3GPP TSG-CN Meeting #24 NP-040208
2nd – 4th June 2004. Seoul, Korea.

Source: **3GPP TSG CN2**

Title: **CR for Rel-6 WI TEI_6**

Agenda item: **9.21**

Document for: **APPROVAL**

This document contains following CR for the Rel-6 WI TEI_6 that was approved by CN2 and is forwarded to TSG CN#24 for approval:

TDoc #	Title	Spec	CR #	Rev	Cat	Rel	Version	WI
N2-040247	Current Location Retrieval for MT call	23.078	659	3	B	Rel-6	6.1.0	TEI_6

CHANGE REQUEST

| ⌘ | **23.078** CR | **659** | ⌘**rev** | **3** | ⌘ | Current version: | **6.1.0** | ⌘ |

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

Title:	⌘	Current Location Retrieval for MT call handling	
Source:	⌘	Ericsson	
Work item code: ⌘	TEI_6		**Date:** ⌘ 14/05/2004
Category:	⌘ B		**Release:** ⌘ Rel-6

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: ⌘

As part of terminating call handling, the HLR may request the VLR for subscriber information. The subscriber information is obtained with the MAP Provide Subscriber Info (PSI) MAP message. The subscriber information received from VLR, is then included in the MAP Send Routing Info (SRI) Ack message, sent to GMSC.

The subscriber information that may be requested from the VLR consists of Subscriber Location and Subscriber State; refer to section 4.3.7.1 of TS 23.078. This information is included in CAP Initial DP Operation for the MT call CAMEL Service.

This information may be used by the MT call CAMEL Service, as input to Service Logic processing. As an example, the location of a subscriber may indicate whether she qualifies for "office zone charging".

The Subscriber Location that may be obtained in this way is read from the VLR. However, the subscriber may have changed location since the VLR was last refreshed. Hence, the location information of the subscriber may be out of date. The age of the subscriber location information is indicated in the "Age of Location" information element, which is part of the Location Information.

Some MT call services require the **active location** of the subscriber. An example is Home Zone: if a subscriber is located in her home zone, then the MT call qualifies for a reduced (or zero) rate. However, since the location information reported in IDP may be out of date, the SCP would have to use e.g. Any Time Interrogation (ATI) to retrieve the subscriber's location. The Service Logic would have to wait until DP Alerting, before sending ATI. Using ATI has the additional risk that late call forwarding may have taken place (e.g. due to no paging response), in which case the alerting signal would pertain to the forwarded-to

CAMEL Phase 3 has introduced "Active Location Information". A gsmSCF may request location information at any time, using the Any Time Interrogation (ATI) mechanism. ATI may include the parameter "Current Location". If ATI includes "Current Location" and "Location Information", then VLR will page the subscriber, resulting in the current location of that subscriber to be returned to the gsmSCF.

However, when the subscriber location is retrieved from VLR within the context of terminating call handling, the active location option is currently not available.

The present CR proposes for 3GPP Rel-6 that the active location retrieval feature be made available to terminating call handling as well. The advantages would be (list is not exhaustive):

- Home Zone charging: A Home Zone service can use the exact subscriber location to determine the terminating call charge;

- VPN: A VPN service can use the exact subscriber location to determine the call handling for that subscriber;

The introduction of the active location retrieval for terminating calls has no impact on the MAP PSI message between HLR and VLR. For the VLR, it is transparent whether PSI is the result of SRI from GMSC or ATI from gsmSCF.

With this method, the Service Logic does not have to use ATI (with or without the ALR flag included); the active location is available at Service Logic invocation.

The requesting of location information, subscriber state or active location, as part of terminating call handling, is purely HLR-internal behaviour. Operators can configure the HLR to request subscriber location for selected subscriber groups, depending on their subscription to CAMEL services for MT call handling. An operator would active this feature only for those subscribers who's MT CAMEL Service requires the active location.

Refer to TS 23.078, Procedure CAMEL_T_CSI_CHECK_HLR. When the check box "subscriber info required" takes the yes exit, the procedure "CAMEL_Provide_Subscriber_Info" will be called. That procedure has the capability to request VLR for active location.

Summary of change: ⌘	• Specify in section 4.3.7.1 (Location information/Subscriber state Interrogation) that HLR may request active location information. • Specify in section 4.6.1.8 that the Location Information in CAP IDP for MT call may contain the IE "Current Location Retrieved". • Specify in section 4.6.9.1 that the Location Information in MAP SRI-Res may contain the IE "Current Location Retrieved".
Consequences if not approved: ⌘	Current Location will not be available for MT call handling. CAMEL services may miss out on a powerful feature.

Clauses affected: ⌘	1, 4.3.7.1, 4.6.7.3, 4.6.10.1		

		Y	N		
Other specs ⌘	X		Other core specifications ⌘	22.078-CRxxx; 23.008-CR131; 29.002-CR733
affected:		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘	

*** **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;

- Criteria for the provision of location information during ongoing call;

- Enhanced Dialled Services~~.~~;

- Current Location Retrieval for MT call handling.

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.

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4 Circuit switched Call Control

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4.3 Description of CAMEL Subscriber Data

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4.3.7 Other CAMEL data

4.3.7.1 Location information/Subscriber state Interrogation

This data indicates whether additional subscriber information shall be sent to the GMSC as part of the terminating call handling.

- an indication that the HLR shall send the location information of the called subscriber~~.~~;

- an indication that the HLR shall send the subscriber state of the called subscriber~~.~~;

- an indication that the HLR shall send the Current Location of the called subscriber.

When a GMSC interrogates the HLR for routeing information, the HLR may use the Provide Subscriber Information procedure to obtain the required information, as listed above, from the VLR.

4.3.7.2 gsmSCF address list for CSI

The gsmSCF address list for CSI indicates a list of gsmSCF addresses to which Notification on Change of Subscriber Data is to be sent. This list is common to all CSI.

4.6 Description of information flows

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4.6.7 HLR to VLR information flows

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4.6.7.3 Provide Subscriber Info

4.6.7.3.1 Description

This IF is described in TS 23.018 [**Error! Reference source not found.**]; it is used by the HLR to request information ~~(any one or more of subscriber state, subscriber location, IMEI & software version and MS classmark information for the CS domain)~~ from the VLR ~~at any time~~, when the HLR receives Any Time Interrogation from the gsmSCF.

The HLR may also use this IF to request one or both of subscriber state and subscriber location (which may be Current Location) from the VLR, when the HLR receives Send Routeing Info from the GMSC.

4.6.10   GMSC to HLR information flows

4.6.10.1   Send Routeing Info

4.6.10.1.1   Description

This IF is described in 3GPP TS 23.018 [**Error! Reference source not found.**]; it is used to request information from the HLR to route an MT call.

4.6.10.1.2   Information Elements

Send Routeing Info contains the following CAMEL specific information elements:

Information element name	Status	Description
Alerting Pattern	S	This IE indicates the kind of Alerting Pattern to be applied. It shall be present if it was received from the gsmSCF or set by the gsmSSF.
Suppression Of Announcement	S	This IE indicates that announcements or tones generated as a result of unsuccessful call setup shall be suppressed. It shall be present in the interrogation if available, i.e. when it has been received from the gsmSCF.
Suppress T-CSI	S	This IE indicates that T-CSI shall be suppressed. It shall always be present in the second interrogation or if it was received from the gsmSCF due to an Initiate Call Attempt IF.
Supported CAMEL Phases	M	This IE lists the supported CAMEL phases in the GMSC.
Offered CAMEL4 CSIs	M	This IE indicates the CAMEL phase 4 CSIs offered in the GMSC. This IE is described in a table below.
Call Reference Number	M	This IE carries the Call Reference Number allocated for the call by the GMSC. It shall be allocated once per call and present in both first and second interrogations.
GMSC Address	M	This IE is the E.164 address of the GMSC.
Call Diversion Treatment Indicator	S	This IE indicates whether or not the call can be forwarded using the Call Forwarding or Call Deflection supplementary services. It shall be present if it was received within Forward Service Interaction Indicator in Service Interaction Indicators Two from the ISUP Initial Address Message or previous CAMEL processing.
Pre-paging supported	C	Shall be present if the GMSC supports Current Location Retrieval for MT call handling, otherwise shall be absent.

Offered CAMEL4 CSIs contains the following information elements:

Information element name	Status	Description
O-CSI	S	This IE indicates the offer of CAMEL phase 4 O-CSI.
D-CSI	S	This IE indicates the offer of CAMEL phase 4 D-CSI.
T-CSI	S	This IE indicates the offer of CAMEL phase 4 T-CSI.