

CONSULTATION

Appropriate approach for the implementation of LLU in the Kingdom of Bahrain

Appropriate approach for the implementation of Local Loop Unbundling (LLU) in the Kingdom of Bahrain

A Consultation document issued by the Telecommunications Regulatory Authority of the Kingdom of Bahrain

26 March 2009

Request for comments:

The Telecommunications Regulatory Authority ("TRA") invites comments on this consultation document from all interested parties. Comments should be submitted by 4 pm on 7 May 2009.

Responses should be sent to TRA for the attention of the General Director preferably by e-mail (or by post) to:

The General Director
consult@tra.org.bh
Telecommunications Regulatory Authority
P.O. Box 10353, Manama, Kingdom of Bahrain
+973 1753 2125

Purpose: To consult on TRA's proposed approach for the implementation of Local Loop Unbundling (LLU) in the Kingdom of Bahrain



CONSULTATION

Appropriate approach for the implementation of LLU in the Kingdom of Bahrain

Table of contents

TABLE OF CONTENTS	2
LIST OF ACRONYMS	5
1 INTRODUCTION	6
2 DESCRIPTION OF LOCAL LOOP UNBUNDLING	8
2.1 DEFINITIONS AND RATIONALE FOR LLU	8
2.2 DESCRIPTION OF THE FULL LLU PRODUCT.....	10
2.3 DESCRIPTION OF THE LINE SHARING PRODUCT	11
2.4 DESCRIPTION OF SUB LOOP UNBUNDLING.....	12
2.5 DESCRIPTION OF KEY ANCILLARY SERVICES TO LLU	14
2.6 DESCRIPTION OF ACTIONS TO BE COMPLETED BY OLOS.....	18
3 DEFINING THE SCOPE OF LLU THAT WOULD BE APPROPRIATE TO BAHRAIN	20
3.1 SHOULD BOTH FULL LLU AND LS BE IMPLEMENTED OR ONLY ONE OF THESE PRODUCTS?.....	20
3.2 IS SLU SUITABLE FOR BAHRAIN AT THIS POINT IN TIME?	21
3.3 SHOULD LLU BE ALLOWED ONLY FOR ACTIVE LINES?.....	22
4 CAPACITY BUILDING OF THE INDUSTRY PRIOR TO LLU IMPLEMENTATION	24
4.1 INTRODUCTION	24
4.2 PROVISION OF LLU-RELATED GENERAL INFORMATION PRIOR TO THE AVAILABILITY OF BATELCO'S LLU OFFER ON REQUEST AND SUBJECT TO A CONFIDENTIALITY AGREEMENT SIGNED BY THE OLO	24
4.3 LLU FIELD TEST EXPERIMENTATIONS	25
4.4 CAPACITY BUILDING WORKSHOPS.....	28
5 SELECTING THE PRINCIPLES FOR SETTING LLU RATES ON AN INTERIM BASIS	30
5.1 INTRODUCTION	30
5.2 PRICING BASIC LLU SERVICES	30
5.3 PRICING LLU ANCILLARY SERVICES	31
6 ANTICIPATING THE MAIN OPERATIONAL ISSUES THAT COULD OCCUR DURING THE INITIAL LLU IMPLEMENTATION PHASE	33
6.1 INTRODUCTION	33
6.2 THE PRINCIPLE OF NON-DISCRIMINATION	33
6.3 ANCILLARY SERVICE #1: PROVISIONING OF LLU-RELATED SPECIFIC INFORMATION	34
6.4 ANCILLARY SERVICE #2: PROVISIONING OF LLU BACKHAUL.....	35
6.5 ANCILLARY SERVICE #3: PROVISIONING OF COLLOCATION	36
6.6 RELATIONSHIPS BETWEEN END-USERS, OLOS AND BATELCO	39
6.7 ACCESS NETWORK FREQUENCY PLAN (ANFP)	39
6.8 BULK MIGRATION	40
6.9 FORECASTS.....	40
6.10 SERVICE LEVEL AGREEMENTS (SLAs)	41
7 MONITORING THE DEVELOPMENT OF LLU	44
7.1 INTRODUCTION	44
7.2 PUBLICATION OF KEY PERFORMANCE INDICATORS (KPIs)	44
7.3 PUBLICATION OF A LLU SCORECARD	45
7.4 CREATION OF WORKING GROUPS HOSTED BY TRA	45
8 OPERATIONAL OR STRUCTURAL SEPARATION OF THE LOCAL LOOP	46
9 KEY MILESTONES OF THE LLU IMPLEMENTATION PHASE	47

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

CONSOLIDATED LIST OF QUESTIONS:.....	49
ANNEX 1:	53

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Instructions for submitting a response

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The General Director
consult@tra.org.bh
Telecommunications Regulatory Authority
P.O. Box 10353, Manama, Kingdom of Bahrain
+973 1753 2125

Responses should include:

- the title printed on the envelop or subject of the sent email should be “LLU Consultation”,
- the name of the company/institution/association, etc.,
- the name of the principal contact person, and
- full contact details (physical address, telephone number, fax number and e-mail address),
- in the case of responses from individual consumers, name and contact details.

In the interest of transparency, TRA intends to make all submissions received available to the public, subject to the confidentiality of the information received. TRA will evaluate requests for confidentiality in line with relevant legal provisions and TRA’s published guidance on the treatment of confidential and non-confidential information.¹

Respondents are required to mark clearly any information included in their submission that is considered confidential. Where such confidential information is included, respondents are required to provide both a **confidential** and a **non-confidential** version of their submission. If a part or a whole submission is marked confidential, reasons must be provided. TRA may publish or refrain from publishing any document or submission at its sole discretion.

Once TRA has received and considered responses to this consultative document, TRA will issue a final version of this document, together with the report on the consultation.

¹ TRA, A Guidance Paper Issued by the Telecommunications Regulatory Authority on its treatment of Confidential and Non-confidential Information, Guidance Paper No. 2 of 2007.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

List of Acronyms

ANFP	Access Network Frequency Plan
ARCEP	Autorité de Régulation des Communications Electroniques et de la Poste (French telecommunications regulator).
DSL	Digital Subscriber Line
DSLAM	Digital Subscriber Line Access Multiplexer
ERG	European Regulators Group
EU	European Union
EU27	The 27 countries of the European Union
FWA	Fixed Wireless Access
HDF	Handover Distribution Frame
KPI	Key Performance Indicator
LS	Line Sharing
LLU	Local Loop Unbundling
MDF	Main Distribution Frame
MSAN	Multi-Service Access Node
NRA	National Regulatory Authority
ODF	Optical Distribution Frame
OLO	Other Licensed Operators
Ofcom	Office of Communications (UK telecommunications regulator)
Oftel	Office of Telecommunications (UK) superseded by Ofcom
RO	Reference (Access) Offer
RUO	Reference Unbundling Offer
SLA	Service Level Agreement
SLU	Sub Loop Unbundling
TRA	Telecommunications Regulatory Authority of the Kingdom of Bahrain
UK	United Kingdom

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

1 Introduction

1. This document sets out the proposed approach for the implementation of Local Loop Unbundling (“LLU”) in the Kingdom of Bahrain.
2. LLU is a process by which copper local loops are connected to Other Licensed Operator (“OLO”)’s networks and are used for their own broadband (e.g. double play services such as Internet and Voice, or triple play services such as Internet, Voice and Television) and other connectivity services. LLU can also be used to provide fixed telephony services only, although in practice it is used primarily to provide broadband and connectivity services.
3. On 28 February 2008, TRA published a report on the Strategic and Retail Market Review (“SRMR”), which detailed a set of regulatory measures designed to further promote competition in the Kingdom of Bahrain and support the implementation of the second National Telecommunications Plan. One of the measures envisaged in the SRMR was the unbundling of local loop based on the following rationale: “TRA considers that LLU can be an essential enabler of further competition at the retail level, especially for the provision of broadband and connectivity services to business users. LLU can be expected to put pressure on prices and to increase product differentiation for the benefits of users. LLU will be an additional wholesale product, not a replacement for any existing products (e.g. Bitstream)”².
4. TRA has issued a Draft Determination on Wholesale Broadband Markets (“the Draft Dominance Determination”)³, wherein TRA proposes to determine Bahrain Telecommunications Company B.S.C. (“Batelco”) as a dominant operator in the “Wholesale Physical Network Infrastructure Access Market” and the “Wholesale Broadband Access Market”. Consequently, Batelco is required to provide LLU as an Access Obligation under the “Draft Order relating to Unbundling Local Loop, Bitstream and Wholesale DSL”⁴ and to publish the relevant terms, conditions and tariffs in its Reference Offer (“RO”).
5. This consultation document is structured as follows:
 - Section 2 describes the LLU product;
 - Section 3 defines the scope of LLU deemed appropriate to Bahrain;

² See: TRA, “Statement on the strategic and retail market review”, 3 June 2008 (Ref: MCD/0508/046), Page 5 & 6.

³ TRA, Draft Dominance Determination in Wholesale Broadband Markets, March 2009

⁴ TRA, Draft Order relating Unbundling Local Loop, Bitstream and Wholesale DSL, March 2009

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

- Section 4 outlines the different capacity building actions necessary to facilitate the adoption and uptake of LLU by market players;
 - Section 5 discusses the principles used for setting LLU prices on a transitory basis;
 - Section 6 identifies the main operational issues that could occur with the implementation of LLU, drawing on LLU experience in other countries, and proposes options to mitigate these prior to the implementation of LLU;
 - Section 7 describes the actions TRA will undertake to monitor the development of LLU; and
 - Section 8 discusses the relevance of operational or structural separation of the local loop in the Kingdom of Bahrain in the context of LLU.
6. In developing this approach, TRA has considered approaches followed by other regulators and has taken into account the specific characteristics of the local market, including the relative size of Bahrain's telecommunications sector. In doing so, TRA has sought to ensure that this approach is consistent with international best practices and does not impose a disproportionate burden on any of the parties involved.
7. The findings of this public consultation will provide guidance for the drafting of the relevant parts of the Access Order⁵ and of Batelco's LLU RO, which Batelco will have to submit to TRA for approval pursuant to the Access Regulation⁶.

⁵ TRA, Draft Order relating Unbundling Local Loop, Bitstream and Wholesale DSL, March 2009

⁶ TRA, "Access regulation", 30 April 2005 (Ref: ERU/0405/078)

CONSULTATION

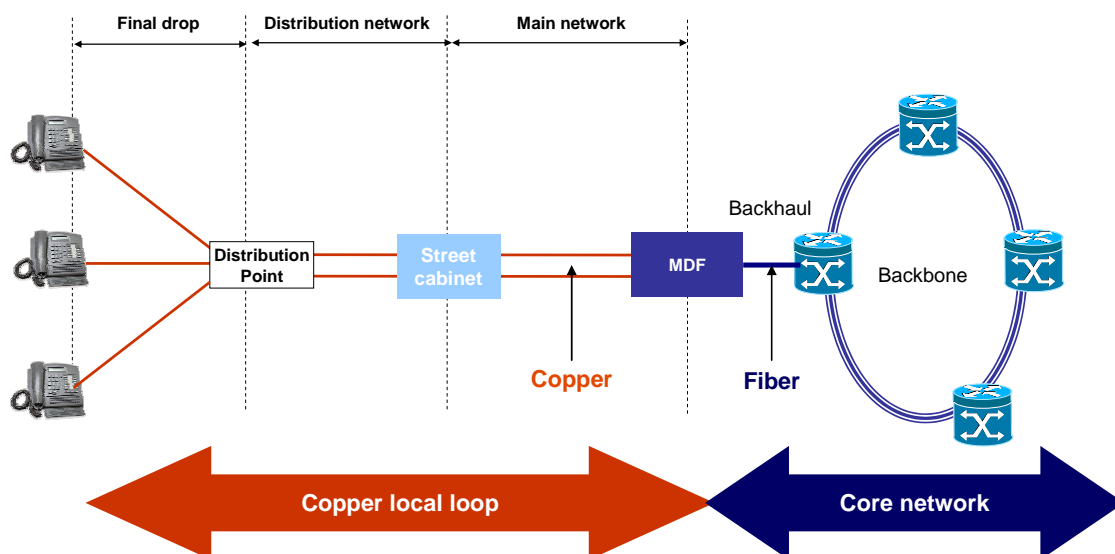
Appropriate approach for implementation of LLU in the Kingdom of Bahrain

2 Description of Local Loop Unbundling

2.1 Definitions and rationale for LLU

8. The local loop is the “last mile” of an operator’s fixed telecommunication network. It forms part of the access network that connects the customer’s premises to the operator’s core network. In the European “Access Directive”⁷, the local loop is defined as “the physical circuit connecting the network termination point at the subscriber’s premises to the main distribution frame or equivalent facility in the fixed public telephone network.”
9. Pursuant to the Draft Determination on Dominance in Wholesale Broadband Markets⁸, this consultation on the appropriate approach for the implementation of LLU in the Kingdom of Bahrain is concerned only with the copper local loop. The copper local loop is only made of passive equipment: copper, boxes, chambers, frames (like the distribution point or the street cabinet), etc. It is deployed either underground in trenches or overhead on poles.

Figure 1 - Scope of the copper local loop and of the core network and associated terms



10. LLU is a process by which the incumbent’s local loop is physically connected to an OLO’s exchange equipment (including but not limited to the Digital Subscriber Line Access Multiplexer/Multiservice Access Node,

⁷ Directive 2002/19/EC of the European Parliament and of the Council of 7 March 2002 on access to, and interconnection of, electronic communications networks and associated facilities (Access Directive), Page 5, Section (e).

⁸ TRA, Draft Dominance Determination in Wholesale Broadband Markets, March 2009

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

“DSLAM/MSAN”) so that the OLO gains access to customer premises and provides communication services such as broadband services using the Digital Subscriber Line (“DSL”) technology. The local loop remains the property of the incumbent, but in return for the rent paid the incumbent is expected to ensure maintenance of the local loop.

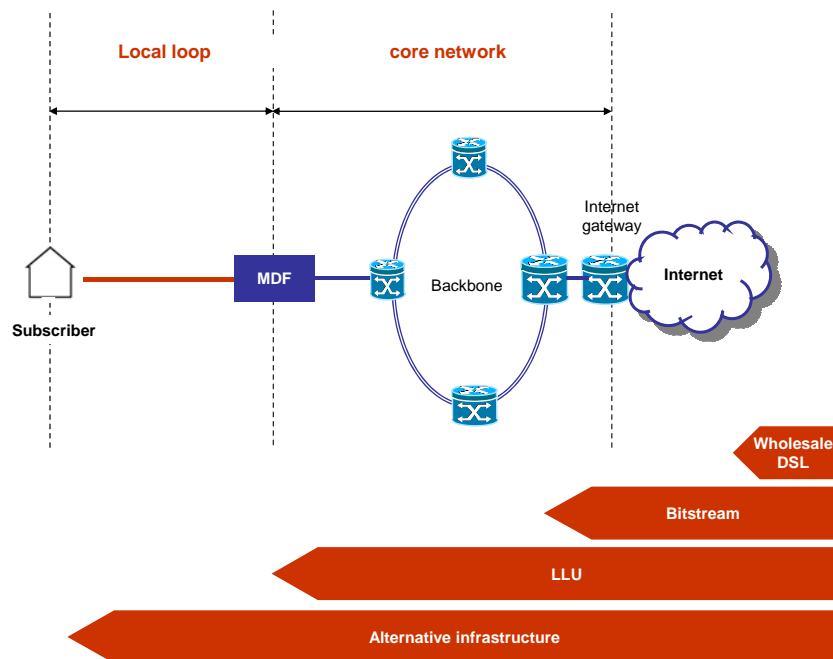
11. LLU is a wholesale product provided by the incumbent. Since the local loop connects most buildings in a given country, it is economically very difficult for it to be replicated by OLOs. As a consequence, LLU has been introduced in many countries to allow OLOs to compete with the incumbent especially for the provision of broadband services without having to deploy their own copper local loop. As discussed in Section 5 of the present consultation, the setting of LLU prices is a major issue in the implementation of LLU.
12. LLU is traditionally considered to be near the top of the investment ladder for broadband and connectivity services⁹ while Bitstream access and Wholesale DSL (resale) products are closer to the bottom. Unlike the Wholesale DSL or the Bitstream access products that require rather low levels of investment and network deployment, LLU requires OLOs to deploy their own network up to each Service Node/Main Distribution Frame (“MDF”) that serves the customers they wish to address. Compared to the Wholesale DSL or the Bitstream products, LLU allows OLOs to differentiate their product from broadband and connectivity products sold by the incumbent. More specifically:
 - retail products sold on the basis of the Wholesale DSL product have exactly the same features as the products of the incumbent;
 - retail products sold on the basis of the Bitstream product are managed by the incumbent’s exchange equipment, namely the DSLAM/MSAN, which means that they have very similar features as the ones of the incumbent;
 - with LLU, the retail products sold by OLOs use the OLO’s own exchange equipment (including but not limited to DSLAM/MSAN), which means that the products can be differentiated from the incumbent’s retail products. In fact, LLU has enabled OLOs in many European countries to innovate by proposing triple play services (i.e. voice, broadband Internet and television) – in some cases even before the incumbent.

⁹ LLU also allows OLOs to offer fixed telephony services although overseas experience tends to show that OLOs use LLU primarily to provide broadband (e.g. double play services such as Internet and Voice, or triple play services such as Internet, Voice and Television) and connectivity services.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Figure 2 - Relative level of network investment required by OLOs with LLU, Bitstream and Wholesale DSL



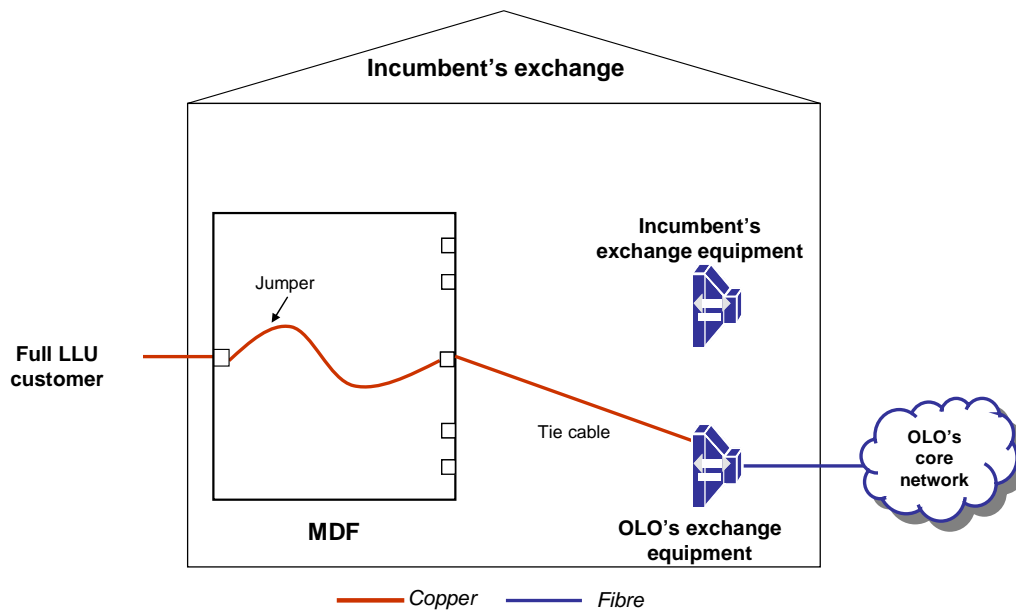
2.2 Description of the full LLU product

13. Two types of LLU products are generally offered by incumbents and implemented through their Reference Offer: full LLU and Line Sharing (“LS”).
14. With full LLU, the incumbent provides OLOs access to the full spectrum of the copper pair. This means that end-users are not connected anymore to the incumbent’s core network and that only OLOs are offering services and connectivity: voice and broadband services are fully managed by the OLO. In addition to that, the end-user is not paying any charge related to the copper local loop to the incumbent (e.g. he/she is no longer required to pay for the retail monthly rental charge to the incumbent).
15. The provision of the full LLU product by the incumbent to OLOs is performed through:
 - the disconnection of the end-user copper line from the incumbent’s network;
 - the installation of a tie cable and a jumper that will ensure connectivity between the end-user copper line and the OLO’s equipment installed close to the MDF.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Figure 3 - Provision of the full LLU product at the MDF level



2.3 Description of the line sharing product

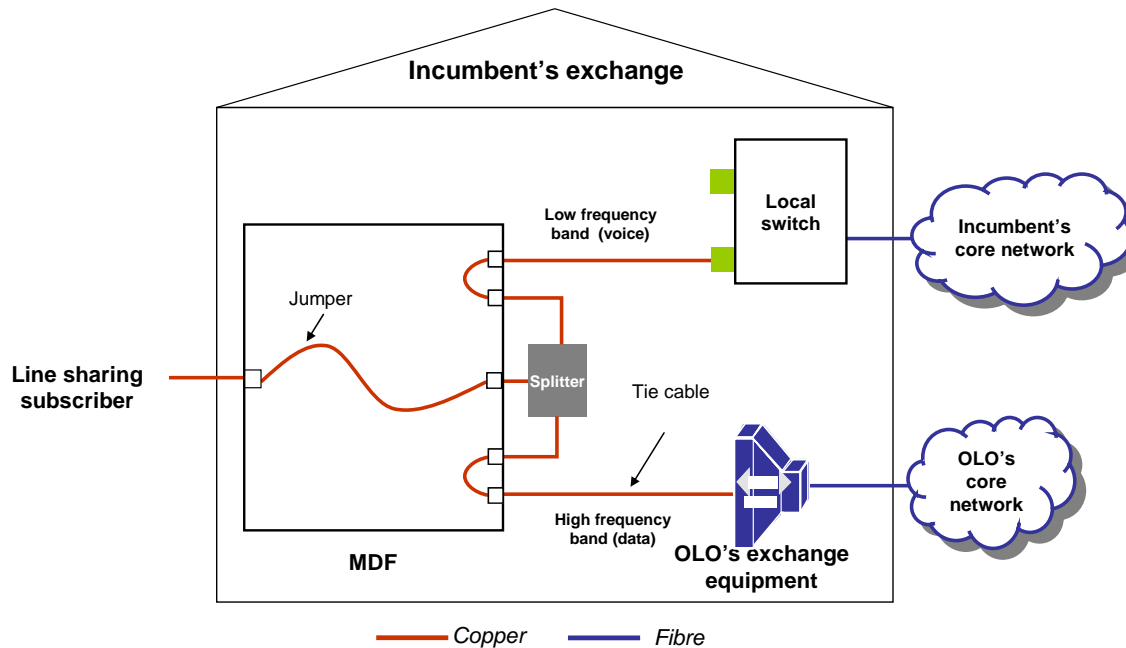
16. With Line Sharing (“LS”), also called “shared access”, the incumbent provides OLOs access to the non-voice band frequency spectrum of the copper pair. This means that end-users are connected to both the incumbent’s network for the provision of narrowband phone services (in general voice services) and to the OLO’s network for the provision of broadband services (broadband Internet access, voice over broadband, etc.). The end-user retains a commercial relationship with the incumbent for the provision of the narrowband services (the incumbent charges the PSTN monthly rental charge to the end-user and the end-user’s phone number remains attached to the incumbent’s voice service). However, for the provision of broadband services, the commercial and technical relationship with the end-user is managed only by the OLO.
17. The provision of the LS product by the incumbent to the OLO is performed through:
 - the installation of a splitter at the MDF (either using MDF blocks that include splitters, using specific frames supporting splitters or using splitters installed on the OLO’s DSLAM);
 - the installation of a tie cable (including the corresponding Hand Over Distribution Frame) and jumpers that will ensure the connectivity between the end-user copper line, the splitter and the incumbent’s PSTN network on the one

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

hand and the end-user copper line, the splitter and the OLO's network on the other hand.

Figure 4 - Provision of the LS product at the MDF level (for illustrative purposes with the configuration where the splitter is installed in a MDF block)



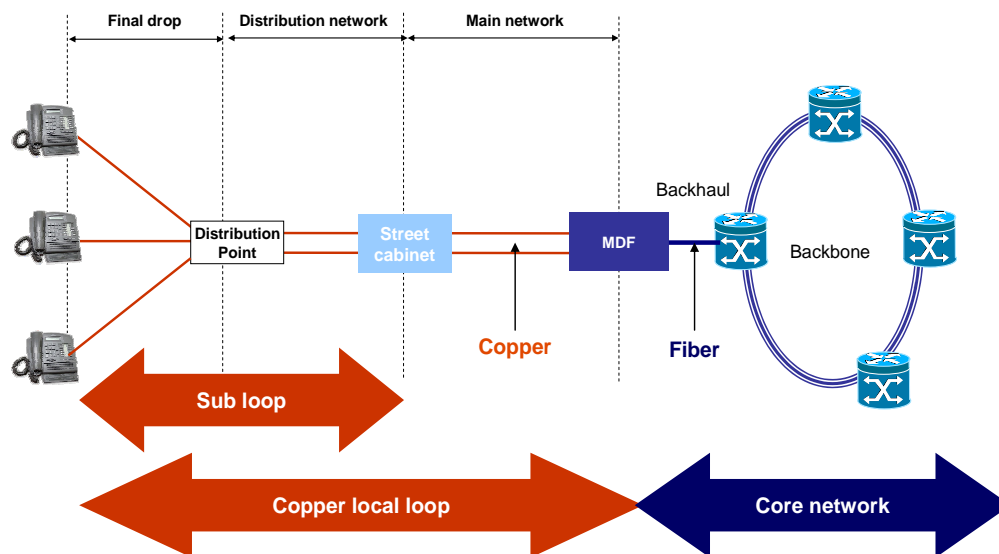
2.4 Description of Sub Loop Unbundling

18. Sub-Loop Unbundling ("SLU") is a form of unbundling of the copper local loop by which OLOs do not rent the whole local loop but only the part of the local loop that extends between the customer premises and the street cabinet of the incumbent. The demarcation point between the incumbent's network and the OLO's network is the street cabinet and not the MDF as is the case for full or LS LLU.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Figure 5 - Scope of the sub loop

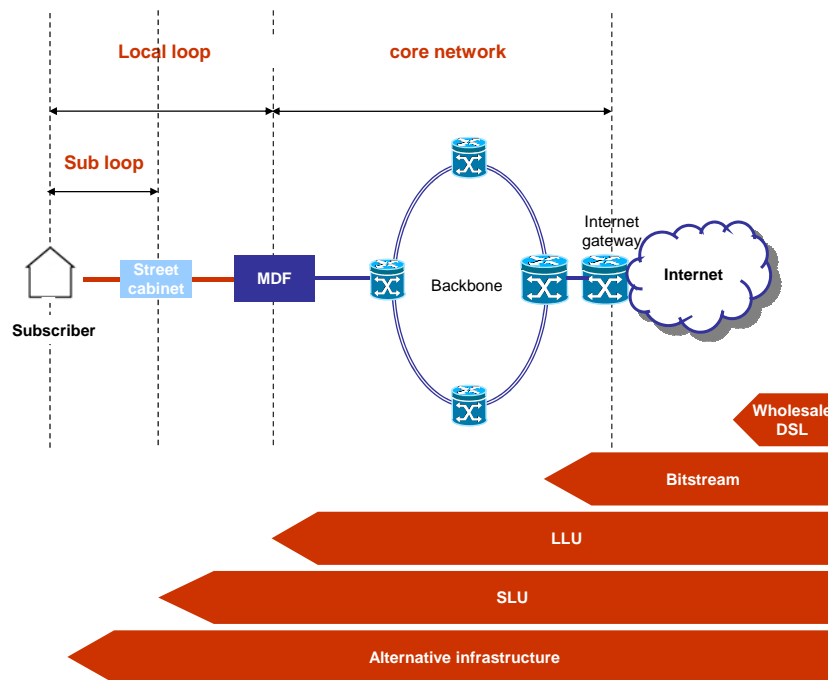


19. The objective of SLU is to shorten the distance between the customer premises and the OLO's equipment. The performances of DSL technologies are sensitive to distances: the shorter the distance between end-users and OLO equipment is, the higher the performances of DSL (e.g. download speed).
20. SLU requires OLOs to install their equipment very close to the street cabinet of the incumbent. SLU requires OLOs to install equipment in more locations and to deploy more extensive backhaul solutions than LLU, and therefore, compared to LLU, SLU stands higher in the investment ladder.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Figure 6 - Relative level of network investment required by OLOs with SLU, LLU, Bitstream and Wholesale DSL



21. As with LLU, two SLU products could be envisaged: a Line Sharing SLU product and a full SLU product.

2.5 Description of key ancillary services to LLU

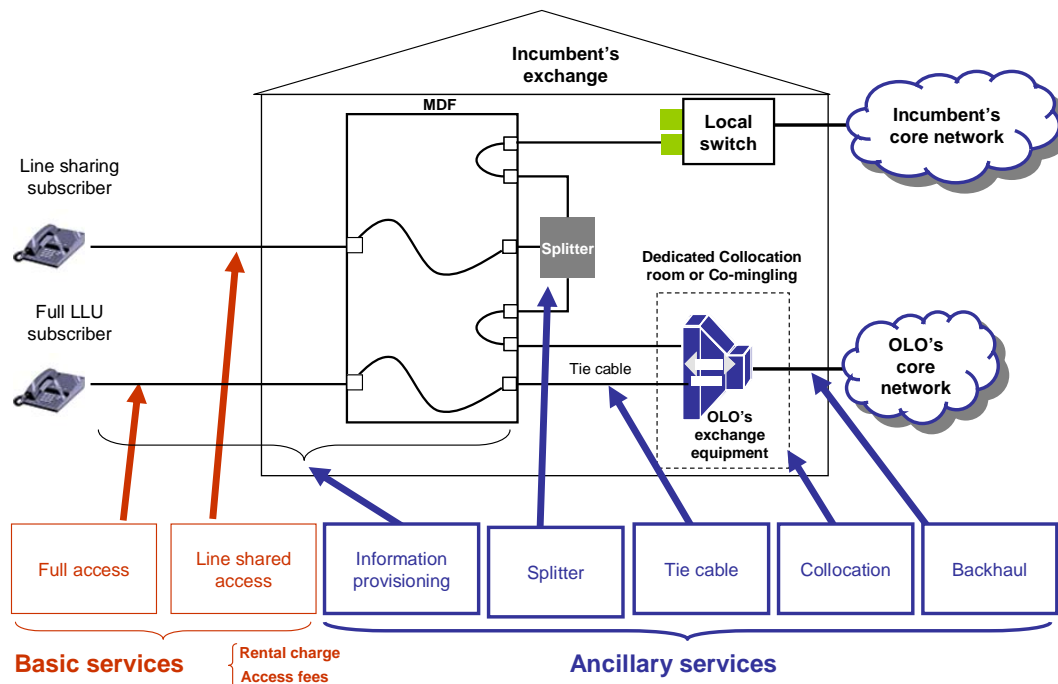
22. For the incumbent, LLU is the provision of local loop access to OLOs. However, to ensure end-to-end connectivity and the effectiveness of LLU between end-users and OLOs, the incumbent has to provide a set of services on top of the basic LLU service. These key additional services are called ancillary services which can be categorised as:
 - i. The provision of information about its local loops;
 - ii. The installation of tie cables between the MDF and the OLO's equipment;
 - iii. In the case of LS, the installation of a splitter;
 - iv. The provision of collocation space (including the Hand over Distribution Frame) inside the MDF site by the incumbent to the OLOs;
 - v. The provision of a backhaul solution between the OLO's equipment installed inside the MDF site and the OLO's Point of Presence located outside the MDF site.

These ancillary services are described in more detail below.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Figure 7 - List of basic and ancillary services to be provided by the incumbent to OLOs



23. In order for the OLOs to decide which MDFs they wish to unbundle, to plan their business and network, and to acquire a deeper knowledge of the local loop, OLOs need to get sufficiently detailed information about the incumbent's local loop. Typically, in countries where LLU has been implemented, the incumbent provides at least information about the location of MDFs, the coverage of MDFs, the capacity of MDFs, the quality and features of copper lines, etc. Some of this information is free of charge and publicly available (like the number of MDFs and their capacity) and some is confidential (See section 6.3 for further details).
24. To ensure connectivity between the OLO's equipment and the MDF, the incumbent has to install a tie cable between the MDF and the OLO's equipment. Since access to the MDF is in general restricted to the incumbent, the tie cable can only be installed by the incumbent. The provision of tie cables can either be said to be "external" if the OLO's equipment is not located inside the MDF site or "internal" if the OLO's equipment is located inside the MDF site.
25. In the case of LS, a splitter is required. Depending on the configuration chosen, the splitter can either be provided by the incumbent or by OLOs (since a lot of new generation equipment and DSLAMs are equipped with internal splitters).
26. As explained above, the DSL technology used by OLOs in the context of LLU is sensitive to the distance between the equipment and end-users. As a consequence, OLOs need to install their equipment as close as possible to the end-users, namely, in the case of LLU, as close as possible to the

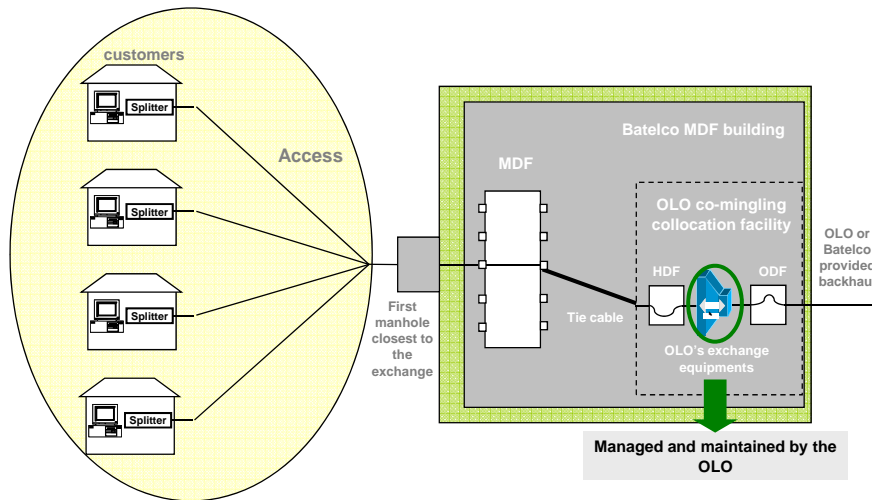
CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

MDF. This is why the incumbent is usually requested to provide collocation space to OLOs in its MDF sites wherever space is available. There are several forms of collocation that can be envisaged depending on the specific setup of the MDF site:

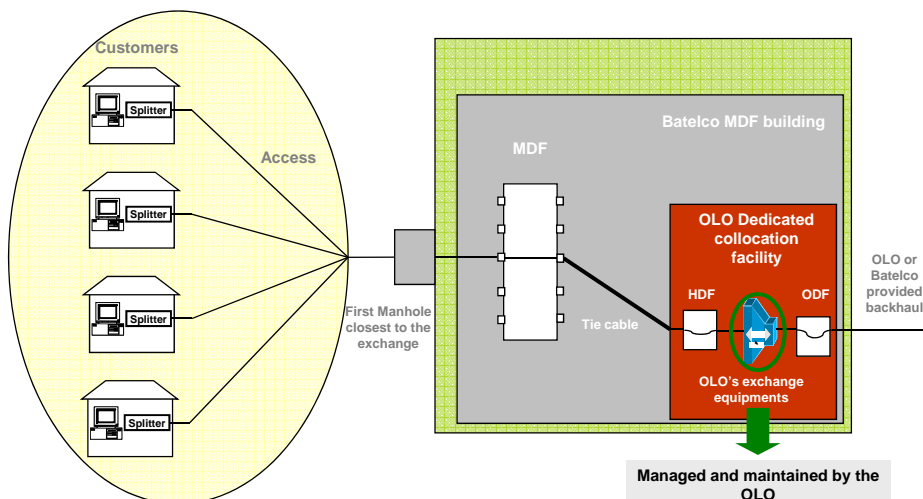
- i. The provision of space in the same room as the incumbent's equipment: this is called **co-mingling**;

Figure 8 - Provision of a co-mingling to OLOs



- ii. The provision of space in a room dedicated to LLU: this is called **dedicated collocation**; and

Figure 9 - Provision of a dedicated room to OLOs

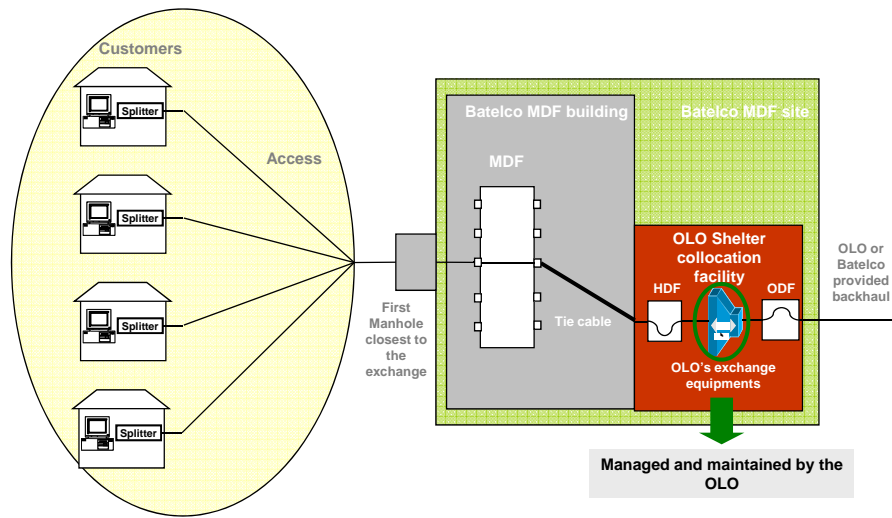


- iii. The provision of space outside the MDF building but inside the incumbent's property in a shelter: this is called **shelter collocation**.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

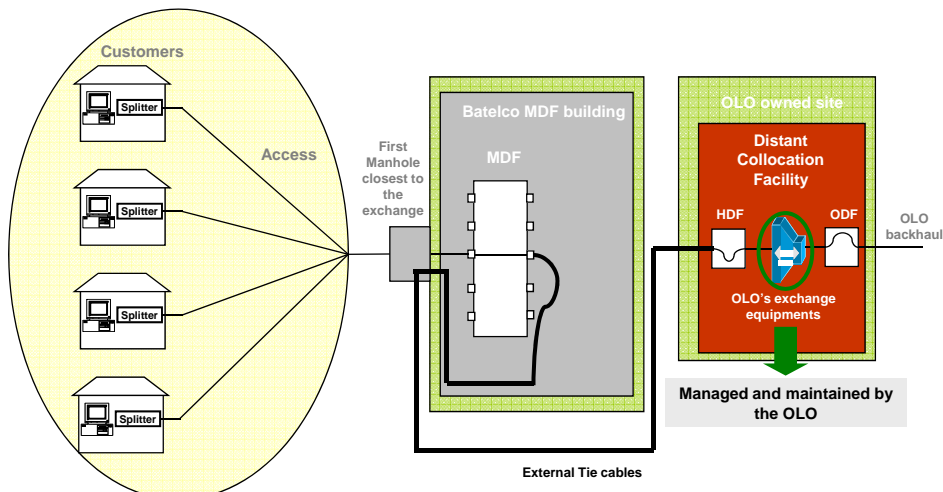
Figure 10 - Provision of a shelter by the incumbent to OLOs



27. Two other forms of collocation are sometimes envisaged but very rarely used in countries where LLU has been implemented:

- i. **Distant collocation** where the OLO deploys its equipment in its own premises located very close to the incumbent's MDF. An "external" tie cable connects the OLO's equipment to the MDF and passes through the first manhole closest to the exchange of the MDF site.

Figure 11 - Distant collocation

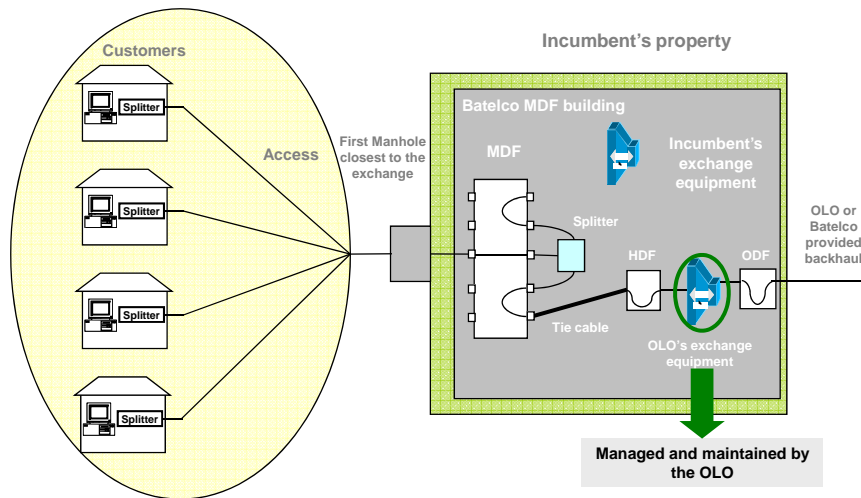


- ii. **Virtual collocation** where the equipment of the OLOs is installed inside the MDF site but maintained by the incumbent.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Figure 12 - Virtual collocation



28. The incumbent's provisioning of collocation space is also accompanied by the provision of: maintenance of space; access to power; OLO access to the allocated collocation space; an Optic Distribution Frame ("ODF") on which one extremity of the backhaul to the OLO's core network, in case the backhaul is provided by the incumbent, is installed; and a Hand Over Distribution Frame ("HDF") to which the tie cables are attached.
29. The last type of service to be provided by the incumbent is a backhaul service. The backhaul service enables OLOs to connect their equipment, installed inside the MDF site of the incumbent, to an OLO's point of presence. Since one extremity of the backhaul is located inside the MDF site, the incumbent needs to provide a backhaul service option, e.g., through a leased line type of offer. However, backhaul can also be deployed by the OLO itself by pulling fibre from the MDF site to its point of presence with the assistance of the incumbent for the part of the backhaul that has to be deployed inside the incumbent's property. Typically, the deployment of backhaul by OLOs is not economically viable in all MDF sites.

2.6 Description of actions to be completed by OLOs

30. While it is required that the incumbent provides the aforementioned ancillary services to OLOs to make LLU effective, OLOs have to carry out a certain number of tasks in order to offer services based on LLU, including:
- Identify the MDFs where they want to deploy their equipment;
 - Ask the incumbent for space in these MDFs for collocation (or find a site close to the MDF);
 - Buy, install and maintain equipment;
 - Connect the equipment through a backhaul service to their core network;

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

- v. Install sufficient servers and capabilities in the core network for the provision of DSL services to end-users;
- vi. Buy iInternet connectivity when appropriate;
- vii. Plan for and request the incumbent to deploy tie cables between the MDF and the HDF;
- viii. Market services to customers;
- ix. Receive orders from customers;
- x. Request the incumbent to provision the local loop access for its customers;
- xi. Provide and install appropriate customer premise equipment (modem, splitters, etc.) at the customer premises;
- xii. Maintain the end-to-end connectivity.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

3 Defining the scope of LLU that would be appropriate to Bahrain

3.1 Should both full LLU and LS be implemented or only one of these products?

31. Full LLU and LS are similar wholesale products. However, LS appears *a priori* to be more complex to implement than full LLU. Since it requires the use of splitters, LS requires the end-user to maintain a contractual relationship with the incumbent and to establish a new contractual relationship with the serving OLO.
32. In almost all European countries, both full LLU and LS products are offered by the incumbent. However, having considered the factors below, TRA is of the view that only full LLU should be implemented.

Simplicity and benefits to end-users

33. While some end-users may prefer keeping a commercial link with the incumbent for the provision of voice services, TRA notices that, with the development of mobile telephony and FWA offers, a number of end-users have no commercial relationship with Batelco as a fixed operator. Also, when fixed number portability is implemented, which is planned by TRA for 2009, full LLU will allow end-users to use OLOs' voice service and keep their phone number. This will not be possible with LS (the former phone number will remain dedicated to Batelco's voice service). TRA is of the view that keeping the same phone number is valuable for end-users, especially for business users.

OLOs' point of view

34. Though some OLOs may wish to only provide internet access, interviews held by TRA in November 2008 with respect to LLU indicated that OLOs wish to provide multi-play services including voice services and to avoid the existence of a mandatory commercial relationship between their broadband users and Batelco.

Operational implementation

35. TRA is of the view that having two LLU wholesale products will complicate the implementation for both Batelco and OLOs. While the LS product is similar to the full LLU product, TRA anticipates that the involvement of the incumbent in the customer relationship may create difficulties. Further, LS requires separating narrowband and broadband signals through the installation of splitters and other jumpers at the MDF and this may increase the risk of MDF congestion.
36. TRA finally notes that in the context of Batelco's NGN deployment, the provision of the LS product may become particularly difficult since the

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

voice services are no longer supported by the incumbent's PSTN network but by the incumbent's NGN network.

37. TRA therefore intends to focus the effort of the industry on the wholesale product which has the greatest potential and interest, i.e., full LLU.

International experience

38. In reviewing international experience with LLU implementation, TRA also notices that, while LS has been a stepping stone towards full LLU in some European countries like France, many countries like Germany, Italy, Denmark, Austria, Cyprus, Luxembourg, Portugal, and Finland, have preferred full LLU compared to LS. TRA also notes that in July 2008, in EU27, there was twice the number of full LLU lines compared to LS lines¹⁰. Furthermore, in countries in which LS uptake had been initially strong, these lines were being substituted by full LLU. Consequently, international experience does not indicate that LS is a prerequisite for LLU to be successful.

Pricing

39. The pricing of LS can be problematic when retail tariffs for fixed telephony services are not fully aligned with underlying cost. In this configuration, the LS rate may not be significantly different from the full LLU rate, and this would greatly reduce, if not eliminate, the attractiveness of LS.

Conclusion

40. For the reasons set out above, TRA is of the view that, in order to ensure the effective and smooth implementation of LLU, only Full LLU should be implemented for the time being.

Question 3.1:

Do you agree with TRA's proposition to implement only Full LLU for the time being? Please elaborate.

3.2 Is SLU suitable for Bahrain at this point in time?

41. Like LS, the suitability of SLU for Bahrain is questionable. TRA notices first that while SLU is available in European countries, there have been no significant commercial deployments of SLU in Europe to date, despite the launch of VDSL plans by some incumbents.

¹⁰ Communications Committee, Working Document, Subject: Broadband access in the EU: situation at 1 July 2008

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

42. Furthermore, OLO equipment has to be located inside street cabinets where air conditioning has to be made available and which makes the deployment much more difficult, especially in Bahrain due to local weather conditions. Finally, the provision of backhaul to the street cabinets may prove to be a disproportionate burden to be imposed.
43. Taking into consideration the advantages of SLU compared to LLU in terms of DSL performance and the questionable viability of SLU due to the limited economies of scale, TRA is of the view that the additional requirement to implement SLU would unnecessarily complicate the implementation of LLU at his point in time and offer very few benefits.
44. As a consequence, TRA is of the view not to implement SLU. However, this decision may be reviewed once LLU has been commercially implemented.

Question 3.2:

Do you agree with TRA's proposition not to implement SLU for the time being?

3.3 Should LLU be allowed only for active lines?

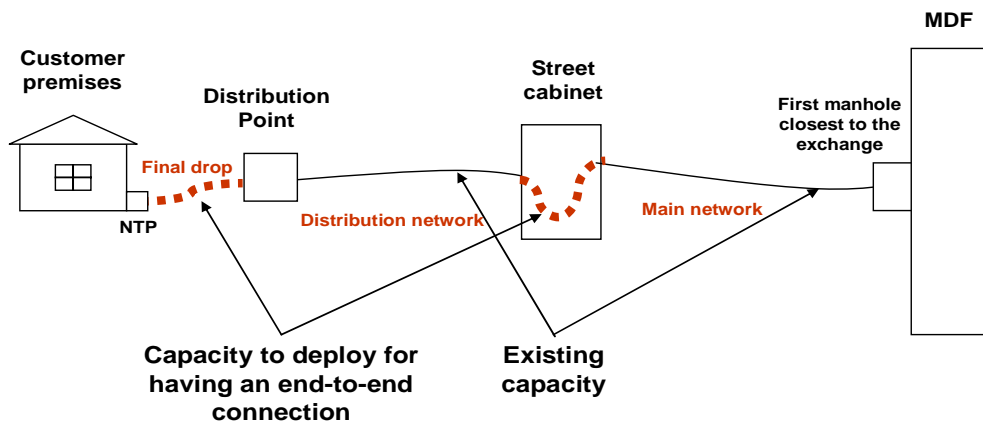
45. The provision of communications services by OLOs on the basis of LLU requires the existence of end-to-end physical connectivity from the customer premises to the equipment of the OLOs. This makes current active lines, i.e., where there is an existing metallic pair in the copper access network in use to provide services to the corresponding end-user, obvious candidates for LLU.
46. However, in many countries such as France, Ireland, the United Kingdom, Malta and Cyprus, not only active lines are allowed to be unbundled but also non-active lines for which there is capacity at both the main network level and the distribution level¹¹. If, for a given customer premises, there is a copper pair available between the closest distribution point and the corresponding street cabinet and there is a copper pair available between this street cabinet and the corresponding MDF, the only work in terms of infrastructure to be done by the incumbent to ensure end-to-end connectivity between the customer premises and the MDF is:
 - i. The deployment of a copper final drop between the customer premises and the distribution point;
 - ii. The installation of a jumper at the street cabinet level.

¹¹ The main network is the part of the local loop that stands between the street cabinet and the MDF. The distribution network is the part of the local loop that stands between the distribution point and the street cabinet.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Figure 13 - Part of the local loop where capacity is required to ensure end-to-end connectivity



47. TRA is of the view that, if capacity exists at the main network level and at the distribution network level, non-active lines should be allowed to be unbundled for the following reasons:
- The work required to ensure end-to-end connectivity is relatively minor;
 - It is needed to allow the provision of leased lines services by OLOs with HDSL and SDSL services that can require two pairs;
 - In countries where the fixed penetration rate is not saturated, it makes the size of the addressable market bigger;
 - The application of the non-discrimination principle requires allowing such lines to be unbundled since Batelco can use these lines for its retail activities.
48. TRA considers that Batelco's refusal to unbundle non-active lines could only be based on objective technical reasons which should be justified to both OLOs and TRA.
49. The scope of lines that might be unbundled shall therefore be active and non-active lines.

Question 3.3:

Do you agree with TRA's proposition that non-active lines for which there is capacity at the main network level and at the distribution level should be unbundled? Please elaborate.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

4 Capacity building of the industry prior to LLU implementation

4.1 Introduction

50. Capacity building activities are an essential ingredient to ensure the successful implementation of LLU.
51. TRA interviewed different stakeholders in November 2008 to assess their views and needs with respect to LLU. While OLOs expressed a real and sometimes precise interest in LLU, TRA identified a need to develop further the knowledge of the industry on LLU prior to its implementation. In order for the market to be “LLU-ready” and to facilitate a smooth and effective introduction of LLU, TRA proposes to undertake a number of specific actions. These actions are described below.

4.2 Provision of LLU-related general information prior to the availability of Batelco’s LLU offer on request and subject to a confidentiality agreement signed by the OLO

52. Having reviewed Reference Unbundling Offers in other jurisdictions which include information on the copper access network, TRA is of the view that some general information on Batelco’s copper access network should be made available free of charge to OLOs by Batelco as soon as possible after the issuance of the Order¹², on simple request and subject to a confidentiality agreement signed by the OLOs, if reasonably required by Batelco.
53. Based on information available on Batelco’s copper access network, TRA is of the view that LLU-related general information should be made available in advance of the Batelco LLU RO. This should include:

- i. The list of MDFs with their category of size in Bahrain, e.g.

Size	MDF
More than 10,000 working lines	MDF1, MDF5, MDF8
Between 7,500 and 10,000 working lines	MDF2, MDF7
...	...

- ii. The location of these MDFs on a map with their coverage area (except the ones for which, in accordance with TRA, valid national security reasons prevent their location being made public).

¹² TRA, Draft Order relating Unbundling Local Loop, Bitstream and Wholesale DSL, March 2009

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

The information on the size of MDFs is necessary because the attractiveness of LLU is sensitive to economies of scale/densities. The information on the location is necessary because LLU requires OLOs to deploy a backhaul that will connect targeted MDFs and to “map” the targeted customers and corresponding MDF.

54. This LLU-related general information shall form a part of the Reference Offer and shall be made available to OLOs on simple request, subject to a confidentiality agreement, where reasonably required by Batelco.

Question 4.1:

Do you agree with TRA’s proposition that the list of MDFs with their category of size and the location of these MDFs on a map (except the ones for which valid national security reasons prevent their location being made public) with their coverage area should be made available free of charge by Batelco on simple request subject to a confidentiality agreement signed by the OLO, where reasonably required by Batelco, as soon as possible after the issuance of the Order? Please elaborate.

4.3 LLU field test experimentations

55. Following its review of international practices related to LLU implementation, TRA notices that in order to facilitate the smooth implementation of LLU some NRAs undertook field test experimentations. For example, in France, ARCEP organized field test experimentations in 2000 that involved both the incumbent and OLOs, during which OLOs had the opportunity to install their own DSL equipment in 12 of France Telecom’s MDFs and to test the DSL technology and end-to-end connectivity with end-users. The lessons learned were discussed within a working group hosted by ARCEP and were used in the drafting process of the Reference Unbundling Offer.
56. TRA is of the view that substantial benefits from LLU field test experimentations can be expected for the incumbent, for OLOs as well as for TRA itself since they should enhance LLU knowledge for all parties, speed up the commercial launch of LLU to the benefit of end-users, enable the anticipation of operational issues and ease discussions between all parties involved.
57. More specifically, field test experimentations would enable the incumbent to build a dedicated LLU task force, to elaborate and refine the relevant provisions of the Reference Offer and the associated operational processes, to learn how to work with OLOs and to offer them LLU basic and ancillary services and to organize itself for an efficient provision of these LLU services.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

58. OLOs could take advantage of these trials to test their equipment, to get know-how about the incumbent's local loop and associated features, to learn how to work with the LLU task force of the incumbent, to adapt or refine their plans related to LLU, to test with real end-users their future commercial offers, to learn more about the processes associated with LLU (for the creation of lines, for the maintenance of lines, etc.) and to identify any potential issues with respect to LLU implementation.
59. Finally, these field test experimentations would allow TRA to get a better understanding of constraints with LLU implementation of both parties and if possible to contribute to solving a large number of issues before commercial launch as well as anticipate eventual blocking points.
60. As a consequence, TRA is of the view that the organisation of LLU field test experimentations will be a major step in LLU implementation.
61. LLU field tests should occur in mid-2009. TRA is of the view that LLU field tests should last for a minimum of 2 months. At the end of the field tests, appropriate provisions shall be made so that end-users, having participated in the test, can migrate back to their original setup prior to the LLU field test.
62. In preparation for these field tests, OLOs will have to contact manufacturers and vendors to select the appropriate equipment, to collect technical information, to be trained to understand the functioning of such selected equipment, to envisage suitable backhaul solutions for these tests to be deployed with the incumbent, and to select some end-users to complete these tests.
63. TRA is of the view that in order to have a productive field test, there should be a minimum and maximum number of end-users involved in the participating OLO's test. The maximum number of end-users as well as the minimum number of end-users shall be the same for all participating OLOs and shall be defined on the basis of answers to this consultation as seen appropriate by TRA for this test.

Site selection

64. Given the number of service nodes in Bahrain, TRA is of the view that these field tests should take place in two of Batelco's Service Node sites. Since TRA foresees collocation as one of the ancillary services that can generate a large number of operational issues, TRA proposes that the two most normally requested collocation options based on international experience be considered during these trials: the co-mingling option and the dedicated room option.
65. Consequently, the field test would involve OLOs installing their exchange equipment in a dedicated collocation room, possibly secured by a lightweight wall, of one of Batelco's Service Node sites (preferably one of

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

the biggest Service Nodes in Bahrain) and the second field test would take place with the classical co-mingling option in the second selected Batelco's Service Node site.

66. To select the most suitable of Batelco's Service Node sites, TRA will discuss and agree with Batelco, mainly taking into account space and appropriate backhaul availability. Batelco shall have to prepare the two selected sites and the corresponding backhaul so as to enable LLU field tests to occur.
67. In any case, TRA will share the information gathered through the field tests with participating OLOs in a working group and publish it on TRA's website (as deemed appropriate).

OLOs selection for dedicated collocation room possibly secured by a lightweight wall

68. TRA envisages that all interested OLOs should be able to take part in this field test subject to the following criteria:
 - i. They are properly licensed operators in the Kingdom of Bahrain;
 - ii. They have expressed in writing to TRA, alongside their response to this consultation, their intention to participate in the field test. TRA requests interested OLOs to mention to which of their core network sites backhaul would have to be provided by Batelco;
 - iii. They are able to install their exchange equipment by the first day of the field test;
 - iv. They have entered a written agreement with the minimum number of end-users required, to be connected to the OLO's equipment in no more than 1 week from the start of the pilot test.
69. TRA will verify, at least two weeks before the beginning of the field test, the names of OLOs which comply with the four criteria set out above and will make public the list of the OLOs participating in the field test.

OLOs selection for classical co-mingling

70. For the second selected MDF site in which the classical co-mingling option will be tested, TRA believes that space availability will be a more critical issue: it will be more difficult to ensure that all OLOs that wish to take part in the field test will be able to effectively participate in it.
71. As a consequence, TRA is of the view that only one OLO should participate in this trial (to be chosen by TRA amongst those participating in the field test at the first selected site) and that the information gathered by this OLO during this trial should be shared with all other participating OLOs in a working group.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

72. On the basis of responses to this consultation, if it is demonstrated to the satisfaction of TRA that there is interest in such LLU field tests, TRA will proceed to specify in greater detail the organisation of these tests taking account of the responses to this consultation.

Question 4.2:

Do you agree with TRA's proposition to organise LLU field tests? Do you agree with the proposed timing? What is your opinion on the site selection proposition? What is your opinion on the OLOs' selection proposition? Please elaborate.

Do you think that other collocation options than the two currently proposed should be envisaged for the LLU field tests?

If as an OLO you are interested in participating in LLU field tests, please specify to which of your network sites backhaul would have to be provided by Batelco.

4.4 Capacity building workshops

73. TRA acknowledges that the LLU offer, included as a part of the Reference Offer, can incorporate very detailed product, technical and operational points. In order to explain and review in detail the main components of the LLU offer (relevant parts of the Reference Offer ("RO")) with all operators, TRA envisages holding capacity building workshops before the commercial launch of LLU. These workshops should take into account when appropriate the findings of the LLU field tests.
74. TRA is of the view that it would be useful to organise the following workshops at the beginning of the 3rd quarter of 2009¹³ with the following agenda:
- i. **Day 1:** Commercial issues and the type of services (basic and ancillary LLU services);
 - ii. **Days 2 & 3:** Technical/operational issues including processes, interference management plan, operational manuals, service details and procedures, etc.

Question 4.3:

Do you agree with TRA's proposition to organise capacity building workshops on the LLU offer (to be included in the RO) prior to LLU implementation? What

¹³ The exact workshop dates will be dependent on the progress of the LLU project and TRA will update the industry regarding the occurrence of such workshops.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

is your opinion on the proposed agenda and timing of these workshops?

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

5 Selecting the principles for setting LLU rates on an interim basis

5.1 Introduction

75. International experience demonstrates that the level of LLU prices has a major impact on the development of LLU. Whilst it is not the purpose of this consultation to discuss the detailed method by which cost-orientated prices for LLU services can be set (this will be addressed in a specific consultation TRA expects to launch later in 2009), this consultation does present how TRA intends to assess, and if necessary adjust, the rates proposed by Batelco for LLU services to ensure that they are fair and reasonable.

5.2 Pricing basic LLU services

76. The Telecommunications Law requires licensed operators in a dominant position to offer access on fair and reasonable terms. In order to assess whether the LLU rates proposed by Batelco in its LLU RO comply with the Telecommunications Law, and in order to provide some guidance regarding the method TRA is likely to follow to order amendments, TRA will consider several sources of evidence. The objective of this is to derive a plausible range and, within that range, to select a point that best achieves meeting the obligations of Batelco and the duties of TRA. The rates adopted will be applicable on an interim basis until such time as a detailed pricing method has been consulted upon and implemented.
77. TRA is of the view that a combination of two main approaches should be used to establish a plausible range from which the initial interim prices for LLU services will be set.
78. The first approach consists of analysing Batelco's cost information currently available. It may be necessary to adjust this information to ensure that only those costs relevant to the LLU products are included.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

79. The second approach is benchmarking. TRA is mindful that benchmarking comes in many flavours. “Simple” benchmarking can be performed, whereby rates in various jurisdictions are benchmarked. Simple benchmarking can usefully be complemented by “intelligent” benchmarking which involves selecting comparable countries to Bahrain in terms of size or other relevant cost drivers and for which LLU prices are available.
80. TRA intends to use a combination of both simple as well as more complex benchmarking techniques. Depending on the availability and accuracy of information gathered in other jurisdictions, TRA will adopt either one or both of the following methods of “intelligent benchmarking”:
- **Peer group:** The first method consists of identifying a peer group of countries that are similar to Bahrain and to use the LLU rates adjusted to take into account the differences between Bahrain and the peer group with respect to key local loop cost drivers. TRA considers at this stage that the main local loop cost drivers are population density, fixed penetration and the cost of civil works.
 - **Econometric analysis:** The second method consists of the econometric estimation of the relationship between cost drivers and LLU rates in other jurisdictions. The estimated relationship is then used to predict the LLU rates in the target country.¹⁴
81. TRA will further assess whether prices established using these methods are non-discriminatory.

Question 5.1:

Do you agree with TRA’s proposition to determine full LLU prices on an interim basis? Please elaborate.

5.3 Pricing LLU ancillary services

82. Following its review of international experience, TRA understands that the way ancillary services are priced can potentially constitute a barrier to entry for OLOs.

¹⁴ See Commerce Commission, 2007, Standard Terms Determination for the designated service Telecom’s unbundled copper local loop network, Decision 609, for an account of how LLU rates were set in New Zealand based on a sophisticated benchmarking approach, including via regression analysis.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

83. First, there is a tendency for incumbents to use “price on application” instead of published prices, which does not enable OLOs to estimate the level of charge they will have to support. TRA believes that “price on application” should be avoided wherever possible, thereby providing greater certainty and transparency to OLOs.
84. Second, because incumbents tend to propose high upfront fees, TRA believes that ancillary service upfront fees should, as far as possible, annualized and transformed into recurring fees as described in ARCEP’s decision n° 02-278¹⁵ and Oftel’s consultation document “Local loop unbundling: provision of collocation in the form of co-mingling”¹⁶. This could be done through the use of a depreciation formula, the cost of capital and an appropriate depreciation period. Annualized upfront fees help OLOs to realize their business plans since their entry is less deterred by the barrier of high upfront costs whilst also allowing the incumbent to recover costs.

Question 5.2:

Do you agree with TRA’s proposition that “price on application” should be avoided in Batelco’s LLU RO? Do you also agree with TRA’s proposition to avoid possible upfront fees and to transform possible upfront fees into recurring charges?

¹⁵ http://www.arcep.fr/uploads/tx_gsavis/02-278.pdf

¹⁶ Local loop unbundling: provision of collocation in the form of co-mingling, Statement and Direction issued by the Director General of Telecommunications, 10 October 2001

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

6 Anticipating the main operational issues that could occur during the initial LLU implementation phase

6.1 Introduction

85. Operational issues have significantly slowed down the roll out of LLU in some countries where LLU has been implemented. The objective of this section of the consultation is to anticipate operational issues that may occur and to consult with the incumbent and OLOs on the appropriate actions to be taken so that these could be avoided.

6.2 The principle of non-discrimination

86. One of the main principles that should guide the definition of operational processes and the drafting of the LLU offer is the principle of non-discrimination. The application of this principle shall ensure that Batelco gives OLOs access to its local loop (and all associated services) in a similar way to its own retail activities.
87. TRA is therefore of the view that the definition of operational processes and the drafting of the LLU offer should rely as much as possible on Batelco's own processes and practices.
88. TRA is aware that, on Batelco's website, the provision of lines is supposed to be performed within 1 to 5 working days: "You can expect your Speednet service to be activated within 1-5 working days, subject to the availability of the ADSL service in your area of residence and telephone line condition. In some cases, activation of the service may take up to one (1) month or more, depending on the service start-up requirements."¹⁷ The application of the non-discrimination principle would require Batelco to provide LLU lines also within the same time frame.
89. TRA will require from Batelco a list and description of internal processes pertaining to the provisioning of lines, together with any associated commitments towards its own end-users such as the above, including:
- i. Documents describing the processes by which the provision of a PSTN line is performed (if relevant, including documents originating from Batelco's vendors for the use of Batelco's technicians as well as documents informing and confirming the acceptance of the service delivery to the end-user);
 - ii. Documents describing the processes by which the provision of broadband access is performed (if relevant, including documents originating from Batelco's vendors for the use of Batelco's technicians as well as documents informing and confirming the acceptance of the service delivery to the end-user);

¹⁷ http://www.batelco.com/inet_terms_conditions.asp

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

- iii. Documents describing the handling of PSTN and broadband faults by Batelco (if relevant, including documents originating from Batelco's vendors for the use of Batelco's technicians);
- iv. Documents describing the relevant Information Systems implemented inside Batelco (e.g. for Batelco staff and/or vendors to know the quality of the line or the status of the line, for Batelco staff and/or vendors to handle an order, etc.);
- v. Documents describing the current arrangements for Batelco's staff and contractors to access Batelco's sites.

Question 6.1:

Do you agree with TRA's non-discrimination approach that should guide the definition of operational processes and the drafting of the LLU offer?

Do you agree with TRA's proposition to request from Batelco a description of its relevant internal processes for the purpose of the Approval of the LLU Reference Offer?

6.3 Ancillary service #1: provisioning of LLU-related specific information

90. In Section 4.2 of this consultation, TRA has defined the general information relating to Batelco's local loop that should be made available, as soon as possible, free of charge and subject to a confidentiality agreement signed by the OLO where reasonably required by Batelco.
91. TRA anticipates that, in order for OLOs to define their strategy for LLU development, they will need to access more specific information from Batelco for each Service Node. This data should also be provided free of charge, subject to a confidentiality agreement where reasonably required by Batelco.
92. Based on a review of relevant Reference Offers in other countries, as well as on a review, yet to be conducted, of available information on Batelco's copper access network, the following LLU specific information could be of relevance for OLOs :
 - i. The number of non-active (e.g. temporarily out of service, soft disconnect, etc.) and active lines suitable for LLU;
 - ii. The geographical location of the Service Nodes (national address);
 - iii. The average length of copper local loops (meters);
 - iv. Power availability at each of Batelco's Service Nodes;

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

- v. Service Node space availability;
 - vi. Cable entry points (First manhole closest to the exchange) and duct capacity available;
 - vii. General information on cable characteristics (e.g. diameter, results from quality tests that have been conducted, technical interference, control and spectral management plan);
 - viii. Results of any xDSL tests.
93. TRA acknowledges that information pertaining to the list above could be of use for OLOs in LLU implementation and requests the industry to comment on the relevance of each item of the list above in the specific context of LLU implementation in Bahrain.
94. TRA is also mindful that some items of the list above may be deemed commercially sensitive and therefore not to be disclosed to OLOs. TRA welcomes the views of the industry on what objective criteria should be used to assess whether an item in the list above should be or should not be considered commercially sensitive in the specific context of LLU implementation in Bahrain.

Question 6.2:

Do you agree with TRA's approach to the provision of specific information related to LLU within the LLU RO of Batelco? Which items of the list above are relevant in the specific context of LLU implementation in Bahrain and should be included in the LLU RO? What are the objective criteria to be used for assessing whether an item of the list above should be considered commercially sensitive in the specific context of LLU implementation in Bahrain?

6.4 Ancillary service #2: provisioning of LLU backhaul

95. LLU backhaul provides capacity between an OLO's exchange equipment at a Batelco Service Node and an OLO's points of presence. There are likely to be various types of backhaul depending on the type of collocation employed by the OLO, and the type and location of the OLO's points of presence.
96. OLOs may choose to self-provide backhaul by deploying fibre and connecting Service Nodes of the incumbent.
97. OLOs may choose to purchase backhaul from either the Incumbent or another OLO.
98. However, overseas experience shows that there is a tendency, especially during the early stages, for OLOs to be reliant upon incumbent-provided

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

backhaul solutions. The costs associated with civil works and the laying of fibre with uncertain economies of scale often form a barrier to entry for OLOs. TRA is therefore of the view that it is necessary for Batelco to provide a cost-oriented backhaul offer (with a corresponding Service Level Agreement). In particular, it should be possible for OLOs to receive multiple LLU backhauls to a single point of presence.

99. Furthermore, TRA is of the view that there should be no provisions in the incumbent's LLU RO that render the build-out of own infrastructure by OLOs uneconomical. Such impediments may include: restrictions relating to access to infrastructure (duct) from the manhole chamber closest to the exchange and the Optical Distribution Frame in the exchange to which an OLO may wish to connect a backhaul circuit; and restrictions placed upon OLOs prohibiting capacity sharing.

Question 6.3:

Do you agree with TRA's view that both a cost-oriented LLU backhaul offer from the incumbent and enabling backhaul built by OLOs are necessary? If yes, could you please detail your expectations for the LLU backhaul offer to be provided by Batelco (bandwidth of backhaul, type of protocol, etc.)?

Could you also please detail your expectations in terms of self-providing LLU backhaul (e.g. deployment of fibre into Batelco's Service Node) or purchasing LLU backhaul from another OLO?

6.5 Ancillary service #3: provisioning of collocation

100. TRA is of the view that, to the extent that there is sufficient space, all the options for collocation listed in Paras 26, 27 and 28 should be made available by Batelco.
101. Since space may be scarce in a number of Service Nodes and there may be demand for this space from several OLOs, TRA believes that rules have to be set to ensure an efficient allocation of space between requesting OLOs.
102. Based on a review of international best practices, TRA is of the view that the following five rules for the efficient allocation of collocation space should be adopted:
- i. **First Come First Served rule.** This rule ensures that OLOs that ask for collocation space earlier are served first. TRA believes that any other rule may slow down the development of LLU. As is the case in duct and civil works, the first OLO shall bear all the associated costs and shall be reimbursed by other OLOs coming afterwards on a pro rata basis.

CONSULTATION

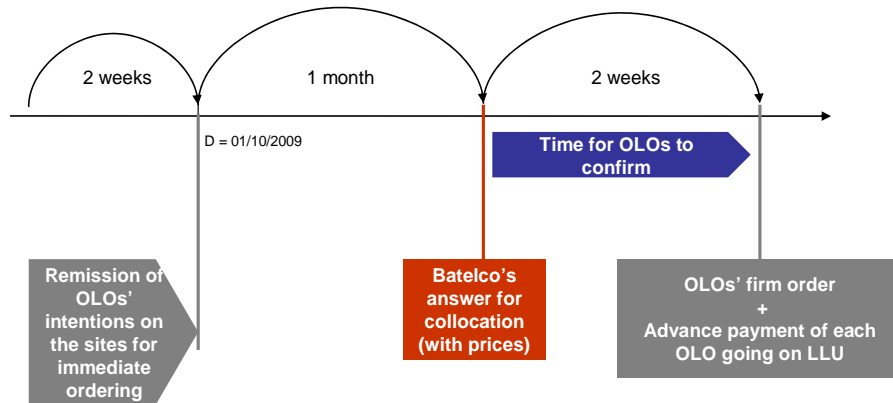
Appropriate approach for implementation of LLU in the Kingdom of Bahrain

- ii. **Use It or Lose It.** By this rule, if an OLO has been granted space but has not used this space after the specified reasonable period of time, the space will be released and re-allocated. This will prevent the inefficiencies created by hoarding space.
 - iii. One single space allocated per OLO per Service Node. Where space is scarce OLOs will be initially restricted to a single space. This restriction will be reviewed on an exchange-by-exchange basis to ensure proportionality. The definition and dimensions of a “space” will be determined through the field tests on the basis of the exchange equipment chosen by the OLOs.
 - iv. Batelco should rely on effective demand for site preparation and as a general rule it should not be required of Batelco to provide space in advance for all or part of its Service Node sites.
 - v. If several collocation options are available, the cheapest option should always be proposed by Batelco. As a consequence, the co-mingling option should always be proposed, and then, if no space is available for this option, the dedicated room option should be proposed, and then if no space is available for this option, the shelter option should be proposed, and then if no space is available for this option, the distant collocation option should be considered.
103. TRA anticipates that there is a risk of inefficient allocation of space in the very first ordering of collocation sites by OLOs, in particular for attractive Service Node sites. TRA proposes the following specific process for the very first collocation ordering:
- i. First, pursuant to a letter sent by TRA, OLOs will have two weeks to specify their orders for the sites for which they intend to place an immediate order.
 - ii. Batelco will determine for each Service Node site the best collocation option that will fulfil the demand within one month, based on orders received and will send OLOs the corresponding collocation prices.
 - iii. OLOs will have two weeks to confirm their order, based on the prices provided by Batelco. Confirmation will be accompanied by a non-refundable advance payment.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Figure 14 - Proposed calendar for the space allocation specific process for the very first collocation ordering (for illustrative purposes only)



104. TRA shall make available information about the Service Nodes during the very first collocation ordering and may undertake site visits if appropriate.

Question 6.4:

Do you agree with TRA's proposed rule for space allocation?
Do you agree with TRA's proposed specific process for space allocation for the very first collocation ordering?
Is there any justification for such a coordinated approach to be envisaged after the very first collocation ordering for subsequent orderings? Please elaborate.

105. TRA is furthermore willing to collect the industry's views on how to specify the above-mentioned "Use it or Lose it Rule". Such a rule could include examples such as the OLO's exchange equipment not being installed or being installed but not connected to the OLO's core network within 3 months of space allocation, in which case it will have to be removed at the OLO's cost. There would need to be some condition placed on the rigidity of the 3-month deadline, for example if the delay is caused by third party issues such as delays in the provision of backhaul services by Batelco.

Question 6.5:

What are your views on how to implement the "Use it or Lose it Rule"? Please explain in detail.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

6.6 Relationships between end-users, OLOs and Batelco

106. In order to prevent any unnecessary relationship between the end-user and the incumbent, when services are provided to the end-user on the basis of LLU, some countries¹⁸ have introduced the possibility for end-users to sign a document that authorises their chosen OLO to perform all the necessary actions with the incumbent for having their line unbundled.
107. TRA considers that LLU should be transparent for end-users and is of the view that end-users do not need to have any contact with the incumbent for having their line unbundled. Therefore, TRA proposes to allow end-users to sign a document authorising an OLO to complete all the necessary actions with the incumbent for having their line unbundled, including fixed number portability when available and as appropriate.
108. Furthermore, TRA is of the view that the consequences of terminating the contract, e.g. clearing current debts, with Batelco should not be a barrier to change from Batelco to an OLO.

Question 6.6:

Do you agree with TRA's proposition to allow end-users to sign a document authorising an OLO to perform all the necessary actions with the incumbent for having their line unbundled, including fixed number portability when appropriate?

Do you agree with TRA's proposition that the consequences of terminating the contract with Batelco should not be a barrier to change from Batelco to an OLO?

6.7 Access Network Frequency Plan (ANFP)

109. In 2003, UK's Oftel defined the Access Network Frequency Plan (ANFP) (also called Interference Management Plan) as "a spectrum management plan for controlling interference, caused by cross talk, within a metallic access network". The ANFP is a major document for LLU implementation as it enables OLOs to deploy services in a predictable and reliable manner. It is specified by a list of Power Spectrum Density masks applicable at a number of defined points in the access network. The ANFP is less constraining for OLOs than a list of allowed technologies.
110. TRA is of the view that Batelco should release the ANFP for the field tests planned to occur in mid-2009 in Bahrain. This ANFP will then be

¹⁸ See for example, France, Ireland or the United Kingdom

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

reviewed in a working group hosted by TRA with interested OLOs and possibly manufacturers when and where required.

Question 6.7:

Do you agree with TRA's suggestion to request Batelco to release the ANFP for the field tests to occur in mid-2009 in Bahrain?

6.8 Bulk Migration

111. A bulk migration is the multiple migrations of Bitstream or Wholesale DSL customers to LLU. Bulk migration is transparent for end-users and allows OLOs to migrate a large number of customers more quickly.
112. While TRA acknowledges that bulk migration has helped in the take-up of LLU in many European countries, such as France, the United Kingdom or Ireland, it does not exist in micro-states like Luxembourg, Cyprus or Malta. Since the number of Wholesale DSL and Bitstream customers in Bahrain is not so large and there is a significant potential to unnecessarily complicate the implementation of LLU in Bahrain, TRA considers that the benefits associated with bulk migration are likely to be minimal.

Question 6.8:

Do you agree with TRA's proposition not to implement bulk migration in LLU implementation?

6.9 Forecasts

113. TRA has noticed issues related to forecasts that have arisen in the context of the Bitstream product provided by Batelco. For the provision of this product, Batelco requires OLOs to forecast their numbers of broadband users. Furthermore, Batelco requires that OLOs sign up to a minimum order value irrespective of whether the OLOs achieve this threshold. This requirement appears to be unnecessarily stringent since OLOs have to pay penalties if the number of broadband users they are able to obtain in reality is different from the forecasts provided.
114. With LLU, OLOs may be required to provide some forecasts about their LLU plans to Batelco to help the incumbent anticipate and plan associated activities.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

115. Since the budgeting for equipment and associated internet connectivity remains the responsibility of the OLO, TRA believes that forecasts are only necessary to assist in the organisation of work to be done in the future and for budgeting jumpers and backhauls if necessary.
116. TRA is of the view that forecasts should not unduly constrain OLOs. If real orders from OLOs are slightly different from forecasts, TRA believes that OLOs should not be subject to penalty.
117. However, TRA is of the view that provisions are required to take into account forecasting tolerances and would welcome the industry's comments.
118. Based on international practices¹⁹, TRA is of the view that OLOs should provide forecasts about their future orders for LLU services:
- i. At most for the next 12 months and at least for the next 6 months for orders relating to collocation (including type and capacity of backhaul requested) and tie cables;
 - ii. At most for the next 6 months and at least for the next 3 months for full LLU orders.

Question 6.9:

Do you agree with TRA's proposition for the forecasts to be done by OLOs? Do you agree with TRA's proposition that OLOs should not pay any penalty if their orders for LLU services are different from forecasts? Do you agree with TRA's proposition that provisions are required to take into account forecasting tolerances? Please elaborate.

6.10 Service Level Agreements (SLAs)

119. Overseas experience shows that there are various possibilities to put competitors at a disadvantage by means of quality discrimination. As the quality of a service is particularly difficult to observe for a regulator, regulators have imposed an obligation to offer service level agreements (SLAs) and periodically report Key Performance Indicators (KPIs) to the regulator and where appropriate to OLOs (e.g. on the website of the operator providing LLU)²⁰. Such KPIs could be reported for services

¹⁹ See, for example, France Telecom's Reference Unbundling Offer

²⁰ See 5.2.4.5 Quality discrimination, in Revised ERG Common Position on the approach to appropriate remedies in the ECNS regulatory framework - Final Version May 2006

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

provided to OLOs as well as for self-provided services, to monitor compliance with the non-discrimination obligation²¹.

120. TRA is of the view that Service Level Agreements (SLAs) with associated penalties ensure that the provision of the LLU product will be done with a known level of quality of service.
121. In light of the encountered implementation difficulties in Europe, such as the complexity of the Bow Wave Process in the UK²² or the constant discussion on the collocation process in Ireland, TRA considers that at a minimum the following parameters should be set for SLAs:
- i. For full LLU line delivery, validation time (time required for the incumbent to consider an order as received and suitable) and delivery time;
 - ii. For ancillary service, validation time (time required for the incumbent to consider an order as received and suitable) and delivery time;
 - iii. For fault clearance, validation time (time required for the incumbent to consider the fault forwarded by the OLO as received and acceptable) and repair time.

Question 6.10:

Do you agree with TRA's list of a minimal set of parameters for SLAs that should be associated with LLU?

122. TRA wishes to set the value for these parameters of SLAs on the basis of the LLU process assessment that will be reviewed with Batelco and on the basis of the opinion of respondents to the present consultation. For that purpose, TRA intends to request from Batelco any appropriate information on existing SLAs and KPIs.
123. TRA recognizes that in the early stage of LLU deployment, it may be difficult for the incumbent to achieve SLAs because of the fact that some processes may be new for Batelco. As a consequence, TRA proposes that Batelco shall publish within its RO target SLAs and associated penalties. Furthermore, Batelco shall publish on a monthly basis corresponding KPIs, based on which final SLAs will be defined, taking into account, whenever appropriate, benchmark information. Final SLAs will be set after 6 months.

²¹ E.g. Indicateurs de qualité de service pour le dégroupage et les marchés aval – Résultats du mois de décembre 2008 – Orange : http://www.francetelecom.com/fr_FR/groupe/reseau/documentation/att00001745/ReportingspourARCEP12-08.pdf

²² <http://www.ofcom.org.uk/static/archive/Oftel/publications/broadband/llu/bowp0201.htm>

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Question 6.11:

Please specify and justify the value for the following parameters of SLAs:

validation time for:

- Full LLU line provisioning
- Information provisioning
- Internal Tie cable provisioning
- External Tie cable provisioning
- Dedicated Collocation space provisioning
- Co-Mingling space provisioning
- Shelter space provisioning
- Backhaul provisioning by incumbent

delivery time for:

- Full LLU line provisioning
- Information provisioning
- Internal Tie cable provisioning
- External Tie cable provisioning
- Dedicated Collocation space provisioning
- Co-Mingling space provisioning
- Shelter space provisioning
- Backhaul provisioning by incumbent

Problem resolution time for:

- Fault clearance
- Backhaul repair

Access to Service Nodes

Question 6.12:

Comments are requested with respect to the proposed establishment of SLAs.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

7 Monitoring the development of LLU

7.1 Introduction

124. The four preceding sections have discussed the implementation of LLU before its commercial launch. This section addresses the issues relating to monitoring LLU.

7.2 Publication of Key Performance Indicators (KPIs)

125. In order to ensure both compliance with non-discrimination obligations and that the services provided to OLOs are fit-for-purpose, TRA is of the view that Batelco should be obliged to periodically report Key Performance Indicators (KPIs) to the regulator (as part of the regulatory requirements relating to the Quality of Service) and where appropriate to OLOs (e.g. on the website of the operator providing LLU).

126. TRA observes that the current minimum set of KPIs in Europe²³ needed to monitor the application of the non-discrimination obligation and the effectiveness of Service Level Agreements and to allow the identification of any persistent or new problems in the context of LLU is the following:

- i. Ordering
- ii. Delivering
- iii. Fault repair

127. As a consequence, TRA is of the view that the minimum set of KPIs that should be measured on a monthly basis and published by Batelco on its website for LLU²⁴ is the following:

- i. Average delivery time (in days)
 - For active lines
 - For non-active lines
 - For all (active and non-active lines)
- ii. % of delivery before or at the committed date
 - For active lines
 - For non-active lines
 - For all (active and non-active lines)
- iii. % of faults cleared in less than 'x' hours
 - For all (active and non-active lines)

128. Once the minimum set of KPIs for LLU is defined, TRA shall request Batelco to measure and publish the corresponding minimum set of KPIs

²³ Report on ERG best practices on regulatory regimes in wholesale unbundled access and Bitstream access, ERG (07) 53, page 16 & 17.

²⁴ An extract of KPIs for residential offers published by the French Incumbent (France Telecom) could be found in Annex 1

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

for other wholesale and retail products necessary to assess prima facie compliance with non-discrimination.

Question 7.1:

What is the minimal set of KPIs for LLU that should be measured on a monthly basis and published by Batelco on its website? Do you agree with TRA's intention to request Batelco to measure and publish the corresponding minimum set of KPIs for other wholesale and retail products necessary to assess prima facie compliance with non-discrimination?

7.3 Publication of a LLU scorecard

129. In order to follow the development of LLU and to provide market data to various stakeholders, TRA intends to develop and publish on its website a LLU scorecard. Similar scorecards are generally made available by regulators²⁵. TRA is of the view that the following three indicators should be tracked and published by TRA on a quarterly basis:

- i. The number of unbundled lines;
- ii. The number of unbundled MDFs;
- iii. A map of the geographical coverage of LLU²⁶.

Question 7.2:

Do you agree with TRA's proposition to publish a LLU scorecard that would include: (a) the number of unbundled lines; (b) the number of unbundled MDFs; and (c) the LLU coverage on the basis of a map once LLU is commercially launched? Do you see other indicators that should be included in this scorecard?

7.4 Creation of working groups hosted by TRA

130. TRA anticipates that the field tests that will take place in mid-2009 and the work that will be undertaken by TRA and its consultants, Batelco and OLOs prior to the commercial launch of LLU will not necessarily be sufficient to address all the operational issues around LLU. Consequently,

²⁵ See e.g. ARCEP, Ofcom and the EC.

²⁶ See e.g. <http://www.arcep.fr/index.php?id=34>

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

TRA is of the view that a **Working Group on LLU Operations and Service Schedules** should be established and meet on a regular basis..

131. The goals of the “LLU Operations and Service Schedules” Working Group would be to analyze and refine any existing processes and SLA/KPI measures, to suggest appropriate amendments to the LLU RO, to if necessary propose new service schedule(s) to the LLU RO (possibly related to SLU, LS, NGN, any new backhaul offer or bulk migration), and as necessary review and propose amendments to the ANFP.
- 132.

Question 7.3:

Do you agree with TRA’s proposition to create a Working Group on LLU Operations and Service Schedules that will review the progress of LLU and suggest amendments to the LLU RO? Do you also agree with TRA’s opinion that the evolution of and amendments to the ANFP should also be discussed within a Working Group on ANFP?

8 Operational or Structural Separation of the Local Loop

133. TRA is aware that some regulators are looking at alternative models of operational or structural separation, in which the access network is separated from the core network so that equivalent access services can be offered to all competing network and service providers²⁷. Such a model ensures the absence (or significant reduction) of incentives to discriminate between the incumbent’s and the OLOs’ end-users.
134. TRA considers that this model may become important in the future, particularly with the moves towards next generation IP networks and the convergence of services (e.g. between fixed and mobile, and between telecoms and broadcasting) or if the implementation of LLU and other products (such as Bitstream) on the basis of the current setup of the incumbent proves to be hindered by incentives to discriminate against OLOs.
135. TRA proposes to continually monitor and evaluate the status of LLU implementation in Bahrain and, where it determines the existence of anti-competitive practices by the incumbent such that LLU deployment is obstructed, it will thereafter consider and adopt an appropriate approach to separation. TRA does not consider structural separation appropriate at this time but may consider it in the future.

27 See the creation of Openreach in January 2006 in the United Kingdom, the current discussions in Poland between the incumbent TP and the NRA and discussions between ComReg and Eircom in Ireland in late 2007.

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Question 8.1:

Do you agree with TRA's opinion that structural separation should not be considered at the current time but should be envisaged in the future if TRA determines the existence of anti-competitive practices by the incumbent such that LLU deployment is stymied?

9 Key milestones of the LLU implementation phase

136. In its Draft Determination on Wholesale broadband markets²⁸, TRA has identified the following market failure: Batelco is dominant in the wholesale physical network infrastructure access market in the Kingdom of Bahrain.
137. TRA intends to request Batelco to provide LLU under Article 3.5 of the Access Regulation, and has therefore conducted, pursuant to Article 3.7 of the Access Regulation issued on 30 April 2005, an assessment²⁹ of whether such an Access Obligation for LLU is no more than is appropriate and necessary to address the market failure identified by TRA, taking into account:
- (a) the technical and economic viability of installing competing facilities, in light of the level and rate of market development;
 - (b) the feasibility and efficiency of providing the form of access, particularly in light of the available capacity; and
 - (c) TRA's duty to safeguard and encourage the long-term development of competition and the long-term interests of end-users.
138. As a consequence, pursuant to Article 5 of the Access Regulation issued by TRA on 30 April 2005, Batelco shall, within two months of being declared by TRA to hold a dominant position in a relevant market, submit its Reference Access Offer to TRA for approval.
139. TRA proposes, therefore, the following key milestones for the LLU implementation phase:
- i. The LLU-related general information that will pre-date the LLU RO of Batelco shall be made available by Batelco on simple request and subject to a confidentiality agreement, if reasonably

²⁸ TRA, Draft Dominance Determination in Wholesale Broadband Markets, March 2009

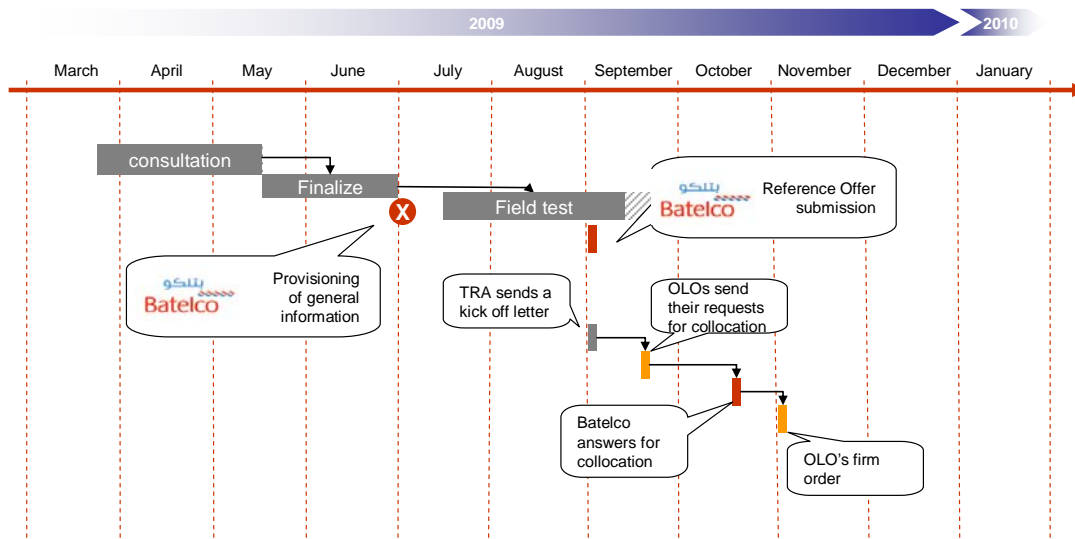
²⁹ TRA, Study on the Regulation of Wholesale Broadband Markets, March 2009

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

- required by Batelco, signed by the OLO (see Section 4.2), by no later than one week after the issuance of the Order³⁰.
- ii. Batelco shall take all appropriate actions so that the LLU field test experimentations (see Section 4.3) can begin by no later than 15 July 2009. The field test experimentations shall last at least two months.
 - iii. Batelco shall submit its LLU Reference Offer to TRA for review and approval or ordering by no later than 30 August 2009 (indicative date, as Batelco shall comply with its obligation pursuant to Article 5 of the Access Regulation issued by TRA on 30 April 2005).
 - iv. The commercial launch is anticipated by the end of 2009.

Figure 15 - Indicative calendar / Key Milestones



Question 9.1:

Do you agree with TRA on the key milestones for the LLU implementation phase?

³⁰ TRA, Draft Order relating Unbundling Local Loop, Bitstream and Wholesale DSL, March 2009

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Consolidated list of questions:

Question 3.1:

Do you agree with TRA's proposition to implement only Full LLU for the time being? Please elaborate.

Question 3.2:

Do you agree with TRA's proposition not to implement SLU for the time being?

Question 3.3:

Do you agree with TRA's proposition that non-active lines for which there is capacity at the main network level and at the distribution level should be unbundled? Please elaborate.

Question 4.1:

Do you agree with TRA's proposition that the list of MDFs with their category of size and the location of these MDFs on a map (except the ones for which valid national security reasons prevent their location being made public) with their coverage area should be made available free of charge by Batelco on simple request subject to a confidentiality agreement signed by the OLO as soon as possible after the issuance of the Order? Please elaborate.

Question 4.2:

Do you agree with TRA's proposition to organise LLU field tests? Do you agree with the proposed timing? What is your opinion on the site selection proposition? What is your opinion on the OLOs' selection proposition? Please elaborate.

Do you think that other collocation options than the two currently proposed should be envisaged for the LLU field tests?

If as an OLO you are interested in participating in LLU field tests, please specify to which of your network sites backhaul would have to be provided by Batelco.

Question 4.3:

Do you agree with TRA's proposition to organise capacity building workshops on the LLU offer (to be included in the RO) prior to LLU implementation? What is your opinion on the proposed agenda and timing of these workshops?

Question 5.1:

Do you agree with TRA's proposition to determine full LLU prices on an interim basis? Please elaborate.

Question 5.2:

Do you agree with TRA's proposition that "price on application" should be avoided in Batelco's LLU RO? Do you also agree with TRA's proposition to avoid possible upfront fees and to transform possible upfront fees into recurring charges?

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Question 6.1:

Do you agree with TRA's non-discrimination approach that should guide the definition of operational processes and the drafting of the LLU offer?

Do you agree with TRA's proposition to request from Batelco a description of its relevant internal processes for the purpose of the Approval of the LLU Reference Offer?

Question 6.2:

Do you agree with TRA's approach to the provision of specific information related to LLU within the LLU RO of Batelco? Which items of the list above are relevant in the specific context of LLU implementation in Bahrain and should be included in the LLU RO? What are the objective criteria to be used for assessing whether an item of the list above should be considered commercially sensitive in the specific context of LLU implementation in Bahrain?

Question 6.3:

Do you agree with TRA's view that both a cost-oriented LLU backhaul offer from the incumbent and enabling backhaul built by OLOs are necessary? If yes, could you please detail your expectations for the LLU backhaul offer to be provided by Batelco (bandwidth of backhaul, type of protocol, etc.)?

Could you also please detail your expectations in terms of self-providing LLU backhaul (e.g. deployment of fibre into Batelco's Service Node) or purchasing LLU backhaul from another OLO?

Question 6.4:

Do you agree with TRA's proposed rule for space allocation?

Do you agree with TRA's proposed specific process for space allocation for the very first collocation ordering?

Is there any justification for such a coordinated approach to be envisaged after the very first collocation ordering for subsequent orderings? Please elaborate

Question 6.5:

What are your views on how to implement the "Use it or Lose it Rule"? Please explain in detail.

Question 6.6:

Do you agree with TRA's proposition to allow end-users to sign a document authorising an OLO to perform all the necessary actions with the incumbent for having their line unbundled, including fixed number portability when appropriate?

Do you agree with TRA's proposition that the consequences of terminating the contract with Batelco should not be a barrier to change from Batelco to an OLO?

Question 6.7:

Do you agree with TRA's suggestion to request Batelco to release the ANFP for the field tests to occur in mid-2009 in Bahrain?

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Question 6.8:

Do you agree with TRA's proposition not to implement bulk migration in LLU implementation?

Question 6.9:

Do you agree with TRA's proposition for the forecasts to be done by OLOs? Do you agree with TRA's proposition that OLOs should not pay any penalty if their orders for LLU services are different from forecasts? Do you agree with TRA's proposition that provisions are required to take into account forecasting tolerances? Please elaborate.

Question 6.10:

Do you agree with TRA's list of a minimal set of parameters for SLAs that should be associated with LLU?

Question 6.11:

Please specify and justify the value for the following parameters of SLAs:

validation time for:

- Full LLU line provisioning
- Information provisioning
- Internal Tie cable provisioning
- External Tie cable provisioning
- Dedicated Collocation space provisioning
- Co-Mingling space provisioning
- Shelter space provisioning
- Backhaul provisioning by incumbent

delivery time for:

- Full LLU line provisioning
- Information provisioning
- Internal Tie cable provisioning
- External Tie cable provisioning
- Dedicated Collocation space provisioning
- Co-Mingling space provisioning
- Shelter space provisioning
- Backhaul provisioning by incumbent

Problem resolution time for:

- Fault clearance
- Backhaul repair

Access to Service Nodes

Question 6.12:

Comments are requested with respect to the proposed establishment of SLAs.

Question 7.1:

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

What is the minimal set of KPIs for LLU that should be measured on a monthly basis and published by Batelco on its website? Do you agree with TRA's intention to request Batelco to measure and publish the corresponding minimum set of KPIs for other wholesale and retail products necessary to assess prima facie compliance with non-discrimination?

Question 7.2:

Do you agree with TRA's proposition to publish a LLU scorecard that would include: (a) the number of unbundled lines; (b) the number of unbundled MDFs; and (c) the LLU coverage on the basis of a map once LLU is commercially launched? Do you see other indicators that should be included in this scorecard?

Question 7.3:

Do you agree with TRA's proposition to create a Working Group on LLU Operations and Service Schedules that will review the progress of LLU and suggest amendments to the LLU RO? Do you also agree with TRA's opinion that the evolution of and amendments to the ANFP should also be discussed within a Working Group on ANFP?

Question 8.1:

Do you agree with TRA's opinion that structural separation should not be considered at the current time but should be envisaged in the future if TRA determines the existence of anti-competitive practices by the incumbent such that LLU deployment is stymied?

Question 9.1:

Do you agree with TRA on the key milestones for the LLU implementation phase?

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

Annex 1:

Figure 16 – Extract from KPIs published by the French incumbent – residential offers (merely for illustrative purposes³¹)

Residential offers, PSTN services		WLR	FT subscription
<i>Relevant delivery time</i>		8 calendar days	
<i>Relevant fault clearance time</i>		48h working days	
Existing lines			
Average delivery time	days	1A	1B
Rate of respect for the relevant delivery time	%	2A	2B
Number of orders delivered in more than 30 calendar days	#	3A	3B
Creating lines			
Average delivery time	days	5A	5B
Rate of respect for the relevant delivery time	%	6A	6B
Number of orders delivered in more than 30 calendar days	#	7A	7B
Existing lines or creating lines			
Rate signs on parks delivered for less than a month - issued by FT	%	9A	9B
Rate of respect for the contractual fault clearance time	%	10A	10B
Rate signs on the park per line and per year - issued by FT	%	11A	11B
Rate signs on the park per line and per year - issued by others	%	12A	12B
Number of faults issued by FT and not pointed out in less than 3 working days	#	13A	13B

Residential offer, DSL access for PSTN lines	A		B	C
	Line sharing	Bitstream	Residential retail offers Orange	
<i>Relevant delivery time</i>	7 working days		8 calendar days	
<i>Relevant fault clearance time</i>	D+1 (working days)			
Average delivery time	days	14A	14B	14C
Rate of respect for the relevant delivery time	%	15A	15B	15C
Number of orders delivered in more than 30 calendar days	#	16A	16B	16C
Rate signs on parks delivered for less than a month - issued by FT	%	18A	18B	18C
Rate of respect for the contractual fault clearance time	%	19A	19B	19C
Rate signs on the park per line and per year - issued by FT	%	20A	20B	20C
Rate signs on the park per line and per year - issued by Others	%	21A	21B	21C
Number of faults issued by FT and not pointed out in less than 3 working days	#	22A	22B	22C

³¹ http://www.francetelecom.com/fr_FR/groupe/reseau/documentation/att00001745/ReportingspourARCEP12-08.pdf

CONSULTATION

Appropriate approach for implementation of LLU in the Kingdom of Bahrain

	A	B	C
Residential offers, DSL access for PSTN lines without 4hours clearance time guarantee (GTR 4h)	Full unbundling	DSL access only	Retail offers DSL naked
<i>Relevant delivery time</i>	<i>7, 8 working days ouvrés or customer appointment</i>		<i>8 calendar days</i>
<i>Relevant fault clearance time</i>	<i>D+2 (working days)</i>	<i>D+1 (working days)</i>	
Existing lines			
Average delivery time	days	23A	23B
Rate of respect for the relevant delivery time	%	24A	24B
Number of orders delivered in more than 30 calendar days	#	25A	25B
Creating lines			
Average delivery time	days	27A	27B
Rate of respect for the relevant delivery time	%	28A	28B
Number of orders delivered in more than 30 calendar days	#	29A	29B
Existing lines or creating lines			
% of respect for achieving delivery with portability in the same day	%	31A	31B
Rate signs on parks delivered for less than a month - issued by FT	%	32A	32B
Rate of respect for the contractual fault clearance time	%	33A	33B
Rate signs on the park per line and per year - issued by FT	%	34A	34B
Rate signs on the park per line and per year - issued by Others	%	35A	35B
Number of faults issued by FT and not pointed out in less than 3 working days	#	36A	36B