Source:	TSG CN WG2
Title:	CR on Rel-5 Work Item CAMEL4
Agenda item:	8.3
Document for:	APPROVAL

Introduction:

This document contains **1** CR on **Rel-5 Work Item CAMEL4.** This CR has been conditionally approved by TSG CN WG2 in CN2#30 (the condition was CN4 approval of corresponding CN4 CRs: 29.002 CR#615 and 23.066 CR#25). After the meeting it was noticed that 23.066 CR#25 was superceeded by CR#26. Therefore the precondition was updated, and the this CR is considered as CN2 approved and is forwarded to TSG CN Plenary meeting for approval.

WG_tdoc	Title	Spec	CR	Rev	Cat	Rel	C_Ver
N2-030456	Using ATI for Mobile Number Portability	23.078	530	2	F	Rel-5	5.4.0

CHANGE REQUEST

⌘	**23.078** CR	**530**	⌘**rev**	**2**	⌘	Current version:	**5.4.0**	⌘

Proposed change affects: UICC apps⌘ ☐   ME ☐ Radio Access Network ☐   Core Network **X**

Title: ⌘	Using ATI for Mobile Number Portability

Source: ⌘	Ericsson

Work item code: ⌘	CAMEL4		**Date:** ⌘	28/08/2003

Category: ⌘ **F** *Sub-Category:* Essential Correction   **Release:** ⌘ Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*

Use one of the following releases:
2   *(GSM Phase 2)*
R96   *(Release 1996)*
R97   *(Release 1997)*
R98   *(Release 1998)*
R99   *(Release 1999)*
Rel-4   *(Release 4)*
Rel-5   *(Release 5)*
Rel-6   *(Release 6)*

Reason for change: ⌘	Operators may apply different tariffs to calls established to their own subscribers and calls established to subscribers belonging to another network. In scenarios without Mobile Number Portability (MNP), the B number (called party) or the A number (calling party) indicates the network to which the subscriber belongs. In scenarios with MNP, the B number (called party) or the A number (calling party) doesn't indicate anymore the network to which the subscriber belongs. With the introduction of MNP, it is impossible for operators to calculate the proper rating based on the MSISDN of the subscribers for on-line charging services, as any subscriber number can be ported to another operator domain. Hence, a mechanism is needed by means of which an on-line charging service may obtain MNP information of a subscriber. This function is missing in the existing standards. It is highly needed to introduce a solution for on-line charging services.

Summary of change: ⌘	The MAP operation Any Time Interrogation is enhanced. A direct MAP interface between gsmSCF and MNP SRF is added to provide MNP information to the gsmSCF.

Consequences if not approved: ⌘	On-line charging services may be charge incorrectly when MNP is introduced in the portability domain because the charge of A number or B number may vary depending on whether the A number or B number is ported or not.

Clauses affected: ⌘	1, 2, 3.2, 12 (new clause)

	Y	**N**

Other specs affected:	⌘	X		Other core specifications	⌘	23.066, 29.002
			X	Test specifications		
			X	O&M Specifications		
Other comments:	⌘			Refer to discussion paper N4-021466, presented and noted on CN4 #17 meeting, for background information on this issue.		

CR page

*** First Modification ***

1   Scope

The present document specifies the stage 2 description for the fourth phase (see 3GPP TS 22.078 [**Error! Reference source not found.**]) of the Customized Applications for Mobile network Enhanced Logic (CAMEL) feature which provides the mechanisms to support services of operators which are not covered by standardized services even when roaming outside the HPLMN.

The CAMEL feature is a network feature and not a supplementary service. It is a tool to help the network operator to provide the subscribers with the operator specific services even when roaming outside the HPLMN.

In the present document, the GSM Service Control Function (gsmSCF) is treated as being part of the HPLMN. The regulatory environment in some countries may require the possibility that the gsmSCF and the HPLMN are controlled by different operators, and the gsmSCF and the HPLMN are therefore distinct entities.

The fourth phase of the CAMEL feature supports, in addition to the third phase of the CAMEL:

- Interactions with Optimal Routing;

- Call Party Handling;

- DTMF Mid call procedure for Mobile Originated and Mobile Terminating calls;

- Inclusion of flexible tone injection;

- Provision of location information of called subscriber;

- Provide location information during ongoing call;

- CAMEL control over MT SMS;

- Notification of GPRS mobility management to CSE;

- Inclusion of ODB data in Any Time Modification;

- Enhancement of Any Time Interrogation and Provide Subscriber Information for PS Domain.;

- Mobile Number Portability database interrogation.

CAMEL applicability to IP-based multimedia services is introduced in the fourth phase of the CAMEL. It is specified in 3GPP TS 23.278 [**Error! Reference source not found.**].

CAMEL is not applicable to Emergency Setup (TS 12), i.e., if an Emergency call is requested, then the gsmSSF shall not be invoked.

The mechanism described in the present document addresses especially the need for information exchange between the VPLMN or IPLMN and the HPLMN for support of operator specific services. Any user procedures for the control of operator specific services are outside the scope of the present document. Subscribers who have subscribed to operator specific services and therefore need the functional support of the CAMEL feature shall be marked in the HPLMN and VPLMN. In case a subscriber is marked to need CAMEL support, the appropriate procedures which provide the necessary information to the VPLMN or the HPLMN are invoked. It is possible for the HPLMN to instruct the VPLMN or IPLMN to interact with a gsmSCF which is controlled by the HPLMN.

The specification of operator specific services is outside the scope of the present document.

*** Next Modification ***

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.*

< unmodified >

[1]   ITU-T Recommendation Q.1224, September 1997: "Distributed Functional Plane for Intelligent Network Capability Set 2".

[42]   3GPP TS 23.066: "3rd Generation Partnership Project; Technical Specification Group Core Network; Support of Mobile Number Portability (MNP); Technical realization; Stage 2".

3.2 Abbreviations

Abbreviations used in the present document are listed in 3GPP TR 21.905 [**Error! Reference source not found.**].

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

< unmodified >

M-CSI	Mobility Management event Notification CAMEL Subscription Information
MF	Mobile Forwarding
MG-CSI	Mobility Management event Notification GPRS CAMEL Subscription Information
MLC	Mobile Location Centre
MNP	Mobile Number Portability
MNP SRF	Mobile Number Portability Signalling Relay Function
MO	Mobile Originating
MO-SMS-CSI	Mobile Originated Short Message Service CAMEL Subscription Information
MSC	Mobile service Switching Centre
MT	Mobile Terminating
MT	Mobile Terminating in GMSC
MT-SMS-CSI	Mobile Terminating Short Message Service CAMEL Subscription Information

< unmodified >

12 Subscriber Mobile Number Portability status retrieval

Support of the procedures described in this clause in CAMEL Phase 4 is a network operator option.

12.1 Architecture

12.1.1 Functional Entities used for CAMEL

This clause describes procedures for the retrieval of subscriber Mobile Number Portability (MNP) information.

The gsmSCF may request subscriber MNP information of a mobile station from the MNP Signalling Relay Function (MNP SRF).

Figure 12.1a indicates the functional entities involved in the procedures for the retrieval of MNP information.
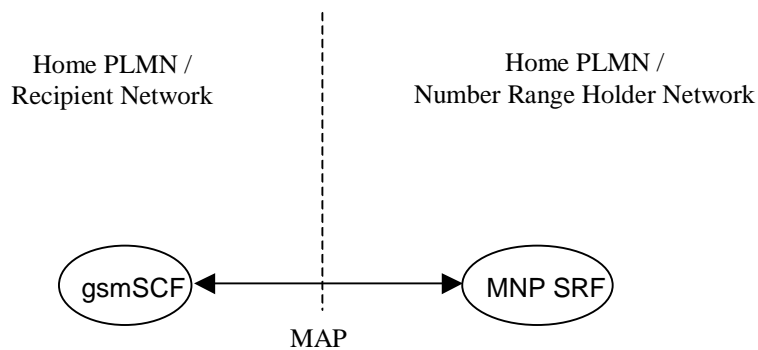
Figure 12.1a: Functional architecture for CAMEL Support of providing MNP information

gsmSCF: see subclause 3.1.

MNP SRF: A functional entity that supports the mobile number portability of a mobile station, which is described in 3GPP TS 23.066 [42].

Recipient Network: network that receives the number in the porting process. This network becomes the subscription network when the porting process is complete. See 3GPP TS 23.066 [42].

Number Range Holder Network: network to which the number range containing the ported number has been allocated. See 3GPP TS 23.066 [42].

12.1.2 Interfaces defined for CAMEL

This subclause describes the interfaces applicable to CAMEL. It specifies on a high level the functions specific to CAMEL.

12.1.2.1 gsmSCF - MNP SRF interface

This interface is used by the gsmSCF to request MNP information from the MNP SRF at any time.

12.1.2.2 MNP SRF - gsmSCF interface

This interface is used by the MNP SRF to return the requested MNP information to the gsmSCF, as requested by the gsmSCF via the Any Time Interrogation procedure.

12.2 Procedures for CAMEL

12.2.1 Provide MNP Information

12.2.1.1 CAMEL_Provide_MNP_Info with ATI

The process for providing MNP information with Any Time Interrogation (ATI) is the following:

- CAMEL_ATI_MNP.

Sheet 1: details of the task box "Query Number Portability Database" may be obtained from 3GPP TS 23.066 [42]. The task box returns an indication whether the MSISDN is known or not.
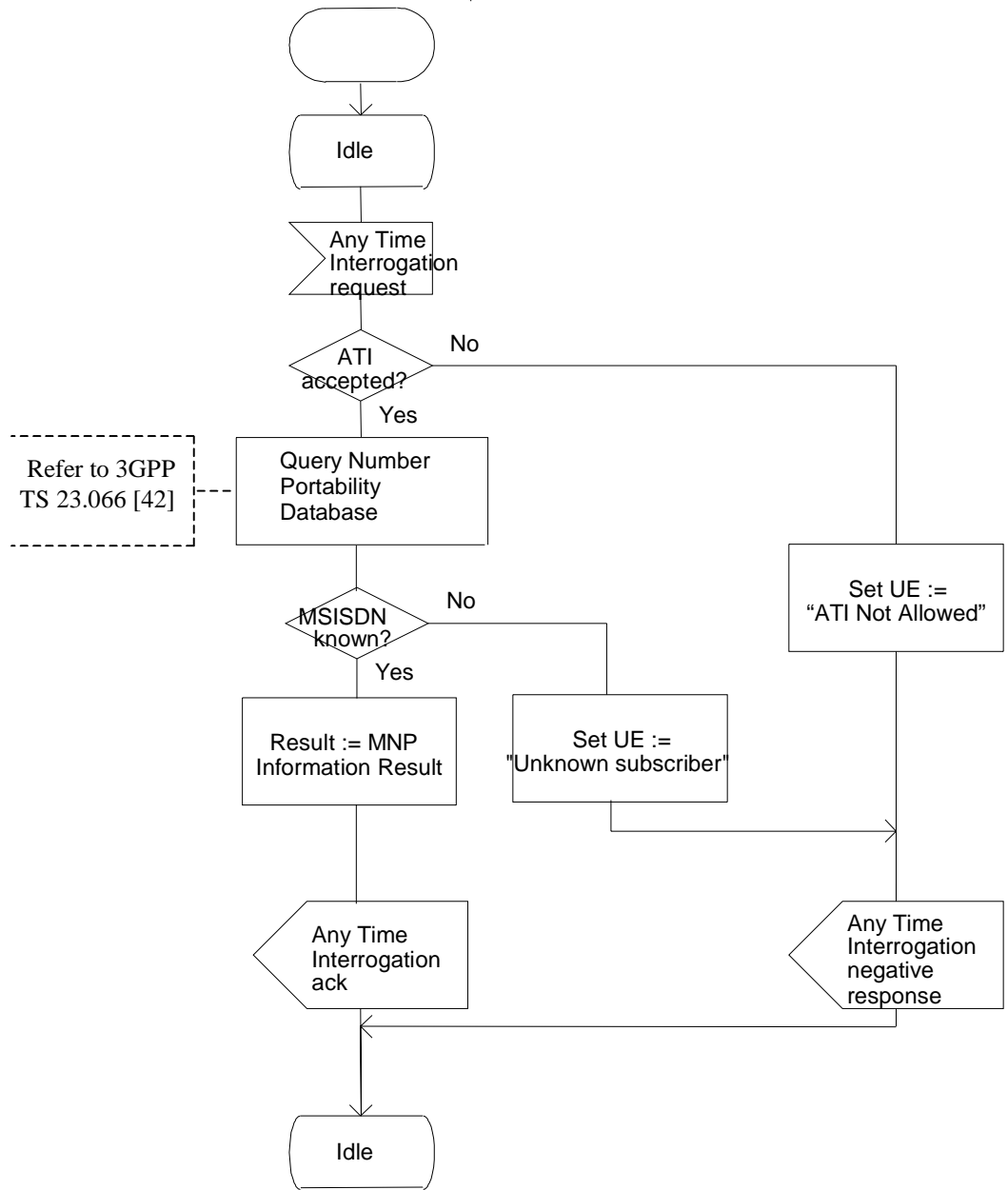
Figure 12.2a: Process CAMEL_ATI_MNP (sheet 1)

12.3 Description of information flows

This subclause contains the detailed description of the information flows used by CAMEL for the retrieval of MNP information about a subscriber.

Each Information Element (IE) is marked as Mandatory (M), Conditional (C), Specific conditions (S), mutually Exclusive (E) or not applicable (-).

An 'M' IE shall always be included. A 'C' IE shall be included if the sending entity has the necessary information to populate the IE. The conditions for the inclusion of an 'S' IE are shown in the 'Description' column of the definition table. When a set of 'E' IEs is shown in the definition of an Information Flow or compound IE, only one of those IEs may be included. A '-' IE shall always be omitted. This categorization is a functional classification, i.e. it defines the requirements for the stage 2 information. It is not a stage 3 classification to be used for the ASN.1 syntax of the protocol.

The following principles apply for the handling of the IEs by the receiving entity:

- The gsmSCF may silently discard any IE which it does not functionally support.

- The MNP SRF shall return an error if it does not functionally support an IE which it receives.

Details of errors and exceptions to these rules are specified in 3GPP TS 29.002 [32].

12.3.1 gsmSCF to MNP SRF information flows

12.3.1.1 Any Time Interrogation Request

12.3.1.1.1 Description

This IF is used by the gsmSCF to request the MNP information for subscribers from the MNP SRF at any time.

12.3.1.1.2 Information Elements

Information element name	Status	Description
gsmSCF Address	M	This IE indicates the address of the interrogating gsmSCF.
Requested Info	M	This IE indicates the type of subscriber information that is requested. ~~The identity shall be~~It shall have the following value: - MNP Requested Info.
Subscriber Identity	M	This IE identifies the subscriber for which the information is requested. The identity shall be: - MSISDN.

MNP Requested Info contains the following information elements:

Information element name	Status	Description
Routeing Number	O	Refer to 3GPP TS 23.066 [42].
IMSI	O	Refer to 3GPP TS 23.066 [42].
MSISDN	O	Refer to 3GPP TS 23.066 [42].
Number portability status	O	Refer to 3GPP TS 23.066 [42].

12.3.2 MNP SRF to gsmSCF information flows

12.3.2.1 Any Time Interrogation ack

12.3.2.1.1 Description

This IF is used by the MNP SRF to provide the requested MNP information for the subscriber to the gsmSCF.

12.3.2.1.2 Information Elements

Information element name	Status	Description
MNP Information Result	M	This IE contains the MNP information for the subscriber. It is described in a table below.

MNP Information Result contains the following information:

Information element name	Status	Description
Routeing Number	C	This IE shall be present, if requested by the gsmSCF. Refer to 3GPP TS 23.066 [42].
IMSI	C	This IE shall be present, if requested by the gsmSCF. Refer to 3GPP TS 23.066 [42].
MSISDN	C	This IE shall be present, if requested by the gsmSCF. Refer to 3GPP TS 23.066 [42].
Number Portability Status	C	This IE shall be present, if requested by the gsmSCF. It may have one of the following values: - Not Known To Be Ported; - Own Number PortedOut; - Foreign Number Ported To Foreign Network; - Own Number Not Ported Out; - Foreign Number Ported In. Refer to 3GPP TS 23.066 [42].

*** End of the Document ***