

# Reference Offer for Broadband Services (ROB)

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## 1. ROB Legal Terms

This Reference Offer for Broadband Services ("**ROB**") defines the terms and conditions, which shall apply and be granted by POST Technologies to Other Alternative Operators ("**Operators**") for the provisioning of POST Technologies' Broadband Services as required by Regulation 14/176/ILR.

All Schedules attached to this ROB form an integral part hereof and detail the different Broadband Services and their respective applicable provisioning terms offered by POST Technologies under this ROB.

The Co-location services as referred to from time to time in this ROB are part of and subject to the applicable Reference Co-location Offer ("**RCO**") and shall be provided by POST Technologies to the Operators in compliance with the specific terms and conditions of the said RCO.

As from the effective date of a Broadband Agreement the Operator is subject to this ROB and any of its subsequent and/or to any reference offers replacing it, as from their date of definitive publication in compliance with the applicable regulations and, more particularly, in compliance with Regulation 14/177/ILR.

This ROB does not purport to diminish the rights of Operators to seek additional services nor POST Technologies' obligation to provide additional services under applicable law.

Apart from this ROB, POST Technologies' commercial offers as well as any other valid and applicable reference offer(s), if any, are still available to the Operator on request pursuant to their respective terms and conditions.

### 1.1. Services covered

This ROB defines the minimal terms and conditions for Broadband Services which POST Technologies will grant to Operators.

Nevertheless, POST Technologies reserves the right to provide more beneficial terms and conditions on a commercial basis, in accordance with the applicable regulatory framework, including the principle of non-discrimination.

The Broadband Services covered by this ROB are:

- (i) Bitstream Services, and
- (ii) EtherConnect Services

A detailed description of these services is provided in Schedule 2 - Broadband Service Description.

Broadband Services delivery and operations by POST Technologies shall be in accordance with the applicable Technical Information, as provided by POST Technologies to the Operator, which shall conform to the general principles set out in and form integral part of the ROB.

## **1.2. Definitions and Interpretation Rules**

### 1.1.1. Definitions

Unless expressly stated otherwise

- (i) references to an article are references to an article of the ROB, while references to clauses and schedules are to the clauses and schedules of the ROB; references to paragraphs are to paragraphs of the relevant schedule;
- (ii) reference to a person includes a natural person, corporate or unincorporated body (whether or not having separate legal personality), while references to a statute or statutory provision is a reference to it as it is in force for the time being, taking account of any amendment, extension or re-enactment and includes any subordinate legislation for the time being in force made under it;
- (iii) a reference to one gender shall include a reference to the other genders and vice versa;
- (iv) words in the singular shall include the plural and vice versa, while references to a gender include any other gender;
- (v) writing or written includes faxes but not e-mail, except if specifically specified in this ROB or in the Broadband Agreement;
- (vi) where the words "include(s)", "including" or "in particular" are used, they are deemed to have the words "without limitation" following them. The words "other" and "otherwise" are illustrative and shall not limit the sense of the words preceding them;
- (vii) any obligation in the ROB or the Broadband Agreement on a person not to do something includes an obligation not to agree or allow that thing to be done.

### 1.1.2. Interpretation Rules

To the extent that they are consistent with and the subject-matter of the provisions concerned have not been replaced by the terms of the ROB and/or the Broadband Agreement, the general conditions of POST Technologies, which can be consulted on POST Technologies' Website, will apply to the provision of the Broadband Services.

Unless expressly defined otherwise hereafter (in particular in Schedule 1 - Glossary below), the terms used in this ROB shall be construed and interpreted in accordance with the Law of February 27th, 2011 on and Electronic Communication Networks and Services and its implementing regulations.

## **1.3. Term**

This ROB is valid as from the date of its definitive publication in accordance with Regulation 14/177/ILR unless the ILR advises otherwise or unless

- (i) a new ROB is published or adopted by POST Technologies, in compliance with Regulation 14/177/ILR, or
- (ii) a material change occurs in the laws or regulations with respect to electronic communication services and networks in Luxembourg and this only to the extent that such a material change would render the ROB in applicable or unenforceable.

#### **1.4. Amendments**

In accordance with Regulation 14/177/ILR the content of this ROB may be timely reviewed and amended in order to comply with applicable rules and regulations. However, amendments to the general conditions of POST Technologies and to the Technical Information can be made in accordance with the amendment provisions set forth therein.

Furthermore, ILR has the right to request or impose on POST Technologies modifications to the applicable ROB or the adoption of a new ROB to be undertaken by POST Technologies in compliance with the applicable procedural rules and regulations.

#### **1.5. ROB Tariffs**

All ROB Tariffs, including those specified in the Schedules attached hereto, are in EURO (€) and exclusive of Value-Added Tax (VAT) or any other legal taxes, which will be added where applicable. Please refer to Schedule 6 - Tariffs.

POST Technologies may revise the ROB Tariffs at any time after having definitively published the reviewed ROB Tariffs in accordance with Regulation 14/177/ILR.

If any ROB Tariff or the means and/or methods of calculating such ROB Tariff is subject to a legal review by the ILR or with any other administrative or judicial authority, the concerned ROB Tariff or the concerned calculation method shall be treated as valid until the final conclusion of the legal review, unless the competent authority directs otherwise. If an authority finds a ROB Tariff or a ROB Tariff calculation method to be unlawful then POST Technologies shall make any necessary alterations to ROB Tariffs for the future.

#### **1.6. Billing**

The Operator undertakes to pay all invoices in relation to this Broadband Agreement in EURO (€) and within the payment period specified on the relevant invoice(s), it being specified that the Operator shall pay to POST Technologies all due amounts as set forth above irrespective of (i) the billing by the said Operator to its own End User and/or of (ii) the payment by the End User(s) of the services provided to them by the Operator on the basis of or in relation to the Broadband Services or any other telecoms service(s) provided by POST Technologies to the Operator.

Upon POST Technologies' request, the Operator shall provide an irrevocable and unconditional bank guarantee issued in favour of POST Technologies by an EU financial institution for an amount of at least 50.000 €

- (i) before POST Technologies' acceptance of any order in case the Operator's creditworthiness appears to be not sufficient for the Broadband Services to be provided by POST Technologies; or in case
- (ii) the Operator has had repetitive credit defaults in the past towards POST Technologies, whichever may be the type of services concerned;
- (iii) the Operator fails to make payment to POST Technologies of any undisputed amount when due in relation to the Broadband Services; or
- (iv) in case the Operator has a material, negative change in its financial conditions and/or creditworthiness.

The above-mentioned guarantee shall be issued for a period equivalent to the duration of the Broadband Agreement, but may be extended having regards to the circumstances upon POST



Technologies' request. When, and as long as serious and ascertained doubts exist regarding the Operator's creditworthiness or solvency, POST Technologies may without prejudice to previous arrangements require payment in advance.

## **1.7. Parties' Obligations**

1.7.1. POST Technologies shall be responsible for

- (i) the Network used to provide the Broadband Services from the End User's NTP, FO-NTP or ONT to the POI;
- (ii) connecting or disconnecting Broadband Access lines further to and in compliance with valid Operator's confirmed orders submitted to POST Technologies in accordance with Schedule 3 – Planning, Ordering and Provisioning;
- (iii) informing the Operator on system alterations to be made in POST Technologies' Network and having a potential effect on the services offered by the Operator in compliance with Article 2.5 - Scheduled System Alteration below;
- (iv) the maintenance of the Broadband Services between the POI with the Operator and the demarcation point on the End User's premises. In no case shall POST Technologies be responsible for bad cabling connections between the network termination points (NTP/FO-NTP/ONT) and the NTU or modem acting as a demarcation point.

POST Technologies shall not be responsible for the performance and follow-up of any service that the Operator operates on a Broadband Access and provided to the latter as part of the Broadband Services.

POST Technologies shall in no case be obliged to expand, modify or condition in any way POST Technologies' Network in whole or in part, to provide any part of the Broadband Services, unless expressly agreed otherwise in the Broadband Agreement and only to the strict extent as specifically agreed upon by and between the Parties or as imposed by the ILR.

Request for new connections to existing and/or new buildings shall be handled pursuant to Schedule 3 - Planning, Ordering and Provisioning.

1.7.2. The Operator shall at least be responsible for the following :

- (i) ordering or terminating, as the case may be, a Broadband Service in accordance with Schedule 3 - Planning, Ordering and Provisioning;
- (ii) using exclusively telecommunications terminal equipment compliant with "Règlement grand-ducal du 4 février 2000 concernant les équipements hertziens et les équipements terminaux de télécommunications et la reconnaissance mutuelle de leur conformité" and any subsequent regulations replacing or amending this regulation, as well as with any specifications provided by POST Technologies in accordance with the terms of this ROB;
- (iii) conducting appropriate fault testing and timely producing associated Fault Reports to evidence faults in the POST Technologies' Network in accordance with this ROB and in particular with Schedule 4 - Fault Repair and Reporting;
- (iv) complying with any obligations of or related to legal interception;
- (v) informing the relevant End User about all technical modifications required on his/her existing installation and the service impacts that might occur; and



- (vi) tracking POST Technologies' system alteration activities as well as achieving relevant steps and actions in due time in order to make sure that the End User's services are maintained;
  - (vii) notifying POST Technologies in writing of its contact details relevant for or in relation to the Broadband Services as of the signature date of the Broadband Agreement as well as notify any change thereto to POST Technologies in due time and in any case sufficiently in advance in compliance with the Broadband Agreement.
- 1.7.3. No Operator (including POST Technologies) shall be responsible for the content of IP traffic or transactions passed through its own or an Operator's network (including POST Technologies' Network). Laws and regulations regarding confidentiality and access by legal authorities to traffic or transactions on the Operator's and POST Technologies' network will apply.

## **1.8. POST Technologies' General Powers**

- 1.8.1. POST Technologies may refuse to grant access to any Broadband Services to any Operator for justified technical constraints or the necessity to warrant POST Technologies' Network's integrity. Any decision to refuse to grant access will be notified to the ILR.
- 1.8.2. Occasionally, POST Technologies, acting reasonably, may suspend in whole or in part the Broadband Services for any of the following reasons:
- (i) if required by any administrative or judicial authority duly authorised and empowered to do so, or
  - (ii) for maintenance reasons, network adaptations and/or in case of any usage creating perturbations or disruptions of any part of the Broadband Services or of any other service(s) using the same infrastructure.
  - (iii) in order to ensure the general availability of the Broadband Services.
- 1.8.3. Wherever possible, POST Technologies will give the Operator reasonable written notice before performing any of the actions related to the above and POST Technologies will do its best efforts to restore Broadband Services as soon as possible after the concerned temporary suspension.
- 1.8.4. POST Technologies shall have the right to disconnect any equipment or any part of it without prior reference or notice to the Operator if at such time, in POST Technologies' reasonable opinion it is exposing or could expose any person to any danger of death or injury.
- 1.8.5. Without prejudice to the foregoing clause, POST Technologies shall have the right to request the Operator to disconnect any equipment or any part of it within a reasonable time period, if, at such time, in POST Technologies' reasonable opinion, it is causing, suspected of causing or could cause damage to the Network or if such exposure or damage is or may be imminent, POST Technologies will immediately notify the Operator of the circumstances in which such compliant equipment has to be disconnected. If the Operator has not disconnected the concerned equipment within a reasonable time period, POST Technologies shall have the right to disconnect itself the concerned equipment after prior notification thereof to the Operator.

- 1.8.6. POST Technologies shall not be liable to the Operator for any loss, damage or injury arising due to POST Technologies' action in disconnecting the equipment or for any interruption to the service provided by the Operator using the equipment howsoever caused, except where the loss damage or injury is caused directly due to POST Technologies' gross negligence.
- 1.8.7. In the event of a disconnection in accordance with the above, the Operator shall not reconnect the equipment until the reasons for its disconnection have been fully remedied. In case the danger or threat referred to above is caused directly due to POST Technologies' negligence, then POST Technologies shall reimburse to the Operator the evidenced reasonable direct costs of reconnecting the equipment.

## **1.9. Limitation of Liability**

- 1.9.1. POST Technologies has no obligation of any kind to the Operator beyond the obligations to exercise the reasonable skill and care of a competent telecommunications operator in performing its obligations under the ROB and the Broadband Agreement.
- 1.9.2. Neither Party undertakes any liability for the acts or omissions of a third provider of telecommunications services, nor shall be held liable for such act or omission. As a consequence, the Party affected by such an act or omission shall carry out all appropriate rights and measures against the concerned third party provider of telecommunications services, without involving the other Party, while the latter will, if appropriate having regards to the circumstances, reasonably cooperate with the concerned other Party in relation to the above.
- 1.9.3. Neither POST Technologies nor the Operator excludes or restricts its liability for death or personal injury caused by its own negligence or liability.
- 1.9.4. POST Technologies will not be liable to the Operator for any claims, proceedings or actions brought or made against POST Technologies by any of the Operator's End Users, it being specified that in such case the Operator shall keep POST Technologies free and harmless of any such claims, proceedings or actions.
- 1.9.5. Neither Party shall be held liable to the other in contract, tort or otherwise, to the fullest extent permitted by law, for indirect or consequential damage or any other loss of profit whatsoever arising in connection with the implementation of this ROB and the relevant Broadband Agreement, howsoever caused.

## **1.10. Property**

All relevant infrastructures and equipment used by POST Technologies for the provision of Broadband Services to the Operator remain and shall remain the integral property of POST Technologies.

The Operator shall be responsible for any equipment put at disposal by POST Technologies and must take reasonable steps to ensure that nobody (other than someone expressly authorised by POST Technologies) adds to, modifies or in any way interferes with it. The Operator will be liable to POST Technologies for any loss of or damage to POST Technologies' equipment, except where such loss or damage is due to fair wear and tear or is caused by POST Technologies, or anyone acting on POST Technologies' behalf.

Any software and/or user manuals provided or made available by POST Technologies to the Operator in relation to any part of the Broadband Services :

- (i) are and shall remain protected by applicable copyright law and as such, any copy, translation, transcription, bearing, correction, integration modification thereof, whichever may be the type, support, way and/or extend thereof, either by the Operator or by an End User, is strictly prohibited; and
- (ii) shall remain the exclusive property of, as the case may be, POST Technologies or any third party having title thereto.

The Operator expressly undertakes to take and/or cause to take all and all necessary or appropriate steps and measures to prevent any breach of the above provisions.

With the cessation of any part of the Broadband Services either by the Operator or by a specific End User, whatever the reason, any usage rights of the Operator on that relevant infrastructure, software and/or user manuals shall automatically expire on the effective cessation date of the Broadband Services, without POST Technologies having to carry out any specific steps in relation thereto and/or for that specific purpose and without prejudice to the right of POST Technologies to recover any physical elements that are its property.

### **1.11. Information Exchange, Confidentiality**

1.11.1. In order to implement the ROB and the Broadband Agreement, POST Technologies and the Operator will have to exchange information and the disclosing Party undertakes to use reasonable endeavours to ensure that the information disclosed is correct to the best of its knowledge at the time of such information provision.

1.11.2. The POST Technologies Staff is under professional secrecy. This legal obligation binds the personnel to secrecy concerning the Operator, as well as its services and data (including those of its End Users).

1.11.3. With respect to each and any Confidential Information provided by either Party (the "Disclosing Party") to the other (the "Receiving Party") in relation to this Agreement, the Receiving Party undertakes to :

- (i) hold such Confidential Information in confidence and protect it with the same degree of care with which it protects its own Confidential Information of equivalent importance, but in no event less than reasonable care;
- (ii) use such Confidential Information only in pursuance of its business relationship with the other Party and its Affiliates as well as in relation to the Broadband Agreement and/or the Broadband Services;
- (iii) not copy or otherwise duplicate in whatever form and on whatever support or mean either known or unknown to date (e.g. in written, pictorial, floppy disks, magnetic disks, optical disks or other tangible form) such Confidential Information or knowingly allow anyone else to access, copy or otherwise duplicate any of such Confidential Information under its control without the Disclosing Party's prior written approval (which shall not be unreasonably refused, delayed or conditioned), except as regards to Authorised Persons as defined below;
- (iv) restrict access to and disclosure of such Confidential Information solely to those of its employees (including its management and directors), external advisors and/or consultants and any of those of its Affiliates and/or of those of its Subcontractors

with a strict need to know and directly involved in the implementation of this Agreement and/or in the provision of any part(s) of the Services (collectively the "Authorised Person(s)"), and not to disclose Confidential Information to any third parties (including, without limitation, any of its other agents, consultants and/or subcontractors not being Authorised Persons); as well as

- (v) require that all Authorised Persons to which access to the Confidential Information has been or will be granted or given duly agree to maintain the confidentiality thereof, and specifically to comply with the provisions set forth herein by contract, work rules or other appropriate methods at the Receiving Party's option; and
- (vi) not analyse or reverse engineer for composition of any Confidential Information, nor assist others to disassemble, decompile, reverse engineer or otherwise attempt to recreate the Confidential Information.

1.11.4. Each Party shall take all reasonable steps and measures to :

- (i) avoid disclosure, dissemination and more generally unauthorised access to or use of Confidential Information, which shall comply with the measures it usually takes to protect its own confidential information or its information of a similar nature and in any case take not less than reasonable care; and
- (ii) segregate Confidential Information from third parties' confidential materials, in particular to prevent commingling; and
- (iii) at its sole expense and including but not limited to court proceedings, to restrict its Authorized Persons from prohibited or unauthorized disclosure or use of the Confidential Information as well as to make each of them sign individual secrecy commitments at least equivalent to those contained in the Broadband Agreement.

1.11.5. This Article 1.11 shall nevertheless not prevent or refrain any Party from complying with its legal information obligations.

1.11.6. The Receiving Party may in particular disclose Confidential Information to European or national competent governmental or administrative authorities to the extent strictly necessary to ensure compliance with any law. In case Confidential Information is to be communicated pursuant to the requirement of law, regulation, judgment, order from any competent administrative authority or judicial body and/or request for the needs of any proceedings with any courts or administrative authorities, having the right to request the disclosure of such a Confidential Information, the Receiving Party shall, to the extent permitted by any applicable law or the relevant regulation, authority or body, notify such request for disclosure to the Disclosing Party without undue delay upon receipt thereof so that the Disclosing Party may, at its sole discretion and costs, seek protective order, confidential treatment and/or other appropriate remedy.

In any case, the Receiving Party shall be entitled to disclose such Confidential Information as strictly requested by the relevant authority, provided it duly specifies to the said authority at the time of such disclosure the confidential nature of such Confidential Information and takes all relevant steps to ensure due protection thereof to the widest extent possible.

1.11.7. The Receiving Party shall notify to the Disclosing Party, immediately upon discovery or knowledge thereof, any unauthorised use, access and/or disclosure of any Confidential Information or any other breach of this Article 1.11 and undertakes in such a case to (i) reasonably cooperate with and support the Disclosing Party and/or its Affiliates to protect

its/their rights and when relevant to regain possession of such Confidential Information as well as to mitigate the consequences of such unauthorised use, access and/or disclosure, to (ii) take out and achieve without undue delay all appropriate and relevant steps and measures to prevent further unauthorised use, access and/or disclosure of the Confidential Information or part thereof and to (iii) take appropriate defensive measures against any claim of infringement, in accordance with the reasonable instructions of the Disclosing Party.

1.11.8. All Confidential Information shall remain the property of the Disclosing Party and/or as relevant of the owner of the concerned Confidential Information.

1.11.9. The Parties agree that the provisions strictly relating to confidentiality set forth in this Article 1.11 shall survive any termination of the Broadband Agreement, whichever may be the ground, for a three years (3) period as from the effective termination date of the Broadband Agreement.

1.11.10. The Parties hereby declare and warrant that they comply with data protection and privacy laws, and any other laws in relation to the Broadband Services, to the extent applicable to them. Each Party particularly undertakes to (i) comply with the legislation in force relating to personal data protection and computer security, including in particular the amended law of 2 August 2002 on the protection of persons with regard to the processing of personal data as well as the amended law of 30 May 2005 on the protection of privacy in the electronic communications sector (ii) hold and maintain such security infrastructure and organization as relevant or necessary to comply with and reasonably carry out its rights and obligations pursuant to this Agreement under optimum safety condition and in compliance with applicable laws.

## **2. ROB Operational Terms**

### **2.1. The Broadband Services shall:**

- (i) be provided by POST Technologies to an Operator in accordance with the terms and conditions of this ROB;
- (ii) consist of and include the provisioning by POST Technologies to an Operator of:
  - a. service to enable the Operator to provide electronic communications and/or telecommunications services to End Users,
  - b. interconnection between POST Technologies' and the Operator's network at the POI (RHD) for the handover of the aggregated traffic flows for the services provided to the operator in the context of this ROB, or
  - c. maintenance and fault clearance for the provided services; and
- (iii) be provided only on a fibre line or a copper line where POST Technologies' Network allows provision of fibre respectively xDSL services.

### **2.2. Quality of Service – Service Level Agreement (SLA)**

The Service level set out in Schedule 5 - Service Level Agreement attached hereto shall apply to the provision of the Broadband Services, while the said Service level shall not apply in case of any Force Majeure event.

### **2.3. System Protection**

Each Party is responsible for the safe operation of its respective system and shall take all reasonable and necessary steps and measures in its operation, implementation and maintenance to ensure that its system does not

- (i) endanger the safety or health of employees, contractors, agents or End Users of the other Party, nor
- (ii) damage, interfere with or cause any deterioration in the operation of the other Party's system or a third party operator's system.

### **2.4. Configuration and Technical Constraints**

- 2.4.1. Broadband Access lines will be provided in accordance with the technical constraints specified in Schedule 2 - Broadband Service Description.
- 2.4.2. POST Technologies shall in no case be liable for any shortage of access lines or cable saturation, e.g. due to broadband usage.

### **2.5. Scheduled System Alteration**

- 2.5.1. Scheduled system alteration with major impact

When POST Technologies wants to make a system alteration which may reasonably have a major impact on the proper provision of the Broadband Services under this ROB to one or several Operator(s), it shall give to the concerned Operator(s) a minimum two (2)-



month written notice prior to the foreseen date of the anticipated system alteration, which shall specify the technical details of the contemplated system alteration and the foreseen date of the said anticipated system alteration.

Following such notification, POST Technologies shall provide to the Operator additional information, as the Operator may reasonably request, including, to the extent reasonably practicable, the potential impact thereof on the service(s) provided by the Operator to the End Users.

Upon an Operator's express request, POST Technologies will grant access to a special test platform where the said Operator can test the compatibility of its Active Equipment with the latest software version applied in POST Technologies' Network.

#### 2.5.2. Scheduled system alteration without major impact

When POST Technologies wants to make a system alteration which may reasonably not have a major impact on the proper provision of the Broadband Services under this ROB to one or several Operator(s), it shall give to the concerned Operator(s) a prior notice having regards to the circumstances which shall in no case be less than three (3) business days prior to the foreseen date of the said anticipated system alteration. Such notification shall specify the technical details of the contemplated system alteration, the foreseen date of the related works and the reasonably foreseeable impact of the said works on the Broadband Services provisioning.

### **2.6. Works or Intervention due to a POST Technologies Network Failure or an Emergency Case**

In case POST Technologies has to intervene on its network further to a network failure or an emergency case, POST Technologies will do its best efforts to limit the time of its intervention having a possible impact on the provisioning of the Broadband Services to the reasonable minimum time having regards to the circumstances. In any case, POST Technologies will inform the Operators of such an intervention as soon as reasonably possible, while the restoration of the service provisioning on POST Technologies' network shall be the priority.

### **2.7. Coordination between the Parties**

2.7.1. POST Technologies will put into place entities in order to manage provisioning, maintenance and fault repair of the Broadband Services, which will be accessible from 8:00 to 12:00 and from 13:00 to 17:00 from Monday to Friday, except on legal, public and usage holidays in Luxembourg.

2.7.2. The contact details of these entities will be published on POST Technologies' Website and shall be the exclusive contact points for any and all Operator's handling questions regarding the operational management of the Broadband Services.

2.7.3. The Operator undertakes to (i) contact only POST Technologies' contact points as specified here above and to (ii) provide its own contact points for the management of Broadband Services, including for questions regarding operational subjects.

2.7.4. POST Technologies' and the concerned Operator's respective contact points in relation to this ROB and to the provision and maintenance of the Broadband Services are or, as the case may be, will be specified in the concerned Broadband Agreement. In addition POST



Technologies will publish its contact points on POST Technologies' Website, while the later version thereof shall always prevail over older ones.

- 2.7.5. The exchange of information related to the ordering process for Bitstream Services shall be done exclusively by means of a Web Service Application communicating via XML-based SOAP (Simple Object Access Protocol) messages. The Operator shall commit to use said Web Service Application for the submission of all orders related to Bitstream Services and to comply with all of POST Technologies' procedures regarding the use of this Web Service Application and the structure of its XML/SOAP messages.

## **2.8. Relations with End Users and Branding**

### 2.8.1. End Users

Without prejudice to the applicable regulatory framework, POST Technologies will not undertake customer handling/care of the Operator's End Users.

The Operator undertakes not to include in the contractual terms with its End Users conditions that are not consistent with the terms of the ROB. The Operator shall be solely liable and responsible for any contractual terms and conditions that the Operator may offer to its End Users beyond the specifications of the Broadband Services.

### 2.8.2. Branding

The Parties agree not to offer any Broadband Service under any brand, including any trademark, trade name or company name of the other Party unless the use of the brand(s) of the other Party is expressly agreed upon in writing between the Parties. Such use of the brand will then be strictly limited to the service at stake.

POST Technologies is allowed to use, for all interventions in the context of this ROB, its normal vehicles and staff uniforms with all advertising on them as for its own products and services.

The Operator is not allowed to attach any branding or advertising signs on POST Technologies' equipment and infrastructure, neither in POST Technologies' sites nor in End User's sites.

### **3. Procedure for reaching a Broadband Agreement**

Broadband Agreements will be negotiated and entered into, based on the standard terms and conditions approved by the ILR, pursuant to and in compliance with the applicable legislation and POST Technologies shall endeavour its best efforts to conclude a Broadband Agreement in no less than fifteen (15) days after receipt of a valid request.

Any request for entering into a Broadband Agreement with POST Technologies under this ROB must be made in writing and per registered mail to the following address:

**Entreprise des Postes et Télécommunications**

POST Technologies

*Département Développement et Vente en gros*

2, rue Emile Bian

L-1235 Luxembourg

Tel: +352 49 91 1

## Schedule 1 Glossary

Access Line	Refers to the physical line (i.e. copper pairs or optical fibres) between the NTP or FO-NTP at the End User's premises and the DSLAM, OLT or other aggregation node in POST Technologies' Network
Active Equipment	Equipment located at the End User's premises owned by either the Operator or the End User and used for circuit termination and delivery of Operator's services (e.g. modem, router, HAG, Set-Top Box) as well as the End User's application equipment (e.g. PC)
ADSL	Asymmetric Digital Subscriber Line
ATH (or "Accès Très Haut débit")	ATH services are defined in the ORATH
Area POP	Site where the point-to-point FTTH fibre infrastructure is terminated and where POST Technologies' and Operators' infrastructures share the same room. Existing Local Exchanges can also serve as Area POPs.
Bitstream Service(s)	Service for providing broadband connectivity to End Users as defined in this ROB
Broadband Agreement	The agreement that must be concluded between POST Technologies and the Operator in order to make the terms of the ROB binding upon the Operator In view of the provision of Broadband Services by POST Technologies and any specific services and features ancillary to the Broadband Services if expressly agreed therein by the Parties
Broadband Service(s)	Bitstream Services and/or EtherConnect Services
Broadband Services KPI(s)	The key performance indicator(s) applicable to Broadband Services as expressly listed in article 3 (3) of the Regulation 14/180/ILR (or any subsequent ILR regulation(s) amending such list in whole or in part)
CBS	Committed Burst Size – Maximum number of bytes available for a burst of Ethernet Frames sent at interface speed to remain CIR-conformant
CIR	Committed Information Rate – Bandwidth up to which the network delivers Ethernet Frames and is committed to meeting the performance objectives
Confidential Information	Includes, without limitation, <ul style="list-style-type: none"> <li>a. all non-public information relating the technology, infrastructure, customers, business plans and business models, tariffs and prices, promotional and marketing activities, strategy, finances, and other business affairs, possible routes, needs, constraints and/or requirements, offers and/or potential or possibly involved Subcontractors or providers relating to any Party and/or its Affiliates;</li> <li>b. all third party information that the concerned Party and its Affiliates are obliged to keep confidential; as well as</li> <li>c. any possible combination of any of the above</li> </ul> and excludes information which <ul style="list-style-type: none"> <li>a. was in the legitimate possession of the Receiving Party (as defined below) at the time of its disclosure by the Disclosing Party (as defined below) or corresponds in substance to information developed by the Receiving Party, as it can be demonstrated on the basis of previously existing documents, and which was not previously acquired from the Disclosing Party on a confidential basis;</li> <li>b. was in the public domain at the time of its disclosure by the Disclosing Party to the Receiving Party, as it can be demonstrated on the basis of published documents which were generally available prior to the disclosure of the relevant information;</li> <li>c. is considered to be part of the public domain subsequent to its disclosure by the Disclosing Party to the Receiving Party, as it can be demonstrated on the basis of documents which were published and are generally available through no act or failure to act of the Receiving Party; and</li> </ul>

	d. was disclosed by a third party to the Receiving Party without restriction on disclosure or use, unless the Receiving Party had actual knowledge that the third party acquired possession of it unlawfully or by a breach of contract or a fiduciary relationship.
CPE	Customer Premises Equipment
Donor Operator	The Operator from which an End User's Bitstream Service is migrated to a Recipient Operator
DSLAM	Digital Subscriber Line Access Multiplexer
EBS	Excess Burst Size – Maximum number of bytes available for a burst of Ethernet Frames sent at interface speed, but without any performance objectives
EIR	Excess Information Rate – Bandwidth up to which the network delivers Ethernet Frames, but without any performance objectives
EtherConnect Service	Service for providing broadband connectivity to End User's as defined in this ROB
End User	Any natural or legal person with whom the Operator has entered into an agreement for the provision of publicly available telecommunication services
EPT	Entreprise des Postes et Télécommunications, an autonomous « Etablissement Public » created by the « <i>Loi du 10 août 1992 portant création de l'Entreprise des Postes et Télécommunications</i> » as further modified
FO-NTP	Fibre Optic Network Termination Point, the termination point of the fibre optic section of POST Technologies' Network at the relevant End User's premises
Force Majeure	A force majeure event as defined in the GTCS of POST Technologies
FTTH	Fibre To The Home – POST Technologies' high-density fibre network for the universal fibre coverage of Luxembourg
FTTO	Fibre To The Office – POST Technologies' purpose-built fibre network providing connectivity for corporate customers
GPON	Gigabit Passive Optical Network
GTCS	POST Technologies' General Terms and Conditions for Sale in force, which can be consulted on POST Technologies' Website
HAG	Home Access Gateway
ILR	<i>Institut Luxembourgeois de Régulation</i> , the national regulatory authority in Luxembourg, in particular in the field of electronic communications networks and services
Intellectual Property Rights	Means all rights in inventions, patents, copyrights, design rights, trade marks and trade names, trade secrets, know-how and other rights having a similar effect (whether registered or unregistered) and all applications for the same anywhere in the world
IP	Internet Protocol
ISDN	Integrated Services Digital Network
LLU	Local Loop Unbundling
Local Exchange (or LE)	The telephony exchange closest to a given End User, usually also offering dedicated Co-location facilities, also termination point for point-to-point copper and fibre infrastructures
MEF	Metro Ethernet Forum
Migration	Process applicable when an End User is migrating for any type of electronic communication services, whereby the electronic telecommunication service initially provided by the Donor Operator will be cancelled and then activated for further provision by the Recipient Operator
NTP	Network Termination Point – termination point of the copper section of POST Technologies' network at the relevant End User's premises

NTU	Network Termination Unit – active equipment installed by POST Technologies at the End User's premises acting as demarcation device for the delivery of the service as defined in this ROB
OGB	Offre en Gros Bitstream
OLT	Optical Line Termination
ONT	Optical Network Termination
Operator	Any legal or natural person operating telecommunications networks and/or providing telecommunications services in Luxembourg as approved by the ILR and having entered into a Broadband Agreement with POST Technologies
ORATH	Offre de Référence Accès Très Hauts Débits sur FTTH
Parties	Collectively POST Technologies and the Operator as specified in the relevant Broadband Agreement
Party	As the case may be, either POST Technologies or the Operator as specified in the relevant Broadband Agreement
Passive Equipment	All the passive equipment e.g. central splitters, in-house cabling, outlets, patchcords required between POST Technologies' NTP, FO-NTP, ONT an/or NTU for the purpose of provisioning Broadband Services at the End User's premises
POI	Point Of Interconnection (in this ROB the POI between POST Technologies' Network and the Operator's network being the RHD)
POP	Point Of Presence
POST Technologies	Telecommunications division of EPT
POST Technologies' Network	Collection of all <u>terminal nodes</u> , <u>links</u> and <u>intermediate nodes</u> which are connected so as to enable <u>telecommunication</u> between all terminals. Includes POST Technologies' passive network (copper and fibre network) as well as POST Technologies' active transport network (access network, backbone).
POST Technologies' Website	Refers to POST Technologies' website for operators <a href="http://www.posttechnologies.lu/portal/lang/en/interconnect">http://www.posttechnologies.lu/portal/lang/en/interconnect</a>
POTS	Plain Ordinary Telephone Service (analogue telephone service)
PSTN	Public Switched Telephone Network
QoS	Quality of Service
RCO	Reference Co-location Offer
RDSLO	Reference DSL Offer
Recipient Operator	The Operator receiving an End User's migrated Bitstream Service from a Donor Operator
Regulation 14/176/ILR	The ILR regulation referenced 14/176/ILR, dated August 28, 2014 and titled « <i>Règlement 14/176/ILR du 28 août 2014 portant sur la définition du marché pertinent de la fourniture en gros d'accès à large bande (Marché 5/2007), l'identification de l'opérateur puissant sur ce marché et les obligations lui imposées à ce titre</i> », as may be subsequently amended or replaced in whole or in part.
Regulation 14/177/ILR	The ILR regulation referenced 14/177/ILR, dated August 28, 2014 and titled « <i>Règlement 14/177/ILR du 28 août 2014 concernant les procédures à suivre par un opérateur identifié comme puissant sur le marché dans le cadre de l'obligation de publication d'une offre de référence</i> », as may be subsequently amended or replaced in whole or in part.
Regulation 14/180/ILR	The ILR regulation referenced 14/180/ILR, dated August 28, 2014 and titled « <i>Règlement 14/180/ILR du 28 août 2014 concernant les procédures à suivre par un opérateur identifié comme puissant sur le marché dans le cadre de la</i>

	<i>fourniture des indicateurs de performance</i> », as may be subsequently amended or replaced in whole or in part.
RHD ( <i>"Raccordement très Haut Débit"</i> )	Interconnection between POST Technologies' Network and the Operator's network in this ROB
RLO	Reference Line Rental Offer
ROB	The present Reference Offer for Broadband Services
ROB Tariff(s)	Any tariff applicable to any part of the Broadband Service(s) as specified in Schedule 6 attached to this ROB
RUO	Reference Unbundling Offer
Rush Order	Order which will be processed with high priority for expedited activation of the Broadband Service
Service Profile	Set of specifications which determine the Broadband Service
Technical Information	Documentation about the technical characteristics related to this ROB and made available to the Operators on POST Technologies' Website
VoE	Voice over Ethernet (VoE services as specified in this ROB are also often referred to as VoB – Voice over Broadband services)
VoIP	Voice over IP
VDSL	Very High speed Digital Subscriber Line
VDSL Bonding	Technology allowing the combined use of multiple VDSL lines for increased throughput
xDSL	Digital subscriber line technologies using the voice-graded copper access network to provide broadband services to customer premises. xDSL technologies supported by POST Technologies for Bitstream Services currently include ADSL1, ADSL2, ADSL2+, VDSL2 and VDSL2 2-pair Bonding technologies depending on the available infrastructure between POST Technologies' broadband access equipment and the End User's premises concerned.
Web Service Application	Application communicating over the internet via XML-based SOAP (Simple Object Access Protocol) messages and used for the ordering process of Bitstream Services
Working Day(s)	Any days of the week in Luxembourg under exclusion of Saturday, Sunday as well as any public, statutory or bank holiday in the Grand-Duchy of Luxembourg.

## Schedule 2 Broadband Service Description

### 2.1. Generalities

The Services described in this ROB are compliant with the specifications of the MEF. Profiles and definitions are based on four parameters (CIR, CBS, EIR, and EBS) defined by the MEF.

CIR bandwidths described in this ROB apply to the Layer 2 Ethernet level including the Ethernet Frame Header according to IEEE 802.3. Therefore the usable bandwidth for the End User will be smaller than the bandwidth indicated in this ROB for each bandwidth profile.

The line rate of the physical Ethernet interface also includes additional overhead in the shape of Inter-Frame Gap, Preamble & Start of Frame Delimiter (SFD) which also limit the attainable Information Rate on a physical Ethernet interface (i.e. lower than 100 Mbps on a Fast Ethernet interface, lower than 1000 Mbps on a Gigabit Ethernet interface). As defined in the MEF specifications this overhead is not counted towards the Committed Information Rate of an Ethernet Virtual Connection.

The following table gives examples of the usable bandwidth depending on the frame length.

	Frame length (bytes)				
	64	128	256	1024	1522
Ethernet Line Rate (Mbps)	Usable throughput (Mbps)				
100	50	71,62	84,78	95,98	97,28
1000	500	716,22	847,83	959,77	972,76

Table 1: Usable throughput for upper layers depending on Ethernet frame length

The Broadband Services are composed of the following two (2) types of services:

- Bitstream Services
- EtherConnect Services

Each of these services will be specified in the following paragraphs.



## 2.2. Bitstream Services Description

Bitstream Services are Broadband Services designed for mass-market consumption using standardised implementation processes.

### 2.2.1. Bitstream Service Components and Service Profiles

The Bitstream Service allows the Operator to connect to POST Technologies' ADSL, VDSL and FTTH networks and offer value-added broadband services to its customers by implementing its own service access profiles adapted to the specific needs of its End Users. The Bitstream Service is provided as a stand-alone service and does not require the use of a new or existing phone line.

The Bitstream Service is composed of four different components:

- (i) Access
- (ii) Connectivity
- (iii) CIR traffic
- (iv) RHD interconnection

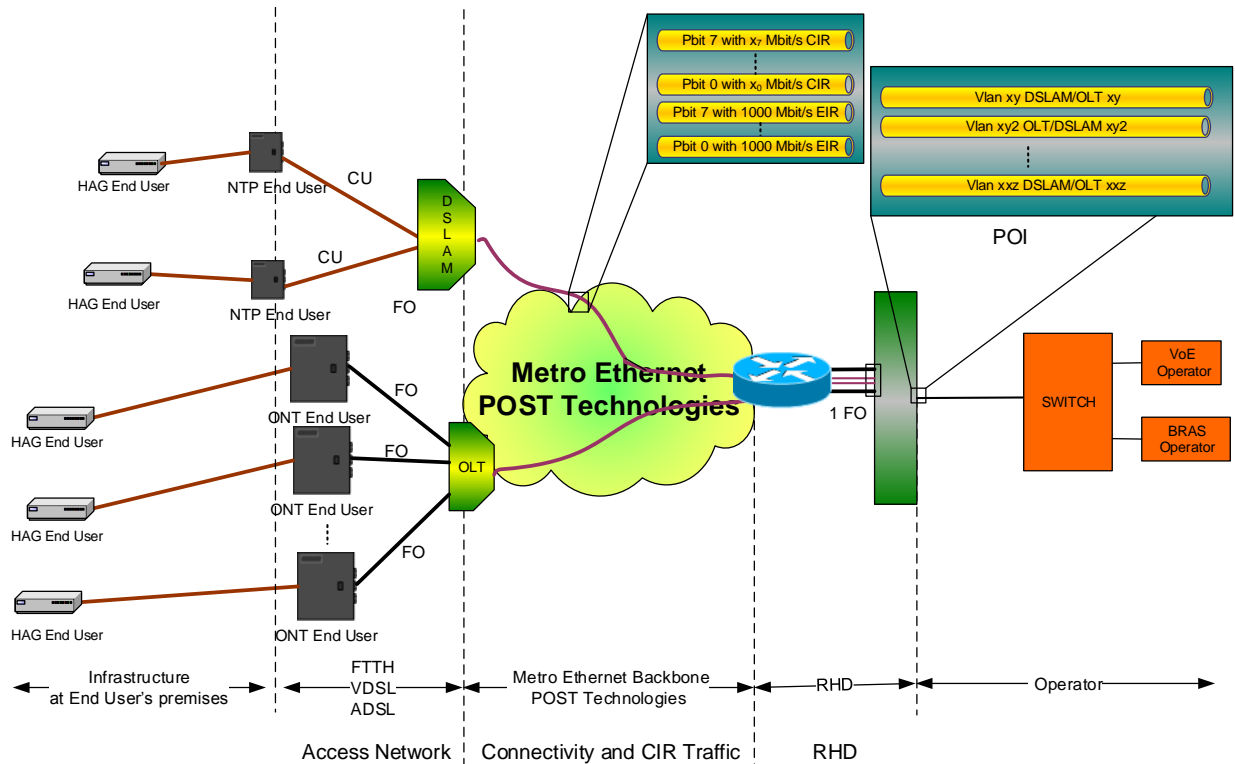


Figure 1: Bitstream Service components in a Mono-VC configuration

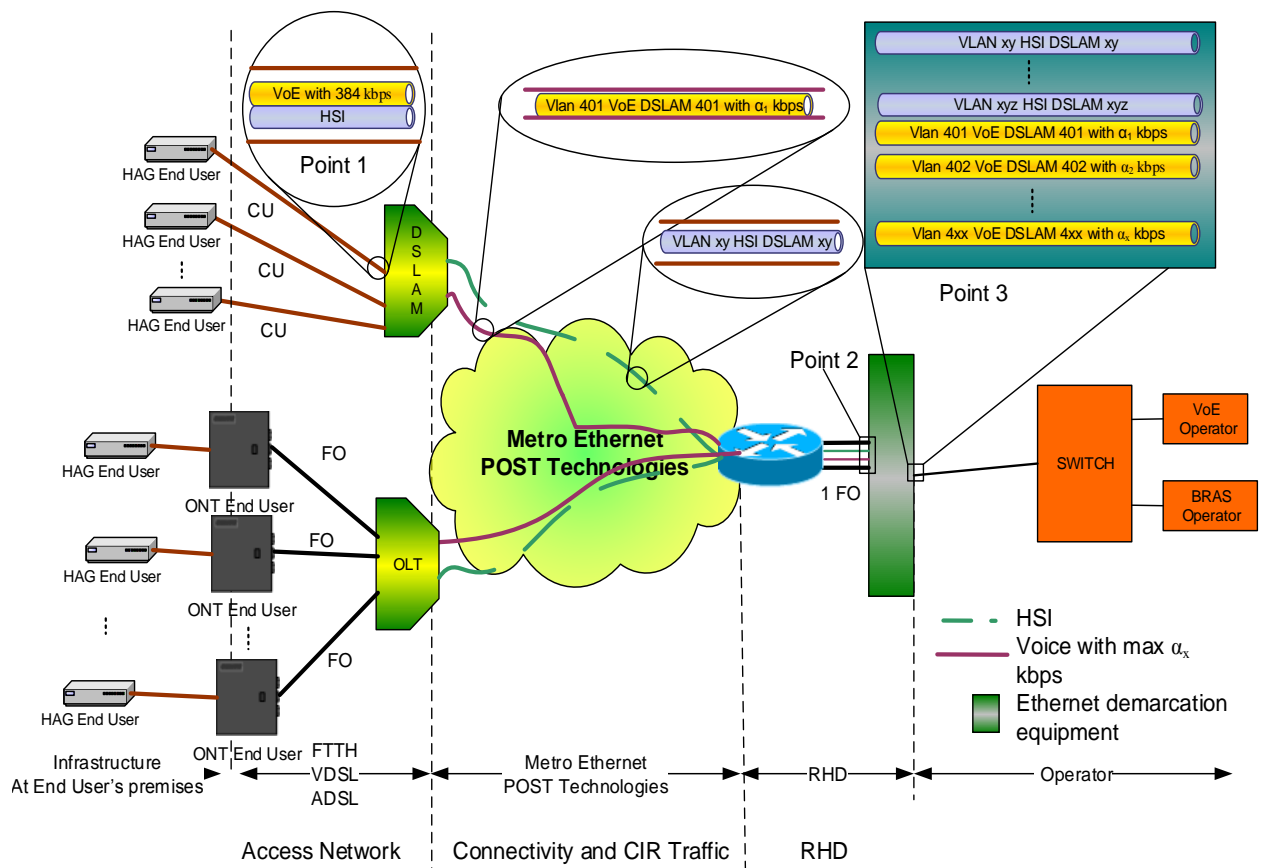


Figure 2: Bitstream Service components in a Multi-VC configuration

As well as providing flexible "Open Access" profiles in a Mono-VC configuration (a single VLAN for all of the Operator's services, e.g. Internet, VoE, etc.) which allow the Operator to purchase and pay only for the traffic and bandwidth actually needed for its own commercial products, this ROB also includes a range of pre-defined bandwidth profiles which are available both in a Mono-VC and Multi-VC configuration (i.e. one VLAN per service).

The following table provides an overview of the available Service Profiles.

Service Profile	Flex 100	Flex 1000	Fix 20	Fix 30	Fix 100	Fix 200
Downstream Maximum bandwidth	100 Mbps	1 Gbps	20 Mbps	30 Mbps	100 Mbps	200 Mps
Upstream Maximum bandwidth	50 Mbps	500 Mbps	768 kbps	10 Mbps	50 Mbps	100 Mbps
Eligible infrastructures	VDSL *) FTTH **)	FTTH	ADSL *) VDSL *) FTTH **)	VDSL *) FTTH **)	VDSL *) FTTH **)	FTTH

Table 2: Bitstream Service Profiles

\*) Availability on ADSL and VDSL infrastructures subject to feasibility check (via online eligibility tool/database as described in Schedule 3).

\*\*) In case an activated FTTH infrastructure exists at the End User's site, xDSL infrastructures will not be eligible for new Bitstream Services even if a copper infrastructure is still active at this site or in use for existing services.

## 2.2.2. Access Component of the Bitstream Service

### 2.2.2.1. Definition of the Access Component

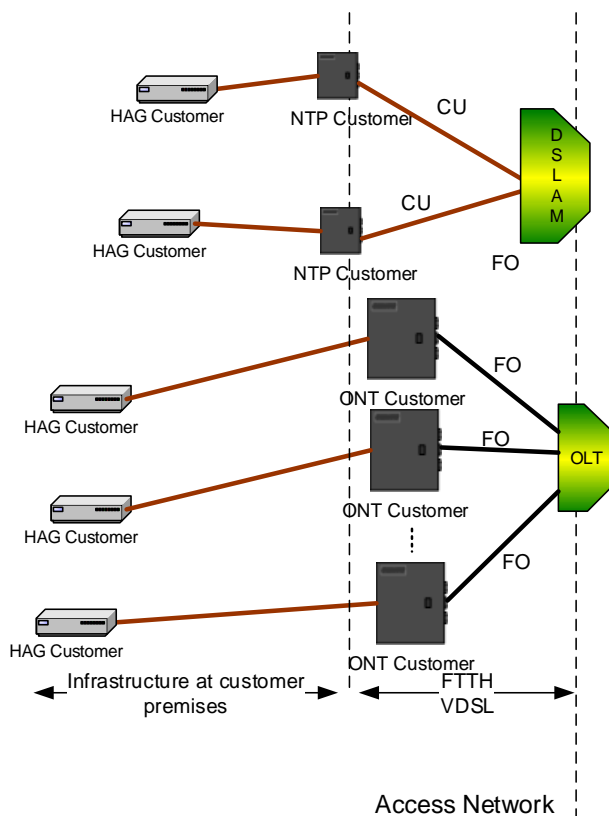


Figure 3: Access component of the Bitstream Service

For circuits based on an optical FTTH infrastructure, the termination point at the End User's premises is the ONT installed by POST Technologies. The ONT offers a Gigabit Ethernet interface (RJ45) according to IEEE 802.3ab.

For circuits based on an ADSL or VDSL infrastructure, the termination point at the End User's premises is the copper pair of the NTP installed by POST Technologies. This copper pair will be connected via POST Technologies' access network to a port on its DSLAM equipment.

As the maximum bandwidth of xDSL circuits depends on the distance between the DSLAM and the xDSL modem, the bandwidth of the Bitstream Services based on an xDSL infrastructure is limited to the maximum speed determined by the physical characteristics of the circuit. POST Technologies only deploys xDSL circuits if the physical characteristics of the circuit enable

- (i) a minimum data throughput of 5 Mbps in the downstream direction and 1 Mbps in the upstream direction for VDSL-based circuits;
- (ii) a minimum data throughput of 1 Mbps in the downstream direction and 128 kbps in the upstream direction for ADSL-based circuits.

The technical specifications of xDSL technologies used by POST Technologies in relation to the Bitstream Services are detailed on POST Technologies' Website.

The Bitstream Service is provided as a stand-alone product ("naked DSL") without a PSTN line on the same copper pair. However, the installation by the Operator of a centralised splitter in close proximity to the NTP is mandatory to minimise interferences from the internal network of the End User (Common Mode Rejection) and to avoid bridge tap effects (cable in parallel to the copper pair between the NTP and the xDSL modem) on the internal cabling of the End User. POST Technologies also recommends the use of Cat. 5e (or better) type cables between the splitter and the xDSL modem.

The HAG used by the Operator to deliver its services at the End User's premises on an xDSL infrastructure must be compatible with the ITU specifications as well as the specifications published on POST Technologies' Website. A list of HAGs approved by POST Technologies ("Whitelist") is also available on POST Technologies' Website. The Operator also has the option to opt for a 2-box-solution as described in paragraph 3.3.2.4 where POST Technologies delivers and installs at the End User's premises an xDSL modem with an Ethernet interface for the connection of the Operator's HAG.

On request, the Operator can test the compatibility between its HAG and POST Technologies' DSLAM equipment in POST Technologies' test laboratory. POST Technologies' point of contact to schedule an appointment is:

[cpe.test.oao.technologies@post.lu](mailto:cpe.test.oao.technologies@post.lu)

This service is invoiced at the hourly rate specified in Schedule 6 for each new type of equipment that the Operator intends to use at its End User's sites.

In case network alterations made by POST Technologies require a reevaluation of the Operator's already tested equipment, this service is provided free of charge if the duration of the tests does not exceed 4 hours. Additional hours will be invoiced at the rate specified in Schedule 6 - Tariffs.

#### **2.2.2.2. Technical Parameters of the Access Component**

Two different Bitstream Service options are available in a flexible "Open Access" configuration. Four options with pre-defined configurations are also available.

While there are no relevant bandwidth limitations on FTTH infrastructures due to the physical characteristics of a fibre optic access line, the maximum bandwidth of the Bitstream Services based on xDSL infrastructures is limited to the maximum speed determined by the physical characteristics of the Access Line. Therefore the available bandwidth on xDSL access circuits between the NTP at the End User's site and the DSLAM might be lower than the maximum bandwidth associated with each Service Profile.

xDSL technologies supported by POST Technologies for Bitstream Services currently include ADSL1, ADSL2, ADSL2+, VDSL2 and VDSL2 2-pair Bonding technologies depending on the available infrastructure between POST Technologies' broadband access equipment and the End User's premises concerned.

The following table shows the minimum attainable bandwidth which shall be available for each Service Profile on xDSL infrastructures. If this minimum bandwidth cannot be provided due to physical limitations on the Access Line between the NTP and the DSLAM, the Service Profile will be deemed not eligible.

<b>Service Profile</b>	<b>Flex 100</b>	<b>Fix 20</b>	<b>Fix 30</b>	<b>Fix 100</b>
Downstream Minimum bandwidth	5 Mbps	1 Mbps	7 Mbps	30 Mbps
Upstream Minimum bandwidth	1 Mbps	128 kbps	1 Mbps	2 Mbps

Table 3: Minimum bandwidth for the Bitstream Service Profiles on xDSL infrastructures

In case of violation of the Ethernet service parameters defined for each individual Bitstream Service, POST Technologies' Network will perform traffic policing according to the MEF specifications. The Operator has to manage its traffic flows in a way to ensure that the service parameters are not violated.

The following tables summarise the default EIR values for each of the Service Profiles. The parameter "maxDSL\_d" designates the maximum attainable throughput in the downstream direction of the xDSL access line concerned, whereas "maxDSL\_u" designates the maximum attainable throughput in the upstream direction of the xDSL access line concerned.

### **(i) Open Access Service Profiles**

<b>Bitstream Flex 100</b>		
<b>Technology</b>	<b>Downstream</b>	
VDSL	EIR	100 Mbps or maxDSL_d*)
FTTH	EIR	100 Mbps
<b>Technology</b>	<b>Upstream</b>	
VDSL	EIR	50 Mbps or maxDSL_u*)
FTTH	EIR	50 Mbps

Table 4: Bitstream Flex 100 – available on VDSL and FTTH infrastructures

\*) EIR will be set to the lowest of the two values

<b>Bitstream Flex 1000</b>		
<b>Technology</b>	<b>Downstream</b>	
FTTH	EIR	1000 Mbps
<b>Technology</b>	<b>Upstream</b>	
FTTH	EIR	500 Mbps

Table 5: Bitstream Flex 1000 – only available on FTTH infrastructures

**(ii) Pre-defined Service Profiles**

<b>Bitstream Fix 20</b>		
<b>Technology</b>	<b>Downstream</b>	
ADSL / VDSL	EIR	20 Mbps or maxDSL_d <sup>*)</sup>
FTTH	EIR	20 Mbps
<b>Technology</b>	<b>Upstream</b>	
ADSL / VDSL	EIR	768 kbps or maxDSL_u <sup>*)</sup>
FTTH	EIR	768 kbps

Table 6: Bitstream 20 – available on ADSL, VDSL and FTTH infrastructures

\*) EIR will be set to the lowest of the two values

<b>Bitstream Fix 30</b>		
<b>Technology</b>	<b>Downstream</b>	
VDSL	EIR	30 Mbps or maxDSL_d <sup>*)</sup>
FTTH	EIR	30 Mbps
<b>Technology</b>	<b>Upstream</b>	
VDSL	EIR	10 Mbps or maxDSL_u <sup>*)</sup>
FTTH	EIR	10 Mbps

Table 7: Bitstream 30 – available on VDSL and FTTH infrastructures

\*) EIR will be set to the lowest of the two values

<b>Bitstream Fix 100</b>		
<b>Technology</b>	<b>Downstream</b>	
VDSL	EIR	100 Mbps or maxDSL_d <sup>*)</sup>
FTTH	EIR	100 Mbps
<b>Technology</b>	<b>Upstream</b>	
VDSL	EIR	50 Mbps or maxDSL_u <sup>*)</sup>
FTTH	EIR	50 Mbps

Table 8: Bitstream 100 – available on VDSL and FTTH infrastructures

\*) EIR will be set to the lowest of the two values

<b>Bitstream Fix 200</b>		
<b>Technology</b>	<b>Downstream</b>	
FTTH	EIR	200 Mbps
<b>Technology</b>	<b>Upstream</b>	
FTTH	EIR	100 Mbps

Table 9: Bitstream 200 – only available on FTTH infrastructures

For the Bitstream Services with pre-defined bandwidth profiles a maximum capacity of 306,4 kbps is configured on the DSLAM/OLT port for each individual Bitstream access circuit in a Mono-VC configuration for the exclusive use of VoE services. This capacity is split according to the values shown in the following table.

Traffic type	Priority Bit	Ethernet service parameters
VoE Data	7	CIR 268 kbps, EIR 0 kbps
Network Control (NC)	6	CIR 19,2 kbps, EIR 0 kbps
VoE Signalling	5	CIR 19,2 kbps, EIR 76,8 kbps

Table 10: Voice service parameters for pre-defined Bitstream Service Profiles

In case of Multi-VC configurations dedicated VLANs are used for HSI (High Speed Internet) and VoE (Voice over Ethernet) services between the End User's CPE and the DSLAM/OLT. The VoE VLAN is configured with the following service parameters:

Traffic type	Priority Bit	VoE VLAN configuration
VoE Data	7	CIR 268 kbps, EIR 0 kbps
Network Control (NC)	6	CIR 19,2 kbps, EIR 0 kbps
VoE Signalling	5	CIR 19,2 kbps, EIR 76,8 kbps
Best Effort Traffic	0	CIR 0 kbps, EIR 384 kbps

Table 11: Default VoE VLAN configuration for pre-defined Bitstream Service Profiles in Multi-VC configurations

The Bitstream Service is transparent to all Layer 3 protocols. The maximum MTU size is 1548 bytes.

Layer 2 and Layer 3 QoS markings configured by the Operator will be transmitted between the End User and the DSLAM/OLT in a transparent way without any alterations.

A maximum of 15 MAC addresses for xDSL-based Bitstream Services and of 62 MAC addresses for FTTH-based Bitstream Services are allowed by default in POST Technologies' Network.



### 2.2.3. Connectivity Component of the Bitstream Service

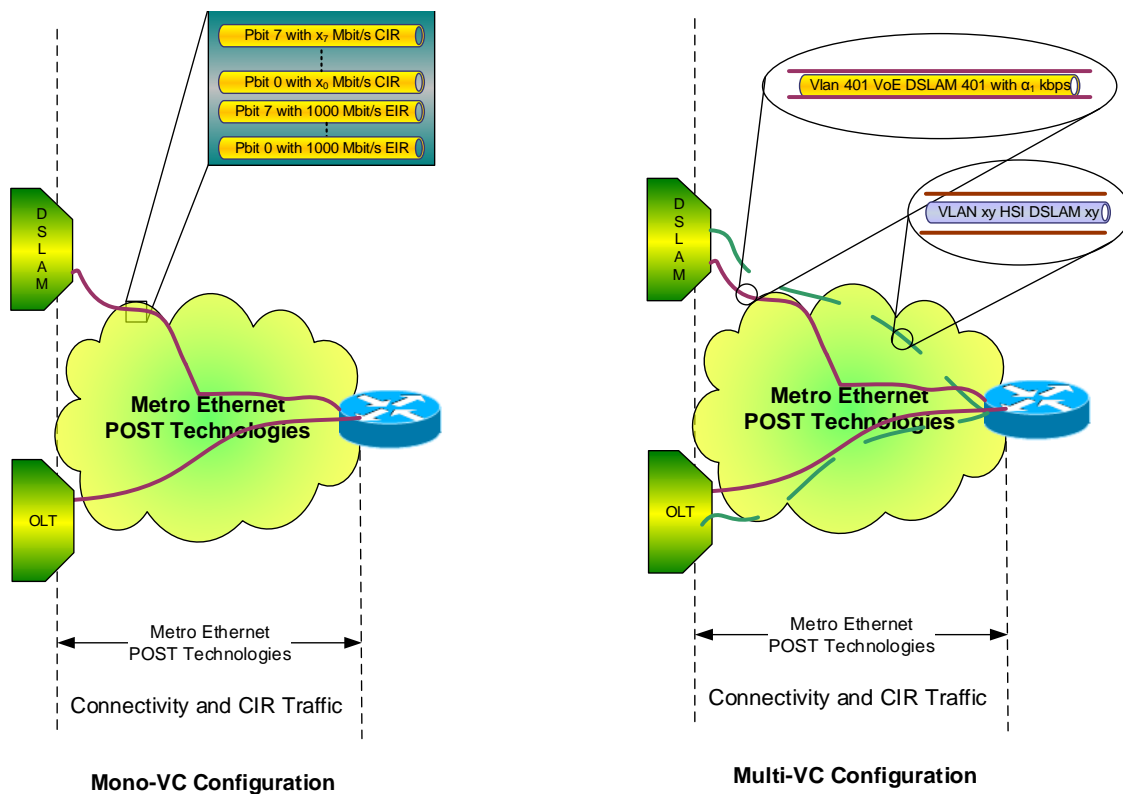


Figure 4: Connectivity component of the Bitstream Service

The Connectivity component ensures the transmission of the Bitstream Service through POST Technologies' Network from the DSLAM/OLT to the RHD ("Raccordement Haut Débit") interconnection between POST Technologies and the Operator.

Two configurations are available:

(i) Mono-VC

One (double tagged) ROOT\_VLAN will be configured between each DSLAM/OLT and the RHD of the Operator. All services of the Operator (e.g. HSI/High Speed Internet, VoE/Voice over Ethernet) will be transmitted within the same VLAN. The double-tagged VLANs are defined by the combination of their S-Tag (which identifies the DSLAM/OLT) and the C-Tag (which identifies the Operator).

(ii) Multi-VC

Multiple (double tagged) VLANs will be configured between each DSLAM/OLT and the RHD of the Operator, enabling the Operator to have one dedicated VLAN for each of its services. By default the Bitstream Services are configured with one VLAN for HSI and one VLAN for VoE. Configurations with additional VLANs can be provided on request by means of a tailor-made quote. The double-tagged VLANs are defined by the combination of their S-Tag (which identifies the DSLAM/OLT) and the C-Tag (which identifies each Operator's service).

### 2.2.3.1. Mono-VC Configuration

The ROOT\_VLAN between each DSLAM/OLT and the RHD has an EIR capacity of 1 or 10 Gbps depending on the DSLAM/OLT's connectivity to POST Technologies' backbone. EIR capacity will be shared between all connected operators (including POST Technologies).

(i) EIR "Best Effort" traffic

A basic usage is included in the monthly subscription fee of each Bitstream Service in order to cover the average peak hour usage generated by all End Users of an identical Service Profile. These values will be reviewed once per year. The following table gives you the average bandwidth usage included for each of the Bitstream Service Profiles.

Service Profile	Flex 100	Flex 1000	Fix 20	Fix 30	Fix 100	Fix 200
Traffic included	0,7 Mbps	8 Mbps	0,35 Mbps	1 Mbps	2 Mbps	3 Mbps

Table 12: Bandwidth consumption included with each Bitstream Service Profile

If the total usage of all of the Operator's Bitstream Services exceeds the sum of all the usage already included in the basic subscription fee of the Bitstream Services, the excess traffic measured at RHD level will be invoiced according to Schedule 6. Details of the measurement are given in paragraph 2.2.5.2 **Error! Reference source not found..**

(ii) CIR "guaranteed" traffic

The ROOT\_VLAN is preconfigured with a CIR capacity of 2,4 Mbps and optimised in order to carry voice traffic, as defined in the following table.

Service Parameter	VoE Data	Network Control	VoE Signalling
Priority Bit (802.1p)	7	6	5
CIR	2,10 Mbps	0,15 Mbps	0,15 Mbps
Total voice-related bandwidth in ROOT_VLAN: 2,4 Mbps			

Table 13: Default configuration for CIR traffic in ROOT\_VLAN

Up to 4000 ROOT\_VLAN's can be configured on a single RHD of an Operator.

N.B.: The sum of the CIR capacities of all the Bitstream Services (as specified in paragraph 2.2.2.2) delivered via the same DSLAM/OLT can be greater than the CIR capacity of the ROOT\_VLAN for this DSLAM/OLT.

The Operator may order additional CIR capacity per DSLAM/OLT as specified in paragraph 2.2.4 thereby increasing the guaranteed capacity of the links between the RHD and the DSLAM/OLT.

The Bitstream Service is transparent to all Layer 3 protocols. The maximum MTU size is 1548 bytes.

Layer 2 and Layer 3 QoS markings configured by the Operator will be transmitted between the End User and the DSLAM/OLT in a transparent way without any alterations.

Traffic sent to or from a DSLAM/OLT marked with a priority bit, but exceeding the pre-configured CIR capacity for this DSLAM/OLT, will not be prioritised and therefore will be processed in the same way as EIR "Best Effort" traffic.

Priority markings for EIR traffic will not be taken into account in POST Technologies' Metro Ethernet network. Nevertheless, the Operator can use prioritisation of its EIR traffic at the End User's HAG and in its terminal equipment.

### 2.2.3.2. Multi-VC Configuration

Two ROOT\_VLANs between each DSLAM/OLT and the RHD will be configured by default. The VLAN for HSI (High Speed Internet) services has an EIR capacity of 1 or 10 Gbps depending on the DSLAM/OLT's connectivity to POST Technologies' backbone. EIR capacity will be shared between all connected operators (including POST Technologies). The second VLAN is optimised for VoE services.

#### (i) EIR "Best Effort" traffic

A basic usage is included in the monthly subscription fee of each Bitstream Service in order to cover the average peak hour usage generated by all End Users of an identical Service Profile. These values will be reviewed once per year. The following table gives you the average bandwidth usage included for each of the Bitstream Service Profiles.

Service Profile	Fix 20	Fix 30	Fix 100	Fix 200
Bandwidth included	0,35 Mbps	1 Mbps	2 Mbps	3 Mbps

Table 14: Bandwidth consumption included with each Bitstream Service Profile

If the total usage of all of the Operator's Bitstream Services exceeds the sum of all the usage already included in the basic subscription fee of the Bitstream Services, the excess traffic measured at RHD level will be invoiced according to Schedule 6. Details of the measurement are given in paragraph 2.3.4.2.

#### (ii) CIR "guaranteed" traffic

The second ROOT\_VLAN between each DSLAM/OLT and the RHD is preconfigured with a CIR capacity of 3,0 Mbps, optimised in order to carry voice traffic, as defined in the following table.

Service Parameter	VoE Data	Network Control	VoE Signalling	Best Effort
Priority Bit (802.1p)	7	6	5	0
CIR	2,10 Mbps	0,15 Mbps	0,15 Mbps	n/a
EIR	0 Mbps	0 Mbps	0,03 Mbps	3 Mbps
Total bandwidth in default VoE ROOT_VLAN: 3,0 Mbps				

Table 15: Default configuration for CIR traffic in default VoE ROOT\_VLAN

Up to 4000 ROOT\_VLAN's can be configured on a single RHD of an Operator.

N.B.: The sum of the CIR capacities of the VoE VLANs of all individual Bitstream Services (as specified in paragraph 2.2.2.2) delivered via the same DSLAM/OLT can be greater than the CIR capacity of the ROOT\_VLAN for this DSLAM/OLT.

The Operator may order additional CIR capacity per DSLAM/OLT and ROOT\_VLAN as specified in paragraph 2.2.4 **Error! Reference source not found.** thereby increasing the guaranteed capacity of the links between the RHD and the DSLAM/OLT.

The Bitstream Service is transparent to all Layer 3 protocols. The maximum MTU size is 1548 bytes.

Layer 2 and Layer 3 QoS markings configured by the Operator will be transmitted between the End User and the DSLAM/OLT in a transparent way without any alterations.

Traffic sent to or from a DSLAM/OLT marked with a priority bit, but exceeding the pre-configured CIR capacity for this DSLAM/OLT, will not be prioritised and therefore will be processed in the same way as EIR "Best Effort" traffic.

Priority markings for EIR traffic will not be taken into account in POST Technologies' Metro Ethernet network. Nevertheless, the Operator can use prioritisation of its EIR traffic at the End User's HAG and in its terminal equipment.

#### 2.2.4. CIR Component of the Bitstream Service

The Operator may order additional CIR capacity for the ROOT\_VLANS of each DSLAM/OLT. Depending on its CoS marking at layer 2 level, Ethernet packets will be assigned to a different forwarding class in order to ensure prioritised transmission across POST Technologies' Metro Ethernet backbone.

Ethernet packets must be marked by the Operator by setting the Priority code point (PCP) ("p-bit") as defined in IEEE 802.1Q to the values as specified in the following table. This table also shows the target maximum values for the corresponding service quality parameters and the maximum bandwidths per ROOT\_VLAN available for ordering.

Priority Bit (p-bit)	Max. CIR*) (Mbps)	Delay**) (ms)	Jitter (ms)	Packet Loss (%)
7	5 %	20	10	0,10
6	10 %	30	-	0,20
5	10 %	40	-	0,20
4	20 %	50	-	0,10
3	50 %	50	-	0,40
2	50 %	50	-	0,50
1	50 %	80	-	0,30
0	n/a	80	-	-

Table 16: Specifications for CIR traffic

\*) Maximum CIR bandwidth which can be ordered per ROOT\_VLAN

\*\*) One-way delay between NTU at End User site and RHD at POST Technologies' co-location facilities

A maximum of 6 different DSLAM/OLT profiles can be defined by each Operator for flexible use in POST Technologies' access network.

The costs for the additional CIR capacities can be found in Schedule 6.

## 2.2.5. RHD Component of the Bitstream Service

### 2.2.5.1. RHD Specifications

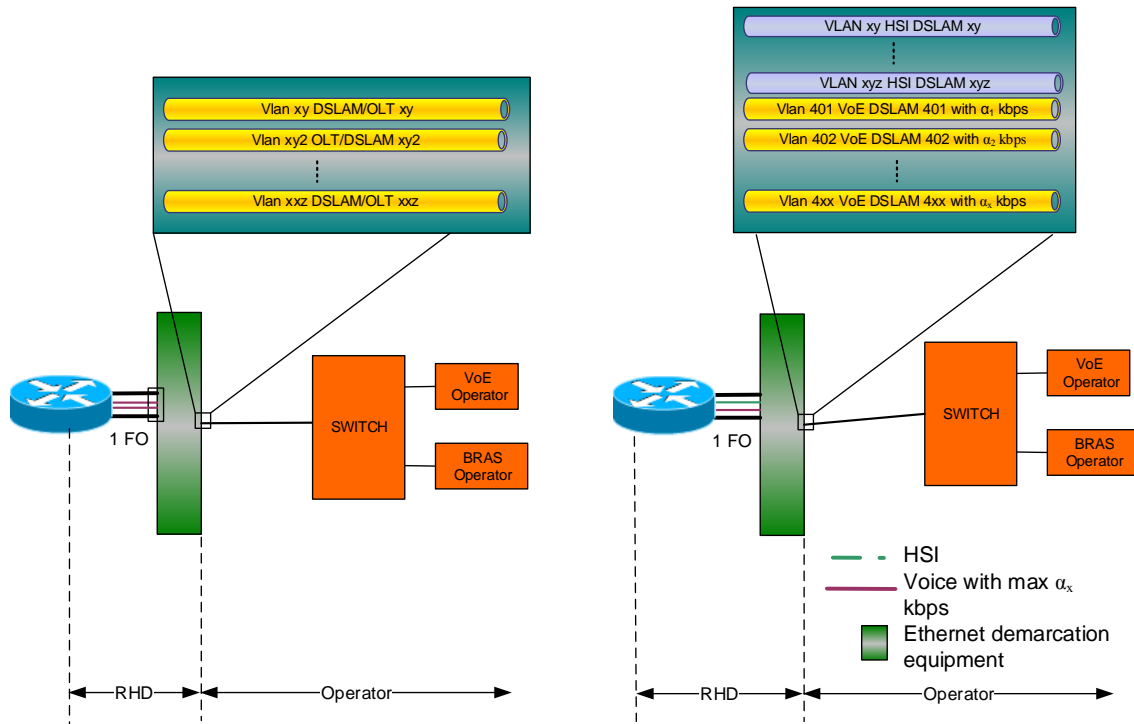


Figure 5: Connectivity component of the Bitstream Service in a Mono and Multi-VC configuration

The RHD ("Raccordement Haut Débit") interconnects POST Technologies' Network with the network of the Operator and consists in a dedicated Ethernet port which serves as an aggregation point for the Operator's Bitstream Services. There is neither a limitation to the number of individual Bitstream Services an Operator can aggregate on a single RHD nor to the bandwidth the Operator may be allowed to use on the RHD. The same RHD can be used for the aggregation of Mono-VC and Multi-VC Bitstream Services.

To connect its network to POST Technologies' "Metro Ethernet" backbone, the Operator must order an RHD interconnection which is terminated on POST Technologies side on an Ethernet demarcation equipment. The RHD can be located either in one of POST Technologies' co-location facilities or in a POP of the Operator.

Two options are available for the RHD interconnection:

i) Centralised RHD interconnection

All Bitstream Services of every DSLAM/OLT equipment can be transported via POST Technologies' Metro Ethernet backbone to a centralised RHD aggregation port. POST Technologies' Local Exchanges available for centralised RHD interconnections are:

- |                       |  |
|-----------------------|--|
| a. CT Gare:           | 10 rue d'Eprenay, L-1490 Luxembourg                |
| b. CT Belair:         | 1, rue Yolande, L-2761 Luxembourg                  |
| c. CT Esch/Wobrecken: | 69, rue Arthur Useldinger, L-4351 Esch-sur-Alzette |
| d. CT Diekirch:       | 20, rue St. Antoine, L-9205 Diekirch               |

The Operator can also opt for a second centralised RHD interconnection in order to achieve redundancy or perform traffic load-balancing. The Operator has to specify with each order for a new Bitstream Service the primary RHD to which the Bitstream Service connects as well as, if applicable, the back-up RHD which the Bitstream Service will switch to in case the primary RHD fails. This optional configuration is available on request via a tailor-made quote for the required setup and configuration. The monthly recurring fees for back-up RHD interconnections are the same as for primary RHD interconnections.

ii) Local RHD interconnection

Local RHD interconnections can be implemented in any of POST Technologies' Local Exchanges and Area POPs for the aggregation of those Bitstream Services delivered via DSLAM/OLT equipment which is directly attached to this same Local Exchange or Area POP.

All of POST Technologies' Local Exchanges and Area POPs (for which no closing date has already been announced at the time of requesting the RHD) are eligible for local RHD interconnections. Local RHD interconnections will only be deployed for Operators committing to implement this type of RHD interconnection in at least 30% of POST Technologies' Local Exchanges and Area-POPs over a period of two (2) years.

In case the Operator has chosen for specific Local Exchanges or Area POPs a local RHD interconnection, all new Bitstream Services delivered via DSLAM/OLT equipment which is directly attached to these Local Exchanges or Area POPs shall be provided by POST Technologies through such local RHD interconnections.

Within the double tagged ROOT\_VLAN, the S-TAG identifies the DSLAM/OLT equipment whereas the C-TAG identifies the Operator or the Operator's services.

RHD interconnections can be installed within POST Technologies' co-location facilities or at the Operator's own datacenters:

(i) On-Site RHD (RHD interconnections in co-location facilities)

The On-Site RHD interconnection terminates on POST Technologies side on an Ethernet demarcation equipment installed in one of POST Technologies' Local Exchanges or Area POPs and extends via a pair of singlemode fibres to the Operator's point of presence in the co-location facilities of the same Local Exchange or Area POP. The Operator can choose between one of the following interfaces:

- a. 10GBase-LR LAN PHY, 1310 nm
- b. 100GBASE-LR4, 1310 nm

The Ethernet ports used for the RHD interconnection will be configured by default in link aggregation mode using the Link Aggregation Control Protocol (LACP) in order to facilitate adding another port of the same type at the same location in order to increase RHD bandwidth.

The lead time is sixty (60) Working Days after receipt of a firm order for the 10GBase-LR RHD links. Lead times for 100GBase-LR4 RHD links are available on request.

(ii) Off-Site RHD (Centralised RHD interconnections in an Operator's own POP)

The centralised Off-Site RHD interconnection is extended from one of the aforementioned POST Technologies Local Exchanges to the Operator's POP where it terminates on a dedicated Ethernet demarcation device. The Operator must provide POST Technologies free of charge with the necessary rack space and a 230V/AC power source for this demarcation equipment. The costs for the electric power consumption as well as any required internal optical cabling in this POP will have to be borne by the Operator.

A feasibility study for the RHD extension will be made subject to the prior signature of the ROB by the Operator. Pricing of the RHD extension might depend on the distance between the Operator's POP and an access point to POST Technologies' Network. A tailor-made quote also mentioning the lead time for the delivery of the extended RHD interconnection will be submitted to the Operator within ten (10) Working Days after receiving such a request.

### **2.2.5.2. Volume-based Billing Principles**

The bandwidth for CIR traffic, transmitted with a higher priority and a guaranteed bandwidth performance, has to be specified per DSLAM/OLT. The billing is based on the CIR traffic configured in POST Technologies' Network and the bandwidths purchased upfront. Traffic sent to or from a DSLAM/OLT marked with a priority bit, but exceeding the pre-configured CIR capacity for this DSLAM/OLT, will not be prioritised and therefore will be processed in the same way as EIR "Best Effort" traffic.

The subscription fee of each individual Bitstream Service includes an EIR traffic volume covering the average monthly per-user usage during peak hour. This volume is converted to a bandwidth-equivalent equal to the average bandwidth necessary to generate this traffic volume during peak hour.

All Bitstream Services are aggregated on one or multiple RHDs. The bandwidth measured on this RHD interface is equal to the combined bandwidth used by all of the Operator's End User's which are connected to this RHD.

In case the bandwidth measured on the RHD interface exceeds the sum of all the bandwidths included with each individual Bitstream Service connected to this RHD, this additional bandwidth is invoiced to the Operator on a monthly basis according to the terms specified in Schedule 6.

EIR traffic will only be measured on the RHD interconnection during the peak traffic period and billed according to the 95<sup>th</sup> percentile rule, meaning that of all the measurements made over a specified period of time, the highest 5% of these values will be discarded and that bandwidth usage will be billed based on the next highest value.

POST Technologies measures the downstream and the upstream flows during the peak traffic period (currently between 20:00 and 22:00, subject to change) in 5-minute intervals. The highest of these two values (i.e. either upstream or downstream) is kept for the 95<sup>th</sup> percentile usage calculation at the end of the month. The average bandwidth used during a 5-minute sampling interval is calculated as the number of bits transferred throughout the interval divided by the duration of the interval (i.e. 300 seconds).

In this way each day 24 measurement values are generated or 720 values over a 30-day period. The 36 (= 5%) highest values are discarded at the end of a 30-day month and the 37<sup>th</sup> highest value will serve as the basis for the calculation of the excess traffic which will be billed in addition



to the basic monthly subscription fee of the RHD component and all the individual Bitstream Services. In case this specific value is lower than the sum of all the bandwidths already included in the individual Bitstream Services, no additional charges will be applied.

### 2.2.6. Substitution Product for Legacy Services

The network evolution towards a fibre based Next Generation Network (NGN) requires POST Technologies to abandon legacy infrastructures (copper infrastructures, legacy equipment) in favour of new FTTH-based technologies. Therefore the Operator should try, with the End User's consent, to have all its RDSLO services converted to commercially available Bitstream Services as specified in this ROB. In order to do so, POST Technologies will inform the Operator at least six (6) months ahead of any planned changes about Network modifications affecting the delivery of existing RDSLO services.

In case an End User, who uses a previously available low-bandwidth ADSL access service bundled with a PSTN line as specified in the Reference DSL Offer (RDSLO), refuses to opt in favour of an equivalent or similar service based on one of the FTTH-based Bitstream Service Profiles as previously described in this ROB, a specific Bitstream Service Profile will be implemented in order to replicate his/her current RDSLO service on the fibre optic infrastructure and allow POST Technologies to proceed with the phase-out of the legacy infrastructures whilst continuing to deliver the service as initially purchased under the RDSLO agreement.

This specific Bitstream Service constitutes a substitution product only used to replicate the "Residential Light" profile of the RDSLO. It will not be otherwise commercially available.

Service Profile	Bitstream Legacy
Downstream Maximum bandwidth	8 Mbps
Upstream Maximum bandwidth	896 kbps

Table 17: Bitstream Legacy Service Profile – not commercially available

Bitstream Legacy		
Technology	Downstream	
FTTH	EIR	8 Mbps
Technology	Upstream	
FTTH	EIR	896 kbps

Table 18: Bitstream Legacy – available only on FTTH infrastructures to replicate previously available ADSL-based RDSLO services in case of phasing out legacy infrastructures

While an existing POTS or ISDN service was a prerequisite for the provision of ADSL-based RDSLO services on an Access Line, the Bitstream Legacy Service is provided in a "naked DSL" configuration and previously provided telephony services will be replicated by POST Technologies using VoIP/VoE technology on a separate POST Technologies-owned CPE/HAG with POTS or ISDN interfaces or via an ONT with additional POTS interfaces.

The Bitstream Legacy Profile does not include any guaranteed CIR traffic for the delivery of VoE services. The guaranteed CIR traffic component necessary for the VoE service provided by POST Technologies will be routed through POST Technologies' ROOT\_VLANS. A maximum bandwidth of 384 kbps will be used by the VoE services, depending on how many voice channels, replicating

either a POTS or an ISDN service, are provided to the End User. In this way, a minimum bandwidth of 512 kbps (downstream) is available at all time on the Access Line for the Operator's own services.

As with the commercially available Bitstream Service Profiles, a basic usage is included in the monthly subscription fee of each Bitstream Legacy Service and excess usage will be measured globally on the RHD interconnection for all Bitstream Services – commercially available and substitute products – and invoiced according to the billing principles as described in paragraph 2.2.5.2.

<b>Service Profile</b>	<b>Legacy</b>
Bandwidth included	0,35 Mbps

Table 19: Bandwidth consumption included with the Bitstream Legacy Service Profile

No installation charges will be invoiced to the Operator for the installation and activation of the Bitstream Legacy Service. The same monthly subscription fee will be invoiced for the VoE-based telephony services as for the previously used PSTN line (POTS or ISDN). In case the delivery of the Bitstream Legacy Service using the FTTH infrastructure requires the modification of the in-house cabling at the End User's premises (i.e. installation of Cat. 5e (or better) cabling), POST Technologies will carry out the necessary works which will be limited to the strict minimum necessary to enable the delivery of the service at the End User's premises (i.e. cabling between the ONT and the End User's first phone outlet which will be replaced by a Cat. 5e (or better) RJ45 outlet). POST Technologies will bear the costs for these modifications.

After implementation of the Bitstream Legacy Service Profile, no further orders for modifications of this service will be accepted (e.g. new Service Profile/bandwidth upgrade, migration to a different Operator, Multicast Option, move to a new address). In case the End User requests such a modification, the Operator has to order one of the commercially available Service Profiles as specified in paragraph 2.2.1 which will then replace the existing Bitstream Legacy Service Profile. If a modification of the in-house cabling was previously necessary for the migration to the Bitstream Legacy Service, these costs will be invoiced to the Operator at the time of delivery of the new Bitstream Service, as these costs would have had to be invoiced to the Operator, had the End User already opted for a commercially available service at the time of migration.

The Bitstream Legacy Service will not be available in cases where legacy infrastructures are abandoned after previous announcements have been made and sites (e.g. local exchanges, street cabinets) are being closed and services terminated in full compliance with the terms and dates as laid out in paragraph 2.4. In those cases only commercially available Bitstream Services will be available for ordering and regular procedures and tariffs as specified in this ROB will apply for these Bitstream Services, meaning in particular that installation charges will be invoiced by POST Technologies and that POST Technologies will not be responsible for carrying out any modifications of the in-house cabling required to deliver the new Bitstream Service at the End User's premises.

## **2.2.7. Multicast Option for Audio and Video Distribution**

### **2.2.7.1. Definition of the Multicast Option**

To optimise traffic distribution and resource utilisation across the network in case of IPTV applications, POST Technologies offers optional support for Multicast traffic management to Operators delivering audiovisual services (e.g. TV and radio channels) to its End Users thereby reducing the required transmission capacity within POST Technologies' backbone. Each Operator requesting the Multicast Option will receive a quote taking into account the specific technical requirements of the Operator (e.g. new Service Profiles) as well as statistical data on the expected usage. Before submitting such a tailor-made quote, technical meetings between POST Technologies and the Operator have to be scheduled in order to define the detailed specifications of the service and exchange any required information.

Multicast communication protocols enable a source to efficiently send the same information addressed to a group of users in a single transmission instead of initiating one traffic flow for each of these users.

The basic Bitstream Service Profiles as described in paragraph 2.2.1 do not include support for Multicast traffic configurations within POST Technologies' Network. The Multicast Option can be ordered for all the commercially available Bitstream Service Profiles, individually for each Bitstream Service. The Multicast Option is also available for the Bitstream Legacy Service Profile if Multicast was already implemented on the previously used RDSLO service.

The Multicast Option will be available for all Bitstream Services, in Mono-VC and Multi-VC configurations, provided that the available bandwidth capacity of the Access Line allows the transmission of multicast services. In case of xDSL based access circuits, availability and number of Multicast flows might be limited. Detailed information about the available capacity at a specific End User address can be found on POST Technologies' Website.

Multicast traffic flows are only available in the downstream direction. End Users will not be able to generate multicast flows and only receive multicast flows transmitted by the Operator from a dedicated RHD interconnection.

The Multicast Option only includes the transport of audio and video streams provided by the Operator across POST Technologies' Network, but does not include the provision or encoding of audio and video channels or other content.

The pictures below show the multicast implementation in POST Technologies' Network between the Operator and the End User.

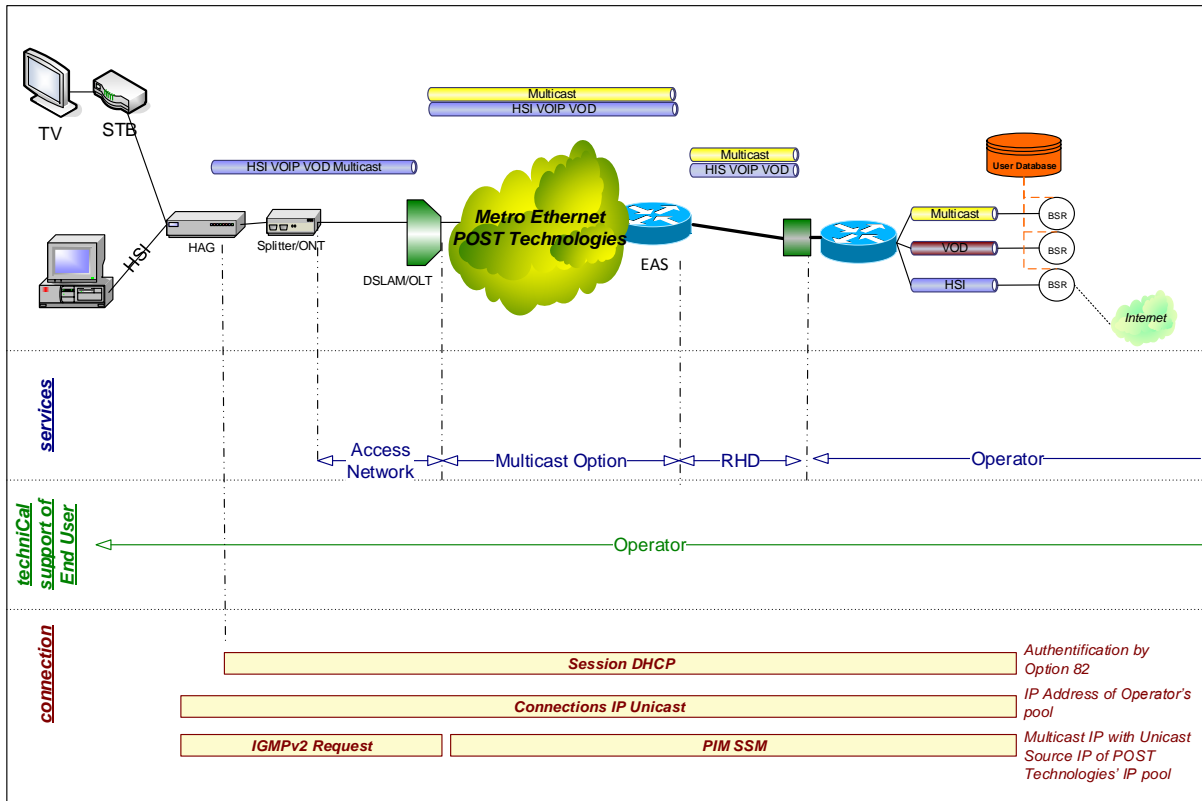


Figure 6: Multicast in Mono-VC configurations

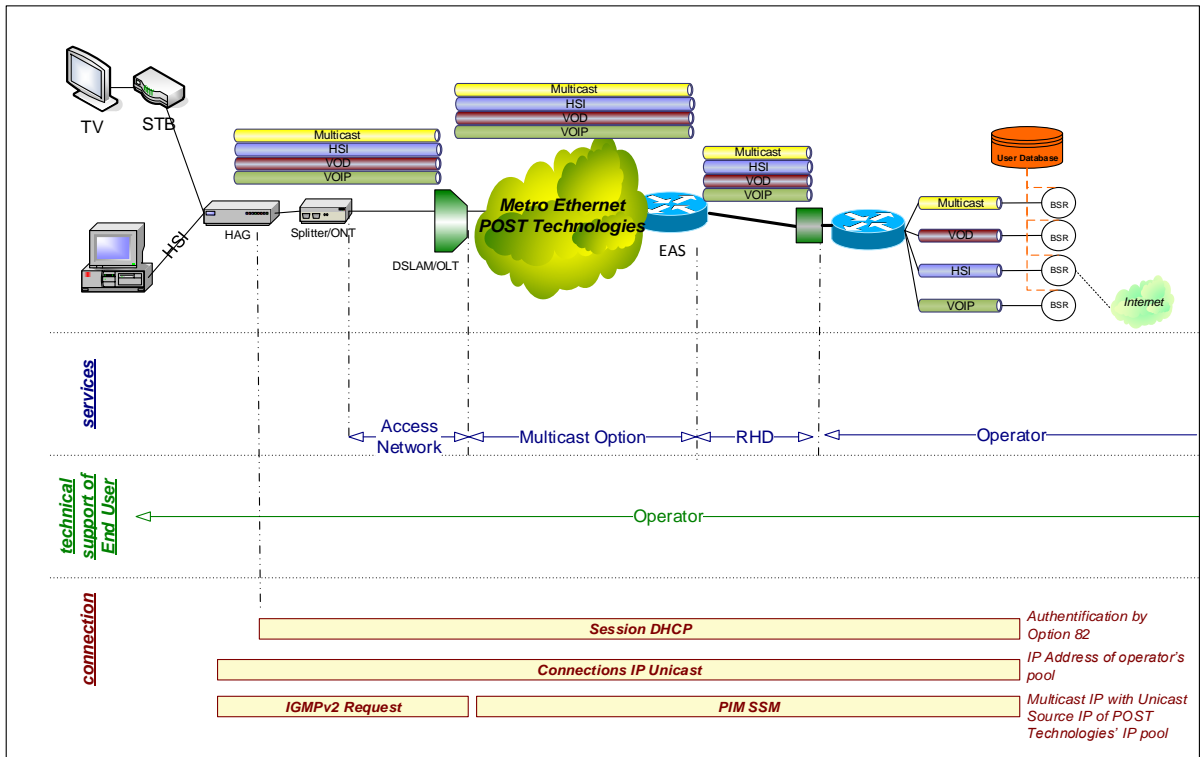


Figure 7: Multicast in Multi-VC configurations

POST Technologies' responsibilities are limited to the correct routing of the multicast flows from the RHD interconnection to the termination point at the End User's premises and do not extend beyond these demarcation points.

### 2.2.7.2. Technical Parameters of the Multicast Option

The following pictures show the traffic flows in a multicast configuration.

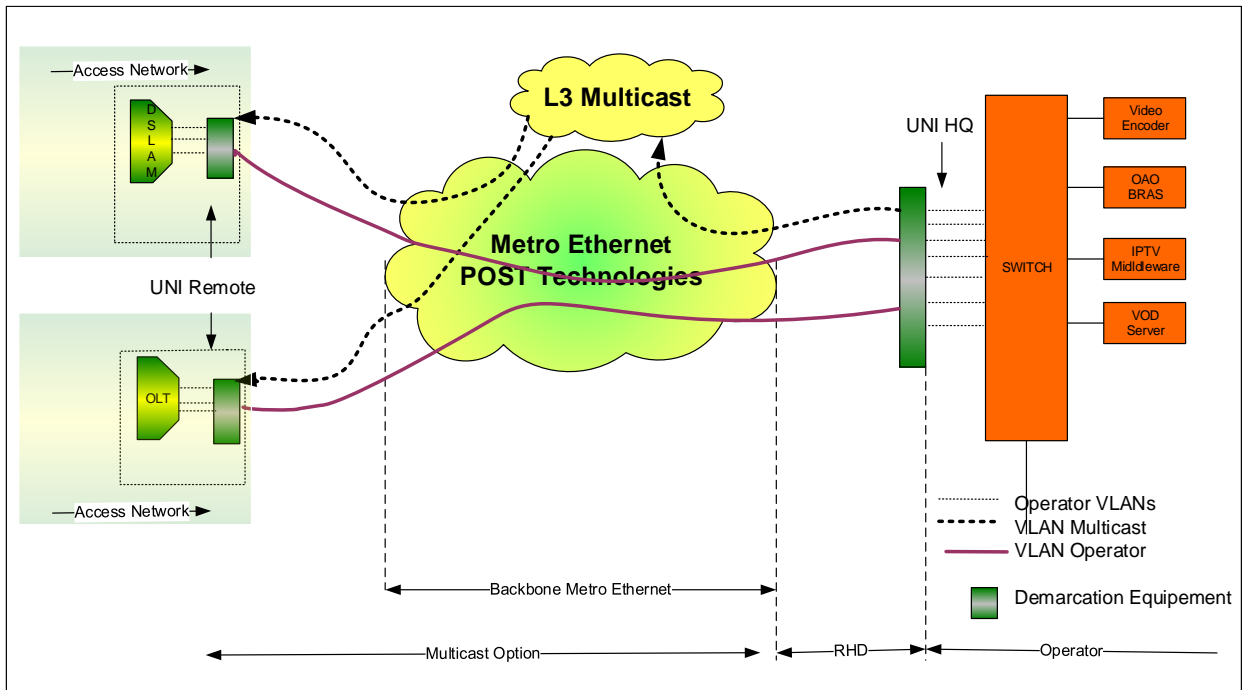


Figure 8: Multicast traffic flow in Mono-VC configurations

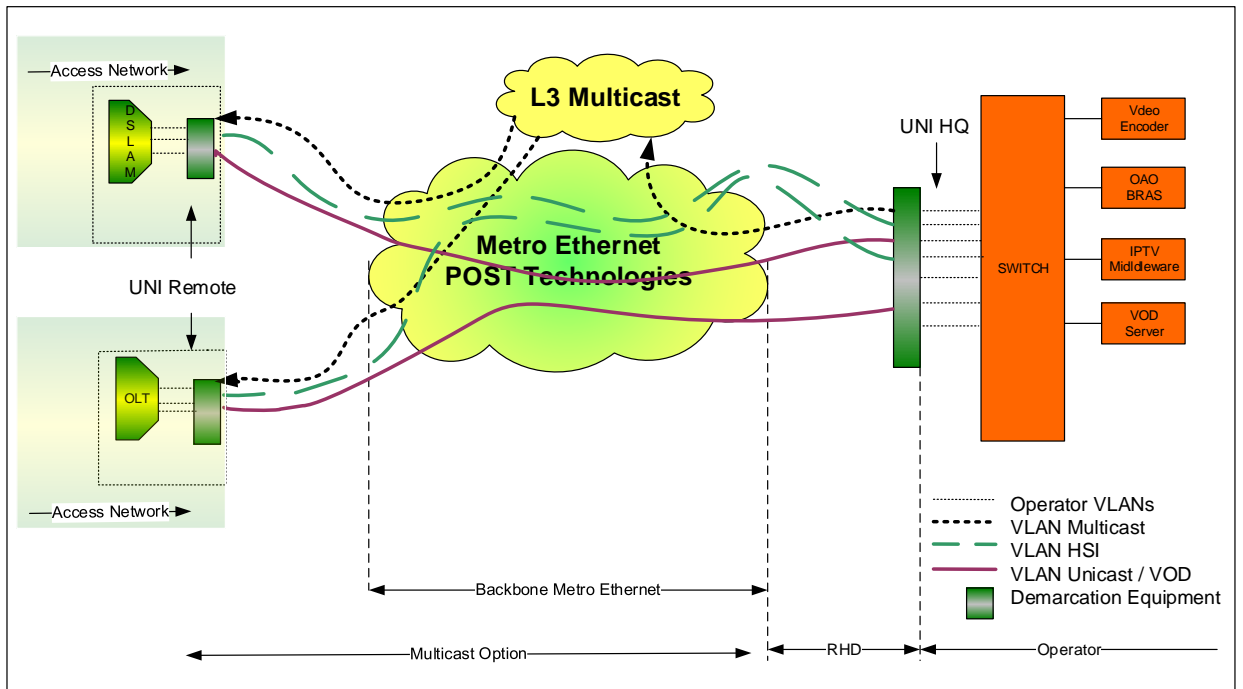


Figure 9: Multicast traffic flow in Multi-VC configurations

Multicast flows enable the transmission of audiovisual channels through POST Technologies' Metro Ethernet network to the End User using a "one-to-many" distribution technique. Using multicast there is no need for the duplication of the same flow on the same physical link. POST Technologies' Network replicates the flows as required for their delivery to the End User.

Transmission of a multicast flow is established only if a valid IGMP join request is issued by the End User's termination equipment. Static multicast and IGMPv1 are not supported. IGMPv2 hosts are supported.

Multicast flows are routed through POST Technologies' Network using the PIM-SSM protocol. An SSM-Translate table is implemented inside the core routers. A range of multicast group addresses with source IP addresses (<S,G>) will be provided to the Operator for multicast streams. The Operator must send the multicast stream at all times through the RHD port (no support of PIM interaction between the Operator and POST Technologies).

The demarcation point between POST Technologies' backbone and the Operator's network is the RHD. End Users will only be able to access the Operator's channel encoders/distributors via the RHD interconnection. The Operator is responsible for dimensioning and ordering the RHD according to the bandwidth requirements of its services.

An IGMP query from an End User's device is only accepted by POST Technologies' network if this End User's Bitstream Service is enabled for multicast traffic. Therefore the Multicast option has to be ordered in addition to the basic Bitstream Service, either at the time of the initial order or at a later stage on top of an existing Bitstream Service.

In order to ensure the necessary transmission quality for audiovisual content, the Operator uses the priority bits as defined by IEEE 802.1p for the QoS marking of related Ethernet packets and to optimise the transmission of IPTV services across POST Technologies' Network.

Multicast Access Profiles will be defined which determine the number of multicast streams that an End User will be able to receive simultaneously. The maximum number of streams depends on the bandwidth required for each type of stream and the overall bandwidth available on the Access Line between the End User and the DSLAM/OLT.

The Operator will have access to an online database in order to check the available bandwidth for multicast services on an End User's access line while leaving a minimum bandwidth of 1 Mbps for the simultaneous use of HSI traffic. Besides bandwidth limitations, a maximum of 10 simultaneous streams will be supported on an End User's VDSL-based Bitstream Service, while a maximum of 62 simultaneous HD streams will be supported on an End User's FTTH-based Bitstream Service.

The bandwidth requirements of the multicast streams are based on Layer 3 IP bandwidths including packet overhead. The actual net rate (payload) available for the MPEG2 transport stream is the result of removing the IP, UDP and RTP headers.

On request, POST Technologies provides a tailor-made quote if the Operator's requirements in terms of bandwidth per stream and QoS marking differ from the standards set for POST Technologies' own IPTV services.

### **2.2.7.3. Multicast Billing Principles**

The Multicast Option will be billed according to the number of channels (different multicast flows injected via a dedicated RHD interconnection) made available to the Operator's End Users and the total amount of Multicast streams (SD/HD) ordered by the Operator's End Users and implemented in POST Technologies' access network.

Price calculation for the Multicast Option is based on the actual use of POST Technologies' Network, taking into account the benefits of the transmission of multicast streams. Thus, the price

per multicast stream per End User decreases if the number of identical streams to be transported throughout POST Technologies' Network increases.

Overall, the capacity used in POST Technologies' backbone depends on the mutualisation effect generated by the multicast transmission in the network. Thus, the price per stream also depends on the total number of audio/video channels available for distribution in the network, a small number of channels requiring less bandwidth than a much larger number of available channels.

The required bandwidth per stream has a direct influence on the price per stream per month. As some channels use more bandwidth than others (e.g. HD channels), the bandwidth taken into account for price determination will be based on the average bandwidth of all the available streams. Certain channels, depending on their type and their popularity, are more likely to be watched than others which also impacts the mutualisation effect in POST Technologies' backbone and the capacity required in its network.

In view of the above, it follows that the pricing of the Multicast Option is an extremely complex matter and requires various technical and statistical data in order to determine a well-founded price scheme for the transmission of multicast streams. Similarly, the initial implementation of the Multicast service, the activation of each channel (flow) and the definition, configuration and testing of new Multicast Access Profiles depend on multiple parameters. Therefore POST Technologies will submit a tailor-made quote to each Operator requesting this Multicast Option based on the aforementioned principles (in order to determine the bandwidth needed) and the tariffs for the CIR traffic component as set out in Schedule 6.



## 2.3. EtherConnect Service Description

Whereas Bitstream Services are designed for mass-market consumption, EtherConnect Services offer additional features in terms of resilience and service level guarantees in order to address the requirements of the more demanding corporate customers.

### 2.3.1. EtherConnect Service Components and Service Profiles

The EtherConnect Service allows the Operator to connect to POST Technologies' xDSL and fibre networks and offer value-added broadband services to its customers. EtherConnect Services are provided as stand-alone services and do not require the use of a new or existing phone line.

The EtherConnect Service is composed of the following three components:

- (i) Connectivity
- (ii) CIR traffic
- (iii) RHD interconnection

Various bandwidth profiles are available for EtherConnect Services as specified in the table below. As they are specifically designed to meet the requirements of the corporate End User, only symmetric Service Profiles are available for EtherConnect Services.

Service Profile	EC 2	EC 5	EC 10	EC 30	EC 50	EC 100
Downstream/Upstream (in Mbps)	2	5	10	30	50	100
Eligible infrastructures	xDSL FTTH FTTO	xDSL FTTH FTTO	xDSL FTTH FTTO	xDSL FTTH FTTO	xDSL FTTH FTTO	xDSL FTTH FTTO

Service Profile	EC 200	EC 500	EC 1000
Downstream/Upstream (in Mbps)	200	500	1000
Eligible infrastructures	FTTH FTTO	FTTH FTTO	FTTH FTTO

Table 20: EtherConnect Service Profiles

While Bitstream Services are limited in their use of infrastructures (ADSL, VDSL, VDSL 2-pair bonding, FTTH/GPON) in order to allow product standardisation and a low-price approach for mass-market consumption, EtherConnect Services will not be restricted to the use of these technologies and infrastructures, but use a wider range of technologies in order to meet the End User's requirements in terms of bandwidth and resiliency. EtherConnect Services will also be provided on FTTO fibre infrastructures as well as use more than 2 copper pairs for a single EtherConnect Service in order to maximise eligibility of high-bandwidth services (e.g. use xDSL bonding techniques with more than 2 pairs).

Installations which require the use of more than 2 copper pairs or the deployment of alternative xDSL technologies (e.g. G.SHDSL, reach extenders) need to be implemented using non-standard equipment and testing procedures.

A specific Service Profile for an EtherConnect Service will only be eligible, if the bandwidth as specified in the table above can be guaranteed on the physical Access Line (downstream and upstream).

In case an activated fibre infrastructure exists at the End User's site, copper infrastructures will not be eligible for new EtherConnect Services even if a copper infrastructure is still active at this site or in use for existing services.

The EtherConnect Backup Service delivers a secondary EtherConnect Service to the same End User enabling the Operator to add resilience to the services provided to an End User. EtherConnect Backup Services always need to be associated to a primary "standard" EtherConnect Service and are not allowed to use the same RHD interconnection. Wherever possible, the EtherConnect Backup Service will use a different routing (i.e. distinct cable infrastructure connected to a distinct Local Exchange or Area POP) and be delivered on a separate NTU (Network Termination Unit). A feasibility study will be carried out for each detailed request for such services.

<b>Service Profile</b>	<b>EC Backup (2 – 100 Mbps)</b>	<b>EC Backup (200 – 1000 Mbps)</b>
Downstream/Upstream (in Mbps)	Same bandwidth as primary EtherConnect Service *)	Same bandwidth as primary EtherConnect Service
Eligible infrastructures	xDSL FTTH FTTO	FTTH FTTO

Table 21: EtherConnect Backup Service Profiles

\*) In case only xDSL infrastructures are available at the backup site limiting the maximum available bandwidth to a value lower than the one of the primary EtherConnect Service, then the EtherConnect Backup Service can be ordered with a Service Profile different from the primary EtherConnect Service.

### *Failover Option*

In addition to the EtherConnect Backup Service, which is a dedicated second circuit between the End User and an Operator's second RHD with failover mechanisms to be implemented and managed by the Operator itself, POST Technologies also offers another redundancy option which can be purchased for any EtherConnect service. In case of a failure at RHD level, this Failover Option managed by POST Technologies re-routes the traffic of all EtherConnect Services purchased with the Failover Option to a second RHD of the Operator.

### 2.3.2. Connectivity Component of the EtherConnect Service

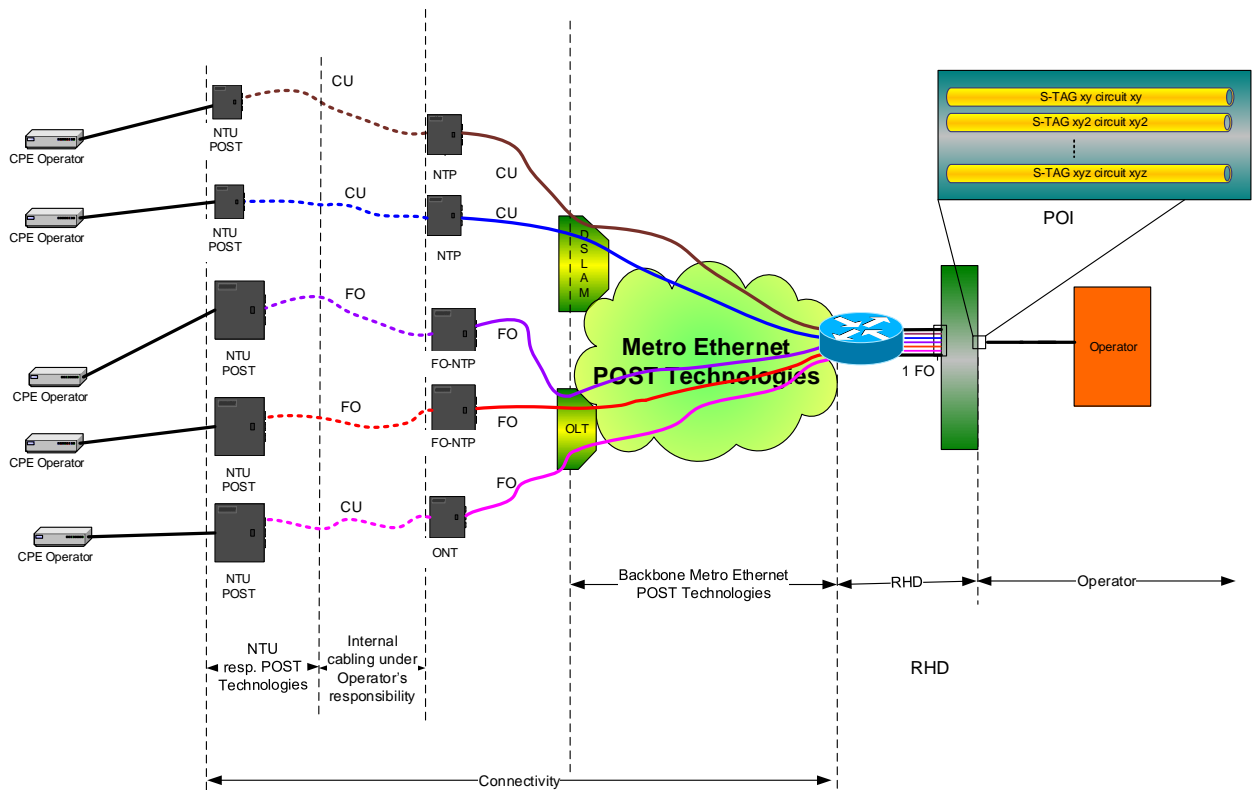


Figure 10: Connectivity component of the EtherConnect Service

An EtherConnect Service terminates towards the End User on a Fast Ethernet (RJ45) or Gigabit Ethernet (RJ45 or optical) port of a NTU installed at the End User's premises in close proximity to the NTP, ONT or FO-NTP (i.e. without any additional in-house cabling infrastructure other than patchcords) and towards the Operator in a VLAN dedicated to this EtherConnect Service and identified by its VLAN tag (S-tag) on the RHD interconnection.

All traffic sent by or towards the Operator's End User is encapsulated in the VLAN dedicated to each EtherConnect Service (Mono-VC configuration). Using the C-Tag the Operator will be able to offer multiple services, each assigned to a different VLAN, over a single EtherConnect Service to its End User.

The EtherConnect Service is primarily aimed at providing Internet services, therefore data is sent over POST Technologies' Metro Ethernet backbone in its "Best Effort" service class. In order to allow the Operator to deploy additional features and monitor its services more efficiently, the EtherConnect Service Profiles also include guaranteed bandwidth reservation for network control protocols.

The table below shows the configuration of these VLANs depending on the chosen EtherConnect Service Profile.

Service Profile *)	p-bit 0		p-bit 6	
	CIR (Mbps)	EIR (Mbps)	CIR (Mbps)	EIR (Mbps)
EtherConnect 2	0	2	0,128	0
EtherConnect 5	0	5	0,256	0
EtherConnect 10	0	10	0,512	0
EtherConnect 30	0	30	1	0
EtherConnect 50	0	50	1	0
EtherConnect 100	0	100	1	0
EtherConnect 200	0	200	1	0
EtherConnect 500	0	500	1	0
EtherConnect 1000	0	1000	1	0

Table 22: EtherConnect Service parameters

\*) EtherConnect Service Profiles only available with symmetric bandwidths, therefore Service Profile parameters are identical for downstream and upstream.

Up to 4000 EtherConnect Services can be configured on a single RHD of an Operator.

The Operator may order additional CIR capacity and define its own EtherConnect Service Profiles as specified in paragraph 2.3.3.

The EtherConnect Service is transparent to all Layer 3 protocols. The maximum MTU size is 1548 bytes.

Layer 2 and Layer 3 QoS markings configured by the Operator will be transmitted between the NTU at the End User's premises and the RHD interconnection in a transparent way without any alterations.

Traffic marked with a priority bit, but exceeding the pre-configured CIR capacity for this EtherConnect Service, will not be prioritised and therefore will be processed in the same way as EIR "Best Effort" traffic.

Priority markings for EIR traffic will not be taken into account in POST Technologies' Metro Ethernet network. Nevertheless, the Operator can use prioritisation of its EIR traffic in its terminal equipment.

Multicast labeled packets can be sent over EtherConnect Services in the downstream direction, but will be blocked in the upstream direction.

A basic usage is included in the monthly subscription fee of each EtherConnect Service. The following table gives you the average bandwidth usage included for each of the EtherConnect Service Profiles.

Service Profile	EC 2 (Mbps)	EC 5 (Mbps)	EC 10 (Mbps)	EC 30 (Mbps)	EC 50 (Mbps)	EC 100 (Mbps)
Traffic included	2	5	10	10	15	20

Service Profile	EC 200 (Mbps)	EC 500 (Mbps)	EC 1000 (Mbps)
Traffic included	40	80	100

Table 23: Bandwidth consumption included with the EtherConnect Service Profiles

If the total usage of all of the Operator's EtherConnect Services exceeds the sum of all the usage already included in the basic subscription fee of the EtherConnect Services, the excess traffic measured at RHD level will be invoiced according to Schedule 6. Details of measurement are given in paragraph 2.3.4.2.

No bandwidth usage is included for EtherConnect Backup Services as their use is restricted to provide backup connectivity in case the primary EtherConnect Service fails. If the Operator wants to operate two redundant EtherConnect Services for the same End User in an active/active mode, then the Operator should request a second "standard" EtherConnect Service connected to a different RHD.

### 2.3.3. CIR Component of the EtherConnect Service

The Operator may order additional CIR capacity for each EtherConnect Service. Depending on its CoS marking at layer 2 level, Ethernet packets will be assigned to a different forwarding class in order to ensure prioritised transmission across POST Technologies' Metro Ethernet backbone.

Ethernet packets must be marked by the Operator by setting the Priority code point (PCP) ("p-bit") as defined in IEEE 802.1Q to the values as specified in the following table. This table also shows the target maximum values for the corresponding service quality parameters and the maximum bandwidths which can be included in the definition of a new EtherConnect Service Profile.

Priority Bit (p-bit)	Max. CIR <sup>*)</sup>	Delay <sup>**)</sup> (ms)	Jitter (ms)	Packet Loss (%)
7	5 %	20	10	0,10
6	10 %	30	-	0,20
5	10 %	40	-	0,20
4	20 %	50	-	0,10
3	50 %	50	-	0,40
2	50 %	50	-	0,50
1	50 %	80	-	0,30
0	n/a	80	-	-

Table 24: Specifications for CIR traffic

<sup>\*)</sup> Maximum CIR bandwidth which can be included in the definition of a new EtherConnect Service Profile indicated as the percentage of the total EtherConnect bandwidth (e.g. maximum CIR for "p-bit 6" traffic in an EC 50 service = 10 % of 50 Mbps = 5 Mbps)

<sup>\*\*)</sup> One-way delay between NTU at End User site and RHD at POST Technologies' co-location facilities

A maximum of 3 different CIR profiles can be defined by each Operator for its EtherConnect Services.

The costs for the additional CIR capacities can be found in Schedule 6.

### 2.3.4. RHD Component of the EtherConnect Service

#### 2.3.4.1. RHD Specifications

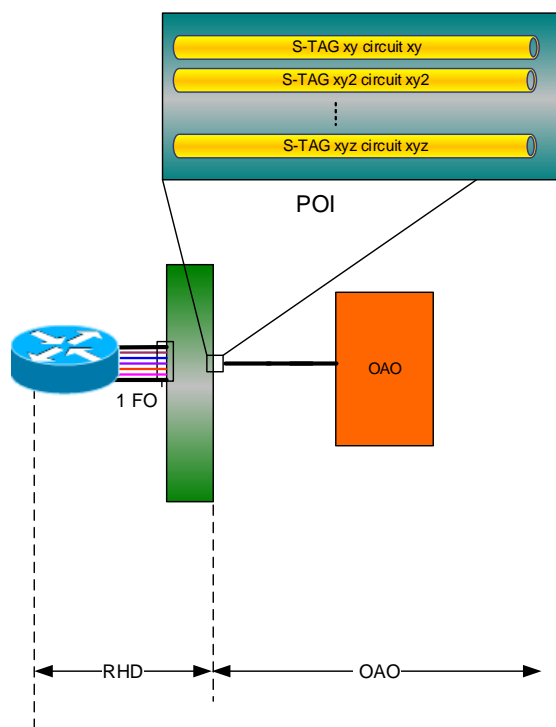


Figure 11: RHD component of the EtherConnect Service

The RHD ("Raccordement Haut Débit") interconnects POST Technologies' Network with the network of the Operator and consists in a dedicated Ethernet port which serves as an aggregation point for the Operator's EtherConnect Services.

RHD interconnections for Bitstream Services cannot be used for EtherConnect Services.

To connect its network to POST Technologies' "Metro Ethernet" backbone, the Operator must order an RHD interconnection which is terminated on POST Technologies' side on an Ethernet demarcation equipment. The RHD can be located either in one of POST Technologies' co-location facilities or in a POP of the Operator. All EtherConnect Services will be transported via POST Technologies' Metro Ethernet backbone to this centralised RHD aggregation port.

POST Technologies' Local Exchanges available for RHD interconnections are:

- |                          |  |
|--------------------------|--|
| (i) CT Gare:             | 10 rue d'Eprenay, L-1490 Luxembourg                |
| (ii) CT Belair:          | 1, rue Yolande, L-2761 Luxembourg                  |
| (iii) CT Esch/Wobrecken: | 69, rue Arthur Useldinger, L-4351 Esch-sur-Alzette |
| (iv) CT Diekirch:        | 20, rue St. Antoine, L-9205 Diekirch               |

The Operator can also opt for a second RHD interconnection in order to achieve redundancy or perform traffic load-balancing. The Operator has to specify with each order for a new EtherConnect Service the primary RHD to which the EtherConnect Service connects as well as, in case of purchasing the Failover Option, the back-up RHD which the EtherConnect Service will switch to in case the primary RHD fails. This optional configuration is available on request via a tailor-made quote for the required setup and configuration.

VLANs on the RHD use the S-Tag for the identification of the EtherConnect Service, while the C-Tag can be freely administered by the Operator to identify its own services.

RHD interconnections can be installed within POST Technologies' co-location facilities or at the Operator's own datacenters:

(i) On-Site RHD (RHD interconnections in co-location facilities)

The On-Site RHD interconnection terminates on POST Technologies side on an Ethernet demarcation equipment installed in one of the aforementioned POST Technologies' Local Exchanges and extends via a pair of singlemode fibres to the Operator's point of presence in the co-location facilities of the same Local Exchange or Area POP. The Operator can choose between one of the following interfaces:

- a. 10GBase-LR LAN PHY, 1310 nm
- b. 100GBASE-LR4, 1310 nm

The Ethernet ports used for the RHD interconnection will be configured by default in link aggregation mode using the Link Aggregation Control Protocol (LACP) in order to facilitate adding another port of the same type to increase RHD bandwidth.

The lead time is sixty (60) Working Days after receipt of a firm order for the 10GBase-LR RHD links. Lead times for 100GBase-LR4 RHD links are available on request.

(ii) Off-Site RHD (RHD interconnections in an Operator's own POP)

The Off-Site RHD interconnection is extended from one of the aforementioned POST Technologies Local Exchanges to the Operator's POP where it terminates on a dedicated Ethernet demarcation device. The Operator must provide POST Technologies free of charge with the necessary rack space and a 230V/AC power source for this demarcation equipment. The costs for the electric power consumption as well as any required internal optical cabling in this POP will have to be borne by the Operator.

A feasibility study for the RHD extension will be made subject to the prior signature of the ROB by the Operator. Pricing of the RHD extension might depend on the distance between the Operator's POP and an access point to POST Technologies' Network. A tailor-made quote also mentioning the lead time for the delivery of the extended RHD interconnection will be submitted to the Operator within 3 weeks after receiving such a request.



### **2.3.4.2. Volume-based Billing Principles**

The subscription fee of each individual EtherConnect Service includes an EIR traffic volume which is converted to a bandwidth-equivalent equal to the average bandwidth necessary to generate this traffic volume.

All EtherConnect Services are aggregated on one or multiple RHDs. The bandwidth measured on this RHD interface is equal to the combined bandwidth used by all of the Operator's End User's which are connected to this RHD. CIR traffic defined in EtherConnect Service Profiles is not measured and already included in the subscription fee of each EtherConnect Service. In case an Operator asks for the definition of a specific QoS profile, the corresponding EtherConnect subscription fee will be calculated based on the pricing for the CIR traffic as set out in Schedule 6 - Tariffs.

In case the bandwidth measured on the RHD interface exceeds the sum of all the bandwidths included with each individual EtherConnect Service connected to this RHD, this additional bandwidth is invoiced to the Operator on a monthly basis according to the terms specified in Schedule 6.

As EtherConnect Services are mainly targeted at corporate End User's, EIR traffic measurement on the RHD interconnection will not be limited to the peak traffic period determined by the residential customer's usage, but measured daily over the entire 24-hour period and billed according to the 95<sup>th</sup> percentile rule, meaning that of all the measurements made over a specified period of time, the highest 5% of these values will be discarded and that bandwidth usage will be billed based on the next highest value.

POST Technologies measures the downstream and the upstream in 5-minute intervals. The highest of these two values (i.e. either upstream or downstream) is kept for the 95<sup>th</sup> percentile usage calculation at the end of the month. The average bandwidth used during a 5-minute sampling interval is calculated as the number of bits transferred throughout the interval divided by the duration of the interval (i.e. 300 seconds).

In this way each day 288 measurement values are generated or 8640 values over a 30-day period. The 432 (= 5%) highest values are discarded at the end of a 30-day month and the 433<sup>rd</sup> highest value will serve as the basis for the calculation of the excess traffic which will be billed in addition to the basic monthly subscription fee of the RHD component and all the individual EtherConnect Services. In case this specific value is lower than the sum of all the bandwidths already included in the individual EtherConnect Services, no additional charges will be applied.

## **2.4. Service Termination**

In case of a network migration that causes POST Technologies to abandon existing infrastructures, close existing sites (e.g. Local Exchanges, street cabinets) and to terminate the delivery of existing Broadband Services or services contracted via the previously available RDSLO, ORATH or OGB offers delivered via these sites and specific infrastructures, POST Technologies will notify the concerned Operators one (1) year in advance in case of a site where no Operator is present and five (5) years in advance in case of sites where an Operator is present. The list of the concerned sites is published on POST Technologies' Website and is updated regularly. It is the responsibility of the Operator to regularly consult POST Technologies' Website in this respect.

## **Schedule 3 Planning, Ordering and Provisioning**

### **3.1. Forecasting**

Providing new Broadband Services to Operators as specified in this ROB is a very labour intensive activity. The volume of activity depends mainly on the commercial activity of the different Operators without any direct influence from POST Technologies. To allow proper planning of POST Technologies' production capacity and of its workforce allocation as well as to respond to the demand within the indicated time limits and to avoid bottlenecks, an accurate forecasting of the required provisioning, based on historical data from POST Technologies' systems and in some cases from Operators concerned, is essential.

To dimension its workforce, POST Technologies will use a rolling forecast based on the orders received during the last 3-month period. No committed forecasts have to be provided by the Operator. POST Technologies will respect the installation time as specified in paragraphs 3.3.9 and 3.4.3 if the deviation from the aforementioned rolling forecast is less than 10%.

In case of major problems reported by an Operator, POST Technologies will provide, on request, to the ILR the detailed figures regarding the Operator's orders as well as the orders of EPT's retail entity. In this case, the reason for major variations in the number of orders placed either by an Operator or EPT's retail entity have to be provided, on request, to the ILR.

In case an Operator foresees a substantial increase in orders for either Bitstream or EtherConnect Services, POST Technologies will do every possible effort to respect the installation time as specified in paragraphs 3.3.9 and 3.4.3 by increasing the necessary workforce as far as the Operator informs POST Technologies by mail hereof at least 3 months in advance.

### **3.2. Procedures for RHD Interconnections**

Each order for an RHD interconnection has to be sent by the Operator to the following address

order.technologies@post.lu

and shall contain at least the following information:

- (i) Operator's name;
- (ii) Type of RHD (Bitstream / EtherConnect)
- (iii) Operator's contact point for this specific project including related e-mail address and telephone number;
- (iv) Address of the location where the RHD interconnection shall be provided;
- (v) Interface to be used;

POST Technologies shall confirm within five (5) business days the receipt of every firm order for an RHD interconnection and shall indicate an estimated ready for service date.

POST Technologies shall inform the Operator by e-mail as soon as the RHD interconnections are ready for service on POST Technologies' side.

### **3.3. Procedures for Bitstream Services**

#### **3.3.1. Ordering Procedures for Bitstream Services**

##### **3.3.1.1. Initial Request, Feasibility Check and Ordering**

POST Technologies provides to the Operator via its Website access to a regularly updated database as well as an online tool to check the feasibility and availability of the Bitstream Services for the End Users. The database and online tool will include information on the technology (e.g. ADSL, VDSL, VDSL Bonding, GPON) to be used for the implementation of the Bitstream Access at the End User's premises.

POST Technologies' Website will also provide detailed information about the evolution of POST Technologies' infrastructures consisting mainly of

- (i) planned completion dates of ongoing and planned FTTH projects;
- (ii) planned dates for the activation of new Area POPs;
- (iii) closing dates of Local Exchanges and street cabinets;
- (iv) other useful information about planned or ongoing network modifications.

In case of a new building which is not yet connected to POST Technologies' network infrastructure (copper or fibre), the Operator can also send a request to POST Technologies on behalf of its End User for the building's connection to POST Technologies' Network, using the related form available on POST Technologies' Website. This formal request has to be signed by the End User who will be directly invoiced for the costs in relation with the building's connection to POST Technologies' Network according to POST Technologies' applicable price structure for underground network connections. POST Technologies will provide information to the Operator about the type of infrastructure which will be deployed at the End User's premises (fibre and/or copper) and the Bitstream Service Profiles which will be available upon completion of the underground connection.

The Operator will have the possibility to ask for a quote on behalf of its End User in order to have a site connected to POST Technologies' fibre network, in case POST Technologies' feasibility check indicates that either no Bitstream Service or only a lower-bandwidth Bitstream Service is currently available at the End User's site and that an FTTH infrastructure is either not yet planned for this site or that its projected completion date does not meet the requirements of the End User. The Operator shall send a request via e-mail to POST Technologies at the following address:

quote.technologies@post.lu .

This request must contain at least the following information:

- (i) Operator's name;
- (ii) Operator's contact point for this specific request including related e-mail address and telephone number;
- (iii) address of the site/building to be connected to POST Technologies' FTTH network

POST Technologies will perform a detailed analysis and submit an answer to the Operator within a period of ten (10) Working Days if no site survey is required. In case the site can be connected to POST Technologies' FTTH network, POST Technologies will send a quote to the Operator mentioning the costs and the approximate lead time for the fibre access.

The End User shall directly order any services requiring a Bitstream Service from his/her Operator, which shall then order the Bitstream Service from POST Technologies. Before signing a contract with the End User, the Operator shall inform him/her of the procedures and responsibilities related to the new service and the impact the Bitstream Service may have on his/her existing telecommunication services. POST Technologies will in no case accept or handle any order for a Bitstream Service issued directly by an Operator's End User. The Operator will be POST Technologies' single point of contact regarding orders for Bitstream Services.

In case of doubt or any claim by the End User or any other operator concerned by the Operator's request for a new Bitstream Service, the Recipient Operator will provide at first request and within a period of five (5) Working Days valid proof of its customer's consent by submitting the original order form signed by the End User.

### **3.3.1.2. Order Acceptance and Processing**

The exchange of information related to the ordering process for Bitstream Services shall be done exclusively by means of a Web Service Application communicating via XML-based SOAP (Simple Object Access Protocol) messages.

To be accepted, the structure of the transmitted messages shall be compliant with POST Technologies' specifications and instructions. For this purpose, a complete documentation describing the Web Service Application/SOAP interface and the procedures for the exchange of messages between the Operator and POST Technologies related to Bitstream Services will be published and timely updated as appropriate on POST Technologies' Website. A series of tests will have to be carried out before the first order can be transmitted.

Between the Operator's declaration of interest in Bitstream Services and the first order to be accepted by POST Technologies, a period of twenty (20) Working Days is foreseen for the setup, execution and validation of test scenarios. In order to meet the proposed deadline, the Operator shall fully cooperate with POST Technologies and the Parties shall mutually agree on a time schedule for the test period.

Orders will be deemed invalid when they either do not include all required mandatory information as specified in the above-mentioned documentation and/or contain erroneous or incompatible information. Any invalid orders will be rejected and not be processed by POST Technologies, which shall inform the Operator thereof. POST Technologies shall not be held liable for any delays caused in this way nor for any consequences arising out of or in relation to such an order rejection.

In case POST Technologies validates and accepts the Operator's request, POST Technologies will send a confirmation message to the Operator within one (1) Working Day and reserve the physical infrastructure (e.g. fibre, copper pair) necessary for the realisation of the Bitstream Service for a period of twenty (20) Working Days. POST Technologies will provide to the Operator an order reference and a Bitstream Service reference number enabling the Operator to book an available time slot in the "Booking Manager" (cf. paragraph 3.3.1.3) within a period of twenty (20) business days. If the Operator does not book a time slot within this period or has not previously opted for a "Do-It-Yourself" installation (cf. paragraph 3.3.2.2, POST Technologies will cancel the order and charge the Operator the amount as set out in Schedule 6 for such a cancellation.

In case POST Technologies rejects the Operator's request, POST Technologies will charge the Operator the amount defined in Schedule 6 for a negative response, if a feasibility check made via its online tool shows that a Bitstream Service is not available at the specified address.

Other causes for rejection could be that

- (i) a Bitstream Service is already active or ordered by another Operator for the End User on the Access Line concerned; or
- (ii) another service incompatible with the Bitstream Service is already active or ordered for the End User on the Access Line; or
- (iii) the Access Line is already unbundled to another Operator.

In any such case of rejection, POST Technologies will inform the Operator thereof, which shall refer to the procedures for a Migration request.

An order for a new Bitstream Service may be associated to an order for the porting of an existing geographic phone number belonging to POST Technologies' geographic number range. The Operator clearly states in his order the geographic phone number to be ported in conjunction with the Bitstream Service as well as the new routing code.

The porting request of a phone number automatically implies the cancellation of all existing telephony services related to this number provided either by EPT's retail entity directly to the End User or via EPT's wholesale department within POST Technologies to the Operator.

A Bitstream Service order with number portability is rejected if the phone number indicated in the associated portability order belongs to or has already been ported to another operator and therefore does not belong to POST Technologies' geographic number range. In this case the Operator has to generate a new Bitstream Service order without number portability and in parallel a porting request to the operator who owns the number. The Recipient Operator of the ported number will be responsible for updating ILR's database for ported numbers.

A list of the possible causes for the rejection of a Bitstream Service order will be published on POST Technologies' Website.

POST Technologies will handle the Operator's new orders, cancellations and/or change requests in a non-discriminatory way and based on the "first come - first served" principle.

Incomplete and/or non-compliant orders or requests will be rejected and consequently not handled by POST Technologies, while similar requests may be grouped in order to allow mass processing.

### **3.3.1.3. Booking of Time Slots for Bitstream Service Provisioning**

The installation of Bitstream Services requires the coordination of time schedules between POST Technologies, the Operator and the End User. The following description applies to the handling of on-site appointments related to the provision of Bitstream Services.

Each Operator will have to use POST Technologies' "Booking Manager" system. This web-based application allows the reservation by the Operator of an as yet available time slot for the installation of a Bitstream Service at the End User's premises. A detailed description of POST Technologies' "Booking Manager" is published and maintained on POST Technologies' Website. Bitstream Service installations will be carried out on Working Days between 8:00 and 12:00 and between 13:00 and 17:00.

The Operator will arrange directly with the End User an appointment for the installation of the

Bitstream Service and reserve for this purpose an available time slot in POST Technologies' "Booking Manager",

To book a time slot, the Operator must indicate the order reference and the Bitstream Service reference it has received in the positive response to a valid request for the activation of a Bitstream Service.

The notification of an appointment by means of booking a time slot in the "Booking Manager" must be made no later than five (5) business days prior to the date of the appointment agreed on between the Operator and the End User.

The Operator also has the possibility to book a time slot as a "virtual appointment" in the "Booking Manager" on first contact with the End User, ahead of sending a formal request for a Bitstream Service to POST Technologies. The Operator has to send the corresponding Bitstream Service order within five (5) Working Days to POST Technologies indicating the virtual appointment reference number (VA#) received from the "Booking Manager" tool. If the VA# indicated in the order for the Bitstream Service matches the VA# of the reserved time slot in the "Booking Manager" tool, the chosen time slot will be confirmed by sending a confirmation message via the SOAP/XML interface.

On the day of the appointment access to the End User's premises must be provided to POST Technologies' staff in order for them to install the termination equipment and to test the quality of the line. If the End User fails to keep a scheduled appointment for more than three (3) times in a row, the order for the Bitstream Service will be closed. The Operator can submit a new request after clarification of the situation with its End User.

If an appointment duly notified to POST Technologies cannot be kept, the Party responsible for the cancellation will inform the other Party thereof without any delay and the Parties will agree on the adequate measures to be taken.

No fee will be charged if a duly notified appointment is cancelled or changed by the Operator before 16:00 of the business day preceding the scheduled appointment. Beyond this period, POST Technologies will charge for any cancellation of an appointment the installation fee for this service as set out in Schedule 6.

### **3.3.2. Installation Procedures for Bitstream Services**

#### **3.3.2.1. Installation Services**

The installation of a Bitstream Service by POST Technologies on behalf of the Operator expressly includes:

- (i) all works necessary to configure the Bitstream Service and connect the circuit from the demarcation point at the End User's premises (Ethernet interface of the ONT in case of an FTTH infrastructure, copper pair(s) of the NTP in case of an xDSL infrastructure) through to the RHD;
- (ii) the tests required to ensure operability of the Bitstream Service after installation, provided both Passive and Active Equipment are ready and in working condition at the End User's premises at the agreed activation date; and
- (iii) in case of an xDSL installation, on an optional basis, the delivery and installation of the splitters at the End User's premises in close connection of the NTP and preparation of the connection to the End User's xDSL modem.



The installation of a Bitstream Service by POST Technologies on behalf of the Operator expressly excludes:

- (i) any installation of new cabling at the End User's premises;
- (ii) activation of any additional services (e.g. telephony or TV services);
- (iii) installation of an additional connector or outlet at the End User's premises;
- (iv) supply and installation of a modem or router and/or of any related accessories;
- (v) configuration in whole or in part of the End User's Active Equipment; and
- (vi) any other task, works and/or duty not expressly included in the first list specified here above.

For each xDSL-based Bitstream Service installation at the End User's premises, the Operator may alternatively opt, at its discretion and unless prevented by technical constraints specific to the End User's site, for the on-site installation to be carried out either by

- (i) POST Technologies' specialised technicians; or
- (ii) the Operator's own staff or the End User himself/herself ("Do-It-Yourself Installation"), all this in compliance with the terms and conditions set forth below.

All installation services provided by POST Technologies will be invoiced according to the terms set out in Schedule 6.

### **3.3.2.2. Do-It-Yourself Installations**

Do-It-Yourself (DIY) Installations allow the Operator and/or the End Users to proceed by themselves with the initial installation of the Bitstream Services on their premises. FTTH-based Bitstream Service installations are not eligible for Do-It-Yourself Installations.

In the case of DIY Installations, the Operator shall make available to its End Users the splitters required for the installation by the End User at his/her premises, together with all necessary instructions and eventually with the support of the Operator or a third party acting under the Operator's responsibility.

The Operator is solely responsible for providing the appropriate technical support to its End Users and shall in all cases remain the single point of contact for DIY Installations and all questions and/or issues related thereto.

POST Technologies shall in no case provide any support to the Operator's End Users in relation to the Bitstream Service installation when the Operator has opted in favour of a DIY Installation.

In case of choosing the DIY Installation, the successful activation and operation of the Bitstream Service cannot be guaranteed as these strongly depend, among others, on the in-house installations (cabling, equipment) at the End User's premises and on the distance between the End User's installation and the DSLAM in POST Technologies' access network.

The Operator shall inform the End User accordingly and shall refund the DIY Installation to its End User in such cases, where due to the above-mentioned reasons the activation and operation of the Bitstream Service is not possible or the installation by specialised POST Technologies staff is needed. In these cases, Bitstream Service installation failure shall not be considered nor construed



as a network fault and POST Technologies shall not be held liable for any additional costs incurred by the Operator or its End User to properly achieve the Bitstream Service installation.

After a successful activation of the Bitstream Service, POST Technologies will ensure the related maintenance and fault clearance as defined in Schedule 4. Nevertheless, the Operator shall remain solely and fully responsible for errors and/or malfunctions detected after the above-mentioned activation date which are directly or indirectly related to a wrongful installation, in whole or in part, by the Operator or by the End User during DIY Installations.

As a consequence of the above, POST Technologies shall not be held liable for any direct or indirect damages caused by or in relation to a Bitstream Service perturbation or delay caused in whole or in part by works done by the Operator or the End User.

The Operator may still order POST Technologies' intervention to install the Bitstream Service, after the End User has failed to properly activate the installation himself. In this case POST Technologies will charge the Operator with the applicable costs for

- (i) all works performed, including travel costs, pursuant to applicable tariffs in Schedule 6 of this ROB, except where the installation problems via the DIY Installation were caused due to problems related to POST Technologies' Network; and
- (ii) all additional equipment and material used to achieve the said installation.

### **3.3.2.3. Service Activation in case of Do-It-Yourself Installations**

The splitters required for an on-site Do-It-Yourself Installation can be purchased by the Operator from POST Technologies according to the tariffs set forth in Schedule 6 of this ROB, or the Operator can use its own equipment. However, this equipment has to comply with the specifications published on POST Technologies' Website.

The Bitstream Service activation will be performed on the due date requested by the Operator in its valid Bitstream Service activation order. The earliest possible due date in this respect is on the fifth (5) Working Day after valid order submission.

The Operator shall ensure that the Passive (splitter, in-house cabling) and Active Equipment (modem/router) are already properly installed at the End User's premises before the said due date.

The Bitstream Service activation will be processed automatically between 8:00 and 17:00 on the requested due date. During that time period, the End User's Active Equipment shall be turned into working mode (power on), enabling thus POST Technologies to control the well-functioning of the related Bitstream Service and to carry out the necessary remote measurements.

POST Technologies will endeavour to achieve on the Operator's requested due date at least 95% of all validly ordered Bitstream Service activations.

Despite any line control failure by POST Technologies on the due date due to the fact that the Active Equipments at the End User's premises were not ready or were not in working mode, POST Technologies will proceed with the automatic activation of the concerned Bitstream Service.

An activation report will be sent to the Operator and the invoicing of the Bitstream Service to the Operator will start on the date of the Bitstream Service activation.

#### **3.3.2.4. Installation of a Bitstream Service with Modem supplied by POST Technologies**

In order to facilitate troubleshooting and avoid compatibility issues between POST Technologies' and the Operator's chosen network components in case of ADSL- or VDSL-based Bitstream Services, POST Technologies will provide a commercial offer upon dedicated request from the Operator for an alternative installation consisting in a 2-box solution where POST Technologies supplies an xDSL modem equipped with a standardised Ethernet Interface for the connection of the Operator's own CPE (HAG).

In addition to the services described in paragraph 3.3.2.1, this offer also includes the supply and installation of the aforementioned xDSL modem as well as the delivery and installation of the splitters at the End User's premises.

While in this case POST Technologies' responsibility in delivering the Bitstream Service also extends to the xDSL modem installed at the End User's premises, it does not include liability for any in-house cabling installation between the NTP and the xDSL modem.

Operator's opting for the 2-box solution will have to use that solution for all future orders for Bitstream Services.

#### **3.3.2.5. Cancellation of a Bitstream Service before Activation**

If an Operator wants to cancel its order for a Bitstream Service after its formal submission via the Web Service Application, it shall send the corresponding XML/SOAP message to POST Technologies as specified in POST Technologies' procedures applicable to Bitstream Services.

If the order cancellation is received by POST Technologies not later than 16:00 of the last business day before the appointment date registered in the "Booking Manager" system, POST Technologies will cancel the order and the Operator will be charged according to the tariff for cancellation of an order before activation as defined in Schedule 6.

In case POST Technologies receives the cancellation later than 16:00 of the last business day before the appointment date, POST Technologies will cancel the order and the Operator will be charged the full installation tariff for a Bitstream Service as defined in Schedule 6.

### **3.3.3. Procedures for the Migration of a Bitstream Service from a Donor Operator to a Recipient Operator**

#### **3.3.3.1. Migration Ordering Process**

A Migration consists of the change of ownership of the Bitstream Service from the current operator (the "Donor Operator") to a new operator (the "Recipient Operator"). As such, the prerequisite of a Migration is that a Bitstream Service already exists on the End User's Access Line and that no modification of the Access Line or an on-site intervention by POST Technologies' field technicians is required.

The Migration aim is to change ownership of the Bitstream Service without extended service interruption for the End User. Therefore, Migration is handled as a special case and not like a cancellation request followed by a new order.

The main Migration process steps are as follows:

- (i) The Recipient Operator informs the End User that he/she is bound by the terms and conditions of his/her contract to the Donor Operator and that a premature termination of this contract can result in the payment of penalties and/or remaining contractual fees to the Donor Operator. The End User has to confirm in writing to the Recipient Operator that he/she cancels the current service provided by the Donor Operator in compliance with applicable contractual obligations between himself/herself and the Donor Operator.

The End User has to confirm in writing to the Recipient Operator his/her request for a Migration as well as the name of the Donor Operator. Upon the Donor Operator's request, the Recipient Operator shall provide within a maximum of five (5) Working Days, notably in case of doubt or claim, a copy of the above-mentioned confirmation.

- (ii) The Recipient Operator will send a Migration request to the Donor Operator.
- (iii) The Donor Operator will reply in writing by mail, fax or e-mail to the Recipient Operator within a maximum of ten (10) Working Days by specifying that:
  - a. the End User is authorised to migrate, indicating POST Technologies' current Bitstream Service reference and the authorised Migration date; or that
  - b. the End User is still bound by the terms of an ongoing agreement, while the Donor Operator shall in such case formally specify to the Recipient Operator in the said reply the first date when the End User is duly allowed to migrate.

Failing to reply formally and validly to the Recipient Operator within the applicable timeframe, the Donor Operator shall be deemed as having duly confirmed its authorisation for the End User to being migrated to the Recipient Operator.

- (iv) After due compliance with the respective principles of both Steps (i) to (iii) set forth here above, the Recipient Operator may send electronically a Migration request to POST Technologies as specified in POST Technologies' procedures applicable to Bitstream Services, indicating the existing Bitstream Service reference and the due date for its Migration. If applicable, the Operator also mentions the geographic phone number to be ported in conjunction with the Bitstream Service as well as the new routing code. The due date for the Migration of the Bitstream Service shall not exceed the period of 3 months from the day of receipt of the order.

- (v) A Migration request will be rejected in any of the following cases:
  - a. the indicated current Bitstream Service does not exist or is not active on the given Access Line;
  - b. the given Access Line is inactive or currently disturbed or disrupted;
  - c. the given Access Line is unbundled or used for shared access as defined in the applicable RUO;
  - d. another Bitstream Service order for the same Access Line is already being processed;
  - e. the related Migration request is incomplete, incoherent and/or not conforming to the ordering process described in POST Technologies' procedures applicable to Bitstream Services.

- (vi) Further to its acceptance by POST Technologies, the Bitstream Service order will be processed by POST Technologies at the indicated due date, without any supplementary authorisation from the Donor Operator being required or necessary in this respect. After execution of the Migration, the Recipient Operator as well as the Donor Operator will be informed by electronic means about the outcome of the Bitstream Service Migration.

The same procedure applies to Migrations of existing DSL, ATH or Bitstream services purchased under the terms of the RDSLO, ORATH and OGB offers, if no modification of the Access Line or an on-site intervention by POST Technologies' field technicians is required. For DSL services two scenarios will have to be distinguished:

- (i) Migration of a "naked" DSL service not linked to an existing PSTN line: the same procedures as for Bitstream Services will be applied;
- (ii) Migration of a DSL service bundled with an existing PSTN line:
  - a. upon the End User's request for number portability, the Operator also mentions the geographic phone number to be ported in conjunction with the Bitstream Service as well as the new routing code. The existing PSTN line will be deactivated at the time of Migration.
  - b. if the End User prefers not to change operators for his/her telephony services, the existing PSTN line will remain in place and the new Bitstream Service will be deployed on a separate Access Line. In this case the procedures for Migration do not apply and the Operator shall send a regular order for a new Bitstream Service to POST Technologies, while the End User will have to cancel himself/herself the (DSL) services provided by the third party operator.

The Migration procedures do not apply to orders requiring a modification of the Access Line or an on-site intervention by POST Technologies' field technicians. In this case the Operator must send an order for a new Bitstream Service and follow the procedures for new Bitstream installations.

### **3.3.3.2. Disputes in relation to a Migration**

In case any dispute between the Donor Operator and the Recipient Operator arose in relation to a Bitstream Service Migration, involving or not the End User concerned, the said dispute shall be exclusively settled between the Recipient Operator, the Donor Operator and, if applicable, the End User.

In case a dispute cannot be amicably settled between the parties as specified here above or in case of any problems encountered by either of the concerned Operators and provided it duly justifies its request, the Donor Operator is entitled to request in writing to POST Technologies a copy of the Migration request submitted by the Recipient Operator, while POST Technologies is duly authorised to transfer this request as well as the Recipient Operator's identity to the Donor Operator.

In addition, POST Technologies is entitled to request from the Recipient Operator due evidence of the End User's agreement as to the Migration, which the Recipient Operator shall provide within a maximum of five (5) Working Days after POST Technologies' said request.

POST Technologies shall in no case be held responsible by the Donor Operator for the implementation of a valid Migration request by the Recipient Operator and shall be kept free and harmless by both the Donor Operator and the Recipient Operator from any claims or damages in connection with the execution of aforementioned Migration request.

### **3.3.3.3. Billing in relation to a Migration**

The Donor Operator will continue to be invoiced for the Bitstream Services until the last day before the effective Migration date, whereas the invoicing of the Recipient Operator will start as from the day of said Migration.

The Migration of the Bitstream Service will be invoiced to the Recipient Operator according to the tariffs set out in Schedule 6.

### **3.3.4. Modification of a Bitstream Service**

A request for modification of an active Bitstream Service and its parameters can be sent at any time by the Operator to POST Technologies via the Web Service Application according to the relevant procedures.

Any compliant order for modification, which can be carried out remotely without any modification of the Access Line or an on-site intervention by POST Technologies' field technicians, shall be executed within five (5) Working Days. POST Technologies will proceed with the automatic activation of the new Bitstream Service Profiles or parameters between 8:00 and 17:00 on the requested due date. In case installations have to be carried out on site, the Operator has to book a time slot through the "Booking Manager" system.

An activation report will be sent to the Operator and the invoicing of the modified Bitstream Service will start on the date of the Bitstream Service modification.

The same procedures and lead times also apply in case the Operator requests the modification of an existing service purchased under the terms of the RDSLO, ORATH and OGB offers without any modification of the Access Line or an on-site intervention by POST Technologies' field technicians.

Only in case of RDSLO services, two scenarios will have to be distinguished:

- (i) Conversion of a "naked" DSL service not linked to an existing PSTN line: the same procedures as for modifications of Bitstream Services will be applied and the old RDSLO DSL service profile will be replaced by a new Bitstream Service Profile on the due day for the modification;
- (ii) Conversion of a DSL service bundled with an existing PSTN line:
  - a. if the PSTN line is directly invoiced to the End User by EPT's retail entity and the End User agrees to the number portability, the Operator must send an additional order to POST Technologies for the porting of the geographic number(s) and follow all the procedures related to number portability. The PSTN line will be deactivated at the time of implementing the new Bitstream Service.
  - b. if the PSTN line is directly invoiced to the End User by EPT's retail entity and the End User does not agree to the porting of the number, the PSTN line will remain in place and the Operator will have to send an order for a new Bitstream Service to be installed on a separate Access Line as well as a cancellation order for the existing DSL service.
  - c. If the PSTN line is invoiced to the Operator, it must send an additional order to POST Technologies for the porting of the geographic number(s). The PSTN line will be deactivated at the time of implementing the new Bitstream Service.

For all change requests requiring a modification of the Access Line or an on-site intervention by POST Technologies' field technicians, the Operator must send an order for a new Bitstream Service and follow the procedure for new Bitstream installations. The Operator will also have to send a cancellation order for the existing service.

### **3.3.5. Move Request of a Bitstream Service**

In case the Operator wants to move an End User's Bitstream Service to a different site, it will submit an order for a new Bitstream Service at the new address and a cancellation order for the existing Bitstream Service.

### **3.3.6. Cancellation of a Bitstream Service**

A Bitstream Service cancellation request may only be sent by the Operator to POST Technologies if so requested expressly by the End User or in case of contractual breach by the End User.

In addition, the Operator undertakes not to send a cancellation request to POST Technologies in case he has previously received a valid Migration request from another Operator.

A Bitstream Service cancellation will be carried out within the timeframe agreed between the Parties. The due date for the cancellation of the Bitstream Service shall not exceed the period of 3 months from the day of receipt of the cancellation request.

In case the cancellation is carried out before the end of the initial minimum contract period for said Bitstream Service, the Operator will be charged for the entire remaining contract period.

The minimum contract period for all Bitstream Services is 6 months.

### **3.3.7. Relation with Local Loop Unbundling (LLU) Services**

Bitstream Services cannot be offered by POST Technologies on an unbundled Access Line. As a consequence, in case of a third party's request for LLU Services on an Access Line where a Bitstream Service is provided, POST Technologies, upon receipt of such an operator's request for LLU Services, will have to cancel the existing Bitstream Service prior to activating the requested LLU Services. The third party operator will have to request the authorisation of the Operator for the cancellation of the Bitstream Services in much the same way as for the Migration of an active Bitstream Service.

For the avoidance of doubt, the Operator may not request any cancellation fees from POST Technologies as a consequence of the above, irrespective of its eventual contractual obligations with its End User.

### **3.3.8. Provisioning of the Bitstream Legacy Substitution Product**

In case the evolution of POST Technologies' Network in certain regions does not allow for the continuous support of two separate infrastructures – copper and fibre - nor the economic delivery of xDSL-based services, while FTTH infrastructures are already available in these regions, every effort should be made to have existing legacy DSL services initially purchased via the RDSLO agreement moved to new Bitstream Services using FTTH technologies.

Therefore the Operator should try, with the End User's consent, to have all its RDSLO services converted to commercially available Bitstream Services as specified in this ROB. Unless agreed otherwise between POST Technologies and the Operator concerned, POST Technologies will



inform the Operator at least six (6) months ahead of any changes in POST Technologies' Network ahead of any planned changes about Network modifications affecting the delivery of existing RDSLO services .

In case an End User, who uses a previously available low-bandwidth ADSL access service bundled with a PSTN line as specified in the Reference DSL Offer (RDSLO), refuses to opt in favour of an equivalent or similar service based on one of the FTTH-based Bitstream Service Profiles as previously described in this ROB, a specific Bitstream Service Profile will be implemented in order to replicate his/her current RDSLO service on the fibre optic infrastructure and allow POST Technologies to proceed with the phase-out of the legacy infrastructures whilst continuing to deliver the service as initially purchased under the RDSLO agreement.

If, for whatever reasons, the Operator is unable to meet the target date for the replacement of all RDSLO services by commercially available Bitstream Services, it will be informed by registered letter that

- (i) in case no further action is taken by the Operator to convert the existing RDSLO services to new Bitstream Services, one (1) month from the date of the registered letter the RDSLO services concerned will be converted to Bitstream Services configured with the "Legacy" Service Profile specifically designed to enable POST Technologies' to continue to deliver RDSLO-equivalent Bitstream Services whilst phasing out legacy network infrastructures;
- (ii) unless it provides an order for the replacement of the existing RDSLO service by a new Bitstream Service according to the financial terms and conditions of this ROB and the tariffs as set out in Schedule 6, it should inform the End User of the actions about to be undertaken by POST Technologies' in order to provide continuous support for his/her existing services and the cost neutrality of these actions for the End user;
- (iii) it should schedule an appointment with the End User for the on-site interventions, reserve a time slot in the "Booking Manager" system and send an order for the "Legacy" Bitstream Service using the Web Service Application.

The ordering and provisioning process for the "Legacy" Bitstream Service will be the same as for the commercially available Bitstream Service Profiles with the following exceptions:

- (i) In case the End User's existing Active Equipment (CPE/HAG) needs to be replaced in order to replicate the existing services delivered by the Operator using the new Bitstream Service on an FTTH infrastructure, the Operator provides this new CPE at its own cost to the End User.
- (ii) In case the in-house cabling needs to be modified in order to deliver the FTTH-based Bitstream Legacy Service, POST Technologies will carry out the necessary works and install the cabling between the ONT and the first RJ45 outlet at the End User's premises and also bear the costs for these modifications.
- (iii) POST Technologies will deliver the telephony services replicating the previous PSTN line using separate equipment (e.g. dedicated CPE/HAG, ONT with additional POTS ports). POST Technologies will bear the costs for this equipment.

No change requests or requests for additional services will be accepted for "Legacy" Bitstream Services.

In case the End User opposes any proposed changes to be made in order to ensure the continuous support for his/her services, the Operator shall send an order for the cancellation of the RDSLO service to POST Technologies and inform the End User of the termination of his/her existing services which will occur on the last day of the month following the date of the registered letter sent to the Operator.



### 3.3.9. Lead Times for Bitstream Service Activation

#### 3.3.9.1. Lead Times for Standard Requests

The following table summarises the lead times for the various steps in the provisioning process leading up to the Bitstream Service activation.

Order type	Lead time
Response time (validation/rejection) to a Bitstream Service activation request	1 Working Day
Earliest possible activation date for a Bitstream Service from the date of submission of the activation request	5 Working Days
Installation of a Bitstream Service with on-site intervention by POST Technologies' field technicians	95 % of all installations will be carried out on the due date as requested by the Operator
Time period for executing 95 % of valid Migration requests from Donor to Recipient Operator	5 Working Days
Time period for executing 95 % of change requests for Bitstream Services not requiring any modification of the Access Line nor any on-site intervention	5 Working Days
Implementation of a 10GE RHD link to POST Technologies-sited co-location facilities	60 Working Days
Implementation of a 100GE RHD link to POST Technologies-sited co-location facilities	on quote
Implementation of an RHD link to non-POST Technologies-sited POP of the Operator	on quote
CIR traffic configuration in POST Technologies' Metro Ethernet not requiring any Network capacity upgrades	15 Working Days
CIR traffic configuration in POST Technologies' Metro Ethernet requiring Network capacity upgrades	30 Working Days

Table 25: Lead times for Bitstream Services

The invoicing of the Bitstream Service to the Operator will start on the date on which POST Technologies activates the Bitstream Service. An activation report will be sent to the Operator.

#### 3.3.9.2. Rush Orders for Bitstream Services

An Operator may request a Rush Order for new Bitstream Services provided that the Operator has first submitted a valid request for this Bitstream Service via the Web Service application, followed by a positive response by POST Technologies.

In order to request a Rush Order for this Bitstream Service, the Operator sends an e-mail to

[backoffice.technologies@post.lu](mailto:backoffice.technologies@post.lu)

which contains at least the following data:

- (i) the mention of the words RUSH ORDER in the subject of the e-mail
- (ii) Bitstream Service reference number
- (iii) order reference
- (iv) contact point, e-mail address and phone number of the Operator
- (v) contact point and phone number of the End User

- (vi) type of Rush Order requested
- (vii) preferred installation time

POST Technologies offers 3 types of Rush Orders:

- (i) Type 1: Activation within 2 Working Days after the related Rush Order e-mail has been received by POST Technologies
- (ii) Type 2: Activation within 3 and 5 Working Days after the related Rush Order e-mail has been received by POST Technologies
- (iii) Type 3: Activation within 6 and 10 Working Days after the related Rush Order e-mail has been received by POST Technologies

The Rush Order service will be invoiced according to the tariffs as set out in Schedule 6 of this ROB.

The Operator may propose an appointment within the before mentioned time frame which POST Technologies should respect under the condition that POST Technologies' field technicians are available at the proposed time. If that is not the case, POST Technologies will fix another appointment within the same time frame.

POST Technologies will reply to the Operator's Rush Order request within a time frame of 4 working hours after receiving the Rush Order e-mail. The message will contain the definitive date and time of the Rush Order appointment.

Rush Order installations will only be carried out on Working Days between 8:00 and 12:00 and between 13:00 and 17:00.

The Operator has to ensure that the End User is informed of the exact date and time of the Rush Order installation, that access to the NTP, FO-NTP and/or ONT is guaranteed and that the in-house cabling at the End User's premises is ready. If the installation cannot be carried out by POST Technologies' staff because of reasons beyond POST Technologies' control (e.g. End User's absence, no access to the NTP/ONT, cabling not ready) despite the appointment made with the End User, POST Technologies will duly report the cancellation of the Rush Order process to the Operator and activate the Bitstream Service within the standard lead times after the Operator has booked a new time slot via the "Booking Manager" system. The Rush Order, although failed, will be invoiced to the Operator.

### **3.4. Procedures for EtherConnect Services**

#### **3.4.1. Initial Request, Feasibility Check and Ordering**

To cover all available technical options for the provision of higher-bandwidth EtherConnect Services, feasibility checks will be performed by POST Technologies upon receiving detailed information about the End User's location. Feasibility studies can also be requested in order to connect a building to POST Technologies' FTTO fibre network or to expedite its planned connection to POST Technologies' FTTH fibre network. Feasibility checks are also required before ordering an EtherConnect Backup Service in order to make sure that such a service fulfills the necessary requirements in terms of redundancy.

Until any specific other instruction from POST Technologies (such as e.g. the use of a SOAP XML procedure), the Operator shall send a request via e-mail to POST Technologies at the following address :

[checktech.technologies@post.lu](mailto:checktech.technologies@post.lu)

As from the date of entry into force of any such other instruction from POST Technologies, the Operator shall comply with the said instruction and related procedure if any. Failing to comply therewith, such request shall be held as invalid.

This request must contain at least the following information:

- (i) Operator's name;
- (ii) Operator's contact point for this specific request including related e-mail address and telephone number;
- (iii) address of the site/building to be connected via an EtherConnect Service;
- (iv) requested EtherConnect Service Profile; and
- (v) in case of requesting an EtherConnect Backup Service, information about a requested or existing primary EtherConnect Service shall be indicated as well.

POST Technologies will perform a detailed analysis and submit an answer with the available Ethernet Service Profiles to the Operator within a period of five (5) Working Days if no site survey is required. POST Technologies cannot commit to extend, modify or adapt its Network to enable the provision of a specific EtherConnect Service Profile. In case the building needs to be connected to POST Technologies' Network or an additional FTTO fibre entry has to be built for redundancy purposes, POST Technologies will send a quote to the Operator mentioning the costs and the approximate lead time for the related civil works.

The End User shall directly order any services requiring an EtherConnect Service from his/her Operator, which shall then order the EtherConnect Service from POST Technologies. Before signing a contract with the End User, the Operator shall inform him/her of the procedures and responsibilities related to the new service and the impact the EtherConnect Service may have on his/her existing telecommunication services. POST Technologies will in no case accept or handle any order for an EtherConnect Service issued directly by an Operator's End User. The Operator will be POST Technologies' single point of contact regarding orders for EtherConnect Services.

The Operator will send any firm order for a new EtherConnect Service or the modification or cancellation of an existing EtherConnect Service by e-mail to

[order.technologies@post.lu](mailto:order.technologies@post.lu)

The order must contain at least the following information:

- (i) the Operator's name;
- (ii) the Operator's contact point for this specific request including related e-mail address and telephone number;
- (iii) in case of modifications, moves or cancellations the existing EtherConnect Service reference number;
- (iv) the EtherConnect Service Profile (and options) to be implemented;
- (v) in case of an EtherConnect Backup Service, information about a requested or existing primary EtherConnect Service must be indicated as well;
- (vi) the RHD(s) on which the EtherConnect Service will be configured;
- (vii) the VLAN\_ID to be used for the EtherConnect Service;
- (viii) End User installation address (for office buildings, datacenters or industrial sites: building, floor, room/rack, etc.);
- (ix) contact point with phone number and e-mail address of the End User;
- (x) in case of non-standard installations, reference of the feasibility check and acknowledgment of the additional costs;
- (xi) if required, request for the feasibility check of a Rush Order.

Similar requests may be grouped within the same order to allow mass processing.

Orders will be deemed invalid when they either do not include all required mandatory information as specified in the above-mentioned documentation and/or contain erroneous or incompatible information. Any invalid orders will be rejected and not be processed by POST Technologies, which shall inform the Operator thereof. POST Technologies shall not be held liable for any delays caused in this way nor for any consequences arising out of or in relation to such an order rejection.

In case POST Technologies validates and accepts the Operator's request, POST Technologies will send a confirmation to the Operator and reserve the physical infrastructure (e.g. fibre, copper pair) necessary for the realisation of the EtherConnect Service. POST Technologies will provide to the Operator an order reference and an EtherConnect Service reference number.

POST Technologies will make every effort to respond to ninety-five percent (95%) of all requests received for EtherConnect Services within a period of five (5) Working Days.

POST Technologies will handle the Operator's new orders, cancellations and/or change requests in a non-discriminatory way and based on the "first come - first served" principle.

If an Operator wants to cancel its order for an EtherConnect Service after its formal submission, it shall do so by sending an e-mail to [backoffice.technologies@post.lu](mailto:backoffice.technologies@post.lu) indicating POST Technologies' order reference and the EtherConnect Service's reference number. The Operator will be charged according to the tariffs for cancellation of an EtherConnect order before activation as defined in Schedule 6.

### 3.4.2. Installation Procedures for EtherConnect Services

The standard installation of a new EtherConnect Service by POST Technologies on behalf of the Operator expressly includes:

- (i) the installation of the physical Access Line(s) via an existing NTP or FO-NTP at the End Customer's premises including the delivery, installation and configuration of eventually required xDSL modems or an ONT;
- (ii) the supply and installation in an existing rack or suitable environment, in close proximity to the NTP, FO-NTP or ONT at the End User's premises, of the NTU, which acts as demarcation device for the EtherConnect Service delivered on one of its Ethernet interfaces;
- (iii) the supply and installation of the necessary patchcords and splitters to interconnect the NTU with the modem(s) and the existing NTP, or to interconnect the NTU with the ONT or the FO-NTP at the End User's premises, under strict exclusion of any internal cabling related supplies and/or services;
- (iv) all works necessary to configure and test the EtherConnect Service and connect the circuit from the demarcation point at the End User's premises (Ethernet interface of the NTU installed in close proximity to the NTP, FO-NTP or ONT) through to the RHD;
- (v) an initial site survey of the End User's premises (max. 1 hour) in order to determine the most suitable location for the installation of the equipment provided by POST Technologies (NTU, modems, ONT) and to verify whether the existing NTP or FO-NTP can be used or whether additional cabling works need to be carried out to enable the interconnection between the NTU and the (FO-)NTP.

The installation of an EtherConnect Service by POST Technologies on behalf of the Operator expressly excludes:

- (i) any installation of new cabling, outlets and/or patchpanels at the End User's premises;
- (ii) installation of a new NTP or FO-NTP at the End User's premises
- (iii) activation of any additional services;
- (iv) configuration in whole or in part of the End User's Active Equipment;
- (v) any other task, works and/or duty not expressly included in the first list specified here above.

As most of the EtherConnect Services are delivered to corporate End User's in multi-tenant buildings and/or dedicated IT rooms, an initial site survey is nearly always necessary to determine whether a new EtherConnect Service can be installed without any modifications in the End User's IT environment. As mentioned before, only the connection of the NTU to the NTP, ONT or FO-NTP by means of patchcords is included in the installation services for EtherConnect Services. If the NTU cannot be installed in close proximity to the existing NTP, ONT or FO-NTP and installation of the NTU requires additional on-site or in-house cabling, these cabling works are the Operator's and/or the End User's responsibilities and will not be part of POST Technologies' scope of work.

230V/16A power supplies and earth connection have to be made available for the connection of POST Technologies' active equipment. All costs related to power consumption, rack space and/or footprints need to be borne by the Operator and/or its End User. POST Technologies has the right to refuse the installation if the Operator and/or the End User cannot provide a suitable environment compliant with the specifications for POST Technologies' equipment (e.g. operating temperature, humidity).

In case no modifications are required, POST Technologies will confirm an installation date while trying to comply with the preferred installation time as expressed by the Operator at the time of its order.

In case modifications or additional installations (e.g. new cabling or rack space required) are necessary to provide the EtherConnect Service at the chosen location within the End User's premises, POST Technologies and the Operator in agreement with the End User will set a new time schedule for the installation of the EtherConnect service.

If the modifications have not yet been carried out or only been carried out incompletely or incorrectly within the agreed time schedule, the Operator will inform POST Technologies thereof no later than 16:00 of the last business day before the agreed installation date. In case the Operator does not inform POST Technologies in time, POST Technologies will invoice the "no-show fee" as defined in Schedule 6.

In case the modifications on site require the installation by POST Technologies of a new NTP or FO-NTP at the End User's premises, POST Technologies will provide a quote within five (5) days to the Operator for the corresponding installation. While POST Technologies will include the supply and connection of the necessary cables in its quote, it will be the Operator's responsibility to ensure that the cables will be laid between the designated extremities within the premises. Upon receiving this quote, the Operator will have to confirm its acceptance by e-mail in order to re-validate the initial EtherConnect order and to relaunch its provisioning process.

EtherConnect Service installations will be carried out on Working Days between 8:00 and 12:00 and between 13:00 and 17:00.

The Operator will be notified by e-mail of the EtherConnect Service activation and invoicing will start on the activation date mentioned in this notification message.

POST Technologies will endeavour to achieve at least 95% of the Operator's requests for EtherConnect Services, which do not require a non-standard installation or any modifications at the End User's premises, within a maximum of forty (40) Working Days.

Modification and move requests of an active EtherConnect Service can be sent at any time by the Operator to POST Technologies after having carried out the necessary feasibility check for the new address or for bandwidth upgrades at the existing installation address.

If the activation of the new EtherConnect Service Profile can be carried out remotely without any modifications of the installations and infrastructures at the End User's premises or any Network modifications or upgrades, POST Technologies will inform the Operator thereof and proceed with the automatic activation of the new EtherConnect Service Profile between 8:00 and 17:00 on the requested due date. In case installations have to be carried out on site or in case of a move to another site, the same procedures as for the installation of a new EtherConnect Service will apply.

After activation, the Operator will be notified by e-mail and the invoicing will be switched to the new EtherConnect Service on the date of the service modification.

A cancellation request for an EtherConnect Service may be sent by the Operator to POST Technologies if so requested by the End User or in case of contractual breach by the End User. An EtherConnect Service cancellation will be carried out within the timeframe agreed between the Parties. The due date for the cancellation of the EtherConnect Service shall not exceed the period of 3 months from the day of receipt of the cancellation request.



In case the cancellation is carried out before the end of the initial minimum contract period for said EtherConnect Service, the Operator will be charged for the entire remaining contract period.

The minimum contract period for all EtherConnect Services is 6 months.

### 3.4.3. Lead Times for EtherConnect Services

#### 3.4.3.1. Lead Times for Standard Requests

The following table summarises the lead times for the various steps in the provisioning process leading up to the EtherConnect Service activation.

Order type	Lead time
Maximum response time to a feasibility check for an EtherConnect Service	5 Working Days
Maximum response time to a request for a new connection of a building to POST Technologies' network (not requiring a site survey)	10 Working Days
Target activation date for a new EtherConnect Service from the date of order submission	< 40 Working Days
Activation of an EtherConnect Service by a POST Technologies technical team with on-site installation (activation due date needs to be validated after site survey)	95 % of all installations will be carried out within the target activation period
Time period for executing 95 % of change requests for EtherConnect Services not requiring on-site interventions or network upgrades/modifications	15 Working Days
Implementation of a 10GE RHD link to POST Technologies-sited co-location facilities	60 Working Days
Implementation of a 100GE RHD link to POST Technologies-sited co-location facilities	on quote
Implementation of an RHD link to non-POST Technologies-sited POP of the Operator	on quote

Table 26: Lead times for EtherConnect Services

The invoicing of the EtherConnect Service to the Operator will start on the date on which POST Technologies activates the EtherConnect Service. An activation report will be sent to the Operator.

#### 3.4.3.2. Rush Orders for EtherConnect Services

An Operator may request a Rush Order for the activation of EtherConnect Services.

POST Technologies offers 3 types of Rush Orders for EtherConnect Services:

- (i) Type 1: Activation within 2 and 5 Working Days after validation of the related Rush Order
- (ii) Type 2: Activation within 6 and 10 Working Days after validation of the related Rush Order
- (iii) Type 3: Activation within 11 and 15 Working Days after validation of the related Rush Order

The Rush Order service will be invoiced according to the tariffs as set out in Schedule 6 of this ROB.

The Operator may request a feasibility check prior to sending a firm order for the required EtherConnect Services. This request shall be sent by e-mail to

[backoffice.technologies@post.lu](mailto:backoffice.technologies@post.lu)



containing the following information:

- (i) the mention of the words RUSH ORDER in the subject of the e-mail
- (ii) the Operator's name;
- (iii) the Operator's contact point for this specific request including related e-mail address and telephone number;
- (iv) in case of moves or modifications the existing EtherConnect Service reference number;
- (v) the EtherConnect Service Profile (and options) to be implemented;
- (vi) in case of an EtherConnect Backup Service, information about a requested or existing primary EtherConnect Service must be indicated as well;
- (vii) End User installation address (for office buildings, datacenters or industrial sites: building, floor, room/rack, etc.);
- (viii) contact point, phone number and e-mail address of the End User;
- (ix) type of Rush Order requested;
- (x) preferred installation day and time.

POST Technologies will inform the Operator within one (1) Working Day about the feasibility of the requested expedite service activation unless the feasibility analysis requires a site survey. In that case POST Technologies will contact the Operator within one (1) Working Day after receiving the Operator's request in order to schedule an appointment for the related site survey. Feasibility checks for Rush Orders will be invoiced according to the tariffs as set out in Schedule 6.

The request for a feasibility check can also be sent together with the firm order for an EtherConnect Service. In this case the order will only be validated after receiving the positive result of the feasibility check.

The Operator has to ensure that the End User is informed of the exact date and time of the Rush Order installation, that access to the NTP, FO-NTP and/or ONT is guaranteed and that the in-house cabling at the End User's premises is ready. If the installation cannot be carried out by POST Technologies' staff because of reasons beyond POST Technologies' control (e.g. End User's absence, no access to the NTP/ONT, cabling not ready), POST Technologies will duly report the cancellation of the Rush Order process to the Operator and activate the EtherConnect Service within the standard lead times. The Rush Order, although failed, will be invoiced to the Operator.

### **3.5. Key Performance Indicators**

POST Technologies will measure applicable Broadband Services KPIs and inform the ILR in compliance with Regulation 14/180/ILR.

### **3.6. Non-standard Requests**

In case of non-standard requests related to Bitstream or EtherConnect Services which demand either a feasibility study including a detailed analysis of the Operator's requirements as well as an evaluation of the technical and financial aspects of a tailor-made implementation and the potential impact on processes and operations or any other special requests (including the request of the Operator to obtain other profiles for Bitstream and Ethernet services than those laid down in the present ROB), POST Technologies will bill the supplementary efforts on an hourly basis as defined

in Schedule 6 and will, subject to the outcome of the feasibility study or its assessment, make its best efforts to conclude an agreement with the Operator within a maximum of 3 (three) months after receiving from the Operator all the information required.

## **Schedule 4    Fault Repair and Reporting**

### **4.1. POST Technologies' Fault Contact Point, Fault Acceptance and Billing**

The Operator shall send a Fault Report to POST Technologies' Fault Contact Point (FCP) at the following email address:

bo\_acc\_der@post.lu .

Upon receipt of a valid Fault Report compliant to the minimum terms set forth below, POST Technologies shall send an email notification ("Incident Ticket Opening") related to a valid Fault Report to the Operator. To do so, the Operator shall provide POST Technologies with an e-mail address for the exchange of these notification messages. After fault resolution an e-mail notification ("Incident Ticket Closing") will be sent to the same address.

All related phone calls should be directed to POST Technologies' designated Fault Contact Point : +352 4991 5868.

Operator's Fault Reports will be accepted by POST Technologies 24 hours a day, 7 days a week.

Fault clearance for all Broadband Services will be performed during normal Working Days, Mondays to Fridays from 8:00 to 12:00 and from 13:00 to 17:00.

Fault clearance shall be performed on Working Days outside of business hours as well as on Saturdays, Sundays and/or legal and public holidays for all Broadband Services for which the Operator has chosen an enhanced Service Level as defined in Schedule 5.

Fault clearance interventions will be billed by POST Technologies to the Operator as defined in Schedule 6.

Fault reporting and fault repairs shall be performed in compliance with the conditions and time schedules specified hereafter.

Only valid Fault Reports and accepted faults will be processed by POST Technologies. To be valid, a Fault Report shall contain the minimum information and data requested in the paragraphs below.

### **4.2. Fault Reporting to POST Technologies by the Operator**

Prior to submitting a Fault Report, the Operator shall have to ensure that a genuine fault exists and that every effort has been made in advance to check that the fault resides within POST Technologies' area of responsibility.

In the Fault Report, the Operator shall provide sufficient information to allow the diagnosis of the reported fault and to enable the progression of the fault until resolution. Therefore, all requests shall be done using a predefined Fault Report form that can be downloaded from POST Technologies' Website. Fault Reports are nevertheless also accepted via simple e-mail containing at least the following data:

- (i) POST Technologies' reference number of the Broadband Service or RHD
- (ii) Contact point and phone number of the End User
- (iii) Address of the End User
- (iv) Contact point and phone number of the Operator

- (v) Type of service affected
- (vi) Description of the reported fault
- (vii) Date and description of the intervention of the Operator's technician

The Operator may pass on any additional information it considers relevant to the Fault Report, while POST Technologies shall not be obliged to use such additional information, whichever may be the reason.

Incident Ticket Opening and Incident Ticket Closing notifications are automatically generated and triggered by POST Technologies' Broadband Service or RHD reference number. If this field is not indicated in the Operator's Fault Report, no incident ticket will be opened, while the concerned Fault Report will be deemed invalid.

Referring to the specifications set forth in 2.2.2.2, POST Technologies shall only accept Fault Reports issued by the Operator for Bitstream Services using xDSL technologies, if the synchronisation speed of the xDSL circuit is below the minimum capacity threshold of the concerned Bitstream Service Profile as available maximum bandwidth of xDSL circuits may vary in time due to a changing cable fill rate (i.e. the number of DSL systems sharing the same cable).

#### **4.3. Fault Reporting to POST Technologies by the End User**

The Operator has to inform the End User about the Operator's responsibility and timely communicate the Operator's own Fault Contact Point to the End User in order to prevent any abuse of POST Technologies' support services.

POST Technologies will not accept any Fault Report from the Operator's End Users. POST Technologies has no obligation to report to the Operator a fault that an End User would have directly reported to POST Technologies.

#### **4.4. POST Technologies and Operator Liabilities for the Fault Clearance**

If the Operator's Fault Report received by POST Technologies is valid and contains the minimum information requested, POST Technologies will issue an Incident Ticket Opening notification and start the fault localisation and fault clearance process during normal working hours. Upon detection of a fault on the Broadband Service, POST Technologies will use all reasonable endeavours to repair the fault as soon as reasonably practicable.

Fault clearance shall be terminated by the end of the Working Day following the Incident Ticket Opening except where the restoration of the Broadband Service requires works of such importance that they need substantial works to be carried out (e.g. civil works) or that an appointment has to be made with the End User for an on-site intervention. The applicable tariffs are specified in Schedule 6.

The Operator shall cooperate with POST Technologies' reasonable requests in an effort to locate and, if possible, resolve any fault. POST Technologies reserves the right to contact and make an appointment with the Operator's End User for the restoration of the Broadband Service. In case contact with the End User is necessary for fault location and/or restoration and the Operator failed to provide the contact information, the related Fault Report will be rejected and deemed invalid.

When POST Technologies believes that the fault has been cleared and the Broadband Service is reestablished, an Incident Ticket Closing notification will be sent to the Operator. Unless the

Operator rejects the concerned Incident Ticket Closing within four (4) hours after its receipt, the Incident Ticket and the related Fault Report will be closed automatically by POST Technologies.

If the Operator rejects the Incident Ticket Closing as specified above, it shall specifically provide the following information:

- (i) The reason why the Operator reasonably believes that the circuit is unsuitable for use of the Broadband service.
- (ii) All additional information that the Operator reasonably considers suitable to assist in understanding and diagnosing any underlying fault in the Broadband Service.

The Operator shall cooperate with POST Technologies to carry out further tests, even on Operator's equipment when reasonably requested to do so. At its sole discretion, POST Technologies may carry out additional works upon the Operator's request, while the costs thereof shall be invoiced to the Operator.

Both Parties recognise and acknowledge that the fault repair time will commence when POST Technologies issues the Incident Ticket Opening and will end when POST Technologies issues the Incident Ticket Closing.

#### **4.5. Wrongful Repair Request**

A wrongful Fault Report occurs when POST Technologies has done all necessary measurements and test results prove that the quality of the Broadband Services mentioned in the Fault Report or its underlying circuit is not the cause of the service interruption or service degradation.

In case of a repair where the detected fault lies outside the scope of POST Technologies' responsibility under this ROB or in case of a wrongful Fault Report, all costs related to works and travelling already performed by POST Technologies in relation to such Fault Report will be charged to the Operator.

#### **4.6. End User's Liabilities**

The Operator shall ensure that the End User(s) will timely grant POST Technologies' field technicians access to the demarcation point and/or network termination points within his/her premises as often as required for an efficient service restoration. In case POST Technologies cannot access the premises, POST Technologies will report this to the Operator, who will have to contact forthwith the End User and take the necessary arrangements to grant access to POST Technologies.

In case the End User is absent during POST Technologies' field technician's visit, POST Technologies will leave a message in his/her mailbox requesting the End User to contact POST Technologies' helpdesk to make a new appointment. In this case, the targeted duration for the restoration of the Broadband Service cannot be met and the fault repair time computation will be automatically suspended until the End User contacts POST Technologies' helpdesk and schedules a new appointment.

## **Schedule 5 Service Level Agreement**

### **5.1. Service Level for Broadband Service Provisioning**

POST Technologies will make every effort to realise ninety-five percent (95%) of all activation requests received for Broadband Services by one Operator on the due date demanded by said Operator. If POST Technologies fails to provide the above-mentioned Broadband Service in compliance with Schedule 3, the Operator will be granted a financial indemnity equivalent to one monthly fee for the Broadband Service concerned, while should this delay fall beyond fifteen (15) calendar days, the said indemnity will be increased to be equivalent to two monthly fees for the Broadband Services concerned.

No financial indemnity will be granted for delays in provisioning the Broadband Service in case:

- (i) of a Force Majeure event;
- (ii) the Operator fails to claim the above-mentioned financial indemnity within thirty (30) calendar days as from the day after which the warranted provisioning time has elapsed; or
- (iii) POST Technologies has been prevented in whole or in part to intervene in due time to comply with the warranted provisioning time, notably due to the Operator's and/or the End User's act or omission.

The Operator can opt for priority handling by purchasing a "Rush Order" for each Broadband Service concerned by means of an additional fee as set out in Schedule 6 and according to the procedures as described in paragraphs 3.3.9.2 and 3.4.3.2, if time slots are available at the time of ordering.

#### **5.1.1. Standard Service Level for Broadband Service Restoration**

POST Technologies will attempt to reestablish Broadband Services before the end of the first (1) Working Day following the day at which a valid Fault Report has been submitted, except where the required clearance works are of such importance that they need substantial works to be carried out (e.g. civil works) or that an appointment with the End User has to be made.

If POST Technologies fails to achieve service restoration within the above-mentioned time period for less than 95% of one Operator's validly submitted Fault Reports while either the concerned fault and/or the restoration delay are within POST Technologies' sole responsibility, the Operator will be granted upon written express request with a financial indemnity equivalent to one monthly fee of the Broadband Services concerned.

In case of outages at RHD level, which affect a majority of End User's connected to the Operator's network via this RHD interconnection, POST Technologies will perform fault clearance outside of business hours and work together with the Operator to reestablish the RHD interconnection within the shortest time possible.

#### **5.1.2. Enhanced Service Level for Broadband Service Restoration**

Fault clearance outside POST Technologies' business hours and/or with priority handling is possible after a valid Fault Report has been submitted,

- (i) provided the Operator has accepted, prior to each intervention and for each relevant exceptional case, the respective one-time fees set out in Schedule 6 and duly contacted

POST Technologies at the following phone number: +352 4991 5868. In this case, the terms and conditions of the Standard Service Level shall not apply, while, according to the fault concerned, the Parties will agree upon a reasonable time schedule applicable to such fault clearance. Interventions will be invoiced according to the tariffs set out in Schedule 6;

- (ii) in case the Operator has opted, by means of paying an additional monthly fee as set out in Schedule 6, for the Business or Premium Service Level option, either at the time of the initial Broadband Service order or at least one month prior to sending the Fault Report.

Fault clearance will be performed 24 hours a day, 7 days a week, for each Broadband Service covered by the Business or Premium SLA Agreement. Interventions will be invoiced according to the tariffs set out in Schedule 6.

The following table summarises the available Service Level options and their characteristics.

<b>Service Level</b>	<b>Standard</b>	<b>Business</b>	<b>Premium</b>
Eligible Service	Bitstream Service EtherConnect Service	Bitstream Service EtherConnect Service	Only for EtherConnect Services bundled with an EtherConnect Backup Service
Additional subscription fee	No	Yes	Yes
Coverage *)	8/5 (business hours) **)	24/7 (incl. public holidays)	24/7 (incl. public holidays)
Extended coverage	Optional (one-time fee per incident)	n/a	n/a
Intervention time	8 (business) hours	4,5 hours	4,5 hours
Yearly availability	99,60 %	99,80 %	99,95 % ***)

Table 27: Service Level parameters

\*) Coverage: Period during which call-back, fault clearance and interventions will be performed

\*\*) Business hours: Working Days from 8:00 to 12:00 and from 13:00 to 17:00

\*\*\*) Service is considered available if one of the two EtherConnect Services (primary or backup) is still operational



The following penalties will apply and be granted to the Operator in the form of a credit note in case the Service Level is not met. Availability, intervention time and penalties will be calculated for each Broadband Service individually.

<b>Service Level</b>	<b>Standard</b>	<b>Business</b>	<b>Premium</b>
Availability calculation period	n/a	Quarterly	Yearly
Availability	n/a	≥ 99,60 and < 99,80 %	≥ 99,90 and < 99,95 %
Penalty	n/a	6 % of quarterly fee	6 % of yearly fee
Availability	n/a	≥ 99,40 and < 99,60 %	≥ 99,85 and < 99,90 %
Penalty	n/a	12 % of quarterly fee	12 % of yearly fee
Availability	n/a	≥ 99,20 and < 99,40 %	≥ 99,80 and < 99,85 %
Penalty	n/a	18 % of quarterly fee	18 % of yearly fee
Availability	n/a	≥ 99,00 and < 99,20 %	≥ 99,75 and < 99,80 %
Penalty	n/a	24 % of quarterly fee	24 % of yearly fee
Availability	n/a	< 99,00 %	< 99,75 %
Penalty	n/a	30 % of quarterly fee	30 % of yearly fee

Table 28: Penalties in case of unavailability

<b>Service Level</b>	<b>Standard</b>	<b>Business</b>	<b>Premium</b>
Intervention time (IT)	n/a	4,5 hours <IT≤ 8 hours	4,5 hours <IT≤ 8 hours
Penalty	n/a	1 monthly fee	1 monthly fee
Intervention time (IT)	n/a	> 8 hours	> 8 hours
Penalty	n/a	2 monthly fees	2 monthly fees

Table 29: Penalties in case of delayed intervention time

The above provision shall not apply in case:

- (i) of a Force Majeure event;
- (ii) the Operator fails to claim the above-mentioned financial indemnity within thirty (30) calendar days as from the day after which the warranted intervention time has elapsed or thirty (30) days after the beginning of a new quarter or calendar year for indemnities related to the quarterly or yearly availability; or
- (iii) POST Technologies has been prevented in whole or in part to intervene in due time to comply with the warranted intervention time, notably due to the Operator's and/or the End User's act or omission.

## Schedule 6 Tariffs

### 6.1. Bitstream Services

#### 6.1.1. One-Off Fees for Bitstream Services

##### 6.1.1.1. Access and Connectivity : One-off Fees for Bitstream Services

Item	One-off fee (EUR excl. VAT)
Installation charges for a new Bitstream Service (incl. on-site intervention and service activation)	74,09
Activation of a Bitstream Service (without on-site intervention)	10,79
Migration of a Bitstream Service to the Recipient Operator	16,91
Charges for moving a Bitstream Service to a new address	74,09
Negative answer to a Bitstream Service order *) or cancellation of an order before activation	14,98
Migration of a RDSLO (VDSL)/ORATH/OGB service to the Recipient Operator and conversion into a Bitstream Service (without on-site intervention)	16,91
Migration of a RDSLO (ADSL) service to the Recipient Operator and conversion into a Bitstream Service	74,09
Conversion of existing RDSLO/ORATH/OGB services into Bitstream Services (not requiring any modification on site or of the underlying circuit)	Free of charge if all RDSLO/ORATH/OGB services are converted at the same time
Change of Bitstream Service Profile – downgrade or upgrade without change of infrastructure or upgrade requiring change from xDSL to FTTH	Free of charge
Conversion of xDSL-based Bitstream Service into FTTH-based Bitstream Service without upgrade	74,09
Provision of splitter for End User's site	5,-
Provision of xDSL modem for End User's site	on quote
Compatibility test of Operator's Equipment (CPE/HAG) on POST Technologies' test platform (in case of alterations of POST Technologies' network, the first four hours of re-evaluation of already tested equipment are free of charge)	156,90 / hour plus labour costs
Installation and activation charges for Bitstream Legacy Service	Free of charge

\*) only in case POST Technologies' online tool clearly showed that the specific address is not eligible for the requested Bitstream Services

##### 6.1.1.2. CIR Component : One-off Fees for Bitstream Services

Item	One-off fee (EUR excl. VAT)
New QoS/CIR profile definition and validation for DSLAM/OLT	4.870,40
Implementation of previously defined QoS/CIR profile in entire POST Technologies access network	1.976,76
Implementation of previously defined QoS/CIR profile per DSLAM/OLT	181,61

### 6.1.1.3. RHD Component : One-off Fees for Bitstream Services

Item	One-off fee (EUR excl. VAT)
Centralised on-site RHD – 10Gigabit Ethernet port	2.814,80
Centralised off-site RHD – 10Gigabit Ethernet port	2.814,80 plus setup of RHD extension to Operator's POP (on quote)
Local on-site RHD – 10Gigabit Ethernet port	2.814,80
Centralised on-site RHD – 100 Gigabit Ethernet port	2.814,80
Centralised off-site RHD – 100 Gigabit Ethernet port	2.814,80 plus setup of RHD extension to Operator's POP (on quote)

### 6.1.1.4. Multicast Option : One-off Fees for Bitstream Services

Item	One-off fee (EUR excl. VAT)
Definition and setup of Multicast configuration	13.490,55
Definition of Multicast Access Profile	4.417,72
Activation or modification per Multicast Group (Channel)	200,-
Activation of Multicast Option per Bitstream Service	15,-
Cancellation of Multicast Option per Bitstream Service	5,-

### 6.1.1.5. Rush Order : One-off Fees for Bitstream Services

Item	One-off fee (EUR excl. VAT)
Rush Order type 1 (within 2 Working Days)	1.000,-
Rush Order type 2 (within 5 Working Days)	750,-
Rush Order type 3 (within 10 Working Days)	500,-

### 6.1.1.6. Fault Repair : One-off Fees for Bitstream Services

Item	One-off fee (EUR excl. VAT)
During business hours (8:00 – 17:00), fault in POST Technologies' Network	Free of charge
During business hours (8:00 – 17:00), fault in the Operator's Network	Invoiced per hour
Priority intervention Monday to Friday 7:00 – 19:00, Saturday 8:00 – 12:00, fault in POST Technologies' or the Operator's Network	Invoiced per hour Min. 250,- EUR per intervention*)
Priority intervention Monday to Friday 19:00 – 7:00, Saturday 0:00 – 8:00 and 12:00 – 24:00, Sundays and public holidays, fault in POST Technologies' Network or the Operator's Network	Invoiced per hour Min. 500,- EUR per intervention*)

\*) Minimum charge will not apply if the Operator has chosen the Business Service Level for its Bitstream Service

#### **6.1.1.7. Service Level : One-off Fees for Bitstream Services**

<b>Item</b>	<b>One-off fee (EUR excl. VAT)</b>
Activation of Business Service Level on a Bitstream Service	14,-

#### **6.1.1.8. Labour Costs**

The currently applicable hourly rates related to labour costs are available on POST Technologies' Website.

## 6.1.2. Recurring Fees for Bitstream Services

*Minimum contract period for each Bitstream Service: 6 months*

### 6.1.2.1. Access and Connectivity : Recurring Fees for Bitstream Services

Item	Monthly Fee (EUR excl. VAT)	
	Connected to centralised RHD	Connected to local RHD
Bitstream Service Flex 100	29,67	27,11
Bitstream Service Flex 1000	85,78	63,47
Bitstream Service Fix 20	26,86	25,13
Bitstream Service Fix 30	30,13	28,68
Bitstream Service Fix 100	33,23	31,39
Bitstream Service Fix 200	39,42	35,30
Bitstream Service Legacy	14,51 <sup>*)</sup>	n/a

<sup>\*)</sup> Access line and telephony service for POTS or ISDN replication will be invoiced separately to the Operator providing this service to the End User according to the tariffs specified in the RLO (Reference Line Rental Offer)

### 6.1.2.2. CIR Component : Recurring Fees for Bitstream Services

Item	Monthly Fee (EUR excl. VAT)	
	Connected to centralised RHD	Connected to local RHD
CIR traffic Priority Bit 7 (per DSLAM/OLT)	13,17 / Mbps	7,82 / Mbps
CIR traffic Priority Bit 6 (per DSLAM/OLT)	12,44 / Mbps	7,39 / Mbps
CIR traffic Priority Bit 5 (per DSLAM/OLT)	11,71 / Mbps	6,95 / Mbps
CIR traffic Priority Bit 4 (per DSLAM/OLT)	10,98 / Mbps	6,52 / Mbps
CIR traffic Priority Bit 3 (per DSLAM/OLT)	10,24 / Mbps	6,08 / Mbps
CIR traffic Priority Bit 2 (per DSLAM/OLT)	9,51 / Mbps	5,65 / Mbps
CIR traffic Priority Bit 1 (per DSLAM/OLT)	8,78 / Mbps	5,22 / Mbps
CIR traffic Priority Bit 0 (per DSLAM/OLT)	6,59 / Mbps	3,91 / Mbps

### 6.1.2.3. RHD Component : Recurring Fees for Bitstream Services

Item	Monthly Fee (EUR excl. VAT)
Centralised on-site RHD – 10Gigabit Ethernet port	498,-
Centralised off-site RHD – 10Gigabit Ethernet port	498,- plus RHD extension to Operator's POP (on quote)
Local on-site RHD – 10Gigabit Ethernet port	498,-
Centralised on-site RHD – 100 Gigabit Ethernet port	3.252,20
Centralised off-site RHD – 100 Gigabit Ethernet port	3.252,20 plus RHD extension to Operator's POP (on quote)
EIR traffic (Excess traffic / 95 <sup>th</sup> percentile billing) at centralised RHD	6,59 / Mbps
EIR traffic (Excess traffic / 95 <sup>th</sup> percentile billing) at local RHD	3,91 / Mbps

### 6.1.2.4. Multicast Option : Recurring Fees for Bitstream Services

Item	Monthly Fee (EUR excl. VAT)
Fee per Multicast stream (0 – 5000 streams)	on quote
Fee per Multicast stream (5000 – 20000 streams)	on quote
Fee per Multicast stream (> 20000 streams)	on quote

### 6.1.2.5. Service Level : Recurring Fees for Bitstream Services

Item	Monthly Fee (EUR excl. VAT)
Business Service Level Agreement covering the first 150 Bitstream Services	2.000,-
Business Service Level per additional Bitstream Services (> 150)	14,-

## 6.2. EtherConnect Services

### 6.2.1. One-off Fees for EtherConnect Services

#### 6.2.1.1. Connectivity : One-off Fess for EtherConnect Services

Item	One-off fee (EUR excl. VAT)
One-off fees for new standard EtherConnect Service installations on existing infrastructures:	
EtherConnect EC 2	675,-
EtherConnect EC 5	675,-
EtherConnect EC 10	675,-
EtherConnect EC 30	675,-
EtherConnect EC 50	855,-
EtherConnect EC 100	855,-
EtherConnect EC 200	855,-
EtherConnect EC 500	1.305,-
EtherConnect EC 1000	1.755,-
EtherConnect EC Backup	same as primary EtherConnect Service of the same bandwidth
Change of EtherConnect Service Profile – downgrade or upgrade – remote intervention only	200,-
Change of EtherConnect Service Profile – downgrade or upgrade – on-site intervention required	same as new installation
Charges for moving an EtherConnect Service to a new address	same as new installation
Negative answer to an EtherConnect Service order	14,98
Cancellation of an order before activation	500,-
No-show at scheduled installation date	200,-
Non-standard installation on existing infrastructure	on quote
Realisation of new fibre infrastructure (e.g. new building connection)	on quote
Feasibility check for EtherConnect Service	9,21 *)
Request for quote for non-standard installation or new infrastructure (building entry/access and/or in-house (FO-)NTP)	120,- *)
Site survey (if required for a quote for non-standard installation or new infrastructure)	150,-
Activation of Failover Option for new EtherConnect Service	Free of charge
Activation of Failover Option for existing EtherConnect Service	350,-

\*) fee will be credited if followed by an order for the proposed installations

#### 6.2.1.2. CIR Component : One-off Fess for EtherConnect Services

Item	One-off fee (EUR excl. VAT)
New QoS/CIR profile definition and validation for EtherConnect Services	4.870,40



### 6.2.1.3. RHD Component : One-off Fess for EtherConnect Services

Item	One-off fee (EUR excl. VAT)
Centralised on-site RHD – 10Gigabit Ethernet port	2.814,80
Centralised off-site RHD – 10Gigabit Ethernet port	2.814,80 plus setup of RHD extension to Operator's POP (on quote)
Centralised on-site RHD – 100 Gigabit Ethernet port	2.814,80
Centralised off-site RHD – 100 Gigabit Ethernet port	2.814,80 plus setup of RHD extension to Operator's POP (on quote)

### 6.2.1.4. Rush Order : One-off Fess for EtherConnect Services

Item	One-off fee (EUR excl. VAT)
Rush Order type 1 (within 2 - 5 Working Days)	2.000,-
Rush Order type 2 (within 6 – 10 Working Days)	1.500,-
Rush Order type 3 (within 11 - 15 Working Days)	1.000,-

### 6.2.1.5. Fault Repair : One-off Fess for EtherConnect Services

Item	One-off fee (EUR excl. VAT)
During business hours (8:00 – 17:00), fault in POST Technologies' Network	Free of charge
During business hours (8:00 – 17:00), fault in the Operator's Network	Invoiced per hour
Priority intervention Monday to Friday 7:00 – 19:00, Saturday 8:00 – 12:00, fault in POST Technologies' or the Operator's Network	Invoiced per hour Min. 250,- EUR per intervention <sup>*)</sup>
Priority intervention Monday to Friday 19:00 – 7:00, Saturday 0:00 – 8:00 and 12:00 – 24:00, Sundays and public holidays, fault in POST Technologies' Network or the Operator's Network	Invoiced per hour Min. 500,- EUR per intervention <sup>*)</sup>

<sup>\*)</sup> Minimum charge will not apply if the Operator has chosen the Business or Premium Service Level for its EtherConnect Service

### 6.2.1.6. Service Level : One-off Fess for EtherConnect Services

Item	One-off fee (EUR excl. VAT)
Activation of Business or Premium Service level	Free of charge

### 6.2.1.7. Labour Costs

The currently applicable hourly rates related to labour costs are available on POST Technologies' Website.

## 6.2.2. Recurring Fees for EtherConnect Services

*Minimum contract period for each EtherConnect Service: 6 months*

### 6.2.2.1. Connectivity : Recurring Fees for EtherConnect Services

Item	Monthly Fee (EUR excl. VAT)
Monthly fee for EtherConnect Services:	
EtherConnect EC 2	177,19
EtherConnect EC 5	210,77
EtherConnect EC 10	235,94
EtherConnect EC 30	235,94
EtherConnect EC 50	266,73
EtherConnect EC 100	305,22
EtherConnect EC 200	522,22
EtherConnect EC 500	808,50
EtherConnect EC 1000	1.025,67
EtherConnect EC Backup 2-100	173,50
EtherConnect EC Backup 200-1000	367,09
Failover Option for EtherConnect Service	20,-

### 6.2.2.2. CIR Component : Recurring Fees for EtherConnect Services

Item	Monthly Fee (EUR excl. VAT)
CIR traffic Priority Bit 7 (per DSLAM/OLT)	13,17 / Mbps
CIR traffic Priority Bit 6 (per DSLAM/OLT)	12,44 / Mbps
CIR traffic Priority Bit 5 (per DSLAM/OLT)	11,71 / Mbps
CIR traffic Priority Bit 4 (per DSLAM/OLT)	10,98 / Mbps
CIR traffic Priority Bit 3 (per DSLAM/OLT)	10,24 / Mbps
CIR traffic Priority Bit 2 (per DSLAM/OLT)	9,51 / Mbps
CIR traffic Priority Bit 1 (per DSLAM/OLT)	8,78 / Mbps
CIR traffic Priority Bit 0 (per DSLAM/OLT)	6,59 / Mbps

### 6.2.2.3. RHD Component : Recurring Fees for EtherConnect Services

Item	Monthly Fee (EUR excl. VAT)
Centralised on-site RHD – 10Gigabit Ethernet port	498,-
Centralised off-site RHD – 10Gigabit Ethernet port	498,- plus RHD extension to Operator's POP (on quote)
Centralised on-site RHD – 100 Gigabit Ethernet port	3.252,20
Centralised off-site RHD – 100 Gigabit Ethernet port	3.252,20 plus RHD extension to Operator's POP (on quote)
EIR traffic (Excess traffic / 95 <sup>th</sup> percentile billing)	6,59 / Mbps

### 6.2.2.4. Service Level : Recurring Fees for EtherConnect Services

Item	One-off fee (EUR excl. VAT)
Business Service Level on an EtherConnect Service EC 2 – EC 30	49,-
Premium Service Level on an EtherConnect Service EC 2 – EC 30	99,-
Business Service Level on an EtherConnect Service EC 50 – EC 200	99,-
Premium Service Level on an EtherConnect Service EC 50 – EC 200	199,-
Business Service Level on an EtherConnect Service EC 500 – EC 1000	199,-
Premium Service Level on an EtherConnect Service EC 500 – EC 1000	299,-
Business Service Level on an EtherConnect Backup Service	Same as primary EC *)
Premium Service Level on an EtherConnect Backup Service	Same as primary EC *)

\*) EtherConnect Backup Service must be purchased with the same Service Level as associated primary EtherConnect Service