

Principles of implementation and best practice regarding LLU

as decided by the Independent Regulators Group

24 November 2000

National Regulatory Authorities (NRAs) implement the regulatory framework laid down in EU and national law. These principles of implementation and best practice (PIBs) have been devised by the IRG to assist in the process of harmonising implementation in IRG member states. The NRAs are committed to implement these principles wherever possible.

Considerations

Regarding Local Loop Unbundling (LLU), the Independent Regulators Group (IRG) has considered the following:

- a) IRG welcomes the European Parliament and Council regulation on unbundled access to the local loop and believes this to be an appropriate instrument to rapidly deliver the desired results;
- b) IRG is committed to contribute to a successful implementation of the Regulation, working together with the Commission and all other interested parties;
- c) IRG wants to ensure a fast-track introduction and maximum availability of unbundled access to the local loop on appropriate terms within the framework of the Regulation and national legislation;
- d) IRG wishes to follow up on the initiatives of the European Commission and wants to achieve before mentioned goals by formulating Principles of Implementation and Best Practice (PIBs)
- e) PIBs are accepted by IRG as its common understanding on the generally accepted best practice regarding LLU;
- f) IRG has formulated PIBs on the basis of the minimum list of items to be included in the Reference Offer and regards the PIBs as an essential minimum set which might be expanded by individual NRAs at their own discretion;
- g) Driving principles when formulating PIBs are:
 - *Non-discrimination* between the access seeker and the notified operator regarding use of the local loop: The notified operator should be prohibited from showing preference to, or exercising discrimination against, any particular operator in relation to the provision of any of the services necessary to access the local loop;
 - *Transparency*: Terms, conditions and prices for these services should be sufficiently transparent to enable operators to assure themselves of the notified operator's compliance with the above principle;
 - *Favouring the development of competition*: The notified operator should provide a number of services essential for LLU;
 - *Cost-orientation*: A cost-oriented price provides the right economic signal for access seekers for a make or buy decision;

- h) IRG intends to remain developing and reviewing PIBs on LLU in the future, with a yearly review on relevance and consistency.

Structure

The regulation on unbundled access to the local loop states that "Notified operators shall publish from 31 December 2000, and keep updated, a reference offer for unbundled access to their local loops and related facilities, which shall include at least the items listed in the annex." IRG has formulated Principles of Implementation and Best Practices (PIBs) for topics mentioned in the reference offer, also explaining why these principles are regarded to be relevant. The following paper is structured according to the reference offer. The paragraphs used are the same as mentioned in the Reference Offer annex to the regulation. The paper presents the understanding and interpretation of the minimum set of the regulation. It is not intended to comment on the reference offer, but to clarify and specify the IRG interpretation of the minimum set¹.

Next steps

The PIBs have been developed over a two month period to facilitate a quick implementation of LLU in line with the regulation. Not all relevant issues could be addressed within this timeframe (i.e. cost basis for shared access). IRG is committed to the development and evaluation of PIBs as LLU is implemented and practical experience is gained in a growing number of countries. Interested parties will be informed via the IRG website on future developments.

¹ If headings have no additional text, IRG has regarded it not as a priority to give a further interpretation to the text of the regulation

These are the views of the WG ULL participants when examining the Commission's proposed Reference Offer format

A Conditions for unbundled access to the local loop

A 1 Network elements to which access is offered

Four groups of services have been identified as a minimum set of services required to enable full and shared access to the local loop:

- Metallic Path Facilities²
- Collocation services (discussed in B)
 - Collocation facilities in the following forms:
 - Physical collocation
 - Distant or adjacent collocation
 - Virtual or managed collocation
 - Hand-over Distribution Frame (HDF) , including the street cabinet where this is relevant to sub-loops
 - Tie Cables
 - Internal Tie Cable
 - External Tie Cable
 - Access seeker's External Tie Cable Pull-Through Service
 - Transmission and backhaul Services
 - Power
 - Air conditioning/chilling/heating (as relevant)
 - Access to collocation space
 - Equipment moving assistance (where lifting/hosting apparatus is needed)

ANNEX 1 defines the above services and shows the configurations that can be used to connect the end user to the HDF in either the notified operator's collocation space or access seekers premises.

- Interface to Operational Support Systems e.g. provisioning, ordering, fault resolution, maintenance etc (discussed in C)
- Provision of information (e.g. network information) (discussed in A, B, C and D)

PIB:

1. All the above mentioned services should be provided as a minimum set of services.
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² Here after referred to as local loop.

A 2 Information concerning the locations of physical access sites, availability of local loops in specific parts of the access network.

Provision of network information and information concerning the locations of physical access sites is a key element of the LLU product portfolio. This general information should be sufficient to enable access seekers to make technical and commercial judgements on the same basis as the notified operator, although it should not include confidential commercial information on customers in the notified operator's possession. This information needs to be updated regularly to reflect changes in the availability of services and increased knowledge of network capabilities. The access seeker should have information before, during and following the signing of an agreement on LLU. An access seeker should be provided with, on request, an adequate, timely, updated list of information (preferably electronically), during and after the negotiations with the notified operator (more details on this information included in annex 2).

Operators should inform the NRA of any change in the Reference Offer. Furthermore, on request of the NRA, the notified operator should make available all information needed to supervise the non-discriminatory treatment of all operators and the effect on competition. This report on the ongoing LLU-process may include among others:

- sites where LLU is effectively available
- sites where LLU is in use and number of operators per site
- number of "unbundled" local loops and "shared" local loops per site
- number of notified operator's new lines and "shared" lines
- pending requests for sites and for lines

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2. On request, the access seekers should have sufficient information for making a possible business case.
3. Sufficiently detailed information should be provided (at the latest) at the beginning of the negotiation with the notified operator, possibly subject to conclusion of a confidentiality agreement.
4. After conclusion of the agreement for access to a specific MDF, the access seeker should have access to any relevant information for operating lines from that MDF.
5. The NRA should have access to all relevant information received by the access seekers and all other relevant information from all operators - both access seekers and the notified operator. The information should be made available upon request.

A 3 Technical conditions related to access and use of local loops, including the technical characteristics of the twisted metallic pair in the local loop

Technical conditions resulting in usage restrictions are dealt with in the next paragraph. Loop characteristics are included as relevant information in Annex 2. Moreover, the notified operator should supply the access seeker requesting a specific loop with any line test information in its possession. It is expected that the result of a line quality test from the exchange will be available in most cases.

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| <p>6. Ordering and provisioning procedures should follow the general principles of transparency and non-discrimination. Furthermore, requested services should be provisioned within a reasonable period of time.</p> |
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Usage restriction

Usage restrictions may follow from in-cable spectral management (and where relevant in-pair). In-cable spectral management is concerned with the allowable pollution on other uses of the access network. The development of spectral management may not lead to delays for introduction of LLU. Development of in-cable spectral management might take place in a latter phase, as introduction of LLU will not impose an immediate threat to network integrity, because of the limited broadband penetration at the start.

The notified operator should consult access seekers when developing a spectral management plan. If agreement cannot be reached within a reasonable period of time the NRA might force/take a decision. To keep interference on other users in a cable within acceptable levels, in-cable (and where relevant, in-pair) spectral management may lead to limitations on systems used, system reach, cable fill, system performance or power spectral density³. These limitations should be equally applied to all access seekers including the notified operator.

The development of new techniques and systems is progressing rapidly. International bodies like ETSI and ANSI are continuously working on new standards in this area. Therefore, in-cable spectral management (and where relevant in-pair) should be flexible and facilitate the introduction of new systems. These procedures worked out by the Member States should allow a speedy acceptance of systems (newly) recognised by international standardisation and compatible with existing masks allowed according to the agreed spectral management plan. Non-internationally standardised systems could be subjected to a more intensive procedure, including testing the effect on other systems.

In most countries some existing services are delivered with systems that might not comply with existing in-cable spectral management (and where relevant in-pair spectral management). Many notified operators argue that existing services must be guaranteed. This claim should not be automatically accepted.

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| <p>7. In-cable spectral management (and where relevant in-pair spectral management) may not lead to a delay of introduction of LLU.</p> <p>8. Development of in-cable spectral management (plan) is a joint responsibility of access seekers (including the notified operator). NRAs may facilitate the discussion and may force decisions if access seekers cannot reach agreement within a reasonable period of time.⁴</p> |
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³ See also ETP recommendations on LLU: provisioning and O&M issues, June 2000

⁴ ICP prefers the following version of PIB8: "Although access seekers might be involved in the development of in-cable spectral management (plan), this is a primary responsibility of the notified operator. NRAs may facilitate the discussion and may take steps to ensure that a spectral management plan is developed within a reasonable period of time".

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| <ol style="list-style-type: none">9. Limitations as a result of in cable spectral management must apply equally to all access seekers.10. In-cable spectral management should include clear procedures for allowing new systems/masks.11. Existing deployment should not automatically be given protective status. |
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B. Collocation services

B 5 Information on the notified operators relevant sites:

In annex 2, information on the notified operator's relevant sites is specified under information on request.

B 6 Collocation options at the sites indicated under point B5.

The provision of collocation facilities can be seen as one of the most vexed issues surrounding the implementation of LLU. The detailed implementation of collocation products will determine whether or not new entry barriers are created, or further competition is established in the access market. There is a need to establish a wide range of collocation products thereby enabling the access seekers to implement their business plans relatively free of the provision of services by the notified operator. The variety of products will also allow the development of competition in the wholesale market for collocation products and services bringing competitive pressure on the availability and prices set by the notified operator. It should be ensured that existing arrangements for the hand-off of traffic are enhanced by new collocation products and services and not compromised.

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| <ol style="list-style-type: none">12. Negotiation and contracts should be used to cover the provision of collocation space and other issues such as access and liability13. There should be at least three forms of collocation products, physical, distant (or adjacent) and, where appropriate, managed (or virtual) collocation14. The provision of collocation products should not impair the provision or development for existing products for the hand over of traffic between networks, for example existing interconnection arrangements |
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B 7 Equipment characteristics: restrictions, if any, on equipment that can be collocated

Local loop unbundling (LLU) means that the alternative operator can rent the local loop, and will consequently choose its preferred (xDSL) systems to deliver services. As some xDSL systems are not compatible, it is generally accepted that significant use of broadband techniques in the access network increases the potential for interference (cross talk). The choice of systems might be limited on the basis of in-cable spectral management, as discussed under A 4 usage restrictions.

B 8 Security issues: measures put in place by notified operators to ensure the security of their locations

Arrangements between access seekers and the notified operator should be clear in terms of accreditation of staff, contractors, liability for health and safety etc. It should be ensured that the product definitions of collocation space do not by definition add additional costs and constraints to the provision of services as seen by the access seekers, eg the definition of useable space as being within the equipment room necessarily adds complexities in terms of access and security although may reduce issues in terms of building services.

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15. The definition and provision of collocation products should not create complexities in other areas, such as access and security, health and safety

B 9 Access conditions for staff of competitive operators

The notified operator should endeavour to provide unescorted access options to the collocation facilities located in its MDF Sites (or equivalent distribution point closer to the customer premises). However, there may be special circumstances where such access cannot be provided, in which case the notified operator should provide escorted access services that meet reasonable demand (including access at short notice to repair faults).

PIB

16. The notified operator should endeavour to provide unescorted access options to the collocation facilities that meet reasonable demand

B 10 Safety standards

Technical standards surrounding collocation should ensure safe operation without allowing 'gold plating' of collocation spaces by the notified operator via high demands on equipment or building services.

PIB

17. Technical standards surrounding collocation space should be set in terms of a minimum requirement acceptable to access seekers and that conforms to appropriate legislation, such as health and safety

B 11 Rules for the allocation of space where collocation space is limited

The allocation of limited collocation space will be very contentious as well as the initial rollout of the exchanges capable of housing collocation equipment. Undoubtedly some access seekers will not gain access to the facilities they demand. The industry needs to devise a allocation method which is inclusive of the needs of all operators. The efficient use of collocation space should be ensured ,amongst others, by encouraging collaboration between access seekers in the initial phase of the product rollout. Secondary trading still needs to be reviewed as there might be problems with windfall profits or legal issues.

PIB

18. Preferably collocation space should be allocated on the basis of a clearly defined set of principles, agreed by the industry subject to a "use or lose clause". The allocation system needs to take into account the diverse needs of customers and access seekers and be acceptable for the NRA

19. The sharing of collocation space should be possible

B 12 Conditions for beneficiaries to inspect the locations at which physical collocation is available, or sites where collocation has been refused on grounds of lack of capacity

The definition of useable space will be contentious but should at a minimum exclude all redundant and obsolete equipment This principle recognises that the burden of proof in terms of the non-availability should fall on the notified operator and not on the access seeker.

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20. Burden of proof of the unavailability of space, including the MDF, should fall on the notified operator

C Information systems

C 13. Conditions for access to notified operator's operational support systems (OSS), information systems or databases for pre-ordering, provisioning, ordering, maintenance and repair requests and billing

The notified operator should make available access to its OSS for ordering, maintenance and repair, and Billing purposes as these represent ancillary services necessary for the use of the services listed in annex 1.

Access to the notified operator's OSS should be granted to all access seekers on fair and non-discriminatory terms. In order to permit access, the notified operator will provide technical specifications concerning an interface between its own and the access seekers' information systems.

Maintenance and quality objectives of cables should be the same, whether the cable is used exclusively by the notified operator or shared with other access seekers. All changes in the network affecting the products and service of access seekers sharing the unbundled local loop should be notified in advance making it possible to the access seeker to react.

The physical line as offered in the LLU context remains under the ownership and responsibility of the notified operator. Notified operators should inform on equal basis end users and other access seekers about maintenance issues and not in advance to end users.

A minimum level of performance (service level) should define a maximum repair time applied by the notified operator. If the notified operator offers special performance to end users (VIPs) access seekers must also be able to make use of these special conditions. These different levels of service could be negotiated between the notified operator and access seekers.

Each operator should be required to inform its end users connected by an LLU on the fault notification procedure and the limitations of responsibilities for the offered services.

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21. Access to the notified operator's OSS where necessary for LLU purposes, should be granted to all access seekers on fair and non-discriminatory terms

22. Maintenance, provisioning, ordering and repair of unbundled local loops should follow the non-discrimination principle

23. The end user should be made aware of clear procedures for fault reporting and cancelling

D Supply Conditions

D 14. Lead-time for responding to requests for supply of services and facilities; service level agreements; fault resolution; escalation procedures and quality of service parameters

As discussed in A4, requested products and services should be provisioned within a reasonable period of time. Nevertheless there may be circumstances in which external factors may delay the provisioning process, and that there may also be exceptional cases which lead to longer provision times. In these circumstances the notified operator would be expected to give timely and reasonable justification for the delay to the requesting access seeker, together with a binding date by which the service will be provided. It should be recognised that for the provision of services to end users the time frames adopted for provisioning of individual wholesale LLU products are interdependent. The timely provisioning of a wholesale service is a necessary, but not sufficient, condition for market development.

Furthermore, it should be ensured that, for example the terms and conditions established for access to collocation sites for repair faults are not worse than the service level agreement (SLA) given to an end user.

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24. If circumstances lead to delays in provisioning of services, the notified operator should give a valid justification and a binding date by which the service will be provided
25. Individual wholesale LLU services should be provided in a reasonable time period in conjunction with the full range of LLU products and services
26. In terms of quality of services the SLAs offered in the wholesale market should not worsen the SLAs offered in the retail market
27. The services offered by the notified operator should be offered on a non-discriminatory basis both in terms of service definitions, quality and prices

D 15 Standard contract terms, including, where appropriate, compensation provided for failure to meet lead times

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D 16 Prices or pricing formulae for each feature, function and facility listed above

The price– the sound economic signal – should provide the basis for a make or buy decision for access seekers. Therefore, only costs of efficient service provisioning should be taken into account. Of course common and joint costs have to be catered for and appropriate cost of capital has to be taken into account. The principle on cost-orientation prevails that costs are only to be recovered once. Also the principle for cost-orientation should be applied to all LLU services and products. Care must be taken in order that the accounting approach adopted is not misleading, or create distortions in the market for example because it depends on accounting rules for the valuation of ducts, trenches, copper and buildings.

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28. The principle of cost orientation prevails,
29. Costs are only to be recovered once.

Monthly rental fee for the LLU

The general principle of cost orientation should apply when dealing with the monthly rent for the LLU. No costing methodology is prescribed, but an international benchmark for all LLU services will be developed and updated. The benchmark will include monthly rental fees for end user line-rental, although the fact that the end user line-rental is reported under cost in some countries makes a direct comparison with the monthly rental fee for the LLU difficult.

Geographic averaging of the rental fee may not reflect the underlying cost in a specific wire area (MDF area). But on a nation-wide averaged basis they give the right incentive for sustainable competition. Therefore averaged line rentals are the preferred approach for pricing the LLU, if good reasons are provided and all implications considered there is also scope for de-averaged loop rates.

The preferred approach for calculating the one-off costs involved by line testing, and handing over the loop to the access seeker's distribution frame is an average per-line basis

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| <p>30. Geographically averaged rentals are the preferred approach for pricing LLU.</p> <p>31. The preferred approach for calculating the one-off costs involved by line testing, and handing over the loop to the access seeker's distribution frame is an average per-line basis</p> |
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Collocation costs

Up front collocation costs incurred for setting up collocation facilities might vary largely with the situation at the different sites. The notified operator should be allowed to pass on the costs incurred for the additional (construction and adaptation) work needed to access seeker.

It is furthermore advisable that the access seeker has the possibility to check the costs of the proposed construction work beforehand. Therefore the notified operator should give a formal, detailed, offer which can be checked by the access seeker in order to ensure that the costs of setting up collocation are minimised. The burden of proof of cost-orientation should be on the notified operator as in standard business practice.

Bearing in mind that regulation is a substitute for non-fully competitive markets there is no need to regulate in areas where a competitive market already exists. As in most member states a market exists for renting space a preferred approach is to set the monthly rates at a market price level. Of course the notified operator has to apply these same „transfer prices“ internally, as otherwise cross-subsidisation might occur, which eventually results in a prize-squeeze. Where no reliable data (index) for rentals are available a non-discriminatory pricing mechanism has to be set up.

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| <p>32. Up front collocation costs might be passed on to access seeker, but the burden of proof of cost orientation is on the notified operator as in standard business practice</p> <p>33. Access seekers should be able to choose the preferred type of collocation on economic grounds</p> <p>34. Market price level is the preferred approach for setting monthly rental charges for collocation space on a non-discriminatory and efficient basis</p> |
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Miscellaneous costs

PIB

35. Costs of agreed in-cable spectral management should be shared by all involved access seekers (including the notified operator) on a non-discriminatory and efficient basis
36. The costs of MDF extension, as long as on a non-discriminatory and efficient basis , might also be shared by all involved access seekers (including the notified operator).

ANNEX 1 List of services to be provided

Metallic Path Facilities

Provision and maintenance of a metallic twisted pair extending between the end user Network terminating Point (NTP) and the serving Main Distribution Frame (MDF) or equivalent distribution point closer to the customer premises. It includes any metallic pair that can be provisioned in accordance with a minimum set of technical standards. The regulation makes clear that the obligation to provide unbundled access to the local loop does not imply that notified operators should install entirely new local network infrastructure, for example extending its network to a new neighbourhood for the purposes of supplying unbundled loops. However, the unbundled local loop does not necessarily have to be the existing customer's telephone line, spare pairs can be used, where a connection is or can be made available. More generally, the access seeker should be able to request and be supplied with a loop, even when this requires the establishment of parts of a new local loop within the existing infrastructure.

Collocation service

In order for an access seeker to provide service over an unbundled loop, a collocation facility will be needed. Moreover there are a number of other services needed to support collocation and these will vary depending on the form of collocation an access seeker chooses to adopt.

- i) **Collocation** access seekers should have the option to choose from three different forms of collocation:
 - (a) *Physical collocation* - where an access seeker can request space to locate its equipment within the notified operator local Main Distribution Frame (MDF) site or equivalent distribution point closer to the customer premises, either in the building containing the MDF or in other space that could be made available in the site (such as adjacent buildings, car parks or warehouses). This space can either be shared with other access seekers or be in a separate room, depending on the requirements of the requesting access seeker and the availability of suitable space.
 - (b) *Distant or adjacent collocation* - where an access seeker can choose to use its own premises and connect to the notified operator's local MDF site or equivalent distribution point closer to the customer premises.
 - (c) *Managed (or virtual) collocation* - where the notified operator houses, owns and runs equipment located in its premises at the MDF site or equivalent distribution point closer to the customer premises on behalf of the access seeker.
- ii) **Hand-over Distribution Frame (HDF)** – A HDF will be needed to terminate the tie cables which extend the local loop from the MDF or equivalent distribution point closer to the customer premises to the access seekers' collocation space. The access seekers should be given the possibility to choose either to self provide the HDF or to request the notified operator to supply it.
- iii) **Tie Cables** - Tie cables, consisting of metallic twisted pairs, should be provided between the MDF and the HDF. When the access seeker is physically co-located with the notified operator the tie cable will remain inside the notified operator's building (internal). Whereas, when the access seeker is employing distant or adjacent collocation the tie cables will need to connect the MDF site and the access seekers premises. In this case the access seeker will need a tie cable which runs inside the notified operator's building (internal) and a tie cable that runs outside the notified operator's building (external). Therefore the notified operator should supply:
 - a) *Internal Tie Cable* - Provision, including testing, termination and maintenance of a metallic twisted pair between the MDF and the HDF (if the access seeker is physically co-locating) or

- between the MDF and the notified operator's joint in cable chamber (if the access seeker is employing distant or adjacent collocation).
- b) *External Tie Cable* - Provision, including testing, termination and maintenance of a metallic twisted pair between the notified operator's joint in cable chamber and the HDF in the access seeker's Distant Collocation space (if the access seeker is employing distant or adjacent collocation). The access seekers should have the option to self provide the external tie-cable.
 - iv) **Access seeker's External Tie Cable Pull-Through Service** – The access seekers who wish to employ distant or adjacent collocation should have to option of self-providing the external tie cable. In this case the notified operator should provide a cable pull through service from a defined Footway Box adjacent to the MDF Site or equivalent distribution point closer to the customer premises, so that the access seeker's cable can be drawn into the MDF site or equivalent distribution point closer to the customer premises and subsequently connected to the MDF, either directly or by the use of internal extensions. This service should include co-operative end to end metallic circuit testing and labelling.
 - v) **Power** – For physical collocation the access seekers should have the choice of being supplied power by the notified operator or arranging their own power feed from a power company. If the notified operator is to provide the power then the access seekers will need to negotiate whether this will be AC and/or DC and whether it is generator and/or battery backed-up.
 - vi) **Air conditioning/chilling/heating** as relevant
 - vii) **Access to collocation space at MDF site** - the notified operator should endeavour to provide unescorted access options to the collocation facilities located in its MDF Sites or equivalent distribution point closer to the customer premises. However, there may be special circumstances where such access cannot be provided, in which case the notified operator should provided escorted access services that meet reasonable demand (including access at short notice to repair faults).
 - viii) **Equipment moving assistance** - where lifting/hosting apparatus is needed.

Transmission and backhaul Services

The access seekers will need to connect the equipment in their collocation space to their core networks (a process referred to as backhaul). The access seekers should be able to either request backhaul from the notified operator or to provide their own backhaul. In the latter case, the notified operator should provide a pull-through and routing service to enable the access seekers fibre to reach its collocation space. The notified operator should also provide access to its duct space. The access seekers may also wish to choose an alternative supplier to the notified operator for backhaul and, if this supplier co-locates in the same site, they should be able to make the connection within the collocation site.

Figure 1 shows the configurations that can be used to connect the end user to the HDF in either the Operator collocation space or own premises.

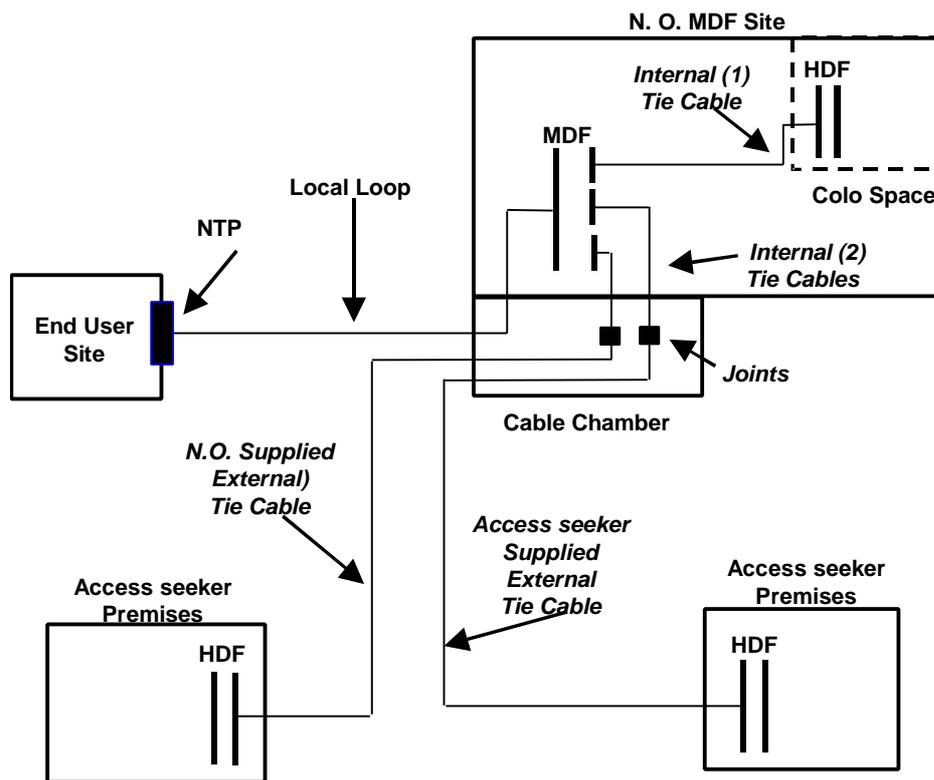


Figure 1: Schematic Diagram of some of the services

Shared access

The additional services required to provide shared access vary depending on how this is implemented. There are two basic possible technical configurations:

1. the notified operator separates the frequencies for voice telephony and those for higher-bandwidth services, and then leases to an access seeker the higher frequency portion of the loop; or
2. the access seeker separates the frequencies and hands back to the notified operator the frequencies for voice telephony.

Under Option 1 the notified operator should provide:

- i. **Splitter**- Provision and maintenance of a splitter at the customer's premises, matching the one the notified operator uses to separate the frequencies at the exchange site.

Under Option 2 the notified operator should provide:

- i. **Internal tie-cable 2** – Provision, including testing, termination and maintenance of a metallic twisted pair between the access seeker's HDF and the MDF, necessary to represent the streamed-off PSTN calls.

There may be a concern that, under Option 2, an access seeker might install splitters that interfere with the voice telephony supplied by the notified operator on the shared line, and thereby degrade the quality of the notified operator's voice telephony services. This problem should be overcome through the specification of a set of the criteria that all splitters would need to meet. The access seekers would have to prove that their equipment is compliant with these criteria before deploying it.

ANNEX 2 Information

Information on request

The basic information on the cabling system could cover:

- list and/or map of MDFs⁵ including:
- postcode coverage or postcode to MDF mapping, or equivalent
- total number of usable loops and number of loops in use
- Data on known disturbers per MDF and per cable
- line length distribution per MDF (weighted average distribution)
- general information concerning cable characteristics including typical type and quality of cable (e.g. diameter, results from quality tests that have been conducted, number of lines, technical interference control and spectral management plan)
- Statistical information about the network, e.g. loop characteristics
- standard spectrum masks and/or list of approved systems
- availability of collocation space and type⁶
- power availability
- MDF space availability
- collocation features available (air conditioning, uninterruptable power supply, security, ...) - (yes/no list, no details required at this stage)

Information during the negotiations could cover:

b) Detailed information on the cabling system:

- latest update of information
- in addition per MDF where the access seeker wants to have access:
- location (physical address information) associated with the MDFs and the name of the associated local switch and/or number ranges associated with MDFs (whatever is nationally relevant)
- exact customer coverage of each MDF if a unique mapping to postcodes or streets is not possible (e.g. overlapping MDF regions)
- detailed information concerning loop characteristics, any known limitations or incompatibilities
- results of any xDSL tests
- any foreseeable limitations on space for MDF-extensions
- detailed description of procedures and conditions relating to LLU

c) MDF-access

- Type of access proposed by notified operator, either
- directly on the MDF, or
- in-house on HDF⁷ (distance, cable type and size (number of pairs)) or
- outside (remote) on HDF (distance, cable type and size (number of pairs))
- cable entry points and capacity available

⁵ MDF is used as generic term for the most far copper distributor seen from the customer site; it is not relevant whether the MDF is close to a switch, a remote concentrator (RDLU) or Optical Network Unit (ONU).

⁶ collocation type could refer to "in house -ready available", "in-house - to be created", "out-door - land available", "unavailable on notified operator's premises"

⁷ Handover Distribution Frame

d) Collocation

- availability of collocation space and type, detailed drawings if space has to be set-up by the access seekers
- collocation features available (air conditioning, uninterruptable power supply, security, ...), technical constraints, terms and conditions of use
- access conditions to the facilities

e) Reference Offer

- a site-specific costs, terms or conditions

Information to be provided after conclusion of the agreement for access to a specific MDF could cover:

- Any foreseeable changes to the above mentioned items should be announced at the latest 6 months before the change will occur. Changes involving civil work should be announced even earlier, with respect of locally relevant authorisation procedures and delays for undertaking such civil work.
- Unforeseeable changes should be notified immediately as the need for the change occurs.
- On request: Line-Quality test results of a specified local loop serving an identified subscriber. If no test has been done so far on that line, the notified operator should make the test and provide the result. Costs may be charged to the access seeker