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Contents

Intellectual Property Rights.....	5
Foreword	5
1 Scope.....	6
2 References.....	6
3 Definitions and abbreviations	7
3.1 Definitions	7
3.2 Abbreviations.....	7
4 Reference model for the ETNS.....	8
4.1 Requirements	8
4.2 Key features of the model	8
4.3 Call-related part	9
4.4 Non call-related part	10
5 The European Number (EN).....	10
5.1 Structure of European Numbers.....	10
5.2 European Service Identity (ESI)	11
5.2.1 NDC-scheme	11
5.2.2 CC-scheme	11
5.3 European Subscriber Number (ESN).....	12
6 Evolution issues	12
6.1 Evolution from a European scheme to a global scheme.....	12
6.2 Evolution from national schemes to the European scheme	13
7 Management of the ETNS.....	13
7.1 Organizations involved in the management of ETNS	13
7.2 Administration of the ESI	14
7.2.1 Establishment of ESIs for pan-European Services	14
7.2.2 Criteria for the establishment of an ESI	15
7.2.3 Criteria for the choice of ESI values	16
7.2.4 Setting up a reserved ESI for an accepted pan-European service.....	16
7.2.5 Recovery of ESI	16
7.3 Registration of the ESNs.....	16
7.3.1 Registrar database	16
7.3.2 Management of structured ESNs.....	17
7.3.3 Management of unstructured ESNs	17
7.3.3.1 Number assignment principles.....	17
7.3.3.2 Registrar procedures	17
7.3.3.3 Applicant procedures and forms	18
7.3.3.4 Duplicate request procedures.....	19
7.3.3.5 Change of Service Provider procedures and forms.....	19
7.3.3.6 Special rules for the service start-up.....	19
7.3.4 Management of the ETNS routing/portability database.....	19
8 Regulatory issues	20
8.1 Memorandum of Understanding (MoU)	20
8.2 Service Providers	20
8.3 Pan-European calls	20

Annex A:	Information to file in a proposal	21
A.1	Description of service	21
A.2	Charging information	21
A.3	Market potential	22
A.4	Timescales.....	22
A.5	Other considerations	22
Annex B:	Concept for the assignment of European Numbers to Corporate telecommunication Networks	23
B.1	Definitions and abbreviations	23
B.1.1	Definitions	23
B.1.2	Abbreviations.....	23
B.2	Service aspects	23
B.2.1	Service transparency	23
B.2.2	Charging	24
B.2.3	CN user identification	24
B.3	Structure of ESNs with regard to CN access	24
B.3.1	The identity of the European application for CN Access identity	24
B.3.2	Structure of Subscriber Number (SN).....	24
B.4	Subscriber Number volume.....	25
B.5	Procedures for the assignment of a European CN_ID	26
B.6	Criteria for the assignment of a European CN_ID.....	26
B.7	Criteria for the choice of European CN_IDs	27
Annex C:	Forms	28
Annex D:	Setting up the framework for the ETNS	30
D.1	Phase 1: Trial phase	30
D.2	Phase 2: Opening phase	30
D.3	Phase 3: On-going phase.....	30
	History	31

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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Network Aspects (NA).

1 Scope

European Telecommunications Office (ETO) will, on behalf of European Committee for Telecommunications Regulatory Affairs (ECTRA) for the European Union, produce proposals for the management of the ETNS, and develop ETNS numbering conventions to be agreed by ECTRA. ETSI, under a separate mandate from the European Union, has been requested to produce a comprehensive proposal for the technical management of the ETNS which includes number structure and numbering space management.

The studies made in ETSI and the standards produced are a prerequisite to the commercial agreements between the parties willing to set up the ETNS.

The present document presents the results of the ETSI studies on the topic. This document will be reported to ETO in order to advance the issues (both technical and non-technical) related to the management of the ETNS. It will be converted into an European Telecommunication Standard (ETS), covering aspects that require formal standardization, and removing non-technical aspects that require purely regulatory decisions.

The present document will cover number structure, possible evolution of European Numbers towards a global scheme and between European schemes, and principles and criteria for the assignment and management of the numbering resource, its creation and utilization.

The two possible structures for European Numbers (i.e. using a dedicated Country Code or using spare national resources) are investigated, although ECTRA decided to base the ETNS on the first solution (November 1996 decision).

The present document focuses on the technical and administrative aspects of the management of the ETNS, but will also raise regulatory and political flags whenever a critical issue is encountered. Regulatory issues are documented in clause 8 of the document.

In its main part the present document discusses the management of the ENTNS for European Services. The particularities applicable to the European application of accessing corporate networks are given in annex B.

2 References

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case the latest version applies.

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

- [1] TR 101 073: "Number portability for pan-European services".
- [2] TR 101 079: "Routing of calls using a pan-European Numbering scheme".
- [3] ITU-T Recommendation E.162: "Capability for seven digits analysis of international E.164 numbers at time T".
- [4] ITU-T Recommendation E.164: "The international public telecommunication numbering plan".
- [5] ITU-T Recommendation E.169: "Application of Recommendation E.164 Numbering plan for universal international freephone numbers for international freephone service".
- [6] ETS 300 170: "Integrated Services Digital Network (ISDN); Public Switched Telephone Network (PSTN); Universal Access Number (UAN) service; Service description".

3 Definitions and abbreviations

3.1 Definitions

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

assisted network: A network which routes all the calls to European Numbers towards a serving network it has agreement with.

called party: A party that terminates a call involving a European Number. The called party may be the subscriber to the European Number itself, or a terminating equipment of the service network (e.g. a recorded announcement equipment).

calling party: A party that dials a European Number.

E.164 number: Addressing number as specified in ITU-T Recommendation E.164 [4].

ETNS administrative database: The part of the ETNS registrar database where administrative data, for each European Number, is registered.

ETNS registrar database: The database where all data, both administrative and operational, for each European Number are registered.

ETNS routing/ portability database: The part of the ETNS registrar database where all operational data necessary for routing and portability (e.g. routing number(s), Service Provider identity), for each European Number are registered.

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

ETNS: Part of the E.164 numbering scheme used to number pan-European Services.

European country: Any country member of the CEPT.

European Number: A number out of the ETNS.

originating network: A network, either assisted or serving, to which the Calling Party is connected.

routing number: An E.164 number, specified by the service network, which can be used to identify and reach the service exchange. It can also identify the called party, the Service Provider, or the originating network.

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

service network: A network that operates the service exchange(s).

Service Provider: An entity that provides one or more pan-European service(s) to its subscribers on a contractual basis.

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

serving network: A national or multi-national network, with one or several serving exchanges.

subscriber: An entity that requests a European Number from a Service Provider in order to offer access from a Calling Party to a pan-European service.

3.2 Abbreviations

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

CC	Country Code
CEPT	Conférence Européenne des Postes et Télécommunications
CN	Corporate Networks

CP	Calling Party
CSSC	Country Specific Service Code
CTM	Cordless Terminal Mobility
DSN	Domain Specific Number
ECC	European Country Code
ECTRA	European Committee for Telecommunications Regulatory Affairs
EN	European Number
ENF	European Numbering Forum
ENTF	European Numbering Task Force
ES	European Services
ESC	European Service Code
ESI	European Service Identity
ESN	European Subscriber Number
ETNS	European Telephony Numbering Space
ETO	European Telecommunications Office
GSN	Global Subscriber Number
ISDN	Integrated Services Digital Network
ITU-T	ITU-Telecommunication Standardization Sector
MoU	Memorandum of Understanding
NDC	National Destination Code
NRA	National Regulatory Authority
PSTN	Public Switched Telephone Network
SN	Subscriber Number
SP	Service Provider
UAN	Universal Access Number
UPT	Universal Personal Telecommunications

4 Reference model for the ETNS

This clause provides a conceptual description of the implementation of the ETNS. Its aim is to explain the relationship between the present document and TR 101 073 [1] and TR 101 079 [2].

4.1 Requirements

Provision of services in the ETNS is an open and competitive area, which means that any subscriber can select a specific Service Provider from one among all the Service Providers within Europe offering the service identified by the European Service Identity (ESI). A Service Provider should treat all requests for subscription from European customers in a non-discriminatory manner.

In order to understand and develop issues pertaining to the management of an ETNS, it is necessary to understand what a pan-European call is. A pan-European call can originate outside Europe, terminate outside Europe, but the intelligence of the call (the serving exchange, the ETNS translation database, the service exchange and the Service Provider) shall be located inside Europe.

4.2 Key features of the model

Two key features characterize the model.

The model has to enable the connection of any new authorized Service Provider and/or service network. As a consequence, there shall be a clear distinction between the serving network and the service network. The serving network is responsible for routing a call towards the service network. The service network is responsible for the service itself. This distinction makes necessary the use of an intermediary number (routing number) for the serving network to address the service network.

The second feature is that the European Numbers are portable between Service Providers. This implies they are managed by an independent centralized authority, the registrar. This authority keeps a database for all the European Numbers and distributes the routing information to the serving networks.

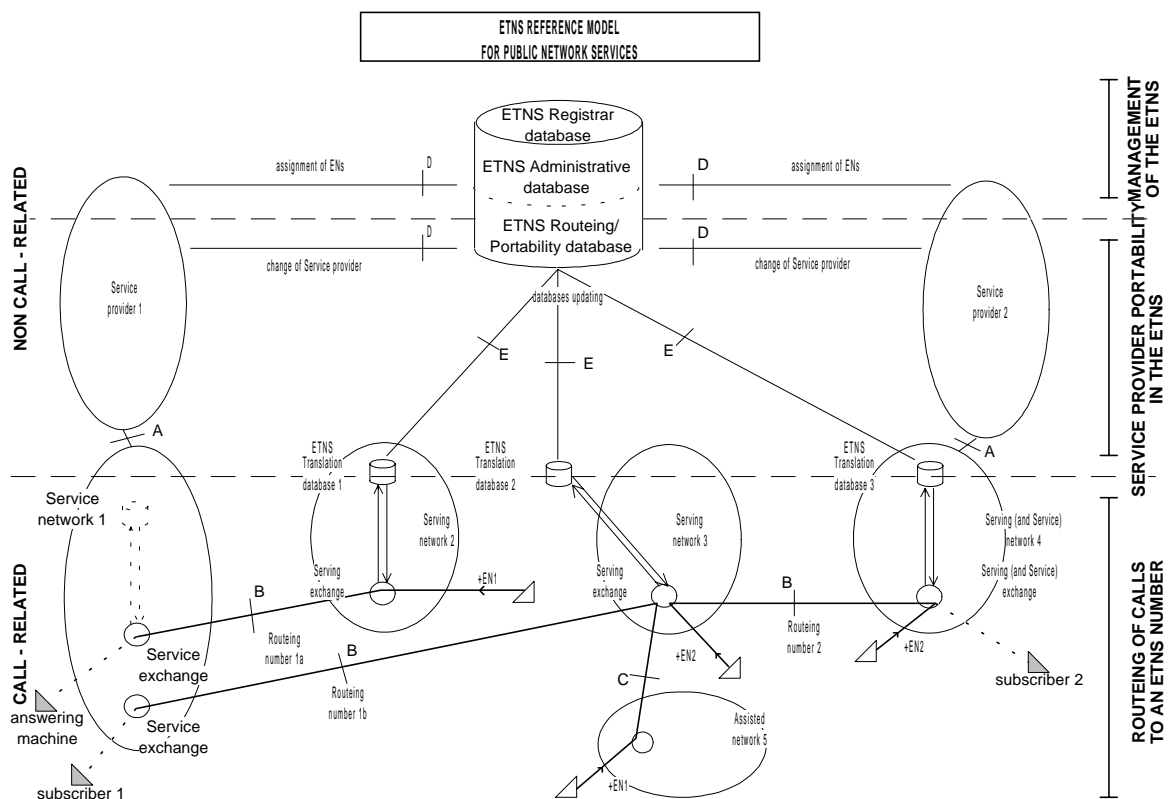
NOTE: Regarding the updating of the ETNS translation databases, the reference model has been developed for a centralized approach (interface E); other variants, e.g. decentralized (no interface E), will also be studied during the standardization process.

4.3 Call-related part

This subclause describes the principles for routing a call from the Calling Party (CP) to the called party. This is studied in detail in TR 101 079 [2].

The Calling Party dials the European Number in its international format.

Based on the ESI (see clause 5), the call is routed to the serving exchange in the serving network. Potentially, this exchange is not in the Calling Party's network, but is located in an assisting network (e.g. in the figure below assisted network 5 does not wish -or is unable- to handle calls to European Numbers, and routes all these calls to serving network 3). The Calling Party's network is then called an assisted network, interconnected to the serving network through interface C.



The serving exchange, analysing the ESI, triggers the ETNS translation database to translate the incoming European Number into an outgoing routing number. The ETNS translation database can be inside or outside the serving network. The routing number need not to be the same for each serving network (e.g. networks 2 and 3 route the calls to EN1 using routing numbers 1a and 1b respectively).

This ends the first leg of the call which consists of routing the call to the service exchange. This leg, including interface B between the serving exchange and the service exchange, has to be standardized.

A second translation can take place at the service exchange to redirect the call to the subscriber, or the call can be terminated on a recorded announcement equipment.

Note that one network operator can have several of the above functions:

- The service network and the Service Provider are the same, so that interface A is internal.

- The serving network and the service network are the same (e.g. network 4). In which case, the same switch can be used as a serving and service exchange. Interface B is internal for a call originating from this network, and external elsewhere; the routing number being necessary only in the latter case.
- The serving network, the service network and the Service Provider are the same, so that both interfaces A and B are internal.

4.4 Non call-related part

This subclause describes the organization of the databases that contain the association of routing numbers to European Numbers, in the centralized approach. The main one is the ETNS registrar database; the others are the serving networks' partial copies of it, i.e. the ETNS translation databases.

The ETNS registrar database can be logically split into two databases.

The first one is the ETNS administrative database, which interacts with the Service Providers through interface D, for EN request and attribution, and for change of Service Provider. The interaction between the registrar and the Service Provider could be a human interface, e.g. using phone and fax, but should be an automatic interface, e.g. using the Internet.

The second one is the ETNS routing/portability database, which interacts with the ETNS translation databases through interface E in updating procedures, occurring when:

- A new EN has been assigned together with one or more routing numbers; only the serving networks where the service is opened should be updated with the right routing information.
- A change of Service Provider has occurred, entailing new routing numbers.
- An ETNS translation database failure has occurred, erasing all or part of the data.
- The Service Provider has decided to change any parameter present in the ETNS translation database.

In any case, the registrar should be informed first of the change. The registrar having access to commercial data, has to be a strictly neutral body.

5 The European Number (EN)

5.1 Structure of European Numbers

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

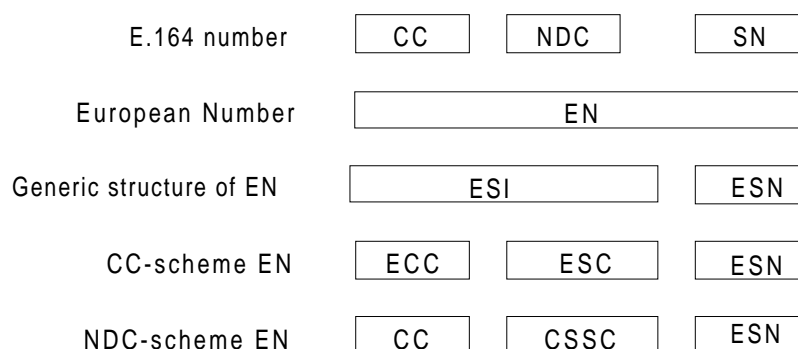


Figure 1: Structure of European Numbers

It is dialled in the international format as + EN (where '+' is an international prefix before the international number, see note). An EN is always dialled in the international format to indicate the European branding of the service, irrespective

of whether the Country Code (CC)- or National Destination Code (NDC)-scheme is used. Other dialling arrangements shall not apply for ENs, e.g. national or local dialling.

NOTE: The use of * and # which may provide an alternative shorter dialling sequence is planned for further study in ITU-T.

For some services the European Subscriber Number (ESN) is not required e.g. access to information services or services that require 2-stage dialling.

The total length of the European Number shall not exceed 15 digits.

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

The structure of the EN should not preclude evolution towards a global numbering scheme on a per service basis when this is a requirement (see clause 6).

The structure of the EN should not preclude portability between Service Providers.

5.2 European Service Identity (ESI)

An ESI is assigned to a pan-European service or a family of services in some specific cases. This occurs when a range of closely related services are grouped behind one ESI, e.g. shared cost services with varying tariff rates.

The ESI is the only part of the European Number that contains information on the tariff of a call to that number. The ESI indicates a maximum charge to the calling party. This charge can vary among the originating networks.

The depth of analysis in the international network is restricted to 7 digits in accordance with ITU-T Recommendation E.162 [3]. Therefore, for the international network to be able to recognize the pan-European service directly, the ESI cannot be more than 7 digits long. The ESI length may vary between 4 and 7 digits, depending on capacity and service needs. Allocation of 4-digit ESI (1/10th of the scheme) should be carefully considered due to the scarcity of the resource.

5.2.1 NDC-scheme

An ESI begins with the Country Code of a European country, followed by a spare National Destination Code (NDC) in that country. An example of spare NDC is 00, in the countries where 00 is reserved as the international call prefix. Use of 00 is recommended as it would allow a clear distinction between ETNS numbers and standard national numbers, from the user's point of view.

The Country Specific Service Code (CSSC) is comprised of the NDC and any additional digit needed to extend the capacity of the ETNS in term of number of services.

The length of the ESI can vary. Minimum length is 4 digits (two-digit CC and two-digit CSSC). Maximum length is 7 digits.

Different services can have ESIs beginning with different Country Codes. The country designated by the Country Code does not necessarily provide the physical infrastructure required for the service. The code merely provides the access mechanism.

It will be possible to reach the goal of 100 ESIs if every country reserves a two-digit NDC.

5.2.2 CC-scheme

An ESI begins with the 3-digit Country Code allocated by ITU-T to ETNS.

The length of the European Service Code (ESC) can vary between 1 and 4 digits.

There is no problem to find a hundred ESCs.

5.3 European Subscriber Number (ESN)

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

Normally, the number's length should be fixed for any given service, and determined by the capacity required (e.g. for services which aim at reaching the goal of 10 millions numbers, the ESN shall be at least 7 digits long). When combined with a 5 digit ESI, this gives a minimum of 12 digits ETNS number.

The ESN can be either structured or unstructured (see figure 2).

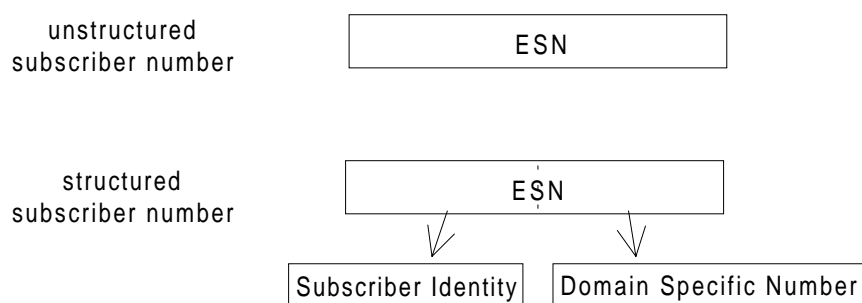


Figure 2: Structured and unstructured ESNs

The ESN is unstructured when no information about the subscriber can be derived from part of the field. One subscriber is allocated only one number for each of his subscriptions. An analogy can be found with universal international freephone numbers, see ITU-T Recommendation E.169 [5].

From a structured number one can derive information about the subscriber with the first digits of the ESN. One subscriber is allocated a block of numbers for each of his subscriptions, and common first digits of all these numbers identify the subscriber. Typical example of structured numbers are corporate network numbers, where the subscriber number splits into a corporate network identity and a partial number. For structured European Numbers, the ESN splits into the subscriber identity and the Domain Specific Number (DSN).

One major difference between unstructured and structured numbers is that in the first case the whole ESN is managed by the registrar, whereas in the second case the registrar only manages the first field of the ESN, the second one involving another private authority, which is the subscriber itself (see also subclause 7.3).

6 Evolution issues

By evolution is meant here the possibility for a subscriber to a service using a first numbering scheme to subscribe to a similar service using a second numbering scheme, while retaining part of his first number. The subscriber has to change his service number (this is not portability), 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.

Evolution has to be envisaged from a European Number to a global service number using an ITU-T defined scheme. It could also happen from national numbers to a European scheme.

6.1 Evolution from a European scheme to a global scheme

Two evolution paths are possible and are detailed in figures 3 and 4, whatever the European scheme.

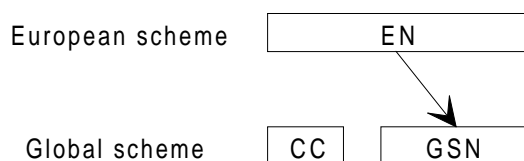


Figure 3: Embedding the whole EN into the Global Subscriber Number (GSN)

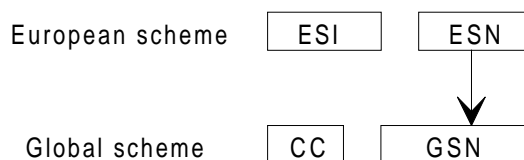


Figure 4: Embedding only the ESN into the GSN

In figure 3, the service indicated in the ESI is now indicated in the Country Code (CC) of the global scheme. The whole European Number, including the ESI, is then embedded in the GSN. The ESI is therefore redundant with the CC.

This evolution path has already been recommended for UPT (scenario 3b). From a purely numbering point of view, it has the drawbacks that the number length is increased 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 4 or 7 digits to 3 digits. But the length of the subscriber number will probably increase by 1 digit or more to avoid too many conflicts between European subscribers willing to retain their number and new subscribers applying for the same number (the extra digit enables the two parties to have the other digits in common). As a total, the whole number length will not increase and is likely to decrease.

In conclusion, we can state that the second evolution path should be preferred for an evolution from a European to a global scheme.

Such an evolution has already been envisaged for the migration of national freephone numbers to universal international freephone numbers, ITU-T Recommendation E.169 [5]. Due to the precedence set by universal international freephone service, it will always appear in ITU-T as a legitimate evolution path. Nevertheless, it will be necessary to deal there with the details of the embedding and the conflict resolution.

6.2 Evolution from national schemes to the European scheme

Similar conclusions can be drawn as above concerning evolution from national schemes to the ETNS: the second evolution path is the only valid one. If evolution is authorized or required for any given ESI, the registrar (see clause 7) will have to set up specific rules for embedding a national subscriber number into the ESN and solve conflicts.

7 Management of the ETNS

In the following the description of the management is made from a functional point of view. Possible allocation of responsibilities is considered.

7.1 Organizations involved in the management of ETNS

The ETNS is managed at two levels. The first deals with the ESIs and how they are attributed to pan-European Services. The second is on a per-service basis and describes how is managed the block of subscriber numbers behind each ESI. The following functions have therefore to be performed:

- The **Administration** function, carried out by the administrator, has the responsibility for the high level management of the ETNS. The administrator decides which ESI is assigned to which pan-European service.

ESI resource should be carefully managed in order to prevent exhaustion. Similarly, ESN management rules for an assigned ESI should be carefully set up by the administrator in order to prevent exhaustion; particular attention should be paid to the length of the ESN field.

It is suggested that the administrator be ECTRA.

- The **Registration** function, carried out by the registrar, has the responsibility for the management of the ESNs behind each ESI. For some pan-European Services ESNs are not used and therefore the registration function is empty. For some other pan-European Services ESNs are structured, in which case the registrar has the responsibility for managing only the Subscriber identity (see subclauses 6.3 and 8.3.2).

It is suggested that the registrar be under the direct control of ETO.

- The **Advisory** function, carried out by an advisory body, has the responsibility to advise the administrator and the registrar in areas where evaluation is needed.

It is suggested that the European Numbering Task Force (ENTF) be the advisory body, as it represents industry-wide views.

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

- The **Service Provider** sells the pan-European service to the subscriber, and requests ENs on behalf of the subscriber to the registrar, according to the process detailed in subclause 7.3.
- The **subscriber** who needs an EN and asks for it from his Service Provider. The subscriber has no direct connection with the registrar. He is always represented by his Service Provider.

7.2 Administration of the ESI

7.2.1 Establishment of ESIs for pan-European Services

- Any party can propose the establishment of a pan-European service to the administrator.

The proposal should comply with the format explained in annex A.

- The administrator forwards the proposal to the advisory body for consideration and comment, both on technical and non technical aspects.

The technical evaluation is a critical step in the decision process, which aims to assess the feasibility of the service including its impacts on the European networks and its interaction with other services. Technical aspects include available technologies, standards to be developed, network management impediments, analysis of overloading risk, and so forth. A list of the technical aspects to be documented in the proposal is given in annex A.

Non technical aspects may include regulatory evaluation by ECTRA, user-friendliness evaluation, ethic issues, political issues, etc.

- The advisory body advise the administrator of any constraints.
- The administrator makes the final decision to allocate or not to allocate an ESI according to the proposal, and defines the length of the EN.
- Decision is notified to the proposing party by the administrator.

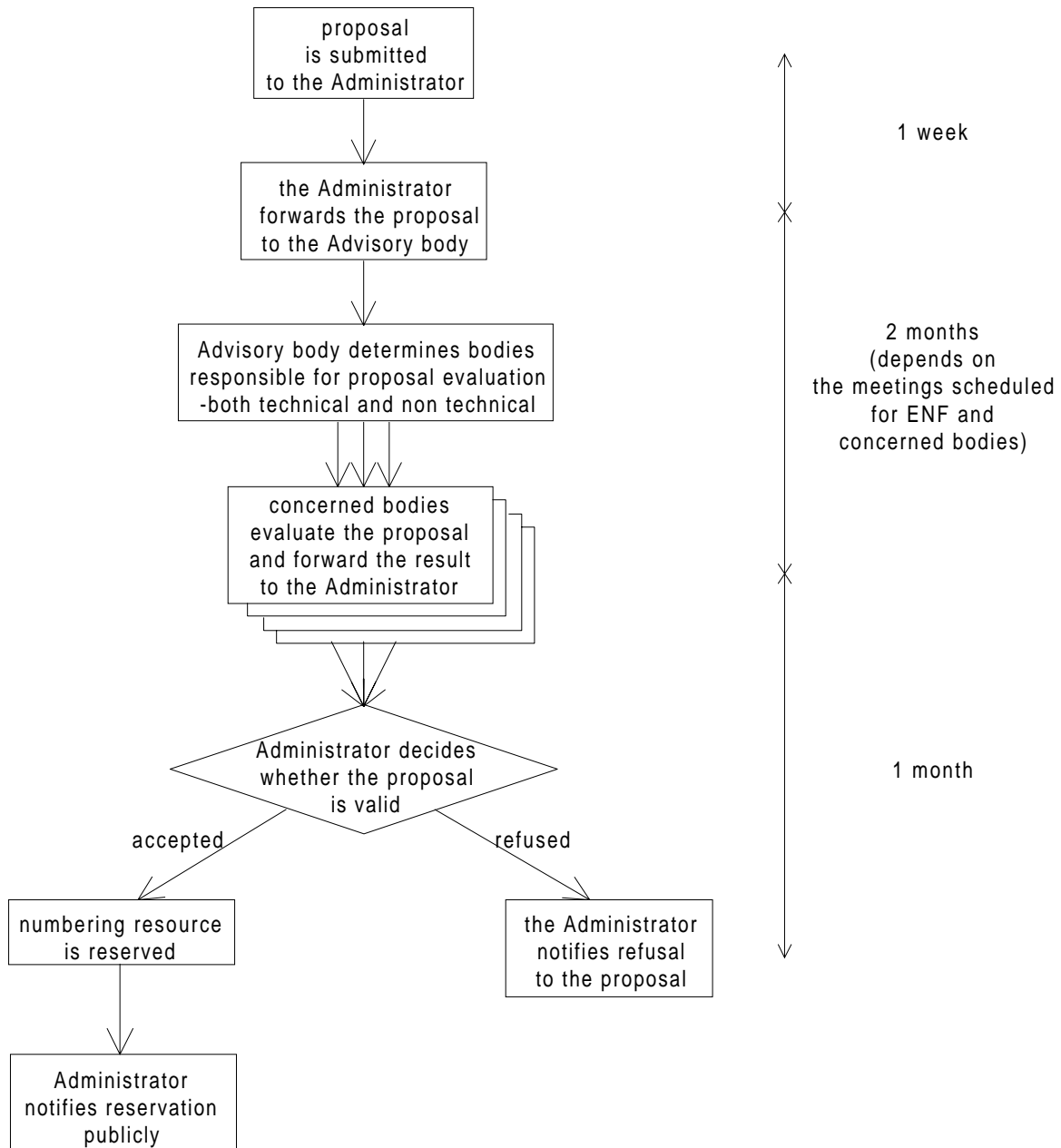


Figure 5: Process for establishing a pan-European service

7.2.2 Criteria for the establishment of an ESI

This subclause details the requirements that services shall fulfil in order to be considered as pan-European Services liable to be attributed an ESI. A proposal needs to comply with the following items to be considered valid by the administrator:

- Pan-European Services shall not violate either ETSI standards or ITU Recommendations.
- National regulatory requirements have to be met.
- Any Service Provider can offer subscription to a pan-European service for subscription in any European country participating in the ETNS. Therefore, the definition of a pan-European service shall not impose a priori restrictions on the offering area.
- Any Service Provider can offer a pan-European service for access in any European country. Therefore, the definition of a pan-European service shall not impose a priori restrictions on the accessing area.
- Service provision shall take place in a European country.

- Numbering resource from an ETNS should be allocated only if corresponding satisfactory global services are not fulfilling the subscribers needs.
- Services implemented for a short period of time e.g. seasonal services (like a Christmas service, an Olympic games service) should be supported, possibly from a specific ESI range.
- Services that cannot be accessed by callers from any part of the world should be the exception.

7.2.3 Criteria for the choice of ESI values

- Only one ESI shall be allocated per pan-European service except where exhaustion occurs.
- Service branding, e.g. 286 standing for Cordless Terminal Mobility (CTM), should be considered in the choice of the ESI value, but Service Provider branding shall not be taken into account, as it would bias competition.
- When the NDC-scheme is used for services that raise either ethical or political issues, or network integrity threats, the National Regulatory Authority (NRA) whose CC is used to access that service should have a veto right.
- In the NDC-scheme, if 2-digits CCs are used, care should be taken not to hinder a future evolution of 2-digits CCs to 3 digits in the context of ITU-T Recommendation E.164 [4] exhaustion.

7.2.4 Setting up a reserved ESI for an accepted pan-European service

The following items should be considered when developing the standard on the management of the ETNS:

- If the service is not operational within one year after it has been allocated an ESI, then allocation shall be reviewed by the administrator.
- An ESI should not be reserved for a service that will not be opened in a reasonable period of time (e.g. one year).
- Necessary standards specific to the pan-European service need to be completed before number assignment begins.
- ESI/ESN allocation for testing will be considered on a case-by-case basis.

7.2.5 Recovery of ESI

The recovery of an ESI is done the administrator on a case-by-case basis. It can occur in specific cases e.g. where no number is in use.

The detailed rules will be developed in ETNS numbering conventions.

7.3 Registration of the ESNs

This clause defines the role of the registrar in managing the ESNs behind an assigned ESI.

The functions to be performed are different according to whether the ESN is structured or unstructured. The latter case is dealt with in the present document (subclause 7.3.3), while only generalities are given in the first case (see subclause 7.3.2), for details of the management of structured ESN may depend on the service and are therefore left for further documents (example is given in annex B).

Number assignment procedures are not activated until all service provisioning activities have been concluded, e.g. establishment of the registration and administration functions, provisioning of ENTs routing/portability database (see subclause 7.3.1).

7.3.1 Registrar database

Numbers shall be logged on a database that is accessible to Service Providers. A directory function may be needed.

7.3.2 Management of structured ESNs

In the management of structured subscriber numbers, two levels of administration are involved: the registrar is responsible for the assignment of subscriber identities, and subscribers (as private authorities) are responsible for the management of Domain Specific Numbers. The management of Domain Specific Numbers is not covered within the present document.

A main role of the registrar is to allocate variable length subscriber identities. The registrar follow agreed non-discriminatory public rules for the determination of the length of the subscriber identity field given to an applicant. These rules will depend on the nature of the pan-European service considered.

The management of structured ESNs will be documented in separate ETSI documents, on a per-ESI basis.

7.3.3 Management of unstructured ESNs

In this subclause, the applicant is the Service Provider that requests an EN to the registrar on behalf of the subscriber.

The Service Providers have to be recognized by the registrar (the terminology 'eligible' applicant is used).

The subclauses below define the day-to-day procedure for the management of European Numbers. Special rules may have to be defined for the service start-up (see subclause 7.3.3.6).

7.3.3.1 Number assignment principles

- a) All assigned ENs have to be used in conformance with relevant standards.
- b) Applications for EN shall only be considered when a valid and complete application request form has been received from an eligible applicant by the registrar.
- c) ENs can only be assigned to subscribers committed to implement the number within 90 days of the date of assignment.
- d) ENs shall not be sold or traded. Neither shall they be transferred, except in the case of mergers or acquisitions. Any contravention of this principle will result in the registrar reclaiming the assigned number.
- e) Subscribers and Service Providers have no legal claim to, or proprietary interest in any EN.
- f) ENs are classified as reserved until the applicant notifies the registrar that the EN is implemented (90 days maximum).
- g) Claims for contiguous numbers will be considered on a case-by-case basis.
- h) The service offered by the subscriber shall be accessible from at least two countries.

7.3.3.2 Registrar procedures

The registrar has the responsibility for the processing, and associated administrative functions, of registration requests from applicants.

The proposed procedures for the registrar are:

- a) Assign all ENs in a fair and non-discriminatory manner.
- d) Receive all application requests by the applicant on behalf of the EN subscriber by facsimile with a EN request form, part A.
- b) Validate the request for an EN in accordance with administration rules, with this ETSI standard, and the standard(s) related to the pan-European service considered if any. Return request to applicant if application is not valid.
- f) Register all applications when received with details of the time and date using the local time of the registrar.

- e) Reserve EN on a first come first served basis. This means that the EN application forms received via facsimile by the registrar, shall be processed in order of receipt, based upon the local time stamp of the registrar's facsimile. At the opening of the pan-European service, a launching period is set up where all requests are considered simultaneously, see subclause 7.3.3.4.
- g) Determine whether the requested EN is available for assignment. If the EN requested is unavailable for assignment, see if an alternate EN was specified, if not, return to the applicant for another choice.
- h) Accept no verbal requests or inquiries, for available ENs.
- i) Accept only one subscriber per EN request form.
- j) Respond with a reservation to the applicant, within 2 working days of receipt of request, via facsimile, with a EN request form, part B, to acknowledge the reservation confirmation. Where a request for a specific number is refused or delayed, the applicant shall be informed of the reason e.g. assigned, reserved, in 6-month ageing period, or pending conflict resolution.
- k) Accept confirmation of service implementation via the EN status notification form, part B, and assign the EN accordingly.
- l) If the EN status notification form, part A, is not received within 90 days, the EN is no longer reserved. The EN shall immediately go back into the pool of numbers available for assignment no ageing period is required, and the applicant notified.
- m) Respond to confirmation of service implementation via the EN Status Form, part B, and mark the EN accordingly.
- n) Update the ETNS registrar database.
- o) Provide information to applicants on application process.
- p) Recognizing a non-conforming use of the EN, the registrar shall inform the applicant of the alleged misuse. The applicant shall be afforded 90 days to either bring the EN into conformance or explain why the current use is conforming. If conformance is not achieved by 90 days, the EN shall be reclaimed by the registrar. The EN shall immediately go back into the pool of numbers available for assignment, following the completion of any specific ageing period.
- q) Accept notice of disconnect via the EN request form, part A, from the applicant.
- r) When an existing EN is completely disconnected, the number can be assigned to another subscriber only after a 6-month ageing period.
- s) The registrar will confirm with the applicant of the disconnection of the EN, via the EN status notification form, part B.
- t) Accept changes of information associated with EN e.g. change of name, address, via the EN request form, part A.
- u) Monitor and audit the status of the EN resource and produce reports to the administrator, including actual quantity of numbers assigned and growth statistics, associated with those assignments.
- v) Exercise authority to take appropriate action regarding inactive or misused ENs.

7.3.3.3 Applicant procedures and forms

The applicant has the responsibility of processing all applications received on behalf of their subscribers and is the sole interface with the subscriber.

The proposed procedures for the applicant are:

- b) Submit valid requests for a EN in accordance with relevant standards, using the particular format as described in annex C. Invalid requests will be returned by the registrar.

- c) Send an EN request form, part A, on behalf of the subscriber, by facsimile to the registrar. Submit only one form per number request, but allow a subscriber to list alternative numbers. If the EN subscriber have no preference for a specific number, any number may be assigned from the available unassigned ENs.
- d) Ensure that all requested ENs are numeric; alpha characters shall not be accepted.
- e) Specify up to 10 ENs which are acceptable to their EN subscriber in order of priority, to limit interaction with the registrar if their early choices are unavailable.
- f) Consult with the subscriber for additional choices if the ENs are either assigned, reserved, in 6-month ageing period, or pending conflict resolution.
- g) Accept request form, part B, as the EN reservation confirmation from the registrar, and notify the subscriber.
- i) Ensure that the EN is implemented within 90 days and notify it to the registrar via the EN status notification form, part A.
- j) Upon advice from the registrar of non conforming use with administration rules, with this ETSI standard, or with any other standard related to the pan-European service involved, the applicant shall be afforded 90 days to bring the EN into conformance. If conformance is not achieved by 90 days, the EN shall be reclaimed by the registrar. The EN shall immediately go back into the pool of numbers available for assignment, following the completion of any specific ageing period, and service shall be withdrawn.
- k) Notify the registrar of changes in information associated with ENs e.g. change of name, address, using the EN request form, part A.
- l) Notify the registrar via the EN Number request form, part A, of a disconnection of a EN.
- m) Receive advice from the registrar of confirmation of number assignment via the EN status notification form, part B, and forward a copy of this form to their subscriber.

7.3.3.4 Duplicate request procedures

The duplicate request procedures will vary from a pan-European service to another, depending on whether embedding of national numbers is allowed or not. These procedures have to be defined by the registrar on a case-by-case basis.

7.3.3.5 Change of Service Provider procedures and forms

The detailed procedures for changing Service Provider will be developed during the completion of standards. They will comply with the following principles:

- the new Service Provider is responsible for the change;
- the registrar shall be informed of the change.

7.3.3.6 Special rules for the service start-up

The start-up phase of ESN assignment behind a new ESI may need special rules where the "first come first served" principle does not apply. These rules have to be defined by the administrator on a service-by-service basis.

7.3.4 Management of the ETNS routeing/portability database

In case of a centralized management of the routeing numbers, the following tasks have to be performed by the registrar:

- a) Request from the Service Provider the list of routeing numbers attached to the different areas from which the service is accessible.
- b) Accept any change in this list on Service Provider request.
- c) Inform the serving networks of the updated list of routeing numbers.

Other tasks are necessary for the change of Service Provider that will be documented in the forthcoming standard.

8 Regulatory issues

8.1 Memorandum of Understanding (MoU)

Participation in the ETNS will be agreed and defined by one or more MoUs.

Participation to the MoU(s) should be made on a voluntary basis.

The MoU(s) will define the processes that need to be followed for the allocation and use of resources that make up the ETNS.

The MoU(s) will identify which resources are made available, and what is the acceptable usage of such resources. A veto is available to the signatories of the MoU(s), where usage of national resource is deemed to be unacceptable (for instance when the NDC-scheme is used for services that raise either ethical or political issues, or network integrity threats).

The functionalities required to support the ETNS according to the ETSI standards need to be specified within the MoU(s).

The signatories of the MoU(s) will be responsible for identifying Service Providers, or at least giving criteria to identify Service Providers, that will have access to ETNS resources.

8.2 Service Providers

Service Providers shall comply with every restrictions due to specific national requirements that apply to them, in order to be recognized at European level as pan-European Service Providers.

Service Providers have to meet the regulatory requirements in all the countries involved in a call to a pan-European service: calling party's country, Service Provider's country, subscriber's country.

8.3 Pan-European calls

Attention is drawn to the text provided in subclause 4.2, second paragraph, on pan-European calls, what they are and how they are provided. The restriction placed on this aspect should be considered from a regulatory perspective.

Annex A: Information to file in a proposal

The application can contain a proposed and argued ESI.

A.1 Description of service

The applicant should provide a service description including:

- how the service is perceived by the end user:
 - how the calling user can access the service;
 - how the user can subscribe/activate/deactivate the service;
 - how the user can select the different options within the service;
 - how the calling and called user is charged for the service;
- how the service is implemented:
 - Service Provider capabilities to implement the service;
 - network capabilities to implement the service e.g.:
 - bandwidth;
 - switching and signalling capability.

Criteria:

Is the proposed service an existing service?

Is the proposed service in conflict with existing services?

Is the service description complete?

Are the high level discussions on the way to provide the service reasonable?

A.2 Charging information

When applying for an ESI, the applicant should provide general information regarding:

- Charging of the calls from the calling user's point of view.
- Charging of the calls from the called user's point of view.

For the two types of charging, the applicant should:

- Identify the network entities involved in the charging process.
- Identify the number of digits in the EN to be analysed to determine the charge.
- Other information used for charging (e.g. geographical location of the caller and called party).
- Additional mechanisms required during the charging process (e.g. announcement) and where these mechanisms need to be implemented.

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

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

A.3 Market potential

The proposal should contain enough arguments to correctly dimension the ESN field.

A.4 Timescales

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

- For the testing period.
 - For the service to be commercially ready.
 - For proposed service launch.
-

A.5 Other considerations

When network overload or other conditions are likely to occur, additional information may be requested by the administrator. For instance, Europe-wide game shows/competitions should only be implemented when it has been confirmed that adequate Europe-wide network management controls are in place, or that they are provided in a manner that minimizes disruption.

The following information may also be added which may support the proposal:

- It is cheaper for the users to use a European scheme rather than national schemes.
- The national authority(ies) will not provide the necessary capacity in the national numbering scheme(s).
- The global scheme has not been developed or will not be developed.
- Non of the existing services provide what the proposer needs.
- The service naturally has a European coverage and/or a European nature.

Annex B:

Concept for the assignment of European Numbers to Corporate telecommunication Networks

This annex covers the technical aspects of managing the assignment of European Numbering resources to Corporate Networks. It also includes principles and criteria for assignment and management of the numbering resource.

This annex complements the documents listed as references TR 101 073 [1] and TR 101 079 [2].

This annex applies to the parties involved in the process of applying for a European Numbering resource, and to the process itself.

B.1 Definitions and abbreviations

B.1.1 Definitions

Definitions specific to this annex are given hereafter.

corporation: A single organization, an extended enterprise, or an industry application group, as defined by the International Chamber of Commerce.

Corporate telecommunication Network (CN): A private telecommunication network operated by a corporation, intended to be used by a pre-determined set of users, without the obligation to offer services to the general public.

NOTE: In the context of the present document, the CN is accessible from the general public, as well as the general public is accessible by the users of the CN.

partial number: The subset of a (European) number which is significant at any access of the CN concerned for unambiguously distinguishing addressable entities beyond that access.

B.1.2 Abbreviations

CN_ID	Corporate Network Indicator
CN_Ind	Corporate Network Indication
CSAC	Country Specific Access Code to corporate networks
EAC	European Application of Corporate network access

B.2 Service aspects

The service which a CN expects from the public switched networks (ISDN and PSTN) is the Universal Access Number (UAN) service. ETS 300 170 [6] represents the stage 1 description of the service aspects of how a CN or its users can be reached by users attached to public networks. General routing requirements shall be derived from this document.

ETS 300 170 [6] does not indicate other service related aspects, e.g. those related to identification of CN users against users of the public networks. These aspects are covered here.

B.2.1 Service transparency

The perception of European users will be that, since they are in Europe, accessing a European CN will be a call within Europe. This shall be respected even in the case of the ETNS based on national resources, i.e. when a Country Code might have to be dialled. A consequence of this perception is that each public network user in Europe shall be provided with access to the European CN as if the CN was directly attached to his operator's public network.

B.2.2 Charging

Each public network user in Europe shall be provided with the charges as if the European CN was directly attached to his operator's public network.

B.2.3 CN user identification

Number identification information shall include the European Number (EN). Any identities of routing means employed in a given call shall not be part of the identity information.

NOTE: This requirement need to overrule current national laws for number identification transfer in some European countries.

B.3 Structure of ESNs with regard to CN access

The general structure of European service numbers is described in the main document. This clause thus describes only the structure of the EN as used for CNs.

The ETNS uses an E.164 number format which is structured as shown in figure 1.

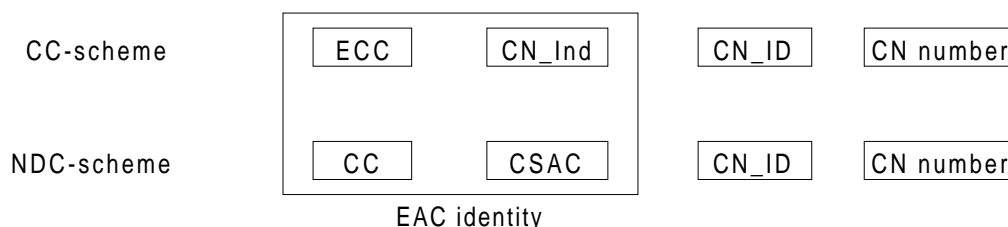


Figure B.1: Composition of the European Number for CNs

The EAC identity identifies a specific other European application, i.e. the application of accessing corporate networks. No indication of the particular corporation is included in the EAC identity. The position and function of the EAC correspond to that of the ESI, see subclause 6.1 in the body of the present document. Whereas the ESI implies the existence of a qualified Service Provider the EAC does not require a Service Provider but just gives access to publicly available infrastructure.

The European EAC number for CNs is always dialled in the format +EN (international prefix before the number).

Initially, the total length of the number shall not exceed 15 digits.

B.3.1 The identity of the European application for CN Access identity

The ECA identity is commonly assigned to all CNs. Its length is 4 digits (e.g. the digit sequence "49 00" in the NDC scheme or "388 5" in the CC scheme).

B.3.2 Structure of Subscriber Number (SN)

The subscriber number is structured, being composed of the CN identity (CN_ID) and the CN number. The CN_ID identifies the particular corporation, whereas the CN number unambiguously points to an addressable entity of that corporate network. The CN number corresponds to the partial number, as described in ITU-T Recommendation E.164 [4].

In the particular other European application case of accessing CNs the structure of the SN is formed by the concatenation of CN_ID and CN number. This concatenation, i.e. the SN, can vary in length, but will initially not exceed the limit of 11 digits for the SN, see figure B.2.

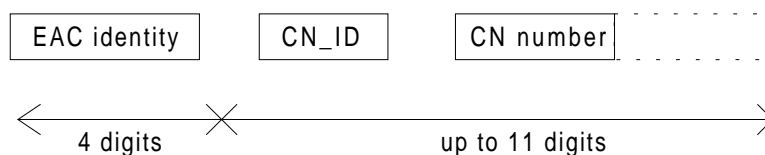


Figure B.2: CN number of variable length

Also the CN_ID can vary in length, within a range from 2 to 8 digits. This range is necessary to cope with CNs of various sizes, i.e. to accommodate CN numbers of (initially) 3 to 9 digits lengths behind the EAC.

Assignment of CN_IDs shall be under the condition that the European corporation attempts to reduce its CN numbers to a minimum length, by an appropriate structure of the CN numbering plan.

Initially, the maximum length of CN numbers will encompass no more than 9 digits.

Depending on the length required for the CN numbers, a CN_ID shall be assigned to that European corporation so that the Subscriber Number (SN) length will just meet 14 digits, leaving one digit length spare.

A sensible spare capacity should thereby be considered for future expansion of the CN numbering volume. Table B.1 indicates when which length of CN_ID is to be used.

Table B.1: CN number length in relation to length of CN_ID

CN number length	CN_ID length
8	2
7	3
6	4
5	5
4	6
3	7
2	8
NOTE: The table takes into consideration 1 spare digit for future enhancements of the CN numbering plan.	

B.4 Subscriber Number volume

Although the hypothetical volume amounts to 10^{11} numbers, due to structuration only a fraction of this will actually be available for identifying CN addressable entities.

Therefore, care shall be given to thrift assignment of CN_ID lengths.

As a general rule only a portion of each decade should be allocated to CN_IDs, the remaining ones being offered to the next decade, which follows the same principle in a repetitive way. An example is shown in table B.2, together with the CN_ID volume obtained.

Table 2: Principle of CN_ID assignment (example)

Length of DC_IDs	Digit Sequence			Number of CN_IDs
2 digits	11	....	59	50
3 digits	600	....	799	200
4 digits	8000	....	8699	700
5 digits	87000	....	89799	2.800
6 digits	898000	....	909999	12.000
7 digits	9100000	....	9199999	100.000
8 digits	92000000	....	92999999	1.000.000

Digit "0" in the first position should not be allocated, but kept reserved for future migration purposes. CN_IDs coded 93... to 99... should be left spare to cover unforeseen demand should other decades expire.

The principle of splitting for the next decade has been chosen arbitrarily in an attempt to achieve fair partitioning of the overall volume and to facilitate direct routeing, see TR 101 079 [2].

However, since it cannot be estimated how many CN_IDs of which length will really be required, careful assignment should apply. Allocation should be made in a counter-directional way, starting for example with "11" for a 2-digit CN_ID in ascending order, and starting with "799" for a 3-digit CN_ID in descending order. The 3-digit CN_ID would be "699". The first 4-digit CN_ID to be assigned would be "8699", and the first 7-digit CN_ID would be "9199999".

This allocation method provides flexibility for easier adaptation to differing demands in the future. For example, the range of 4-digit CN_IDs could be enhanced by including also the "87.." series to it, on charge of the capacity of the 5-, 6- and 7-digit CN_ID volumes.

B.5 Procedures for the assignment of a European CN_ID

Any European corporation is entitled to apply for the assignment of a CN_ID.

Under the aspect of obtaining a CN_ID, a corporation shall be recognized as a European corporation, if at least half of its addressable entities to be accommodated behind the CN_ID are located in Europe. This criterion applies to location - dependent as well as to location-independent CN numbering plans. Proof of this can consist of the number of employees in Europe and outside Europe.

NOTE 1: The issue of which criterion shall be met to qualify for a European corporation, is subject to ongoing discussion in the European Numbering Forum.

The applicant can only apply for making his CN publicly accessible, i.e. that the CN users can be accessed from European and non-European public networks, and vice versa. The mere provisioning of public services to the general public, in competition to public Service Providers, does not form a criterion for CN_ID allocation.

NOTE 2: If a corporation wishes to apply for provisioning of public correspondent services, this application should be treated separately.

B.6 Criteria for the assignment of a European CN_ID

Only one CN_ID will be assigned to the same European corporation.

Access to CNs shall not violate ETSI or ITU-T standards. This requirement is considered to be fulfilled by proving or ensuring that only attachment-approved equipment will be operated at both ends of the interfaces between public and private networks in Europe.

A CN shall be open for access from and to public network users inside and outside Europe.

Evidence (contracts, letters of intent, etc.) shall be provided that CN accessibility in at least two European countries will be implemented within 90 days after allocation of the CN_ID.

B.7 Criteria for the choice of European CN_IDs

The maximum length of the CN_ID in terms of number of digits shall be derived from the volume of CN numbers which need to be accommodated behind the ECA for the proper operation of the CN. The applicant shall include evidence on the required volume in his application.

For location-dependent numbering the evidence should consist of a volume estimate per location to be covered, and of a (1 or 2-level) region code plan set up to interconnect these locations. For location-independent numbering (e.g. mobile services, organization-oriented numbering) a similar break-down of numbering requirements should be provided. Sensible spare capacities for future enhancements and flexibility to changes should be recognized.

Annex C: Forms

The following forms are given for illustrative purpose. Forms will be developed by the registrar.

Number request form

Part A filled out by the applicant

Date:

Company name:

Country:

Contact name:

Address:

Telephone number:

Fax number:

Pan-European service:

Prefix:

Request Type (fill with a X)	New	Change	Disconnect	Cancel
---------------------------------	-----	--------	------------	--------

European Number requests (in order of priority):

- | | |
|---------------------|----------------------|
| 1) (+ Prefix) _____ | 6) (+ Prefix) _____ |
| 2) (+ Prefix) _____ | 7) (+ Prefix) _____ |
| 3) (+ Prefix) _____ | 8) (+ Prefix) _____ |
| 4) (+ Prefix) _____ | 9) (+ Prefix) _____ |
| 5) (+ Prefix) _____ | 10) (+ Prefix) _____ |

Subscriber name:

Expected subscriber due date:

Part B filled out by the registrar

Date:

The below European Number is reserved for 90 days:

Service Prefix

Subscriber Number

+ _____

The following numbers were denied reservation:

- (1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

Reason:

Other(s):

Status notification form

Part A filled out by the applicant
Date:

Company name:

Country:

Contact name:

Address:

Telephone number:

Fax number:

European Number Service prefix Subscriber Number
 _____ + _____ _____

Request Type (fill with a X)	First implementation	Change of implementation	Disconnect
---------------------------------	-------------------------	-----------------------------	------------

 The above number shall be implemented with the below routeing numbers

Date of activation is (Day / Month / Year) _____ / _____ / _____

Serving network
 (country, group of countries)

Routeing number
 (international format)

_____ _____ _____	+ + +	_____ _____ _____
-------------------------	-------------	-------------------------

(Other routeing numbers or routeing numbers bound to part of a country to fill in an extra sheet of paper)

 The above number was disconnected

Date of deactivation is (Day / Month / Year) _____ / _____ / _____

Part B filled out by the registrar
Date

- The above European Number was assigned.
- The above routeing numbers were registered.
- The above European Number was disconnected.

Annex D: Setting up the framework for the ETNS

This annex summarizes the phased set up of the ETNS.

D.1 Phase 1: Trial phase

ETO Registration function shall be set up (database, interface D).

An ESI shall be reserved.

The serving networks (i.e. the trial participants) shall be set up (ETNS translation databases, billing procedures).

D.2 Phase 2: Opening phase

In the opening phase the pan-European Services are made available to the public.

This phase can take place when the trial has proved the routing and billing to be technically feasible, and the procedures between the parties to be consistent.

The administration and the advisory functions have to be ready.

The regulatory framework has to be ready, and the MoU has to be signed.

D.3 Phase 3: On-going phase

In this phase, enhancements of the framework are sought.

New charging mechanisms are developed.

Interface D is developed in order to become more user-friendly.

Impacts of CS-2 capabilities on the ETNS architecture are studied and tried.

History

Document history		
V1.1.1	June 1997	Publication