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OPERATION, NUMBERING, ROUTING AND MOBILE SERVICE

APPLICATION OF E.164 NUMBERING PLAN FOR UPT

ITU-T Recommendation E.168

(Previously "CCITT Recommendation")

FOREWORD

The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of the International Telecommunication Union. 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, established the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

ITU-T Recommendation E.168 was prepared by the ITU-T Study Group II (1988-1993) and was approved by the WTSC (Helsinki, March 1-12, 1993).

NOTES

1 As a consequence of a reform process within the International Telecommunication Union (ITU), the CCITT ceased to exist as of 28 February 1993. In its place, the ITU Telecommunication Standardization Sector (ITU-T) was created as of 1 March 1993. Similarly, in this reform process, the CCIR and the IFRB have been replaced by the Radiocommunication Sector.

In order not to delay publication of this Recommendation, no change has been made in the text to references containing the acronyms "CCITT, CCIR or IFRB" or their associated entities such as Plenary Assembly, Secretariat, etc. Future editions of this Recommendation will contain the proper terminology related to the new ITU structure.

2 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 E.168

APPLICATION OF E.164 NUMBERING PLAN FOR UPT

(Helsinki, 1993)

1 Introduction

The concept of universal personal telecommunications (UPT) has brought about the realization that personal identity could open up the current perception of how numbering can be used across and within international and national telecommunication networks.

Given that UPT will generate Recommendations that will lead to innovative and marketable services and features, care must be taken in ensuring that basic concepts are understood.

From a user point of view there will exist different degrees of mobility within the UPT concept. When full user mobility is not the desired objective, translation logic governing geographic limits for call termination may be adopted for this purpose.

Recognizing that UPT is evolving there are items requiring further study including those identified in Annex A. The intention of this Recommendation is to provide a basis for a common understanding of the underflying issues and hence to facilitate early implementation of UPT within a common framework.

Of the several UPT call types, this Recommendation provides a framework of numbering for "In-calls", i.e. calls incoming to the UPT user. In-call registration (transactions between UPT user and UPT service profile), Out-calls and Out-call registration are separate issues and are not covered in this Recommendation.

2 Definitions

UPT introduces the concept of called party mobility across many networks. This includes but is not limited to ISDN, PSTN, PLMN and PSPDN.

This leads to the conclusion that mobility, in the wider context, provides the ability to access users independent of location, terminal type, network type or network operator.

For this, a UPT number is defined as;

A **UPT number** (see Recommendation E.164): Uniquely identifies the end user and is used by the caller to reach the user. A UPT indicator is defined as that portion of the UPT number that identifies the call as UPT.

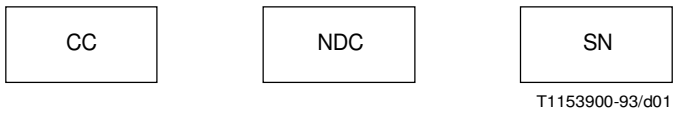
3 Other relevant Recommendations

Unless exceptions are noted within this application, Recommendations E.160, E.161, E.164, E.165 and E.166 are appropriate references.

4 UPT number structure

A UPT number should have a very simple and basic structure. The structure must conform to Recommendation E.164.

Recommendation E.164 (Numbering plan for the ISDN ERA) has been designed with an open evolutionary format which can accommodate new services and applications (see Figure 1).



CC country code as defined by Recommendation E.164
NDC National destination code
SN subscriber member

FIGURE 1/E.168

E.164 number structure

For UPT, three independent scenarios are considered. These may coexist in the international network.

The length and structure of a UPT number must conform to Recommendations E.164 and E.165.

Information relating to the UPT service is held in the associated service profile. Access to this profile is done on the analysis of the full number.

4.1 Scenario 1 – Home-related scheme

For this, the E.164 structure may be interpreted as follows:

CC Country code

NDC + SN National (significant) number

In this scenario, the number itself does not contain any form of UPT identity. Information relating to the UPT service is held in the associated service profile in the home domain. The mobility of the UPT user is then limited by the capability of the home domain and restricted only by routing and performance considerations.

4.2 Scenario 2 – Country-based scheme

For this, the E.164 structure may be interpreted as follows:

CC Country code

NDC UPT indicator of UPT/Service provider indicator

SN Subscriber number

The international UPT number is CC + NDC + SN.

A national format may exist, but must include the NDC and SN.

Possible NDC structure for scenario 2

When considering the deployment of UPT in this scenario, sub-structuring of the NDC and SN fields may need to be considered.

NDC

The NDC structuring is a national matter. However, it is desirable to establish a structure that would allow at least the national calling party as well as the network to recognize a UPT number.

Two components that are considered as candidates for the NDC are

a) the identification of a UPT call;

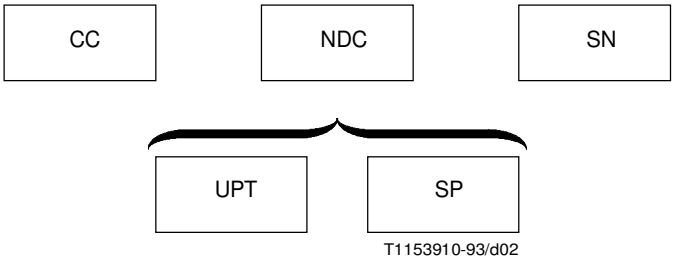
b) the identification of service provider.

The order and allocation of these components are national matters, although it may be more convenient for the implementation of the service to place a) in front of b) in order to allow the calling party's country to recognize the UPT nature of the call by an analysis of a minor number of digits after the country code.

SN

A likely requirement is to identify groups of number which are associated with network nodes. To this end, the SN can be structured.

The complete E.164 number structure as described previously is shown in Figure 2.



UPT UPT indicator
SP Service provider indicator

FIGURE 2/E.168

Scenario 2 UPT number structure

4.3 Scenario 3 – Country code-based global scheme

This scenario is considered in the progression of UPT numbering, to accommodate universal number portability. The implementation aspects of this scenario are for further study.

For this the E.164 structure may be interpreted as follows:

CC	UPT Indicator
NDC	Global or country identification (maximum three digits; e.g. derived from the CC within Recommendation E.164)
SN	Subscriber number

This structure requires the allocation of a country code to allow the determination of a UPT call. This would need to be allocated from the range of spare country codes in Recommendation E.164[1)].

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1) The allocation and management of E.164 country codes is under review and scenario 3 requirements will need to be taken into account.

The NDC digits following CC(UPT) give structure to the remainder of the number. These digits will include either an E.164 CCITT assigned country code or one additional E.164 assignment not conflicting with country code assignments. This additional assignment may be as short as one digit (e.g. "0") or may be as long as three digits, and signifies global (CCITT) administration of numbers. Where country codes appear as NDC, national administration of numbers is anticipated.

The number of digits in the SN is a national matter, but the total number of international digits must not exceed 12 digits before time T. Since international analysis may expand to 6 digits, some applications of this scenario may not be appropriate prior to time T.

The international UPT number is either:

a) CC(UPT) + NDC(non-CC) + SN; or

b) CC(UPT) + NDC(CC) + SN;

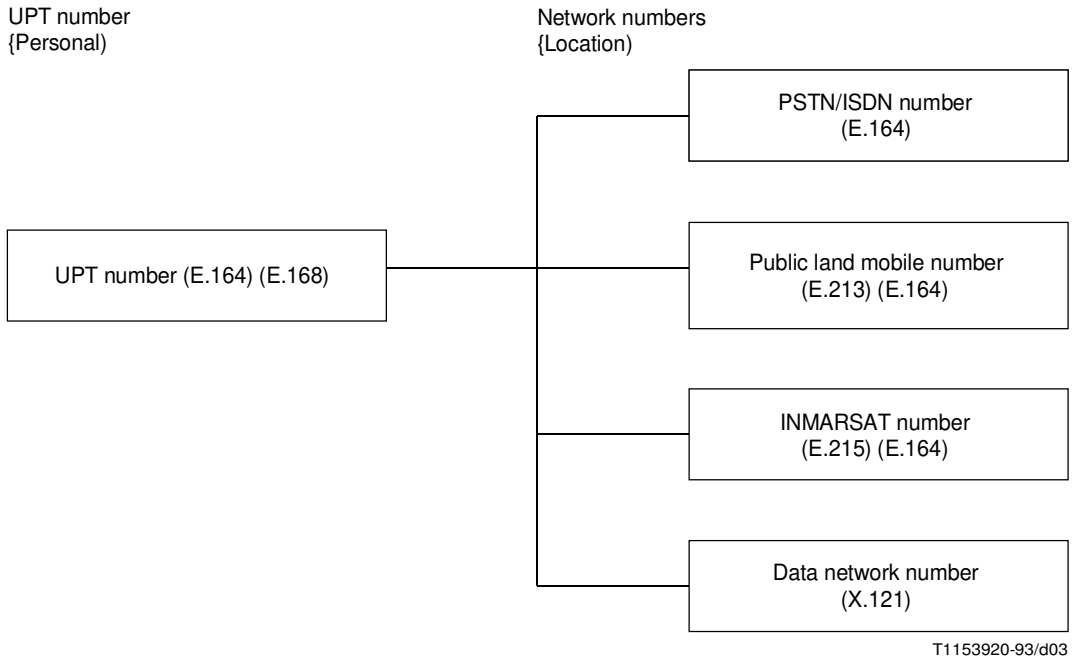
with

a) global number administration; or

b) national number administration of numbers.

5 Relationship of UPT and network numbers

It is necessary to show how location and personal identity may be related. Figure 3 illustrates the variation of dynamic and permanent numbering relationships that may exist within a UPT environment.



( ) related Recommendation

FIGURE 3/E.168

Relationship of UPT and network numbers

The UPT number will provide the necessary information to enable access to the appropriate user's service profile, to trigger the translation to the network number. The routing will then be based on the network number.

6 Number administration responsibility

Table 1 assigns responsibility for the number administration.

The administration of UPT numbers within CCITT is for future study.

TABLE 1/E.168

Number administration responsibility

Scenario	CC	NDC	SN
1	CCITT	National	National
2	CCITT	National	National
3	CCITT	a) CCITT	CCITT
		b) CCITT	National

7 Dialling plans

The use of a prefix within dialling plans has been identified as a method of recognizing that the following digits represent a UPT number.

The development of dialling plans is a national matter and some countries may find it advantageous to incorporate a UPT prefix in their dialling plans.

Additional benefits for service providers and users could result if a unique international standardized prefix was adopted. To this end, further study will be undertaken in order to

a) evaluate the implications of adopting a universally available prefix, and if appropriate

b) recommend a standard prefix for those countries adopting a UPT prefix.

A unique UPT prefix, if used, would be applied with the full international format of the three scenarios discussed in 4.

Annex B provides further detail and an example.

8 Recommendation history

First issue – 1993.

Annex A

(to Recommendation E.168)

Items for further study

(This annex forms an integral part of this Recommendation)

UPT is an evolving capability requiring many areas of further investigation. The following list reflects continuing work on the UPT numbering framework as contained in 1 to 6:

- evolution of UPT numbering;
- comparison of scenarios;
- portability;
- signalling requirements, e.g. TON/NPI, CLI, etc.;
- sub-address (sub-addresses should not be included unless it has been assured that they are appropriate to the ultimate destination);
- the advantages/disadvantages of dual UPT identification in the situation where a dialled prefix, as defined in 6, precedes a UPT number;
- co-existence among various scenarios;
- the administration of UPT numbers within CCITT;
- the implementation aspects of scenario 3.

Annex B

(to Recommendation E.168)

Dialling plans for UPT

(This annex forms an integral part of this Recommendation)

A UPT prefix used to identify a UPT number, is consistent with current dialling/numbering plans. The use of the UPT prefix would enable identification of the digits that follow as being a UPT number.

The UPT prefix may be used to identify or further identify that the dialled number in scenarios 1, 2 or 3 is a UPT number.

The UPT number would consist of the CC + NDC + SN and would be preceded by the UPT prefix. Thus, the dialling plan would be as follows:

(&) CC NDC SN

where the UPT prefix is indicated by the (&).