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## Foreword

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

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

This ETR describes the service requirements on Universal Personal Telecommunication (UPT) numbering, addressing and identification.

This ETR consists of 11 parts as follows:

- Part 1: "Principles and objectives".
- Part 2: "General service description".
- Part 3: "Service aspects of charging, billing and accounting".
- Part 4: "Service requirements on security mechanisms".
- Part 5: "UPT terminals and UPT access devices".
- Part 6: "UPT subscriptions, service profiles and information model".
- Part 7: "User procedures and user states".
- Part 8: "Man-machine interface aspects".
- Part 9: "Service requirements on numbering, addressing and identification".**
- Part 10: "Supplementary services".
- Part 11: "Service requirements on protection of third parties".

## Introduction

This ETR identifies areas where numbers or identities may be needed to carry out a task. The primary purpose of this ETR is to identify requirements and examples are used to illustrate these requirements. Other methods may be possible and ETSI STC NA2 may consider these when studying mechanisms to support the identified requirements.

The purpose of this ETR is to provide requirements to ETSI STC NA7 for the standardization work of other ETSI bodies. These requirements include:

- a UPT number user by other parties to dial the UPT user;
- a Personal User Identity (PUI) as a private identity to enable the UPT user to activate UPT procedures; an account number to identify to the UPT user to the UPT subscriber and the UPT service provider; and
- the support of UPT number portability. Any example mechanism to support UPT number portability is given here for information. It is not given as a solution.

UPT Access Codes (UPT-ACs), numbers and addresses; used by the UPT user or subscriber to gain access to their service.

The possible use of a UPT prefix.

The need for a subscriber identity to enable the recognition of the subscriber for billing and accounting by the service provider.

Objectives on UPT number portability and number administration.

## 1 Scope

This ETSI Technical Report (ETR) describes the service requirements on Universal Personal Telecommunication (UPT) numbering, addressing and identification, i.e. the requirements from the user's perspective. The detailed UPT numbering, addressing and identifications plans are, however, defined in other ETRs, taking into account all CCITT Recommendations.

NOTE: All "UPT access code" should read "UPT (service) access code".  
All "UPT access number" should read "UPT (service) access number".  
All "UPT access address" should read "UPT (service) access address".

## 2 References

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

- [1] ITU-T Recommendation E.118: "The international telecommunication charge card".
- [2] CCITT Recommendation E.164: "Numbering plan for the ISDN era".
- [3] ITU-T Recommendation E.168: "Application of E.164 numbering plan for UPT".
- [4] CCITT Recommendation E.212: "Identification plan for land mobile stations".
- [5] CCITT Recommendation Q.24: "Multifrequency push-button signal reception".
- [6] ITU-T Recommendation X.121: "International numbering plan for public data networks".

## 3 Abbreviations

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

DTMF	Dual Tone Multi Frequency
PIN	Personal Identification Number
PUI	Personal User Identity
UPT	Universal Personal Telecommunication
UPT-AA	UPT Access Address
UPT-AC	UPT Access Code
UPT-AN	UPT Access Number

## 4 Service requirements

### 4.1 General requirements

From a service point of view, the following general requirements should apply to UPT numbering, addressing and identification:

- issues related to the caller:
  - the dialled number to reach a UPT user should be easily recognisable and should be distinguishable from a non-UPT number. This informs the calling user that he may be subject to specific arrangements (e.g. for charging);
  - the dialled UPT number should be as short as practicable;
  - should be possible to dial the UPT number from any terminal in any telecommunication network;
  - the UPT number should not increase the likelihood of misdialling;
  - the UPT user should ideally be able to keep his UPT number, even if he changes address or service provider;
  - any evolution of the UPT numbering plan should minimise changes to user numbers and terminal equipments;
  - it is desirable that the UPT prefix(es), if required, used for dialling a UPT number are the same national and/or international in all networks;
- issues related to the UPT user:
  - it is desirable that the UPT Access Number (UPT-AN) used for accessing UPT procedures in a specific UPT service entity, has significance across national and international boundaries;
  - it is desirable that the UPT Access Code (UPT-AC) used for accessing UPT procedures, if any, is the same across national and international boundaries, amongst UPT service providers and across networks;
  - it is desirable that the various types of UPT-ACs are as few as possible, and as short as possible, if they need to be dialled.



## 4.2 Specific UPT numbers and identities

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

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

In addition, some numbers/identities must be used by the UPT user in order to access the UPT service:

- c) a Personal Identification Number (PIN) code, if applicable;
- d) a UPT-AC;
- e) a UPT-AN;
- f) a UPT-Access Address (UPT-AA);
- g) a UPT prefix(es) (national, international).

NOTE: From a network point of view, there may also be other numbers and identities associated with a UPT call. These are, however, only of interest to the network and are discussed in other standards.

### 4.2.1 The UPT number

A UPT number uniquely and unambiguously identifies each UPT user. It is used by a calling party to reach the UPT user.

This number is independent of terminal, network or service used and must conform to ITU-T Recommendation E.168 [3].

### 4.2.2 The PUI

The PUI is an identity by which a user is known to the UPT service providers and identifies a UPT user unambiguously. The PUI is not used by any calling parties and should not be known to any third parties. The UPT user may know the PUI and may use it for activation of UPT procedures, however, knowledge of the PUI is not required when a UPT access device is used.

The PUI is a private identity used to identify the UPT user when activating UPT procedures; this will reduce the traceability of calls and service requests. Thereby reduce the general security risks caused when an eavesdropper may use publicly quoted numbers, to monitor the services requested by a user. The UPT number and the PUI will, although being different numbers/identities, normally have a one-to-one relationship.

NOTE 1: The authentication of the UPT user is not an issue of the use of the PUI but is guaranteed by the security algorithms used during authentication. However, the use of the PUI as a private number, used to activate UPT procedures can reduce the security risks caused by eavesdropping.

## Requirements:

It needs to be possible from the structure of the PUI number, for any local UPT supporting network to identify and route messages to the home service provider, relating to the UPT user, thereby allowing the service provider to access the correct UPT service profile. The service provider identity will be incorporated in this PUI.

The administrative purposes of the UPT service provider, require that the PUI is able to be changed with minimal impact on the UPT users perceived service. This new PUI will then be used to activate UPT procedures in the usual way. The request for such a change may be initiated by a UPT subscriber. Such flexibility for all involved parties should not influence the UPT number.

EXAMPLE: This may be the case when a company who subscribes to UPT re-organises the roles of individuals in the organisation.

In order to allow UPT procedure activation using the PUI whilst roaming internationally and between different networks the structure of the PUI requires standardization.

NOTE 2: The detailed standardization of these issues relate to the network aspects of numbering and routing; it is noted that CCITT Recommendation E.212 [4] provides sufficient structure for the purposes of signalling and routing.

The use of the PUI is required for UPT phase 1, it therefore requires standardisation.

Guidelines on the use of the PUI:

- the use of the complete PUI from a pre-programmed UPT access device is recommended, as this improves the ease of use, and is complementary with authentication requirements using the same access device. Automatically it would take less than 3 seconds to enter 16 Dual Tone Multi Frequency (DTMF) digits (see CCITT Recommendation Q.24 [5]);
- in an stand-alone network implementation, providing limited roaming the network or national significant part of the PUI may be used to simplify the entry of the UPT user identification;
- the use of pre-programmed UPT access devices will remove any motivation for this simplified PUI entry.

### 4.2.3 The PIN Code

Whenever a UPT user authenticates himself to the UPT service entity, this authentication procedure may involve the use of a PIN code.

### 4.2.4 UPT access addressing

The UPT service may be accessed by one of two numbers, a UPT-AC, or a UPT-AN. These numbers address UPT service entities, which may be managed by UPT service providers or network operators.

#### 4.2.4.1 The UPT-AC

To access the facilities of the UPT service from any communications terminal (e.g. registration), in a network supporting the UPT service, a UPT-AC may be used (e.g. when using a plain telephone, the UPT user would dial a service access code). UPT specific service access codes of global significance would be preferred.

The use of a UPT-AC implies that the originating network supports the functionality to access a UPT service entity, which in turn is able to gain access to the UPT users' UPT service profile from the home UPT service provider's database.

This service access code may be used to access UPT facilities generally, or different UPT-ACs may be used for different purposes. Whether to allow the use of one or several UPT-ACs is for further study.

The UPT-AC may contain indication, by an extension, of the preferred language for subsequent voice announcements.

#### **4.2.4.2 The UPT-AN**

The UPT-AN is a CCITT Recommendation E.164 [2] number used by a UPT user to access a specific UPT service entity under the control of a specific UPT service provider, from any communications terminal in any telecommunications network.

The use of UPT-AC(s) may not always be possible, or the caller may not know them or wish to use them. This specific access number enables the UPT user to directly access the services of the home UPT service provider (e.g. to receive announcements in their native tongue, or provide improved data security).

This method of access will allow UPT users to access the UPT service from within networks which cannot fully support the UPT service. This may be used to directly access specific UPT procedures, or to invoke a dialogue with the UPT service entity.

#### **4.2.4.3 The UPT-AA**

The more general term UPT-AA is for further study.

This term may relate to a CCITT Recommendation E.164 [2] number, which includes the use of number ranges to specifically access UPT procedures within the addressed UPT service entity. This may be of greater importance when coupled with the use of intelligent UPT Devices.

Also the term, UPT-AA, may relate to the use of a ITU-T Recommendation X.121 [6] number and address. Which may be advantageous in the support of advanced interrogation and modification of the UPT service profile which itself is for further study.

#### **4.2.5 International UPT prefix**

The use of an international UPT prefix within a dialling plan may be required (e.g. when using a plain telephone, the user would dial an international prefix CCITT Recommendation E.164 [2] followed by the ITU-T Recommendation E.168 [3] international UPT number). It would be preferable to have an international UPT prefix of global significance. However, the establishment of such a prefix is for further study.

The issue of a specific UPT prefix for national/international UPT calls is for further study.

#### **4.2.6 Subscriber identity**

A subscriber identity is required by: subscribers, network operators and service providers, to facilitate charging, accounting, etc.

**Requirements:**

- this requires a number which need not be known, recognised and understood to any party except the UPT subscriber and the UPT service provider;
- the UPT user may be able to recognise this subscriber identity;
- indeed it may be useful, if the UPT user is able to recognise this subscriber identity in the their relationship with the UPT subscriber;
- it may be beneficial for network operators to be able to recognise and match such subscriber identities, for accounting integrity checking;
- otherwise, such information would be regarded as confidential between the subscriber and service provider;
- changing such a number when a UPT subscriber changes service provider is a normal requirement, i.e. subscriber identity portability is not a requirement;
- this is required in a service provider to subscriber relationship;
- such confidentiality, should protect the subscriber and user not the service provider; it is not a requirement to not identify the service provider or UPT service entity from the structure of an subscriber identity;
- if this subscriber identity is used for inter-operator accounting then recognition of the billing authority (service provider) is useful;
- international uniqueness and use of a standardised structure is useful if this subscriber identity is used for inter-operator accounting;
- the subscriber identity must have a unique relationship to a group of UPT users and their PUIs' and may be part of the structure of the PUI.

EXAMPLE:                   It would be possible to charge business calls to the company's subscriber identity, and to charge private calls to the subscriber identity relevant to the user. This implies a relationship between the subscribers subscriber identity and the various PUIs and UPT numbers allocated to each role.

NOTE:                    The ITU-T Recommendation E.118 [1] defines the structure of telecommunications card identities.

**4.2.7           UPT number portability**

Portability of the UPT number between service providers, within a country code domain (i.e. national), is a requirement of UPT phase 2.

To reduce the expense incurred by uses relating to changing their directory numbers, when they change service providers.

To allow the UPT user to be reached using the same number irrespective of network upgrades, or changes to the network operator. This portability relates to the number which calling parties use to reach the UPT user, and therefore applies to incoming UPT calls only.

To allow the portability of UPT numbers between differing service providers, thereby allowing UPT subscribers to keep their same numbers when changing service providers. Therefore, the public quoted directory number (i.e. given to potential/desired callers) need not change, making the UPT number a truly personal number. The amount of location information will depend upon the category of portability provided.

It needs to be possible to identify the UPT service provider, the PUI may be useful in this context.

The range of the allowed UPT number portability may be categorised as follows:

- a) local area number portability;
- b) national UPT number portability;
- c) global UPT number portability.

It is not yet clear which of these are required for UPT phase 2.

## **5 Administration**

The following principles apply to the administration of the UPT dialling/numbering plan:

- should not be too complex;
- should not give cause to long delays getting individual numbers into use;
- needs to be reliable (e.g. prevention of double allocations);
- shall not be too expensive.

## History

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