus for entering the introduction cable and the departure of the vertical cabling.
- **CPE:** Customer Premises Equipment.
- **Customer Equipment:** any equipment that belongs to the Beneficiary.
- **DTP:** Distribution Termination Point. Is the end point of the distribution and the transition to the introduction.
- **End-User premises :** Living Unit of an End-User.
- **End-User :** User of electronic services provided by the Beneficiary, Third Party Beneficiary, or a reseller of that service, and/or Proximus.
- **ESS:** Ethernet Service Switch.
- **Fiber GPON:** the Proximus Fiber GPON solution is an ITU-T G.984X based Gigabit Passive Optical Network solution.
- **FTTB:** Fiber To The Business: business zones where there is a mix of GPON and copper technologies.
- **FTTH:** Fiber To The Home.
- **FTTH Brownfield :** zones where Proximus intends to replace all copper technologies by the GPON technology.
- **FTTH Greenfield :** zones where no copper technologies are present.
- **GE:** Gigabit Ethernet.
- **GPON:** Gigabit Passive Optical Network.
- **IP:** Installation Point.
- **LDC:** Proximus Local Distribution Center.
- **LEX:** Proximus Local Exchange.
- **LU:** Living Unit. A Living Unit corresponds to the dwelling used by one family or one group of persons.
- **MDU:** Multi Dwelling Unit. An MDU corresponds to a building used by several families or several groups of persons, each identified as one single End-User.
- **MSO:** Multi Service Ordering.
- **NNI:** Network Node Interface.
- **OAL:** OLO (Ethernet) Access Line. An Access Line is an interface between the Customer Equipment and a Proximus Service Router located in the Service PoP of the Service Area.
- **OFF:** Optimized Fiber Point. Is the end point of the feeding and the beginning of the distribution.
- **OLO:** Other Licensed Operator.
- **OLT:** Optical Line Terminal. Is the end point of a passive optical network, performing conversion between electrical signals used on the Proximus Ethernet backbone and fibre optic signals used by the passive optical network, and coordinating the multiplexing between the ONTs of the PON.
- **ONTP:** Optical Network Termination Point. Box that terminates one fibre in the Living Unit or in the technical room (for some MDUs).
- **ONT:** Optical Network Terminal. The ONT (optical modem) is an active network element that is controlled via the OLT.
- **Partner Technician:** technician employed by one of the Proximus authorized contractors.
- **PON:** Passive Optical Network.
- **P-bit:** priority bit.
- **SDU:** Single Dwelling Unit. An SDU corresponds to a building used by one family or one group of persons, identified as one single End-User.
- **Service PoP:** a Service PoP provides access to the Proximus Ethernet network through NNI connection with a Proximus Service Router.
- **Service Router:** Proximus Service Routers are installed in each Service PoP and in the LEXs. A Service Router installed in a LEX provides Ethernet transport to a Service PoP.
- **UNI:** User to Network Interface.
- **UTAC:** Universal Telecom Access.
- **UTP:** Unshielded Twisted Pair.
- **VLAN:** Virtual Local Area Network.

2 Scope

1. This document provides a description of the Bitstream Fiber GPON service that Proximus offers to a Telecommunications Operator¹, hereafter called “Beneficiary”.
2. This document entails the conditions related to the provision by Proximus to the Beneficiary of the Bitstream Fiber GPON service, which will enable the Beneficiary to define its own Fiber GPON products and to market, distribute and sell under its name and on its behalf its own Fiber GPON products towards End-Users, using Proximus installed and existing Network infrastructure, pursuant to the technical limitation of this existing infrastructure for offering the service.
3. This offer and its tariffs are only applicable for connecting End-User premises connected to an OLT located in Proximus premises (LEX or LDC). The identification of zones where the Living Units are eligible for a Fiber GPON service is available on the Beneficiary dedicated e-library².
4. This document describes in broad terms the technical, operational and financial conditions of the Bitstream Fiber GPON service offered by Proximus.
5. The provision of the hereunder-described service supposes the following list of prerequisites that will need to be met at all times and in all circumstances:
 - Connection between the network of the Beneficiary and the Proximus network (hereafter the “Network”) is established pursuant to the principles set out in this document;
 - A PON between the End-User premises and a Proximus OLT must be available;
 - When termination works are required to deliver the service (also referred to as SNA or Small Network Adaptations in this offer) and are allowed by the Beneficiary, they will be performed by Proximus (or one of its subcontractors) according to the intervention type defined by the latter: splicing underground, splicing façade and/or splicing indoor.
6. A Bitstream Fiber GPON service is only offered if technically feasible and in accordance with the Fiber GPON deployment in the Proximus network. Proximus will perform a technical feasibility study on the End-User line (Fiber GPON UNI port availability, etc...) after having received the order of the Beneficiary.
7. Upon reasonable firm request by the Beneficiary, Proximus will analyse with the latter the access to (sections of) ducts for optical fibre in the underground FTTH distribution networks of Proximus where the End-Users are connected by such underground ducts from end to end, subject to the effective availability of free space in such ducts to host the requested elements of electronic communications networks, inter alia by taking account of (future) needs for such ducts by Proximus, as evaluated at the time of the request.

More specifically, the specifications, conditions, operational modalities and tariffs of access to (sections of) ducts of the underground FTTH distribution networks of Proximus will be assessed by Proximus and set out in detail by means of an engineering study covering the technical and IT feasibility as well as the reasonability of the request.

¹ “Telecommunications Operator” under the present reference offer is to be understood as entitled to provide telecommunications services under national legislation, and which is eligible for Bitstream Fiber GPON access. Reference is made to the Annex “General Terms and Conditions” for further details on the eligibility.

² This information is subject to the signature of a specific Non-Disclosure Agreement.

3 Practical Information

8. Further requests for information concerning the present reference offer can be made in writing by interested Parties at the following Proximus contact point. In particular, in the event of doubt as to the interpretation of the provisions of this reference offer, Proximus should be contacted. In the event of doubt and as stated by the BIPT, contacting Proximus is without prejudice to any clarification of the reference offer given by the BIPT.
9. In case of disagreement about the interpretation, one of the Parties can request the BIPT for a decision on the specific case. This decision will be taken within a reasonable term and will take into account the legal framework and the valid advice. The possibility for the Parties to present the BIPT a problem in interpretation will not influence the legal means that remain at the Parties' disposal in case of a conflict.

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10. The sharing by Proximus of some types of information (e.g. the addresses of Proximus buildings) is subject to the prior signing of a Non-Disclosure Agreement by the requesting Party. Furthermore, a payment may be due for obtaining certain documents.
11. It is also a right for everyone who has signed a Non-Disclosure Agreement to obtain information via the Proximus website through a secured access. Information on how to access the mentioned website can be obtained at the Proximus contact point mentioned above.
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4 Proximus Fiber GPON Access Network overview

13. The Proximus Fiber GPON solution is a shared fibre solution, shared amongst a number of End-Users: an ITU-T G.984.x based Gigabit Passive Optical Network (GPON) solution composed of the following elements:
- An OLT (Optical Line Terminal) in the LEX (Central Office) and the OLT NT to the Ethernet Service Switch in the LEX.
 - A shared fibre. This fibre exits the LEX in fiber cables, which are split and terminated in a small underground manhole (OFP or Optimized Fiber Point) in the street, equipped with splitters. From the fiber cables, which exit the manhole and run either underground or on façade, a single fiber is extracted from the cable and fed into a DTP (Distributed Termination Point).
 - The DTP is a small box where the introduction fibre cables are spliced onto the distribution fibre cable. These introduction fiber cables exit the DTP and enter the Living Units where they are terminated on the ONTP (Optical Network Termination Point).
 - An Optical Network Terminal, which is installed and configured by Proximus (or one of its subcontractors) at End-User premises.
 - The UNI is a Gigabit Ethernet interface on the ONT, for connecting the Beneficiary's End-User LAN and/or Service Box.
 - The network demarcation point is the Ethernet port on the ONT box.

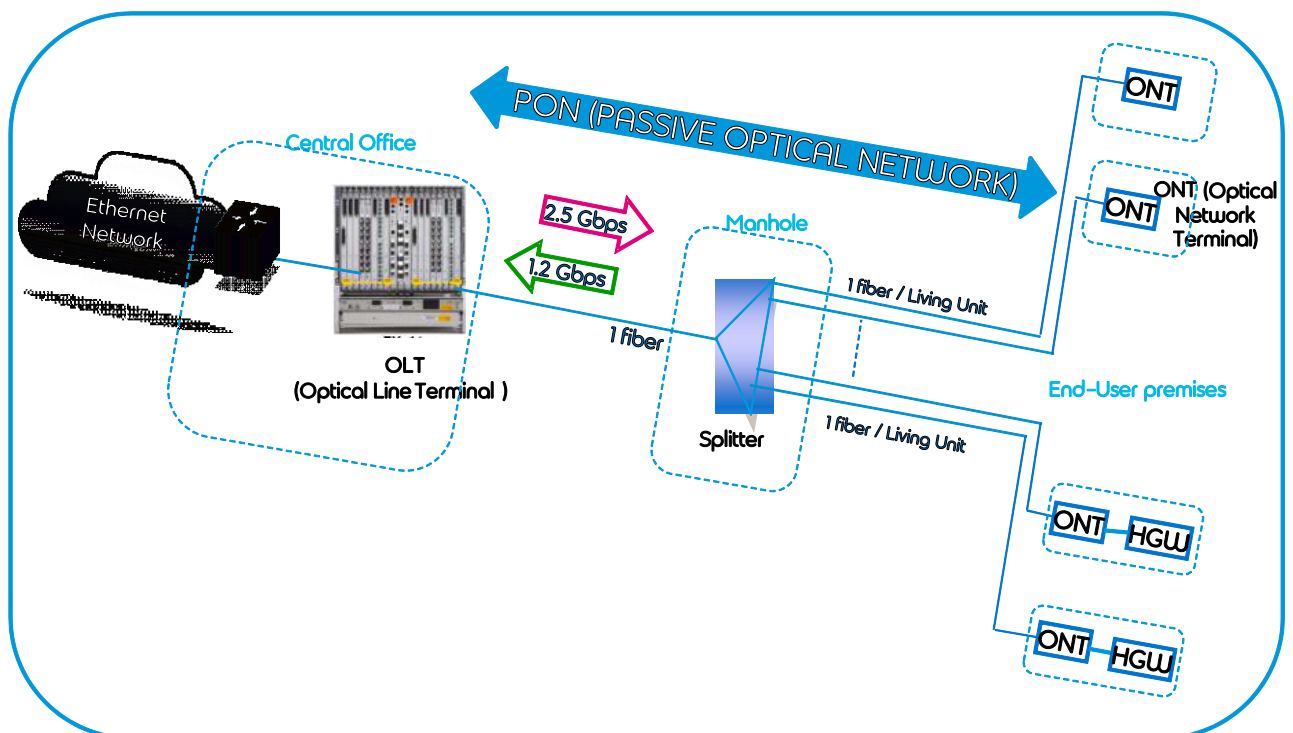


Figure 1: Proximus Fiber GPON Access Network overview

5 Description of the Bitstream Fiber GPON service

5.1 General

14. As most of the European operators, Proximus is in the process of adapting and upgrading its telecommunication infrastructure. In this regard, Beneficiaries shall be able to benefit from any changes in the Proximus broadband network similar to the changes provided by Proximus to its own retail services. In case these network changes have an impact on the Bitstream Fiber GPON service offered, whether a major impact (e.g. introduction of a new technology, a new network element or a new topology) or a minor impact for the Beneficiary (e.g. a new or adapted configuration, a new or adapted UNI rate limiting type profile or new/adapted product parameters), Proximus will respect the same periods of notice as those defined in the Annex "Planning & Operations" of the present reference offer regarding the IT projects. The BIPT will be informed in any case and can allow exceptions concerning the periods of notice.
15. After having first informed the BIPT, Beneficiaries shall be notified 12 months in advance of any withdrawal of a Bitstream Fiber GPON service in the "existing" infrastructure. If Proximus wants to withdraw a Bitstream Fiber GPON service before the end of these 12 months, an alternative agreement in good faith discussion will be concluded with the concerned Beneficiaries.
16. The Bitstream Fiber GPON service will allow the Beneficiary to connect on the Proximus network at a Proximus Service PoP and to receive Ethernet frames from the End-User using the Fiber GPON technology. The transport end-to-end between the End-User and the Beneficiary is Ethernet.
17. The service offering covers:
 - The provision by Proximus of one or several OLO Access Lines between the Customer Equipment and the Proximus Service PoPs.
 - The provision by Proximus of transport bandwidth (VLANs) between the Ethernet Service Switches to which the OLTs are connected and the Proximus Service PoPs to which the Customer Equipment is connected; these VLANs are shared³ between several End-Users of a Beneficiary in a same LEX.
 - The configuration by Proximus of the Ethernet Transport between the OLTs on which the Beneficiary wants to connect End-Users and the Customer Equipment.
 - The provision by Proximus of Fiber GPON lines to the End-Users.

³ Conditional to the availability of sufficient resources for IT and network implementation, the development of the Bitstream Fiber GPON "Dedicated VLAN" service in the Proximus network and systems is expected to be available with the October 2019 IT release. This timeframe does not contain a commitment of Proximus. The technical specifications of this new service will be detailed out at a later stage.

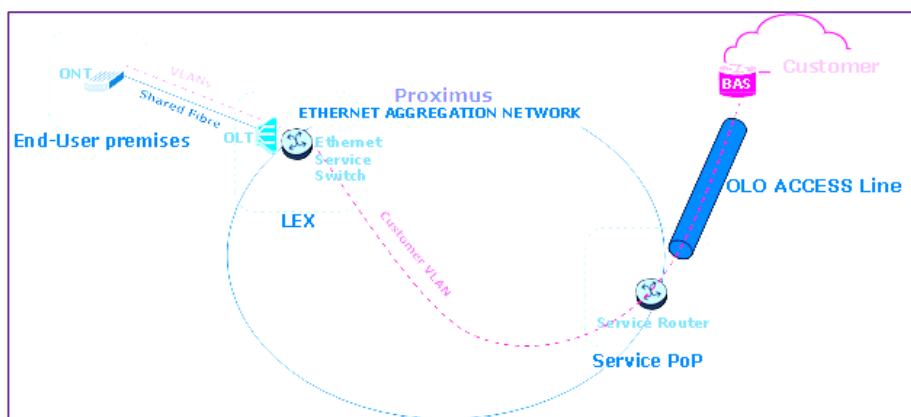


Figure 2: End-to-end overview

18. The Bitstream Fiber GPON service is offered on the basis of the equipment delivered by Proximus' supplier at the moment of the bringing into service of the equipment in a given site.
19. Proximus will ensure the management of the OLTs and ONTs and their proper configuration.
20. The Bitstream Fiber GPON service does not allow 'shared pair' alike services where the Beneficiary provides data services and Proximus would provide classical fixed voice services⁴ over the same network.

⁴ Classical voice services = PSTN & ISDN services.

5.2 OLO Access Line between a Proximus Service PoP and the Customer Equipment

21. For the description of the OLO Access Line service, reference is made to the document “Main Body” of the Bitstream xDSL reference offer, section “OLO Access Line between a Proximus Service PoP and the Customer Equipment”.
22. The same OLO Access Lines may be used by the Beneficiary for the Bitstream Fiber GPON and Bitstream xDSL services.

5.3 Ethernet Transport between the OLT and the Customer Equipment

23. The Bitstream Fiber GPON service offers an Ethernet connectivity between the OLO Access Lines and the End-User Fiber GPON lines.
24. Three service qualities are offered for the Bitstream Fiber GPON service, differentiated by the Ethernet p-bit (P)⁵:
 - o P=0: best effort.
 - o P=3: medium priority.
 - o P=5: highest priority and better performance for jitter and delay sensitive traffic.
25. For the Virtual LANs (VLANs) of the Fiber GPON lines, the Ethernet traffic of a Beneficiary's End-User is aggregated and transported in 1 Shared VLAN per service quality and per LEX to a Service PoP in the same Service Area where an OLO Access Line of the Beneficiary is connected.

In each LEX where Proximus installed OLT equipment, Proximus will create for the Beneficiary at maximum 6 Shared VLANs - with a maximum of 2 VLANs per service quality - to which the Beneficiary's End-Users are connected in order to transport their Fiber GPON traffic from the ESS (on which the OLT is connected) to the Customer Equipment and reversely.

The same Shared VLANs corresponding to the same service qualities are used by the Beneficiary for the Bitstream Fiber GPON and Bitstream xDSL services, for Ethernet connectivity between the OLO Access Lines and the LEX.

26. There are 5 Service Areas for the whole of Belgium, each of them covering 1 geographical area. Per Service Area there are 2 Service PoPs, located in 2 different buildings. The list of Proximus Service Areas, their definition and the address of the related Service PoPs is available in Appendix A.
27. VLANs will be configured by Proximus, on behalf of the Beneficiary, to transport the Fiber GPON traffic of the Beneficiary's End-Users from the OLTs on which the Beneficiary's End-Users are connected up to the Customer Equipment and reversely.

⁵ Conditional to the availability of sufficient resources for IT and network implementation, the development of the service quality P=1 in the Proximus network and systems is expected to be available with the October 2019 IT release. This timeframe does not contain a commitment of Proximus. The technical specifications of this new service quality will be detailed out at a later stage.

5.4 Bandwidth between the Local Exchanges and the Proximus Service PoP to which the Customer Equipment is connected

28. The Beneficiary will order bandwidth and more precisely Shared VLANs between each LEX in which the Beneficiary wants to connect End-Users and where Proximus installed OLTs and the Proximus Service PoP(s) to which the Beneficiary is connected. Each Beneficiary may order up to 2 VLANs per service quality per LEX.
29. The bandwidths that can be ordered by the Beneficiary between a LEX and a Proximus Service PoP are summarized in the table 1 below, in function of the service quality chosen by the Beneficiary for the related VLAN.

Offered VLAN Bandwidth (Mbps)	P=0	P=3	P=5
2	Y	Y	Y
4	Y	Y	Y
6	Y	Y	Y
8	Y	Y	Y
10	Y	Y	Y
12	Y	Y	Y
14	Y	Y	Y
16	Y	Y	Y
18	Y	Y	Y
20	Y	Y	Y
30	Y	Y	Y
40	Y	Y	Y
50	Y	Y	Y
60	Y	Y	Y
70	Y	Y	Y
80	Y	Y	Y
90	Y	Y	Y
100	Y	Y	Y
120	Y	Y	N
140	Y	Y	N
160	Y	Y	N
180	Y	Y	N
200	Y	Y	N
220	Y	Y	N
240	Y	Y	N
260	Y	Y	N

Offered VLAN Bandwidth (Mbps)	P=0	P=3	P=5
280	Y	Y	N
300	Y	Y	N
320	Y	N	N
340	Y	N	N
360	Y	N	N
380	Y	N	N
400	Y	N	N
420	Y	N	N
440	Y	N	N
460	Y	N	N
480	Y	N	N
500	Y	N	N
600	Y	N	N
700	Y	N	N
800	Y	N	N
900	Y	N	N
1gig	Y	N	N

Table 1: bandwidths allowed for ordering, per service quality.

30. Higher bandwidths could be possible in the future, if reasonable and sufficient justification can be submitted by the Beneficiary to Proximus.

5.5 Interconnection at LEX level

31. In addition to the connection of the Beneficiary on Service PoP level described in the above sections of this chapter, which allows the Beneficiary to use Bitstream services to connect End-Users of the whole Service Area, the Beneficiary may also interconnect with Proximus at LEX level.
32. The interconnection at LEX level is defined in Annex 2 – Technical Specifications of the present reference offer.

5.6 Activation of Bitstream Fiber GPON on a specific End-User line

33. Subject to the condition that the Beneficiary has ordered the necessary infrastructure (OLO Access Line and Shared VLAN(s)), the Beneficiary will be able to offer to End-Users services based on Fiber GPON technology, using the installed and existing Network infrastructure of Proximus, pursuant to the technical limitation of this existing infrastructure for offering Fiber GPON technology.
34. When the Remote Installation Method as further described below is not possible (or not wished by the Beneficiary), a Proximus or Partner Technician⁶ will install the Bitstream Fiber GPON service at End-User premises according to the Beneficiary's orders submitted to Proximus through the MSO SOA interface or the GUI. For further details regarding the MSO ordering and the Partner Technician type, reference is made to the Annex "Planning & Operations".
35. Proximus is able to configure the individual lines of End-Users at the OLT level on the basis of the following characteristics:
 - o Maximum 3 VLANs per End-User line, each dedicated to a different service quality. The 3 service qualities⁷ are:
 - P=0: best effort.
 - P=3: medium priority.
 - P=5: highest priority and better performance for jitter and delay sensitive traffic.
 - o The VLANs of different Beneficiary's End-User lines are aggregated per service quality and per LEX and transported in 1 Shared VLAN to a Service PoP where an Access Line of the Beneficiary is connected.
 - o A rate limiting is applied in upstream and downstream, on the flows of the UNI, according to the rate limiting type specified for each line individually by the Beneficiary. The Beneficiary can use the rate limiting types defined in a common pool of profiles. For the list of available rate limiting types, reference is made to the Annex "Technical Specifications", section "VLAN ID allocation and QoS at UNI" of the present reference offer.

⁶ Conditional to the availability of sufficient resources for IT and operational implementation, the use of the Installation Methods with the Partner Technician in the Proximus systems is expected to be allowed as from the June 2019 IT release. This timeframe does not contain a commitment of Proximus. The references towards "Partner Technician" in the remainder of the text should be read in the light of this provision.

⁷ Conditional to the availability of sufficient resources for IT and network implementation, the development of the service quality P=1 in the Proximus network and systems is expected to be available with the October 2019 IT release. This timeframe does not contain a commitment of Proximus. The technical specifications of this new service quality will be detailed out at a later stage.

5.7 Fiber GPON infrastructure at End-User premises

5.7.1 General

36. A Living Unit (LU) corresponds to the dwelling used by one family or one group of persons:

- An **SDU** (Single Dwelling Unit) corresponds to a building used by one family or one group of persons, identified as one single End-User.
- An **MDU** (Multi Dwelling Unit) corresponds to a building used by several families or several groups of persons, each identified as one single End-User.

The word “LU” or “Living Unit” covers both Residential and Business Living Units.

37. The figure 3 schematizes the Fiber GPON infrastructure needed in a Living Unit to provide a Bitstream Fiber GPON service.

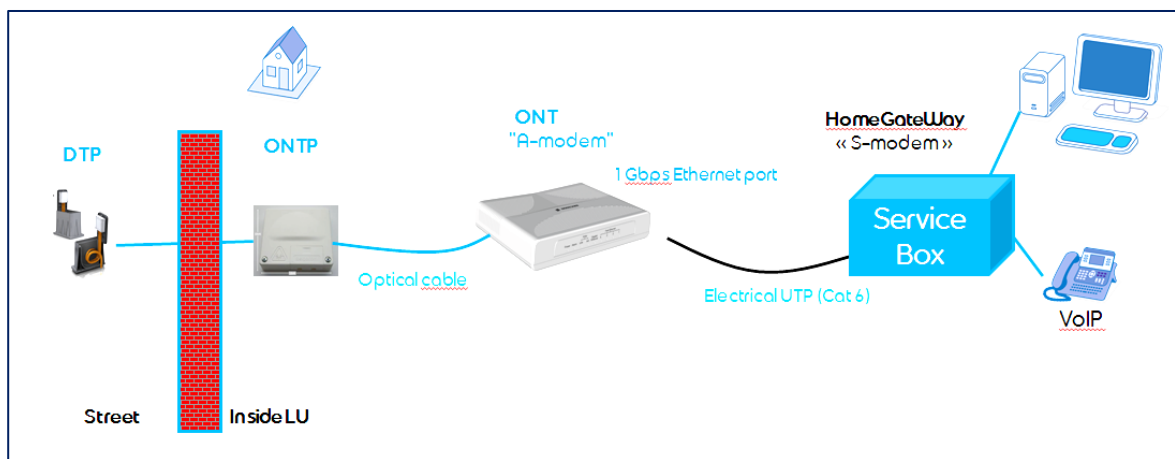


Figure 3: Fiber GPON infrastructure needed in a Living Unit

5.7.2 Optical Network Termination Point

38. The Optical Network Termination Point (ONTP) is the first termination point of the fibre connecting the Living Unit to the PON. The Optical Network Termination Point is a part of the Proximus network.

39. The ONTP is always installed by a splicer (a Proximus splicer or a Third Party splicer working for Proximus) in the Living Unit or in the technical room (for some MDUs).

5.7.3 Optical Network Terminal and Service Box

40. The Optical Network Terminal (ONT), connected to the ONTP, is an optical modem. It's an active network element managed via the OLT and it's a part of the Proximus network.

41. The ONT is managed by GPON in-band channel, called **ONT Management and Control Interface (OMCI)** as defined in ITU-T Recommendations G.984.

42. Depending on the Proximus engineering design, the ONT will get one of the two functionalities described hereafter:

- Shared ONT aims to connect up to 4 IPs in the context of an MDU with ethernet vertical cabling.
 - Multiple Service ONT aims to activate different services from different operators by IP.
43. Depending on the minimum Installation Method required to perform the activation, the ONT will be installed by a Proximus or Partner Technician in the Living Unit (for Multiple Service ONT) or in the technical room (for Shared ONT).
44. The access to the high bandwidth at End-User premises will be at the ONT Ethernet port, which is the Proximus network demarcation point, where the Beneficiary or the Beneficiary's End-User will connect its LAN or its Service Box. The **Service Box** will be provided, installed and connected to the ONT⁸ by the Beneficiary or the Beneficiary's End-User, according to the requirements set forth in Annex 2, "Technical Specifications", section "Service Box".

5.7.3.1 For SDU

45. The ONT and the optical patch cord⁹ connecting it to the ONTP are provided and installed by a Proximus or Partner Technician in the SDU.

5.7.3.2 For MDU equipped with optical fibre structured cabling

46. For MDUs where a complete **optical fibre** structured cabling is available from a Building Distribution Frame Optical (BDFO) inside a technical room to the different LUs, each ONT is provided, connected to the structured cabling and installed by a Proximus or Partner Technician in the Living Unit, and connected to the ONTP through the correct and working optical fibre structured cabling.

5.7.3.3 For MDU equipped without optical fibre structured cabling

47. For MDUs where a complete optical fibre structured cabling is not available from a Building Distribution Frame Optical (BDFO) inside a technical room to the different LUs, the ONT and the optical patch cord connecting it to the ONTP are provided and installed by a Proximus or Partner Technician in the technical room of the MDU.
48. In this case, Proximus recommends the use of **electrical** (UTP type, minimum CAT6) structured cabling to connect the different LUs of the building to a Building Distribution Frame (BDF) hosted inside a technical room of the building.
49. It is the Beneficiary or the Beneficiary's End-User responsibility to connect the ONTs installed and configured by a Proximus or Partner Technician to the Living Units through the structured cabling.

⁸ Proximus recommends the use of an UTP cable, minimum CAT6.

⁹ For maximum distances of the optical patch cord installed by Proximus, reference is made to the section "With Customer Visit" of the present document.

5.8 Bitstream Fiber GPON End-User line installation

5.8.1 General

50. Three (3) different types of Installation Methods relating to Bitstream Fiber GPON End-User lines are possible in function of the connectivity status of the Fiber GPON Installation Point (IP): Home New, Street Passed, Home Passed, Intro Building, Floorbox Terminated, Home Terminated, Home Connected or Home Activated.
51. The Fiber GPON Installation Point (IP) defines the installation point within a Fiber GPON deployment zone (FTTH Greenfield, FTTH Brownfield or FTTB) on which the ordered fiber product needs to be installed. The IP consists of two parts: the UTAC and the UNI, which are described in the section “Identifiers of the End-User line and the End-User Living Unit” of the present document.
52. The connectivity status (or IP status) depends on different criteria: the Living Unit situation (inside or outside a Fiber GPON deployment zone), the OLT presence, the OFP presence, the DTP presence, the ONTP presence, the ONT presence and the presence of a Fiber GPON service.
53. The IP status represents the status of 1 fibre terminating in (or available for) the Living Unit. Depending on the design, we have at least 1 terminating fibre per Living Unit.
 - Home New [HN] is set for a new fibre termination that has been designed/planned by Proximus engineering.
 - Street Passed [SP] is set when OFP [Optimized Fiber Point] has been successfully installed.
 - Home Passed [HP] is set when DTP [Distribution Termination Point] has been successfully installed.
 - Intro Building [IB] is set when Fiber cable enters the building in the context of an MDU or when UTP cable enters the LU in the context of an MDU with Ethernet vertical cabling.
 - Floorbox Terminated [FT] is set when the Floorbox has been successfully installed on the floor in the context of an MDU (FT is only possible for MDUs with vertical cabling in fiber – not for MDUs with Ethernet vertical cabling).
 - Home Terminated [HT] is set when ONTP has been successfully installed.
 - Home Connected [HC] is set when ONT has been successfully installed and configured.
 - Home Activated is set when (at least) a service is activated.
54. The Building Termination status represents the aggregated status of the building:
 - Building New [BN]: all IPs in the building are Home New.
 - Street Passed [SP]: all IPs in the building are Street Passed.
 - Building Passed [BP]: all IPs in the building are Home Passed.
 - Building Terminated [BT]: all IPs in the building are Intro Building (only for MDU).
 - Building Floorbox Terminated [BFT]: all IPs in the building are Floorbox terminated (only for MDU).
 - Building Home Terminated [BHT]: all IPs in the building are Home terminated.
55. The figures below schematically summarize the different connectivity statuses allowed in (i) an SDU and (ii) an MDU.

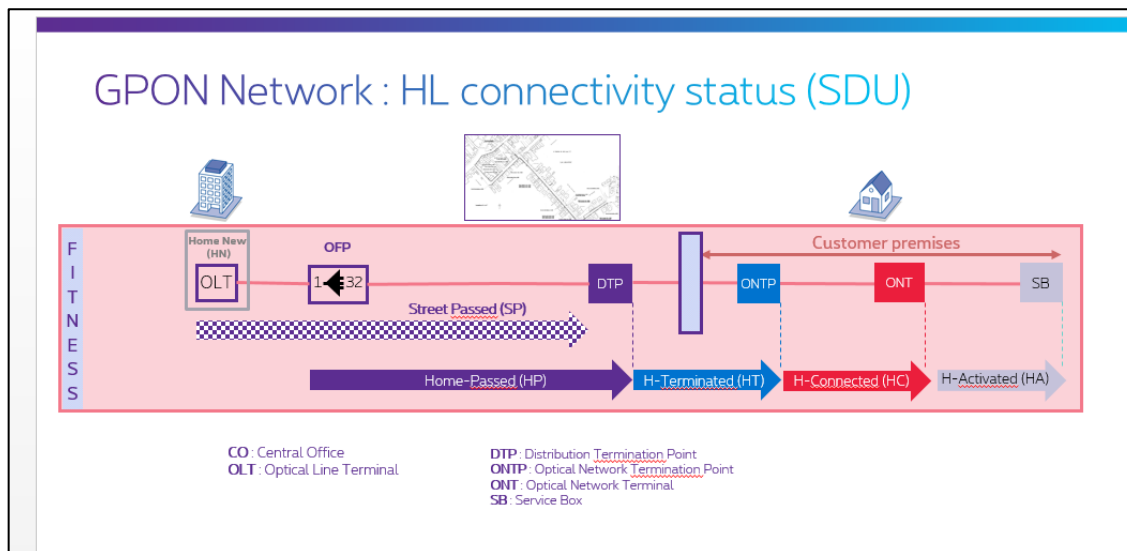


Figure 4: HL connectivity status (SDU)

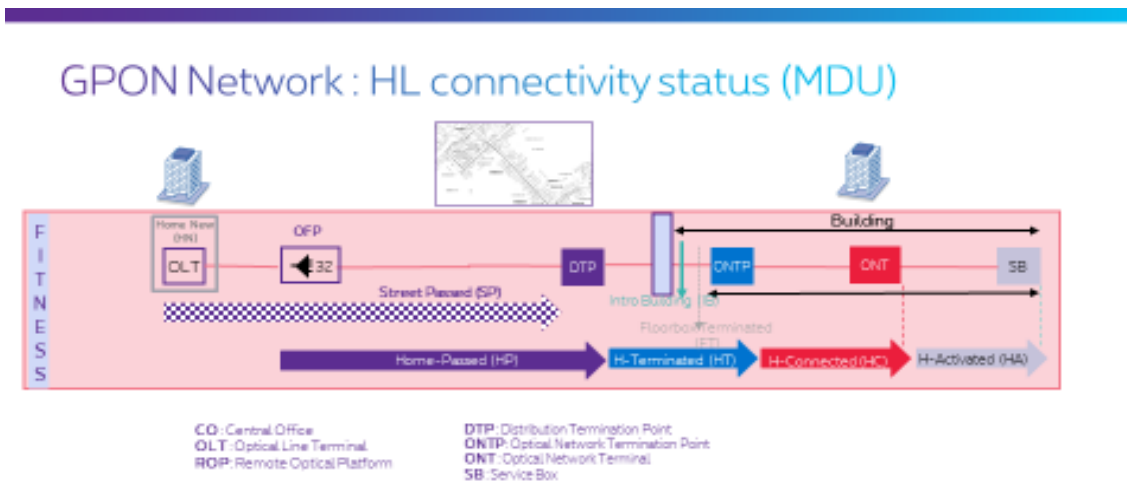


Figure 5: HL connectivity status (MDU)

56. Independently of the minimum Installation Method required to activate the Bitstream Fiber GPON service, the Beneficiary or the Beneficiary's End-User is always responsible for the delivery, installation and connection of the Service Box to the ONT:
- placed inside the Living Unit (for SDU and MDU with optical fibre structured cabling),
 - or placed inside the technical room of the MDU, through the MDU structured cabling (for MDU with electrical structured cabling).

5.8.2 Home Termination for SDU

57. In case an SDU is “new” or “passed” (“Home New”, “Street Passed” or “Home Passed”) according to the definition explained above, the Beneficiary may order a **Wholesale Home Termination** to Proximus for this Living Unit, to make it ready for a possible later activation of a Bitstream Fiber GPON service. A Home Termination consists of the following:
 - If SDU is “Home New”: the delivery and installation by Proximus of the OFP & DTP outside the Living Unit and the delivery and installation by Proximus of the ONTP inside the Living Unit and its connection to the PON.
 - If SDU is “Street Passed”: the delivery and installation by Proximus of the DTP outside the Living Unit and the delivery and installation by Proximus of the ONTP inside the Living Unit and its connection to the PON.
 - If SDU is “Home Passed”: the delivery and installation by Proximus of the ONTP inside the Living Unit and its connection to the PON.
58. On the private domain, duct or trench must be provided by the Beneficiary or its End-User.
59. The Wholesale Home Termination will only be performed upon specific request of the Beneficiary and provided that the Proximus standard conditions for access are fulfilled. This requires that a free duct or an open trench is available on the private domain. If neither a free duct nor an open trench is available on the private domain, Proximus can be asked to also perform this part of the work on condition that the Beneficiary agrees to pay the price for that part of the work performed by Proximus. This price will be determined on a case-by-case basis according to a cost estimate if the Beneficiary allows it.
60. Proximus will only perform the Wholesale Home Termination provided that the installation address is eligible for such access.
61. In case no more free fibre is available in the Distribution Cable, the request for Wholesale Home Termination will be discarded. The construction or trenching of new distribution cabling, another DTP than the one designed by Proximus engineering or new feeder cabling is outside the scope of the present offer.
62. An order for Wholesale Home Termination may occur independently of a Bitstream Fiber GPON service order. Once realized by Proximus, a Wholesale Home Termination may be used by any Beneficiary to order a Fiber GPON service for the concerned End-User, based on any Fiber GPON services offered by Proximus, or by Proximus itself to provision a Retail Fiber GPON service.
63. The Wholesale Home Termination Product will always be installed by splicers (Proximus splicers or Third Party splicers working for Proximus).

5.8.3 With Customer Visit splicing included

64. In case a Living Unit is “new” or “passed” (“Home New”, “Building New”, “Street Passed” or “Home Passed”) according to the definition explained above, Proximus will report as minimum Installation Method required a **“With Customer Visit splicing included”** for the activation of the Bitstream Fiber GPON service for this Living Unit.

65. When the minimum Installation Method required to activate the Bitstream Fiber GPON service is a “With Customer Visit splicing included”, the following works will be executed:
 - o Fibre splicing or termination works (splicing underground, splicing façade and/or splicing indoor) including the ONTP installation. These termination works are also referred to as “Small Network Adaptations” or SNA.
 - o Activation works at End-User premises including the ONT installation and configuration.
66. Once the ONT is installed in the LU, this installation includes the delivery and placement¹⁰ of an optical patch cord of 1, 3 or 5 meters maximum between the ONTP and the ONT.
67. An upgrade of the Installation Method is not possible.
68. Reference is made to the above section “Home Termination for SDU” for the aspects related to the works on private domain.
69. SNA and additional works on private domain in FTTB zones always require a site survey and the creation of a cost estimate.

5.8.4 With Customer Visit

70. In case a Living Unit is “Terminated” (“Home Terminated”, “Building Terminated” or “Floorbox Terminated”) according to the definition explained above, Proximus will report as minimum Installation Method required a “**With Customer Visit**” for the activation of the Bitstream Fiber GPON service for this Living Unit.
71. When the minimum Installation Method required to activate the Bitstream Fiber GPON service is a “With Customer Visit”, the following works will be executed:
 - o Activation works at End-User premises including the ONT installation and configuration.
72. If the ONT is installed in the LU (in case of SDU or MDU with optical fibre structured cabling), this installation includes the delivery and placement¹¹ of an optical patch cord of 1, 3 or 5 meters maximum between the ONTP and the ONT.
73. An upgrade of the Installation Method is not possible.

5.8.5 Remote

74. In case a Living Unit is “Connected” or “Activated” according to the definition explained above, Proximus will report as minimum Installation Method required a “**Remote activation**” of the Bitstream Fiber GPON service for this Living Unit.
75. When the minimum Installation Method required to activate the Bitstream Fiber GPON service is a “Remote”, the Beneficiary will not be able to select a technician type given the absence of field work to perform in the Proximus network.

¹⁰ Only in case of no vertical cable and no drilling work. The optical patch cord is placed in an existing cable gutter.

¹¹ Only in case of no vertical cable and no drilling work. The optical patch cord is placed in an existing cable gutter.

76. An upgrade of the Installation Method towards a “With Customer Visit” is however possible.

6 Operational Processes

77. The provisioning and repair processes for the OAL, the VLANs and the End-User lines are detailed in the Annex 3, "Planning & Operations" of the present reference offer.

7 Pricing, Compensations and Billing

78. Principle: all Standard Fees as described in Annex 5, "Pricing, Compensations & Billing" of the present reference offer will be invoiced to and are to be paid by the Beneficiary whenever relevant.
79. The Beneficiary will receive a monthly invoice containing the fees (recurring and non-recurring) for that period. Invoices related to any relevant fees are to be paid within the foreseen deadlines as set out in the Annex 5, "Pricing, Compensations & Billing" of the present reference offer.

8 Identifiers of the End-User line and the End-User Living Unit

8.1 UTAC, UNI & UTAC/UNI

80. The **UTAC** is the identifier of the **fibre terminating on the Optical Network Termination Point [ONT]** or the BDFO (Building Distribution Frame Optical used in some SDU/MDU), part of the Fiber GPON access network. Only 1 Optical Network Terminal [ONT] can be connected on this fibre.

The UTAC is allocated when the fibre is designed by Proximus engineering to be terminated on a certain Living Unit located at a certain installation address. The UTAC is independent from the services provided on the Fiber GPON access.

Its format is described below:

GS1 Company Prefix > < Individual Asset Reference >

X1... X7

X8... X18

54 **13729**¹²

9 999 999 999 X

UTAC examples: 54 1372 9000 0000 0012, 54 1372 9000 0000 0029

UTAC is the unique identifier of the Wholesale Termination Product.

81. The **UNI** is the identifier of the **Ethernet port** on the ONT.

Then, for a given End-User, 1 Ethernet service will be provided on 1 UNI of the ONT connected on the "terminated" fibre identified by 1 UTAC.

UNI format is x-y where x = slot (always 1) and y = port (1, 2, 3 or 4)

UNI example: 1-1, 1-2, 1-3 or 1-4.

82. The UTAC/UNI is the combination of the two here-above mentioned identifiers (UTAC & UNI) and refers to the Fiber GPON installation point ID. This combination can be used by the Beneficiary as a substitute to the detailed installation address for the provide-like order types.

¹² X1...X7 always remains fixed as

54 is the identifier of Belgium.

13729 is the identifier of Proximus PLC under Belgian Public Law.

83. In the context of a Multiple Service ONT, the first free UNI of the IP must always be used for a new activation.

8.2 Circuit ID (CID)

84. The **CID** is the unique identifier of the **Ethernet service** provided on the ONT.

CID is the identifier of the Proximus Bitstream and Fast Internet Fiber GPON services.

8.3 NA (Subscriber Number)

85. The **NA** is the identifier of the Proximus voice over IP service.

8.4 Detailed installation address

86. The **detailed installation address** is for all providers the identifier of the **Living Unit** of the **End-User**.

8.5 SSID

87. The **SSID** is the identifier of the **Proximus TV/Multicast** service.

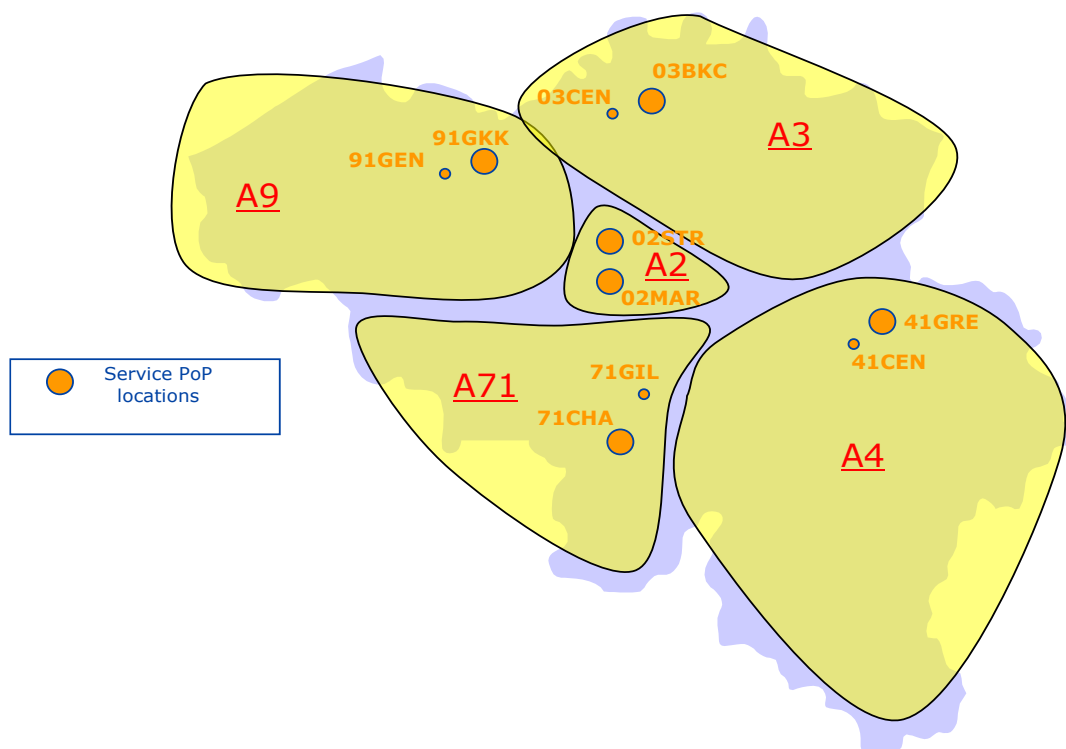
9 Unique reference per End-User line

88. In case a Beneficiary sends a request to take over a Bitstream Fiber GPON service from another Beneficiary or a Proximus retail Fiber GPON service, there will be an issue in the identification of the fibre on addresses with for example more than one fibre in service.
89. With the MSO "Location Check" and "Active Installation Check" functionalities, the Beneficiary will be able to validate the input given by the End-User with the internal Proximus IT system(s). The validation can be done by using the installation address or the service identifier (NA for the Voice, CID for the Internet service and/or SSID for the TV service) or the Fiber GPON installation point ID (UTAC/UNI). The location check is a mandatory step for Provide, Change Operator and Move orders. The location check based on the service identifier or Fiber GPON installation point ID will provide the most reliable and precise installation address information.
90. The Circuit ID that has been communicated by Proximus at the provisioning of a new Bitstream Fiber GPON service (or of a new Proximus Fast Internet Fiber GPON service) is a unique reference that will identify both the service and the ONT UNI.
91. Communicating such unique service identifier on the bills and contracts sent by the Beneficiary to the End-User for the Bitstream Fiber GPON service provided on the basis of the present reference offer will help facilitate the change of operator on the Proximus network. Such communication will allow the End-User to provide the Beneficiary – as recipient operator – with the Circuit ID to enable a seamless Change Operator process. As a matter of fact, the systematic inclusion of the Circuit ID in the orders will allow to avoid identification problems.
92. The Proximus Fast Internet Fiber GPON service is identified by a Circuit ID which can be found on the End-User invoice.
93. As long as the Bitstream Fiber GPON service remains active for the same Beneficiary, the service identifier will remain the same. For further details on the service identifier behaviour, reference is made to the "MSO User Guide" documented on the secured wholesale personal page.
94. The Beneficiary will also provide in each repair case the service identifier (Circuit ID) that was provided by Proximus in the provisioning process.

Appendix A: List of Service Areas and Service PoPs

a. Overview

5 Service Areas and 10 Service PoPs



b. Definition of the Service Areas

Service Area	Included Telephone Zones
A3:	03, 011, 012, 013, 014, 015, 016, 089
A2:	02
A4:	019, 04, 061, 063, 080, 081, 082, 083, 084, 085, 087
A71:	010, 060, 064, 065, 067, 068, 069, 071
A9:	050, 051, 052, 053, 054, 055, 056, 057, 058, 059, 09

(*): For the sake of clarity, it is confirmed that the zone codes indicated above in the context of the present offer are limited to the numbers which identify fixed network termination points. In particular, 09 and 04 are respectively limited to the number series 092, 093 and 042, 043. As far as the code 080 is concerned, the numbers starting with 0800 are excluded.

c. List of Service PoPs

Area		City	Address	NCOW
A9	91GKK	Gent - Keizer Karel	Keizer Karelstraat 1	9265
A9	91GEN	Gent - Centrum	Sint Niklaasstraat 27	9223
A3	03CEN	Antwerpen - Centrum	Lange Nieuwstraat 106	3224
A3	03BKC	Antwerpen - Berchem	Karel Coggestraat 2	3227
A2	02MAR	Brussels - Marais	Rue du Marais - Broekstraat 72-74	2220
A2	02STR	Brussels - Paille	Rue Lebeau - Lebeauststraat 2	2513
A71	71GIL	Charleroi - Gilly	Sentier de la Limite 80	7141
A71	71CHA	Charleroi - Centre	Rue de la science 2	7127
A4	41CEN	Liège - Centre	Rue de l'université 30	4223
A4	41GRE	Liège - Grétry	Rue d'Harscamp 17	4349

As announced in the document "Network Transformation Outlook 2016-2021" (which is published on the Proximus wholesale website), the Service PoPs 03CEN and 91GKK will move to neighbouring villages. The Service PoP 03CEN ("Antwerpen-Centrum") with a "stop service" date of 30/06/2019 will move to 03WOM (Jacobsveldweg 15, 2160 Wommelgem). The Service PoP 91GKK ("Gent - Keizer Karel") with a "stop service" date of 30/06/2020 will move to 91WON (Zeeschipstraat 209, 9032 Wondelgem).

End of document