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**Cordless Terminal Mobility (CTM);
Numbering and identification**

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Contents

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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Network Aspects (NA).

1   Scope

The present document defines:

    a) directory number formats for the subscribers to the CTM service;

    b) an identification plan for these subscribers;

    c) routeing numbers used to establish incoming calls.

Radio identities are outside the scope of the present document.

Numbers and identities used for CTM are valid at any phase of the standardisation process. As regard to numbers, not all the options will be implemented immediately (see also subclause 4.3). The decision for a numbering option to belong to any phase of the CTM project is outside the scope of the present document.

2   References

References may be made to:

    a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

    b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

    c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

    d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

2.1   Normative references

    [1]   ITU-T Recommendation E.164: "Numbering Plan for the ISDN era".

    [2]   ITU-T Recommendation E.212: "Identification plan for land mobile stations".

    [3]   ITU-T Recommendation E.214: "Structure of the land mobile global title for the Signalling Connection Controle Part (SCCP)".

    [4]   DEN/NA-020039: "CTM phase 1: service description".

    [5]   DEN/NA-020061: "CTM phase 2: service description".

    [6]   DEN/NA-061302: "IN architecture and functionality for the support of CTM".

    [7]   DEN/NA-021413: "Management of the ETNS".

    [8]   ETS 300 189: "Private Telecommunication Network (PTN); Adressing; ECMA-PTNA".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following definitions apply. These definitions are provided to understand the numbering and identifying of CTM; more detailed definitions, which do not relate only to numbering and identifying, are given in [4], [5] and [6]. In case of conflict with other CTM Standards, the definition contained in the other Standards take precedence.

CTM identity: The unique and unambiguous identity by which a subscriber is known to the CTM service providers and networks supporting CTM.

CTM number: The directory number that uniquely and unambiguously identifies a CTM subscriber.

CTM routeing number: A number which depends on the location of the CTM user and that is used to route incoming calls.

fixed part: The CTM equipment, at the edge of the visited public network, where is located the user.

home database: A database belonging to the service provider which contains information about the location of the CTM user.

home network: A network, with CTM facilities, to which the CTM subscriber has registered.

subscriber: A person or entity that subscribed the CTM service.

user: A person delegated by the subscriber to use the CTM service.

visited database: A database, in the visited network, used in some routeing option to facilitate the management of the location of the user.

visited network: A network, with CTM facilities, where the CTM user is roaming.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

CC	Country Code (E.164)
CTM	Cordless Terminal Mobility
CTM ID	CTM Identity
CTMN	CTM Number
ESI	European Service Identifier (NA-021408)
ESN	European Subscriber Number (NA-021408)
ETNS	European Telephony Numbering Space (NA-021408)
MCC	Mobile Country Code (E.212)
MNC	Mobile Network Code (E.212)
MSIN	Mobile Subscriber Identification Number (E.212)
NDC	National Destination Code (E.164)
NRA	National Regulation Authority
SCCP	Signalling Connection Control Part
SN	Subscriber Number (E.164)

4   CTM number

4.1   Definition and use of the CTM number

The CTM number is a E.164 number globally and uniquely identifying a CTM subscriber.

It is dialled by the calling party to call the CTM user wherever he is roaming.

The CTM Number (CTMN) is the only information available during incoming call set-up, from which the address of the home database should be derived.

4.2   Alternative structures for the CTM number

The structure of the CTM number determines the authority(ies) responsible for number assignment.

The structure of the CTM number determines whether service provider portability is possible or not.

4.2.1   Option I: national geographic numbers

4.2.1.1   Definition

By geographic number is meant a number from the national numbering plan commonly used to address a fixed access in the local loop. The DEN/NA-020039 [4] anticipates the possibility for a subscriber to keep his geographic E.164 number when he moves to a CTM subscription. This case of service portability is a network option for the local loop operator. The CTM number is in this case a geographic E.164 number with an enhanced service offering.

4.2.1.2   Assignment authority

The assignment of national geographic numbers to CTM subscribers is a national matter.

4.2.1.3   Service provider portability

Service provider portability of geographic numbers, and whether it includes service portability from fixed to CTM subscriptions, are national matters.

4.2.1.4   Dialling procedure

No distinction being made between geographic numbers attached or not attached to a CTM subscription, these numbers are dialled through the standard national procedure (local or full national dialling).

4.2.2   Option II: national CTM numbers

4.2.2.1   Definition

In this scenario, specific National Destination are reserved from the national numbering plan, for the CTM service. The CTM number has the following structure:

$$CTMN = CC + NDC (CTM) + SN$$

Which National Destination Codes (NDCs) are reserved for the CTM service is a national matter.

Two sub-options are possible:

(II-1)   The NDC (CTM) is allocated to a specific CTM service provider:

$$NDC (CTM) = NDC (CTM \text{ service provider})$$

(II-2) The NDC (CTM) is shared by several service providers:

$$NDC (CTM) = NDC (CTM service)$$

4.2.2.2 Assignment authority

Allocation of NDCs to the CTM service / service providers is a national matter.

In II-1, the service provider who is granted the NDC is responsible for the management of Subscriber Numbers (SN) behind this block.

In II-2, the national administration is responsible for the management of the whole number.

4.2.2.3 Service provider portability

By definition, structure II-1 does not allow service provider portability.

Using structure II-2 allows service provider portability. The decision to have service provider portability is a national matter.

4.2.2.4 Dialling procedure

Full national dialling applies to option II CTM numbers.

4.2.3 Option III: ETNS numbers

4.2.3.1 Definition

Here it is assumed that CTM numbers are taken out of the European Telephony Numbering Space DEN/NA-021413 [7]. Their structure is:

$$CTMN = ESI (CTM service) + ESN$$

4.2.3.2 Assignment authority

The European Telephony Numbering Space (ETNS) Registrar is responsible for the allocation of an European Service Identifier (ESI) to the CTM service, and for the allocation of European Subscriber Number (ESN) to the subscribers.

4.2.3.3 Service provider portability

According to ETNS standards, an ETNS number is normally portable between service providers.

4.2.3.4 Dialling procedure

ETNS numbers are always dialled in international format.

4.2.4 Option IV: private networks numbers

4.2.4.1 Definition

Private networks can develop any private numbering scheme for their CTM service, provided that it complies with ETS 300 189 [8].

When the Direct Dialling In service is used, the private CTM number is embedded into a public number, which can be a geographic number, or a number from a range of the national scheme reserved for private network numbering. From the public network point of view, this public number is a standard geographic number / private network number, like any other belonging to the block of numbers allocated to the private network. The public network does not know that this number has been allocated to a CTM subscriber.

4.2.4.2   Assignment authority

The private administration is responsible for the management of private numbers.

4.2.4.3   Service provider portability

Private CTM numbers are not portable.

4.2.4.4   Dialling procedure

Procedures for dialling inside the private network are under the private administration authority. From the public network, the number is dialled like an ordinary public number.

4.3   Conclusions

The different options can coexist in the public networks, depending on what the regulators authorize, on what the service providers wish to offer, and on what the technology enables.

Portability of any type of number is a regulatory decision that has implications on the architecture of the service. If CTM numbers are not portable between service providers, the identity of the service provider can be retrieved from the number, and the home database location derived from the first digits of the number. If CTM numbers are portable between service providers, full-length analysis or special routeing / database query is required.

In early implementations (CTM Phase 1) of the CTM, CTM procedures are designed for national CTM numbers including a CTM Service Provider indication (option II-1), and national geographic numbers (option I). Other options are left for future phases of the CTM project.

5   CTM identity

5.1   Definition and use of the CTM identity

The CTM Identity (CTM ID) is an E.212 number globally and uniquely identifying a CTM subscriber.

It is only known by the service provider and the network operators. For security purposes, it has not to be publicly known. It doesn't need to be known by the subscriber.

It can be changed without changing the CTM number, i.e. it is not portable.

It is not a diallable number.

It is used by the networks to identify the home database.

5.2   Structure of the CTM identity
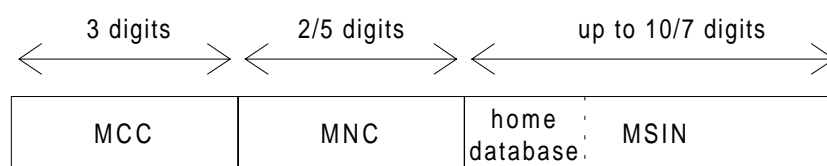
The CTM ID is structured as follows:

Figure 1: Structure of the CTM ID

The Mobile Country Code (MCC) identifies the country or geographical area where the CTM subscriber is registered. It is a 3-digit field allocated by ITU-T.

The Mobile Network Code (MNC) identifies the CTM service provider. It is allocated by the national administration to the service provider. Its length should be carefully designed to meet the supply of service in each country.

The Mobile Subscriber Identification Number (MSIN) identifies a subscriber of the service provider. It is managed by the service provider. The first digits of the MSIN may designate different home databases of the service provider.

The use of the CTM ID in the signalling network is described in ITU-T Recommendation E.214 [3].

6 CTM Routeing numbers

6.1 Definition and use of the CTM Routeing numbers

The routeing numbers are E.164 numbers used to route the call, through the visited network, to the CTM user.

They are granted by the national administration to the service provider so that he can operate the call and identify his equipment / IN functional entities. They do not belong to the pool of directory numbers offered to the CTM subscribers, i.e. they cannot be allocated as public numbers. They are not diallable, i.e. dialling them directly to reach the CTM user should not be allowed.

6.2 Routeing methods

The routeing methods depend on the structure of the CTM Number. This document focuses on the two options considered in DEN/NA-061302[6], options II-1 and I.

6.2.1 Option II-1 CTM Number

Two options are identified to terminate the call in DEN/NA-061302 [6] and are illustrated below (for the detailed procedures and the functional elements involved, DEN/NA-061302 [6] refers):
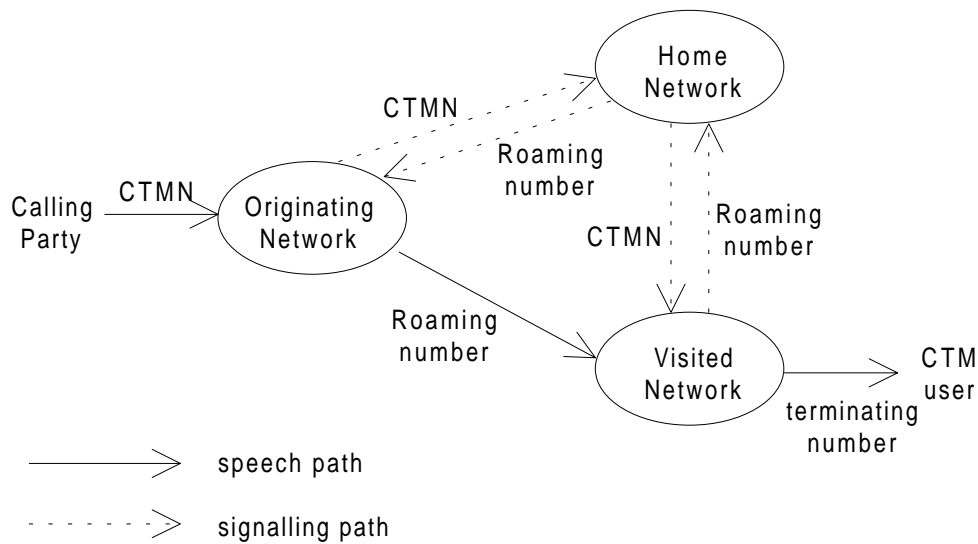
6.2.1.1 Routeing number identifies a CTM subscriber (roaming number)

The following steps are performed:

- the call is routed to an Originating Network functional element with CTM capability;

- this functional element interrogates the Home Network via SCCP;

- the Home Network interrogates the Visited network via SCCP;

- the Visited Network allocates a temporary routeing number to the CTM user;

- the routeing number is passed down to the Home Network, and then to the Originating Network;

or

- an alternative to the three steps above is that the Originating Network retrieves the SCCP address of the Visited Network and interrogates it directly to get a routeing number;

- the Originating Network forwards the call to the routeing number;

- the Visited Network triggers a CTM functional element on receipt of the routeing number;

- this functional element uses the routeing number as a key in the Visited Database to retrieve the location of the user (a Fixed Part Number);
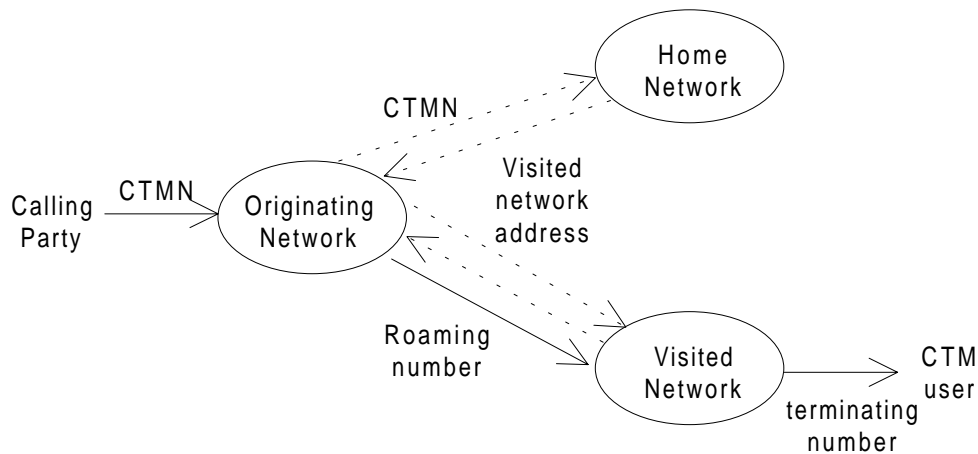
- the Visited Network ends the call.

Figure 2: Routeing number identifies a CTM subscriber

6.2.1.2   Routeing number identifies a visited network element

The following steps are performed:

-    the call is routed to an Originating Network CTM functional element;

-    this functional element interrogates the Home Network via SCCP;

-    the Home Network returns a routeing number which identifies a CTM functional element in the Visited Network;

-    the Originating Network forwards the call to this number, and passes the CTM Number as a separate parameter;

-    the Visited Network triggers a CTM functional element on receipt of the routeing number;

-    this functional element uses the CTM Number as a key in the Visited Database to retrieve the location of the user (a Fixed Part Number);

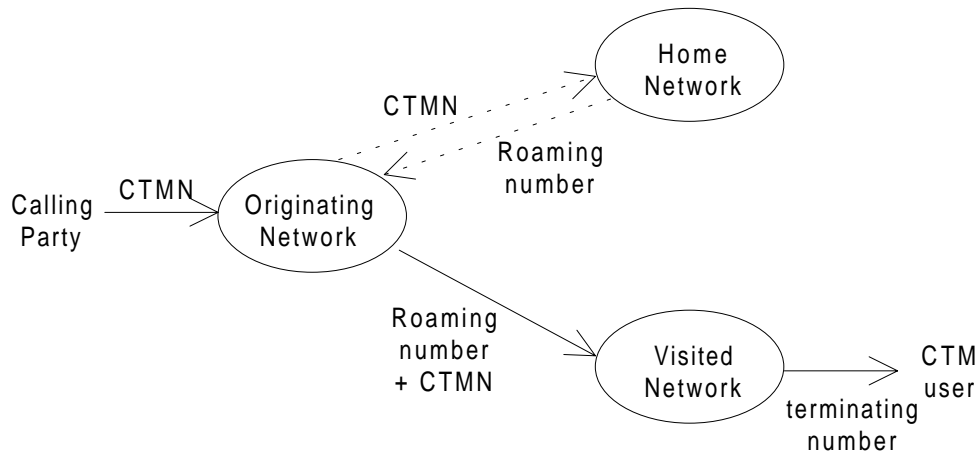-   the Visited Network ends the call.

Figure 3: Routeing number identifies a visited network element

6.2.2   Option I CTM Number

Calls to a national geographic CTM Number are first routed to the Home Network (the concept of Originating Network with CTM facility does not apply). Then the call is proceeded using one of the procedures of the above section.

6.3   Structure of the CTM Routeing number

The CTM Routeing number is an E.164 number that identifies the visited system that will trigger the visited database, and that potentially identifies the registered terminal in this database:
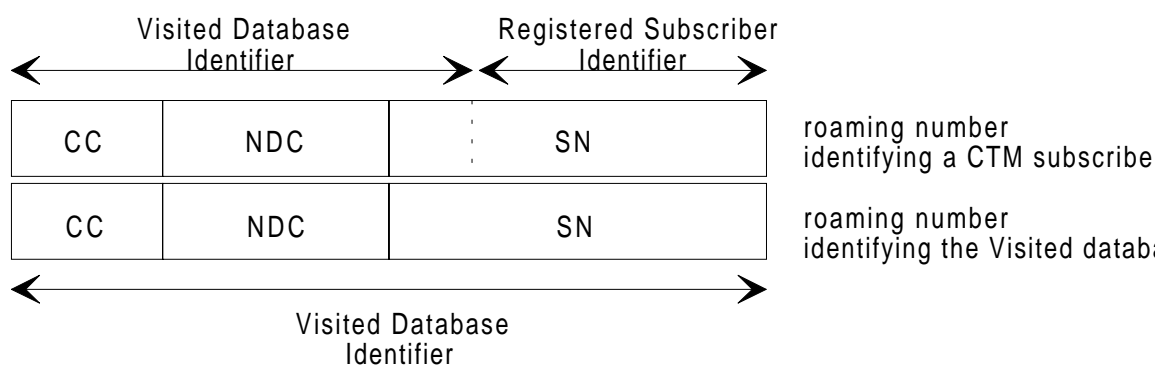

Figure 4: E.164 routeing number

The NDC used in a routeing number may be a geographic NDC or a NDC specific to the CTM service provider.

In case of a routeing number identifying a CTM subscriber, the SN is a temporary field allocated to the user only during the time necessary to establish an incoming call.

6.4   Fixed Part number

Like any terminating point of a public network, the Fixed Part is addressed by a E.164 number, the Fixed Part number. This E.164 number may be completed with a sub-address used to identify a particular location area behind the Fixed Part. A Routeing Number is translated into a Fixed Part number in the visited database.

History

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<tr><td>V1.1.1</td><td>November 1997</td><td>Membership Approval Procedure</td><td>MV 9803:</td><td>1997-11-18 to 1998-01-16</td></tr>
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