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Number portability in Sweden – Administrative process for number portability for public digital mobile telephony services, including the administrative interface and the central reference database – Technical prestudy

Nummerportabilitet i Sverige – Administrativa rutiner för nummerportabilitet för digital mobiltelefonitjänst inkluderande administrativa gränssnitt och central referensdatabas – Teknisk förstudie

A technical prestudy on functions and requirements for the reference database, administrative interface and processes supporting number portability for public digital mobile telephony services in Sweden.

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Upplysningar om **sakinnehållet** i standarden lämnas av ITS.
Telefon: 08 - 793 90 00. *Telefax*: 08 - 751 53 63
E-post:info@its.se
Prisgrupp T
Tryckt i xxxx 1999

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Preface

This report is structured in the following way:

Introduction gives a general introduction to the document.

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Clause 4 explains abbreviations used in the document.

Clause 5 describes the preconditions for the administrative process for MNP.

Clause 6 analyses the possibility to use SS 63 63 91 for MNP.

Clause 7 analyses the structure of a Guide/Swedish Standard for MNP.

The preconditions for the network interface and methods for the support of mobile number portability is analysed in the Report ITS 14, *Number Portability in Sweden – Network solutions for Service Provider Portability for public digital mobile telephony services – Technical prestudy* [3].

This report is produced by a working group of Information Technology Standardization, ITS, Working Group 15, AG15. Interested parties from the telecommunications operators and industry have manned this group.

Participants in the special team has been:

HiQ Data	Stefan Andersson, Chairman and editor
Cap Gemini	Dag Samnegård
Tele1 Europe	Jan Perdén
Tele1 Europe	Ulrika Björnerot
Telenordia	Lars Byström
Telia	Torbjörn Klasa
Telia	Gunnar Scheutz

Introduction

This report analyses the possibility to use the central reference database solution and to use or modify the basic administrative process, described in SS 63 63 91:1999 edition 1, *Number Portability in Sweden – Administrative process for number portability, including the administrative interface and the central reference database [2],* also for mobile number portability.

This report also recommends an administrative solution for service provider portability for public digital mobile telephony services provided in a PLMN (GSM) to be specified as a Guide or Swedish Standard.

1 Scope

This report addresses the needs and technical requirements for a reference database, used for mobile number portability defined as service provider portability for public digital mobile telephony services between public land mobile networks PLMN (GSM) within a country. The report focuses on areas that will have an impact on the choice of an administrative solution for service provider portability for public digital mobile telephony services provided in a PLMN (GSM), see figure 1.1 below.

In this report, Mobile Number Portability is used in the sense of Service Provider Portability.

NOTE 1: In the ETSI MNP-standard [10] MNP is defined as the ability for a mobile subscriber to change GSM subscription network within the same country whilst retaining their original MSISDN(s).

NOTE 2: The IMSI shall not be ported.

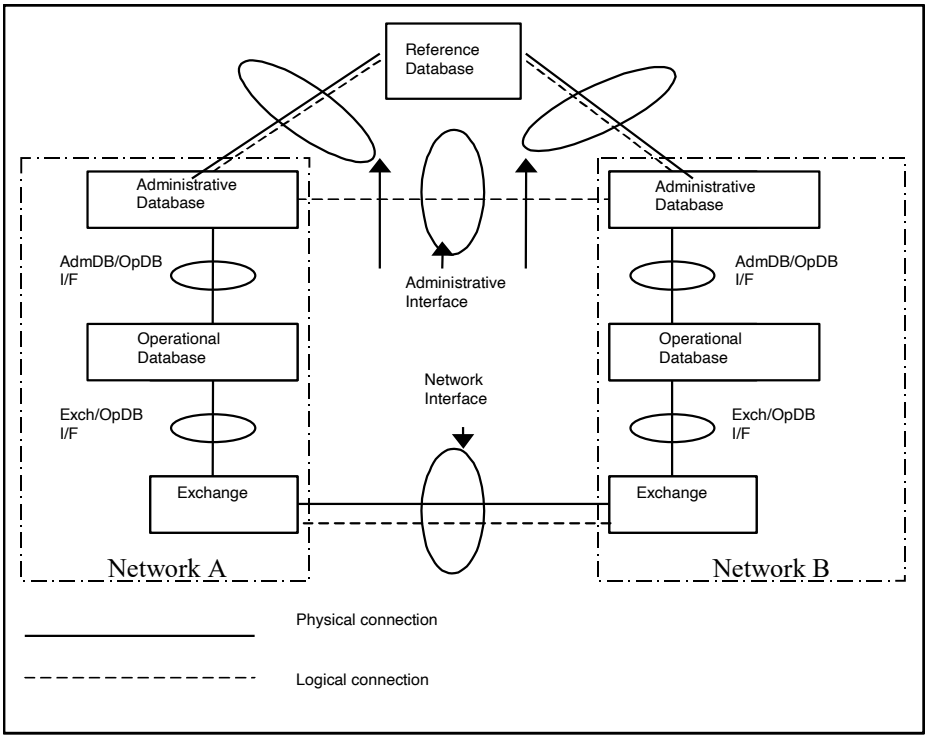


Figure 1:1

NOTE: The figure (that is generic) shall be seen in the context of mobile number portability, where Network designate PLMN (GSM).

2 References

2.1 Normative References

SS 63 63 90:1999 edition 1	Number Portability in Sweden – Network Solutions for Service Provider Portability for fixed public telecommunications services [**1**]
SS 63 63 91:1999 edition 1	Number portability in Sweden – Administrative process för number portability, including the administrative interface and central reference database [**2**]
Report ITS 14	Number Portability in Sweden – Network solutions for Service Provider Portability for public digital mobile telephony services – Technical prestudy [**3**]
ETSI EN 301 715 V7.0.1	Digital cellular telecommunications system (Phase 2+), Support of Mobile Number Portability (MNP), Service description, Stage 1, (GSM 02.66 version 7.0.1 Release 1998) [**4**]

2.2 Informative References

Regeringens proposition 1997/1998:126	Nummerfrågor [**5**]
OVUM report on Number Portability in Sweden	Ovum's study (report and annexes) on the possible introduction of Number Portability (February 1997) [**6**]
Svensk nummerplan för telefoni (E.164)	NPTA decision Hk 94-4621 and additional decision. [**7**]
PTSFS 1999:3	Post- och telestyrelsens föreskrifter och allmänna råd om nummerportabilitet för fasta teletjänster. [**8**]
Second interim report on Number Portability for mobile networks	ETO, 24 September 1999 [**9**]
ETSI EN 301 716 V7.1.0	Digital cellular telecommunications system (Phase2+), Support of Mobile Number Portability (MNP), Technical Realization, Stage 2 (GSM 03.66 Version 7.1.0 Release 1998) [**10**]

3 Terms and definitions

For the purpose of this report the following terms and definitions apply.

3.1 Entities

3.1.1 network operator

An entity operating a public telecommunications network in order to route calls.

NOTE: A network operator can also be the service provider.

3.1.2 public telecommunications operator (PTO)

A telecommunications operator in Sweden offering public telecommunications services.

NOTE: This term includes both Service Provider and Network Operator.

3.1.3 reference database administrator (RefDB Adm)

The functions and services surrounding the physical reference database which performs the activities for the handling of porting of numbers.

3.1.4 service provider

An entity offering public telecommunication services to subscribers and users involving the use of network resources.

NOTE: "Service Provider" is, in this standard, used in a generic sense, and may have a different status according to the service provided.

3.1.5 swedish number portability administrative centre (SNPAC)

The entity operating the Central Reference Database and the supportfunctions and services.

3.2 Numbers

3.2.1 directory number (DN)

An E.164 number in the national numbering plan assigned to a subscriber for a public telecommunications service.

NOTE 1: The Directory Number is assigned directly to subscribers by the public telecommunication operators from number ranges assigned by the NPA. The Directory Number consists of the national (trunk) prefix + NDC + SN.

NOTE 2: The MSISDN consists of the country code and the national (significant) number for public digital mobile telephony services. The directory number designate the national (significant) number, appendid with the national (trunk) prefix for public digital mobile telephony services.

3.2.2 national (significant) number

The portion of the number that follows the national (trunk) prefix. The national (significant) number consists of the National Destination Code (NDC) followed by the Subscriber Number (SN).

3.2.3 ported number

A Directory Number subject to mobile number portability.

3.3 Other definitions

3.3.1 administrative database (AdmDB)

The Service Provider's not call related database or similar function in charge of the storage and updating of the Operational Database of ported Directory Numbers necessary for the Service Provider's correct routing of calls.

3.3.2 administrative interface

The interface between Service Providers' Administrative Databases and between the Service Providers' Administrative Databases and the Reference Database, if implemented.

NOTE: See Figure 1.1.

3.3.3 international mobile subscriber identity (IMSI)

The identity of a mobile subscriber, used internally within the GSM network to identify a mobile subscriber.

3.3.4 mobile number portability

Service provider portability for public digital mobile telephony services within a country.

3.3.5 network interface

The interface between public telecommunications operators supporting Mobile Number Portability.

NOTE: See Figure 1.1.

3.3.6 operational database (OpDB)

A database used in real-time by the network operator or service provider for the correct routing of calls to ported Directory Numbers.

NOTE: The Operational Database could form part of an IN implementation, could be embedded within the exchange or could be some other type of on-line database.

3.3.7 reference database (RefDB)

The database in charge of the storage and updating of the Administrative Databases of the Service Providers' ported Directory Numbers.

NOTE: The data stored is necessary for correct routing of calls by all PTOs in the Routing Domain using the All Call Query (call related) and Direct routing (non-call related) methods. The Reference Database can be centralised (CRefDB) or distributed (DRefDB).

3.3.8 service provider portability, number portability

A function enabling the subscribers to cancel their subscriptions with a Service Provider and to contract another subscription with another Service Provider, without changing their Directory Numbers and the nature of the service offered.

4 Abbreviations

AdmDB	Administrative Database
CRefDB	Centralised Reference Database
DRefDB	Distributed Reference Database
ETSI	European Telecommunications Standards Institute
GSM	Global System for Mobile communications
IMSI	International Mobile Subscriber Identity
ITS	Information Technology Standardisation
MNP	Mobile Number Portability
MSISDN	Mobile Station International ISDN Number
NP	Number Portability
NPTA	National Post & Telecom Agency, the national regulatory authority for the telecommunications sector
OpDB	Operational Database
PLMN	Public Land Mobile Network
PTO	Public Telecommunications Operator
RefDB	Reference Database
RefDB Adm	The functions and organisation operating the RefDB
SNPAC	Swedish Number Portability Administrative Centre

5 Preconditions for the administrative process for MNP

The following requirements have been identified when producing edition 1 of SS 63 63 91:1999 [2] and ETSI EN 301 715 [4]. The same preconditions have been found applicable also for mobile number portability and are listed here for information.

5.1 Requirements concerning the reference database

- A long term solution
- Non-discriminatory
- Possible to operate by third party
- Open interfaces
- Adaptation to International Recommendations and European Standards.

5.2 Requirements concerning the porting process

- The process must be possible to use both between public telecommunications operators and towards the reference database
- The process must be applicable both using simplified communication and more advanced programs.
- The process must allow for different suppliers or system integration houses.
- Alternative processes in the case no reference database administrator is established.
- The process of porting a number may involve a disruption in service to the customer. The time that no service is available shall be minimised.
- In addition, for the porting process an efficient and effective way is needed to exchange porting information between all types of GSM network operators.

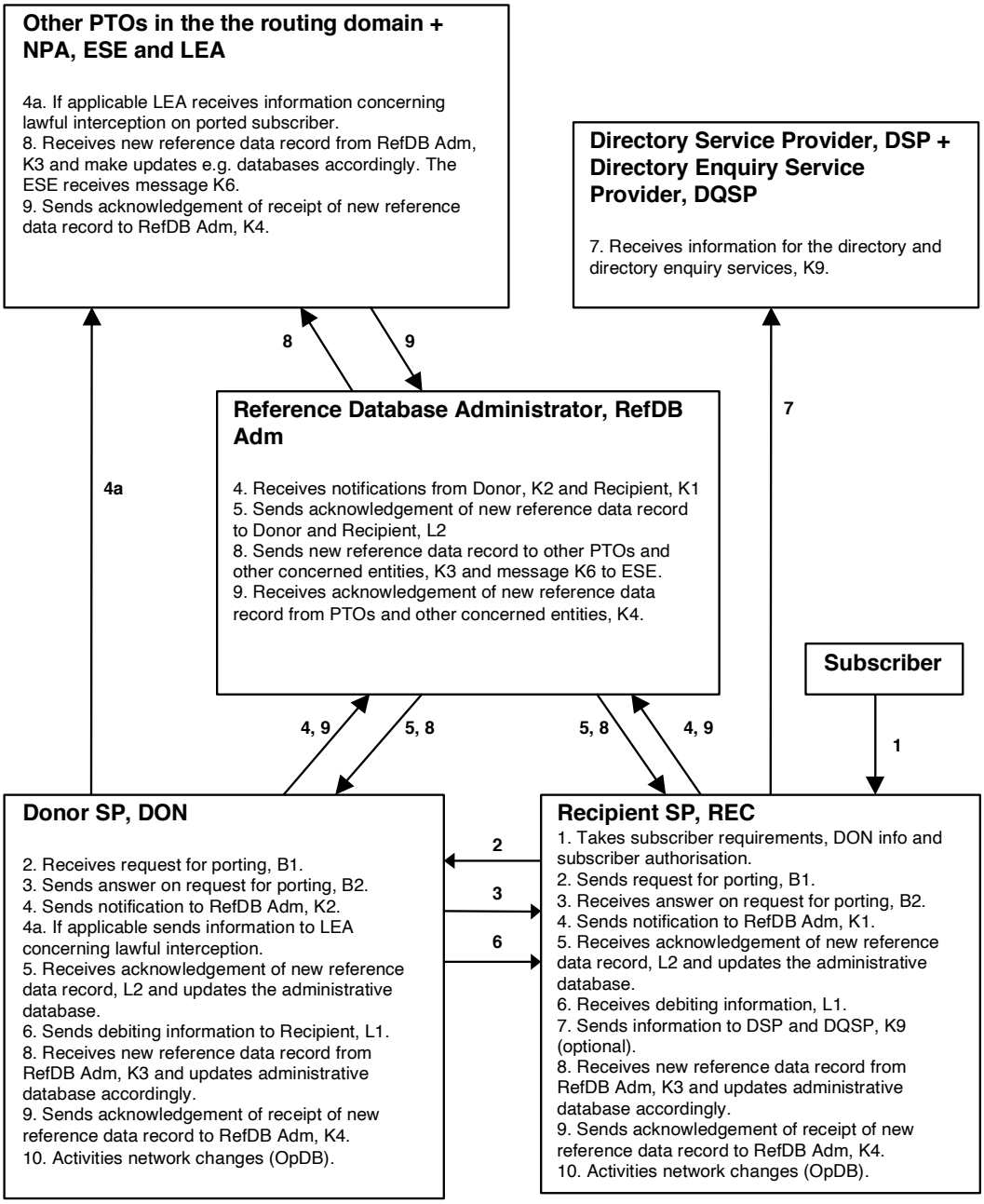
5.3 Requirements concerning the interface protocols

- No creation of barriers of entry.
- Possibility to start with a simplified method if others will not be available in time.
- Automated as well as manual systems.
- Reference Database Administration working as mediation device

The analyses described in SS 63 63 91[2], Annex B – Considerations, chapter B.3, B.4 and B.5 are all also applicable for MNP.

6 The possibility to use SS 63 63 91 for MNP

The following diagram shows the high level sequence of operations that are performed for the initial porting of a subscriber from Donor PTO to Recipient PTO, as described in SS 63 63 91 [2].



The administrative process described in SS 63 63 91, *Number Portability in Sweden – Administrative process for number portability, including the administrative interface and the central reference database [2]*, is intended to be generic, i.e. to facilitate the support of Reference Database functions for support of Service Provider Portability for public digital mobile telephony services.

Two main cases for porting a number between two service providers have been identified when analysing, if the administrative process described in SS 63 63 91 [2], is possible to use also for MNP.

NOTE: A number of varieties of these two main cases exist.

In case 1, the porting takes place between two service providers which are also network operators, i.e. they own a PLMN. In case 2, the porting takes place between service provider A who are also a network operator and service provider B who rents partly or fully its network resources from a PLMN operator.

Case 1 is covered by the existing porting process described in SS 63 63 91 [2]. Case 2 is covered by the existing porting process described in SS 63 63 91 [2], as long as service provider A and service provider B acts as the responsible entities for the porting process. The specific process between service provider B and its network operator has to be settled between the two parties.

According to the assumptions above, it is concluded that the existing porting process, described in SS 63 63 91 [2], is applicable also for MNP. The simplified processes for porting, described in SS 63 63 91, Annex C [2], is also applicable for MNP.

The only information that has been identified as specific for public digital mobile telephony services, is the IMSI. The IMSI will not be used in the porting process since the customer will change their SIM-card and the donor operator will deactivate the card when the actual porting takes place.

The timers specified in SS 63 63 91 [2] are also applicable for MNP, but the actual values will be different. The specific values will be specified outside the standard.

A need for additional Order Reject Cause Codes, specific for MNP, has been identified. An example is when a binding agreement exist for a subscription.

This concludes that there is no need for any specific information for MNP, other than specific Order Reject Cause Codes. SS 63 63 91 [2] is therefore applicable for MNP.

The structure and the interfaces used by the RefDB should be the same for all types of numbers that are portable.

7 Structure of Guide/Swedish Standard for MNP

The existing standard for the administrative process, as described in SS 63 63 91 [2] is applicable also for MNP. There should be one common standard that is applicable for both NP and MNP. The existing standard should be revised to include also MNP. The specification shall still have the status of a Swedish Standard.