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SERIES F: NON-TELEPHONE TELECOMMUNICATION
SERVICES

Universal personal telecommunication

**Universal personal telecommunication (UPT) –
Service description (service set 2)**

ITU-T Recommendation F.852

(Formerly CCITT Recommendation)

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**UNIVERSAL PERSONAL TELECOMMUNICATION (UPT) –
SERVICE DESCRIPTION (SERVICE SET 2)**

Summary

This Recommendation "Universal Personal Telecommunication (UPT) – Service Description (Service Set 2)" provides the service description and operational provisions for Universal Personal Telecommunication (UPT) – Basic UPT service scenario.

It describes the main principles of UPT, for example personal mobility, authentication and service profile management. It defines the UPT service aspects from the user's perspective (e.g. numbering and charging aspects). It also describes the essential features necessary to provide the UPT service, and the optional features, which may be used to support additional enhancements.

UPT Service Set 1 was a restricted scenario providing UPT service that supported provision of telephone service over PSTN, ISDN and PLMN networks. UPT Service Set 1 is incorporated in this Recommendation for UPT Service Set 2.

UPT Service Set 2 – The Basic UPT service scenario – incorporates more services and networks, moving towards full universal service availability, terminal independence and operation across multiple networks. In this scenario, for example, various data services may be provided in addition to telephone service as in Service Set 1.

Source

ITU-T Recommendation F.852 was prepared by ITU-T Study Group 2 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on 13 March 2000.

FOREWORD

ITU (International Telecommunication Union) is the United Nations Specialized Agency in the field of telecommunications. The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the ITU. The ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Recommendation F.852

UNIVERSAL PERSONAL TELECOMMUNICATION (UPT) – SERVICE DESCRIPTION (SERVICE SET 2)

(Geneva, 2000)

1 Scope

This Recommendation is intended to provide the service description and operational provisions for Universal Personal Telecommunication (UPT).

Following the principles laid down in Recommendation F.850, "Principles of UPT" and in Recommendation F.851 "Universal Personal Telecommunication (UPT) Service Description (Service Set 1)", this Recommendation provides the general service description (service description Service Set 2) from the point of view of the individual UPT subscriber or UPT user. It does not consider network implementation or regulatory issues.

F.851 was a restricted short-term UPT service scenario. Only the telephone service over PSTN, ISDN and PLMN was supported in this scenario.

F.852 defines the basic service scenario. It incorporates more services and networks, moving towards full universal service availability, terminal independence and operation across multiple networks. In this scenario for example various data services may be provided.

For the purpose of this Recommendation, the term UPT Service(s) describes the offering of a combination of network capabilities together with the appropriate user-network interface facilities which enable each UPT user to participate in a user-defined set of subscribed services. This offering may vary according to the scope of such capabilities that the service provider may wish to offer.

Definitions given in Recommendation F.851 are duplicated in Recommendation F.852.

1.1 General description

UPT introduces the concept of UPT number. In fixed telecommunication networks, a user or subscriber is associated with the network access point of the terminal, the point of attachment of the terminal. In certain mobile telecommunication networks, a user or subscriber is associated with the specific terminal in use.

In the UPT environment, the fixed association between terminal and user identification is removed. In order to offer users the capability of establishing and receiving calls on any terminal and at any location, the identification of UPT users is treated separately from the addressing of terminals and network access points. UPT user identification is achieved by means of a UPT number. The UPT user is therefore personally associated with his or her own UPT number, which is used as the basis for making and receiving calls. The UPT number is diallable on a global basis and routable from any fixed or mobile terminal, across multiple networks irrespective of geographical location, limited only by the terminal and network capabilities and any restrictions imposed by the network operator. The UPT user may be assigned one or more UPT numbers.

UPT also allows the UPT user to participate in a user-defined set of subscribed services, from amongst which the user defines personal requirements, to form a UPT service profile.

The following summary, of both short-term and long-term UPT objectives, includes:

- a) *UPT service profile*
A personalized UPT service profile which contains a list of services and facilities subscribed to by the UPT subscriber, and a range of options.
- b) *Personal numbering*
A UPT number, which uniquely identifies each UPT user and is used by the caller to reach that UPT user. A UPT user may have more than one UPT number for different applications (for example, a business UPT number for business calls and a private UPT number for private calls).
- c) *Personal charging*
Charging, which is associated with the UPT number rather than with any terminal or network used by the UPT user.
- d) *Simple billing*
Preferably, a UPT subscriber will only receive bills from one UPT service provider even though UPT facilities may have been used in different networks, in different countries and using different network operators.
- e) *Terminal independence*
Telecommunication services are provided to the UPT user, independent of the terminal used. The terminal, if capable of providing the services requested by the UPT user, will make them available to the UPT user.
- f) *Security and privacy*
The UPT user may use the UPT service with minimal risk of violated privacy or erroneous charging due to fraudulent use.
- g) *Automation of user interaction with the UPT service*
The UPT users may make use of means to facilitate and automate their interactions with the UPT service.
- h) *Access from multiple networks*
The UPT service may be used across multiple networks (e.g. PSTN, ISDN, PLMN, PDNs, etc.) using the same UPT number. The serving network, if capable of supporting the services requested by the UPT user, may make them available to the UPT user.
UPT may also operate over private networks if the private networks agree to UPT interworking with the public network.
- i) *Universal service availability*
In principle, any basic telecommunications service can be used with the UPT service. The services provided to the UPT user are only limited by the networks and terminals used.
- j) *Dynamic registration of terminal address*
The UPT user may dynamically and independently register with the terminal addresses at which he will make or receive calls. The registered terminal addresses may differ from service to service.
- k) *Subscription involving multiple UPT users*
One UPT subscriber may be responsible for more than one UPT user, each having a personal UPT number and an associated UPT service profile (e.g. a company having a set of employees).

l) *Privacy for third parties*

Third party users (e.g. terminal owners) will, in principle, not suffer in terms of privacy or freedom of actions as a result of UPT activities by UPT users.

Early implementations of UPT may not be able to realize all these objectives. Provision of UPT services is expected to commence with a simplified set of essential and optional UPT features and capabilities, which will evolve into more advanced scenarios. Evolution of UPT is described in 4.1.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; all users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published.

- ITU-T Recommendation D.280 (1995), *Principles for charging and billing, accounting and reimbursements for universal personal telecommunications*.
- ITU-T Recommendation E.164 (1997), *The international public telecommunication numbering plan*.
- ITU-T Recommendation E.168 (1999), *Application of E.164 numbering plan for UPT*.
- ITU-T Recommendation F.850 (1993), *Principles of Universal Personal Telecommunication (UPT)*.
- ITU-T Recommendation F.851 (1995), *Universal Personal Telecommunication (UPT) – Service description (service set 1)*.
- ITU-T Recommendation F.853 (1998), *Supplementary services in the Universal Personal Telecommunication (UPT) environment*.

3 Definitions and terminology

The following definitions of UPT terms used throughout this Recommendation are consistent with the abbreviated definitions in Recommendation I.114 "Vocabulary of Terms for Universal Personal Telecommunication".

3.1 authentication: A process by which the verification of the UPT user identity is accomplished.

3.2 call: In the UPT context, "call" is used to indicate telephony, data, facsimile, ISDN, B-ISDN, etc. calls.

3.3 charging reference location: The geographical location that may be used by the UPT service providers to determine the distance-related charges applying to the calling party and/or called UPT user.

3.4 identification: A process to identify the UPT user or the UPT service provider.

3.5 network limitations: The UPT-serving (or UPT-supporting) network should provide a UPT user with access to all services delineated in the UPT user's personal UPT service profile. However, the serving network may not be capable of providing, or may choose not to provide, all such services for reasons which may include coverage limitations, regulatory restrictions and domestic or international safety or other requirements.

3.6 personal mobility: The ability of a user to access telecommunication services at any terminal on the basis of a personal identifier [e.g. the UPT number or PUI (Personal User Identity)], and the capability of the network to provide those services delineated in the user's service profile. Personal mobility involves the network capability to locate the terminal associated with the user for the purposes of addressing, routing and charging of the UPT user's calls.

3.7 terminal address: A number used to identify a unique terminal or fixed network access point on a network.

3.8 terminal limitation: A UPT user accessing a network that is providing the full services of the UPT user's personal UPT service profile is only limited by the capabilities that the terminal attached to the network can support.

3.9 terminal mobility: The ability of the terminal to access telecommunication services from different locations while in motion, and the capability of the network to identify and locate that terminal.

3.10 Universal Personal Telecommunication (UPT): UPT enables access to telecommunication services while allowing personal mobility. It enables each UPT user to participate in a user-defined set of subscribed services and to initiate and receive calls on the basis of a personal, network-transparent UPT number across multiple networks on any fixed or mobile terminal, irrespective of geographical location, limited only by terminal and network capabilities and restrictions imposed by the network operator.

3.11 UPT Access Code (UPTAC): A code the UPT users may need to dial, when using certain terminals and networks, in order to enter the UPT environment before any UPT procedures can be carried out.

3.12 UPT environment: The environment within which the facilities of the UPT service are offered. It consists of combinations of networks and UPT service control facilities, which when combined, enable the UPT user to make use of the telecommunication services offered by these networks.

To the UPT user, the UPT environment appears as one global network which provides personal mobility. However, when making use of telecommunication services, the UPT user may be limited by restrictions imposed by the network, by the capabilities of the terminals and networks used, or by regulatory requirements.

3.13 UPT Number (UPTN): A number that uniquely identifies a UPT user; it is also used by a calling party to reach that UPT user. A UPT user may have more than one UPT number (for example, a business UPT number for business calls and a private UPT number for private calls).

3.14 UPT procedures: UPT procedures, as seen by the UPT user, are procedures that must be carried out in order to ensure that the UPT user is able to make or receive calls.

3.15 UPT service profile: The UPT service profile is a record containing all the information related to a UPT user in order to provide that user with the UPT service. Each UPT service profile is associated with a single UPT number.

3.16 UPT service profile management: The capability to access, interrogate and modify the UPT service profile.

3.17 UPT service provider: A service provider, to which a UPT user must subscribe for use of the facilities of UPT. The service provider will make the arrangements necessary for the provision of such facilities.

3.18 UPT subscriber: A person or legal entity having specifically subscribed to a UPT service provider for UPT services to be used by one or more UPT users. The subscriber defines, and may modify, the limits within which such users can modify their personal service profile. The subscriber is responsible for payment of the charges due to that service provider. The UPT subscriber may also be the UPT user.

3.19 UPT user: A person or entity having access to UPT services and having been assigned one or more UPT numbers. The UPT user may also be the UPT subscriber.

3.20 UPT user group: A specific set of UPT users.

3.21 UPT Access Number (UPTAN): An UPTAN is a number dialled by a UPT user to contact directly his service provider when using certain terminals and networks.

3.22 Personal User Identity (PUI): A PUI is an identity which unambiguously identifies the UPT user but is different from the UPT number although there is a one-to-one mapping between them. The PUI is an identity by which the UPT user is known to his UPT service provider, and by which the UPT user's service provider is known to other service providers and networks supporting UPT.

4 Basic considerations

4.1 Evolution of UPT

UPT is expected to materialize over a period of time and will experience an evolutionary path that is heavily impacted by evolving market needs and advances in technology. Provision of the UPT service will start with a simplified set of essential and optional UPT features and capabilities and progress into more advanced scenarios. Standardization of UPT may therefore be split into three general phases.

This Recommendation is devoted to the definition of UPT features and procedures for Service Set 2. Consequently, UPT Service Set 2 features and procedures specified in the remainder of this Recommendation are generally referred to as UPT features and UPT procedures.

4.1.1 UPT Service Set 1 – Restricted short-term UPT service scenario

In this scenario, available network capabilities may result in restrictions on the level of services, security and user-friendly features that can be offered. The restricted short-term UPT service scenario provides UPT service over the PSTN, ISDN and PLMN networks. Only the telephone service is supported in this scenario.

4.1.2 UPT Service Set 2 – Basic UPT service scenario

The basic UPT service scenario will incorporate more services and networks, moving towards full universal service availability, terminal independence and operation across multiple networks. In this scenario, for example, various data services may be provided.

4.1.3 UPT Service Set 3 – Enhanced UPT service scenario

The enhanced UPT service scenario is the long-term scenario. It is also likely that, in the future, several technological and market developments may give rise to evolutionary phases of the UPT service, which cannot be foreseen today.

4.2 Summary of UPT features

UPT Service Set 2 supports the following restricted set of features.

4.2.1 Services provided

Only the telephone service was envisaged for Service Set 1. For Service Set 2 also data services, telefax and video telephone services are considered.

4.2.2 Networks involved

All voice networks (e.g. PSTN, ISDN and PLMN) and Data networks.

4.2.3 Essential UPT features

- a) UPT user identification.
- b) UPT user identity authentication.
- c) InCall registration.
- d) Outgoing UPT call.
- e) InCall Delivery.
- f) Remote InCall registration.
- g) Outcall follow-on.
- h) Global follow-on.
- i) UPT service profile interrogation.
- j) UPT service profile modification.
- k) Access to Voice-Mail.

4.2.4 Optional UPT features

- a) OutCall registration.
- b) Remote OutCall registration.
- c) AllCall registration.
- d) Remote AllCall registration.
- e) Linked registration.
- f) Remote Linked registration.
- g) UPT-specific indications.
- h) Multiple Terminal Address registration (modified from F.851).
- i) Call Pick Up.
- j) Variable default InCall registration.
- k) Intended Recipient Identity Presentation.
- l) Access to groups of UPT service profiles.
- m) UPT service assistance.
- n) Called party specified secure answering of incoming UPT calls.
- o) UPT service provider authentication.
- p) Calling party specified secure answering of incoming UPT calls.
- q) Remote answering.
- r) Advanced addressing capability.
- s) Calling Party Message Presentation.
- t) Simultaneous Multiple UPT number InCall Registration.
- u) Choice of language for Announcements.

4.2.5 Numbering

UPT numbering is based on a personal UPT number which uniquely identifies the UPT user.

4.2.6 Charging

Location related charges are based on the caller's location and the current location of the called UPT user.

4.2.7 Service profiles

Personalized UPT service profile to enable UPT user and subscriber control and flexibility in the selection of the UPT user telecommunication services.

4.2.8 Third party protection mechanisms

- a) Essential mechanisms (see 6.7.3.1):
None identified.
- b) Optional mechanisms (see 6.7.3.2):
 - 1) exemption from any UPT usage;
 - 2) indications of UPT registrations (see 6.7.3.2.1);
 - 3) reset of registrations for incoming UPT calls (see 6.7.3.2.2);
 - 4) blocking/deblocking of registrations for incoming UPT calls (see 6.7.3.2.3);
 - 5) blocking/deblocking of incoming UPT calls (see 6.7.3.2.4);
 - 6) reset of registration for outgoing UPT calls (see 6.7.3.2.5);
 - 7) suspension of registration for outgoing UPT calls (see 6.7.3.2.6).

4.3 UPT user perspective

4.3.1 Quality of Service

In general, telecommunication services extended to UPT users via the UPT service should conform to the quality of service provisions for those telecommunication services. The transmission quality should not be influenced by the application of the UPT service. That is, the transmission quality perceived by the caller should be comparable to that obtained if the caller had dialled the number of the terminal at which the UPT call is answered. Other factors such as traffic, connection processing delay and availability may be affected by the UPT service resulting in the provision of different levels of quality to meet different end user needs.

In addition, a UPT user should in no way harm the visited network or degrade the quality of service of normal services.

4.3.2 Human factors

UPT facilities should be easy-to-use and consistent across terminal types and geographic and network boundaries so as not to deter the user from using the UPT service.

The UPT user should, therefore, not have to manually enter a large amount of information to use basic features. Similar procedures across service providers should be used for UPT access and authentication, and use of UPT procedures. Such similar procedures would simplify the UPT user interaction, reduce user errors and facilitate a degree of automation.

5 Definitions of UPT features

A summary list of UPT features is presented in 4.2. In this clause, definitions of essential and optional UPT features are provided. Additional information on UPT user identity authentication is provided in 6.5.3. Protection of third party mechanisms are specified in 6.7.3.

For the purposes of call registrations, it should be possible to register on different accesses or terminals, using the same UPT number, to support different telecommunications services.

5.1 essential UPT features: Essential UPT features are those features which are part of the basic operation of UPT and are therefore considered essential for UPT implementations. UPT enables the UPT user to use the following essential features.

5.1.1 UPT user identification: A feature by which the user identifies himself to the service providers as a specific UPT user. This allows after the authentication of the user, his connection to his service profile. For the identity, the user may use the PUI or the UPTN. The procedure is used only once at the connection of the user but is valid during all the session. Refer to 6.3 for additional information on identities.

5.1.2 UPT user identity authentication: A feature by which the UPT service provider verifies that the identity of the UPT user is the one claimed. It protects the UPT user and the UPT service provider against unauthorized and fraudulent use. This feature may be used in each UPT procedure. The authentication of the UPT user should not rely solely on something the UPT user possesses that could be used by a third party if stolen or lost. Refer to 6.5.3 "Authentication" for additional information.

5.1.3 InCall registration: A feature that enables the UPT user to register from the current terminal address for incoming calls to be presented to that terminal address. When registered, all incoming calls to the UPT number of the UPT user will be presented to the registered terminal address, for the duration specified by the UPT user (duration may also be specified in terms of number of incoming UPT calls), or until a specified deregistration time. A UPT user's InCall registration will cancel the previous InCall registration of that UPT user's UPT number. Several UPT users may register for incoming calls to the same terminal address simultaneously. The UPT user may also explicitly deregister for incoming calls.

5.1.4 outgoing UPT call: A feature by which the UPT user can initiate, from any terminal, an outgoing UPT call attempt. This feature requires the UPT user identity authentication feature for each outgoing UPT call attempt.

5.1.5 InCall delivery: A feature by which incoming calls are presented at the terminal address registered previously by InCall registration. This feature is invoked when originating parties or others call the UPT user.

5.1.6 remote InCall registration: A feature by which a UPT user registers from any terminal address for incoming calls to be presented to any specified terminal address.

5.1.7 OutCall follow-on: A feature by which the UPT user, when terminating an outgoing UPT call, indicates that another outgoing UPT call is to follow, without the need for further authentication or the use of the global follow-on feature.

5.1.8 global follow-on: A feature by which a UPT user, when terminating a UPT procedure (for which a successful authentication procedure has been carried out), indicates before disconnecting completely, a follow-on activity. This allows further UPT procedures without further authentication.

5.1.9 UPT service profile interrogation: This feature enables the UPT user to interrogate (read only) the current status of the UPT user's own UPT service profile (e.g. for location information, availability of services, etc.).

5.1.10 UPT service basic profile modification: This feature enables the UPT user to modify (read and write) the UPT user's own UPT service profile (e.g. for change of password, change of default UPT service profile parameters, etc.). This covers both essential and optional features if offered.

5.1.11 access to voicemail: This feature gives the UPT user a convenient way to access his voice mailbox using his UPT subscription. The user should be presented with the same choice in the UPT service access menu whether in his home network or in a visited network.

5.2 optional UPT features: Optional UPT features are additional UPT features that provide enhancements to the basic operation of the UPT service. UPT may enable access to the following optional features, limited by terminal and network capabilities and restrictions imposed by the network provider.

5.2.1 OutCall registration: A feature that enables the UPT user to register for outgoing calls from the current terminal address to allow outgoing calls to be made from that terminal address. When registered, upon accessing the UPT facilities, all outgoing UPT calls can be made from that terminal address for the duration specified by the UPT user (duration may also be specified in terms of number of outgoing UPT calls), or until a specified deregistration time. Outgoing UPT calls will be charged to the UPT subscriber.

Normally, the UPT user will not have to carry out any further authentication procedures in order to make outgoing calls. However, optionally a simplified authentication procedure may be used. A UPT user may register for outgoing calls to several terminal addresses simultaneously, but at any time only one UPT user/number may be registered for outgoing calls at the same terminal address. The UPT user may also explicitly deregister outgoing calls.

5.2.2 remote OutCall registration: A feature by which a UPT user registers, from any terminal address, for outgoing calls to be made from any other specified terminal address.

5.2.3 AllCall registration: This feature enables the UPT user to make an InCall registration and an OutCall registration to the same terminal address using one single procedure. The effect of an AllCall registration is as if InCall and OutCall registration had been carried out separately. The duration of the registration (duration may also be specified in terms of number of incoming and/or outgoing UPT calls), or a specified deregistration time may be specified by the UPT user. The UPT user may also explicitly deregister AllCall. Unlike Linked registration (see 5.2.5), the UPT user can explicitly deregister the InCall registration or OutCall registration separately.

5.2.4 remote AllCall registration: This feature enables the UPT user to make a remote InCall registration and a remote OutCall registration to the same terminal address using one single procedure. The effect of a remote AllCall registration is as if remote InCall and remote OutCall registration had been carried out separately.

5.2.5 linked registration: As for the AllCall registration feature, the use of this feature combines the registrations for incoming and outgoing calls for the current terminal address in a single procedure. However, unlike AllCall registration, a Linked registration cannot be overridden in all or in part by:

- a) InCall, Remote InCall, AllCall or Remote AllCall registrations by the same UPT user.
- b) OutCall, Remote OutCall, AllCall, Remote AllCall, Linked or Remote Linked registrations by other UPT users.

The UPT user must explicitly deregister a Linked registration, or override it by another Linked or Remote Linked registration.

5.2.6 remote Linked registration: A feature by which a Linked registration for one specified terminal address can be carried out from another terminal address.

5.2.7 UPT-specific indications: A set of UPT-specific user-friendly standard announcements or indications (e.g. for support of specific charging arrangements) is provided.

5.2.8 multiple terminal address registration: This feature enables the UPT user to simultaneously register multiple terminal addresses for incoming and/or outgoing UPT calls.

The feature also allows a different registration address for each service (e.g. a terminal address for fax registration and a different address for voice registration).

5.2.9 call pick up: A feature by which the UPT user answers an incoming UPT call at another terminal access, different from the terminal access (or accesses) specified by the InCall registration (for example, if the UPT user is alerted on a paging network). Call Pick Up always requires authentication when answering the call.

5.2.10 variable default InCall registration: A feature by which the UPT user sets up a default registration matrix of terminal addresses for incoming UPT calls, so that incoming UPT calls could be routed and handled differently (directed to a default address or cleared) according to time of day, day of week, calling party's identity, service type, the number dialled, and for "on no answer" and "on busy" conditions. This matrix can be modified by the UPT user. This feature would enable a UPT user with a regular travel routine or schedule to set up a "timetable" matrix.

5.2.11 intended recipient identity presentation: A feature by which the identity of the intended recipient (UPT number or name, etc., specified by the called UPT user) is presented on the alerting terminal.

5.2.12 access to groups of UPT service profiles: This feature enables the UPT subscriber (or authorized UPT user) responsible for a group of UPT users, to access, create, interrogate and modify their UPT service profiles using UPT service profile management procedures.

5.2.13 UPT service assistance: A feature by which the UPT user can contact a UPT service centre (e.g. an operator) to invoke UPT procedures in cases where automatic UPT procedures are unavailable or in cases of difficulty.

5.2.14 called party specified secure answering of incoming UPT calls: A feature by which the UPT user specifies that incoming UPT calls cannot be answered unless the answering party first successfully authenticates as the called UPT user.

5.2.15 UPT service provider authentication: A feature by which the UPT user can verify that the UPT service entity is the one claimed. With some authentication procedures, it will be provided automatically together with the user identity authentication. Refer to 6.5.3 "Authentication" for additional information.

5.2.16 calling party specified secure answering of incoming UPT calls: Calling party specified secure answering of incoming UPT calls is a feature by which the calling party, whether UPT user or non-UPT user, specifies that outgoing calls to UPT users cannot be answered unless the answering party first successfully authenticates as the called UPT user.

5.2.17 remote answering: The UPT user may specify one terminal address for the alerting of incoming UPT calls and specify a second, different terminal address for the answering of incoming UPT calls (e.g. the user could be alerted on an office telephone that a call is waiting to be answered at the organization's videophone).

5.2.18 advanced addressing capability: The UPT user may use other types of information than a number to initiate an outgoing UPT call, e.g. the UPT user's name, address, profession, etc., or a combination of these.

5.2.19 calling party message presentation: An arbitrary message, programmed by the UPT user, is displayed or announced on the caller's terminal when the UPT user is called.

5.2.20 simultaneous multiple UPT number InCall registration: The ability of a UPT user to invoke InCall registration using two or more UPT numbers on the same network access. For example, a UPT user with both a business UPT and a private UPT number could register both business and private calls on the same network access using a single InCall registration.

5.2.21 choice of language for announcements: A feature by which the UPT user can in real time specify the preferred language he wants to use during his dialogue with his service profile. It is assumed that UPT service nodes will support a range of languages to support own UPT users as well as visiting UPT users.

6 UPT service provisions

6.1 Subscription

Subscription to the UPT service satisfies the following requirements:

- a) The UPT service provider allocates UPT number(s) and associated PUIs to the UPT subscriber. The UPT subscriber assigns UPT number(s) and associated PUIs to UPT users. The UPT subscriber may also be the UPT user. The UPT user could have more than one UPT number with associated PUIs.
- b) The UPT service provider offers the range of available telecommunication services from which the subscriber may define the personal requirements which will form the basis for the UPT user's personal UPT service profile.
- c) The UPT user will be advised of standard means for UPT access and authentication.

In order to make use of telecommunication services in the flexible ways enabled by UPT, a specific subscription to a UPT service provider is required. The method of subscription is a national matter.

It is desirable that access to all national and international UPT facilities be obtainable by subscribing to one UPT service provider. The UPT subscriber may request several subscription options, such as:

- a) basic telecommunication services included with the UPT subscription;
- b) supplementary services applied to each basic telecommunication service;
- c) roaming restrictions applied to each telecommunication service;
- d) confidentiality of the UPT user's private information (such as the UPT user's general location).

The UPT subscriber may request the withdrawal of the UPT subscription. Conditions under which the UPT service provider may withdraw the UPT subscription are a national matter.

6.2 UPT identities

(UPT numbering and identity principles are described in ITU-T Recommendation E.168.)

The following numbers and identities are used within the UPT service to identify UPT users:

- a) a UPT Number (UPTN);
- b) a Personal User Identity (PUI).

A PUI is an identity which unambiguously identifies the UPT user but is different from the UPT number although there is a one-to-one mapping between them. The PUI is an identity by which the UPT user is known to his UPT service provider, and by which the UPT user's service provider is known to other service providers and networks supporting UPT. Along with PUI numbers and dedicated algorithms, PUI's can assist by providing a more secure way of activating UPT procedures.

For a user, his UPTN will be different from his PUI, although in general there will be a one-to-one mapping between them.

In order to allow UPT activation procedures to take place in a standard manner, whilst roaming internationally and between different networks, a standardized structure of the PUI is needed.

6.3 Service aspects of numbering and dialling

UPT numbering is discussed in Recommendation E.168 "Application of E.164 numbering plan for UPT". Recommendation E.168 discusses UPT number structure and its relationship to network numbers to support personal mobility. Three UPT numbering scenarios are introduced in Recommendation E.168 to address UPT short-term and long-term UPT numbering service aspects. In general, from the UPT user's point of view, it is desirable that UPT numbering support the following UPT service aspects.

6.3.1 UPT number structure

- a) The UPT number structure should be such that the UPT number is easily recognized and distinguished from ordinary (non-UPT) numbers by users and potential calling parties.
This enables calling parties to know or infer that the call might be charged in a special manner, handled in a different manner, dialled in a different manner, dialled with additional options, etc.
- b) If there is some form of UPT prefix (a number, a calling party must dial before dialling a UPT number) it should be the same (or similar) across national and international boundaries, amongst UPT service providers, and across networks.
- c) The UPT number should be as short as practicable in order to minimize the number of digits a calling party must dial.
- d) The UPT number should be diallable and routable from any terminal.
- e) UPT subscribers should be able to retain their UPT number(s) whenever they change service provider.
- f) In the long term, the UPT number should be usable across all networks, all terminals, and using any service.
- g) The evolution of the UPT numbering plan should minimize the changes to UPT numbers.

6.3.2 UPT access code

- a) The UPT access code (which may be used for entering the UPT environment) should be the same across national and international boundaries, amongst service providers, and across networks. Although a single UPT access code would be desirable, UPT access codes may vary between networks and geographical areas.
- b) The UPT access code(s) (if any) should be as short as practicable.

6.3.3 UPT number representation

- a) The representation of a UPT number, whenever it appears in human readable form (e.g. business cards, letterheads or directories), should be easily recognized and distinguished from ordinary (non-UPT) numbers by users and potential calling parties. For example, a special symbol could be prefixed to the number, similar to the "+" symbol used to designate international numbers.
- b) The default charging reference location of the UPT user may need to be indicated to users and potential calling parties.

6.3.4 UPT access number

- a) The UPTAN is normally an E.164 number.
- b) The UPTAN must contain information which could be used to route the call to the users service provider.
- c) An UPTAN would need to be diallable both nationally and internationally.

- d) In some cases an UPTAN would need to include the possibility of invoking a language code. Alternatively language indication could be stored within the users profile. This method simplifies dialling requirements for the UPT user.

6.4 Charging aspects

6.4.1 User-perspective aspects

In general, from the UPT user's point of view, it is desirable that billing and charging in a UPT environment support the following UPT-specific service aspects:¹

- a) The UPT subscriber should be billed by one UPT service provider. Other billing methods may still be used to allow the UPT user to direct a particular charge to a particular billing address, e.g. a charge card.
- b) The UPT user's UPT number to provide the effective billing identification.
- c) The UPT subscriber's billing account should be associated with the UPT user's UPT number.
- d) Charging should be based on a unique UPT user identification.
- e) For a call to a UPT user who has roamed, the calling party should be given sufficient information so as to make a decision to continue or terminate the call set up when there would be a higher-than-expected call charge rate.
- f) UPT charges should be understandable by the calling party and the UPT subscriber.
- g) To the extent practicable, the charging options (e.g. reverse charge service) available to a non-UPT call originator should not be restricted in a call to a UPT user.
- h) Flexible charging options should be made available to UPT subscribers to suit their various requirements, for example temporarily changing the charging reference location.
- i) UPT subscribers' bills should be accurate and rendered in a timely manner.
- j) The UPT user has protection against unexpected charges for both incoming and outgoing calls. For example, through the provision of advice of charge rate information.
- k) Charging procedures similar to the telephone service should apply to the calling party if the call to the UPT user is not successful (e.g. no answer, busy, etc.).

6.4.2 Operational aspects

The capabilities enabled by UPT, may result in UPT-specific charging aspects, for example:

- a) The charging elements may not be limited to telecommunication service usage charges, but may include, for example, elements for location and personal UPT service profile management.
- b) Service provision may result in split charges between the calling and called parties.

6.5 Security

6.5.1 Introduction

Generally in the field of telecommunication, users may be exposed to various forms of misuse, for example in the case of UPT:

- a) Fraudulent use of a UPT user's resources by unauthorized parties who manage to take up the identity of the user.

¹ See ITU-T-Recommendation D.280.

- b) Eavesdropping or unauthorized tapping of information exchanged during communication. This could result in unauthorized disclosure of the UPT user's identity (carried for example in signalling messages), and therefore violating the confidentiality of the UPT user's identity.
- c) Eavesdropping or unauthorized tapping of information in the UPT user's service profile.
- d) Disclosure of the user's physical location during normal UPT call procedures (e.g. through use of identification supplementary services).

The security mechanisms provided by the UPT service, irrespective of their strength of protection, should however not appear to the UPT user as any extra complication at all, but be part of the general UPT procedures.

Security in a UPT context refers to issues of:

- fraud;
- privacy;
- service availability.

6.5.1.1 Fraud

Fraud is the abuse of UPT facilities by unauthorized intruders, in particular to make chargeable use of UPT service, which charge is made against a legitimate UPT user's account. Resulting requirements are for example:

- authentication of users and subscribers;
- incontestable charging;
- auditing.

6.5.1.2 Privacy

Privacy is the concept that information concerning the UPT user and the UPT subscriber are not revealed to anyone who does not have legal authority to examine that information. This information includes:

- the content of communication;
- account details;
- call details;
- registration details.

6.5.1.3 Service availability

The ability of UPT users to receive the UPT services at any time that they wish may be limited by:

- service reliability;
- service denial.

6.5.2 General objectives for security

The following general objectives for security in UPT apply:

- a) the UPT user may use the UPT service with minimal risk of violated privacy or erroneous charging due to fraudulent use;
- b) the security provided to a UPT user when using UPT services should be comparable to the security provided by the contemporary fixed networks when using the same services;
- c) the security provided to a UPT service provider or network operator should be at least comparable to the security provided by the contemporary fixed networks and should protect the business interests of such providers or operators;

- d) the legal, regulatory and commercial aspects of the security provided by UPT should accommodate worldwide availability;
- e) the security to be provided by UPT should be adequately standardized to provide secure international interoperability and roaming.

6.5.2.1 General security requirements

The introduction of UPT and the powerful communication capabilities enabled by it necessitate that various security mechanisms be made available to affected users. The security levels afforded by these mechanisms depend on various factors:

- a) the particular security mechanisms of choice;
- b) the choice of UPT terminals;
- c) the actual use of the UPT procedures;
- d) the choice of access and authentication procedures.

It is noted that some security mechanisms appear as integral parts of certain UPT procedures. It is, in general, desirable that all security mechanisms supported by the UPT service be simple to use and appear as part of the general UPT procedures (e.g. using optional authentication when answering incoming calls).

It is desirable that a range of security levels be supported by UPT service providers. These would be offered to UPT users to choose from at subscription time.

The security level offered to the UPT user depends heavily on the choice of the degree of authentication.

6.5.2.2 Service related requirements

The following service related requirements on security apply to UPT:

- a) security features provided for the protection of the UPT users should be user-friendly and easy to use. They should as far as possible be transparent to the users, and should require as little interaction between user and network as possible;
- b) security features provided for the protection of the UPT users should not significantly increase call setup times;
- c) security features should work without reduced security when roaming;
- d) security features provided by UPT should work with the various environments of UPT, and not be constrained by any one physical layer or access method;
- e) the privacy of non-UPT users should not be affected by the use of UPT equipment or services.

6.5.2.3 Access related requirements

The following access related service requirements on security apply to UPT:

- a) it should be very difficult for intruders to impersonate the UPT user or subscriber;
- b) it should be very difficult for intruders to impersonate a UPT service provider/network operator in communication with a UPT user, or in communication with another UPT service provider;
- c) it should be very difficult for intruders to access, read or modify a UPT user's stored or transmitted subscription information.

6.5.3 Authentication

A choice of various options of authentication mechanisms may be supported by UPT service providers, for use by UPT users. Annex A presents authentication levels and provides some examples of how UPT user identity authentication could be realized. Annex A also presents the service requirements for an optional means of providing a relatively strong form of UPT user identity authentication in UPT Service Set 2.

6.5.3.1 Degrees of authentication

The degree of authentication (stronger or weaker) depends on the authentication method used. The degree of authentication used should be sufficient to abate the anticipated security risks. Examples of security risks include:

- 1) *Fraudulent duplication of key personal information by a third party* – In this regard, numerical identity (e.g. a personal identification number or PIN) is considered a weak form of authentication, while an individual physical feature (e.g. voiceprint) is considered a strong authentication feature.
- 2) *Eavesdropping by a third party during authentication procedures* – In this regard, the weakest authentication procedure is to directly send the required key personal information over the available communication channel. Stronger authentication levels may be achieved, for example, by using various encryption methods.

In general, authentication should also be strong enough to guarantee a sufficient level of security when UPT services are accessed through UPT-supporting networks visited by UPT users. The authentication procedure to be adopted may be negotiated between the UPT service provider and the visited networks. UPT users and UPT service providers have the options to support various authentication mechanisms to meet the required degree of authentication.

6.5.3.2 Types of authentication

UPT authentication procedures can be classified into several types, including:

- a) One-way with a fixed Personal Identification Number (PIN):
In this case, the authentication procedure is completed by sending the correct PIN by the UPT user.
- b) One-way with variable authentication codes:
In this case, the authentication procedure still uses one-way transmission, but with a variable authentication code.
- c) Two-way with variable authentication codes:
In this case, the authentication procedure employs two-way transmission in a challenge-response mode.

As mentioned earlier in 6.5.3, Annex A discusses UPT user identity authentication levels and realizations.

6.6 UPT service profiles

The information contained in the UPT user's service profile needs to be updated according to the UPT user needs and requests. At the same time, the data contained in a UPT user's service profile needs adequate protection against unauthorized access and modification.

In order to modify the service profile or to make any other operation on it, it is necessary to have an access procedure, that can be different for the various parties invoking it.

6.6.1 Involved parties

The possibility of accessing to the service profile is available for the following categories of UPT users:

The **service provider** has a guaranteed access to all the information without any restriction; the UPT subscriber has to agree with him, at the subscription time, which kind of access is permitted to himself and to the eventual UPT users associated. For any modification to the access modality agreed at the subscription, the subscriber has to contact the service provider.

The **UPT subscriber** can access only the information allowed by the service provider on subscription contract basis; furthermore, some information can only be displayed to him and not modified (e.g. the UPT number). Anyway, he can ask to modify some parameters via administration procedures with the service provider.

The **UPT user** can access the service profile if this possibility has been given to him by the subscriber at the subscription time; however, the UPT user may have some restrictions in the access, fixed by the service subscriber (e.g. he could not modify the restrictions on permitted callers).

6.6.2 Access procedure

The access procedure to the subscriber/user data has to be user-friendly and in the same time has to guarantee the security of communication.

The UPT service profile is accessed using the service profile management procedures or by off-line administrative procedures.

6.6.3 Operations on the service profile

The following operations can be performed by the subscriber/user on his service data:

- Service profile modification: this operation is made using the Service Profile Modification procedure and allows to change the variable information.
- Service profile display: this operation is made using the Service Profile Interrogation procedure and allows the subscriber/user to obtain information on the current status of the service profile.

Furthermore, the system has to validate the service profile after any modification made by the subscriber/user.

6.6.4 Structure of the UPT service profile

The UPT subscriber will, at subscription time, set up a matrix of authorized actions in the UPT service profile (e.g. access parameters for service management procedures, interrogation or modification and a list of services and facilities actually subscribed to).

Information stored in the UPT service profile may be divided into two general categories: fixed information and variable information. The fixed information is typically agreed to (with the UPT service provider) at subscription time and can, in part, be changed only by the UPT subscriber, while only the variable information can be changed by the UPT user.

Division of UPT service profile information into categories, and the type of information in each category are UPT service provider options. Service profile information is stored in the service provider's database.

6.6.4.1 Fixed service profile information

Fixed service profile information can be classified into:

- a) Information agreed to at subscription time, managed only by the UPT service provider. If allowed by the UPT service provider, this information could however be displayed to UPT users and UPT subscribers. Changes to this information may be requested by the UPT subscriber, administrative procedures must be used to allow the UPT service provider to set up a new UPT subscription.
- b) Information changeable by the UPT subscriber. Restrictions by the UPT subscriber may not allow the UPT user to modify this information.

Examples of fixed information under service provider control include:

- service provider identity;
- UPT number;
- subscriber identity (for home service provider use only);
- user identity (PUI);
- charging reference location (of the UPT user);
- UPT supplementary services subscribed (see ITU-T Recommendation F.853);
- types of authentication mechanisms subscribed (weak and/or strong);
- authentication information (PUI and/or keys);
- security options subscribed (e.g. user event control, user identity confidentiality);
- subscribed charging services (credit limit checking);
- subscribed location restrictions (e.g. whether remote registration is limited to the list of terminal accesses subscribed, forbidden access points for incoming/outgoing calls);
- security options subscribed (e.g. called party specified secure answering of incoming calls, intended recipient identity presentation);
- set of terminal accesses allowed for out/allcall/linked registrations (areas or accesses where you can register when getting to them);
- set of terminal accesses allowed for remote out/allcall/linked registrations (areas or accesses where you can register when getting to them).

In addition, optionally, a set of restrictions to be enforced when weak authentication can be used if agreed between the service provider and the subscriber at subscription time. These restrictions may also be enforced when strong authentication is used. The following information is used to describe these restrictions:

- set of terminal accesses allowed for InCall registrations (areas or accesses where you can register when getting to them);
- set of terminal accesses allowed for remote InCall registrations (areas or accesses where you can register when getting to them);
- set of terminal accesses allowed from which modification of the service profile is allowed;
- set of terminal accesses allowed for outgoing calls;
- set of terminal accesses allowed from which interrogation of the service profile is allowed;
- maximum number of outgoing follow-on calls allowed;
- maximum number of follow-on service feature requests allowed;
- maximum number of failed authentication attempts, before blocking the PUI.

Typical information that can be modified only by the UPT subscriber within limits set by the service provider, either directly or indirectly, include:

- maximum number of terminal addresses for group registration for incoming calls;
- maximum number of terminal addresses for group registration for outgoing calls;
- preferred language for UPT specific announcements.
- maximum credit limit allowed to the user (cost-related or number of local/long distance calls, within the limits specified for the subscription);
- allowed procedures (e.g. service profile procedures, charging options, authentication procedures) for the UPT user and further restrictions on the locations where those procedures can be performed (i.e. set of terminal accesses);
- security options allowed;
- allowed supplementary services applying to the UPT user;
- data access parameters (read and write restrictions);
- activated location restrictions;
- allowed basic services;
- restrictions on roaming, if any.

If allowed by the UPT subscriber, information under UPT subscriber control may be displayed to the UPT users.

6.6.4.2 Variable service profile information

The information described in the following is defined "variable" from the user's point of view; it can be changed using the service profile modification procedures or the personal mobility procedures only.

Variable information stored in the UPT service profile is divided into service-related information and mobility-related information, and can be changed by the UPT user (or the UPT subscriber) using:

- a) UPT service profile modification procedures for service-related parameters; or
- b) personal mobility procedures for mobility-related parameters.

Typical **service-related information** changeable by the UPT user or the UPT subscriber, using the UPT service profile modification features, includes:

- type of authentication mechanisms activated. Note that in case both weak and strong authentication procedures are allowed to a user, the service provider may elect to ignore this information and to impose the used procedure. This prevents the use of weak authentication when a safer method is available;
- security options activated;
- activation status of the secure answering service feature;
- preferred language for UPT specific announcements;
- activated charging options;
- restrictions on permitted calling parties.
- activation status for each supplementary service;
- customized announcements;
- specific confidentiality requirements, if any (e.g. restrictions on disclosure of current terminal addresses).

Typical **mobility-related information** changeable by the UPT user or the UPT subscriber.

Information modified by UPT service profile management procedures:

- temporary charging reference location;
- default terminal accesses for incoming calls (one by basic service);
- list of common terminal accesses for incall registration with abbreviated numbering;
- default duration of the registration for incoming calls;
- default terminal accesses for outgoing calls;
- default terminal addresses for combined registrations;
- default duration (or number of calls) for registration for out/allcall/linked registration;
- activation status of the authentication for outgoing calls when registered for outgoing calls;
- information related to variable default InCall registration;
- routing by call originating area;
- routing by calling line identity (if applicable);
- time dependent routing (by day of week, by day of year, by time of day, etc);
- routing by "on busy" condition;
- routing by "no answer" condition;
- routing by "not reachable" condition;
- other information related to supplementary services.

Information modified by UPT personal mobility procedures:

- current terminal addresses for incoming calls;
- duration of the registration for incoming calls;
- current terminal addresses for outgoing calls;
- duration (or number of calls) for out/allcall/linked registration;
- a Linked-registered terminal address (address of the terminal access being part of a linked registration);
- necessity of UPT user identity authentication for answering incoming UPT calls;
- current terminal addresses for combined registrations;
- whether or not a simplified authentication procedure shall be used for outgoing UPT calls during the registration for outgoing calls;
- number of terminal accesses used for multiple registration.

UPT call events information:

The following parameters are indirectly modified by the user or the subscriber when a call procedure occurs:

- number of outgoing follow-on calls placed;
- number of follow-on service features requested;
- number of failed authentication attempts;
- user credit limit.

6.6.5 UPT service profile access

There are certain restrictions on UPT service profile access for interrogation or modification (see the descriptions of these optional features in 7.4). The level of restriction varies by UPT service provider, UPT subscriber or UPT user. The degrees of access to a UPT service profile vary between:

- a) no access;
- b) interrogate access (read only); or
- c) modify access (read and write).

6.6.5.1 Service profile access by UPT service providers

The UPT service provider may access all the information contained in a user's UPT service profile without restrictions.

6.6.5.2 Service profile access by UPT subscribers

The type of access permitted to both, the UPT subscriber and the eventual UPT users associated with the subscriber is agreed with the UPT service provider at subscription time. The UPT subscriber can access only the information negotiated with the UPT service provider. Parts of this information can only be read, but not modified (e.g. the UPT number).

Modifications to the access restrictions agreed at subscription time between the UPT service provider and UPT subscriber can only be made by arrangements with the UPT service provider via administrative procedures.

6.6.5.3 Service profile access by UPT users

The UPT user can have access to his or her own UPT service profile if authorized by the UPT subscriber. Additional restrictions on UPT user access to his or her own service profile may be applied by the associated subscriber.

6.7 Protection of third parties

UPT provides personal mobility to UPT users by allowing them to register for incoming or outgoing UPT calls to a terminal of their choice. UPT users may borrow existing and available terminals and subscriber lines for their temporary use, while temporarily taking over any charges associated with those terminals and subscriber lines. In principle, such temporary "ownership" could conflict with the needs of the terminal owners or line subscribers.

6.7.1 General requirements

Third parties (e.g. terminal owners or line subscribers) should, in principle, not suffer in terms of privacy or freedom of actions, as a result of UPT activities by UPT users. In addition, the introduction of UPT or the activities of any UPT user should in no way harm the serving network or degrade the quality of service of non-UPT services.

6.7.2 Specific privacy requirements

6.7.2.1 Protection against unwanted incoming UPT calls

The subscriber of a terminal address may want to restrict incoming UPT calls to this terminal address in order to avoid incoming UPT calls at the terminal to UPT users.

6.7.2.2 Protection against malicious OutCall registrations

A malicious UPT user could use an OutCall registration (or remote OutCall registration) to log activities of an ordinary (non-UPT) subscriber. A subscriber who owns a particular terminal address may want to restrict, or be aware of OutCall registrations to their terminal address.

In the case of outgoing call registration, a user of the terminal should be given an indication that an outcall registration has taken place on this terminal. This could be done for example by a message given while using the terminal.

6.7.3 UPT mechanisms provided for third parties

Restrictions on registrations, for incoming and outgoing UPT calls, may be used to prevent UPT users from registering, intentionally or unintentionally, to terminal addresses owned by third parties.

6.7.3.1 Essential mechanisms

None identified.

6.7.3.2 Optional mechanisms

6.7.3.2.1 Indications of UPT registrations

Indications of UPT registrations should, when practicable, be given to the user of a terminal when the terminal has a registration for incoming and/or outgoing UPT calls. The type of indications will depend on network and terminal capabilities.

6.7.3.2.2 Reset of registrations for incoming UPT calls

This mechanism provides means for a third party to explicitly reset all UPT users who may have registered for incoming UPT calls to a terminal address.

6.7.3.2.3 Blocking/deblocking of registrations for incoming UPT calls

This mechanism provides means for third parties to prohibit UPT users from registering for incoming calls to a specific terminal address.

6.7.3.2.4 Blocking/deblocking of incoming UPT calls

This mechanism provides means for third parties to block all incoming UPT calls to a specific terminal address.

6.7.3.2.5 Reset of registration for outgoing UPT calls

This mechanism provides means for third parties to explicitly reset the UPT user who has registered for outgoing calls to a specific terminal address.

6.7.3.2.6 Suspension of registration for outgoing UPT calls

This mechanism provides means for third parties to temporarily suspend a UPT user's registration for outgoing UPT calls to a specific terminal address.

7 UPT functional procedures

This clause gives a general description of the various UPT procedures to support the UPT features described in clause 5. It describes the UPT procedures as seen by the UPT user (or any other user in terms of possible interactions with the UPT service). No restrictions on network implementation or man-machine interfaces are intended. For example, OutCall registration and remote OutCall registration (see 5.2) could be combined as one user procedure.

UPT functional procedures are classified into five different categories:

a) *Elementary procedures*

Elementary UPT procedures are procedures that are carried out either before, or in conjunction with other UPT procedures. The following elementary UPT procedures are identified:

- 1) access;
- 2) identification;
- 3) authentication;
- 4) global follow-on;
- 5) OutCall follow-on.

b) *Personal mobility procedures*

Personal mobility procedures are UPT procedures relating to the personal mobility of the UPT user and require access, identification and authentication procedures to be carried out with or before these procedures. Personal mobility procedures are registration procedures used to specify where to receive or make calls and do not include the actual receiving or making of calls. The following is a list of personal mobility procedures:

- 1) InCall registration;
- 2) InCall deregistration;
- 3) OutCall registration;
- 4) OutCall deregistration;
- 5) AllCall registration;
- 6) AllCall deregistration;
- 7) Linked registration;
- 8) Linked deregistration.

c) *UPT call handling procedures*

UPT call handling procedures are procedures relating to the actual receiving and making of calls and may require access, identification and authentication procedures to be carried out with or before these procedures. The UPT call handling procedures are:

- 1) outgoing UPT call;
- 2) alerting for incoming UPT calls;
- 3) answering of incoming UPT calls.

d) *UPT service profile management procedures*

UPT service profile management procedures allow the UPT user to manage accessible data in their own personal service profile, and require access, identification and authentication procedures to be carried out before or as part of these procedures. Three procedures are possible:

- 1) profile Interrogation;
- 2) profile Modification;
- 3) authentication code change.

e) *Third party protection procedures*

Third party protection procedures are intended for the protection and privacy of third parties. They are intended to be carried out by third parties, UPT or non-UPT. They are:

- 1) reset of registrations for incoming UPT calls;
- 2) blocking of registrations for incoming calls;

- 3) deblocking of registrations for incoming calls;
- 4) blocking of incoming UPT calls;
- 5) deblocking of incoming UPT calls;
- 6) reset of registrations for outgoing UPT calls;
- 7) suspension of registrations for outgoing UPT calls.

In all the UPT procedures some information needs to be provided by the UPT user, some of which is mandatory and some is optional. All optional information may be included in the UPT user's service profile as default parameters, or may be provided on a case-by-case basis.

7.1 Elementary procedures

Elementary UPT procedures are procedures that have no significance on their own. These procedures are always carried out in conjunction with other UPT procedures (e.g. call handling or personal mobility).

7.1.1 Access

An access procedure may be required before a UPT procedure can be carried out.

7.1.2 Identification

This procedure is carried out by the UPT user to identify himself or herself to the UPT service provider. This identification procedure may be required before, or as a part of, other UPT procedures. Identification information (e.g. UPT number or PUI) will be required.

7.1.3 Authentication

The authentication procedure is used by the UPT service provider to ensure that the calling party or answering party has the correct UPT user identity claimed.

The authentication procedures may be required before, or as part of, other UPT procedures. The identification procedures may be required before, or as a part of the authentication procedures. Some information is mandatory and must be provided by the UPT user. A choice of authentication procedures may be available depending on the degree of authentication required. For further information, refer to 6.5.3.2.

Information needed	
Mandatory	<ul style="list-style-type: none"> – Preferred language for specific UPT announcements – Security keys/PIN – Service provider identity – User identity (PUI)
Optional	– None

7.1.4 Global follow-on

The global follow-on procedure is used by the UPT user to terminate the current UPT procedure, and follow it by a new UPT procedure without having to repeat the identification and authentication procedures.

To carry out the global follow-on procedure, the mandatory information required from the UPT user is the new UPT procedure type only.

7.1.5 OutCall follow-on

The OutCall follow-on procedure is used by the UPT user when terminating an outgoing UPT call, in order to follow it by a new outgoing UPT call before disconnecting completely. With this procedure, there is no need to repeat the identification and authentication procedures or use the global follow-on procedure.

To carry out the OutCall follow-on procedure, the mandatory information required from the UPT user is the request for a new outgoing UPT call.

7.2 Personal mobility procedures

Personal mobility procedures are UPT procedures relating to the personal mobility of the UPT user, and are intended to allow the UPT user to make or receive calls. Personal mobility procedures do not involve the actual making or receiving of calls.

7.2.1 InCall registration

InCall registration provides means for a UPT user to indicate where incoming UPT calls shall be presented. Such a registration will override any previous registration. An InCall registration procedure may also be carried out as part of an AllCall registration procedure.

The necessary access, identification and authentication procedures must have been successfully completed before, or as a part of, this procedure.

The UPT user may be expected to obtain agreement of the owner of the particular terminal address to which InCall registration is intended.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

Information needed	
Mandatory	– UPT procedure type.
Optional	<ul style="list-style-type: none">– Activated secure answering.– Access Registration Address(es).– Duration of the registration.– An indication of group registration, if needed. If no indication is given, registration of a single terminal address is assumed.– An indication of the telecommunication services to which the registration applies, if needed. If no service is specified, the default services for InCall registrations, indicated in the UPT service profile, are assumed.– One or more terminal addresses, if needed (e.g. if the user chooses to specify a terminal address other than the one currently used, or for group registration). Each of these terminal addresses may be restricted to call answering and/or call alerting. If no address is specified, the address of the used terminal is assumed. Each terminal address can be either a complete access address or a pointer to one of a number of pre-selected access addresses for InCall registrations, stored in the UPT service profile.

The network will indicate to the UPT user if the registration is accepted or give an appropriate announcement if not, and the procedure is terminated. This procedure could be terminated for example due to lack of correct authentication, or due to UPT service profile restrictions.

7.2.2 InCall deregistration

An InCall registration may be cancelled in one of the following ways:

- a) The UPT user can explicitly deregister.
- b) The UPT user can register to another terminal, causing the previous registration to be overridden.
- c) The UPT service provider can specifically deregister the UPT user to terminate the registration.
- d) Other users (UPT or non-UPT), may deregister the UPT user to terminate the registration to a specific terminal address
- e) By timer or counter expiry.

The following procedures apply to items a) and b) above. The procedures for item d) are shown in 7.5.1.

When an InCall registration has been deregistered, except when by explicit override, the presentation of incoming calls will go to an appropriate default terminal address defined in the UPT service profile. Examples of default terminal addresses are a mailbox, a paging network or "no terminal address". Unless "no terminal address" is specified, the UPT user will never be completely deregistered for incoming calls.

UPT access, identification and authentication procedures must have been successfully completed before, or as part of, this procedure. During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

Information needed	
Mandatory	– UPT procedure type.
Optional	<ul style="list-style-type: none">– Access Registration Address.– An indication of group deregistration, if needed. If no indication is given, deregistration of a single terminal address is assumed.– One or more terminal addresses, if needed (e.g. if the user chooses to specify a terminal address other than the one he is currently using, or for group deregistration). If no address is specified, the address of the used terminal address is assumed. The address could also indicate all terminal access terminal addresses registered for incoming UPT calls. Each terminal address can be either a complete access address or a pointer to one of a number of pre-selected access addresses for InCall registrations, stored in the UPT service profile.– An indication of the telecommunication services to which the deregistration applies, if needed. If no service is specified, all services for which the registration applied are assumed.

The network will indicate to the UPT user if the deregistration is accepted or give an appropriate announcement if not, and the procedure is terminated. This procedure could be terminated due to lack of correct authentication or incorrect terminal address.

7.2.3 OutCall registration

A UPT user may register for outgoing calls to a terminal address to initiate a session, using the OutCall registration procedure. During the session, no additional authentication is normally required from the UPT user in order to make subsequent outgoing calls. The terminal address registered to is personalized for the user, and all outgoing calls from that terminal address will be charged to the UPT number of that UPT user. Only one UPT user/number may be registered for outgoing calls to a specific terminal address at the time. An OutCall registration procedure may also be carried out as part of an AllCall registration procedure.

The necessary access, identification and authentication procedures must have been successfully completed before, or as a part of, this procedure.

The UPT user may be expected to obtain agreement of the owner of the particular terminal address to which OutCall registration is intended.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

Information needed	
Mandatory	<ul style="list-style-type: none">– UPT procedure type.
Optional	<ul style="list-style-type: none">– Access Registration Address(es).– Activated deregistration by override.– Indication of group registration.– Number of outgoing calls allowed.– Terminal addresses, if needed (e.g. if the user chooses to specify another terminal address other than the one he is currently using, or for group registration). If no address is specified, the address of the used terminal is assumed.– An indication of the telecommunication services to which the registration applies, if needed. If no service is specified, the default services for OutCall registrations, indicated in the UPT service profile, are assumed.– The duration of the registration, if needed. This may also be specified in terms of number of outgoing calls.– An indication of whether or not additional authentication (e.g. a PIN code) is required at each call set up. If no indication is given, no additional authentication will be required.– An indication of whether or not any other UPT users shall be allowed to deregister the UPT user for outgoing calls from a terminal address by override.

The network will indicate to the UPT user if the registration is accepted or give an appropriate announcement if not, and the procedure is terminated. This procedure could be terminated for example due to lack of correct authentication or due to UPT service profile restrictions.

Specifically, this registration procedure will be terminated if another user has already registered for outgoing calls to the terminal address specified (without permitting override).

7.2.4 OutCall deregistration

An OutCall registration may be cancelled in one of the following ways:

- a) The UPT user can explicitly deregister.
- b) The UPT service provider can specifically deregister the UPT user to terminate the registration.
- c) By timer or counter expiry.
- d) Optionally, as may be given in the UPT user's OutCall registration, another UPT user may register for outgoing calls to the same terminal address, thus causing the previous registration to be cancelled (by override).

When all OutCall registrations have been deregistered, the registration will fall back to either the default terminal addresses for outgoing call registration or to the "no terminal address" as specified in the UPT service profile. Unless "no terminal address" is specified, the UPT user will never be completely deregistered for outgoing calls.

UPT access, identification and authentication procedures must have been successfully completed before, or as a part of, this procedure.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

Information needed	
Mandatory	– UPT procedure type.
Optional	<ul style="list-style-type: none">– Indication of group deregistration.– One or more terminal addresses (i.e. if the user chooses to specify a terminal address other than the one he is currently using, or for group deregistration). The address could also indicate all terminal addresses registered for outgoing UPT calls. If no address is specified, the address of the used terminal is assumed. Each terminal address can be either a complete access address or a pointer to one of a number of pre-selected access addresses for OutCall registrations, stored in the UPT service profile.– An indication of the telecommunications services to which the deregistration applies, if needed. If no service is specified, all services to which the registration applied are assumed.

The network will indicate to the UPT user if the registration is accepted or give an appropriate announcement if not, and the procedure is terminated. This procedure could be terminated for example due to lack of correct authentication or due to UPT service profile restrictions.

7.2.5 AllCall registration

The InCall and OutCall registration procedures may be combined into a single user procedure, an AllCall registration procedure. Only one set of authentication parameters are necessary for the AllCall registration procedure. If used, the effect of this AllCall registration procedure is as if an InCall registration and an OutCall registration procedure had been carried out separately to the same terminal address. Except for the authentication parameters, the input parameters and network responses seen by the UPT user would be exactly as if separate procedures were used.

7.2.6 AllCall deregistration

In the same manner as for AllCall registration, an AllCall deregistration procedure may also be used to deregister an InCall and an OutCall registration for the same terminal address in one operation. Where an AllCall deregistration is performed for a terminal where only an InCall is active, InCall deregistration takes place and OutCall deregistration is rejected. Similarly, when an AllCall deregistration is performed for a terminal where only an OutCall is active, OutCall deregistration takes place and InCall deregistration is rejected.

7.2.7 Linked registration

The Linked registration procedure is used not only to combine the InCall and OutCall registrations into one single procedure, but also to link the InCall and OutCall registrations to each other and to the same terminal address. A Linked registration can only be changed by another Linked registration (by override) or by a Linked deregistration procedure. During a Linked registration session, no additional authentication is normally required from the UPT user in order to make subsequent outgoing calls or receive incoming UPT calls. Only one UPT user/number may have a Linked registration to a specific terminal address at the same time and only one terminal address can be part of a Linked registration. A Linked registration to a terminal address will further preclude any other registration to that terminal address, except InCall registrations by other UPT users or by the UPT user with another UPT number.

UPT access, identification and authentication procedures must have been successfully completed before, or as a part of, this procedure. During this procedure, the input information and network responses seen by the UPT user would be exactly as if separate procedures were used. The network will indicate to the UPT user if the registration is accepted or give an appropriate announcement if not, and the procedure is terminated. This procedure could be terminated for example due to lack of correct authentication or due to UPT service profile restrictions. Specifically, Linked registration will be terminated if another UPT user has already registered for outgoing calls to the requested terminal address (without permitting override).

7.2.8 Linked deregistration

A Linked registration may be cancelled in one of the following ways:

- a) The UPT user can specifically deregister.
- b) The UPT user can perform a Linked registration to another terminal address with the same UPT number, thus causing the previous registration to be overridden.
- c) The UPT service provider can specifically deregister the UPT user to terminate the session.
- d) By timer or counter expiry.

When a Linked registration has been deregistered, except when by explicit override, the registration will be completely deregistered to "no terminal address".

UPT access, identification and authentication procedures must have been successfully completed before, or as a part of, this procedure.

During this procedure, the input information and network responses seen by the UPT user would be exactly as if separate procedures were used.

The network will indicate to the UPT user if the deregistration is accepted, or give an appropriate announcement if not, and the procedure is terminated. This procedure could be terminated for example due to lack of correct authentication or due to UPT service profile restrictions.

7.3 UPT call handling procedures

UPT call handling procedures are procedures relating to the actual making or receiving of UPT calls.

7.3.1 Outgoing UPT call

This procedure may be used by a UPT user in order to make an outgoing UPT call, independent of any previous InCall or OutCall registrations by the same UPT user or other UPT users on the same terminal address. No personal mobility state of any UPT user is affected by this procedure. The outgoing UPT call is charged to the UPT number.

UPT access, identification and authentication procedures must have been successfully completed as a part of this procedure. During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

Information needed	
Mandatory	<ul style="list-style-type: none">– Called party number– UPT procedure type
Optional	<ul style="list-style-type: none">– ISDN subaddress

The network will indicate to the UPT user if the outgoing UPT call is not accepted. This procedure could be terminated for example due to lack of correct authentication.

7.3.2 Alerting for incoming UPT calls

This procedure is used by the UPT service for alerting of incoming UPT calls to UPT users. It can only be carried out for a UPT user who has registered for incoming calls beforehand.

The network performs an alerting for incoming calls on the terminal address, or a paging network, given by the UPT user's registration for incoming calls.

If the UPT user has a registration for incoming calls indicating "no terminal address", the calling party will receive an appropriate announcement indicating "UPT user currently not reachable".

This procedure is terminated in one of the following ways:

- by explicit action from the calling party;
- by a successful answering of incoming UPT calls procedure;
- by timer expiry.

During this procedure, no information needs to be provided by the UPT user.

Alerting for incoming UPT calls in the case of Multiple Terminal Address registration (see 5.2.8). In this case, two scenarios are possible:

- all terminals are alerted in parallel;
- all terminals are alerted in sequence.

Some networks may not be able to support parallel alerting.

7.3.3 Answering of incoming UPT calls

Having registered for incoming calls, this procedure is used by the UPT user to answer incoming UPT calls indicated by the "Alerting for incoming UPT calls" procedure. When the "Answering of incoming UPT calls" procedure is successfully completed, call completion can proceed in the normal way.

When alerted by the "Alerting for incoming calls" procedure, the UPT user answers this alerting on the terminal of choice, as determined by registration for incoming calls. If the UPT user is registered for incoming calls on a paging network, any terminal may be used.

Except for the cases below, for answering incoming UPT calls, no procedures are required by the UPT service and anyone (including non-UPT user) is able to answer the alerting.

- a) If authentication of answering UPT user is required by the registration for incoming calls (see 5.2.14), authentication procedures must be successfully completed before, or as a part of, this procedure.
- b) If authentication of answering UPT user is required for incoming calls by the calling party (see 5.2.16), authentication procedures must be successfully completed before, or as a part of, this procedure.
- c) If the UPT user answers the alerting on another terminal different from the terminal address specified by the registration for incoming calls (i.e. Call Pick Up, see 5.2.9), UPT access identification and authentication procedures must be successfully completed before, or as part of, this procedure.

During this procedure, only in the case of answering at another terminal address, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

- a) Mandatory information – UPT procedure type.
- b) No optional information is needed.

The network will indicate to the UPT user if the call answering is accepted or give an appropriate announcement if not, and the procedure is terminated. This procedure could be terminated due to lack of correct authentication or due to UPT service profile restrictions.

7.3.4 UPT registered Outgoing call set up

This procedure is used to set up outgoing calls from a terminal access to which a UPT User has registered for Outgoing UPT calls. The outgoing calls will be charged to the UPT number.

During this procedure, the user must supply the following information:

- a) Mandatory – B-party address.
- b) Optional – Authentication code (if requested by the UPT User at registration time, e.g. PIN code).

The network will indicate to the user if the procedure is not accepted, and the procedure is terminated. Any rejection could depend on authentication code mismatch, UPT Service Profile restrictions, etc.

7.4 UPT service profile management procedures

UPT service profile management procedures are procedures used by the UPT user in order to manage his or her own accessible UPT service profile data.

7.4.1 UPT service profile interrogation

This procedure allows the UPT user to obtain information on the current status of the UPT user's own service profile. UPT identification and authentication procedures must have been successfully completed before, or as part of, this procedure.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

- a) Mandatory information – UPT procedure type.
- b) Optional information includes:
Information concerning the type of UPT service profile information to be read. Such information may include, telecommunication services subscribed to, default parameters, activated supplementary services, or current registrations for incoming or outgoing calls.

The network will respond with the required information, unless the procedure is terminated for example, due to lack of correct authentication or due to UPT service profile restrictions.

7.4.2 UPT service profile modification

The UPT service profile modification procedure allows the UPT user to change appropriate UPT service profile parameters. UPT identification and authentication procedures must have been successfully completed before, or as part of, this procedure.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

- a) Mandatory information – UPT procedure type.
- b) Optional information includes:
Information concerning the type of UPT service profile information to be modified. Such information could concern activation or deactivation of supplementary services or changes to various default parameters.

As described in 6.6 under service profile modification, certain restrictions apply, both to UPT users and to UPT subscribers.

The network will indicate to the UPT user if the modification request is accepted or give an appropriate announcement if not, and the procedure is terminated. This procedure could be terminated due to lack of correct authentication or due to UPT service profile restrictions.

7.4.3 Authentication code change

The Authentication code procedure is used by the UPT User in order to change the authentication code (e.g. PIN) used for weak authentication.

The Identification and Authentication procedures must have been successfully completed before, or as a part of, this procedure.

During this procedure, the UPT User must supply the following information.

- a) Mandatory information – UPT procedure type.
 - The new authentication code (e.g. new PIN code and it is entered twice for verification).
- b) No optional information is needed.

The network will indicate to the UPT User if the change of the authentication code (e.g. PIN) is accepted or give an appropriate announcement if not, and the procedure is terminated. Any rejection could depend on the authentication procedure, incorrectly verified new authentication code, UPT Service Profile restrictions, etc.

7.5 Third party protection procedures

These procedures are intended for the protection of the privacy, integrity and security of third parties (e.g. the owner of a particular terminal address). These procedures are intended to be carried out by third parties. Therefore, third party identification and authentication may optionally be required to prevent undesired actions by unauthorized third parties.

Example

The owner of a terminal receiving unwanted UPT calls should be able to cancel the UPT registration causing these calls. This may be done in a simple way where the service provider allows the owner of the terminal to make the cancellation by calling a UPT service number from his own terminal. Only UPT registrations to that terminal are cancelled. The UPT service provider should register that such deregistration has happened and inform the UPT user.

7.5.1 Reset of registrations for incoming UPT calls

Reset of registrations for incoming UPT calls provides means for a third party to explicitly deregister all UPT users who may have registered for incoming UPT calls to the terminal address owned by the third party. This procedure cancels all registrations for incoming UPT calls to this specific terminal address.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

- a) Mandatory information – UPT procedure type.
- b) No optional information is needed.

The address of the terminal in use will be assumed for the reset. Reset from a remote terminal is not allowed.

In case a registration for incoming UPT calls to the terminal address is part of a group registration, the effect should be as if this group registration has been cancelled.

A UPT user, whose registration has been reset in this manner, will have his or her incoming calls directed to the default terminal address for incoming calls.

The network will indicate to the user if the reset is accepted or give an appropriate announcement if not, and the procedure is terminated. This procedure could be terminated due to lack of correct authentication or due to UPT service profile restrictions.

7.5.2 Blocking of registrations for incoming UPT calls

Blocking of registrations for incoming UPT calls provides means for third parties to prohibit UPT users from registering for incoming calls to a specific terminal address. When this procedure has been carried out, any attempts by UPT users to register for incoming UPT calls to the terminal address will be rejected. The network could optionally allow the duration of blocking to be specified.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

- a) Mandatory information – UPT procedure type.
- b) No optional information is needed.

The address of the terminal in use is assumed for the blocking. Blocking of registrations from a remote terminal is therefore not allowed.

The network will indicate to the user if the blocking is accepted or give an appropriate announcement if not, and the procedure is terminated.

7.5.3 Deblocking of registrations for incoming UPT calls

Deblocking of registrations for incoming UPT calls provides means for third parties to open a terminal address for subsequent registrations for incoming UPT calls. When this procedure has been carried out, any UPT user may register for incoming UPT calls to the terminal address. The network could optionally allow the duration of deblocking to be specified.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

- a) Mandatory information – UPT procedure type.
- b) No optional information is needed.

The address of the terminal in use is assumed for the deblocking. Deblocking of registrations from a remote terminal is therefore not allowed.

The network will indicate to the user if the deblocking procedure is accepted or give an appropriate announcement if not, and the procedure is terminated.

7.5.4 Blocking of incoming UPT calls

Blocking of incoming UPT calls provides means for third parties to block all incoming UPT calls to a specific terminal address. When this procedure has been carried out, any incoming UPT calls will be rejected, even if a successful registration for incoming calls has been carried out by a UPT user, and an announcement will be given to the calling users to this effect.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

- a) Mandatory information – UPT procedure type.
- b) No optional information is needed.

The address of the terminal in use is assumed for the blocking. Blocking of incoming UPT calls from a remote terminal is therefore not allowed.

The network will indicate to the user if the blocking is accepted or give an appropriate announcement if not, and the procedure is terminated.

7.5.5 Deblocking of incoming UPT calls

Deblocking of incoming UPT calls provides means for third parties to open a terminal address for subsequent incoming UPT calls. When this procedure has been carried out, any UPT user registered for incoming UPT calls to the terminal address may receive incoming calls.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

- a) Mandatory information – UPT procedure type.
- b) No optional information is needed.

The address of the terminal in use is assumed for the deblocking. Deblocking of incoming UPT calls from a remote terminal is therefore not allowed.

The network will indicate to the user if the deblocking is accepted or give an appropriate announcement if not, and the procedure is terminated.

7.5.6 Reset of registration for outgoing UPT calls

The reset of registration for outgoing UPT calls provides means for third parties to explicitly deregister the UPT user who has registered for outgoing calls to a specific terminal address.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

- a) Mandatory information – UPT procedure type.
- b) No optional information is needed.

The address of the terminal in use is assumed for the reset. Reset of registrations from a remote terminal is therefore not allowed.

In case the registration for outgoing UPT calls to the used terminal address was part of a group registration, only the used terminal address in question will be cancelled from the group.

The network will indicate to the user if the reset is accepted or give an appropriate announcement if not, and the procedure is terminated. This procedure could be terminated for example due to lack of correct third-party authentication.

7.5.7 Suspension of registration for outgoing UPT calls

The suspension of registration for outgoing UPT calls provides means for third parties to temporarily override a registration for outgoing UPT calls to a specific terminal address. When this procedure has been carried out, a normal outgoing call (charged to the terminal address or otherwise as appropriate) can be made. When the call is terminated, the registration for outgoing UPT calls is resumed.

During this procedure, the UPT user must provide certain mandatory information and may provide additional optional information as follows:

- a) Mandatory information – UPT procedure type.
- b) No optional information is needed.

The address of the terminal in use is assumed for the suspension. Suspension of registrations from a remote terminal is therefore not allowed.

In case the registration for outgoing UPT calls to the used terminal address was part of a group registration, only the used terminal address is temporarily cancelled from the group.

The network will indicate to the user if the suspension is accepted or give an appropriate announcement if not, and the procedure is terminated. This procedure could be terminated due to lack of correct third-party authentication.

8 Supplementary services

Supplementary services in the UPT environment: UPT supplementary services are part of the UPT service offering, which are supplementary to the basic operation of UPT. This subject is described in detail in ITU-T Recommendation F.853 "Supplementary Services in the Universal Personal Telecommunication (UPT) Environment".

8.1 Definition of supplementary services feature

3 PTY	Three-Party Service
CCBS	Completion of Calls to Busy Subscriber
CCNR	Completion of Calls on No Reply
CD	Call Deflection
CFB	Call Forwarding Busy
CFNR	Call Forwarding No Reply
CFNRc	Call Forwarding on Terminal Not Reachable
CLIP	Calling Line Identification Presentation
CLIR	Calling Line Identification Restriction
CNIP	Calling Name Identification Presentation
CNIR	Calling Name Identification Restriction
COLP	Connected Line Identification Presentation
COLR	Connected Line Identification Restriction
CONF	Conference Calling
CW	Call Waiting
DA	Distinctive Alerting

ECT	Explicit Call Transfer
HOLD	Call Hold
ICS	Incoming Call Screening
MCID	Malicious Call Identification
MLPP	Multi-Level Precedence and Pre-emption
MMC	Meet-Me Conference
OCS	Outgoing Call Screening
PRC	Conference Call – Preset
SCFB	Selective Call Forwarding Busy
SCFNR	Selective Call Forwarding No Reply
SCFNRC	Selective Call Forwarding on Terminal Not Reachable
SMCI	Special Marked Call Indication

8.2 Procedures for the support of UPT supplementary services

8.2.1 Activate UPT supplementary services

This procedure is used by the UPT user in order to activate a specific service.

The Identification and Authentication procedures must have been successfully completed before, or as a part of, this procedure.

During this procedure, the UPT user must supply the following information:

- a) Mandatory – UPT procedure type.
- b) Optional – Information concerning the service that is wanted activated.

The network will indicate to the UPT user if the activation is accepted or give an appropriate announcement if it is not accepted. The procedure is then terminated. A rejection could result from a wrong authentication procedure, UPT Service Profile restrictions, etc.

8.2.2 Deactivate UPT supplementary services

This procedure is used by the UPT user in order to deactivate a specific service.

The Identification and Authentication procedures must have been successfully completed before, or as a part of, this procedure.

During this procedure, the UPT User must supply the following information:

- a) Mandatory – UPT procedure type.
- b) Optional – Information concerning the service that is wanted deactivated.

The network will indicate to the UPT User if the deactivation is accepted or give an appropriate announcement if it is not accepted. The procedure is then terminated. A rejection could result from a wrong authentication procedure, UPT Service Profile restrictions, etc.

9 Operational provisions

Operational service aspects involve the network capability of locating the UPT user for the purposes of addressing and routing of calls. Advanced operations and management systems are required to support UPT services. The architecture and capabilities of UPT supporting networks will impact operations systems functions.

9.1 UPT user aspects of operational provisions

UPT user aspects of operational provisions include the following items:

- a) service provisioning;
- b) UPT service profile management.

9.2 UPT service provider aspects of operational provisions

UPT service provider aspects of operational provisions include the following items:

- a) performance monitoring of aspects affecting the UPT service;
- b) detection, localization and correction of faults affecting the UPT service;
- c) interworking management information between networks supporting the UPT service.

ANNEX A

UPT user identity authentication

A.1 Example realizations of UPT user identity authentication

If UPT user identity authentication is provided by using a UPT device², the level of protection depends on how the device is realized. UPT devices may exist in different realizations depending on the networks, terminals and services used, which put different restrictions on the security mechanisms that can be provided in a simple and user-friendly way. For this reason, it may be necessary to have different authentication procedures for different realizations of the UPT devices. Possible realizations include:

- a) No UPT Device – In this case, the UPT user's UPT number may have to manually be input for identification, and it may be necessary to restrict the authentication procedure to the use of a PIN code only.
- b) A Magnetic Strip-Card UPT Device – This type of UPT device requires a terminal equipped with a magnetic strip card reader and a signalling interface to communicate with the network.
- c) A Tone Type UPT Device One Way (e.g. DTMF) – This device could either simply simulate the sequence of tones that would be generated by the UPT user who uses a PIN for authentication, or it could contain the intelligence to provide authentication procedures similar to that possible with an intelligent-card using one-way authentication (the UPT device transmits data only). See A.2 for more information.
- d) A Modem Type UPT Device – This would be similar in functionality to the Tone Type Device, but with the physical acoustic in-band signalling using a modem standard. Ideally, the authentication procedures should in this case be the same as with an intelligent-card using one-way or two-way authentication (i.e. the UPT device transmits and receives data).
- e) An Intelligent-card Type UPT Device – Either a one-way or a two-way authentication procedure could be used. UPT service provider authentication could be combined with subscriber identity authentication (mutual authentication).

The UPT device may require the UPT user to be authenticated to the device to prevent unauthorized users from fraudulently using the device. This could be done by using, for example, a PIN.

² A device that contains UPT user identification information and that may be used to facilitate and automate the UPT user interaction with the UPT service.

A.2 Example of UPT user identity authentication using a UPT device

This subclause presents the services requirements for an optional means of providing a relatively strong form of UPT user identity authentication in UPT Service Set 1.

The UPT device (e.g. tone type device, one way) provides a method for strong authentication. Other devices could be used. An example of the requirements for such a device is:

- a) The device would require the UPT user to be authenticated to the device to prevent unauthorized users from fraudulently using the device. This could be done using, for example, a PIN. The way that the UPT user authenticates himself to the device is an implementation issue.
- b) The device would use a standardized protocol to communicate authentication and command data with the local UPT service provider (e.g. through a voice channel). It must perform the necessary cryptographic calculations for secure authentication of the UPT user's identity and authentication of the requested procedures. The algorithms used should be standardized so that remote authentication is possible across networks.
- c) The device would provide a consistent (but implementation dependent) user-friendly command interface.
- d) The UPT user would interact with the device to enter the desired procedures together with any associated data. Once this interaction is complete, the UPT user dials an access code to connect with the UPT server. The UPT user would then use the device to send a burst of tones. The UPT server would then respond with either the appropriate confirmation messages or an indication of why the requested actions were denied.

A.3 Example procedures for UPT access, authentication and Service Profile management

The UPT service is expected to be a global concept supported by a lot of service providers. UPT users will travel and use their UPT subscription in services offered by foreign service providers.

To make it as easy as possible to access and use the UPT service, it is essential that some basic elements of the user interface do not change from service provider to service provider.

It is also planned to introduce "UPT devices" to lower the user barrier. To make it possible to use a pre-programmed DTMF-device in a UPT service offered from a service provider other than the one where you are subscribing to UPT, the user procedure must be the same.

It is also stated that similar user procedures should be supported across networks (see 4.3.2).

A minimum man-machine interface for UPT that should be supported by service providers accepting visiting UPT users (UPT users from other UPT service providers).

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