Final draft **EN 301 161** V1.1.1 (1998-08)

European Standard (Telecommunications series)

Management of the European Telephony Numbering Space (ETNS)

ETSI

Reference
DEN/NA-021413 (ar000ico.PDF)

Keywords
management, addressing

ETSI

Postal address
F-06921 Sophia Antipolis Cedex - FRANCE

Office address
650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16
Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Internet
secretariat@etsi.fr
http://www.etsi.fr
http://www.etsi.org

ETSI

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available **free of charge** from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://www.etsi.fr/ipr or http://www.etsi.org/ipr).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Network Aspects (NA), and is now submitted for the Voting phase of the ETSI standards Two-step Approval Procedure.

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

Introduction

ETSI, under a mandate from the CEU, has been requested to produce a standard for the number structure, possible evolution of European numbers (Ens) towards a global scheme, and framework of functions regarding ETNS numbering conventions. ETO has, on behalf of ECTRA for the CEU, produced proposals for the management of the ETNS, and developed ETNS numbering conventions to be agreed by ECTRA. The studies made in ETSI and the standards produced are a prerequisite to the necessary commercial agreements between the parties willing to participate in the ETNS.

The present document is based on the results of the ETSI studies on the topic, based on the prime requirement of the ETNS which is the ability to introduce services in an open competitive environment.

ECTRA having decided in November 1996 to base the ETNS on Country Code (CC) 388 (see note), this numbering scheme is therefore the only one covered within the present document.

    NOTE: The country code has currently only been reserved for trial purposes until the beginning of 1999.

The present document has been designed for an early implementation of the ETNS. Improvements of the ETNS architecture may occur later and result in revisions of the present document. In particular, the present document contains some architectural alternatives which will be assessed during the trial period.

1   Scope

The present document specifies the methods for routeing a call from the calling party to the called party and the management methods to be used for controlling such procedures. It also describes the number structure, including the allocation of codes to the service described, number length and evolution from National numbers to pan-European to global numbers.

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 a EN with the same number.

2.1   Normative references

[1]   ITU-T Recommendation E.164 : "The international public telecommunication numbering plan".

[2]   EN 301 160 (V1.1): "Routeing of calls to the European Telephony Numbering Space (ETNS) services".

2.2   Informative references

[3]   TR 101 073 (V1.1): "Number portability for pan-European services".

[4]   TR 101 079 (V1.1): "Network Aspects (NA); Routeing of calls to pan-European services using European Telephony Numbering Space (ETNS)".

[5]   ES 201 104 (V1.1): "Human Factors (HF); Human factors requirements for a European Telephony Numbering Space (ETNS)".

[6]   ETO Report: "Management, Routeing and Portability aspects of the European Telephony Numbering Space (ETNS)".

[7]   NPTF WP0 Document.

[8]   NPTF WP1 Document.

3   Definitions and abbreviations

3.1   Definitions

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

administrator: The administrator has the responsibility for the high level management of the ETNS.

assisted network: A network which routes a call to an European number towards a serving network it has agreement with in order to complete the call.

called party: An entity that terminates a call to an European number. The called party may be the ETNS subscriber to the European number, an entity delegated by the ETNS subscriber, or a terminating equipment of the service network (e.g. a recorded announcement equipment).

calling party: An entity that dials a European number.

ETNS country: A CEPT member country participating in the ETNS.

ETNS Registrar database: The database maintained by the Registrar where all data, both administrative and operational, for each European number are registered.

ETNS routeing number: An ITU-T E.164 [1] number used to route to the service exchange. It can also identify the called party, the ETNS service provider, and / or the originating network for routeing purposes.

ETNS service provider: An entity that provides one or more ETNS service(s) to its ETNS subscribers on a contractual basis.

ETNS service: A service that has been assigned an ESI.

ETNS subscriber: An entity that requests a European number from a ETNS service provider in order to offer access from a calling party to a ETNS service.

ETNS translation database: A database which, in the call process, translates the European number into a routeing number.

ETNS: The numbering resource identified by E.164 [1] country code 388, used for the provisioning of the ETNS services.

European number: A number out of the ETNS.

originating network: A network, either assisted or serving, to which the calling party is connected.

Registrar: The registrar is responsible for the day-to-day management of the ESNs behind each ESI.

service exchange: An exchange of the service network that triggers the provision of the service on reception of the routeing number, and then forwards the call.

service network: A network that operates one or more service exchange(s).

serving exchange: An exchange, in the serving network, that can interrogate directly or indirectly an ETNS translation database to obtain a routeing number related to the European number, and then forward the call.

serving network: A network, with one or more serving exchange(s).

3.2   Abbreviations

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

CC	E.164 [1] Country Code
CEPT	Conférence Européenne des Postes et Télécommunications
CEU	Commission of the European Union
ECC	European Country Code
ECTRA	European Committee for Telecommunications Regulatory Affairs
En	European number
ENTF	European Numbering Task Force
ESC	European Service Code
ESI	European Service Identity
ESN	European Subscriber Number
ETNS	European Telephony Numbering Space
ETO	European Telecommunications Office
GSN	Global Subscriber Number
IN-CS1	Intelligent Network Capability Set 1
ISUP	International Signalling User Part
NDC	National Destination Code
NRA	National Regulatory Authority
SgN	Serving Network
SN	Subscriber Number
SP	ETNS Service Provider
Rn	Routeing number

4   Reference model for the ETNS

This clause provides a conceptual description of the implementation of the European Telephony Numbering Space (ETNS). Figure 1 shows the actors involved in the ETNS, and their relationship with each other. Also shown in figure 1 are the relevant reference points for the ETNS that are described in subclauses 4.2 and 4.3. Figure 1 is divided into call-related and non call-related parts in order to clearly show the distinction between the routeing functions and the management functions.

MANAGEMENT PART
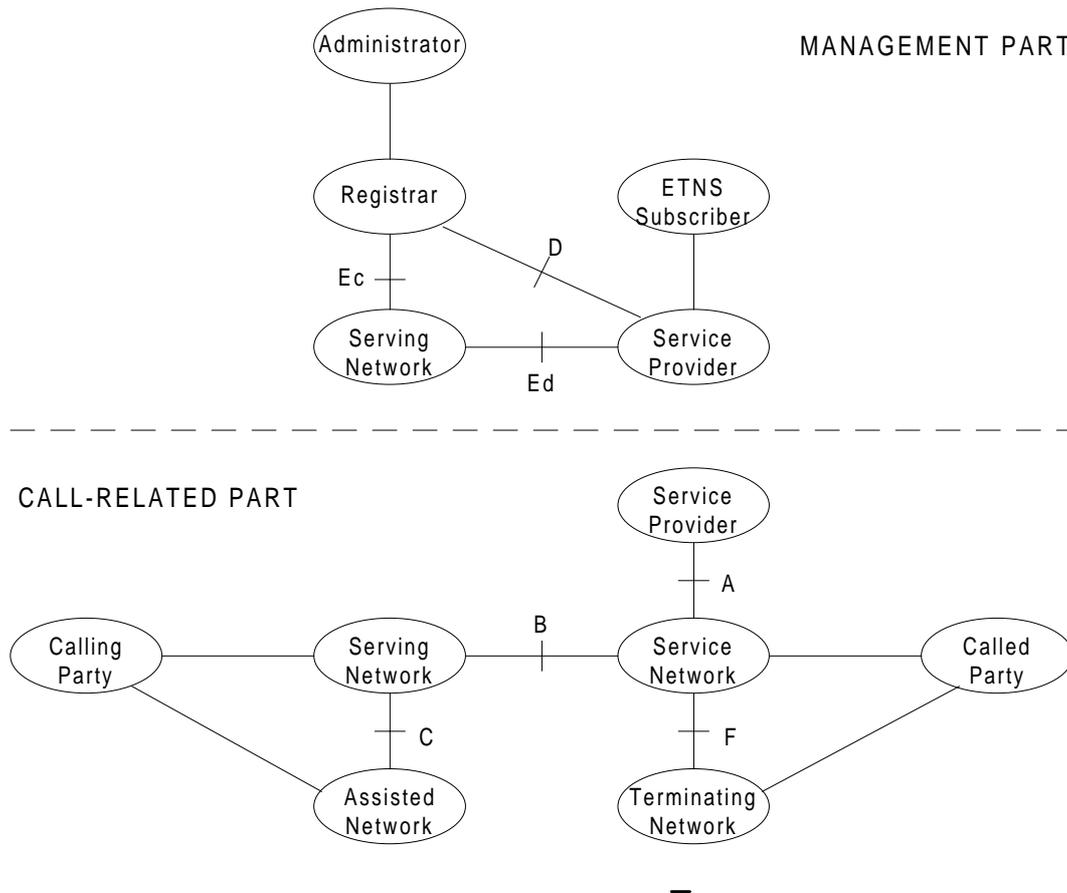
CALL-RELATED PART

Figure 1: Actors and reference points

The reference points in the management (non call-related) part of the figure 1 are used in the present document, while the reference points in the call-related part are used in TR 101 079 [4].

The ETNS Service Provider (SP) is the entity that is relevant in the process of number assignment. The service network is the entity that is relevant in call processing. One single entity may be both the ETNS SP and the service network, or they may be different entities; in the latter, the entity that assumes the function of ETNS SP may or may not participate in the call process. Such a distinction leads to recognize two concepts under the word "service provision": the function of the first is to sell a service to a ETNS subscriber, and to be the sole interface with this ETNS subscriber, this is the role of the ETNS SP; the function of the second is to operate the call, this is the role of the service network.

The Serving Network (SgN) is responsible for routeing a call from the calling party to the service network. The service network (and potentially the SP) is (are) responsible for providing the service itself.

European numbers (Ens) are managed by independent authorities which are identified as the registrar and the administrator in figure 1.

4.1   Call-related part

This subclause describes the principles for routeing a call from the calling party to the called party. This is studied in detail in TR 101 079 [4] and EN 301 160 [2]. A call to a European number (En) can be divided in two parts.

4.1.1   First leg: getting the routeing number

The calling party shall dial the En in its international format.

Based on the European Service Identifier (ESI), clause 5, the call is routed to the serving exchange in the SgN. Potentially, this exchange may not be located in the calling party's network. The originating network is then called an assisted network, interconnected to the SgN through reference point C. An assisted network can be connected to different SgNs, e.g. for routeing differently depending on the ESI, or it can redirect all ETNS calls to one SgN.

The serving exchange, analysing the ESI, triggers the ETNS translation database to translate the incoming En into an outgoing Routeing number (Rn). The ETNS translation database can be inside or outside the SgN, e.g. when several SgNs share the same ETNS translation database. The Rns can vary from a SgN to another.

Whether the area from where a single En is accessible relies on a subscription or not, is service dependent.

This ends the first leg of the call which consists of routeing the call to the service exchange.

4.1.2   Second leg: providing the ETNS service

The proceeding of the call set up in the service network and beyond depends on the nature of the service on the one side, and on the relationship between the ETNS SP and the service network on the other side.

The nature of the service will determine the path of the call, whether it terminates to the subscriber or to a recorded announcement, whether it needs a second number translation or not, etc. These features are service dependent and are outside the scope of the present document.

The relationship between the ETNS SP and the service network will determine the responsibilities of each actor as regards service provision. The two actors can be the same entity which operates the service, or the ETNS SP can rely upon the telecommunication infrastructure of a different service network and only operate e.g. a database when a double translation is required. The implementation of reference point A between the service network and the SP depends on the technical constraints related to the service, and on the regulatory environment.

4.1.3   Service provision by the Serving network

Where the SgN and the service network are the same, the serving exchange and the service exchange can also be the same, and reference point B is then internal.
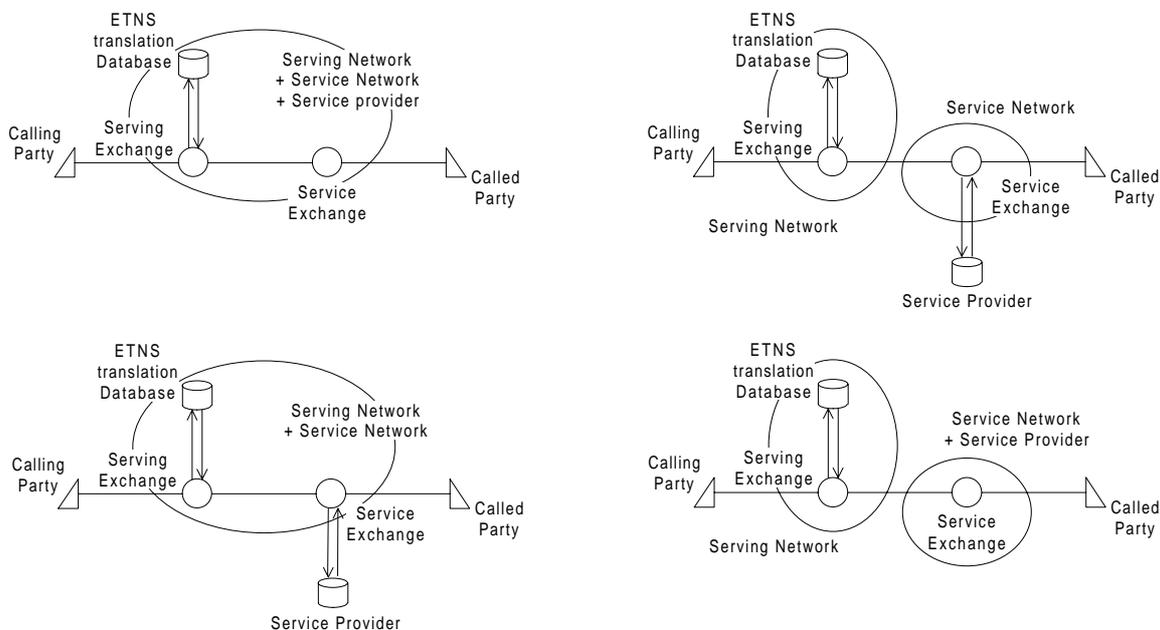
Figure 2: Examples of call configurations

Note that in figure 2, the calling and the called parties do not need to be directly connected to the serving and the service networks respectively.

4.2 Management part

Two functions are performed in the management process. The first is the number assignment process. The second is the distribution, to the SgN, of the Rns bound to Ens.

4.2.1 European number assignment

The ETNS registrar database is primarily used in the interaction between the registrar and the SPs for number assignment. Procedures are outlined in the ETO Report [6].

4.2.2 Routeing numbers (Rns) updating

The distribution of routeing information to the SgNs occurs e.g. when:

- a new En has been assigned;

- coverage of an En has changed;

- an En has been withdrawn;

- a change of ETNS SP has occurred, that may entail new Rns.

The procedure for the distribution of the Rns to the SgNs can take place in two ways. In either case, it is assumed that the SP has obtained the Rns from the service network(s) it has agreement with, or directly from a NRA.

Centralized: the SP informs the registrar of the Rns and its connected En. The registrar distributes Rns and their connected Ens to the SgNs (Reference Point Ec).

Decentralized: the SP informs the SgN of the Rn(s) and its connected En (Reference Point Ed).

This topic is further addressed in clause 9.

Centralized approach

Distributed approach
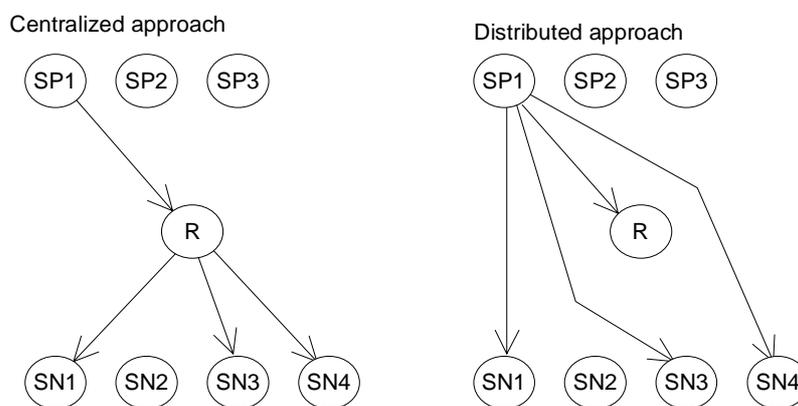
Figure 3: Alternative for the updating of ETNS translation databases

Figure 4 recaps the three previous figures for an overview of the ETNS architecture. The call configurations described there are only examples and do not match call configuration is in figure 3.
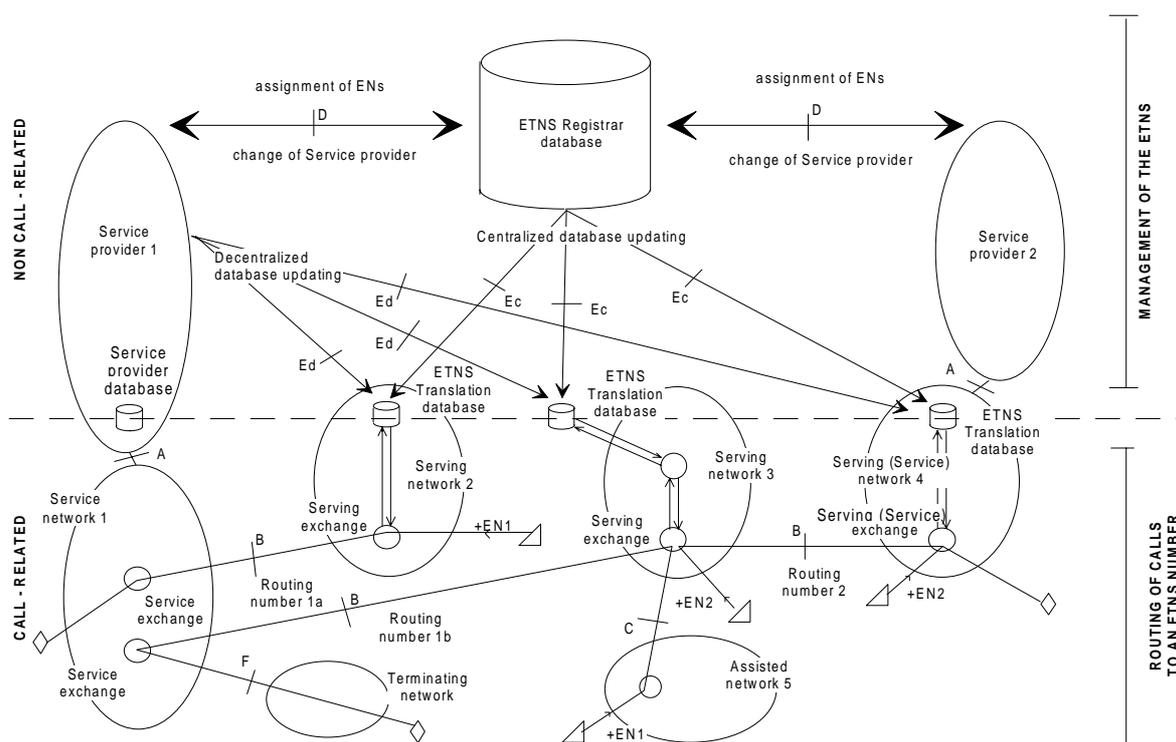

Figure 4: ETNS reference architecture

5   The European number (En)

5.1   Requirements for European numbers

The ETNS is part of the international public telecommunication numbering plan E.164 [1]. As such, the total length of the En shall not exceed 15 digits. The ETNS number space shall be seen as a non-geographic, overlay number space on top of all existing national numbering schemes of CEPT countries.

As a goal, additional digits that may be dialled by the calling party following the recognized En shall not result in a call failing.

The ETNS shall be designed to have a minimum of 100 European services and a potential of 10 million numbers per service.

The structure of the En shall facilitate evolution towards a global numbering scheme on a per service basis (see clause 6).

The structure of the En shall facilitate portability between ETNS SPs.

5.2   Structure of European numbers

The ETNS uses E.164 [1] numbers which are structured as shown in figure 5.

European number	En		
	↓		↓
Generic structure of En	ESI		ESN
	↓	↓	↓
Detailed structure of En	ECC	ESC	ESN
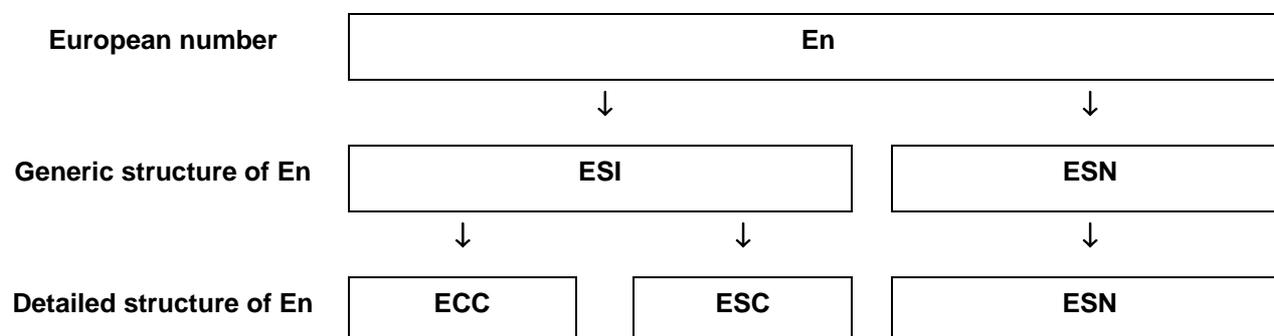
Figure 5: Structure of European numbers

The European Country Code (CC) is the E.164 [1] Country Code 388 reserved by ITU-T for the ETNS trial.

The En shall always be dialled in the international format ie + En (where "+" represents an international prefix before the international number).

For some services, e.g. a service that requires two stage dialling, the ESN is not required.

5.3   European Service Identity (ESI)

An ESI shall be assigned to a service or a family of services in some specific cases; this occurs when a range of closely related services are grouped behind one ESI.

Following the reservation of CC for ETNS services, an ESI shall comprise the ECC 388 and a European Service Code (ESC).

The depth of analysis in the international network is restricted to 7 digits in accordance with ITU-T Recommendation E.164 [1]. Therefore, for the international network to be able to recognise the ETNS service directly, the ESI cannot be more than 7 digits long. The ESI length may vary between 4 and 7 digits (i.e. an ESC from 1 to 4 digits long), depending on capacity and service needs.

If tariff information to the calling party is to be contained within the En, it shall only be contained in the ESI.

5.4   European Subscriber Number (ESN)

The length and the structure of the ESN are service dependent.

The number length shall be determined by the capacity required. For instance for services which aim at reaching the goal of 10 millions numbers, a fixed length ESN shall be at least 7 digits long.

Additional digits that may be dialled by the calling party following the recognised ESN shall not result in the call failing.

The ESN can be either structured or unstructured (figure 6).

Unstructured subscriber number	ESN

	ESN
Structured subscriber number	↓ ↓

Domain Identity	Domain Specific Number
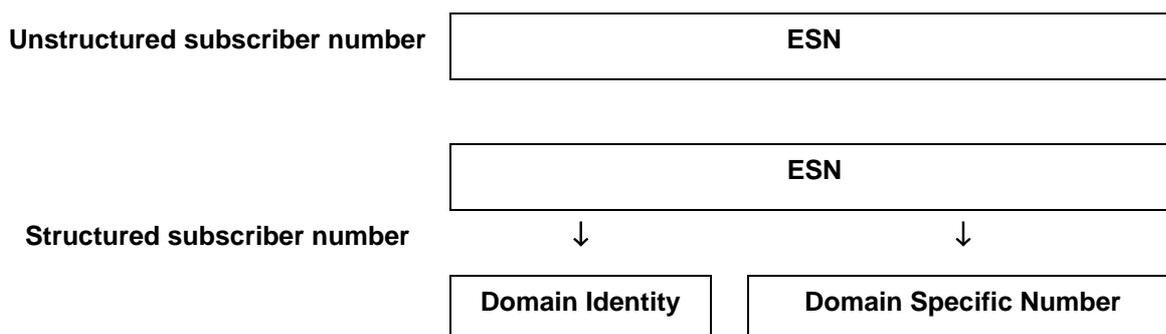
Figure 6: Structured and unstructured European subscriber numbers

Unstructured numbers:

The ESN is unstructured where no information about the subscriber can be derived from part of the field. The ESN shall have a fixed length for one specific ESI.

The whole ESN is managed by the registrar.

Structured numbers:

The ESN shall be divided into the domain identity and the domain specific number. Each ETNS subscriber is allocated a domain identity for each of their subscriptions. The domain identity can be of variable length depending on capacity needs. For structured ESNs the length of the En may be variable.

In this case the registrar only manages the domain identity of the ESN.

6   Evolution from ETNS to a global scheme

Evolution provides the possibility for a subscriber to a service using a first numbering scheme to subscribe to a similar service using a second numbering scheme, while retaining part of his first number. Although the subscriber would have to change his service number to gain advantage of the new scheme, he may want the new number to look like the old one as much as possible. This is achieved by embedding all or part of the old number into the new one.

Evolution shall be considered from a En to a global service number using an ITU-T defined scheme.

Figure 7 shows the preferred method of evolution from a European to a global scheme.

European scheme	ESI	ESN
Global scheme	CC	GSN
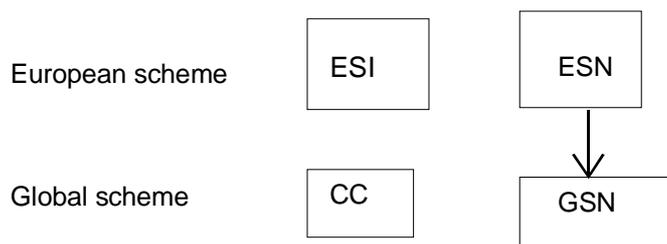
Figure 7: Embedding the ESN into the global subscriber number

In figure 7, only the ESN is retained and embedded in the GSN. The ETNS subscriber entirely changes their ESI to the global CC. The length of the header is reduced from between 4 to 7 digits to 3 digits. But the length of the subscriber number will increase by 1 digit or more to minimize conflicts between European subscribers willing to retain their number and new subscribers applying for the same global number (the extra digit enables the two parties to have the other digits in common). As a total, the whole number length will not increase and is likely to decrease.

Other evolution paths, like the embedding of the whole En behind the global CC, can not be excluded.

7   Management of the ETNS

7.1   Organizations involved in the management of ETNS

The ETNS is managed at two levels. The first deals with the ESIs and how they are attributed to ETNS services. The second is on a per-service basis and describes how the ESN behind each ESI is managed. The following functions shall be performed:

-    the administration function, carried out by the administrator, is the responsibility for the high level management of the ETNS, i.e. the establishment and change of the ETNS numbering conventions. It includes the decision to introduce ETNS services, the choice of the ESIs they are assigned, and the management rules of the ESNs behind these ESIs.

ESI resources shall be carefully managed in order to prevent exhaustion. Similarly, ETNS numbering conventions for an assigned ESI shall be carefully set up by the administrator in order to prevent exhaustion; particular attention shall be paid to the length of the ESN field.

-    the registration function, carried out by the registrar, is the responsibility for the day-to-day management of the ESNs behind each ESI. For some ETNS services ESNs may not be used and therefore the registration function is not required. Some other ETNS services ESNs are structured, in which case the registrar shall have the responsibility for managing only the domain identity.

-    the advisory function, carried out by an advisory body, is the responsibility to advise the administrator and the registrar.

The following parties will also be involved in the process of allocating ESNs:

-    as regards ESN request: the ETNS SP sells the ETNS service to the ETNS subscriber, and requests a En on behalf of the ETNS subscriber to the registrar. The ETNS subscriber has no direct connection with the registrar, and is always represented by their ETNS SP.

-    as regards ESI request: any party can propose the establishment of a ETNS service to the administrator. The proposal should comply with the information in annex A.

7.2   Criteria for the establishment of an ESI

This section details the requirements that services must fulfil in order to be considered as ETNS services liable to be attributed an ESI. A proposal shall comply with the following items to be considered valid by the administrator:

-    ETNS services must not violate either ETSI standards or ITU-T Recommendations.

-    ETNS services must not violate specific criteria set by ITU-T when a CC is allocated for this purpose.

-    All national regulatory requirements have to be met in the countries where the proposed service will be offered.

-    The definition of a ETNS service shall not impose any specific constraints (in terms of service offering area and service accessing area) on any country participating in the ETNS.

-    Services implemented for a short period of time e.g. seasonal services (like a New Year service, an Olympic Games service) shall be supported, possibly from a specific ESI range.

-    The proposed ETNS service shall not currently exist as either an ETNS or global service.

-    The service description shall contain all information necessary to launch the service.

-    Only one ESI shall be allocated per ETNS service except where exhaustion occurs. The length of the ESI requires careful consideration due to the scarcity of the resource.

-    Service branding, e.g. 286 standing for CTM, should be considered in the choice of the ESI value, but ETNS SP branding must not be taken into account, as it would bias competition.

8 ETNS numbering conventions

When the ETNS numbering conventions are established, they can only be changed, after consultation of the advisory body and other interested parties, by the administrator. These ETNS numbering conventions shall include the procedures, requirements and conditions for the opening up of (family of) ETNS services, the choice of ESIs and the management of the ESNs. These issues are not elaborated in the present document and are introduced in ETO Report [6].

9 Distribution of routeing numbers

The centralized and distributed approach were introduced with figure 4.

9.1 Centralized management approach

In case of a centralized management of the Rns, the following tasks shall be performed by the registrar:

   a) Receive from the ETNS SP the list of Rns , associated to each En attached to the different areas from which the service is accessible.

   b) Accept any change in this list on ETNS SP request.

   c) Inform the SgNs of the updated list of Rns.

9.2 Distributed management approach

In case of a distributed management of the Rns, the ETNS SPs shall be responsible for distributing the Rns to the SgNs. This shall be achieved through a standardized procedure, so that each SgN receives the same type / format of information, whatever the service and the ETNS SPs concerned. The registrar may require to be informed of the Rns.

10 ETNS Service Provider (SP) portability

Ens with an unstructured ESN shall be portable between ETNS SPs. Additional information related to ETNS number portability is contained in TR 101 073 [3], NPTF WPO Document [7], NPTF WP1 Document [8]. Implementation and administration of number portability is for further study.

Annex A (informative):
Information to file in a proposal for reservation

A.1   Preferred ESI

The application can propose a particular value of an ESI for a service.

A.2   Description of service

The proposer shall provide a service description including at least details of:

- how the service is perceived by the end user,

    - how the calling party can access the service,

    - how the subscribers can subscribe/activate/deactivate the service,

    - how the subscribers can select the different options within the service,

- how the service is implemented,

    - ETNS service network / SP capabilities to implement the service within the stated timescale,

    - other networks capabilities to implement the service e.g. bandwidth (if applicable), switching and signalling capability required,

    - verification that it does not violate any ETSI or ITU Standards.

A.3   Charging Information

When proposing an ESI, the proposer shall provide general information regarding:

- charging of the calls from the calling party's point of view,

- charging of the calls from the called party's point of view.

For the two types of charging, the proposer shall identify:

- the network entities involved in the charging process,

- the number of digits in the En to be analysed to determine the charge,

- other information used for charging (e.g. geographical location of the caller and called party),

- additional mechanisms required during the charging process (e.g. announcement) and where these mechanisms need to be implemented.

The applicant should also give information element regarding billing (identify the body who will either the calling or called user) and accounting, mainly between ETNS service provider (SP) and network operators.

A technical description of the network mechanisms is all that is required.

A.4   Market Potential

The proposal should contain initial figures to assist in the estimation of the length of the ESN field.

A.5   Timescales

The proposal should contain an implementation schedule detailing the foreseen dates:

-   for testing / trial periods,

-   for earliest date for service launch.

A.6   Other considerations

It should be noted that additional information may also be requested to assist in evaluating any proposal such as:

-   potential impact due to network overload/focused high volume, short term call attempts,

-   confirmation that the proposed service is compliant with all national regulatory requirements in countries where the service will be provided.

History

Document history				
V1.1.1	March 1998	Public Enquiry	PE 9829:	1998-03-20 to 1998-07-17
V1.1.1	August 1998	Vote	V 9840:	1998-08-04 to 1998-10-02