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Service aspects of charging, billing and accounting**

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Foreword

This ETSI Technical Report (ETR) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI).

ETRs are informative documents resulting from ETSI studies which are not appropriate for European Telecommunication Standard (ETS) or Interim European Telecommunication Standard (I-ETS) status. An ETR may be used to publish material which is either of an informative nature, relating to the use or the application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or an I-ETS.

This ETR gives service requirements on the charging and billing mechanism involved with the Universal Personal Telecommunication (UPT) service, and the necessary information transfer required between UPT service providers and network operators.

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1 Scope

This ETSI Technical Report (ETR) gives service requirements on the charging and billing mechanism involved with the Universal Personal Telecommunication (UPT) service, and the necessary information transfer required between UPT service providers and network operators. It also specifies the principles for international accounting. Detailed realisation of these mechanisms are specified in other specifications.

NOTE: This ETR concerns a restricted UPT service. The restrictions relative to the long-term objectives are summarised in ETR 214 [1].

2 References

This ETR incorporates by dated and undated reference, provisions from other publications. These references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETR only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] ETR 214: "Universal Personal Telecommunication (UPT); Service requirements on UPT numbering, addressing and identification; Phase 1 - restricted phase".

3 Abbreviations

For the purposes of this ETR, the following abbreviations apply:

DTMF	Dual Tone Multi-Frequency
ISDN	Integrated Services Digital Network
PIN	Personal Identification Number
PSTN	Public Switched Telephone Network
PUI	Personal User Identity
TAC	Transaction Authentication Code
UPT	Universal Personal Telecommunication

4 Charging and billing principles

4.1 Charging

A UPT subscriber associated to a UPT user shall be charged on the basis of a unique user identification. The UPT subscriber's charging account shall be associated with the UPT user's UPT number.

The basic structure of the UPT charging model shall, whenever possible, be consistent with those of the services offered by the serving networks, i.e. when using the services without a UPT number. However, the UPT subscriber associated to a UPT user shall be offered various options to select the charging model which best suits his needs.

The following types of charges may in principle apply to UPT:

- a) subscription related charges;
- b) subscription management related charges;
- c) location related charges.

Under no circumstances a UPT subscriber should be exposed to double charging due to a UPT service access performed by a UPT user or an incoming call received by a UPT user.

4.1.1 Subscription related charges

The UPT service provider may charge the UPT subscriber a fixed amount related to the UPT subscription alone, e.g. a fixed amount per month. These charges are not related to any UPT procedures, and are to be decided by the UPT service provider or by appropriate national authorities.

4.1.2 Subscription management related charges

The UPT service provider may charge the UPT subscriber for service management related actions, i.e. actions that a UPT user performs to modify the information included in the service profile by means of service profile management procedures. These charges may either occur as a fixed amount related to the UPT subscription alone, e.g. a fixed amount per month, or on a per action basis. These charges are to be decided by the UPT service provider or by appropriate national authorities.

4.1.3 Location related charges

4.1.3.1 Introduction

Location related charges are charges related to the actual locations of the communicating parties. These charges are not related to the use of any UPT procedures, and are to be decided by the UPT service provider or by appropriate national authorities. In principle, these could depend on various factors, like:

- the calling and called users locations;
- the time of the day;
- the duration of the communication;
- etc.

Concerning the calling and the called users locations, the tariffs used by a given UPT service providers can generally be split into 3 parts, originating from:

- 1) the originating access network;
- 2) the intermediate transit network;
- 3) the terminating access network,

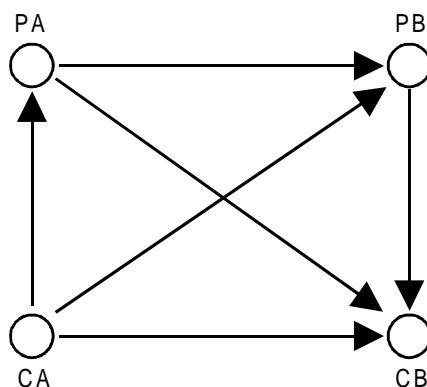
which, in the general case, all must be assumed operated by different network operators, and there are internationally agreed methods to deal with this.

The tariff parts coming from the originating and terminating access networks may also depend on the type of access used.

The UPT service provider must have a mutual agreement with other service providers and network operators. However, from the UPT service providers' point of view, the following factors could also have impact on the location related charges applied.

- if the A-user and/or B-user are UPT users or non-UPT users;
- if UPT user A and/or B are at their permanent location or not.

This mobility aspect is illustrated in figure 1.



CA, CB = Current location of UPT users A and B.
PA, PB = Permanent location of UPT users A and B,
or location of non-UPT users A and B.

Figure 1: Possible routes as a basis for location oriented charges

In principle, location related charging can be based on the connection CA -> CB or split into parts in several ways as follows:

- a) (CA -> PA) + (PA -> PB) + (PB -> CB)
- b) (CA -> PB) + (PB -> CB)
- c) (CA -> PA) + (PA -> CB)

Any part of these charges, or all charges, can in principle be applied to user A, B, or even to a third party, and on a permanent basis.

4.1.3.2 Possible solution

In the PSTN today, the party charged for the communication is generally the calling party (the A-subscriber). In the pan-European public land mobile network (i.e. GSM), the calling party and called party (the B-subscriber) have split charging, where the calling party is charged for the part of the communication up to the called party's home location, while the called party is charged for the roaming part of the connection.

In a UPT environment, it is reasonable to assume the following from the user's point of view:

- the calling party should generally be willing to be charged for outgoing calls, provided he can approximately predict the cost of the call;
- also the called party would like to know approximately the cost of receiving calls;
- the UPT subscriber associated with the called UPT user may be willing to be charged for receiving calls when the UPT user is temporarily away from his home location. However, on the other hand, he may not want to be charged for receiving calls if he is rather permanently at a location other than his home location;
- if the cost for the call will be more than expected, then an announcement indicating this should be given;
- the network solutions for UPT are generally invisible to the users, whether called party or calling party. The calling party knows a-priori only his own physical location and the UPT number of the called party. The called UPT user knows a-priori his physical permanent location and his current physical location;

- neither the calling nor the UPT subscriber associated with the called UPT user would like to be charged with long-distance charges for a call that a-posteriori has been identified as a short-distance or local call because of roaming.

4.1.3.2.1 Default charging

Split charging: the charging of a UPT call should be based on what is known to the users, whether calling party or called party. Hence, the charging of a UPT call should generally be split between the called party and the calling party as follows:

- the calling party is at the maximum charged for the part of the call from his own physical location to the home location of the called subscriber;
- the UPT subscriber associated with the called UPT user is at the maximum charged for the part of the call from the UPT user's home location to his current location. The current location is the location at which the call is received, and the home location the location on which split charging is based;
- if the cost for the call will be more than expected, then an announcement indicating this should be given;

NOTE: The home location and current location of the UPT user are not to be understood as unique locations like e.g. specific terminal accesses, but as certain geographical areas.

- when the current location of the called UPT user is significantly closer to the physical location of the calling subscriber than the called UPT user's home location, so that the charges for the calling subscriber would be significantly lower when based on the current location of the called UPT user, then the calling subscriber should be charged for the whole connection from his own physical location to the called UPT user's current location, and the UPT subscriber associated to the called UPT user should not be charged at all.

The location related charging principle indicated above applies generally to a UPT subscriber associated with a called UPT user, irrespective of whether or not the calling party is a UPT user. The home and current locations of the called UPT user and the physical location of the calling subscriber are indicated in figure 2.

4.1.3.2.2 Other charges

If the called party is a non-UPT user, the charging principle would then be as in the network used, irrespective of whether or not the calling party is a UPT user, and is irrelevant to the UPT service.

If the originating network does not support UPT and therefore a UPT incoming call implies a leg to the home country of the called subscriber, then the charges for that leg will be applied to the calling party while the remaining part of the charges will be applied to the UPT subscriber.

4.1.4 Supplementary/additional charges

Specific charges may be levied for UPT features and UPT supplementary services. These may be charged on a subscription basis and/or on an invocation basis.

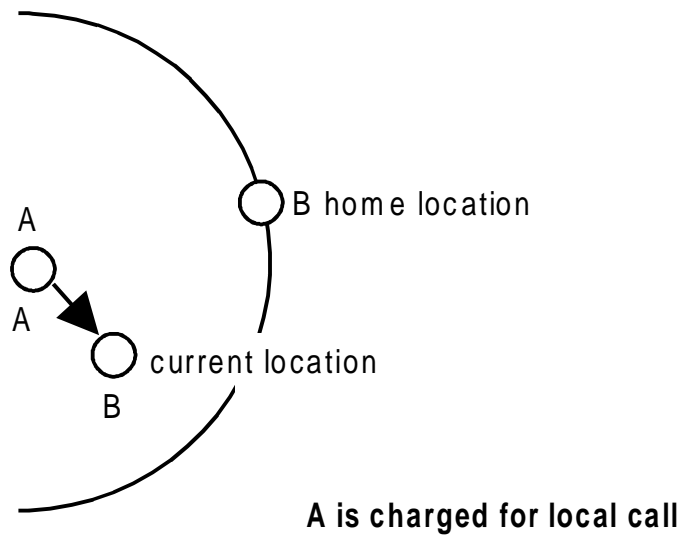


Figure 2: Location related charging (case 1)

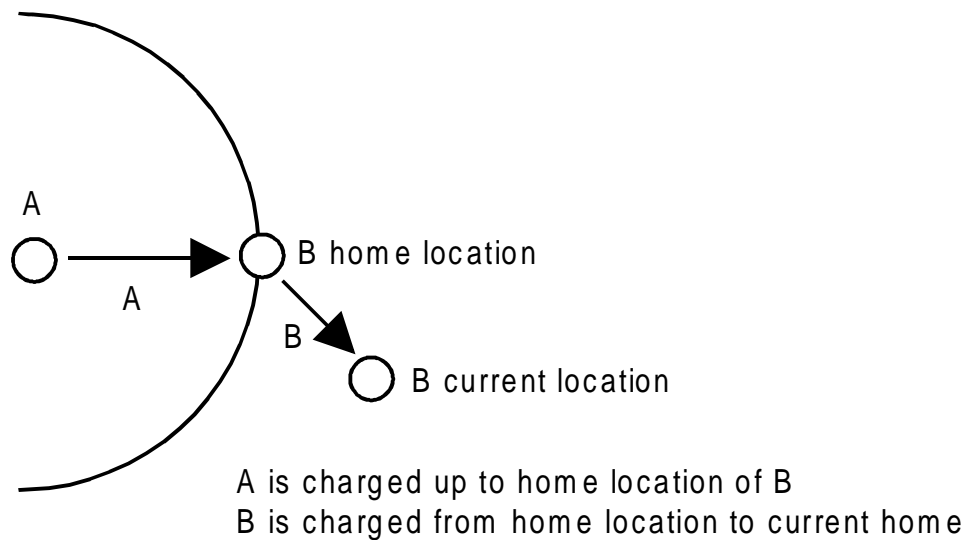


Figure 3: Location related charging (case 2)

4.2 Billing

The UPT subscriber associated to a UPT user shall only have to receive bills from one source per UPT subscription, normally from his UPT service provider.

5 Accounting and operational aspects

5.1 General requirements

International UPT traffic may be originated and terminated in any national network with UPT capabilities. The UPT-subscriber will, however, only need to deal with his home UPT service provider.

5.1.1 General principles

The routing of the UPT traffic shall always follow the regular international routes between the fixed networks in the countries concerned. The existing international accounting principles are applicable between these fixed networks.

The existing international accounting principles shall not be effected by UPT introduction. A UPT service provider will have to establish agreements with national network operators supporting UPT in the home country. In addition UPT service providers may have to establish agreements with network operators supporting UPT and UPT service providers in countries of interest for roaming.

5.1.2 Inter-operator requirements

Special inter-operator relations are required in a multi-network operation and possibly multi UPT service provider environment.

The agreements between a UPT service provider and network operators supporting UPT must contain regulations related to accounting and billing. It shall be necessary to establish an international transfer account procedure and billing information to be exchanged between different operators and UPT service providers.

5.1.3 Subscription related requirements

It must be assumed that UPT users will want to roam outside areas covered by their home UPT service providers. UPT subscribers associated with such UPT users must apply to their home UPT service provider for a UPT subscription containing the necessary entitlements to make use of the UPT service in the requested geographical area.

The home UPT service provider shall then at subscription time issue an admission to the UPT subscriber to utilise the transferred account procedure. This transfer account procedure will be based on a UPT number issued by the home UPT service provider.

5.2 Transfer of charging information between operators

5.2.1 General

The transferred account procedure and billing information shall be applied to all telecommunication services which are available in the actual network supporting UPT.

The UPT service providers and network operators may also agree on different procedures for notification and payment on a bilateral or multilateral basis.

5.2.2 Exchange of transferred accounts and billing

The operator of networks supporting UPT must regularly (X times a month) prepare a transfer account and billing information for each UPT service provider with whom he has an agreement. The network operator must at least prepare an agreed minimum of information relevant to the transfer account.

The transfer must include all calls up to a fixed point in time prior to the date of transfer.

All transferred information must be retained for a minimum of x months by the network operator. At request by a UPT service provider this information may be made available.

5.2.3 Network operator identification

For transfer of billing information, the network operators supporting UPT must provide a minimum of network operator specific data, including:

- 1) name of network operator;
- 2) address for correspondence related to operation of the transferred account and billing procedure;
- 3) availability of telecommunication services for the UPT-subscribers;
- 4) any special observations or instructions.

5.2.4 Accounting format

The accounting format must contain an agreed minimum of information with:

- header and trailer of record;
- per call information:
 - originated calls;
 - terminated calls.

5.3 International accounting

5.3.1 General

To facilitate the international accounting between operators in different countries with different currencies, a common currency will be necessary. This currency may be a virtual currency.

5.3.2 The transferred account

UPT users will visit and use networks supporting UPT. The operators of visited networks shall create charging records as if the visiting subscribers were "home" subscribers. The prices should be regular prices of the visited networks.

The prices on the individual charging record shall be converted into the common currency for inclusion in the transfer account.

At regular intervals the charging records shall be made up into files (transfers) and transmitted by agreed standards to the home UPT service providers.

5.3.3 Inter-operator invoice

At regular intervals (monthly) the visited operators shall prepare an invoice, which should be billing for the transfers to the home UPT service providers.

If VAT is charged by visited operators, the home UPT service providers should be able to recover the VAT. To facilitate VAT recovery the invoice should be expressed in local currency of the country of visited operator.

5.3.4 Settlement

The home UPT service provider may settle the balance directly with the visited operator according to invoices.

History

Document history	
November 1995	First Edition