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Technical Specification

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Foreword

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The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
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1 Scope

This TS defines the stage one description of the Support of Mobile Number Portability between networks in the same country as well as North America cross-sector portability (i.e.,. number portability between fixed and 3GPP system). Stage one is an overall service description, primarily from the service subscriber's and user's points of view, but does not deal with the details of the human interface itself.

Mobile Number Portability (MNP) is applicable only to those telecommunication services identified by an MSISDN.

This specification includes information applicable to network operators, service providers and terminal, switch and database manufacturers.

This specification contains the core requirements for the Support of Mobile Number Portability between network operators in the same country as well as North America cross-sector portability which are sufficient to provide a complete service.

Other cross-sector portability options (e.g. number portability between fixed and mobile networks outside the North American Region) are outside the scope of this technical specification. It is highly desirable however, that technical solutions for MNP should be sufficiently flexible to allow for possible enhancements, e.g. cross-sector number portability, and MNP between analogue and digital mobile networks. Additional functionalities not documented in this specification may implement requirements which are considered outside the scope of this specification. This additional functionality may be on a network-wide basis, nation-wide basis or particular to a group of users. Such additional functionality shall not compromise conformance to the core requirements of the service.

Porting between Service Providers (i.e. service provider portability) which does not involve a change of Network Operator is outside the scope of this specification.

The relationship between Service Providers and Network Operators is outside the scope of this specification.

The relationship between a Service Provider and subscriber is outside the scope of this specification. The interface between the User Equipment (UE) and any external applications are outside the scope of this specification. Charging principles are outside the scope of this specification except where explicitly stated in the text.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this specification the following definitions apply:

number range owner network: The network to which the number range containing the ported number has been allocated.

directory number: any E.164 dialable number assigned to a wireline or a wireless subscriber. A DN can be a 10-digit number in the context of the North American Numbering Plan (without a country code) or up to 15 digits for an international number(country code included).

donor network: The subscription network from which a number is ported in the porting process. This may or may not be the number range owner network.

mobile number portability: The ability for a mobile subscriber to change digital mobile subscription network within the same country retaining their original DN(s). Additional regulatory constraints apply in North America.

network operator: A PLMN operator.

North American GSM number portability: the ability for a subscriber to change subscription between North American GSM networks and other subscription networks within an FCC regulated geographical area within North America

originating network: the network where the calling party is located.

ported number: Is a MSISDN that has undergone the porting process.

ported subscriber: The subscriber of a ported number.

porting process: A description of the transfer of a number between network operators.

recipient network: The network which receives the number in the porting process. This network becomes the subscription network when the porting process is complete.

service provider: An entity which offers service subscriptions to individual subscribers and contracts with a network operator to implement services for a specific DN. A service provider may contract with more than one network operator.

service provider portability: The transfer of numbers between two unique Service Providers.

subscription network: The network with which the customer"s Service Provider has a contract to implement the customer"s services for a specific DN.

NOTE: The term "recipient network" is used during the porting process. The recipient network becomes the "subscription network" after the completion of the porting process.

3.2 Abbreviations

For the purposes of this specification the following abbreviations apply:

DN	Directory Number
IMPI	IP multimedia CN subsystem Private Identity
MMI	Man Machine Interface
MNP	Mobile Number Portability
MSISDN	Mobile Station ISDN number
NAGNP	North American GSM Number Portability
PLMN	Public Land Mobile Network
SIM	Subscriber Identity Module

USIM Universal Subscriber Identity Module

Further related abbreviations are given in TR 21.905 [1].

4 Applicability

Mobile Number Portability cannot be offered to a subscriber as a stand alone service. Mobile Number Portability is applicable to all teleservices (e.g. SMS, voice, fax), IP Multimedia services and bearer services (e.g. data), except for TS12 (emergency call).

The implementation of MNP shall be flexible enough to apply to each DN of a subscriber separately. Where the DNs used in the donor network are ported to different recipient mobile networks then a new IMSI/IMPI (and SIM/USIM/ ISIM) will be required for each recipient network. The basic and supplementary services provisioned in the recipient network shall not be dependent on those that were provisioned in the donor network.

5 Description

Mobile Number Portability (MNP) is the ability for a mobile subscriber to change digital mobile subscription networks within the same country whilst retaining her original DN or DNs. Additional regulatory constraints apply in North America.

North American GSM Number Portability (NAGNP) is the ability for a subscriber to change subscription between North American GSM networks and other subscription networks within an FCC regulated geographical area within North-America.

The IMSI/IMPI shall not be ported, hence the recipient mobile network of the porting process will issue a new IMSI/IMPI for the ported subscription. The porting process may, but need not, include a change in service provider.

The ported subscriber can use exactly the same services as non-ported customers in the same subscription network. That is: whether the DN of a subscriber belongs to a subscription network or is ported to the subscription network shall have no influence on the services offered to the customer by that subscription network.

The services offered by the number range owner network and/or the donor network have no influence on the services offered by the subscription network. When a subscriber ports a DN to a new network then the donor network no longer provides support for the services of the ported number (this includes supplementary and value added services).

NOTE: This also implies that if a service supported in the donor network is not available on the recipient network then number portability mechanisms need not provide that service for the ported subscriber.

A network can be a donor of numbers and a recipient of numbers. A DN can be ported more than once; a ported number can be ported back to its number range owner network. Even after multiple portings, the technical solution shall involve only the number range owner network and recipient network.

The solution for MNP/NAGNP shall have a minimal adverse effect upon the quality of service offered to ported and non-ported subscribers. It may be the case that the quality of service for ported and non-ported subscribers differs slightly (e.g. due to additional call set-up delay).

Any additional delay in call set-up to ported numbers shall be minimised.

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.

The technical implementation of the support of MNP/NAGNPin a network should not impede number availability and efficient use of numbers.

The technical implementation for the support of MNP/NAGNPshall not involve loss of functionality in the number range owner, donor or subscription network.

The technical implementation of MNP/NAGNPshall support optimisation of the use of network and inter-network resources so as to minimise costs associated with transport of traffic and/or appropriate signalling and/or processing activities (e.g. optimal routing).

In addition, for the porting process an efficient and effective way is needed to exchange porting information between all types of network operators.

6 Normal procedures with successful outcome

Mobile Number Portability is offered to all subscribers of telephone services subject to regulatory requirements.

A porting process is initiated at a subscriber"s request on their selected DN(s) with the relevant networks. Initiation of the porting process is an off-line administrative process and cannot be invoked via a specific MMI on the hand-set.

After successful porting the subscriber, is able to use the provisioned telephone services and network specific services of the subscription network as offered to non-ported subscribers on that network. Porting will effectively initiate a new subscription

As part of the porting process, the donor, number range owner and recipient networks shall update their relevant network elements in order to perform the porting. After the porting process is complete, the subscription details related to the ported DN on the donor network shall not be required and can be deleted. Therefore, only the number range owner network and the recipient network are involved in the MNP/NAGNPsolution for support of service to the ported subscriber.

The originating network may not be aware of the ported nature of the number; therefore the technical solution shall work even if networks other than the number range owner and recipient have no knowledge of the ported nature of the number.

NOTE: Other networks may be involved to increase the efficiency of call-set-up to ported numbers.

When a ported subscriber takes an additional DN at her subscription network that additional DN should not have to come from the number range owner network(s) of the subscriber"s ported numbers.

Where number ranges are assigned to network operators, the number range owner network shall receive the ported number back from the recipient network when the subscriber relinquishes the ported number, i.e. when the ported number ceases to be an active service number.

7 Exceptional procedures

Service related data (e.g. numbers used in the call-forwarding service, etc.) may not be transferred to the recipient network during the porting process.

8 Addressing

As a consequence of MNP, the DN of a subscriber may no longer explicitly identify the subscription network of that subscriber.

9 Supplementary Services and Service Interworking

The support of mobile Number Portability in a network shall not affect the handling of supplementary service for the subscribers, i.e. there shall be no difference in the handling of the supplementary services between ported in and normal subscribers of the same network.

9.1 Calling line identification presentation (CLIP)

No impact.

9.2 Calling line identification restriction (CLIR)

No impact.

9.3 Connected line identification presentation COLP)

No impact.

9.4 Connected line identification restriction (COLR)

No impact.

9.5 Call Forwarding Unconditional (CFU)

No impact.

9.6 Call Forwarding on mobile subscriber Busy (CFB)

No impact.

9.7 Call Forwarding on No Reply (CFNRy)

No impact.

9.8 Call Forwarding on mobile subscriber Not Reachable (CFNRc)

No impact.

9.9 Call Waiting (CW)

No impact.

9.10 Call hold (HOLD)

No impact.

9.11 Multiparty services (MPTY)

No impact.

9.12 Closed User Group

No impact.

9.13 Advice of Charge services

No impact.

9.14 Barring of All Outgoing Calls (BAOC)

No impact.

9.15 Barring of Outgoing International Calls (BOIC)

No impact.

9.16 Barring of Outgoing International Calls except those directed to the Home PLMN Country (BOIC-exHC)

No impact.

9.17 Barring of All Incoming Calls (BAIC)

No impact.

9.18 Barring of Incoming Calls when roaming outside the home PLMN country (BIC-Roam)

No impact.

9.19 Explicit Call Transfer (ECT)

No impact.

9.20 Completion of Calls to Busy Subscriber (CCBS)

No impact.

9.21 Support of Private Numbering Plan (SPNP)

No impact.

9.22 Multiple Subscriber Profile (MSP)

The porting process may apply on a per profile basis.

9.23 enhanced Multi-Level Priority and Pre-emption (eMLPP)

No impact.

10 Interworking with other network features

10.1 Customised Applications for Mobile network Enhanced Logic (CAMEL)

No impact.

10.2 Support of Optimal Routing (SOR)

No impact.

NOTE: This is a service requirement. However, it may be difficult to find an MNP solution with no impact on Optimal Routing.

11 Networking interworking

All services offered in co-operation with other types of networks shall still be offered in combination with MNP. This includes the basic services, all supplementary services and all network features.

12 Charging aspects

Enough information shall be collected to allow different tariffs to be applied to calls and short messages in the following case:

- The calling subscriber is roaming in her home PLMN

and

- The called subscriber is a subscriber of any of the PLMNs in the country of the calling subscriber's home PLMN

In this case the collected information shall allow to distinguish between

- Calls and short messages directed to a called subscriber who subscribes to the calling subscriber''s home PLMN
- Calls and short messages directed to a called subscriber who does not subscribe to the calling subscriber''s home PLMN.

Enough information should be collected to allow the involved networks to workout inter-network charging.

13 Lawful Interception Issues

Lawful interception shall be possible on a ported MSISDN.

Annex A: (informative)
Change history

Change history											
TSG SA#	**SA Doc.**	**SA1 Doc**	**Spec**	**CR**	**Rev**	**Rel**	**Cat**	**Subject/Comment**	**Old**	**New**	**Work Item**
Jun 1999			02.66					Transferred to 3GPP SA1	7.0.0		
SA#04			22.066			R99		Version 3.0.0 Approved		3.0.0	
SP-05	SP-99479	S1-99621	22.066	001		R99	D	Editorial changes for alignment to 3GPP	3.0.0	3.0.1	
SP-07	SP-000061	S1-000134	22.066	002		R99	B	PCS-1900 Service Provider Number Portability impacts for Mobile Number Portability	3.0.1	3.1.0	
SP-08	SP-000207	S1-000434	22.066	003		R99	F	North American Service Provider Number Portability impacts for Mobile Number Portability	3.1.0	3.2.0	
SP-11	SP-010065	S1-010258	22.066			Rel-4		Transferred to 3GPP Release 4	3.0.1	4.0.0	
SP-16	SP-020267	S1-021043	22.066			Rel-5		Updated from Rel-4 to Rel5	4.0.0	5.0.0	
SP-18	SP-020655	S1-021910	22.066	004		Rel-6	B	CR to 22.066 on IMS number portability	5.0.0	6.0.0	IMS
SP-20	SP-030263	N4-030451	22.066	006	1	Rel-6	A	Charging Requirements in an MNP environment	6.0.0	6.1.0	TEI5

History

Document history		
V6.1.0	June 2003	Publication