FINAL REPORT

ON

Management, Routeing and Portability aspects of the European Telephony Numbering Space (ETNS)

15 June 1998

This study has been prepared by ETO on behalf of ECTRA for the Commission of the European Union. The study includes three work orders on an ETNS.

At this stage, the report does not necessarily reflect the views of ECTRA or the Commission, nor do ECTRA members or the Commission accept responsibility for the accuracy of the information contained herein.

Work orders ***48 374, Management of an ETNS***
48 375, Number portability for pan-European services
48 376, Routeing aspects for pan-European service calls

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This report has been prepared by Jack Nuijten , Marco Bernardi and Jukka Kanervisto from the ETO with the kind assistance of the other experts, Gerd Wiedenhaupt in particular, the ECTRA Project Team on Numbering, ECMA, ETNO, ECTEL, EIIA, ETSI, INTUG Europe and GSM MoU EIG. It is to be noted, however, that the report does not necessarily reflect the official opinions of the said organisations.

Executive summary

This study on issues related to a European Telephony Numbering Space (ETNS) has been prepared by ETO on behalf of ECTRA for the European Commission. The ETNS study arises from the Council resolution on the promotion of Europe-wide co-operation on numbering of telecommunications services in 1992. The need for it was also confirmed by the ECTRA consultation in 1994-95 and the resulting ECTRA decisions on the ETNS.

The objective of a European Telephony Numbering Space (ETNS) is to allow effective numbering for international services. For these services, national numbers may not be adequate and global numbers are, in general, not available. Service providers and service subscribers who offer international services in the European market area could obtain a single number from the ETNS for accessing their services. The ETNS, as it has been defined at present, is a European numbering space parallel to existing national numbering spaces.

The establishment of the ETNS needs 1) numbering space, 2) organisational procedures for the management of the space, 3) transparent, objective and non-discriminatory rules on the management of the space and 4) standards with regard to the technical management of the ETNS (including number structure) and to the routeing of pan-European service calls (including portability aspects of ETNS numbers). As the ETNS is a totally new numbering space established for a highly competitive market, ETO considers that ETNS numbers should be portable between service providers.

Action has been taken by Europe to acquire numbering resources for the ETNS. On request of 23 CEPT/ECTRA countries, ITU-T has temporarily reserved Country Code (CC) 388 in 1997. The final decision on the allocation of '388' will be made in 1999 meeting. In the meantime, the code can be used for test purposes.

This study is based on the use of CC 388. It deals with the management, routeing and portability aspects of ETNS numbers from a regulatory point of view. It is partly based on the ETSI standards which cover the same issues from a technical perspective and which have recently been developed. The management is the most important issue. It is covered in the report by the so-called ETNS conventions which consist of the ETNS definition, the organisations responsible for management of the ETNS and the rules for management of the ETNS. Each of the subjects is dealt with in the following paragraphs.

The ETNS definition mainly concerns the structure of the numbers of the ETNS, the European Numbers (ENs). An EN consists of the Country Code 388 followed by a European Service Identity (ESI) and a European Subscriber Number. The ESI should have 4 to 7 digits. The total length of the EN should not exceed 15 digits.

ETO proposes to manage the ETNS on behalf of the CEPT/ECTRA countries. The ECTRA/ETO framework fulfils the principle of separation of regulatory and operational functions and Europe-wide co-operation. In numbering issues, ECTRA has committed itself to consulting the European Numbering Forum (ENF) before any decision on numbering is taken. It should be recalled that one of the reasons for which ETO was established by ECTRA in 1994 was the management of the ETNS as stated in the MoU on the establishment of ETO signed by 24 ECTRA members. The ETO MoU will be replaced by the ETO Convention during the next two years.

Following its decision on the establishment of the ETNS, ECTRA should also decide on the management of the ETNS and mandate ETO to take care of this task. ECTRA should normally decide issues that have a political flavour or include the involvement of all CEPT/ECTRA countries. These decisions should also be discussed with the European Commission in order to guarantee their compliance with the European Union telecommunications policy. The implementation of ECTRA decisions should be discussed and decided within ETO, including its Administrative Council. Assignment of numbers and related issues should be carried out as normal operational tasks given to ETO, in accordance with the ETNS Conventions. Consideration of other options for the ETNS Administrator was not deemed necessary as there was wide agreement on the nomination of ETO for this purpose.

The management of the ETNS needs expertise and the commitment of the European telecommunications industry. Any major decisions made may have an impact on telecommunications networks and users of telecommunications services. Industry consultation is necessary before any major decision is made. The European Numbering Forum has been established to advise ECTRA and the Commission on numbering decisions. It is proposed that ENF should act as an advisory body for the management of the ETNS.

The rules for management of the ETNS have been worked out, both for designation of ESIs and for assignment of ENs from designated ESIs. The rules for ESI designation, fulfilled by the ETO Council, imply two basic principles. One is the requirement that an ETNS telecommunications service can be invoked from at least two ETNS countries. The other one is that fees for assignment of ENs should be established only to cover the management costs. The rules for assignment of ENs imply the two basic principles that the ETNS should be considered as a public resource and that a service provider should qualify for offering a particular type of ETNS telecommunications service. An ETNS service provider should apply for ENs on behalf of its subscribers and cannot apply for ENs which are not requested by its subscribers.

The technical framework for the management of the ETNS is presented in this study. This framework is based on the ETSI European Numbering Task Force (ENTF) activity, which focussed on ETNS implementation from the technical point of view. These technical studies have led to ETSI standards with regard to the structure of the ETNS resources, routeing of ETNS service calls taking into account portability of ETNS numbers and human factor aspects. The structure and the assignment procedures of Routeing Numbers (RNs) should be under the responsibility of NRAs. The distribution of RNs should be carried out with a distributed approach. A centralised approach, involving a third party, could be considered in the long run.

Number portability between service providers should be provided for ENs. The distribution of RNs due to the porting of an EN should be carried out with a distributed approach. A centralised approach, involving a third party, could be considered in the long run.

1. Presentation of the study

This study on issues related to a European Telephony Numbering Space (ETNS) has been prepared by ETO on behalf of ECTRA for the European Commission. The study has been compiled to respond to the following three separate work orders:

- Management of the ETNS,
- Number portability for pan-European services, and
- Routeing aspects of pan-European service calls.

The ETNS will enable numbers for different pan-European services. The implementation of the ETNS will have an impact on:

- Administrative issues such as the establishment of an administrative framework for the ETNS, establishment of a body which allocates number resources to applicants, establishment of the ETNS including the available resources and number structures and establishment of a set of rules to be followed in number assignment.
- Technical issues such as call handling and call routeing and issues related to location of databases with regard to effective routeing, co-operation of databases including updating of routeing numbers.
- Regulatory issues such as obligations and responsibilities of ETNS service providers.

Furthermore, in planning the use of ETNS resources, human factor issues have to be taken into account in order to facilitate easy use of pan-European telecommunications services.

The work orders addressed to ETO are as follows:

The management of the ETNS:

1. To study and make proposals for:
   - The number structure, including which codes should be allocated to which services and what could be the length of the number, taking into account possible evolution paths from national numbers to pan-European numbers and from pan-European numbers to global numbers. The work will involve the preparation of short service descriptions;
   - Number allocation principles, including procedures - for both applicants and the Administrator - for resolving allocation conflicts, and procedures for recovering and reallocating numbers. Work will involve developing criteria for number usage in relation to questions of ethics for relevant services;
   - Rights and obligations of the Administrator and number recipient, including pricing of numbers, trading of numbers, publicity, and procedures for monitoring and auditing the status of the ETNS resources.
2. To study administrative issues including the tasks and responsibilities of the Administrator, the appeal process, the Administration's relationship with other organisations (such as ECTRA, ENF) and to make proposals for:
   - The Terms of Reference of the Administrator
   - The selection of the Administrator
   - The contract or MoU establishing the Administrative functions

Number portability for pan-European services:

1. To study the impact of number portability on competition in freephone service provision in the US, to give some background on the situation in the UK and Germany and make some predictions for Europe;
2. To review the work presently being carried out on number portability inside and outside Europe and the Intelligent Network (IN) implementation of number portability of freephone services in the US;
3. To define and evaluate technical alternatives for introducing number portability into pan-European services, including IN technology and other available solutions, and to address the possibilities of transferring numbers from national schemes to pan-European schemes;
4. To study the cost of introducing number portability into pan-European services and to make proposals for cost sharing;
5. To make proposals for the provision of number portability in pan-European services.

Routeing aspects of pan-European service calls:

1. To define alternative strategies for the handling of service calls, originating from anywhere inside or outside Europe and numbered through a European numbering scheme;
2. Based on these alternatives, to study the routeing aspects of an ETNS in cases where such an ETNS is created from global resources (such as +388X) or by national resources (such as +310, +440), including the possible migration of national numbers to pan-European numbers and of pan-European numbers to global numbers;
3. To propose short and medium term solutions for the efficient handling of service calls.

This study, which includes the three above mentioned work orders, is carried out in close co-operation with the European Commission, the ECTRA Project Team on Numbering (ECTRA/PTN) and the European Numbering Forum (ENF). A study on technical aspects of implementation of an ETNS has been carried out by ETSI under a separate Commission work requirement.

Two interim reports, a draft final report and the final report have been delivered. The first and second interim reports and the draft final report were distributed for comments to the ECTRA Plenary members, the ECTRA/PTN members and the ENF members in June 1997, in February and in May 1998 respectively.

The issues for the management of the ETNS were discussed at an ETO numbering workshop for ECTRA/PTN and ENF members in November 1997. The workshop and the received comments proved to be useful to achieve more clarity on some fundamental issues.

At this stage, it is not possible to include descriptions of ETNS services, because of the uncertainty that exist on which services would be feasible. Descriptions have, however, been developed in parallel during the ETO study on a business plan for the ETNS.

The final report of the study contains the findings and proposals as approved by CEPT/ECTRA. The final report also include any comments which individual CEPT/ECTRA members have on these issues with regard to their respective national regimes. The final report will be delivered to the Commission after approval by the ECTRA Plenary.

2. Introduction to the ETNS

Today, telephony services are numbered from national E.164[1] numbering resources with only the few exceptions mentioned below. Service providers providing international services in several countries have to use national service numbers of the different countries in question or internationally dialled national numbers.

The Universal International Freephone Service (UIFS) and Universal Personal Telecommunications (UPT) are the first services - and so far the only ones - numbered from global E.164 resources. The Universal International Freephone Numbers (UIFNs) enable freephone service provision with the same dialling procedure all over the world. Service providers can use these global numbers independent of the country in which the service is provided. Service descriptions of global shared revenue and shared cost services have been approved by ITU and a Country Code has been reserved for each service. A discussion on their number structures has been started. Global numbering resources have also been allocated by ITU for Global Mobile Satellite Services (GMSSs) as well as for international networks.

Global service numbers are dedicated to some specific, commonly accepted global services only. In addition to national numbering spaces, no space exists today which could facilitate the development of regional services covering more than one country but for which no global solutions exist or for which global solutions are not needed.

In Europe, an E.164 numbering space for regional - such as pan-European - services has been lacking. This was reflected in the Council resolution on the promotion of Europe-wide co-operation on numbering of telecommunications services in 1992[2]. It was also the conclusion at the ECTRA consultation in 1994-95 on the "Strategic options for numbering of telecommunication services in Europe". This consultation strongly supported the establishment of a European Telephony Numbering Space (ETNS) for the numbering of pan-European services for which national solutions are too limited and global resources are not available or do not meet the demands of the European telecommunications market.

An ETNS is an E.164 numbering space parallel to existing national E.164 numbering schemes. The objective of an ETNS is to allow service providers, who plan to offer their services in the European market area, to obtain a single number with a unique dialling procedure to be used throughout Europe for accessing their services. Calls to European numbers would be dialled with the same international format not only from European countries but also from outside Europe. The limitations on the use of numbers would be set on the one hand by service providers or subscribers, who may want to limit the market area (number of countries) in which they want to market their services, and on the other hand by National Regulatory Authorities in European countries in cases where they want to restrict access to these numbers (such as adult services).

[1] E.164 numbering resources are resources defined in ITU-T Recommendation E.164.

[2] Council resolution 92/C318/02 on the promotion of Europe-wide cooperation on numbering of telecommunications services.

The ECTRA consultation in 1994-1995 on the "Strategic Options for numbering of telecommunications services in Europe" resulted in strong support for the establishment of ETNS. Following the consultation exercise, different alternatives for the ETNS resources were studied [3],[4] and discussed by the market parties represented in the European Numbering Forum. These alternatives were divided into two groups: 1) the use of national E.164 resources and 2) the use of global E.164 resources.

Based on these studies and discussions, ECTRA made a Decision in November 1996 on the establishment of an ETNS based on the use of Country Code 388. Global resources for E.164 Country Codes are the responsibility of ITU. The application for obtaining this code for Europe was presented to ITU-T in May 1997. ITU-T reserved Country Code 388 temporarily for Europe and it is available for test purposes until the first Study Group 2 meeting of 1999. The final decision on the assignment of the code for Europe will be taken at that meeting.

In this study, the ETNS is defined as a numbering space starting with E.164 Country Code 388.

ETO proposes that the ETNS should be defined as a European numbering space starting with E.164 Country Code 388

The next steps in the establishment of an ETNS require the following elements:

- organisations for the management of the ETNS
- ETNS conventions
- technical framework for the ETNS
- number portability for ETNS services.

These elements are studied in more detail in the following chapters.

[3] ETO Report on on behalf of ECTRA for the European Commission on the "Preparation of submission to ITU requesting a virtual Country Code for the implementation of a numbering space for special services of a pan-European nature", April 1995

[4] ETSI Report on European Telephony Numbering Space – Analysis of preferred options; Edinburgh, April 1996

3. Organisations for the management of the ETNS

The Council Resolution 92/C31/318/02 defines requirements for the management of numbering schemes for pan-European services as follows:

- Management must be carried out within a framework of Europe-wide co-operation
- Such a framework of co-operation must respect the principle of separation of regulatory and operational functions
- Management of numbering schemes must be carried out in an objective, transparent and non-discriminatory manner.

ECTRA is an organisation of European regulators of the CEPT countries and respects the above requirements. The ECTRA/ETO framework fulfils the principle of Europe-wide co-operation and separation of regulatory and operational functions. In addition, ECTRA has committed itself to consulting the European Numbering Forum (ENF) before any decisions on numbering are taken. The membership of ENF covers representatives of European telecommunications users, service providers, fixed and mobile operators, manufacturing industry, and standardisation and regulation bodies. The European Telecommunications Office (ETO), established by ECTRA, is the permanent office of this committee. ETO's functions are defined in the ETO MoU, which is to be replaced by a Convention. The existing ETO framework covers:

- ECTRA as an establisher of ETO
- a close relationship with all ECTRA and EFTA countries and the European Commission;
- the ETO Administrative Council as the decision-making body of ETO;
- the work programme, the budget, directives and guidelines given by the ETO Council and/or ECTRA;
- the ETO Director as responsible for the execution of all internal and external activities of the ETO in accordance with the ETO MoU and decisions of the Council;
- secretarial support by ETO for the ENF (European Numbering Forum).

The ETO Convention will strengthen ETO as an international organisation. The ETO framework, with the ETO Council, would offer an existing mechanism for management of the ETNS. ETO has the numbering expertise needed to carry out the management of the ETNS. This would, however, be a new task for ETO. According to the ETO Convention, ETO can undertake activities requested by ECTRA and approved by the ETO Council.

The application to ITU-T for Country Code 388 was signed by 23 ECTRA countries. The list of countries is almost the same as the list of ETO MoU signatories (Annex G). Austria, Cyprus and Luxembourg have signed the ETO MoU but they did not sign the ITU-T contribution. Slovenia and Liechtenstein signed the ITU-T contribution but they have not signed the ETO MoU.

Although the ETO MoU has been signed only by 24 of the 43 CEPT/ECTRA countries today, the ETO Council is open to membership for all ECTRA countries. Representatives of ECTRA members that have not signed the ETO MoU may also attend the ETO Administrative Council meetings as observers. Representatives of the European Commission and of the EFTA may attend the meetings as counsellors.

Based on the reasoning above, ETO makes the following proposals:

1. ETO should be the responsible organisation for management of the ETNS.
2. ECTRA should give a mandate to ETO to carry out this task.
3. The ETO Council should make a decision to carry out this task.
4. ECTRA should further discuss the framework for the management of the ETNS.

4. ETNS conventions

This chapter is to be considered as the draft ETNS conventions.

The ETNS conventions consist of the set of rules needed for management of the ETNS. They are composed of three elements:

- the ETNS definition
- the ESI designations, that is the ESIs, the specific structure of the associated ENs and the specific conditions attached to each of the ESIs
- the rules for management of the ETNS.

The ETNS conventions include the rights and obligations of parties involved:

- organisations responsible for management of the ETNS
- service providers and subscribers for the use of ENs.

Management of the ETNS would have to follow the four 'rules of fairness' established for the 1998 EU liberalisation. According to these rules, the management will have to be:

- transparent - the rules will be public
- objective - the rules may not be based on subjective characteristics of the application or applicant
- non-discriminatory - the rules have to be the same for any applicant or application insofar that they apply to similar situations
- proportionate - the rules may impose constraints only to an extent proportionate with the purpose pursued in terms of equity or wise management.

An important principle is the portability of ENs between service providers, which is an general requirement for all ENs except for structured ENs identifying service providers.

Section 4.1 contains a definition of the ETNS and its different elements, in particular the European Number (EN), the European Service Identity (ESI) and the European Subscriber Number (ESN). The functions of management of the ETNS are described in section 4.2. Section 4.3 is devoted to the Administration function, in particular the designation of ESIs including the setting of management fees. Section 4.4 concerns the Registration function, in particular the assignment and withdrawal of ENs. The ETNS conventions proposed in this chapter will offer a comprehensive framework for management of the ETNS, certain aspects of which will need formulation in greater detail before being put into practice.

ETO proposes that the introductory text of chapter 4 is fully included in the ETNS conventions. The introductory text is summarised below.

The ETNS conventions consist of the following three elements:

1. the ETNS definition
2. the ESI designations
3. the rules for the management of the ETNS.

Management of the ETNS should follow the 'rules of fairness' established for the 1998 EU liberalisation. An important principle is the portability of ENs between service providers.

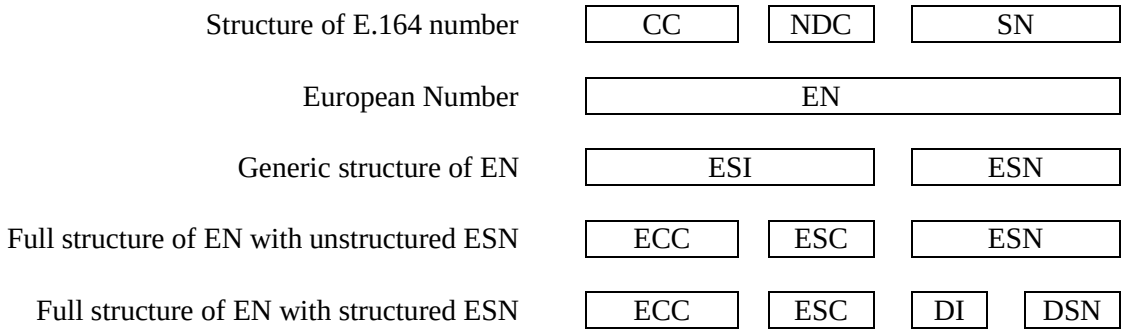
4.1 Definition of the ETNS

The ETNS is defined by the following three elements:

- The general structure of the European Numbers (ENs), that is, the possible subdivisions of the ENs and the length of each subdivision.
- The dialling plan, that is, the use of prefixes.
- The general division of broad categories of services over the initial digits (the first digit behind the European Country Code 388).

The first two elements are defined below.

The European Numbering Task Force (ENTF) of ETSI has produced a report on management of the ETNS[5] in which the ETNS, either based upon a Country Code or based upon national resources, has been defined. According to this report, a Country-Code based ETNS would use E.164 numbers structured as shown below in Figure 1.



CC =	Country Code	SN =	Subscriber Number
NDC =	National Destination Code	EN =	European Number
ESI =	European Service Identity	ESN =	European Subscriber Number
ECC =	European Country Code 388	DI =	Domain Identity
ESC =	European Service Code	DSN =	Domain Specific Number

Figure 1: Structure of European Numbers

The maximum length of the European Number (EN) is 15 digits. The initial part of the EN consists of the European Country Code (ECC) 388, followed by the European Service Code (ESC). The ECC and the ESC together constitute the European Service Identity (ESI) which consists of four to seven digits. The ESI denotes an access code for a specific type of ETNS telecommunications service. The European Subscriber Number (ESN) consists of the remaining digits of the EN. The ESN is normally unstructured. For some special services, such as access to corporate networks, the ESN may be structured[6]. The ESN is then subdivided into an initial Domain Identity (DI) followed by a Domain Specific Number (DSN). In the case of corporate networks, the DI identifies the corporate network. The DSNs behind a particular DI are to be used for the corporate network concerned.

In specific cases of ESIs used as short codes, the ESN may be completely absent.

[5] ETSI Technical Report Draft ETR NA-2 Version 3.5; Management of the ETNS; March 1997

[6] See ETO study on 'The Numbering Requirements of Corporate Telecommunication Networks.

In public telephony networks, the numbers are dialled in the international format as + EN (where '+' is an international prefix before the international number). More details on the structure of the EN can be found in Annex E.

ETO shares the described ETSI/ENTF position. Within the defined ETNS structure, ESIs will be designated when deciding on applications for ESIs for specific types of ETNS telecommunications services. Each ESI designation will include the determination of the number length of the ESNs concerned (and, if applicable, the lengths of DIs and DSNs), taking user-friendliness of uniformity of number lengths into account.

ETO proposes that section 4.1 is fully included in the ETNS conventions. This section is summarised below.

The ETNS should be defined, in line with ETSI standards, by the following:

1. The European Number (EN) has a maximum length of 15 digits.

2. The EN consists of a European Service Identity (ESI; 4-7 digits) followed by the European Subscriber Number (ESN; 0-11 digits).

3. The ESN may be subdivided into a Domain Identity (DI) followed by a Domain Specific Number (DSN).

4. In public telephony networks, the ENs are dialled in the international format (+EN) only.

4.2 Functions of management of the ETNS

Three functions of management of the ETNS could be distinguished:

- the Administration function.
- the Registration function.
- the Advisory function.

The three functions are described below. They have also been described in the report of ETSI/ENTF. The description below is in line with this report:

The Administration function
The Administration function would be carried out by the Administrator. Administration of the ETNS comprises the establishment of ETNS conventions, that is, the definition of the ETNS, the designation of ESIs and the setting up of the rules for management of the ETNS.

The Registration function
The Registration function would be carried out by the Registrar. It comprises the assignment of the ENs from designated ESIs, surveillance of the usage conditions and withdrawal of assigned ENs.

The Advisory function
The Advisory function would be carried out by an Advisory body. The body should advise the Administrator on important issues of the numbering conventions on request of the Administrator or on its own initiative. It may advise on the intention for large-scale withdrawals of ENs. It should be open to representatives of all relevant telecommunications market parties that operate in Europe.

The Administration and Registration functions could be fulfilled by ETO. Decisions needed for administration should be made by the ETO Council.

On a national level, NRAs are committed to and have experience in the administration of national telephone numbering schemes. The NRAs are represented in the ETO Council. Therefore, the ETO Council is a natural platform for administration of the ETNS. As administration of the ETNS requires no daily activities, the ETO Council could well fulfil its duties by having a limited number of meetings during the year.

ETO, in accordance with the ETO MoU and tasks given by ECTRA, has the potential and the expertise to carry out both the Administration and Registration functions.

The Advisory function could be fulfilled by the European Numbering Forum (ENF).
The establishment of ETNS telecommunications services will have a technical and organisational impact on networks and services and an economic and social impact on users of these services. This will require the input from the specific expertise of all market parties. On a national level, NRAs generally use an industry forum for consultation and advice in national decision making. The equivalent on a European level is the ENF. The ENF has been established in order to exchange information and expertise, to co-ordinate and consult on European numbering issues. The existing relation between ETO and the ENF and the openness of the ENF to representatives of network operators, service providers, manufacturing industry, standardisation bodies and users make the ENF the natural candidate to be designated as the Advisory Body.

An appeal function was considered to be a fourth function. Ideally, an appeal body should be independent from the other functions and independent from the market parties. At present, such a body does not exist. The only example comparable with the ETNS conventions is ITU-T Recommendation E.169 on the assignment of Universal International Freephone Numbers (UIFNs). The numbering plan for UIFNs has been defined by Study Group 2 of ITU-T. The assignment of UIFNs is executed by ITU-TSB, the Telecommunication Standardization Bureau of ITU. No provision has been made for an appeal function involving a body independent of Study Group 2 and TSB.
As with the UIFNs, it is expected that management of the ETNS will not require the guarantee of independence by having an appeal function involving an independent appeal body. There does not seem to be sufficient ground to justify the provision of the legal framework and the creation of an independent body to realise an appeal function.

ETO proposes that section 4.2 is fully included in the ETNS conventions. This section is summarised below.

The following three functions and their corresponding organisations regarding management of the ETNS should be distinguished:

1. the Administration function, that is the establishment of ETNS conventions, to be fulfilled by the ETO Council

2. the Registration function, that is the assignment, withdrawal and surveillance of European Numbers, to be fulfilled by the ETO Director

3. the Advisory function for advice on numbering conventions issues, to be fulfilled by the European Numbering Forum (ENF).

These proposals imply that an appeal function, involving an independent appeal body, is not considered necessary.

4.3 Establishment of European Service Identity (ESI) designations

The designation of ESIs should be carried out by the Administrator conform to the definition of the ETNS. The sections which follow subsequently deal with:

- procedures for designation of ESIs
- service and numbering requirements for designation of ESIs
- setting of fees, procedures and conditions for assignment of ENs
- conditions for refusal of proposed ESIs
- conditions for changing of the ETNS definition or ESI designations
- conditions for withdrawal of designated ESIs
- procedures for withdrawal of ESIs or changing of ESI designations.

ETO proposes that section 4.3 is fully included in the ETNS conventions. This section implies two basic principles:

1. An ETNS telecommunications service should meet the requirement that it can be invoked from at least two ETNS countries.

2. The fees for assignment of ENs from the ESIs should only seek to cover the management costs and are, for individual cases, proportionate to the work involved. Where scarce resources are involved, the fees may reflect the need to ensure optimal use of these resources.

4.3.1 Procedures for designation of ESIs

The designation of ESIs to a specific family of ETNS telecommunications services should include the following:

1. *Proposal*
   Any interested party can propose to the Administrator the designation of ESIs to a specific new or existing type of ETNS telecommunications service. The Administrator could also take the initiative. The proposal should include its rationale. On receiving a proposal, the Administrator should acknowledge receipt and inform the proposing party about the time scale of the decision-making process receipt as soon as possible. The Administrator may request more information from the proposing party, if required for taking a decision.

2. *Objection and advice*
   The Administrator should publish the proposal and invite interested parties to support or to object to the proposal. It should forward the proposal to the Advisory body and/or to the Registrar for advice. The advice would not be binding. The Administrator should observe confidentiality concerning commercially sensitive information where requested by the proposing party.

3. *Decision*
   The Administrator should decide on the designation of specific ESIs, including the structures of the ESNs behind these ESIs, the definition of the type of ETNS telecommunications service concerned and the fees for application and assignment of ENs from the ESIs. If default procedures or conditions for assignment of ENs should not apply to the ENs concerned, specific procedures or conditions should be defined instead in the ESI designation (see section 4.3.3).
   The Administrator should notify the proposing party and the advising parties of the decision and the reasons for it. The time scale from the receipt of the proposal to the notification should not cause unnecessary delay in the introduction or development of the type of ETNS telecommunications service concerned.

4. *Publication and recording*
   The Administrator should ensure that the decisions are immediately and appropriately published and recorded by the Registrar.

4.3.2 Service and numbering requirements for designation of ESIs

The following service and numbering requirements should be fulfilled for designation of ESIs:

- An ETNS telecommunications service using the ESIs can be invoked from at least two ETNS countries.
- The ESIs provide sufficient capacity in both the short term and the long term.
- An ESI designation enables fair and open competition.
- An ESI designation is in line with the already established ETNS conventions and with relevant ITU-T Recommendations and ETSI Standards as far as these do not conflict with the ETNS conventions.

4.3.3 Setting of fees, procedures and conditions for assignment of ENs

The following requirements regarding fees, procedures and conditions for assignment should be fulfilled for designation of ESIs:

- The fees for assignment of ENs from the ESIs only seek to cover the management costs and should, for individual cases, be proportionate to the work involved. Where scarce resources are involved, the fees may reflect the need to ensure optimal use of these resources.
- The following default procedures and conditions for assignment of ENs may be overruled by specific procedures and conditions defined in the ESI designation:
  - portability of ENs (portability between service providers is default)
  - the dormant period of the ENs after withdrawal (six months is default)
  - the periods before starting assignment of the ENs (two preceding periods as described in section 4.4.1 is default)
  - the period of designation (an unlimited period is default; an example of a designation for a limited period is a temporary designation for trials of new services).

4.3.4 Conditions for refusal of proposed ESIs

If one or more of the following conditions apply, the designation of proposed ESIs should be refused:

- The type of ETNS telecommunications service concerned violates relevant ITU-T Recommendations or ETSI Standards (as far as these do not conflict with the ETNS conventions).
- There are satisfactory global numbering resources available.
- ESIs that have already been designated before provide adequate free capacity for the type of ETNS telecommunications service concerned.

4.3.5 Conditions for changing of the ETNS definition or ESI designations

The ETNS definition or specific ESI designations may be changed because of capacity shortage or international trends but only if this is in the interest of the market parties as a whole. The subscribers of reserved or assigned ENs affected by such a change should have the following rights:

- Each affected EN should be replaced by a new number aiming at international numbers that are as similar as possible.

- There should be a period of parallel running of the old and new numbers, followed by a period of recorded announcements to callers of the old numbers.

- The publicity of the change should be well co-ordinated and timely and the subscribers of affected ENs should be notified two years ahead of the activation of the new numbers.

The costs incurred by parties affected such as subscribers and service providers as a consequence of such a change would be borne by these parties.

4.3.6 Conditions for withdrawal of designated ESIs

If one or both of the following conditions applies to a specific ESI designation, then the ESIs concerned may be withdrawn:

- After designation of the ESIs in question, there have been no ENs assigned from the ESIs in the course of the last three years

- One of the specific conditions attached to the ESI designation is not met or has expired (such as a temporary period of designation).

4.3.7 Procedures for withdrawal of ESIs or changing of ESI designations

The withdrawal of ESIs or the changing of ESI designations should include the following:

1. *Proposal*
   Any interested party can propose to the Administrator to withdraw an ESI or change an ESI designation. The Administrator itself could take the initiative. The proposal should include its rationale. On receiving a proposal, the Administrator should acknowledge receipt and inform the proposing party about the time scale of the decision-making process as soon as possible. The Administrator may request more information from the proposing party, if required before a decision can be taken.

2. *Objection and advice*
   The Administrator should publish the proposal and invite interested parties to support or object to the proposal. The Administrator should forward information on the proposal to the Advisory body or to the Registrar for advice. The advice would not be binding.
   Confidentiality concerning commercially sensitive information should be observed. If assigned numbers are involved, the Administrator may request the Registrar to inform the service providers concerned about the proposal and to ask for their comments on behalf of their subscribers.

3. *Decision*
   The Administrator should decide on the withdrawal or the change. It should immediately notify the proposing party and the advising parties and ensure that the Registrar immediately informs the service providers which were asked for their comments on the decision and the reasons for it. The time scale from reception of the proposal to the notification should not be extended unnecessarily.

4. *Publication and recording*
   The Administrator should ensure that the decisions are immediately and appropriately published and recorded by the Registrar.

4.4 Assignment and withdrawal of European Numbers (ENs)[7]

The assignment and withdrawal of ENs should be carried out by the Registrar in conformance with ESI designations. The ETNS should be considered a public resource. This would imply that subscribers, service providers and other market parties can never own ENs and can only be granted rights of use of ENs. ENs should not be transferred by market parties to third parties.

The procedures are comparable with those of the assignment of Universal International Freephone Numbers (UIFNs) by ITU, which is the only comparable example[8]. This implies that telecommunications service providers apply for the ENs on behalf of their subscribers. They cannot apply for ENs which are not requested by their subscribers. The procedures and conditions for assignment and withdrawal of ENs are based on the normal case of unstructured European Subscriber Numbers (ESNs), that is without a subdivision into DIs and DSNs. The same procedures and conditions are, generally speaking, applicable to cases of structured ESNs. Where they are not applicable, this is explicitly mentioned (mainly the time scales and the qualification of service providers).

The sections which follow subsequently deal with:

- procedures for assignment of ENs
- requirements for assignment of ENs
- conditions for refusal of ENs
- conditions for withdrawal of reserved and assigned ENs
- procedures for withdrawal of reserved and assigned ENs
- conditions regarding qualification of service providers
- procedures regarding qualification of service providers.

ETO proposes that section 4.4 is fully included in the ETNS conventions. This section implies two basic principles:

1. The ETNS should be considered as a public resource. This implies that market parties can only be granted rights of use of ENs and that they can never own ENs and cannot transfer ENs to third parties.

2. A service provider should qualify for offering a particular type of ETNS telecommunications service. This implies that the service provider acts as an intermediary between its subscribers and the Registrar, makes applications for ENs on behalf of its subscribers and cannot apply for ENs which are not requested by its subscribers.

[7] Assignment of an EN can be seen as the assignment of an ESN behind a specific ESI. In the report the term 'EN' is used in the context of assignment as each EN is unique. If the term 'ESN' is used, reference to a specific ESI should be made to indicate the uniqueness of the ESN.

[8] The assignment of UIFNs by ITU is described in ITU-T Recommendation E.169.

4.4.1 Procedures for assignment of ENs

Three periods
ESI designation is normally followed by assignment of ENs from the designated ESIs. An exception is when the designated ESIs are used as short codes without ESNs.
Generally, certain ENs from a newly designated ESI are more attractive than others. To allow equal opportunity to all market parties to obtain attractive ENs, two periods should precede the start of reservation and assignment. The first period is meant to allow distribution of information regarding the new ESI designation to interested market parties. The second period is to allow equal treatment of initial applications for ENs from the newly designated ESIs. The principle of 'first come, first served', which should be used in the normal assignment procedures, is not considered suitable for the initial applications. There may be exceptions where the additional two periods are not required or when they are required in a way different from what is stated below. In those cases, the ESI designation should define how to start assignment of the ENs concerned.
For the default procedures, three subsequent periods regarding assignment of ENs from the ESIs should be distinguished*:*

I In the first three months after publication of the ESI designation, no applications for the ENs concerned should be accepted.

II In the following two months, applications should be treated according to the normal procedures described below but with the following deviation:
- A selection procedure should be used which is independent of the moment of receipt of the application. The normal principle of ‘first come, first served’ should not be applicable. Instead, a procedure for resolving coinciding applications at the end of the two-month period should be established.
- No reservations or assignments should be made. Only refusals should be allowed.
- The planned date of activation of the requested ENs may be more than the normal three months from the moment of application, but it should not be more than three months from the end of the two-months period.

III In the following indefinite period, the normal procedures using the principle of ‘first come, first served’ should be applicable.

The normal procedures, following the principle of ‘first come, first served’, for the reservation and assignment of ENs for a specific ETNS telecommunications service should include the following:

1. *Application*
   Any service provider which intends to provide or provides an ETNS telecommunications service for which ENs can be used, should be eligible to apply to the Registrar for the assignment of specific ENs on behalf of its customers. The application should at least contain the name and address of the subscriber, name of the service provider and name of the service for which ENs are requested. It should be accompanied by the application fee as defined in the ESI designation concerned.
   An application form should be available which clearly indicates the required information. One form should be used for one ETNS subscriber at a time (for ENs with a DI, one form should be used per DI). The required information should include:
   - The specific ENs that are preferred, the use and the planned date of activation of the ENs. For ENs with a DI, a plan of the use of the ENs from the initial activation and three years ahead is also required.
   - If a dormant EN is requested, proof that the previous subscriber does not object to reassignment of the EN during the second half of the dormant period.

   Incomplete or incorrect applications should immediately be rejected and returned.

2. *Decision*
   The Registrar should respond to the applicant within two working days of the receipt of the application. The response is to notify the applicant of a reservation of ENs, a refusal of the request or a delay of the decision (for ENs with a DI, the initial response is only a confirmation of the receipt of the application and further notification should be given within one month from the date of receipt).
   The Registrar may request more information from the applicant if required before the decision can be taken.
   A reservation should only cover ENs requested. A reservation may include specific conditions that are also mentioned in the notification. An example of a specific condition is a limited period of assignment, such as for trials of new services. A reservation of ENs with a DI should always have a specific condition attached on the required degree of activation after three years.
   A refusal and a delay may be partial, in which case only a part of the requested ENs should be reserved.
   In case of a delay, the applicant should be given the reasons for the delay and should be notified of the decision within 10 working days (for ENs with a DI within three months) from the receipt of the application.
   The notification of a decision should be recorded and published by the Registrar. It should always include the reasons of the decision and information about procedures for objection. The applicant should be able to object.

3. *Objection to the Registrar*
   If the applicant objects to the decision, it should send its objection and the reasons for the objection to the Registrar within ten working days (for ENs with a DI within two months) after notification of the decision.
   The Registrar, after appropriately hearing the applicant, should notify the applicant of its decision on the objection and the reasons for it within ten working days (for ENs with a DI within two months) after the objection. The applicant should be able to make a second objection to the Administrator.

4. *Objection to the Administrator*
   If the applicant objects for the second time, he should send his objection and the reasons for the objection to the Administrator within two months after notification of the decision. The Administrator, after appropriately hearing the objecting applicant and the Registrar, should notify the objecting applicant and the Registrar of its decision on the objection and the reasons for it within three months after the receipt of the objection.

5. *Assignment*
   The applicant should immediately notify the Registrar of the activation of ENs (for ENs with a DI, the start of the activation of ENs) which have been reserved on his request. When both the notification and the required initial fee have been received, the Registrar should assign the reserved ENs and send a confirmation to the applicant.

6. *Recording*
   The Registrar should immediately and appropriately record the decisions.

4.4.2 Requirements for assignment of ENs

The following requirements for reservation and assignment of ENs should be fulfilled:

1. The Registrar should reserve and assign ENs in accordance with the relevant ESI designations.

2. The Registrar should reserve and assign ENs in an objective, non-discriminatory, equitable, proportionate, timely and transparent manner. It should periodically publish data on the number of assigned ENs per ESI.

3. The Registrar should promote efficient use of ESI space and timely propose additional ESIs to avoid exhaustion of the available ESIs for a particular ETNS service.

4. The Registrar should offer access to its records to any party. This access should only enable the party to obtain information on the status of ENs. Confidential information on market parties should be protected.

5. The registration system should as a minimum record the following elements:
   - all ESI designations including the specific structure of the associated ENs, the ETNS service definitions and, if applicable, specific conditions
   - the data of the subscribers and service providers concerning the ENs that have been reserved or assigned
   - the status of each of the ENs, by indicating whether the number is:
   - free,
   - reserved,
   - assigned,
   - dormant,
   - pending for conflict resolution,
   - unusable, or
   - spare, that is, belonging to a designated ESI but not available for reservation or assignment at present.

If the status period has been limited to a certain date, then the date should be shown. This would always be the case for reserved, dormant and pending numbers and may be the case for assigned, unusable and spare numbers.

4.4.3 Conditions for refusal of ENs

If one of the following conditions apply to specific requested ENs, the ENs should be refused:

- The service provider is not qualified to offer the type of ETNS service concerned.
- The planned use of the service by the subscriber violates relevant ITU-T Recommendations or ETSI Standards (as far as these do not conflict with the ETNS conventions) or national or international regulations applicable in the ETNS countries where the service or access to its subscriber is offered.
- ENs which have already been reserved or assigned fulfil the need adequately.
- The requested ENs are not free and, if dormant, not in the second half of the dormant period.
- The requested ENs are dormant and in the second half of the dormant period, while the Registrar has no proof that the previous subscribers do not object to reassignment during the second half of the dormant period..

The last bullet item requires some clarification. The dormant period may differ per ETNS service. For example, if the dormant period is six months, then an EN should never be reserved or assigned during the first three months of its dormant period. In the latter half of the dormant period, the EN can only be reserved or assigned if the Registrar has proof that the previous subscriber does not object to reassignment during the second half of the dormant period. When reassignment of a dormant EN is made, the dormant period is considered to have elapsed.

4.4.4 Conditions for withdrawal of reserved and assigned ENs

The conditions for changing of the ETNS definition or ESI designations which affect reserved or assigned ENs is described in section 4.3.4. In these cases, the withdrawn ENs are replaced.

This section only concerns the withdrawal of ENs without replacement. If one of the following conditions apply to specific reserved or assigned ENs then these ENs may be withdrawn:

- The period of reservation exceeds six months (for ENs with a DI one year).
- The subscriber no longer uses or intends to use the reserved or assigned ENs.
- The subscriber does not continue with a qualified ETNS service provider.
- The use or planned use of the ETNS telecommunications service by the subscriber violates relevant ITU-T Recommendations or ETSI Standards (as far as these do not conflict with the ETNS conventions) or national or international regulations applicable in the ETNS countries where the service or access to its subscribers is offered.
- After activation, the ENs have become deactivated (for ENs with a DI, all ENs from a specific DI have become deactivated).
- The ENs have been transferred to third parties.
- One of the specific conditions for the reservation or assignment of ENs is not met or has expired (such as a temporary period of assignment).

4.4.5 Procedures for withdrawal of reserved and assigned ENs

The procedures for changing of the ETNS or of ESI designations which affect reserved or assigned ENs are described in section 4.3.4. In these cases, the withdrawn ENs are replaced.
This section only concerns the withdrawal of ENs without replacement. The procedures should include the following:

1. *Intention*
   The Registrar should notify its intention to withdraw ENs, including the reasons for this, to the service provider who uses the ENs and should allow him to return his comments within two months.

2. *Decision*
   If no comments are received in time, the Registrar may decide to withdraw the ENs according to notice given. Otherwise, the Registrar should decide whether or not to proceed with the withdrawal of the ENs within one month after having received the comments. The Registrar should immediately notify the service provider of its decision, the reasons for the decision and the procedures for objection. The service provider should be able to object on behalf of its subscriber.

3. *Objection to the Registrar*
   If the service provider objects against the decision, it should send its objection to the Registrar within two months after notification of the decision. The Registrar, after appropriately hearing the objecting service provider, should notify the service provider of its decision and the reasons for the decision within one month of receipt of the objection. The service provider should be able to make a second objection to the Administrator.

4. *Objection to the Administrator*
   If the service provider objects for the second time, it should send its objection and the reasons for the objection to the Administrator within two months of notification of the decision. The Administrator, after appropriately hearing the objecting service provider and the Registrar, should notify the objecting service provider and the Registrar of its decision on the objection and the reasons for the decision within three months of the receipt of the objection.

5. *Recording*
   The Registrar should immediately and appropriately record the decisions. As soon as an assigned EN is withdrawn, it enters a dormant period of, normally, six months. The six months period is a default which could be overruled by a different period if specified in the ESI designation concerned. The information on the subscriber of the EN should be kept until the dormant period has elapsed.

4.4.6 Conditions regarding qualification of service providers

A distinction should be made between two types of ETNS telecommunications service providers:
- one type offering public services which can be provided with unstructured ENs
- one type exploiting a corporate network which can be provided with a Domain Identity (DI).

Each service provider is required to qualify for offering a particular ETNS telecommunications service. The conditions for qualifying differ for the two types of ETNS service providers. The difference is caused by the requirement that an ETNS service provider applies for ENs on behalf of its ETNS subscribers. The ETNS service provider is required to act as an intermediary between its ETNS subscribers and the Registrar. This requires some extra conditions if the ETNS service in question is offered to the public. These extra conditions are not required when the service is not publicly available, which may be the case for example when the service provider is exploiting a corporate network.

Qualification would imply for both types of ETNS service providers that the service provider undertakes:

- to provide an ETNS telecommunications service that conforms to the definition and the conditions of one of the types of ETNS telecommunications services for which ESIs have been designated
- to provide information about the ETNS telecommunications service as required by the Registrar
- to provide information about the usage or planned usage of ENs of its ETNS subscribers as required by the Registrar
- to inform the Registrar when an EN is activated and deactivated (for ENs with a DI, when activation of ENs starts and when activation is terminated of all ENs) as soon as this becomes apparent
- to inform the Registrar of any relevant change that has occurred to the information provided earlier as soon as that change becomes apparent
- to pay the initial fee and the periodic fee for the usage of the ENs as required by the Registrar
- to conform to all national regulatory and legal requirements of the countries in which the service provider provides ETNS services.

The first bullet item mentioned above implies that qualification should be made for each ETNS service separately.

Qualification for ETNS service providers offering a public service implies that the service provider additionally undertakes:

- to act as an intermediary for information exchange and payments between the ETNS subscribers and the Registrar
- to support the rights of the ETNS subscribers to change their ENs and to keep their ENs when changing ETNS service provider or location
- to inform the Registrar as soon as possible when an ETNS subscriber joins or leaves the service provider
- to inform the Registrar as soon as possible about the new postal address when an ETNS subscriber changes location.

If all required conditions are fulfilled, qualification is granted.
If one of the above-mentioned conditions is not fulfilled, qualification is not granted or may be withdrawn.

4.4.7 Procedures regarding qualification of service providers

If a service provider wants to qualify for offering a particular type of ETNS telecommunications service, he should provide the necessary information to the Registrar. An qualification form should be available which clearly indicates the required information. It should at least include name, address and telephone number of the service provider and a description of the service for which the ENs are requested. The service provider may provide the information together with its first application for ENs.

The procedures for qualification should be similar to the normal procedures for assignment of ENs described in section 4.4.1. The applicant is then acting on its own behalf and not on behalf of its customers.

If a service provider no longer fulfils the conditions for qualification then procedures should be followed which are similar to the procedures for withdrawal of assigned ENs described in section 4.4.5. Again, the applicant is then acting on its own behalf and not on behalf of its customers.

5. Technical framework of the ETNS

This section describes the technical framework of ETNS, pointing out different routeing alternatives and highlighting regulatory issues. This technical framework is partially based on the ETSI European Numbering Task Force (ENTF) activities which have led to the preparation of ETSI standards at the moment under Public Enquiry.

5.1 The ETNS reference model

An ETNS reference model was developed by ETSI to describe the relationships between the different entities involved in the ETNS implementation. This reference model is based on separation between the call related part and the non-call related part. The call related part mainly refers to the routeing whereas the non-call related part refers to number portability and distribution of RN (Routeing Number) and EN.

Figure 2 shows a simplified version of the ETNS reference model based on the assumption that the calling and the called parties are directly connected to the Serving Network and Service Network. These two networks play a key role in the routeing of the ETNS call. In particular the Serving Network is responsible for the translation of the EN in a Routeing Number used to reach the Service Provider that is connected to the Service Network (for more details on routeing mechanisms see section 5.2).

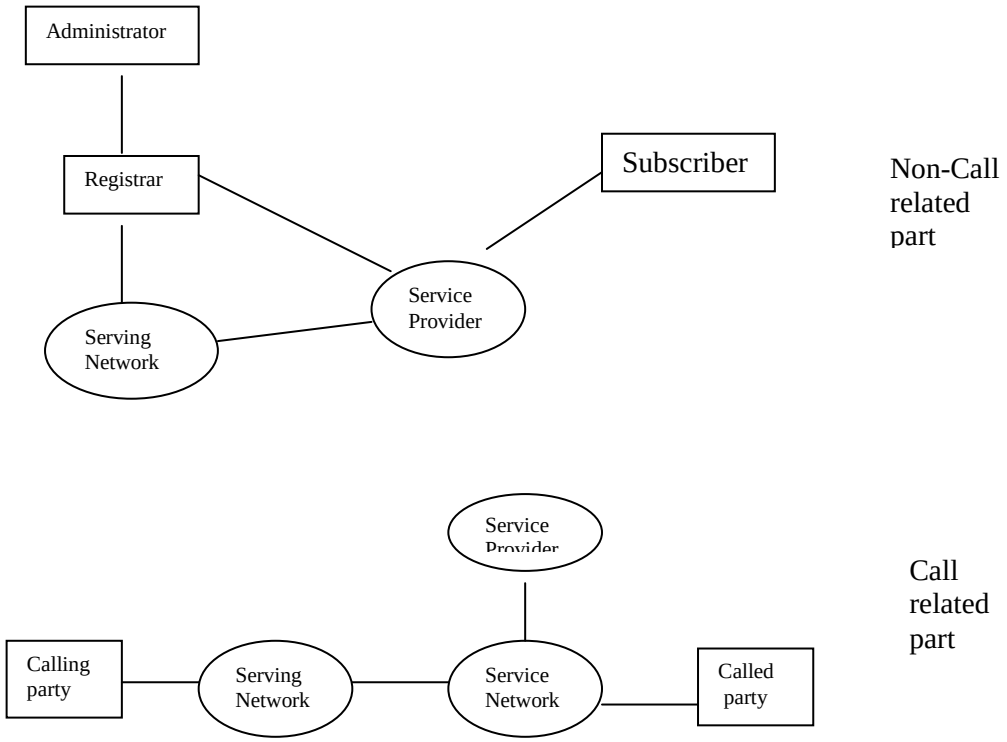


Figure 2: ETNS reference model as defined by ETSI

Two essential features characterise the ETNS reference model:

- The first feature is that the services using the ETNS must be open to competition. This implies that the model should enable the participation of any new Service Provider or Operator. Consequently, there must be a clear distinction between the Transport Level (Serving Network + Service Network) responsible for the delivery of the ETNS Service and the Service Provision Level (Service Provider) responsible for the provision of the ETNS service.
- The second feature is that the "information flow" between the Service Providers and the Serving Network (such as distribution of Routeing Number) can be either distributed or centralised via the Registry.

ETSI has developed a reference model for the ETNS to describe the relationship between the different entities.

5.2 Technical aspects of the routeing of ETNS calls

Different routeing mechanisms have been studied in ETSI for routeing an ETNS call. In particular the mechanism called "double translation using speech path" has been identified as preferable in the short term.

Figure 3 depicts the mechanism.

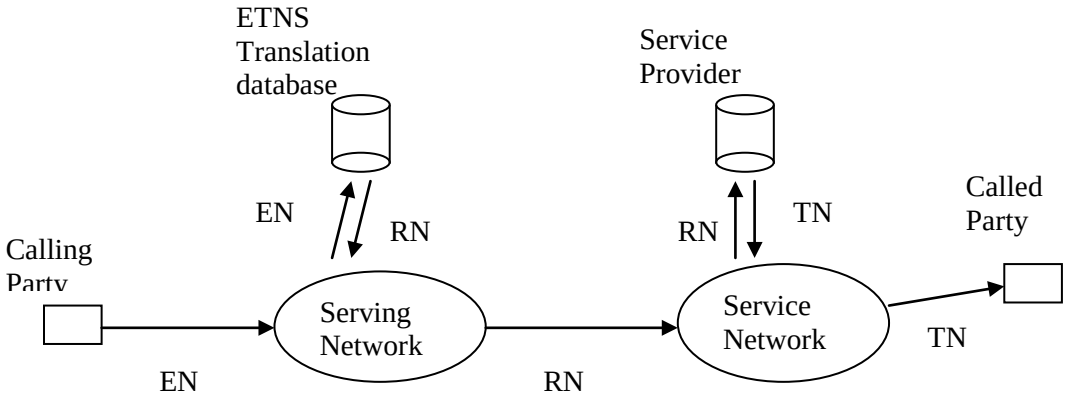


Figure 3: Double translation using speech path

The calling party dials the European number (EN) in its international format. Based on the European Service Identifier (ESI), the call is routed to the Serving Network. A network is called a Serving Network when it is able to analyse and translate the European Number by means of an ETNS Translation database.

In some cases, the calling party does not directly connect to a Serving Network, and then the ETNS call is routed via an Assisted Network. The Assisted Network has only to analyse the ESI to route the call to the appropriate Serving Network.

On receipt of an ETNS call the Serving Network triggers the ETNS Translation database to translate the incoming EN into an outgoing Routeing Number (RN). The RN points to the Service Network that is the network to which the Service Provider is connected. In most cases a second translation is performed by the Service Provider to get a Terminating Number (TN) to address the called party.

In the long run we can envisage the use of standardised signalling interfaces between the ETNS Translation database and the Service Provider database to allow the mapping of EN-RN-TN without using speech paths between the Serving and Service networks. This solution, allowing an optimisation of the network resources, requires capabilities of Intelligent Network that are not yet available.

In specific cases, like corporate network, direct routeing may be utilised[9]. Direct routeing does not require number translation in public networks. By direct routeing the exchanges involved in the set-up phase route the call only on the analysis of the European Number.

ETO supports the ETSI view that in the first phase routeing of ETNS calls should be performed by using double translation with speech path.

5.3 Call origination and termination

An ETNS call can be originated and/or terminated within or outside Europe.

The ETNS subscriber may indicate the area from where the call may be originated. The limitation of the areas from where the call can be originated must not clash with the regulatory conditions for the characterisation of an ETNS service (such as the service must be accessible from at least two ETNS countries).

5.4 Routeing Number

Routeing Numbers are used for network internal purposes to route the call through networks. In the case of double translation the Routeing Number is used to identify the Service Network and the Service Providers connected to this network.

The question can be asked whether Routeing Numbers are obtained by existing national mechanisms or specific Routeing Numbers are allocated separately to ETNS Service Providers. The existing mechanism of using Routeing Numbers from Network Operators is preferred. This implies that each Service Network has to be assigned Routeing Numbers to be used for ETNS calls. These Routeing Numbers related to the provision of ETNS services have to be considered as an additional demand to existing use of the Routeing Numbers.

[9] See ETO study on 'The Numbering Requirements of Corporate Telecommunication Networks.

The structure of the ETNS Routeing Number is under the responsibility of the NRAs who are also responsible for their assignment to the various Service Networks. As ETNS Routeing Numbers are international numbers, it is requested that routeing and charging information are present in the first 7 digits of RN.

ETO proposes that:

1. The Routeing Numbers (RNs) should be allocated to the Service Networks (see figure 3) from number space assigned by NRAs.

2. The structure and the assignment procedures of RNs should be the responsibility of NRAs.

5.4.1 Distribution of Routeing Numbers

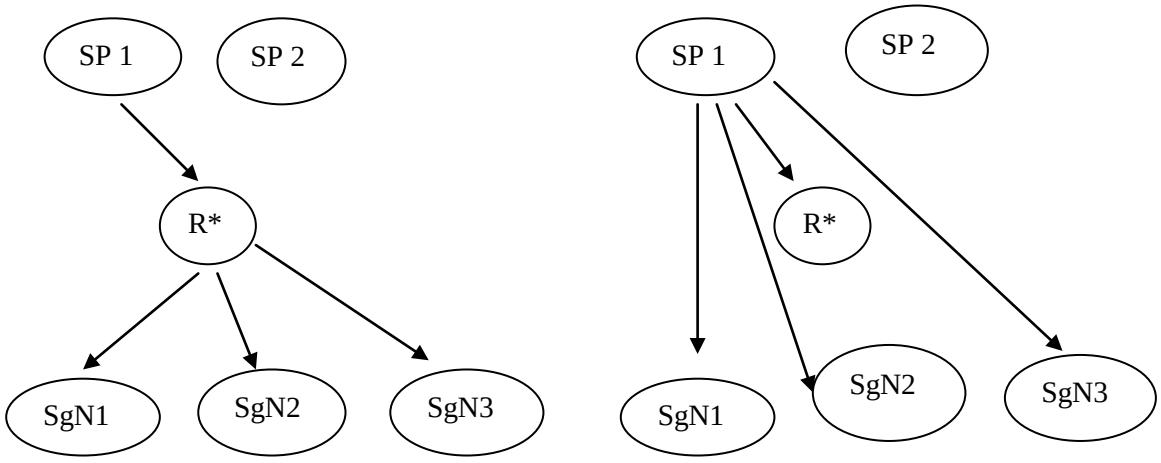
The ETNS Translation databases are responsible for maintaining an updated association between ENs and the corresponding RNs. This implies that each time a RN associated with a specific EN changes, the Serving networks must be informed in order to update the ETNS Translation databases properly. In the following we call this process the distribution of Routeing Numbers

The distribution of Routeing Numbers takes place in the following cases:

- when a new EN has been assigned;
- when an EN has been withdrawn;
- when an ETNS subscriber has ported his own EN between two ETNS Service Providers.

According to the ETNS reference model, the distribution of RNs refers to the non-call related functions and has no impact on the set up phase of an ETNS call.

As shown in figure 4 two mechanisms can be envisaged to perform the distribution of Routeing Numbers.



Centralised approach

Distributed approach

Figure 4: Mechanisms for the distribution of Routeing Numbers

Centralised approach

- The first mechanism, called "centralised", implies that the Service Provider informs a centralised entity (in the following called R*) of the new association RN <> EN. R* is then responsible for distributing RNs and the associated ENs to all the Serving Networks involved.

Distributed approach

- The second mechanism, called "distributed", implies that the Service Provider directly distributes the RNs and the associated ENs to all the Serving Networks involved. The Routeing Numbers are also distributed to R*.

R* can be either the Registrar or a third party. In particular the second option seems the most appropriate one. As a matter of fact the distribution of the Routeing Number is something which does not require regulatory involvement and can be performed by a third entity devoted to this specific task.

All the entities involved in the implementation of the ETNS (such as Service Providers, Serving Networks) would be expected to contribute to the establishment of this third entity[10].

The two approaches described above have different characteristics and they put different burdens and responsibilities on the various actors involved in the implementation of the ETNS.

[10] The definition of the rules for the establishment of the third party is for further study

The problem of the distribution of the Routeing Numbers for the ETNS is not different from the distribution of the RNs for the UIFN (Universal International Free phone Number). Like EN, UIFN numbers are non geographic numbers that need to be translated into RNs to allow the completion of the free phone calls.

The experience of UIFN proves that the distributed approach can work in a satisfactory way. As such, it seems reasonable to recommend starting the implementation of the ETNS using a distributed approach with the intention to migrate in future, if requested, to a centralised one.

It should be noted that the different parties involved in the implementation of the ETNS are defining a field trial to verify the technical feasibility of the ETNS and gain some experience. The field trial is expected also to check the suitability of the two above mentioned approaches.

ETO proposes that:

1. As long as the situation is simple (that is, few Service Providers and Serving Networks; see figure 3), the distributed approach should be regarded as the most suitable mechanism for the distribution of Routeing Numbers.

2. In the future, if requested, the introduction of a centralised approach based on the use of a Third Party (other than the Registrar) could be envisaged.

5.5 Serving Network and Assisted Network

Any artificial determination of the location of the ETNS Translation database is not an issue for serious consideration. A decision in favour of only a restricted number of locations implies an ongoing regulatory intervention, which will not be necessary if no regulatory restrictions are imposed. Therefore, the location of the ETNS database should be left to commercial arrangements between network operators/service providers.

In addition Network Operators are not obliged to act as Serving Networks offering ETNS translation database services to other networks. Likewise a Network Operator cannot be obliged to act as an Assisted Network.

The relationship between the Serving Network and the Assisted Networks should not be regulated but left to commercial agreements between operators.

ETO proposes that:

The location of the ETNS Translation databases should be left to commercial agreements between the entities involved.

The offering of ETNS translation services should be left to commercial agreements between Network Operators and Service Providers.

Network Operators cannot be obliged to act as Assisted Networks.

5.6 Service Network

Most of the regulatory considerations applying to the Serving Network can also apply to the Service Network.

In particular, in order to promote competition it does not seem appropriate to use regulation to determine who will be a Service Network. Each operator should be free to decide whether or not to act as a Service Network on the basis of considerations of market opportunities only.

Once a network operator has decided to be Service Network for a specific ETNS Service Provider, the relationship between the two entities (Service Network, Service Provider) should be based on commercial agreements with the goal of creating an open European market.

With reference to routeing aspects, the Service Network must identify a set of Routeing Numbers used to route the call properly to the ETNS Service Provider. These Routeing Numbers are taken from the set of RNs associated with the Service Network. It is the responsibility of the Service Network to communicate the Routeing Numbers to the Service Provider and route incoming calls with such RNs to the selected Service Provider.

In order to provide the ETNS Service the Service Provider has to distribute the individual RNs to all the Serving Networks involved. As described in section 5.4.1 this should preferably be done with a distributed approach.

ETO proposes that:

Network Operators cannot be obliged to act as Service Networks.

The relationship between Service Networks and Service Providers should be based on commercial agreements.

6. Number portability for ETNS services

The main objective of the study of number portability for ETNS services is to make proposals and guidelines for the implementation of number portability between ETNS Service Providers. ETSI has been providing input under a separate study on the same subject[11].

6.1 Definition of number portability for the ETNS

Number portability in this report refers to service provider portability. This type of portability is the capability that allows a subscriber of an ETNS service to change the Service Provider for this specific service retaining the same EN. The capability of changing ETNS service while keeping the same EN is outside the definition of number portability for the ETNS.

Regardless of the specific solution chosen to implement the ETNS, number portability between Service Providers for ETNS services is widely recognised as a key factor to develop and strengthen a competitive service market on a European basis. The entrance and the development of new Service Providers will be facilitated by the possibility for a customer to change Service Provider keeping his own European Number. Many Service Providers feel the lack of number portability as an important barrier to their entrance and success in the ETNS service market.

As described in chapter 5, except for the specific case of direct routeing, EN must be regarded as a location independent number. That implies that EN does not contain any geographic information on the physical location of the called party and in order to terminate the call the European Number must be translated into one or more Routeing Numbers. The lack of geographic information in EN makes EN itself easily portable between different locations (location portability).

However it is widely recognised that location portability is less important from a regulatory point of view than service provider portability. ETNS location portability could be offered by using the mechanisms put in place for service provider portability.

ETO proposes that number portability between Service Providers should be provided for ENs, i.e. it should be possible for a subscriber of an ETNS service to change Service Provider for this specific service while retaining the same EN.

[11] DTR/NA-021409 Number portability for pan-European services

6.2 General assumptions and requirements regarding number portability

The provision of number portability in the ETNS is based on a number of assumptions and requirements:

- Only the EN (not including prefixes and suffixes) is eligible to be ported
- The entire EN and not only a portion of it is portable
- Portable EN must not contain in its structure any indication of the Service Provider
- The calling party should not be able to recognise whether or not one is calling a ported EN
- The calling party should not be charged differently when calling a ported EN
- The privacy of a customer who has ported his EN should be ensured

It should be noted that the requirement of not having any indication of the Service Provider in the EN raises some problems in the specific case of corporate networks[12]. Typically an EN used for Corporate Network services has a structured subscriber number. As shown in figure 1 in section 4.1 a structured ESN is divided into 2 parts: Domain identity and Domain Specific number.

ETO proposes that all ENs should be portable except those which contain an explicit indication of the Service Provider.

6.3 Management of the porting of ENs

The provision of number portability affects the management and the distribution of European Numbers and Routeing Numbers.

With reference to the ETNS reference model described in chapter 5, number portability refers to the non-call related part. That implies that during the set up phase of an ETNS call the fact that the called EN has been ported does not have any impact on the establishment of the communication. All the requested actions related to number portability take place at the non-call related level.

When a European Number is ported between two Service Providers, some actions will be required on the part of the Registrar responsible for the assignment and distribution of EN:

- The old Service Provider (in the following called Donor Service Provider) informs the Registrar of the deactivation of the EN and the intention of the subscriber to port the number to another Service Provider (in the following called Recipient Service Provider).

[12] See ETO study on 'The Numbering Requirements of Corporate Telecommunication Networks.

- The Recipient Service Provider informs the Registrar of the activation of the ported EN.
- The Registrar checks whether the Recipient Service Provider is qualified for the ETNS service concerned. If not, the Recipient Service Provider has to become qualified first or else the porting has to be refused by the Registrar.
- When the porting of the EN is accepted by the Registrar, the change of Service Provider is registered in the registration system accordingly.

As described above, portability of ENs requires a transfer of information between the Service Providers and the Registrar. Appropriate interfaces to allow this kind of communication require to be defined. The need to implement ETNS in a short time gives rise to the conclusion that at the beginning the interfaces between the Service Providers and Registrar will be proprietary and based on the presence of human operators. Fax and electronic mails are just two examples of the proprietary interfaces for the distribution of ENs.

It should be noted that the use of non-automatic interfaces based on the involvement of human operators may affect in a negative way the quality of the service offered to the customers of ETNS services. For example when an EN is ported there may be a period of time where the service is not available due to the allocation or deallocation procedures involving the Service Providers and the Registrar. To avoid this kind of lapse it is recommended to make use in the medium to long term of automatic standardised interfaces with a limited involvement of human operators.

For the provision of number portability the Registrar and the Service Providers have to communicate to allow the distribution of the ported ENs.

ETO proposes that in the short term such communication should be based on proprietary interfaces with involvement of human operators. In the long term the human function could be replaced by use of standardised automatic interfaces.

6.4 Impact of number portability on Routeing Numbers

Implementing number portability requires changes and investments in the network and this process is expected to take a certain amount of time.

As is envisaged, routeing of an ETNS call is done by using an ETNS Translation database that translates the EN into a Routeing Number used to reach the Service Provider and then terminate the call.

When an EN is ported from the Donor Service Provider to the Recipient Service Provider the Routeing Number associated with the EN must be modified. This is due to the fact that it is no longer possible to reach the Service Provider responsible for the provision of the ETNS service (Recipient one) by using the old RN.

Implementing number portability means then modifying the association between EN and RN in the appropriate ETNS Translation databases. Such modification is not done during the set up phase of the ETNS call but as a non-call related function

In the short term, considering the technology available, the limited number of Service Providers and Service Networks the distributed approach seems to be the most appropriate one. This approach requires that the Recipient Service Provider updates in appropriate ways the ETNS Translation databases used to route the ETNS call.

The updating of the ETNS Translation databases can be done by using two different approaches: centralised and distributed. The considerations recorded in section 5.4.1 on the distribution of RNs are still applicable for number portability.

ETO proposes that:

1. In the short term, the distribution of RNs due to the provision of number portability should be performed with a distributed approach.

2. In the long run, if requested, a migration toward a centralised approach based on the use of a Third Party can be considered.

6.5 Example of service provider portability

Freephone in the UK and in the North American Numbering Plan are two well established examples in the world of a comparable situation for a non-geographic service for which number portability between service providers has been implemented.

In the American example (see Annex E), a single database performs the tasks of administration, updating of routeing information and translation during call set-up. The freephone service providers all have access to the database and can make assignments and activations on behalf of their own subscribers. For routeing a call, one translation is made in the database, from the freephone number into the destination address.

It took many years to develop the 800 Service to the present level. Having all functions integrated in one database has the advantage of simplicity of management and updating.

It should, however, be kept in mind that the North American situation is not quite comparable to the European one:

- ETNS routeing is based on a distributed approach and it is not envisaged to migrate towards a centralised one
- ETNS non call related functions are likely to be implemented with a distributed approach and only in a second phase, if requested, will the introduction of a centralised approach be taken into consideration.
- The ETNS would be available for many different types of services instead of just freephone.

To conclude, ETNS implementation is based on different principles from the Free phone in NANP and it is unlikely that a convergence between the two implementations will develop.

7. Proposals

ETO makes the proposals dealt with in the following sections.
They should lead to further discussions in ECTRA regarding the framework of the ETNS management and decisions by ECTRA and by the ETO Council to give ETO the new task of ETNS management.

ETNS conventions

ETO proposes that chapter 4 of this report is fully included in the ETNS conventions. The main elements are summarised in the first seven proposals below.

General

1. The ETNS conventions consist of the following three elements:
   a the ETNS definition
   b the ESI designations
   c the rules for the management of the ETNS.

2. Management of the ETNS should follow the 'rules of fairness' established for the 1998 EU liberalisation. An important principle is the portability of ENs between service providers.

Definition of the ETNS

3. The ETNS should be defined, in line with ETSI standards, by the following:
   a The European Number (EN) starts with E.164 Country Code 388[13].

   b The EN has a maximum length of 15 digits.

   c The EN consists of a European Service Identity (ESI; 4-7 digits) followed by the European Subscriber Number (ESN; 0-11 digits).

   d The ESN may be subdivided into a Domain Identity (DI) followed by a Domain Specific Number (DSN).

   e In public telephony networks, the EN is dialled in the international format (+EN) only.

[13] E.164 numbering resources are resources defined in ITU-T Recommendation E.164

Organisations responsible for management of the ETNS

4. ETO should be the responsible organisation for management of the ETNS. This would require that ECTRA gives a mandate to ETO to carry out this task and that the ETO Council makes a decision to carry out this task.
5. The three functions of management of the ETNS and their corresponding organisations should be the following:

   a The Administration function, that is the establishment of ETNS conventions, to be fulfilled by the ETO Council.

   b The Registration function, that is the assignment, withdrawal and surveillance of European Numbers, to be fulfilled by the ETO Director.

   c The Advisory function for advice on numbering conventions issues, to be fulfilled by the European Numbering Forum (ENF).

   These proposals imply that an appeal function, involving an independent appeal body, is not considered necessary.

Rules for management of the ETNS

6. The rules for designation of European Service Identities (ESIs) imply two basic principles:

   a An ETNS telecommunications service should meet the requirement that it can be invoked from at least two ETNS countries.

   b The fees for assignment of ENs from the ESIs should only seek to cover the management costs and are, for individual cases, be proportionate to the work involved. Where scarce resources are involved, the fees may reflect the need to ensure optimal use of these resources.

7. The rules for the assignment and withdrawal of European Numbers (ENs) imply two basic principles:

   a The ETNS should be considered as a public resource. This implies that market parties can only be granted rights of use of ENs, that they can never own ENs and cannot transfer ENs to third parties.

   b A service provider should qualify for offering a particular type of ETNS telecommunications service. This implies that the service provider acts as an intermediary between its subscribers and the Registrar, makes applications for ENs on behalf of its subscribers and cannot apply for ENs which are not requested by its subscribers.

Technical framework of the ETNS

8. The Routeing Numbers (RNs) should be allocated to the Service Networks.

9. The structure and the assignment procedures of RNs should be under the responsibility of NRAs.

10. As long as the situation is simple (such as few Service Providers and Serving Networks), the distributed approach should be regarded as the most suitable mechanism for the distribution of RNs. In the future, if requested, the introduction of a centralised approach based on the use of a Third Party (other than the Registrar) could be envisaged.

11. The location of ETNS Translation databases should be left to commercial agreements between the entities involved.

12. The offering of ETNS translation services should be left to commercial agreements between Network Operators and Service Providers.

13. Network Operators cannot be obliged to act as Assisted Networks.

14. Network Operators cannot be obliged to act as Service Networks.

15. The relationship between Service Networks and Service Providers should be based on commercial agreements.

Number portability for ETNS services

16. Number portability between Service Providers should be provided for ENs; i.e. it should be possible for a subscriber of an ETNS service should be able to change Service Provider for this specific service retaining the same EN. All ENs should be portable except those which contain an explicit indication of the Service Provider.

17. In the short term, the distribution of RNs due to the provision of number portability should be carried out with a distributed approach. In the long run, if requested, a migration toward a centralised approach based on the use of a Third Party could be considered.

Annexes

Annex A Work requirements

1. Subject: Management of a European Telephony Numbering Space

1.1. Purpose

The work requirement covers the work that the European Telecommunications Office (ETO) will conduct on behalf of ECTRA for the European Commission in the area of numbering of telecommunications services. This Annex defines the terms of reference for a study on the management of a European Telephony Numbering Space (ETNS). The main objective is to prepare a comprehensive proposal for the management of an ETNS which includes establishing a management authority, a number structure, a numbering space management plan and procedures.

1.2. Justification

Numbering policy needs to maintain consistency with market developments and the EU policy goals. The numbering of telecommunications services will therefore need to be subject to a fundamental rethinking. Changes in the way that numbers are used and administered are needed as the market develops, facilitating a dynamic, innovative and competitive telecommunications market and meeting single market goals.

The numbering strategy is currently being developed by ECTRA with the assistance of the ENF. A new ETNS to be used in parallel with the present national numbering spaces is under consideration. This will allow European carriers and service providers to bring their services under a common numbering umbrella and acquire economies-of-scale. The space would also provide an opportunity to harmonise the numbering of pan-European services and to bring the future personal communications environment under a common numbering space. This would greatly contribute to transparency in dialling procedures in an increasingly complex European environment to the benefit of European customers.

In view of the fact that a European space is planned to open in 1997, there is an urgent need to establish a management plan for such a space and to have it approved at the European level. Questions such as the following require an answer: Who will administer this space?; What structures will the numbers have?; Does one have to pay for numbers and if so, how much?

1.3. Work requirement

(1) to study and make proposals for:

a) the number structure, including which codes should be allocated to which services and what could be the length of the number, taking into account possible evolution paths from national numbers to pan-European numbers and from pan-European numbers to global numbers. The work will involve the preparation of short service descriptions;

b) number allocation principles including procedures - for both applicants and the Administrator - for resolving allocation conflicts, and procedures for recovering and reallocating numbers. Work will involve developing criteria for number usage in relation to questions of ethics for relevant services;

c) rights and obligations of the Administrator and number recipient, including the pricing of numbers, trading of numbers, publicity, and procedures for monitoring and auditing the status of the ETNS resource.

(2)To study administrative issues including the tasks and responsibilities of the Administrator, the appeal process, the Administration's relationship with other organisations (such as ECTRA, ENF) and to make proposals for:

a) the Terms of Reference of the Administrator

b) the selection of the Administrator

c) the contract or MoU establishing the Administrative functions

1.4. Execution

The work will be carried out in close co-operation with the CEC, the ECTRA PT on Numbering and the European Numbering Forum. A substantial part of the work will reside with ETSI who will carry out specific work on the technical arrangements for the management of an ETNS under a separate Commission mandate. This work requirement therefore needs to be seen in combination with the relevant ETSI work requirement.

The final report of the study shall be delivered to the CEC by 30 June 1997 and the delivery date may be postponed if the corresponding ETSI work is delayed.

1.5. Deliverables

Two interim reports and one final report shall be delivered.

The first interim report shall be delivered during the course of the work, containing proposals for the rights and obligations of the Administrator and number recipient and proposals to establish an administrative function.

The second interim report shall contain the draft findings and proposals, as they will be submitted to CEPT/ECTRA for approval.

The final report shall contain the findings and proposals, as approved by CEPT/ECTRA and will include any comments individual CEPT/ECTRA members have on implementation in their respective national regimes.

All reports shall be made available in draft form one month before the liaison meeting at which results will be discussed and approval must be given for their release.

The Commission shall receive three copies of the interim reports, while the approved final report shall be made available in 15 bound copies, one unbound copy and one copy on floppy disk in Word for Windows V2.0 format. *G*raphics shall be made available on separate hard copies.

1.6. Manpower

It is expected that this task can be accomplished in 4 man-months at expert level, including possible subcontracting.

1.7. Subcontracting

Subcontracts - totalling 1 man-month - may be given to external experts for the execution of parts of this contract.

2. Subject: Number portability for pan-European services

2.1. Purpose

The work requirement covers the work that the European Telecommunications Office (ETO) will conduct on behalf of ECTRA for the European Commission in the area of numbering of telecommunication services. This Annex defines the terms of reference for a study on number portability for pan-European services. The main objective of the study is to investigate the technologies available to implement number portability for pan-European services and how to route pan-European service calls, to assess the cost of implementation, and to make proposals and guidelines for implementation.

2.2. Justification

In a 1991 ruling, the US FCC ordered portability for freephone services to begin by 1993. Local and long distance telephone companies are now spending hundreds of millions of dollars on the necessary changes and additions to their networks. The new post-portability environment in the US calls for a centralised database and an operational management system. This will enable all long-distance companies to reserve, activate and deactivate freephone numbers.

When considering that over 40% of all long distance trunk calls in the US (to a certain extent comparable with intra-European international calls) are freephone calls, the impact of this measure on competition in the US market is clear. Due to the competitive situation in the US, US players will be in a much better position than European players to compete on the world market when it opens up for global services competition.

A strong and competitive services market in Europe needs to be developed quickly. Service codes for establishing pan-European services are likely to become available over the next few years. In order that a highly competitive market may develop without constraints, it is important that customers are not locked into one particular service provider but are free to take their number with them if they wish to change service providers. In this context, a study must be carried out to investigate number portability between European service providers for pan-European services in general.

2.3. Work requirement

(1) to study the impact of number portability on competition in freephone service provision in the US, to give some background on the situation in the UK and Germany and make some predictions for Europe;

(2) To review the work presently being carried out on number portability inside and outside Europe and the Intelligent Network (IN) implementation of number portability of freephone services in the US;

(3) To define and evaluate technical alternatives for introducing number portability into pan-European services, including IN technology and other available solutions, and to address the possibilities of transferring numbers from national schemes to pan-European schemes;

(4) To study the cost of introducing number portability into pan-European services and to make proposals for cost sharing;

(5) To make proposals for the provision of number portability in pan-European services.

2.4. Execution

The work will be carried out in close co-operation with the CEC, the ECTRA PT on Numbering and the European Numbering Forum. Part of the work, mainly the technical aspects, will be carried out by ETSI under a separate Commission work requirement. This work requirement therefore has to be seen in conjunction with the ETSI work requirement.

The final report of the study shall be delivered to the CEC by 30 June 1997 and the delivery date may be postponed if the corresponding ETSI work is delayed.

2.5. Deliverables

Two interim reports and one final report shall be delivered.

The first interim report shall be delivered during the course of the work, containing an assessment of the impact of number portability on competition in pan-European service provision and a review of the work presently being carried out on number portability inside and outside Europe.

The second interim report shall contain the draft findings and proposals as they will be submitted to CEPT/ECTRA for approval.

The final report shall contain the findings and proposals, as approved by CEPT/ECTRA and will include any comments individual CEPT/ECTRA members have on implementation in their respective national regimes.

All reports shall be made available in draft form one month before a liaison meeting at which results will be discussed and approval must be given for their release.

The Commission shall receive three copies of the interim reports, while the approved final report shall be made available in 15 bound copies, one unbound copy and one copy on floppy disk in Word for Windows V2.0 format. *G*raphics shall be made available on separate hard copies.

2.6. Manpower

It is expected that this task can be accomplished in 6 man-months at expert level, including subcontracting.

2.7. Subcontracting

Subcontracts - totalling 2 man-months - may be given to external experts for the execution of parts of this contract.

3. Subject: Routeing aspects of pan-European services calls

3.1. Purpose

The work requirement covers the work that the European Telecommunications Office (ETO) will conduct on behalf of ECTRA for the European Commission in the area of numbering of telecommunication services. This Annex defines the terms of reference for a study on routeing aspects of pan-European service calls. The main objective of the study is to define aspects of importance and propose solutions for the efficient handling of pan-European service calls under a common European numbering scheme.

3.2. Justification

The opening of a European numbering space will pose all sorts of questions with regard to the routeing of pan-European service calls. Origin and destination are no longer necessarily contained within one country or the country of destination is no longer uniquely defined.

Until an intelligent routeing system is made available (this would be the ultimate IN solution for portability of pan-European service calls), the destination of a service call using a pan-European service number will in some way have to be extracted by a rudimentary form of number analysis. Call forwarding techniques do not offer a solution because they could theoretically result in "cascade routeing" through many countries.

Routeing based on number analysis imposes severe restrictions on number plan structure, to the detriment of capacity and flexible routeing of pan-European service calls. In this context, it is necessary to conduct a study to define aspects of importance and propose solutions for an efficient and flexible routeing of pan-European service calls under a common European numbering scheme.

3.3. Work requirement

(1) to define alternative strategies for the handling of service calls, originating from anywhere inside or outside Europe and numbered through a European numbering scheme;

(2) Based on these alternatives, to study routeing aspects of an ETNS in cases where such an ETNS is created from global resources (such as +388X) or by national resources (such as +310, +440), including the possible migration of national numbers to pan-European numbers and of pan-European numbers to global numbers;

(3) to propose short and medium term solutions for the efficient handling of service calls.

3.4. Execution

Work will be carried out in close co-operation with the CEC, the ECTRA PT on Numbering and the European Numbering Forum. Part of the work, mainly the technical aspect, will be carried out by ETSI under a separate Commission work requirement. This work requirement therefore has to be seen in conjunction with the ETSI work requirement.

The final report of the study shall be delivered to the CEC by 30 June 1997 and the delivery date may be postponed if the corresponding ETSI work is delayed.

3.5. Deliverables

Two interim reports and one final report shall be delivered.

The first interim report shall be delivered during the course of the work by December 1996.

The second interim report shall contain the draft findings and proposals as they will be submitted to CEPT/ECTRA for approval.

The final report shall contain the findings and proposals, as approved by CEPT/ECTRA and will include any comments individual CEPT/ECTRA members have on implementation in their respective national regimes.

All reports shall be made available in draft form one month before a liaison meeting at which results will be discussed and approval must be given for their release.

The Commission shall receive three copies of the interim reports, while the approved final report shall be made available in 15 bound copies, one unbound copy and one copy on floppy disk in Word for Windows V2.0 format. *G*raphics shall be made available on separate hard copies.

3.6. Manpower

It is expected that this task can be accomplished in 4 man-months at expert level including possible subcontracting.

3.7. Subcontracting

Subcontracts - totalling 1 man-month - may be given to external experts for the execution of parts of this contract.

Annex B Bibliography

Second Interim Report on "The Numbering Requirements of Corporate Telecommunication Networks (CNs) and their impact on Public Network Numbering", ETO, 17 April 1998.

ITU-T Recommendation E.164 "The International Public Telecommunications Numbering Plan", 1997.

ITU-T Recommendation E.169 "Application of Recommendation E.164 numbering plan for universal international freephone numbers for international freephone service", revised draft, March 1998.

ETSI Standard - EN 301 160 "Routing of calls to ETNS services"

ETSI Standard - EN 301 161 "Management of the European Telephony Numbering Space"

ETSI Report - ETR NA-021409 "Number portability for pan-European services", 1997

Annex C Definitions

Activation: the putting into service of European Numbers (ENs) by network operators and service providers.

Administration of the ETNS: establishment of the ETNS conventions (and changes to them).

Assignment: the granting of the rights of use of European Numbers (ENs) to service providers or users. Assignment is preceded by reservation.

Assisted Network: a network which routes all the calls to European Numbers towards a Serving Network it has agreement with in order to complete the call.

Dormant period: a certain period of time during which a European Number remains idle as soon as it is withdrawn after a previous assignment.

ESI designations: the ESIs, the specific structure of the associated ENs and the specific conditions attached to each of the ESIs.

ETNS conventions: set of rules needed for management of the ETNS. They are composed of three elements: the ETNS definition, the ESI designations and the rules for management of the ETNS.

ETNS country: a CEPT country participating in the ETNS.

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

ETNS Service: a service using ETNS resources.

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

ETNS subscriber: an entity that has subscribed to an ETNS

ETNS Translation database: a database which, in the call process, translates the European number into a Routeing number.

European Number: a number from the ETNS.

Management of the ETNS: the whole of the Administration, Registration and Advisory function for the ETNS.

Originating network: a network, either assisted or serving, to which the calling party is connected.

Registration: the assignment of the ENs from designated ESIs, surveillance of the usage conditions and withdrawal of assigned ENs

Reservation: the reservation of the rights of use of European Numbers (ENs) for individual service providers or users. Reservation precedes possible assignment.

Routeing Number: an E.164 number used to route to the Service exchange. It can also identify the called party, or the ETNS Service provider, or the originating network for routeing purposes.

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 get a N number related to the European Number, and then forward the call.

Serving Network: a network with one or several Serving exchange(s). A Serving Network, contrary to an Assisted Network, can analyse the whole European number through database dip.

Annex D List of abbreviations

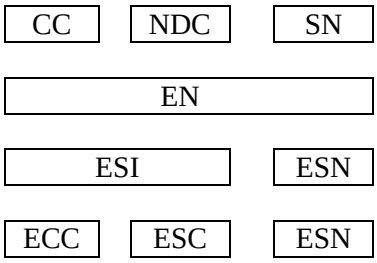
CC	Country Code
CEPT	European Conference of Postal and Telecommunications Administrations
CERP	European Committee on Postal Regulation
CEU	Commission of the European Union
CLI	Calling Line Identification
CN	Corporate Network
DI	Domain Identity
DSN	Domain Specific Number
DTMF	Dual Tone Multi Frequency
ECC	European Country Code
ECMA	Standardizing Information and Communication Systems
ECTEL	The European Telecommunications and Professional Electronic Industry
ECTRA	European Committee for Telecommunications Regulatory Affairs
ECTRA PTN	ECTRA Project Team on Numbering
ECTUA	European Council of Telecommunications Users Association
EIG	European Interest Group
EIIA	European Information Industry Association
EN	European Number
ENF	European Numbering Forum
ERC	European Radiocommunications Committee
ESC	European Service Code
ESI	European Service Identity
ESN	European Subscriber Number
ETNO	European Public Telecommunications Network Operators' Association
ETNS	European Telephony Numbering Space
ETO	European Telecommunications Office
ETS	European Telecommunication Standard
ETSI	European Telecommunications Standards Institute
ETSI/ENTF	European Numbering Task Force of ETSI
ETSI STC NA2	ETSI Sub Technical Committee Network Aspects 2
EU	European Union
GSM	Global System for Mobile Communications
IN	Intelligent Network
INTUG	International Telecommunications Users Group
ISDN	Integrated Services Digital Network
ITU	International Telecommunication Union
ITU-T	Telecommunication Standardization Sector of ITU
MoU	Memorandum of Understanding
NANP	North American Numbering Plan
NDC	National Destination Code
NMT	Nordic MobileTelephone
NRA	National Regulatory Authority
N(S)N	National (Significant) Number
R	Registrar

RN	Routing Number
SAC	Service Access Code
SgN	Serving Network
SN	Subscriber Number
SP	Service Provider
SPC	Stored Program Control
TN	Terminating Number
UIFN	Universal International Freephone Number
VPN	Virtual Private Network

Annex E The structure of European Numbers (ENs)

The following text is based on the ETSI technical report of the European Numbering Task Force: Management of the European Telephony Numbering Space.

The ETNS uses E.164 numbers which are structured as shown in Figure 1.



CC =	Country Code	SN =	Subscriber Number
NDC =	National Destination Code	EN =	European Number
ESI =	European Service Identity	ESN =	European Subscriber Number
ECC =	European Country Code	ESC =	European Service Code

Figure 1 Structure of European Numbers

The numbers are dialled in the international format as + EN (where '+' is an international prefix before the international number[14]). An EN is always dialled in the international format to indicate the European branding of the service. Other dialling arrangements must not apply for ENs, such as national or local dialling.

The ETNS shall be designed to have a minimum of 100 European services and a maximum of 10 million numbers per service. This requires at least 2 digits for the ESC for most services. With a 3-digit ECC, being assigned by ITU-T to the ETNS, the ESI length is then at least 5 digits. Only in exceptional cases could the ESC consist of 1 digit and the associated ESI of 4 digits.

The ESN need not be longer than 7 digits. For some services the ESN is not required at all, such as access to information services or services that require 2-stage dialling.

The European Service Identity (ESI)

An ESI is assigned to an ETNS service or a family of services in some specific cases. A family of services could be a range of closely related services that are grouped behind one ESI, such as shared cost services with varying tariff rates. The ESI indicates a tariff range to the calling party. This charge can vary among the Originating networks, such as due to the different currencies used.

[14] The use of * and # which may provide an alternative shorter dialling sequence is marked for further study in ITU-T

The depth of analysis is restricted to 7 digits in accordance with ITU-T Recommendation E.162. Therefore, in order to analyse a European service directly, the ESI cannot be more than 7 digits long.

With a three-digit ECC, the ESI may vary between 4 and 7 digits, depending on capacity and service needs.

The European Subscriber Number (ESN)

The structure and length of the ESN are service dependant. Normally, the number length should be fixed for any given service, and determined by the capacity required. For services which aim at reaching the goal of 10 million numbers, the ESN must be at least 7 digits long. With a requirement for ESIs of at least 5 digits for most services, the minimum length of European numbers will be 12 digits. The total length of the European number shall not exceed 15 digits.

The ESN can be either structured or unstructured. The ESN is unstructured when no information about the subscriber can be derived from the first digits of the field. See Figure 2.

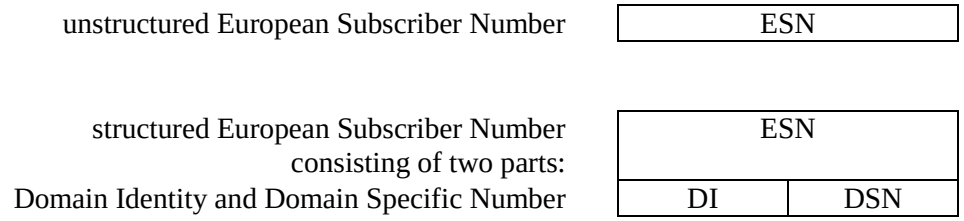


Figure 2 Structured and unstructured European subscriber numbers

In a structured ESN, information about the subscriber can be derived from the first digits of the ESN. Structured numbers are always assigned to the subscriber in blocks. A typical example of structured numbers are corporate network numbers, where the ESN splits into a corporate network identity and a corporate network specific number. By analogy with this example, the terms Domain Identity and Domain Specific Number are used to designate these two fields.

One major difference between unstructured and structured numbers is that in the first case the whole ESN is assigned by the Registrar, whereas in the second case the Registrar only assigns the first field (Domain Identity) of the ESN, the second one (Domain Specific Identity) is assigned by the subscriber itself.

The demands on European Numbers for evolution to global numbers

When at a later stage global numbering schemes become available for international services which are using an ETNS, the global schemes may be preferred by subscribers to these services rather than continuing with the ETNS. For these cases, migration from an ETNS to a global scheme should be considered.

By evolution is meant here the possibility for a subscriber to a service using a particular numbering scheme to subscribe to a similar service using another numbering scheme, while retaining at least part of his first number. The subscriber has to change his number, but wants the new number to look like the old one as much as possible, by embedding all or part of the old number into the new one (partial number portability across services).

Two migration paths are possible from an ETNS to a global scheme and are detailed in the following Figures 3 and 4.

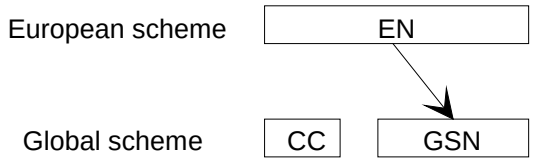


Figure 3 Embedding the whole EN into the Global Subscriber Number (GSN)

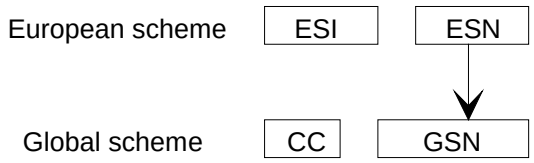


Figure 4 Embedding only the ESN into the Global Subscriber Number (GSN)

In Figure 3, the service indicated in the ESI is, after migration, indicated in the CC of the global scheme. The whole European number, including the ESI, is then embedded in the GSN. This migration path is being recommended by ITU-T when migrating from a national scheme to a global scheme for UPT (scenario 3b). From a purely numbering point of view, it has the drawback of increasing the number length by 3 digits.

In Figure 4, only the ESN is retained and embedded in the GSN. The subscriber entirely changes his ESI to the global CC. The length of the header is reduced from typically 5 digits to 3 digits. But the GSN will probably be composed of the ESN plus at least an extra digit in front, in order to avoid too many conflicts between European subscribers and other subscribers with the same old subscriber number. (An extra digit enables the two parties to have the remaining part of the GSN in common). As a total, the whole number length will decrease rather than increase.

Such an evolution is allowed by ITU-T for the migration of national freephone numbers to Universal International Freephone Numbers (UIFNs).

It can be concluded that the last-mentioned migration path does not impose restrictions on the number length of ETNS numbers and allows shorter global numbers. Only this migration path, consisting of the embedding of the subscriber number only, should therefore be considered for ETNS services.

Annex F Freephone in the North American Numbering Plan

The only well established example in the world of a non-geographic service for which number portability between service providers has been implemented is freephone in the North American Numbering Plan (NANP). The NANP Industry Guidelines for 800 Number Administration, Issue 3.1, June 1, 1994 is summarized below.

On May 1, 1993, the process of management and assignment of 800 numbers was transferred to the national Service Management System / 800 (SMS/800) database. This system enables an 800 Service subscriber to retain its existing 800 number when changing 800 Service provider.
The basic principles are:

- 800 Service numbers are fundamentally a resource of the North American Numbering Plan.
- 800 numbers are not to be treated as commodities which can be bought or sold.
- 800 Service numbers are assigned by qualified 800 Service providers to its subscribers from a common pool of available numbers.
- Reservation, assignment or activation can only be made by the 800 Service providers.
- At any given time, each service provider can have up to 1000 numbers reserved or 15% of its total quantity of active 800 Service numbers, whichever is greater.

The SMS/800 database combines different purposes of numbering management: it serves the assignment of numbers as well as the routeing and service provision. Database management is under the responsibility of the airplane manufacturer Lockheed which could be considered as a neutral party towards the 800 Service providers.
The assignment of 800 Service numbers is left to the 800 Service providers which can access the database to assign numbers to their own subscribers. No central authority is involved in the assignment process. The only means to control the assignment process centrally is by having audits.
Each call to an 800 Service number is first routed to the SMS/800 database. The database associates the number with the 800 Service provider that has assigned the number and routes the call to the service provider database. The service provider database maps the number on a destination address and the call is routed to the subscriber concerned.

Annex G Signatories of ITU-T application and ETO MoU

Country	23 Signatories of ITU-T application	24 Signatories of ETO MoU
Austria		x
Belgium	x	x
Bulgaria	x	x
Czech Republic	x	x
Croatia	x	x
Cyprus		x
Denmark	x	x
Finland	x	x
France	x	x
Germany	x	x
Greece	x	x
Hungary	x	x
Ireland	x	x
Italy	x	x
Liechtenstein	x	
Luxembourg		x
The Netherlands	x	x
Norway	x	x
Poland	x	x
Portugal	x	x
Slovenia Republic	x	
Slovak Republic	x	x
Spain	x	x
Sweden	x	x
Switzerland	x	x
UK	x	x