3GPP TSG CN Plenary Meeting #18 **NP-020603**
4th – 6th December 2002 New Orleans, USA.

Source: TSG CN WG4

Title: Location Service Enhancement for Release 6

Agenda item: 9.9

Document for: APPROVAL

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
29.002	491	1	N4-021260	Rel-6	Addition of LCS Format Indicator to LCS Client ID	B	5.3.0
29.002	517	2	N4-021504	Rel-6	Addition of V-GMLC Address to the Update Location and Update GPRS Location requests	B	5.3.0
29.002	518	3	N4-021567	Rel-6	Addition of V-GMLC and H-GMLC Addresses to the Send Routing Info for LCS response	B	5.3.0
29.002	519	2	N4-021506	Rel-6	Addition of PPR Address to the Send Routing Info for LCS response	B	5.3.0

3GPP TSG CN WG4 Meeting #16 **N4-021260**
Miami, USA, 23rd – 27th September 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.002** **CR** **491** ⌘ **rev** **1** ⌘ Current version: **5.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

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

Title:	⌘	Addition of LCS Format Indicator to LCS Client ID
Source:	⌘	CN4
Work item code:	⌘	LCS2
Date:	⌘	24/09/2002
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)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

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:	⌘	LCS Client Name and LCS Requestor ID could be presented in several different types. Therefore it would be useful for the target UE to know exact type of the LCS Client Name and LCS Requestor ID when it performs some operations.
Summary of change:	⌘	LCS Format Indicator is added to the LCS Client Name and LCS Requestor ID parameters.
Consequences if not approved:	⌘	Target UE can not be sure what is the type of the LCS Client Name and the LCS Requestor ID.

Clauses affected:	⌘	17.7.13			
Other specs affected:	⌘	**Y** Other core specifications	⌘	23.271 CR 105	
		N Test specifications			
		N O&M Specifications			
Other comments:	⌘				

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

17.7.13 Location service data types

```
MAP-LCS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-LCS-DataTypes (25) version8 (8)}

DEFINITIONS
IMPLICIT TAGS
::=
BEGIN

EXPORTS
   RoutingInfoForLCS-Arg,
   RoutingInfoForLCS-Res,
   ProvideSubscriberLocation-Arg,
   ProvideSubscriberLocation-Res,
   SubscriberLocationReport-Arg,
   SubscriberLocationReport-Res,
   LocationType,
   LCSClientName,
   LCS-QoS,
   Horizontal-Accuracy,
   ResponseTime,
   Ext-GeographicalInformation,
   SupportedGADShapes,
   Add-GeographicalInformation,
   LCSRequestorID,
   LCSCodeword
;

IMPORTS
   AddressString,
   ISDN-AddressString,
   IMEI,
   IMSI,
   LMSI,
   SubscriberIdentity,
   AgeOfLocationInformation,
   LCSClientExternalID,
   LCSClientInternalID,
   LCSServiceTypeID
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version8 (8)}

   USSD-DataCodingScheme,
   USSD-String
FROM MAP-SS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0) gsm-Network (1) modules (3)
   map-SS-DataTypes (14) version8 (8)}

   APN
FROM MAP-MS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MS-DataTypes (11) version8 (8)}

   Additional-Number
FROM MAP-SM-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SM-DataTypes (16) version8 (8)}
;
```

```
RoutingInfoForLCS-Arg ::= SEQUENCE {
     mlcNumber                          [0] ISDN-AddressString,
     targetMS                           [1] SubscriberIdentity,
     extensionContainer                 [2] ExtensionContainer            OPTIONAL,
     ...,
     lcsCodewordApplicability           [3]  LCSCodewordApplicability     OPTIONAL }
```

```
LCSCodewordApplicability ::= ENUMERATED {
     codewordCheckApplicable             (0),
     codewordCheckNotApplicable          (1),
     ...}
--   exception handling:
--   unrecognized values shall be ignored by the receiver.
```

```
RoutingInfoForLCS-Res ::= SEQUENCE {
     targetMS                            [0] SubscriberIdentity,
     lcsLocationInfo                     [1] LCSLocationInfo,
     extensionContainer                  [2] ExtensionContainer          OPTIONAL,
     ...,
     lcsCodewordNotification             [3]  NULL                       OPTIONAL
     -- lcsCodewordNotification may be present only if
     -- lcsCodewordApplicability was present in RoutingInfoForLCS-Arg.
     -- If received when lcsCodewordApplicability was not present in
     -- RoutingInfoForLCS-Arg then lcsCodewordNotification shall be ignored.
}
```

```
LCSLocationInfo ::= SEQUENCE {
     networkNode-Number                  ISDN-AddressString,
     -- NetworkNode-number can be either msc-number or sgsn-number
     lmsi                                [0] LMSI                        OPTIONAL,
     extensionContainer                  [1] ExtensionContainer          OPTIONAL,
     ... ,
     gprsNodeIndicator                   [2] NULL                        OPTIONAL,
     -- gprsNodeIndicator is set only if the SGSN number is sent as the Network Node Number
     additional-Number                   [3] Additional-Number           OPTIONAL
     }
```

```
ProvideSubscriberLocation-Arg ::= SEQUENCE {
     locationType                        LocationType,
     mlc-Number                          ISDN-AddressString,
     lcs-ClientID                        [0] LCS-ClientID                OPTIONAL,
     privacyOverride                     [1] NULL                        OPTIONAL,
     imsi                                [2] IMSI                        OPTIONAL,
     msisdn                              [3] ISDN-AddressString          OPTIONAL,
     lmsi                                [4] LMSI                        OPTIONAL,
     imei                                [5] IMEI                        OPTIONAL,
     lcs-Priority                        [6] LCS-Priority                OPTIONAL,
     lcs-QoS                             [7] LCS-QoS                     OPTIONAL,
     extensionContainer                  [8] ExtensionContainer          OPTIONAL,
     ... ,
     supportedGADShapes                  [9]  SupportedGADShapes         OPTIONAL,
     lcsServiceTypeID                    [10] LCSServiceTypeID           OPTIONAL,
     lcsCodeword                         [11] LCSCodeword                OPTIONAL }

     -- one of imsi or msisdn is mandatory
```

```
LocationType ::= SEQUENCE {
     locationEstimateType                [0] LocationEstimateType,
     ...,
     deferredLocationEventType           [1] DeferredLocationEventType   OPTIONAL }
```

```
LocationEstimateType ::= ENUMERATED {
     currentLocation                     (0),
     currentOrLastKnownLocation          (1),
     initialLocation                     (2),
     ...,
     activateDeferredLocation            (3),
     cancelDeferredLocation              (4) }
--   exception handling:
--   a ProvideSubscriberLocation-Arg containing an unrecognized LocationEstimateType
--   shall be rejected by the receiver with a return error cause of unexpected data value
```

```
DeferredLocationEventType ::= BIT STRING {
     msAvailable                         (0) } (SIZE (1..16))
-- exception handling
-- a ProvideSubscriberLocation-Arg containing other values than listed above in
-- DeferredLocationEventType shall be rejected by the receiver with a return error cause of
-- unexpected data value.
```

```
LCS-ClientID ::= SEQUENCE {
     lcsClientType                       [0] LCSClientType,
     lcsClientExternalID                 [1] LCSClientExternalID         OPTIONAL,
     lcsClientDialedByMS                 [2] AddressString               OPTIONAL,
     lcsClientInternalID                 [3] LCSClientInternalID         OPTIONAL,
     lcsClientName                       [4] LCSClientName               OPTIONAL,
```

```
    ...,
    lcsAPN                          [5] APN                         OPTIONAL,
    lcsRequestorID                  [6] LCSRequestorID              OPTIONAL }
```

```
LCSClientType ::= ENUMERATED {
    emergencyServices               (0),
    valueAddedServices              (1),
    plmnOperatorServices            (2),
    lawfulInterceptServices         (3),
    ... }
    --   exception handling:
    --   unrecognized values may be ignored if the LCS client uses the privacy override
    --   otherwise, an unrecognized value shall be treated as unexpected data by a receiver
    --   a return error shall then be returned if received in a MAP invoke
```

```
LCSClientName ::= SEQUENCE {
    dataCodingScheme                [0] USSD-DataCodingScheme,
    nameString                      [2] NameString,
    ...,
    lcs-FormatIndicator             [x] LCS-FormatIndicator         OPTIONAL }

-- The USSD-DataCodingScheme shall indicate use of the default alphabet through the
-- following encoding
--   bit  7 6 5 4 3 2 1 0
--        0 0 0 0 1 1 1 1
```

```
NameString ::= USSD-String (SIZE (1..maxNameStringLength))
```

```
maxNameStringLength  INTEGER ::= 63
```

```
LCSRequestorID ::= SEQUENCE {
    dataCodingScheme                [0] USSD-DataCodingScheme,
    requestorIDString               [1] RequestorIDString,
    ...,
    lcs-FormatIndicator             [x] LCS-FormatIndicator         OPTIONAL }
```

```
RequestorIDString ::= USSD-String (SIZE (1..maxRequestorIDStringLength))
```

```
maxRequestorIDStringLength  INTEGER ::= 127
```

```
LCS-FormatIndicator ::= ENUMERATED {
    logicalName                     (0),
    e-mailAddress                   (1),
    msisdn                          (2),
    url                             (3),
    sipUrl                          (4),
    ... }
```

....

3GPP TSG CN WG4 Meeting #17 **N4-021504**
Bangkok, THAILAND, 11th – 15th November 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.002** **CR** **517** ⌘ **rev** **2** ⌘ Current version: **5.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

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

Title:	⌘	Addition of V-GMLC Address to the Update Location and Update GPRS Location requests
Source:	⌘	CN4
Work item code:	⌘	LCS2
Date:	⌘	12/11/2002
Category:	⌘	**B**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
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Detailed explanations of the above categories can be found in 3GPP TR 21.900.

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:	⌘	V-GMLC address is needed to be included in the Update Location and Update GPRS Location requests because of the introduction of the Lr interface (GMLC - GMLC). This is needed to align stage 3 with stage 2.
Summary of change:	⌘	V-GMLC Address is added to the Update Location and Update GPRS Location requests.
Consequences if not approved:	⌘	Stage 3 definitions for the introduction of the Lr interface (GMLC – GMLC) will be incomplete.
Clauses affected:	⌘	7.6.2, 8.1.2, 8.1.7, 17.7.1

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

****** FOR INFORMATION ******

From 23.271 v6.1.0:

6.3.5 MSC/VLR

The MSC/VLR contains functionality responsible for UE subscription authorization and managing call-related and non-call related positioning requests of LCS. The MSC is accessible to the GMLC via the Lg interface. The LCS functions of MSC are related to charging and billing, LCS co-ordination, location request, authorization and operation of the LCS services. If connected to SGSN through the Gs interface, it checks whether the UE is GPRS attached to decide whether to page the UE on the A/Iu or Gs interface.

The MSC/VLR may inform HLR/HSS about the UE's LCS Capabilities and may include the address of the V-GMLC associated with the MSC/VLR in the MAP UPDATE LOCATION message, during Registration and Inter MSC Update Location procedures.

6.3.6 MSC Server

The MSC Server handles the same functionality as the MSC/VLR including charging and billing, LCS co-ordination, location request, authorization and operation of the LCS services. The MSC Server is accessible to the GMLC via the Lg interface.

6.3.7 SGSN

The SGSN contains functionality responsible for UE subscription authorization and managing positioning requests of LCS. The SGSN is accessible to the GMLC via the Lg interface. The LCS functions of SGSN are related to charging and billing, LCS co-ordination, location request, authorization and operation of the LCS services.

The SGSN may inform HLR/HSS about the UE's LCS Capabilities for GPRS and may include the address of the V-GMLC associated with the SGSN in the MAP UPDATE GPRS LOCATION message, during Attach and Inter SGSN Routing Area Update procedures.

The SGSN forwards the circuit-swiched paging request received from the Gs interface to the BSS/RNC.

****** FIRST MODIFIED SECTION ******

7.6.2 Numbering and identification parameters

…

7.6.2.xx V-GMLC Address

This parameter refers to the IP address of a V-GMLC.

****** NEXT MODIFIED SECTION ******

8.1.2 MAP_UPDATE_LOCATION service

8.1.2.1 Definition

This service is used by the VLR to update the location information stored in the HLR.

The MAP_UPDATE_LOCATION service is a confirmed service using the service primitives given in table 8.1/2.

8.1.2.2 Service primitives

Table 8.1/2: MAP_UPDATE_LOCATION

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
IMSI	M	M(=)		
MSC Address	M	M(=)		
VLR number	M	M(=)		
LMSI	U	C(=)		
Supported CAMEL Phases	C	C(=)		
SoLSA Support Indicator	C	C(=)		
IST Support Indicator	C	C(=)		
Super-Charger Supported in Serving Network Entity	C	C(=)		
Long FTN Supported	C	C(=)		
Supported LCS Capability Sets	C	C(=)		
Offered CAMEL 4 CSIs	C	C(=)		
Inform Previous Network Entity	C	C(=)		
CS LCS Not Supported by UE	C	C(=)		
V-GMLC Address	U	C(=)		
HLR number			C	C(=)
User error			C	C(=)
Provider error				O

8.1.2.3 Parameter definitions and use

Invoke Id

See definition in clause 7.6.1.

IMSI

See definition in clause 7.6.2.

MSC Address

See definition for MSC number in clause 7.6.2. The MSC address is used for short message delivery only and for each incoming call set-up attempt the MSRN will be requested from the VLR.

VLR number

See definition in clause 7.6.2.

LMSI

See definition in clause 7.6.2. It is an operator option to provide the LMSI from the VLR; it is mandatory for the HLR to support the LMSI handling procedures.

Supported CAMEL Phases

This parameter indicates which phases of CAMEL are supported. Must be present if a CAMEL phase different from phase 1 is supported. Otherwise may be absent.

HLR number

See definition in clause 7.6.2. The presence of this parameter is mandatory in case of successful HLR updating.

SoLSA Support Indicator

This parameter is used by the VLR to indicate to the HLR in the Update Location indication that SoLSA is supported. If this parameter is not included in the Update Location indication and the Subscriber is marked as only allowed to roam in Subscribed LSAs, then the HLR shall reject the roaming and indicate to the VLR that roaming is not allowed to that Subscriber in the VLR.

This SoLSA Support Indicator shall be stored by the HLR per VLR where there are Subscribers roaming. If a Subscriber is marked as only allowed to roam in Subscribed LSAs while roaming in a VLR and no SoLSA Support indicator is stored for that VLR, the location status of that Subscriber shall be set to Restricted.

IST Support Indicator

This parameter is used to indicate to the HLR that the VMSC supports basic IST functionality, that is, the VMSC is able to terminate the Subscriber Call Activity that originated the IST Alert when it receives the IST alert response indicating that the call(s) shall be terminated. If this parameter is not included in the Update Location indication and the Subscriber is marked as an IST Subscriber, then the HLR may limit the service for the subscriber (by inducing an Operator Determined barring of Roaming, Incoming or Outgoing calls), or allow service assuming the associated risk of not having the basic IST mechanism available.

This parameter can also indicate that the VMSC supports the IST Command service, including the ability to terminate all calls being carried for the identified subscriber by using the IMSI as a key. If this additional capability is not included in the Update Location indication and the HLR supports the IST Command capability, then the HLR may limit the service for the subscriber (by inducing an Operator Determined barring of Roaming, Incoming or Outgoing calls), or allow service assuming the associated risk of not having the IST Command mechanism available.

Long FTN Supported

This parameter indicates that the VLR supports Long Forwarded-to Numbers.

Super-Charger Supported in Serving Network Entity

This parameter is used by the VLR to indicate to the HLR that the VLR supports the Super-Charger functionality and whether subscription data has been retained by the VLR. If subscription data has been retained by the VLR the age indicator shall be included. Otherwise the VLR shall indicate that subscriber data is required.

If this parameter is absent then the VLR does not support the Super-Charger functionality.

Supported LCS Capability Sets

This parameter indicates, if present, the capability sets of LCS which are supported. If the parameter is sent but no capability set is marked as supported then the VLR does not support LCS at all.

If this parameter is absent then the VLR may support at most LCS capability set 1, that is LCS Release98 or Release99 version.

Offered CAMEL 4 CSIs

This parameter indicates the CAMEL phase 4 CSIs offered in the VMSC/VLR (see clause 7.6.3.36D).

Inform Previous Network Entity

This parameter is used by the VLR to ask the HLR to inform the previous network entity about the update by sending the previous network entity a Cancel Location message. It is used in case Super-Charger is supported in the network and the serving network entity has not been able to inform the previous network entity that MS has moved, that is if it has not sent Send Identification to the previous serving entity.

CS LCS Not Supported by UE

See definition in clause 7.6.11.

V-GMLC address

See definition in clause 7.6.2.

User error

In case of unsuccessful updating, an error cause shall be returned by the HLR. The following error causes defined in clause 7.6.1 may be used, depending on the nature of the fault:

- unknown subscriber;
- roaming not allowed;

  This cause will be sent if the MS is not allowed to roam into the PLMN indicated by the VLR number. The cause is qualified by the roaming restriction reason "PLMN Not Allowed" or "Operator Determined Barring". If no qualification is received (HLR with MAP Version 1), "PLMN Not Allowed" is taken as default.
- system failure;
- unexpected data value.

Provider error

For definition of provider errors see clause 7.6.1.

****** NEXT MODIFIED SECTION ******

8.1.7 MAP_UPDATE_GPRS_LOCATION service

8.1.7.1 Definition

This service is used by the SGSN to update the location information stored in the HLR.

The MAP_UPDATE_GPRS_LOCATION service is a confirmed service using the service primitives given in table 8.1/7.

8.1.7.2 Service primitives

Table 8.1/7: MAP_UPDATE_GPRS_LOCATION

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
IMSI	M	M(=)		
SGSN number	M	M(=)		
SGSN address	M	M(=)		
Supported CAMEL Phases	C	C(=)		
SoLSA Support Indicator	C	C(=)		
Super-Charger Supported in Serving Network Entity	C	C(=)		
GPRS enhancements support indicator	C	C(=)		
Supported LCS Capability Sets	C	C(=)		
Offered CAMEL 4 CSIs	C	C(=)		
Inform Previous Network Entity	C	C(=)		
PS LCS Not Supported by UE	C	C(=)		
V-GMLC Address	U	C(=)		
HLR number			C	C(=)
User error			C	C(=)
Provider error				O

8.1.7.3 Parameter definitions and use

Invoke Id

See definition in clause 7.6.1.

IMSI

See definition in clause 7.6.2.

SGSN number

See definition in clause 7.6.2.

SGSN address

See definition in clause 7.6.2.

Supported CAMEL Phases

This parameter indicates which phases of CAMEL are supported. The SGSN can only support CAMEL phase 3 or greater.

SoLSA Support Indicator

This parameter is used by the SGSN to indicate to the HLR in the Update GPRS Location indication that SoLSA is supported. If this parameter is not included in the Update GPRS Location indication and the Subscriber is marked as only allowed to roam in Subscribed LSAs, then the HLR shall reject the roaming and indicate to the SGSN that roaming is not allowed to that Subscriber in the SGSN.

This SoLSA Support Indicator shall be stored by the HLR per SGSN where there are Subscribers roaming. If a Subscriber is marked as only allowed to roam in Subscribed LSAs while roaming in a SGSN and no SoLSA Support indicator is stored for that SGSN, the location status of that Subscriber has to be set to Restricted.

Super-Charger Supported in Serving Network Entity

This parameter is used by the SGSN to indicate to the HLR that the SGSN supports the Super-Charger functionality and whether subscription data has been retained by the SGSN. If subscription data has been retained by the SGSN the age indicator shall be included. Otherwise the SGSN shall indicate that subscriber data is required.

If this parameter is absent then the SGSN does not support the Super-Charger functionality.

GPRS enhancements support indicator

This parameter is used by the SGSN to indicate to the HLR in the Update GPRS Location indication that GPRS enhancements are supported. If this parameter is included in the Update GPRS Location indication the HLR may send the extensible QoS in the PDP contexts to the SGSN.

HLR number

See definition in clause 7.6.2. The presence of this parameter is mandatory in case of successful HLR updating.

Supported LCS Capability Sets

This parameter indicates, if present, the capability sets of LCS which are supported. If the parameter is sent but no capability set is marked as supported then the SGSN does not support LCS at all.

The SGSN is not allowed to indicate support for LCS capability set 1.

If this parameter is absent then the SGSN does not support LCS at all.

Offered CAMEL 4 CSIs

This parameter indicates the CAMEL phase 4 CSIs offered in the SGSN (see clause 7.6.3.36D).

Inform Previous Network Entity

This parameter is used by the SGSN to ask the HLR to inform the previous network entity about the update by sending the previous network entity a Cancel Location message. It is used in case Super-Charger is supported in the network and the serving network entity has not been able to inform the previous network entity that MS has moved, that is if it has not sent SGSN Context Request to the previous serving entity.

PS LCS Not Supported by UE

See definition in clause 7.6.11.

V-GMLC address

See definition in clause 7.6.2.

User error

In case of unsuccessful updating, an error cause shall be returned by the HLR. The following error causes defined in clause 7.6.1 may be used, depending on the nature of the fault:

- unknown subscriber;
- roaming not allowed.

  This cause will be sent if the MS is not allowed to roam into the PLMN indicated by the SGSN number. The cause is qualified by the roaming restriction reason "PLMN Not Allowed" or "Operator Determined Barring".
- system failure;
- unexpected data value.

The diagnostic in the Unknown Subscriber may indicate “Imsi Unknown” or “Gprs Subscription Unknown”.

Provider error

For definition of provider errors see clause 7.6.1.

****** NEXT MODIFIED SECTION ******

17.7 MAP constants and data types

17.7.1 Mobile Service data types

```
MAP-MS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MS-DataTypes (11) version8 (8)}

DEFINITIONS

IMPLICIT TAGS

::=

BEGIN

EXPORTS

   -- location registration types
   UpdateLocationArg,
   UpdateLocationRes,
   CancelLocationArg,
   CancelLocationRes,
   PurgeMS-Arg,
   PurgeMS-Res,
   SendIdentificationArg,
   SendIdentificationRes,
   UpdateGprsLocationArg,
   UpdateGprsLocationRes,
   IST-SupportIndicator,
   SupportedLCS-CapabilitySets,

   -- gprs location registration types
   GSN-Address,

   -- handover types
   ForwardAccessSignalling-Arg,
   PrepareHO-Arg,
   PrepareHO-Res,
   PrepareSubsequentHO-Arg,
   PrepareSubsequentHO-Res,
   ProcessAccessSignalling-Arg,
   SendEndSignal-Arg,
   SendEndSignal-Res,


   -- authentication management types
   SendAuthenticationInfoArg,
   SendAuthenticationInfoRes,
   AuthenticationFailureReportArg,
   AuthenticationFailureReportRes,

   -- security management types
   EquipmentStatus,
   Kc,

   -- subscriber management types
   InsertSubscriberDataArg,
   InsertSubscriberDataRes,
   LSAIdentity,
   DeleteSubscriberDataArg,
   DeleteSubscriberDataRes,
   Ext-QoS-Subscribed,
   SubscriberData,
   ODB-Data,
   SubscriberStatus,
   ZoneCodeList,
   maxNumOfZoneCodes,
   O-CSI,
   D-CSI,
   O-BcsmCamelTDPCriteriaList,
   T-BCSM-CAMEL-TDP-CriteriaList,
   SS-CSI,
   ServiceKey,
   DefaultCallHandling,
   CamelCapabilityHandling,
   BasicServiceCriteria,
   SupportedCamelPhases,
   OfferedCamel4CSIs,
   OfferedCamel4Functionalities,
   maxNumOfCamelTDPData,
   CUG-Index,
   CUG-Info,
```

```
   CUG-Interlock,
   InterCUG-Restrictions,
   IntraCUG-Options,
   NotificationToMSUser,
   QoS-Subscribed,
   IST-AlertTimerValue,
   T-CSI,
   T-BcsmTriggerDetectionPoint,
   APN,

   -- fault recovery types
   ResetArg,
   RestoreDataArg,
   RestoreDataRes,

-- provide subscriber info types
   GeographicalInformation,
   MS-Classmark2,
   GPRSMSClass,

   -- subscriber information enquiry types
   ProvideSubscriberInfoArg,
   ProvideSubscriberInfoRes,
   SubscriberInfo,
   LocationInformation,
   LocationInformationGPRS,
   RAIdentity,
   SubscriberState,
   GPRSChargingID,

   -- any time information enquiry types
   AnyTimeInterrogationArg,
   AnyTimeInterrogationRes,

   -- any time information handling types
   AnyTimeSubscriptionInterrogationArg,
   AnyTimeSubscriptionInterrogationRes,
   AnyTimeModificationArg,
   AnyTimeModificationRes,

   -- subscriber data modification notification types
   NoteSubscriberDataModifiedArg,
   NoteSubscriberDataModifiedRes,

   -- gprs location information retrieval types
   SendRoutingInfoForGprsArg,
   SendRoutingInfoForGprsRes,

   -- failure reporting types
   FailureReportArg,
   FailureReportRes,

   -- gprs notification types
   NoteMsPresentForGprsArg,
   NoteMsPresentForGprsRes,

   -- Mobility Management types
   NoteMM-EventArg,
   NoteMM-EventRes



;

IMPORTS
   maxNumOfSS,
   SS-SubscriptionOption,
   SS-List,
   SS-ForBS-Code,
   Password
FROM MAP-SS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-DataTypes (14) version8 (8)}

   SS-Code
FROM MAP-SS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SS-Code (15) version8 (8)}
```

```
   Ext-BearerServiceCode
FROM MAP-BS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-BS-Code (20) version8 (8)}

   Ext-TeleserviceCode
FROM MAP-TS-Code {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-TS-Code (19) version8 (8)}


   AddressString,
   ISDN-AddressString,
   ISDN-SubaddressString,
   FTN-AddressString,
   AccessNetworkSignalInfo,
   IMSI,
   IMEI,
   TMSI,
   HLR-List,
   LMSI,
   Identity,
   GlobalCellId,
   CellGlobalIdOrServiceAreaIdOrLAI,
   Ext-BasicServiceCode,
   NAEA-PreferredCI,
   EMLPP-Info,
   MC-SS-Info,
   SubscriberIdentity,
   AgeOfLocationInformation,
   LCSClientExternalID,
   LCSClientInternalID,
   Ext-SS-Status,
   LCSServiceTypeID



FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version8 (8)}

   AbsentSubscriberDiagnosticSM
FROM MAP-ER-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ER-DataTypes (17) version8 (8)}


;


-- location registration types

UpdateLocationArg ::= SEQUENCE {
    imsi                              IMSI,

    msc-Number                        [1] ISDN-AddressString,
    vlr-Number                        ISDN-AddressString,
    lmsi                              [10] LMSI OPTIONAL,
    extensionContainer                ExtensionContainer              OPTIONAL,
    ... ,
    vlr-Capability                    [6] VLR-Capability              OPTIONAL,
    informPreviousNetworkEntity       [11] NULL                       OPTIONAL,
    cs-LCS-NotSupportedByUE           [12] NULL                       OPTIONAL,
    v-gmlc-Address                    [xx] GSN-Address                OPTIONAL }
```

```
VLR-Capability ::= SEQUENCE{
    supportedCamelPhases                [0] SupportedCamelPhases          OPTIONAL,
    extensionContainer                  ExtensionContainer                OPTIONAL,
    ... ,
    solsaSupportIndicator               [2] NULL                          OPTIONAL,
    istSupportIndicator                 [1] IST-SupportIndicator          OPTIONAL,
    superChargerSupportedInServingNetworkEntity   [3] SuperChargerInfo    OPTIONAL,
    longFTN-Supported                   [4]  NULL                         OPTIONAL,
    supportedLCS-CapabilitySets         [5]  SupportedLCS-CapabilitySets  OPTIONAL,
    offeredCamel4CSIs                   [6] OfferedCamel4CSIs             OPTIONAL }
```

```
SuperChargerInfo ::= CHOICE {
    sendSubscriberData                  [0] NULL,
    subscriberDataStored                [1] AgeIndicator }
```

```
AgeIndicator ::= OCTET STRING (SIZE (1..6))
    -- The internal structure of this parameter is implementation specific.
```

```
IST-SupportIndicator ::=  ENUMERATED {
    basicISTSupported                   (0),
    istCommandSupported                 (1),
    ...}
-- exception handling:
-- reception of values > 1 shall be mapped to ' istCommandSupported '
```

```
SupportedLCS-CapabilitySets ::= BIT STRING {
    lcsCapabilitySet1 (0),
    lcsCapabilitySet2 (1),
    lcsCapabilitySet3 (2) } (SIZE (2..16))
-- Core network signalling capability set1 indicates LCS Release98 or Release99 version.
-- Core network signalling capability set2 indicates LCS Release4.
-- Core network signalling capability set3 indicates LCS Release5 or later version.
-- A node shall mark in the BIT STRING all LCS capability sets it supports.
-- If no bit is set then the sending node does not support LCS.
-- If the parameter is not sent by an VLR then the VLR may support at most capability set1.
-- If the parameter is not sent by an SGSN then no support for LCS is assumed.
-- An SGSN is not allowed to indicate support of capability set1.
-- Other bits than listed above shall be discarded.
```

```
UpdateLocationRes ::= SEQUENCE {
    hlr-Number                          ISDN-AddressString,

    extensionContainer                  ExtensionContainer                OPTIONAL,
    ... }
```

```
CancelLocationArg ::= [3] SEQUENCE {
    identity                            Identity,
    cancellationType                    CancellationType                  OPTIONAL,
    extensionContainer                  ExtensionContainer                OPTIONAL,
    ...}
```

```
CancellationType ::= ENUMERATED {
    updateProcedure                     (0),
    subscriptionWithdraw                (1),
    ...}
    -- The HLR shall not send values other than listed above
```

```
CancelLocationRes ::= SEQUENCE {
    extensionContainer                  ExtensionContainer                OPTIONAL,
    ...}
```

```
PurgeMS-Arg ::= [3] SEQUENCE {
    imsi                                IMSI,
    vlr-Number                          [0] ISDN-AddressString            OPTIONAL,
    sgsn-Number                         [1]  ISDN-AddressString           OPTIONAL,
    extensionContainer                  ExtensionContainer                OPTIONAL,
    ...}
```

```
PurgeMS-Res ::= SEQUENCE {
    freezeTMSI                          [0]  NULL                         OPTIONAL,
    freezeP-TMSI                        [1]  NULL                         OPTIONAL,
    extensionContainer                  ExtensionContainer                OPTIONAL,
    ...}
```

```
SendIdentificationArg ::= SEQUENCE {
     tmsi                                TMSI,
     numberOfRequestedVectors            NumberOfRequestedVectors          OPTIONAL,
     -- within a dialogue numberOfRequestedVectors shall be present in
     -- the first service request and shall not be present in subsequent service requests.
     -- If received in a subsequent service request it shall be discarded.
     segmentationProhibited              NULL                              OPTIONAL,
     extensionContainer                  ExtensionContainer                OPTIONAL,
     ...}
```

```
SendIdentificationRes ::= [3] SEQUENCE {
     imsi                                IMSI                              OPTIONAL,
     -- IMSI shall be present in the first (or only) service response of a dialogue.
     -- If multiple service requests are present in a dialogue then IMSI
     -- shall not be present in any service response other than the first one.
     authenticationSetList               AuthenticationSetList             OPTIONAL,
     currentSecurityContext              [2]CurrentSecurityContext         OPTIONAL,
     extensionContainer                  [3] ExtensionContainer            OPTIONAL,
     ...}
```

-- authentication management types

```
AuthenticationSetList ::= CHOICE {
     tripletList                         [0] TripletList,
     quintupletList                      [1] QuintupletList }
```

```
TripletList ::= SEQUENCE SIZE (1..5) OF
                                         AuthenticationTriplet
```

```
QuintupletList ::= SEQUENCE SIZE (1..5) OF
                                         AuthenticationQuintuplet
```

```
AuthenticationTriplet ::= SEQUENCE {
     rand                                RAND,
     sres                                SRES,
     kc                                  Kc,
     ...}
```

```
AuthenticationQuintuplet ::= SEQUENCE {
     rand                                RAND,
     xres                                XRES,
     ck                                  CK,
     ik                                  IK,
     autn                                AUTN,
     ...}
```

```
CurrentSecurityContext ::= CHOICE {
     gsm-SecurityContextData             [0] GSM-SecurityContextData,
     umts-SecurityContextData            [1] UMTS-SecurityContextData }
```

```
GSM-SecurityContextData ::= SEQUENCE {
     kc                                  Kc,
     cksn                                Cksn,
     ... }
```

```
UMTS-SecurityContextData ::= SEQUENCE {
     ck                                  CK,
     ik                                  IK,
     ksi                                 KSI,
     ... }
```

```
RAND ::= OCTET STRING (SIZE (16))
```

```
SRES ::= OCTET STRING (SIZE (4))
```

```
Kc ::= OCTET STRING (SIZE (8))
```

```
XRES ::= OCTET STRING (SIZE (4..16))
```

```
CK ::= OCTET STRING (SIZE (16))
```

```
IK ::= OCTET STRING (SIZE (16))
```

```
AUTN ::= OCTET STRING (SIZE (16))
```

```
AUTS ::= OCTET STRING (SIZE (14))
```

```
Cksn ::= OCTET STRING (SIZE (1))
     -- The internal structure is defined in 3GPP TS 24.008
```

```
KSI ::= OCTET STRING (SIZE (1))
     -- The internal structure is defined in 3GPP TS 24.008
```

```
AuthenticationFailureReportArg ::= SEQUENCE {
     imsi                                IMSI,
     failureCause                        FailureCause,
     extensionContainer                  ExtensionContainer              OPTIONAL,
     ... ,
     re-attempt                          BOOLEAN                         OPTIONAL,
     accessType                          AccessType                      OPTIONAL,
     rand                                RAND                            OPTIONAL,
     vlr-Number                          [0] ISDN-AddressString          OPTIONAL,
     sgsn-Number                         [1] ISDN-AddressString          OPTIONAL }
```

```
AccessType ::= ENUMERATED {
     call (0),
     emergencyCall (1),
     locationUpdating (2),
     supplementaryService (3),
     shortMessage (4),
     gprsAttach (5),
     routingAreaUpdating (6),
     serviceRequest (7),
     pdpContextActivation (8),
     pdpContextDeactivation (9),
     ...}
     -- exception handling:
     -- received values greater than 9 shall be ignored.
```

```
AuthenticationFailureReportRes ::= SEQUENCE {
     extensionContainer                  ExtensionContainer              OPTIONAL,
     ...}
```

```
FailureCause ::= ENUMERATED {
     wrongUserResponse  (0),
     wrongNetworkSignature  (1)}
```

-- gprs location registration types

```
UpdateGprsLocationArg ::= SEQUENCE {
     imsi                                IMSI,
     sgsn-Number                         ISDN-AddressString,
     sgsn-Address                        GSN-Address,
     extensionContainer                  ExtensionContainer              OPTIONAL,
     ... ,
     sgsn-Capability                     [0] SGSN-Capability             OPTIONAL,
     informPreviousNetworkEntity         [1]  NULL                       OPTIONAL,
     ps-LCS-NotSupportedByUE             [2]  NULL                       OPTIONAL,
     v-gmlc-Address                      [x]  GSN-Address                OPTIONAL }
```

3GPP TSG CN WG4 Meeting #17 **N4-021567**
Bangkok, THAILAND, 11th – 15th November 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.002** **CR** **518** ⌘ **rev** **3** ⌘ Current version: **5.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

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

Title:	⌘	Addition of V-GMLC and H-GMLC Addresses to the Send Routing Info for LCS response
Source:	⌘	CN4
Work item code:	⌘	LCS2
Date:	⌘	14/11/2002
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)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

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:	⌘	V-GMLC and H-GMLC addresses are needed to be included in the Send Routing Info for LCS response because of the introduction of the Lr interface (GMLC - GMLC). This is needed to align stage 3 with stage 2.
Summary of change:	⌘	V-GMLC and H-GMLC Addresses added to the Send Routing Info for LCS response.
Consequences if not approved:	⌘	Stage 3 definitions for the introduction of the Lr interface (GMLC – GMLC) will be incomplete.

Clauses affected:	⌘	7.6.2, 13A.1, 17.7.13

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

****** FOR INFORMATION ******

From 23.271 v6.1.0:

9.1 Mobile Terminating Location Request

9.1.1 MT-LR routing procedure in PS and CS domain

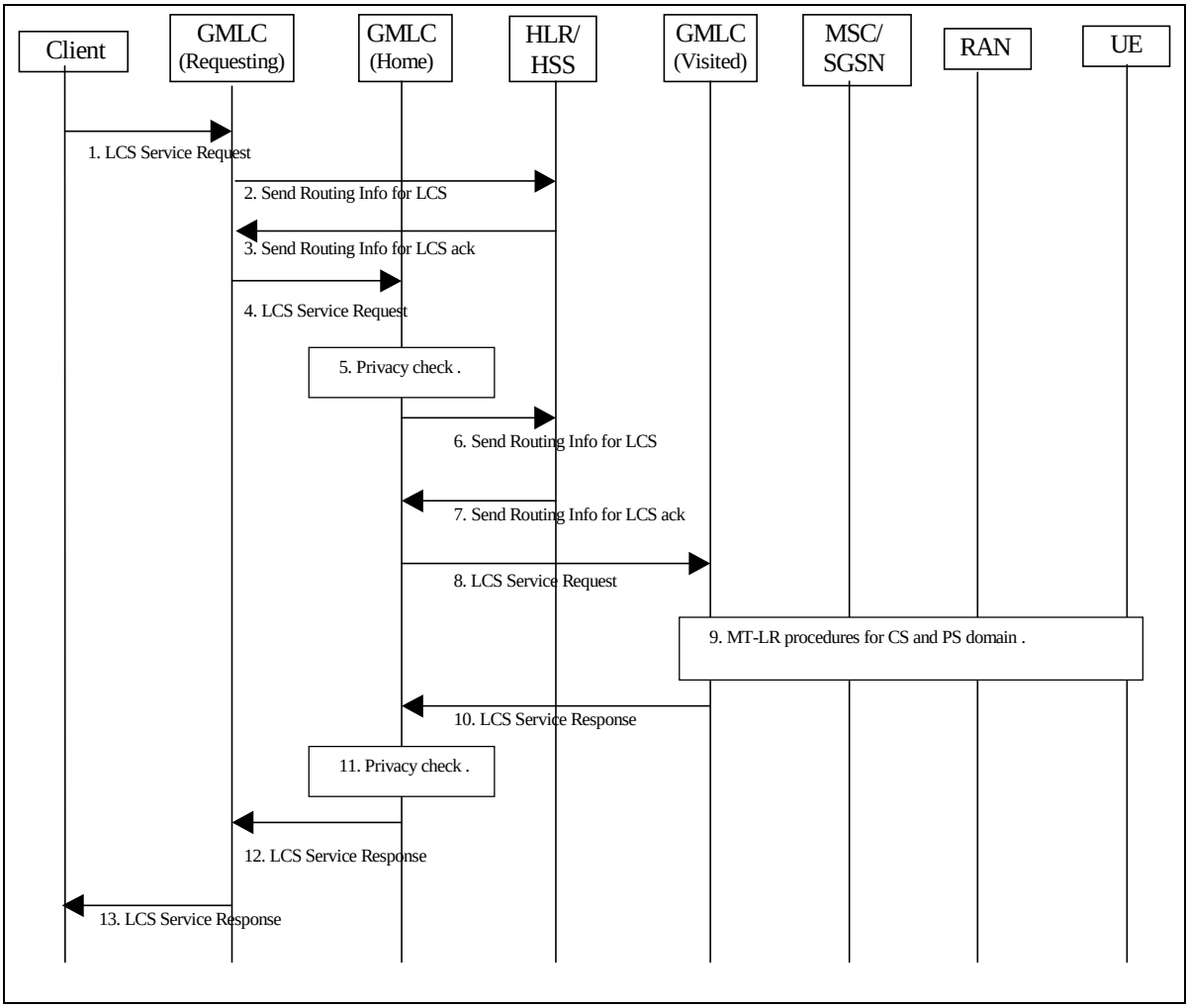

Figure 9.1: General Network Positioning for a MT-LR

1) An external LCS client requests the current location of a target UE from a GMLC. The LCS Client may also request a deferred location request, i.e. based on event. The R-GMLC verifies the identity of the LCS client and its subscription to the LCS service requested and derives the MSISDN or IMSI or PDP address, (NOTE: IP addressing in this context is FFS, one reason is the dynamic IP addressing used in IPv4.) of the target UE to be located and the LCS QoS from either subscription data or data supplied by the LCS client. For a call related location request, the R-GMLC obtains and authenticates the called party number of the LCS client. For a session related location request, the R-GMLC obtains and authenticates the APN-NI of the LCS client.
The LCS request may carry also the Service Identity and the Codeword. The R-GMLC may verify that the Service Identity received in the LCS request matches one of the service identities allowed for the LCS client. If

the service identity does not match one of the service identities for the LCS client, the R-GMLC shall reject the LCS request. Otherwise, the R-GMLC can map the received service identity in a corresponding service type.

If the location request is originated by a Requestor, the Requestor Identity may be added to the LCS service request. LCS client should authenticate the Requestor Identity but this is outside the scope of this specification.

The LCS service request may also contain the type of the Requestor identity if the requestor identity was included.

The R-GMLC verifies whether it stores the privacy profile of the target UE. If the R-GMLC stores the UE's privacy profile, (this means the R-GMLC is the H-GMLC of the target UE), then step 2, 3, 4 and 12 are skipped. If location is required for more than one UE, or if periodic location is requested, the steps following below may be repeated.

Editor's note: This would mean that R-GMLC handles the periodicity of location requests as requested by the LCS client both in CS and PS domain. It is for further study should H-GMLC handle the periodicity of location requests.

2) The R-GMLC sends a SEND_ROUTING_INFO_FOR_LCS message to the home HLR/HSS of the target UE to be located with the IMSI or MSISDN of the UE. If the R-GMLC supports the Lr interface, the R-GMLC capability information shall be included in the SEND_ROUTING_INFO_FOR_LCS message.
If the R-GMLC already knows, or is able to determine, the network address of H-GMLC of the target UE, (e.g. from a previous location request), then step 2 and step 3 may be skipped. One possibility could be to use a DNS lookup to determine the H-GMLC address, but this is FFS.

Editor´s note: According to the current version of TS29.002 the PDP address cannot be transferred by using the SEND_ROUTING_INFO_FOR_LCS message, so this is for ffs.

3) The HLR/HSS verifies the R-GMLC's network address. The HLR/HSS may return the address of the PPR to the GMLC if available. The HLR/HSS then compares the R-GMLC address with the H-GMLC network address for the target UE. The HLR/HSS verifies whether the R-GMLC is authorized to request UE location information. If not, an error response is returned. The HLR/HSS returns the address of the H-GMLC.

4) If R-GMLC finds out that it is the H-GMLC, the signalling steps 4 and 12 are skipped.
The R-GMLC sends the location request to the H-GMLC.

5) The H-GMLC verifies LCS barring restrictions in the UE user's privacy profile in the H-GMLC. In verifying the barring restrictions, barring of the whole location request is assumed if any part of it is barred or any requisite condition is not satisfied. If the location service request is to be barred and the LCS client does not have the override capability, an error response is returned to the R-GMLC or the LCS client.

6) If the H-GMLC already knows both the VMSC/MSC server or SGSN location or the network address of V-GMLC and IMSI for the particular MSISDN or PDP address, (e.g. from a previous location request), the rest of this step and step 7 may be skipped. Otherwise, the H-GMLC sends a SEND_ROUTING_INFO_FOR_LCS message to the home HLR/HSS of the target UE to be located with the IMSI, PDP address or MSISDN of this UE.

Editor´s note: According to the current version of TS29.002 the PDP address cannot be transferred by using the SEND_ROUTING_INFO_FOR_LCS message, so this is for ffs.

7) The HLR/HSS verifies the network address of the H-GMLC in order to check that the H-GMLC is authorized to request UE location information. The HLR/HSS then returns one or several of the network addresses of the current SGSN and/or VMSC/MSC server, the LCS core network signalling capabilities of the serving nodes and whichever of the IMSI and MSISDN was not provided in step (2) or (6) for the particular UE. The HLR/HSS may also return the address of the V-GMLC, if available..

Note: HLR/HSS may prioritize between the MSC/VLR or SGSN address sent to the GMLC. The prioritisation might be based on information received from SGSN and/or MSC/VLR concerning the UE's capabilities for LCS. Other priority criteria are for further study.

8) The GMLC may ask the PPR to perform the privacy check as described in the 9.1.1.1 or if the GMLC stores the UE's privacy profile, the H-GMLC may perform privacy check on the basis of the UE user's privacy profile and the capabilities of the serving nodes (MSC/VLR and/or SGSN).
If the H-GMLC received the address of the V-GMLC from the HLR/HSS and the V-GMLC address is different from the H-GMLC address, the H-GMLC may forward the location request to the V-GMLC. The forwarded location request shall contain, one or several of the network addresses of the current SGSN and/or MSC/VLR, and the IMSI and MSISDN for the target UE. The forwarded location request may also carry the requested action of the VPLMN as the result of the privacy check in the H-GMLC (e.g. by using the pseudo-external identity as described in Annex X). The V-GMLC first authenticates that the location request is allowed from this PLMN or from this country. If not, an error response is returned.
In the cases when the H-GMLC did not receive the address of the V-GMLC, when the V-GMLC address is the same with the H-GMLC address or when both PLMN operators agree not to use Lr interface, the H-GMLC does not forward the location request to the V-GMLC and step 10 is skipped.

Editor's note: The case when the V-GMLC is the same as the R-GMLC may need further elaboration.

9) In case the GMLC (H-GMLC, R-GMLC or V-GMLC) receives only the MSC/VLR address, the MT LR proceeds as the CS-MT-LR procedure described in 9.1.2. In case GMLC receives only the SGSN address, the MT LR proceeds as the PS-MT-LR procedure described in 9.1.6. In case the GMLC receives several of the following addresses, SGSN, VMSC and/or MSC Server, it has to decide where to send the location request. If the requested MT-LR is known to be associated with a CS call, the CS-MT-LR procedure shall be invoked. If the requested MT-LR is associated with a PS session, the PS-MT-LR procedure only shall be invoked. Otherwise, both CS-MT-LR and PS-MT-LR are applicable. If LCS Client indicated deferred location request, GMLC shall indicate this together with applicable event type (ex. UE available) in requested PS/CS-MT-LR, see 9.1.8.

NOTE: The order in which these procedures are invoked and whether one or both procedures are used may depend on subscription information for the LCS client, possible priority information returned by the HSS or information already stored in the GMLC (e.g. obtained from previous location requests).

10) The V-GMLC sends the location service response to the H-GMLC.

11) If the privacy check in step 5 indicates that further privacy checks are needed, or on the basis of the privacy profile, the H-GMLC shall perform an additional privacy check.

12) The H-GMLC sends the location service response to the R-GMLC.

13) R-GMLC sends the location service response to the LCS client. If the LCS client requires it, the R-GMLC may first transform the universal location co-ordinates provided by the SGSN or MSC/MSC server into some local geographic system. The GMLC may record billing for both the LCS client and inter-network revenue charges from the SGSN or MSC/MSC server's network.

The detailed CS-MT-LR and PS-MT-LR procedures in step 4 of figure 9.1 are described in 9.1.2 and 9.1.6.

The detailed procedure for deferred PS/CS-MT-LR is described in 9.1.8.

****** FIRST MODIFIED SECTION ******

7.6.2 Numbering and identification parameters

…

7.6.2.xx V-GMLC Address

This parameter refers to the IP address of a V-GMLC.

7.6.2.xx H-GMLC Address

This parameter refers to the IP address of a H-GMLC.

****** NEXT MODIFIED SECTION ******

13A Location Service Management Services

13A.1 MAP-SEND-ROUTING-INFO-FOR-LCS Service

13A.1.1 Definition

This service is used between the GMLC and the HLR to retrieve the routing information needed for routing a location service request to the servicing VMSC or SGSN. The MAP-SEND-ROUTING-INFO-FOR-LCS is a confirmed service using the primitives from table 13A.1/1.

13A.1.2 Service Primitives

Table 13A.1/1: MAP-SEND-ROUTING-INFO-FOR-LCS

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
MLC Number	M	M(=)		
MSISDN	C	C(=)	C	C(=)
IMSI	C	C(=)	C	C(=)
LCS Codeword Applicability	C	C(=)		
LMSI			C	C(=)
Network Node Number			C	C(=)
GPRS Node Indicator			C	C(=)
Additional Number			C	C(=)
LCS Codeword Notification			C	C(=)
V-GMLC Address			U	C(=)
H-GMLC Address			C	C(=)
User error			C	C(=)
Provider error				O

13A.1.3 Parameter Use

Invoke id

See definition in clause 7.6.1.

MLC Number

See definition in clause 7.6.2.

MSISDN

See definition in clause 7.6.2. The request shall carry either the IMSI or MSISDN. The response shall carry whichever of these was not included in the request (see 3GPP TS 23.271 for details).

IMSI

See definition in clause 7.6.2.

LCS Codeword Applicability

See definition in clause 7.6.11.19.

LMSI

See definition in clause 7.6.2. It is an operator option to provide this parameter from the VLR; it is mandatory for the HLR to include the LMSI in a successful response, if the VLR has used the LMSI.

Network Node Number

See definition in clause 7.6.2. This parameter is provided in a successful response. If the “Network Node Number” and “Additional Number” are received in the GMLC, the "Network Node Number" is used in preference to the "Additional Number".

GPRS Node Indicator

See definition in clause 7.6.8. The presence of this parameter is mandatory only if the SGSN number is sent in the Network Node Number.

Additional Number

See definition in clause 7.6.2. This parameter is provided in a successful response. If the “Network Node Number” and “Additional Number” are received in the GMLC, the "Network Node Number" is used in preference to the "Additional Number".

LCS Codeword Notification

See definition in clause 7.6.11.22. The presence of this parameter indicates that codeword shall be sent to the subscriber. HLR may include this parameter in the response only if codeword checks had been indicated as applicable in the request.

V-GMLC address

See definition in clause 7.6.2.

H-GMLC address

See definition in clause 7.6.2. The requirements for its presence are specified in 3GPP TS 23.271 [26a].

User error

The following errors defined in clause 7.6.1 may be used, depending on the nature of the fault:

- Unknown subscriber;
- Absent Subscriber;
- Facility Not Supported;
- System failure;
- Unexpected Data Value;
- Data missing;
- Unauthorised requesting network.

Provider error

For definition of provider errors see clause 7.6.1.

****** NEXT MODIFIED SECTION ******

17.7.13 Location service data types

```
MAP-LCS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-LCS-DataTypes (25) version8 (8)}

DEFINITIONS
IMPLICIT TAGS
::=
BEGIN

EXPORTS
   RoutingInfoForLCS-Arg,
   RoutingInfoForLCS-Res,
   ProvideSubscriberLocation-Arg,
   ProvideSubscriberLocation-Res,
   SubscriberLocationReport-Arg,
   SubscriberLocationReport-Res,
   LocationType,
   LCSClientName,
   LCS-QoS,
   Horizontal-Accuracy,
   ResponseTime,
   Ext-GeographicalInformation,
   SupportedGADShapes,
   Add-GeographicalInformation,
   LCSRequestorID,
   LCSCodeword
;

IMPORTS
   AddressString,
   ISDN-AddressString,
   IMEI,
   IMSI,
   LMSI,
   SubscriberIdentity,
   AgeOfLocationInformation,
   LCSClientExternalID,
   LCSClientInternalID,
   LCSServiceTypeID
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version8 (8)}

   USSD-DataCodingScheme,
   USSD-String
FROM MAP-SS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0) gsm-Network (1) modules (3)
   map-SS-DataTypes (14) version8 (8)}

   APN
FROM MAP-MS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MS-DataTypes (11) version8 (8)}

   Additional-Number
FROM MAP-SM-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SM-DataTypes (16) version8 (8)}
;
```

```
RoutingInfoForLCS-Arg ::= SEQUENCE {
     mlcNumber                          [0] ISDN-AddressString,
     targetMS                           [1] SubscriberIdentity,
     extensionContainer                 [2] ExtensionContainer            OPTIONAL,
     ...,
     lcsCodewordApplicability           [3]  LCSCodewordApplicability     OPTIONAL }
```

```
LCSCodewordApplicability ::= ENUMERATED {
     codewordCheckApplicable              (0),
     codewordCheckNotApplicable           (1),
     ...}
--   exception handling:
--   unrecognized values shall be ignored by the receiver.
```

```
RoutingInfoForLCS-Res ::= SEQUENCE {
     targetMS                             [0] SubscriberIdentity,
     lcsLocationInfo                      [1] LCSLocationInfo,
     extensionContainer                   [2] ExtensionContainer            OPTIONAL,
     ...,
     lcsCodewordNotification              [3]  NULL                         OPTIONAL,
     v-gmlc-Address                       [x]  GSN-Address                  OPTIONAL,
     h-gmlc-Address                       [x]  GSN-Address                  OPTIONAL }
     -- lcsCodewordNotification may be present only if
     -- lcsCodewordApplicability was present in RoutingInfoForLCS-Arg.
     -- If received when lcsCodewordApplicability was not present in
     -- RoutingInfoForLCS-Arg then lcsCodewordNotification shall be ignored.
}
```

3GPP TSG CN WG4 Meeting #17 **N4-021506**
Bangkok, THAILAND, 11th – 15th November 2002

CR-Form-v7

CHANGE REQUEST

⌘ **29.002** **CR** **519** ⌘ **rev** **2** ⌘ Current version: **5.3.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

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

Title:	⌘	Addition of PPR Address to the Send Routing Info for LCS response
Source:	⌘	CN4
Work item code:	⌘	LCS2
Date:	⌘	12/11/2002
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)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

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:	⌘	PPR address is needed to be included in the Send Routing Info for LCS response because of the introduction of the Privacy Profile Register (PPR). This is needed to align stage 3 with stage 2.
Summary of change:	⌘	PPR Address is added to the Send Routing Info for LCS response.
Consequences if not approved:	⌘	Stage 3 definitions for the introduction of the Privacy Profile Register will be incomplete.

Clauses affected:	⌘	

		Y	N			
Other specs affected:	⌘		X	Other core specifications	⌘	
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

****** FOR INFORMATION ******

From 23.271 v6.1.0:

9.1 Mobile Terminating Location Request

9.1.1 MT-LR routing procedure in PS and CS domain

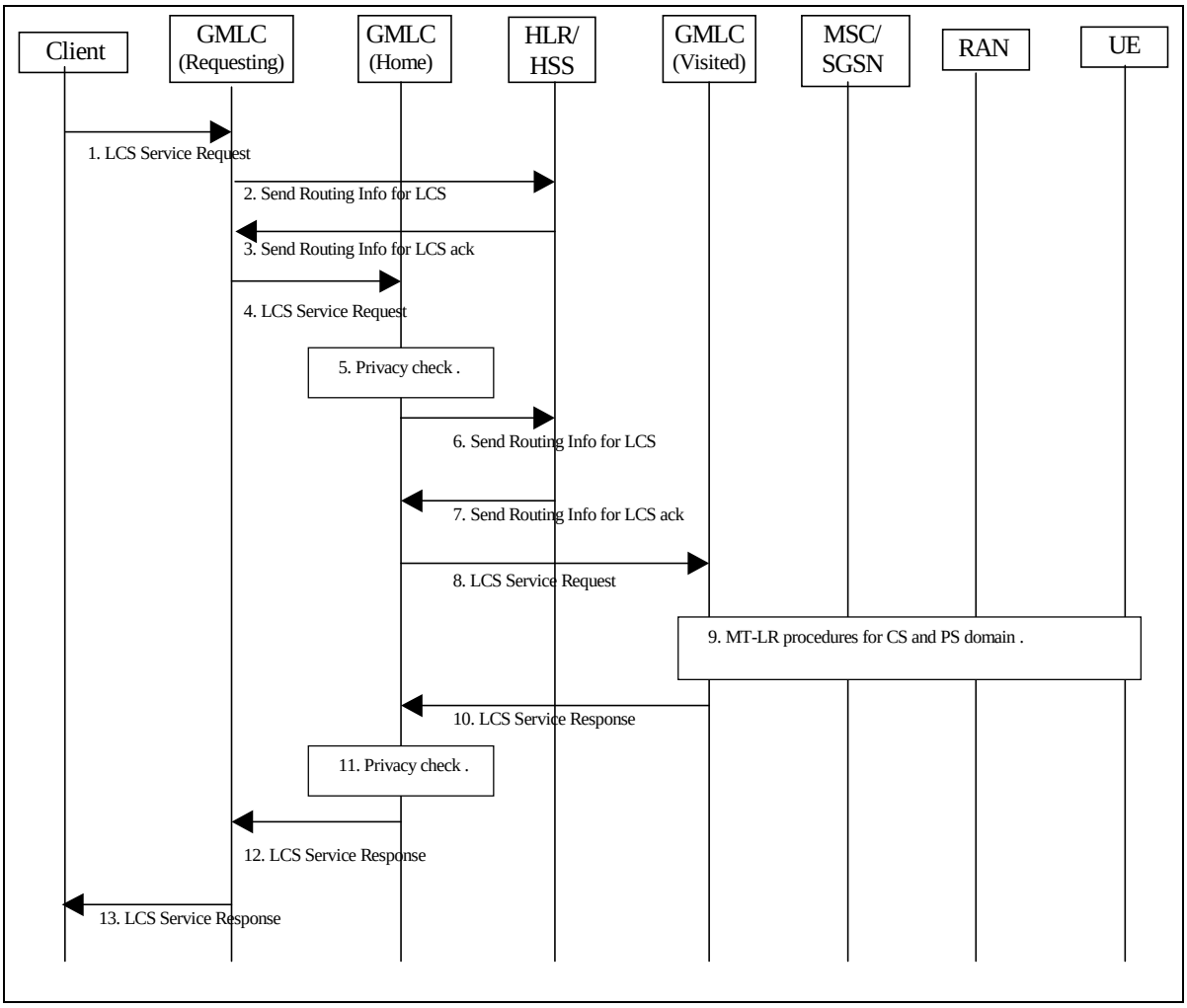

Figure 9.1: General Network Positioning for a MT-LR

1) An external LCS client requests the current location of a target UE from a GMLC. The LCS Client may also request a deferred location request, i.e. based on event. The R-GMLC verifies the identity of the LCS client and its subscription to the LCS service requested and derives the MSISDN or IMSI or PDP address, (NOTE: IP addressing in this context is FFS, one reason is the dynamic IP addressing used in IPv4.) of the target UE to be located and the LCS QoS from either subscription data or data supplied by the LCS client. For a call related location request, the R-GMLC obtains and authenticates the called party number of the LCS client. For a session related location request, the R-GMLC obtains and authenticates the APN-NI of the LCS client.
The LCS request may carry also the Service Identity and the Codeword. The R-GMLC may verify that the Service Identity received in the LCS request matches one of the service identities allowed for the LCS client. If the service identity does not match one of the service identities for the LCS client, the R-GMLC shall reject the LCS request. Otherwise, the R-GMLC can map the received service identity in a corresponding service type.

If the location request is originated by a Requestor, the Requestor Identity may be added to the LCS service request. LCS client should authenticate the Requestor Identity but this is outside the scope of this specification.

The LCS service request may also contain the type of the Requestor identity if the requestor identity was included.

The R-GMLC verifies whether it stores the privacy profile of the target UE. If the R-GMLC stores the UE's privacy profile, (this means the R-GMLC is the H-GMLC of the target UE), then step 2, 3, 4 and 12 are skipped. If location is required for more than one UE, or if periodic location is requested, the steps following below may be repeated.

Editor's note: This would mean that R-GMLC handles the periodicity of location requests as requested by the LCS client both in CS and PS domain. It is for further study should H-GMLC handle the periodicity of location requests.

2) The R-GMLC sends a SEND_ROUTING_INFO_FOR_LCS message to the home HLR/HSS of the target UE to be located with the IMSI or MSISDN of the UE. If the R-GMLC supports the Lr interface, the R-GMLC capability information shall be included in the SEND_ROUTING_INFO_FOR_LCS message.
If the R-GMLC already knows, or is able to determine, the network address of H-GMLC of the target UE, (e.g. from a previous location request), then step 2 and step 3 may be skipped. One possibility could be to use a DNS lookup to determine the H-GMLC address, but this is FFS.

Editor´s note: According to the current version of TS29.002 the PDP address cannot be transferred by using the SEND_ROUTING_INFO_FOR_LCS message, so this is for ffs.

3) The HLR/HSS verifies the R-GMLC's network address. The HLR/HSS may return the address of the PPR to the GMLC if available. The HLR/HSS then compares the R-GMLC address with the H-GMLC network address for the target UE. The HLR/HSS verifies whether the R-GMLC is authorized to request UE location information. If not, an error response is returned. The HLR/HSS returns the address of the H-GMLC.

4) If R-GMLC finds out that it is the H-GMLC, the signalling steps 4 and 12 are skipped.
The R-GMLC sends the location request to the H-GMLC.

5) The H-GMLC verifies LCS barring restrictions in the UE user's privacy profile in the H-GMLC. In verifying the barring restrictions, barring of the whole location request is assumed if any part of it is barred or any requisite condition is not satisfied. If the location service request is to be barred and the LCS client does not have the override capability, an error response is returned to the R-GMLC or the LCS client.

6) If the H-GMLC already knows both the VMSC/MSC server or SGSN location or the network address of V-GMLC and IMSI for the particular MSISDN or PDP address, (e.g. from a previous location request), the rest of this step and step 7 may be skipped. Otherwise, the H-GMLC sends a SEND_ROUTING_INFO_FOR_LCS message to the home HLR/HSS of the target UE to be located with the IMSI, PDP address or MSISDN of this UE.

Editor´s note: According to the current version of TS29.002 the PDP address cannot be transferred by using the SEND_ROUTING_INFO_FOR_LCS message, so this is for ffs.

7) The HLR/HSS verifies the network address of the H-GMLC in order to check that the H-GMLC is authorized to request UE location information. The HLR/HSS then returns one or several of the network addresses of the current SGSN and/or VMSC/MSC server, the LCS core network signalling capabilities of the serving nodes and whichever of the IMSI and MSISDN was not provided in step (2) or (6) for the particular UE. The HLR/HSS may also return the address of the V-GMLC, if available..

Note: HLR/HSS may prioritize between the MSC/VLR or SGSN address sent to the GMLC. The prioritisation might be based on information received from SGSN and/or MSC/VLR concerning the UE's capabilities for LCS. Other priority criteria are for further study.

8) The GMLC may ask the PPR to perform the privacy check as described in the 9.1.1.1 or if the GMLC stores the UE's privacy profile, the H-GMLC may perform privacy check on the basis of the UE user's privacy profile and the capabilities of the serving nodes (MSC/VLR and/or SGSN).

If the H-GMLC received the address of the V-GMLC from the HLR/HSS and the V-GMLC address is different from the H-GMLC address, the H-GMLC may forward the location request to the V-GMLC. The forwarded location request shall contain, one or several of the network addresses of the current SGSN and/or MSC/VLR, and the IMSI and MSISDN for the target UE. The forwarded location request may also carry the requested action of the VPLMN as the result of the privacy check in the H-GMLC (e.g. by using the pseudo-external identity as described in Annex X). The V-GMLC first authenticates that the location request is allowed from this PLMN or from this country. If not, an error response is returned.
In the cases when the H-GMLC did not receive the address of the V-GMLC, when the V-GMLC address is the same with the H-GMLC address or when both PLMN operators agree not to use Lr interface, the H-GMLC does not forward the location request to the V-GMLC and step 10 is skipped.

Editor's note: The case when the V-GMLC is the same as the R-GMLC may need further elaboration.

9) In case the GMLC (H-GMLC, R-GMLC or V-GMLC) receives only the MSC/VLR address, the MT LR proceeds as the CS-MT-LR procedure described in 9.1.2. In case GMLC receives only the SGSN address, the MT LR proceeds as the PS-MT-LR procedure described in 9.1.6. In case the GMLC receives several of the following addresses, SGSN, VMSC and/or MSC Server, it has to decide where to send the location request. If the requested MT-LR is known to be associated with a CS call, the CS-MT-LR procedure shall be invoked. If the requested MT-LR is associated with a PS session, the PS-MT-LR procedure only shall be invoked. Otherwise, both CS-MT-LR and PS-MT-LR are applicable. If LCS Client indicated deferred location request, GMLC shall indicate this together with applicable event type (ex. UE available) in requested PS/CS-MT-LR, see 9.1.8.

NOTE: The order in which these procedures are invoked and whether one or both procedures are used may depend on subscription information for the LCS client, possible priority information returned by the HSS or information already stored in the GMLC (e.g. obtained from previous location requests).

10) The V-GMLC sends the location service response to the H-GMLC.

11) If the privacy check in step 5 indicates that further privacy checks are needed, or on the basis of the privacy profile, the H-GMLC shall perform an additional privacy check.

12) The H-GMLC sends the location service response to the R-GMLC.

13) R-GMLC sends the location service response to the LCS client. If the LCS client requires it, the R-GMLC may first transform the universal location co-ordinates provided by the SGSN or MSC/MSC server into some local geographic system. The GMLC may record billing for both the LCS client and inter-network revenue charges from the SGSN or MSC/MSC server's network.

The detailed CS-MT-LR and PS-MT-LR procedures in step 4 of figure 9.1 are described in 9.1.2 and 9.1.6.

The detailed procedure for deferred PS/CS-MT-LR is described in 9.1.8.

****** FIRST MODIFIED SECTION ******

7.6.2 Numbering and identification parameters

…

7.6.2.xx PPR Address

This parameter refers to the IP address of a Privacy Profile Register.

****** NEXT MODIFIED SECTION ******

13A Location Service Management Services

13A.1 MAP-SEND-ROUTING-INFO-FOR-LCS Service

13A.1.1 Definition

This service is used between the GMLC and the HLR to retrieve the routing information needed for routing a location service request to the servicing VMSC or SGSN. The MAP-SEND-ROUTING-INFO-FOR-LCS is a confirmed service using the primitives from table 13A.1/1.

13A.1.2 Service Primitives

Table 13A.1/1: MAP-SEND-ROUTING-INFO-FOR-LCS

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
MLC Number	M	M(=)		
MSISDN	C	C(=)	C	C(=)
IMSI	C	C(=)	C	C(=)
LCS Codeword Applicability	C	C(=)		
LMSI			C	C(=)
Network Node Number			C	C(=)
GPRS Node Indicator			C	C(=)
Additional Number			C	C(=)
LCS Codeword Notification			C	C(=)
PPR Address			U	C(=)
User error			C	C(=)
Provider error				O

13A.1.3 Parameter Use

Invoke id

See definition in clause 7.6.1.

MLC Number

See definition in clause 7.6.2.

MSISDN

See definition in clause 7.6.2. The request shall carry either the IMSI or MSISDN. The response shall carry whichever of these was not included in the request (see 3GPP TS 23.271 for details).

IMSI

See definition in clause 7.6.2.

LCS Codeword Applicability

See definition in clause 7.6.11.19.

LMSI

See definition in clause 7.6.2. It is an operator option to provide this parameter from the VLR; it is mandatory for the HLR to include the LMSI in a successful response, if the VLR has used the LMSI.

Network Node Number

See definition in clause 7.6.2. This parameter is provided in a successful response. If the “Network Node Number” and “Additional Number” are received in the GMLC, the "Network Node Number" is used in preference to the "Additional Number".

GPRS Node Indicator

See definition in clause 7.6.8. The presence of this parameter is mandatory only if the SGSN number is sent in the Network Node Number.

Additional Number

See definition in clause 7.6.2. This parameter is provided in a successful response. If the “Network Node Number” and “Additional Number” are received in the GMLC, the "Network Node Number" is used in preference to the "Additional Number".

LCS Codeword Notification

See definition in clause 7.6.11.22. The presence of this parameter indicates that codeword shall be sent to the subscriber. HLR may include this parameter in the response only if codeword checks had been indicated as applicable in the request.

PPR address

See definition in clause 7.6.2.

User error

The following errors defined in clause 7.6.1 may be used, depending on the nature of the fault:

- Unknown subscriber;
- Absent Subscriber;
- Facility Not Supported;
- System failure;
- Unexpected Data Value;
- Data missing;
- Unauthorised requesting network.

Provider error

For definition of provider errors see clause 7.6.1.

****** NEXT MODIFIED SECTION ******

17.7.13 Location service data types

```
MAP-LCS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-LCS-DataTypes (25) version8 (8)}

DEFINITIONS
IMPLICIT TAGS
::=
BEGIN

EXPORTS
   RoutingInfoForLCS-Arg,
   RoutingInfoForLCS-Res,
   ProvideSubscriberLocation-Arg,
   ProvideSubscriberLocation-Res,
   SubscriberLocationReport-Arg,
   SubscriberLocationReport-Res,
   LocationType,
   LCSClientName,
   LCS-QoS,
   Horizontal-Accuracy,
   ResponseTime,
   Ext-GeographicalInformation,
   SupportedGADShapes,
   Add-GeographicalInformation,
   LCSRequestorID,
   LCSCodeword
;

IMPORTS
   AddressString,
   ISDN-AddressString,
   IMEI,
   IMSI,
   LMSI,
   SubscriberIdentity,
   AgeOfLocationInformation,
   LCSClientExternalID,
   LCSClientInternalID,
   LCSServiceTypeID
FROM MAP-CommonDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-CommonDataTypes (18) version8 (8)}

   ExtensionContainer
FROM MAP-ExtensionDataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-ExtensionDataTypes (21) version8 (8)}

   USSD-DataCodingScheme,
   USSD-String
FROM MAP-SS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0) gsm-Network (1) modules (3)
   map-SS-DataTypes (14) version8 (8)}

   APN
FROM MAP-MS-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-MS-DataTypes (11) version8 (8)}

   Additional-Number
FROM MAP-SM-DataTypes {
   itu-t identified-organization (4) etsi (0) mobileDomain (0)
   gsm-Network (1) modules (3) map-SM-DataTypes (16) version8 (8)}
;
```

```
RoutingInfoForLCS-Arg ::= SEQUENCE {
     mlcNumber                          [0] ISDN-AddressString,
     targetMS                           [1] SubscriberIdentity,
     extensionContainer                 [2] ExtensionContainer            OPTIONAL,
     ...,
     lcsCodewordApplicability           [3]  LCSCodewordApplicability     OPTIONAL }
```

```
LCSCodewordApplicability ::= ENUMERATED {
     codewordCheckApplicable              (0),
     codewordCheckNotApplicable           (1),
     ...}
--   exception handling:
--   unrecognized values shall be ignored by the receiver.
```

```
RoutingInfoForLCS-Res ::= SEQUENCE {
     targetMS                             [0] SubscriberIdentity,
     lcsLocationInfo                      [1] LCSLocationInfo,
     extensionContainer                   [2] ExtensionContainer            OPTIONAL,
     ...,
     lcsCodewordNotification              [3]  NULL                         OPTIONAL,
     ppr-Address                          [x]  GSN-Address                  OPTIONAL }
     -- lcsCodewordNotification may be present only if
     -- lcsCodewordApplicability was present in RoutingInfoForLCS-Arg.
     -- If received when lcsCodewordApplicability was not present in
     -- RoutingInfoForLCS-Arg then lcsCodewordNotification shall be ignored.
}
```