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ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE

Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

Tel.: +33 92 94 42 00 - Fax: +33 93 65 47 16

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Foreword

ETSI Technical Reports (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 application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or I-ETS.

This ETSI Technical Report (ETR) provides a general discussion on the interaction between Universal Personal Telecommunication (UPT) features and the features and supplementary services of the serving network. It also provides some guidelines on how to analyse the issues and required functionalities.

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1 Scope

This ETSI Technical Report (ETR) provides a general discussion on the interaction between Universal Personal Telecommunication (UPT) features and the features and supplementary services of the serving network. It also provides some guidelines on how to analyse the issues and required functionalities.

Specific issues and functionalities for the different UPT phases are discussed in the appropriate documents, for UPT phase 1 this is DTR/NA-71304 [1], an ETR is also planned for UPT phase 2.

2 References

The following reference is used within this ETR.

- [1] DTR/NA-71304: "Universal Personal Telecommunication (UPT) Phase 1: Network functionalities for feature interaction".

3 Abbreviations

For the purposes of this ETR, the following abbreviations are used.

CFU	Call Forwarding Unconditional
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
COLP	Connected Line identification Presentation
COLR	Connected Line identification Restriction
FPLMTS	Future Public Land Mobile Telecommunication Service
GSM	Global System for Mobile communications
ISDN	Integrated Services Digital Network
MCID	Malicious Call Identification
PLMN	Public Land Mobile Network
PSTN	Public Switched Telephone Network
UMTS	Universal Mobile Telecommunication System
UPT	Universal Personal Telecommunication

4 The feature interaction model

UPT, being a package of services, will have interactions with other services or service features.

These interactions can occur at the time of:

- 1) service/feature introduction in the network;
- 2) service/feature subscription;
- 3) service/feature invocation by the user;
- 4) service/feature operation.

It is also noted that interactions may occur, at least:

- a) among different features associated to the same UPT related service;
- b) between features associated to the UPT service for a given UPT subscriber and features associated with other services that the same subscriber may have invoked or subscribed to;
- c) between features associated to the UPT service for a given UPT subscriber and features associated with possible services related to the terminal/calling line onto which that subscriber is currently registered.

As a principle, in UPT, supplementary services should be independent of those offered by the serving network. Thus activation of a UPT supplementary service from a specific terminal should not affect, and should not be affected by, the supplementary services offered to, or activated by, the terminal by virtue of its association with its serving network.

5 Service subscription interactions

There are four scenarios that can be considered which illustrate terminal and UPT service subscription interactions. In each of these scenarios the replying of terminating exchanges, identified supports UPT.

5.1 A UPT user makes an outgoing call from a fixed or mobile terminal without prior registration

In accordance with current network operation, a call set-up request would be checked against the terminal-related services subscription. However, the UPT user will expect his/her service subscription ("service profile") to apply. Therefore, the serving exchange must be able to distinguish an outgoing call made by a UPT user, from an outgoing call made by a non-UPT user.

Furthermore, the exchange must be able to identify which UPT user is making the call, so that the user's specific services can be provided. Therefore, a UPT user identification/authentication process is also required. The UPT user should be able to make use of any service which is subscribed in the user's service profile with the exception of services which the serving¹⁾ exchange of the terminal is unable to support.

In addition, the services to which the terminal itself is subscribed should have no impact on the user's request. For example, the terminal may not be subscribed to abbreviated dialling but the UPT user may be subscribed. The exchange should accept an abbreviated number in a UPT call set-up request and use information in the UPT user's service profile to determine the full called number.

5.2 A UPT user registers to make multiple outgoing calls from a fixed terminal

The UPT user may want to make multiple outgoing calls without going through an identification/authentication process before each call. Therefore, UPT user registers so that the serving exchange will treat all subsequent outgoing calls as UPT calls from that user. Unlike the case given in subclause 5.1, the serving exchange must now "remember" who the user is in order to properly handle subsequent calls as UPT calls rather than as traditional terminal calls.

5.3 A UPT user registers to make multiple outgoing calls from a mobile terminal

This case is similar to the case given in subclause 5.2, as long as the mobile terminal is served by the same exchange (network) through which the user registered. However, if the mobile terminal moves to another area, existing mobile network procedures only provide the new serving exchange (network) with information about the terminal; the information associated with the UPT user registration is not provided.

¹⁾ The serving exchange serves the terminal.

Therefore, the new serving exchange will treat subsequent outgoing calls as terminal calls but the user will expect them to continue to be treated as UPT calls. This situation requires that either the user re-register or the previous serving exchange must be able to provide UPT user registration information to the new serving exchange. The latter alternative is preferable. However, the transfer of such information should ideally be done without changing existing mobile network procedures.

5.4 Incoming call to a UPT user registered at a fixed or mobile terminal

UPT users will expect their subscribed services to apply for both outgoing and incoming calls. Incoming calls to UPT users are made by the caller (UPT user or non-UPT user) dialling the user's UPT number. Information in the UPT user's service profile is used to determine the routing for the call.

However, if the call is routed in the traditional manner, the terminating exchange will not be able to distinguish a call made to the terminal from a call made to a UPT user at that terminal. Therefore, only the terminal-related services would be provided. For example, if the UPT user subscribes to call waiting but the terminal is not subscribed to call waiting, then call waiting would not be provided, but this is not what the UPT user would expect. Therefore, it must be possible for the terminating exchange to distinguish incoming UPT calls from non-UPT calls.

Furthermore, if more than one UPT user is associated with the same terminal, the terminating exchange must be able to distinguish the specific UPT user for which the call is intended, so that user's specific services are provided.

6 Methodology for identifying network functionalities for feature interaction

In order to define the UPT requirements for feature interaction for the given UPT implementation phases, the following procedure is recommended:

- identification of the UPT features that apply for the UPT phase considered;
- identification of the features and supplementary services of the serving network;
- analysis and mapping of the above features;
- identification of the feature interaction issues;
- identification of possible solutions;
- formulation of required (additional) functionalities.

7 UPT features

Two categories of UPT features have been identified:

- core UPT features, i.e. those features which are fundamental for the UPT service concept, and are considered essential for UPT provision;
- additional UPT features, i.e. those features which are additional to the fundamental UPT service concept. Additional UPT features may be considered essential or optional for UPT provision.

The core and additional UPT features that apply for the UPT implementation phase considered must be taken from the relevant ETRs.

8 Serving networks

The features and supplementary services of the serving networks that apply for the phase considered must be analysed. Examples of serving networks are:

- a) Public Switched Telephone Network (PSTN), the public telephony network;
- b) Integrated Services Digital Network (ISDN), with some restrictions in the initial UPT implementation phases;
- c) Public Land Mobile Networks (PLMNs):
 - mobile GSM;
 - UMTS; and
 - FPLMTS;
 will be considered;
 - analogue mobile networks do not need to be considered.

9 Feature interaction issues and solutions

A mapping is performed between the UPT features and the features and supplementary services of each serving network. Interactions are defined based on the analysis described in the preceding Clauses, and solutions proposed.

A sample of the mapping in case of ISDN is given in table 1.

Table 1: Interaction issues - ISDN (sample)

UPT features	Features/supplementary services of serving network						
	CLIP	CLIR	COLP	COLR	MCID	CFU	...
InCall registration						(1)	
Outgoing UPT call set-up							
OutCall registration							
AllCall registration							
Linked registration							
CLIP:	Calling Line Identification Presentation					CFU: Call Forwarding Unconditional	
CLIR:	Calling Line Identification Restriction					MCID: Malicious Call Identification	
COLP:	Connected Line identification Presentation						
COLR:	Connected Line identification Restriction						

As an example, the table indicates an interaction issue between the call forwarding unconditional supplementary service and InCall registration ((1) in table 1).

A conflict exists if a UPT subscriber registers for incoming calls on a terminal on which the call forwarding unconditional supplementary service has been invoked ((1) in table 1).

The following solutions have been identified to avoid counteraction of these features:

- InCall registration is not possible in this case;
- InCall registration overrides the call forwarding unconditional supplementary service. This solution requires the capability of distinguishing UPT calls from non-UPT calls and resulting additional actions.

History

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