Technical Specification Group Services and System Aspects ***TSGS#12(01)0510***

Meeting #13, Beijing, China, 24-27 September 2001

Source: **TSG SA WG2**
Title: **CRs on LCS at SA2 (03.71, 23.171, 23.271)**
Agenda Item: **7.2.3**

The following Change Requests (CRs) have been approved by TSG SA WG2 and are requested to be approved by TSG SA plenary #13.
Note: the source of all these CRs is now S2, even if the name of the originating company(ies) is still reflected on the cover page of all the attached CRs.

- CR applicable to different Releases:

Spec	CR #	Rev	Rel	Title	cat	Ver in	Ver out	S2 Tdoc #	WI
03.71	A032	1	R98	Applicability of Privacy Override Indicator	F	7.6.0	7.7.0	S2-012362	LCS
03.71	A029	1	R99	Applicability of Privacy Override Indicator	A	8.2.0	8.3.0	S2-012359	LCS
23.171	019	1	R99	Applicability of Privacy Override Indicator	F	3.4.0	3.5.0	S2-012360	LCS
23.271	032	1	R4	Applicability of Privacy Override Indicator	F	4.2.0	4.3.0	S2-012361	LCS1
03.71	A030	1	R98	Correction of Inconsistent text	F	7.6.0	7.7.0	S2-012357	LCS
03.71	A031	1	R99	Correction of Inconsistent Text	A	8.2.0	8.3.0	S2-012358	LCS

- CR applicable to Release 4:

Spec	CR #	Rev	Rel	Title	cat	Ver in	Ver out	S2 Tdoc #	WI
23.271	028	1	R4	Correction on the categorization of the periodical location request	F	4.2.0	4.3.0	S2-012363	LCS1
23.271	029		R4	Addition of the notification on the acceptance of the deferred location request	F	4.2.0	4.3.0	S2-012180	LCS1
23.271	031	1	R4	Correction on the handling of the deferred location request in detached case	F	4.2.0	4.3.0	S2-012365	LCS1
23.271	033		R4	Privacy Check procedures for CS Call related MT-LR	F	4.2.0	4.3.0	S2-012191	LCS1
23.271	034	1	R4	Privacy Class selection rule clarification	F	4.2.0	4.3.0	S2-012366	LCS1

- CR creating Release 5 (to be implemented after the other ones):

Spec	CR #	Rev	Rel	Title	cat	Ver in	Ver out	S2 Tdoc #	WI
23.271	035	1	R5	Release 5 alignment of 23.271 with GERAN LCS stage 2, TS 43.059	B	4.2.0	5.0.0	S2-012367	LCS1

3GPP TSG-SA2 Meeting #19
Sophia Antipolis, France, 27 – 31 August, 2001

Tdoc S2-012359
(Revised S2-012188)

CR-Form-v3

CHANGE REQUEST

⌘ **03.71** **CR** **A029** ⌘ rev **1** ⌘ Current version: **8.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Applicability of Privacy Override Indicator
Source:	⌘	Ericsson
Work item code:	⌘	LCS
Date:	⌘	2001-Aug-21
Category:	⌘	**A**
Release:	⌘	R99

Use one of the following categories:
F *(essential 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)*

Reason for change:	⌘	The current handling of the Privacy Override Indicator is not according to LCS stage 1 3GPP TS 22.071.
Summary of change:	⌘	The Privacy Override Indicator shall be applicable only if the subscriber to be positioned is in the same country as the GMLC, as allowed by regulatory requirements.
Consequences if not approved:	⌘	The Privacy Override Indicator would be handled not according to LCS stage 1 requirements. Misalignement between LCS stage1 and stage2 TSs.

Clauses affected:	⌘	7.12.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	This is a mirror CR for CR A032 on TS 03.71 v.7.6.0 (R98).

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

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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

7.12.1 Privacy Override Indicator (POI)

The POI is used to determine whether the privacy settings of the subscriber to be positioned shall be overridden by the request for location services. The assignment of a POI value with an 'override' or 'not override' value in the LCS client profile is done during the LCS client provisioning. The type of LCS client requesting location information (i.e.emergency, law-enforcement etc.) shall determine the value of the POI assigned to the LCS client profile.

There are two distinct cases regarding the handling of the privacy override indicator.

Procedure A*:* If the subscriber to be positioned is in the ~~same PLMN or~~ same country as the GMLC then the POI shall override the subscriber's privacy options~~.~~, as allowed by regulatory requirements.

Procedure B: Otherwise the POI shall not override the subscriber's privacy options**.**

3GPP TSG-SA WG2 Meeting #19 ***Tdoc S2-012357***
Sophia Antipolis, France, 27th – 31st, August 2001 (Revision of Tdoc S2-012193)

CR-Form-v3

CHANGE REQUEST

⌘ **03.71** **CR** **A030** ⌘ rev **1** ⌘ Current version: **7.6.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Correction of Inconsistent Text
Source:	⌘	Ericsson and Motorola
Work item code:	⌘	LCS
Date:	⌘	2001-08-07
Category:	⌘	**F**
Release:	⌘	R98

Use one of the following categories:
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Use one of the following releases:
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R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Make descriptions consistent with the Stage 3 specs and agreed principle that all assistance messages are optional to allow enough flexibility and to reduce traffic flow, which will in turn benefit future enhancement. Make sure that the broadcast messages specified in Stage 3 are described properly.
Summary of change:	⌘	Change the wording
Consequences if not approved:	⌘	It would lead to unnecessary confusion, inconsistency, and inefficiency.

Clauses affected:	⌘	10.1, 10.2, 10.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	The content of this CR was approved by SA2 already (see Tdoc S2-011513, CR A023 rev.2 on TS 03.71 rev. 7.5.0), but SA plenary sent it back to SA2. This document includes the comments received in the SA plenary meeting and it is based on the newest revision of the TS.

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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.

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

10 E-OTD and GPS Positioning Procedures

10.1 General Procedures

For any location request where the highest priority level is assigned and MS-based GPS positioning is not used, the SMLC shall provide sufficient assistance data to a target MS to enable a location estimate or location measurements to succeed according to the required QoS on the first attempt. The SMLC shall not assume in this case that the target MS already possesses assistance data. For a lower priority location request or when MS-based GPS positioning is used, the SMLC may reduce the assistance data provided to a target MS on the first location attempt. For these cases, sections 10.2 and 10.3 indicate what reduced assistance data may be provided.

In the high priority case with MS-assisted GPS for the first positioning attempt, acquisition assistance data shall be included in the RRLP measure position request message.

10.2 Positioning for BSS based SMLC

This signaling flow is generic for all MS based or assisted location methods (MS Based E-OTD, MS Assisted E-OTD, GPS and Assisted GPS). If the SMLC desires to avoid lower layer (e.g. BSSAP-LE) segmentation and transfer the LCS assistance data more reliably, this procedure may be preceded by an "Assistance Data Delivery from BSS based SMLC" procedure. Note that part of the entire set of assistance data may be included in the RRLP Measure Position Request even when the message is preceded by an "Assistance Data Delivery from BSS based SMLC" procedure.

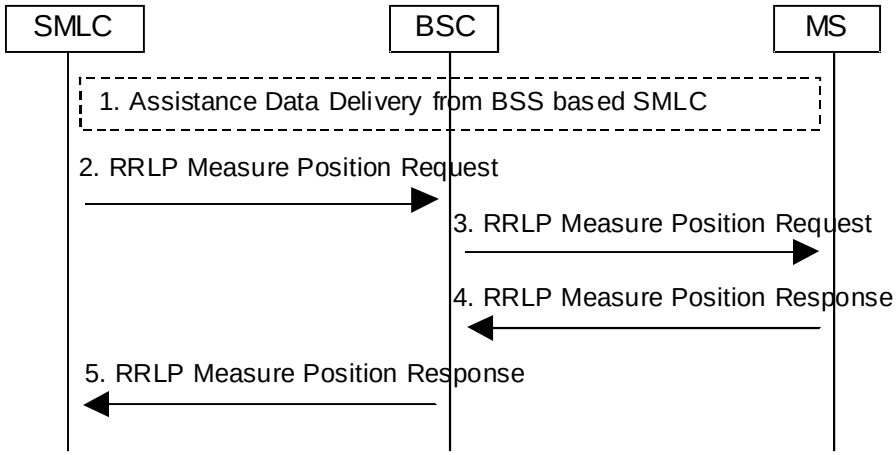

Figure 54: E-OTD/GPS Positioning Flow

1. The SMLC may precede the RRLP MEASURE POSITION REQUEST with an optional Assistance Data Delivery from BSS based SMLC procedure (see 10.4).

2. The SMLC determines possible assistance data and sends RRLP MEASURE POSITION REQUEST to the BSC.

3. The BSC forwards the positioning request including the QoS and any assistance data to the MS in a RRLP MEASURE POSITION REQUEST.

4. The MS performs the requested E-OTD or GPS measurements, if needed assistance data is available in the MS. If the MS is able to calculate its own location and this is required and needed assistance data is available in MS, the MS computes a location estimate based on E-OTD or GPS measurements. In case of E-OTD, any data necessary to perform these operations will either be provided in the RRLP MEASURE POSITION REQUEST~~request~~ or available from broadcast sources. In case of Assisted GPS and first positioning attempt, a minimum set of ~~Acquisition Assistance data and optionally Differential~~ GPS assistance data will be either provided in the RRLP MEASURE POSITION REQUEST or available from broadcast sources. ~~In case of MS based GPS and~~For further positioning attempt (failure in first attempt due to missing assistance data), ~~complete~~sufficient GPS assistance data, possibly excluding the assistance data sent in the first

attempt~~Acquisition Assistance data,~~ will be provided in the RRLP MEASURE POSITION REQUEST and possibly preceding RRLP ASSISTANCE DATA messages. The resulting E-OTD or GPS measurements or E-OTD or GPS location estimate are returned to the BSC in a RRLP MEASURE POSITION RESPONSE. If the MS was unable to perform the necessary measurements, or compute a location, a failure indication identifying the reason for failure (e.g. missing assistance data) is returned instead.

5. BSC forwards the RRLP MEASURE POSITION response to SMLC.

10.3 Positioning for NSS based SMLC

This signaling flow is generic for all MS based or assisted location methods (MS Based E-OTD, MS Assisted E-OTD, GPS and Assisted GPS). If the SMLC desires to avoid lower layer (e.g. BSSAP-LE) segmentation and transfer the LCS assistance data more reliably, this procedure may be preceded by an "Assistance Data Delivery from NSS based SMLC" procedure. Note that part of the entire set of assistance data may be included in the RRLP Measure Position Request even when the message is preceded by an "Assistance Data Delivery from NSS based SMLC" procedure.

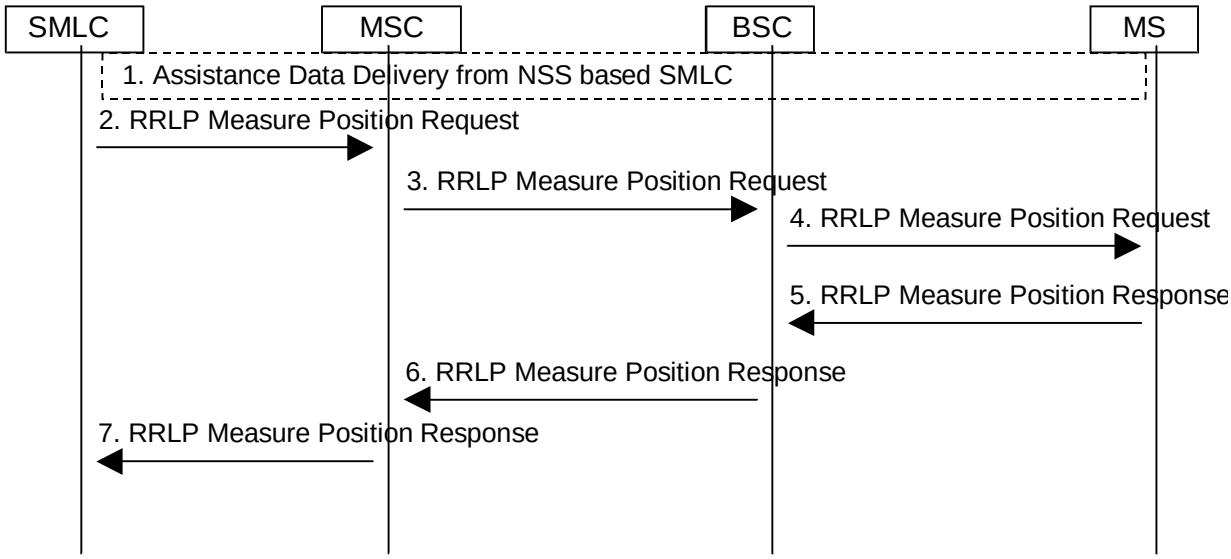

Figure 55: E-OTD/GPS Positioning Flow

1. The SMLC may precede the RRLP MEASURE POSITION REQUEST with an optional Assistance Data Delivery from NSS based SMLC procedure (see 10.5).

2. The SMLC determines possible assistance data and sends RRLP MEASURE POSITION REQUEST to MSC.

3. The MSC forwards the RRLP MEASURE POSITION REQUEST to the BSC.

4. The BSC sends the positioning request including the QoS and any assistance data to the MS in a RRLP MEASURE POSITION REQUEST.

5. The MS performs the requested E-OTD or GPS measurements, if needed assistance data is available in MS. If the MS is able to calculate its own location and this is required and needed assistance data is available in MS, the MS computes an E-OTD or GPS location estimate. In case of E-OTD, any data necessary to perform these operations will be either provided in the RRLP MEASURE POSITOIN REQUEST~~request~~ or available from broadcast sources. In case of Assisted GPS and first positioning attempt, a minimum set of ~~Acquisition Assistance data and optionally Differential~~ GPS assistance data will be either provided in the RRLP MEASURE POSITION REQUEST or available from broadcast sources. ~~In case of MS based GPS and~~For further positioning attempt (failure in first attempt due to missing assistance data), ~~complete~~sufficient GPS assistance data, possibly excluding the assistance data sent in the first attempt~~Acquisition Assistance data~~, will be provided in the RRLP MEASURE POSITION REQUEST and possibly preceding RRLP ASSISTANCE DATA messages. The resulting E-OTD or GPS measurements or E-OTD or GPS location estimate are returned to the BSC in a RRLP MEASURE POSITION RESPONSE. If the MS was unable to perform the necessary measurements, or compute a location, a failure indication identifying the reason for failure (e.g. missing assistance data) is returned instead.

6. BSC sends measurement results in the MEASURE POSITION RESPONSE within BSSMAP Connection Oriented Information message to MSC.

7. MSC forwards the measurement results in the MEASURE POSITION RESPONSE within LCS Information Report message to SMLC.

CR-Form-v3

CHANGE REQUEST

⌘ **03.71** **CR** **A031** ⌘ rev **1** ⌘ Current version: **8.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Correction of Inconsistent Text
Source:	⌘	Ericsson and Motorola
Work item code:	⌘	LCS
Date:	⌘	2001-08-03
Category:	⌘	**A**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
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Reason for change:	⌘	Make descriptions consistent with the Stage 3 specs and agreed principle that all assistance messages are optional to allow enough flexibility and to reduce traffic flow, which will in turn benefit future enhancement. Make sure that the broadcast messages specified in Stage 3 are described properly.
Summary of change:	⌘	Change the wording
Consequences if not approved:	⌘	It would lead to unnecessary confusion, inconsistency, and inefficiency.

Clauses affected:	⌘	10.1, 10.2, 10.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	The content of this CR was approved by SA2 already (see Tdoc S2-011514, CR A024 rev.2 on TS 03.71 rev. 8.1.0), but SA plenary sent it back to SA2. This document includes the comments received in the SA plenary meeting and it is based on the newest revision of the TS. This is a mirror CR for CR A030 on the R98 version of this specification.

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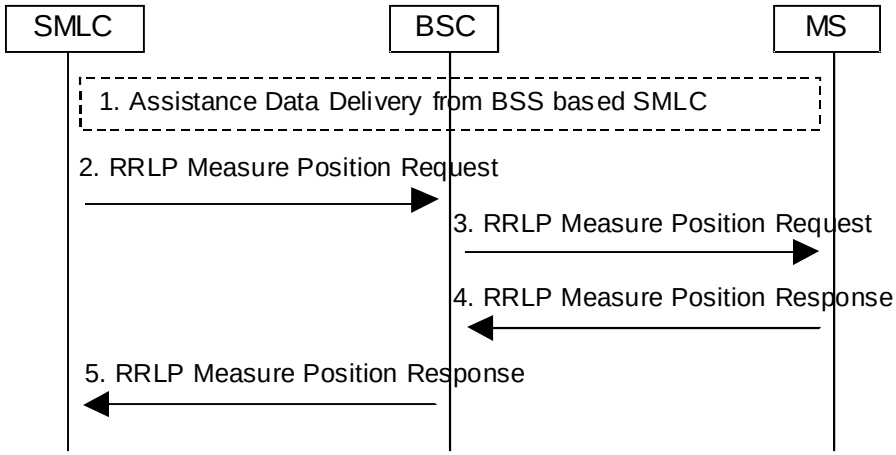

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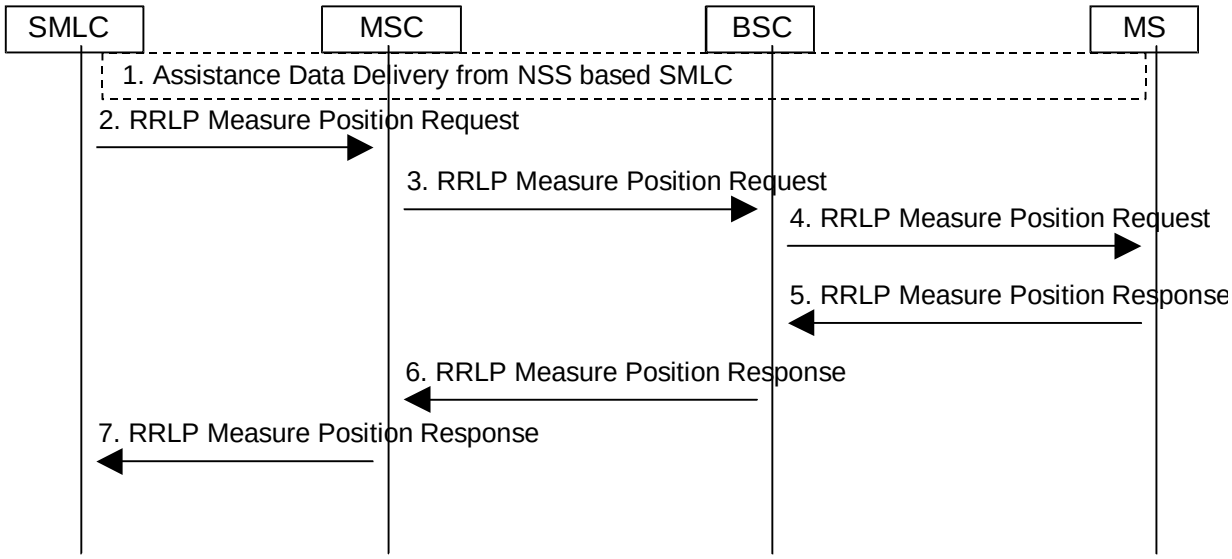

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6. BSC sends measurement results in the MEASURE POSITION RESPONSE within BSSMAP Connection Oriented Information message to MSC.

7. MSC forwards the measurement results in the MEASURE POSITION RESPONSE within LCS Information Report message to SMLC.

3GPP TSG-SA2 Meeting #19
Sophia Antipolis, France, 27 – 31 August, 2001

Tdoc S2-012362
(Revised S2-012224)

CR-Form-v3

CHANGE REQUEST

⌘ **03.71** **CR** **A032** ⌘ rev **1** ⌘ Current version: **7.6.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Applicability of Privacy Override Indicator
Source:	⌘	Ericsson
Work item code:	⌘	LCS
Date:	⌘	2001-Aug-20
Category:	⌘	**F**
Release:	⌘	R98

Use one of the following categories:
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R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The current handling of the Privacy Override Indicator is not according to LCS stage 1 GSM TS 02.71.
Summary of change:	⌘	The Privacy Override Indicator shall be applicable only if the subscriber to be positioned is in the same country as the GMLC, as allowed by regulatory requirements.
Consequences if not approved:	⌘	The Privacy Override Indicator would be handled not according to LCS stage 1 requirements. Misalignement between LCS stage1 and stage2 TSs.

Clauses affected:	⌘	7.12.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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The POI is used to determine whether the privacy settings of the subscriber to be positioned shall be overridden by the request for location services. The assignment of a POI value with an 'override' or 'not override' value in the LCS client profile is done during the LCS client provisioning. The type of LCS client requesting location information (i.e.emergency, law-enforcement etc.) shall determine the value of the POI assigned to the LCS client profile.

There are two distinct cases regarding the handling of the privacy override indicator.

Procedure A*:* If the subscriber to be positioned is in the ~~same PLMN or~~ same country as the GMLC then the POI shall override the subscriber's privacy options~~.~~, as allowed by regulatory requirements.

Procedure B: Otherwise the POI shall not override the subscriber's privacy options**.**

3GPP TSG-SA2 Meeting #19
Sophia Antipolis, France, 27 – 31 August, 2001

Tdoc S2-012360
(Revised S2-012189)

CR-Form-v3

CHANGE REQUEST

⌘ **23.171** **CR** **019** ⌘ rev **1** ⌘ Current version: **3.4.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Applicability of Privacy Override Indicator
Source:	⌘	Ericsson
Work item code:	⌘	LCS
Date:	⌘	2001-Aug-21
Category:	⌘	~~A~~ F
Release:	⌘	R99

Use one of the following categories:
F *(essential 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)*

Reason for change:	⌘	The current handling of the Privacy Override Indicator is not according to LCS stage 1 3GPP TS 22.071.
Summary of change:	⌘	The Privacy Override Indicator shall be applicable only if the subscriber to be positioned is in the same country as the GMLC, as allowed by regulatory requirements.
Consequences if not approved:	⌘	The Privacy Override Indicator would be handled not according to LCS stage 1 requirements. Misalignement between LCS stage1 and stage2 TSs.

Clauses affected:	⌘	8.11.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	This is a mirror CR for CR A032 on TS 03.71 v.7.6.0 (R98).

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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

8.11.1 Privacy Override Indicator (POI)

The POI is used to determine whether the privacy settings of the subscriber to be positioned shall be overridden by the request for location services. The assignment of a POI value with an "override" or "not override" value in the LCS client profile is done during the LCS client provisioning. The type of LCS client requesting location information (i.e. emergency, law-enforcement etc.) shall determine the value of the POI assigned to the LCS client profile.

There are two distinct cases regarding the handling of the privacy override indicator.

Procedure A: If the subscriber to be positioned is in the ~~same PLMN or~~ same country as the GMLC then the POI shall override the subscriber's privacy options~~.~~, as allowed by regulatory requirements.

Procedure B: Otherwise the POI shall not override the subscriber's privacy options.

3GPP TSG-SA2 Meeting #19 ***Tdoc S2-012363***
Sophia-Antipolis, France, 27-31 August 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **028** ⌘ rev **1** ⌘ Current version: **4.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction on the definition of the type of the location request
Source:	⌘	Fujitsu
Work item code:	⌘	LCS1 ***Date:*** ⌘ 20/8/2001
Category:	⌘	**F** ***Release:*** ⌘ REL-4

Use one of the following categories:
F *(essential 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)*

Reason for change:	⌘	The definition of the ‘immediate location request’ and ‘deferred location request’ is not aligned between stage1 and stage2.
Summary of change:	⌘	The definition of the ‘immediate/deferred request’ was aligned with stage1.
Consequences if not approved:	⌘	

Clauses affected:	⌘	4.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
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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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

4.4 Types of Location Request

4.4.1 Immediate Location Request

Request for location where the LCS Server~~MSC/SGSN~~ replies immediately to the LCS Client~~GMLC~~ with the current location estimate if this could be obtained.

4.4.2 Deferred Location Request

Request for location contingent on some current or future events where the response from the LCS Server~~MSC/SGSN~~ to the LCS Client~~GMLC~~ may occur some time after the request was sent.

3GPP TSG-CN SA2 Meeting #19 ***Tdoc S2-012180***
Sophia-Antipolis, France, 27-31 August 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **029** ⌘ rev **-** ⌘ Current version: **4.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Addition of the notification on the acceptance of the deferred location request
Source:	⌘	Fujitsu
Work item code:	⌘	LCS1 ***Date:*** ⌘ 20/8/2001
Category:	⌘	**F** ***Release:*** ⌘ REL-4

Use one of the following categories:
F *(essential 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)

Reason for change: ⌘

According to the current procedure for the deferred location request, the LCS client doesn't receive any notification from the GMLC until the specified event ocurrs.

However the LCS Client should be aware of whether the request was successfully accepted by the LCS Server (i.e. the specified event was successfully set) or not in order to distinguish following cases.

Case1. The request was successfully accepted and the GMLC is waiting for the occurrence of the event.

Case2. The request was not accepted e.g. because the request to or the response from the GMLC was lost.

The notification on the acceptance of the deferred location request enables the LCS Client to distinguish above cases and to immediately take some appropriate measures in some failure cases.

Summary of change: ⌘ The notification on whether the deferred location request was successfully accepted or not was added.

Consequences if not approved: ⌘ Even if the deferred location request or response was lost, the LCS Client may contines to wait for the response from the GMLC.

Clauses affected: ⌘ 9.1.8

Other specs affected: ⌘
☐ Other core specifications ⌘
☐ Test specifications
☐ O&M Specifications

Other comments: ⌘

How to create CRs using this form:

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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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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.

9.1.8 Mobile Terminating Deferred Location Request

Figure 9.6a illustrates the procedures for a Deferred Location Request, where the Location Report is returned based on a event.

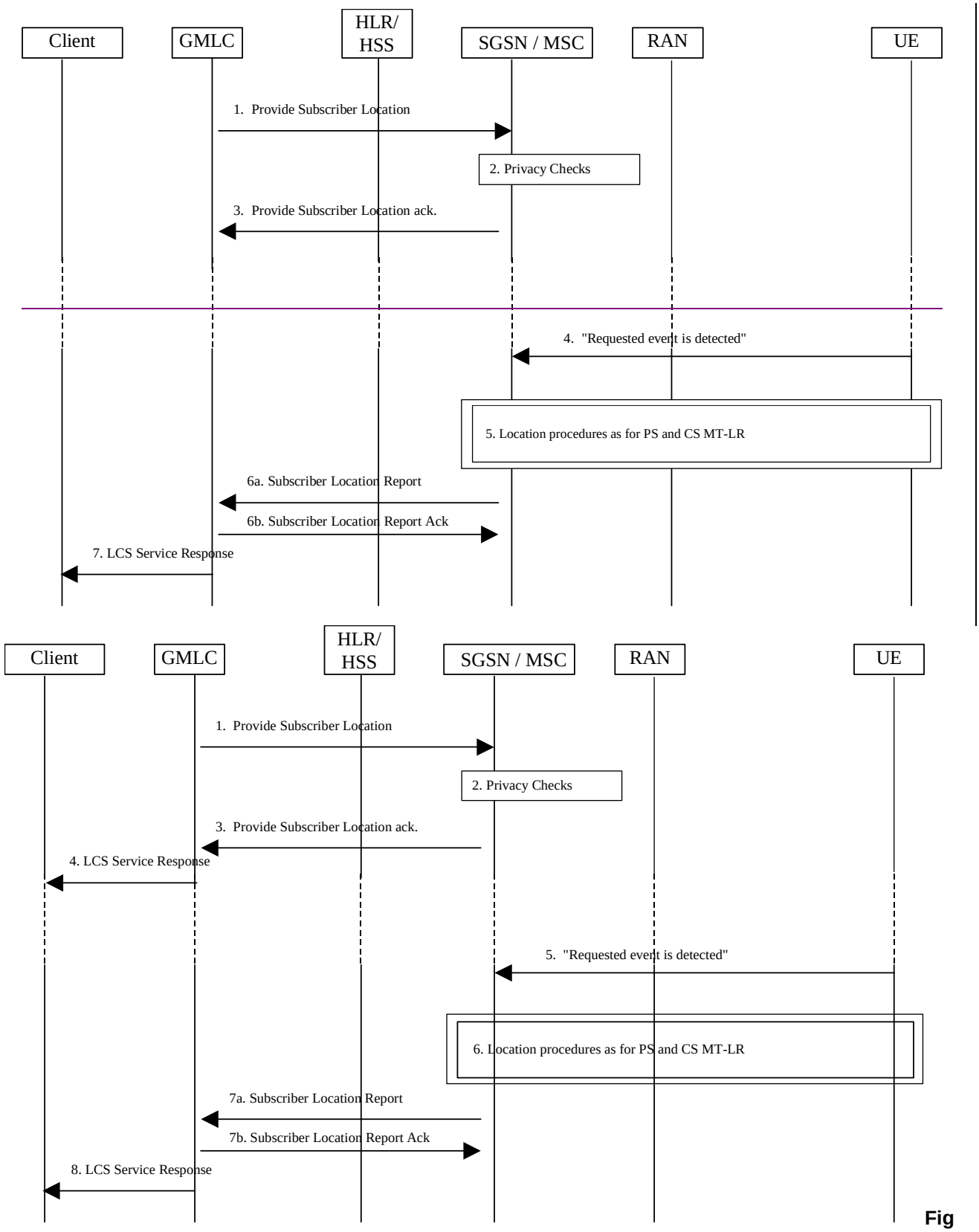

Figure 9.6a: General Network Positioning for a Deferred MT-LR

9.1.8.1 Deferred Location Request Procedure

1) Provide Subscriber Location is received in SGSN/MSC as described in 9.1.2/9.1.6. In addition, the Deferred Location Request includes the event that shall trigger the sending of Location Report.

2) If the SGSN/MSC cannot support the deferred location request for the specified event (for temporary or permanent reasons), a Provide Subscriber Location return error shall be returned in step 3 with a suitable cause. The SGSN/MSC verifies that the LCS client is allowed to position the requested UE according to subscription information (no interaction at this stage with the UE). If not, a Provide Subscriber Location return error is returned in step 3.

3) If the SGSN/MSC can support the deferred location request for the specified event and the privacy checks in step 2 are satisfied, a Provide Subscriber Location ack. shall be returned to the GMLC without a location estimate. The GMLC will at this stage not return any response to the LCS Client. It will instead due to the Deferred Location Request wait for a Subscriber Location Report message from SGSN/MSC.

4) The GMLC then returns the LCS Service Response to the LCS Client to notify whether the request was successfully accepted or not.

9.1.8.2 Location Report Procedure

~~5~~4) Immediately following step 3, the SGSN/MSC shall verify if the requested event is already satisfied (e.g. UE available inferred from a current transaction) or can be invoked immediately (e.g. by paging the UE and receiving a page response). If requested event is not existing the SGSN/MSC waits until it has occurred or until some maximum time has expired.

=> In case the SGSN/MSC receives an indication that the UE has moved to another SGSN/MSC while it is waiting for the requested event to happen, a Subscriber Location Report is directly sent to the GMLC with the information that MT-LR must be re-initiated against the new SGSN/MSC. The adress of the new SGSN/MSC is included in Subscriber Location Report if available. (If new SGSN/MSC adress was included, the GMLC continues at step 1 above, otherwise it continues with an interrogation against HLR as described in 9.1.1.)

~~6~~5) When the requested event is detected, the SGSN/MSC will proceed with the location request as described in 9.1.2/9.1.6.

If either security or privacy checks fails, a Subscriber Location Report is returned with appropriate error cause indicating termination of the deferred location request.

~~7~~6) When location information has been obtained from the RAN, the SGSN/MSC returns the Subscriber Location Report. Included in the report is an indication that this is a response to a previously sent deferred location request.

If the location information could not be obtained, or the SGSN/MSC for some other reason decides to not wait any longer for the requested event to occur (ex. timer expires), the Subscriber Location Report will be returned with an appropriate error cause indicating termination of the deferred location request.

~~8~~7) GMLC then returns the LCS Service Response to the LCS Client as in 9.1.2/9.1.6.

3GPP TSG-SA2 Meeting #19 ***Tdoc S2-012365***
Sophia-Antipolis, France, 27-31 August 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **031** ⌘ rev **1** ⌘ Current version: **4.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Correction on the handling of the deferred location request in detached case
Source:	⌘	Fujitsu
Work item code:	⌘	LCS1 ***Date:*** ⌘ 20/8/2001
Category:	⌘	**F** ***Release:*** ⌘ REL-4

Use one of the following categories:
F *(essential 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)

Reason for change: ⌘

In the last meeting, it was proposed to add an indication to the Send Routing Info for LCS. This indication is used to indicate that the GMLC requests the HLR to return routing information when available. However this was not agreed since some companies were concerned with the impact to the current implementation of the HLR.

In current specification, the HLR decides to return routing information to the GMLC referring to the some flags (e.g. MNRF/MNRG/MNRR). However the logic for the decision is implementation dependent, therefore, the HLR may return routing information even if the MNRR is set to 'IMSI detached'. Besides the HLR is not always aware of whether the UE is in detached mode or not. (*)

This means the deferred location request with the event 'UE available' can be sent to the MSC/SGSN even if the UE is in detached mode.

(*) *The MSC/SGSN doesn't inform the HLR that the UE entered in detached mode. The HLR is notified of it only when MT_LR, MT_SMS or Network Requested PDP Context activation failed.*

Summary of change: ⌘ Above clarification was made.

Consequences if not approved: ⌘ The behaviour of the MSC/SGSN, when it receives the Provide Subscriber Location during the targetted UE is in detached mode, is ambiguous.

Clauses affected: ⌘ 4.4

Other specs affected: ⌘
☐ Other core specifications ⌘
☐ Test specifications
☐ O&M Specifications

Other comments: ⌘

How to create CRs using this form:

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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.

4.4 Types of Location Request

4.4.1 Immediate Location Request

Request for location where the MSC/SGSN replies immediately to the GMLC with the current location estimate if this could be obtained.

4.4.2 Deferred Location Request

Request for location contingent on some current or future events where the response from the MSC/SGSN to the GMLC may occur some time after the request was sent.

4.4.2.1 Types of event

a) UE available: Any event in which the MSC/SGSN has established ~~which radio~~ a contact ~~is established~~ with the UE ~~when not in IMSI detached mode~~. Note, this event is considered to be applicable when the UE is temporarily unavailable due to inaction by the UE user, ~~or~~ temporarily loss of radio connectivity or IMSI detach and so on. Note that IMSI detach is only applicable in the case UE has previously been registered and information is still kept in the node.

b) Other events are FFS (Release 5)

3GPP TSG-SA2 Meeting #19 ***Tdoc S2-012361***
Sophia Antipolis, France, 27 – 31 August, 2001 **(Revised S2-012190)**

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **032** ⌘ rev **1** ⌘ Current version: **4.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Applicability of Privacy Override Indicator
Source:	⌘	Ericsson
Work item code:	⌘	LCS1
Date:	⌘	2001-Aug-21
Category:	⌘	~~A~~ F
Release:	⌘	REL-4

Use one of the following categories:
F *(essential 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)*

Reason for change:	⌘	The current handling of the Privacy Override Indicator is not according to LCS stage 1 3GPP TS 22.071.
Summary of change:	⌘	The Privacy Override Indicator shall be applicable only if the subscriber to be positioned is in the same country as the GMLC, as allowed by regulatory requirements.
Consequences if not approved:	⌘	The Privacy Override Indicator would be handled not according to LCS stage 1 requirements. Misalignement between LCS stage1 and stage2 TSs.

Clauses affected:	⌘	9.5.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	This is a mirror CR for CR A032 on TS 03.71 v.7.6.0 (R98).

How to create CRs using this form:
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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

9.5.1 Privacy Override Indicator (POI)

The POI is used to determine whether the privacy settings of the subscriber to be positioned shall be overridden by the request for location services. The POI is applicable only to Emergency service and Lawful intercept service. The assignment of a POI value with an "override" or "not override" value in the LCS client profile is done during the LCS client provisioning. The type of LCS client requesting location information (i.e. emergency, law-enforcement etc.) shall determine the value of the POI assigned to the LCS client profile.

There are two distinct cases regarding the handling of the privacy override indicator.

Procedure A: If the subscriber to be positioned is in the ~~same PLMN or~~ same country as the GMLC then the POI shall override the subscriber's privacy options~~.~~, as allowed by regulatory requirements.

Procedure B: Otherwise the POI shall not override the subscriber's privacy options.

3GPP TSG-SA2 Meeting #19 ***Tdoc S2-012191***
Sophia Antipolis, France, 27 – 31 August, 2001

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **033** ⌘ rev **-** ⌘ Current version: **4.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Privacy Check procedures for CS Call Related MT-LR
Source:	⌘	Ericsson
Work item code:	⌘	LCS1 ***Date:*** ⌘ 2001-Aug-21
Category:	⌘	**F** ***Release:*** ⌘ REL-4

Use one of the following categories:
F *(essential 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)

Reason for change:	⌘	The privacy checks for a call related CS-MT-LR cannot be performed in cases of IN rerouting (i.e. LCS client reached via IN).
Summary of change:	⌘	The call related CS-MT-LR privacy check is always performed upon the number dialed by the UE and the called party number (call-related identity) sent by the GMLC can also be an E.164 number not in "international" format. It is up to the GMLC to use the valid national specific number in case of toll free number or abbreviated number routing when positioning an UE in the visited country.
Consequences if not approved:	⌘	The call related CS-MT-LR privacy checks would always fail in case the LCS client is reached via IN rerouting.

Clauses affected:	⌘	9.5.3.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	The content of this CR was already approved by TSG #11 (CR 016, doc SP-010120) but was not included in the TS.

How to create CRs using this form:
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downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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

9.5.3.2.1 Call/session-related class in the CS-domain

If the UE subscribes to the call/session-related class, an CS-MT-LR may be allowed if both of following conditions are met:

- The UE previously originated a call in CS domain that is still established and the called party number ~~either~~ dialled by the UE ~~or used by the VMSC/MSC Server for routing~~ matches the called party number received from the GMLC.
- The identity of the LCS client or LCS client group supplied by the GMLC matches the identity of any LCS Client or LCS Client group contained in the UE's SLPP and any other GMLC restrictions associated with this LCS Client identity in the SLPP are also met

If these conditions are satisfied, the CS-MT-LR shall be allowed if the UE user subscribes to either location without notification or location with notification. If the UE user subscribes to location with notification and privacy verification, the CS-MT-LR shall be allowed following notification to the UE if the UE user either returns a response indicating that location is allowed or returns no response but subscribes to allowing location in the absence of a response. In all other cases, the CS-MT-LR shall be restricted.

3GPP TSG-SA2 Meeting #19
Sophia Antipolis, France, 27 – 31 August, 2001

Tdoc S2-012366
(Revised S2-012192)

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **034** ⌘ rev **1** ⌘ Current version: **4.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	Privacy Class selection rule clarification
Source:	⌘	Ericsson
Work item code:	⌘	LCS1
Date:	⌘	2001-Aug-21
Category:	⌘	**F**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential 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)

Reason for change:	⌘	The looser condition concept for the privacy class selection rule is not clear in the TS.
Summary of change:	⌘	If more than one privacy class are subscribed, the privacy settings to be compared in order to apply the looser are the results of the privacy checks for each applicable class.
Consequences if not approved:	⌘	Not clear requirements concerning the looser privacy to be applied could lead to wrong privacy class selection rule application.

Clauses affected:	⌘	Annex A (normative)
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
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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://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 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

Annex A (normative): Privacy Class selection rule

If more than one privacy class are subscribed, privacy class for an MT-LR is selected according to the following flow diagram.

An MT-LR may be applied to more than one privacy class. In this case, looser privacy setting shall be selected. All possible privacy setting values are listed in the table below. The privacy settings to be compared are the results of the privacy checks for each applicable class. The interrelation among each privacy setting in terms of privacy strictness is shown as follows:

loose	Positioning allowed without notifying the UE user
↑	Positioning allowed with notification to the UE user
	Positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user or if there is no response to the notification
↓	Positioning requires notification and verification by the UE user; positioning is allowed only if granted by the UE user
strict	Positioning not allowed

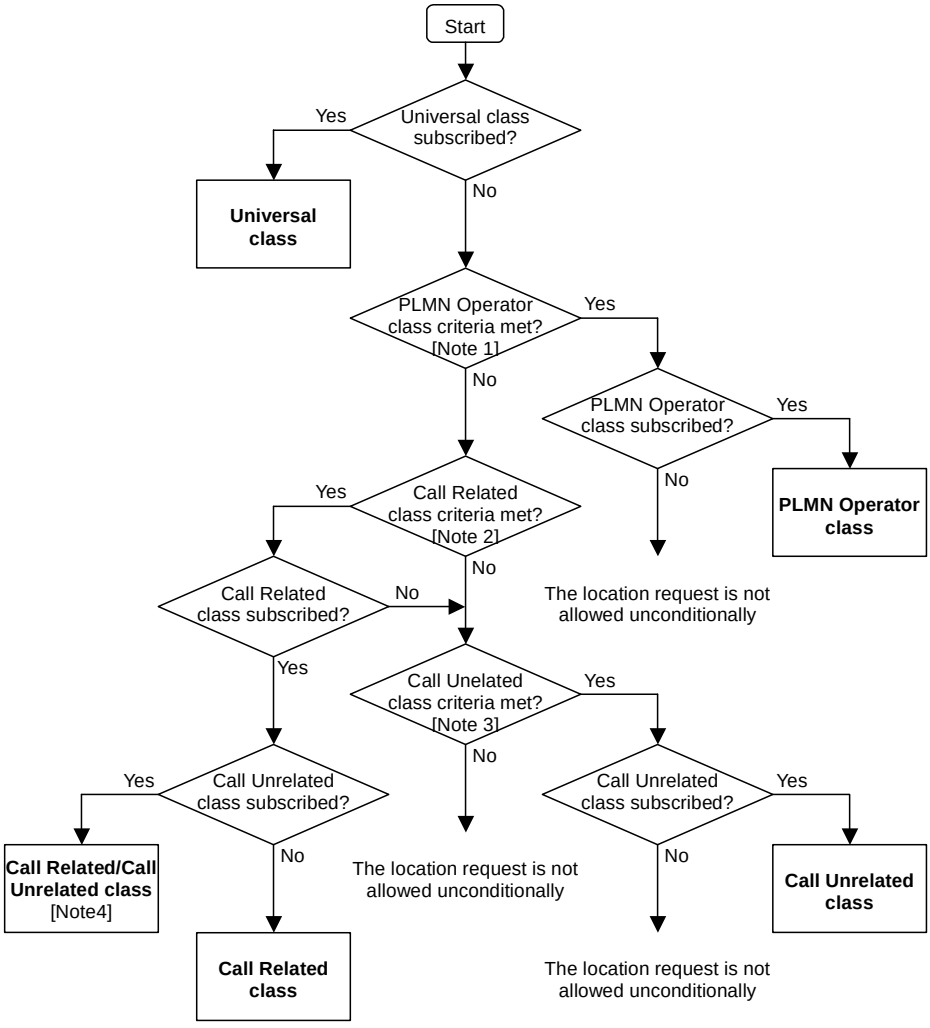

Figure A.1: Privacy Class selection flow diagram

Note 1: The client type indicates PLMN Operator service, and the client is within or associated with the VPLMN.
Note 2: The client type indicates value added service, and the Dialled by UE is available and matched with a call/session established.
Note 3: The client type indicates value added service.
Note 4: The looser privacy setting shall be selected.

3GPP TSG- SA WG2 (LCS drafting) **Tdoc S2-012367**
Sophia-Antipolis, France, 27.-31.8.2001 (Revision of Tdoc S2-012227)

CR-Form-v3

CHANGE REQUEST

⌘ **23.271** **CR** **035** ⌘ rev **1** ⌘ Current version: **4.2.0** ⌘

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

Proposed change affects: ⌘ (U)SIM [ ] ME/UE [X] Radio Access Network [X] Core Network [X]

Title:	⌘	Release 5 alignment of 23.271 with GERAN LCS stage 2, TS 43.059
Source:	⌘	Nokia
Work item code:	⌘	LCS1 ***Date:*** ⌘ 22.8.2001
Category:	⌘	**B** ***Release:*** ⌘ REL-5

Use one of the following categories:
F *(essential 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)*

Reason for change:	⌘	GERAN Rel-5 supports LCS also in the PS domain. Alignment between TS 43.059 and TS 23.271 in Rel-5.
Summary of change:	⌘	This CR for Rel-5 reintroduces LCS in the GERAN PS domain, which was removed from the Rel-4 version of TS 23.271 in CR022. Network architecture figure was changed and note removed. References to GSM added in PS domain parts.
Consequences if not approved:	⌘	Misalignment between TS 23.271 and TS 43.059

Clauses affected:	⌘	3.3 6 6.1 Figure 6.2 6.3.7 7.1 8.6 9.1.1 9.1.2 9.1.6 9.1.7 9.2.2 9.4.3
Other specs affected:	⌘	[ ] Other core specifications ⌘ [ ] Test specifications [ ] O&M Specifications
Other comments:	⌘	This CR upgrades the specification from release 4 to release 5 and the version with this CR implemented should be 5.x.x.

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

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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.

<< first modified section>>.

3.3 Abbreviations

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

2G-	Second Generation
3G-	Third Generation
AC	Admission Control
AI	Application Interface (prefix to interface class method)
ANM	Answer Message (ISUP)
APN	Access Point Name
ARIB	Association of Radio Industries and Business
ATD	Absolute Time Difference
BCCH	Broadcast Control Channel
BER	Bit Error Rate
BSS	Base Station Subsystem
BTS	Base Transceiver Station
CAMEL	Customised Application For Mobile Network Enhanced Logic
CAP	CAMEL Application Part
CM	Connection Management
CN	Core Network
CSE	Camel Service Environment
DL	Downlink
DRNC	Drift RNC
E-OTD	Enhanced Observed Time Difference
FER	Frame Error Rate
GERAN	GSM EDGE Radio Access Network
GGSN	Gateway GPRS Support Node
GMLC	Gateway MLC
GPRS	General Packet Radio Service
GPS	Global Positioning System
HE	Home Environment
HSS	Home Subscriber Server
HLR	Home Location Register
HPLMN	Home Public Land Mobile Network
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
IPDL	Idle Period Downlink
LA	Location Application
LAF	Location Application Function
LBS	Location Based Services
LCAF	Location Client Authorization Function
LCCF	Location Client Control Function
LCCTF	Location Client Co-ordinate Transformation Function
LCF	Location Client Function
LCS	LoCation Services
LDR	Location Deferred Request
LIR	Location Immediate Request,
LMU	Location Measurement Unit
LSAF	Location Subscriber Authorization Function
LSBcF	Location System Broadcast Function
LSBF	Location System Billing Function
LSCF	Location System Control Function
LSOF	Location System Operation Function
LSPF	Location Subscriber Privacy Function
MAP	Mobile Application Part
ME	Mobile Equipment
MExE	Mobile Execution Environment
MLC	Mobile Location Center

MM	Mobility Management
MO-LR	Mobile Originated Location Request
MS	Mobile Station
MSC	Mobile Services switching Center
MSC	Mobile services Switching Centre
MSISDN	Mobile Station Integrated Services Data Network
MT-LR	Mobile Terminated Location Request
NA-ESRD	North American Emergency Service Routing Digits
NA-ESRK	North American Emergency Service Routing Key
NI-LR	Network Induced Location Request
OSA	Open Service Architecture
OTDOA	Observed Time Difference Of Arrival
PC	Power Control
PCF	Power Calculation Function
PLMN	Public Land Mobile Network
POI	Privacy Override Indicator
PRCF	Positioning Radio Co-ordination Function
PRRM	Positioning Radio Resource Management
PSE	Personal Service Environment
PSMF	Positioning Signal Measurement Function
PSTN	Public Switched Telephone Network
QoS	Quality of Service
RA	Routing Area
RACH	Random Access Channel
RAN	Radio Access Network
RANAP	Radio Access Network Application Part
RIS	Radio Interface Synchronization
RNC	Radio Network Controller
RRM	Radio Resource Management
RTD	Real Time Difference
SAT	SIM Application Tool-Kit
SCCP	Signalling Connection Control Part
SGSN	Serving GPRS Support Node~~, SGSN in this specification normally refers to 3G SGSN only, SGSN in GSM is noted 2G SGSN~~
SI	Service Interface (prefix to interface class method)
SIM	Subscriber Identity Module
SIR	Signal Interference Ratio
SLPP	Subscriber LCS Privacy Profile
SMLC	Serving Mobile Location Center
SMS	Short Message Service
SP	Service Point
SRNC	Serving RNC
SS7	Signaling System No 7
TA	Timing Advance
TMSI	Temporary Mobile Subscriber Identity
TOA	Time Of Arrival
UDT	SCCP Unitdata message
UE	User Equipment
UL	Uplink
UMTS	Universal Mobile Telecommunication System
USIM	Universal Subscriber Identity Module
UTRAN	Universal Terrestrial Radio Access Network
VASP	Value Added Service Provider
VHE	Virtual Home Environment
WCDMA	Wideband Code Division Multiple Access

Further GSM related abbreviations are given in GSM 01.04. Further UMTS related abbreviations are given in 3G TS 21.905 [**Error! Reference source not found.**].

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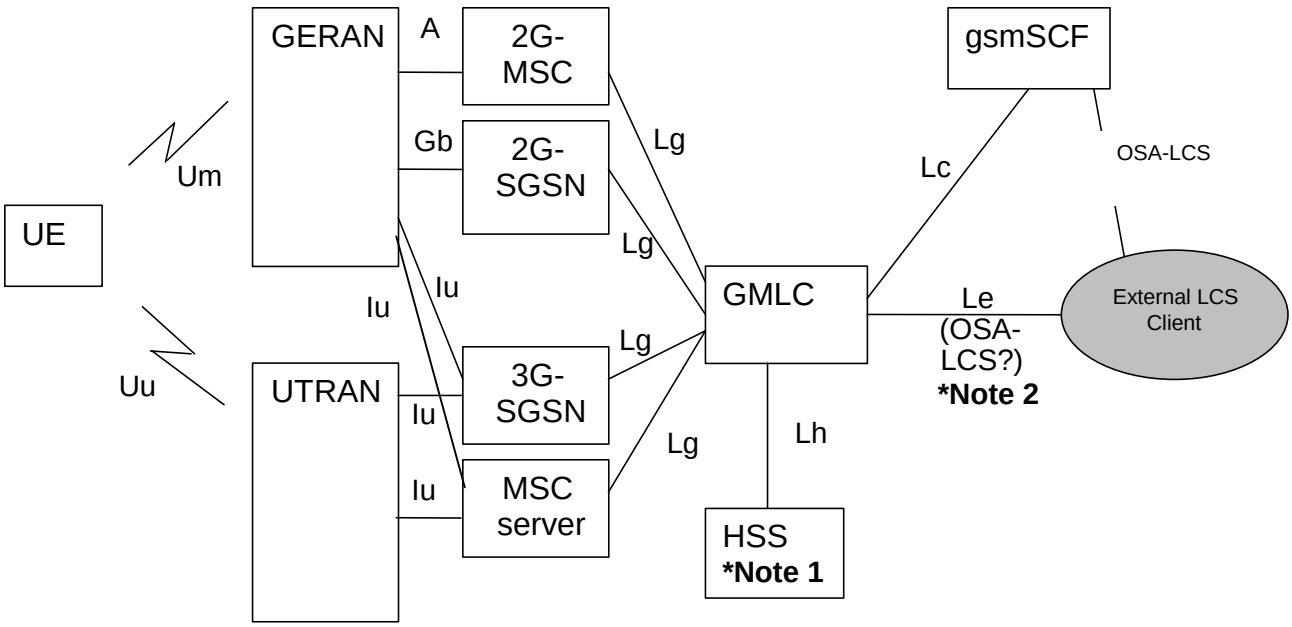
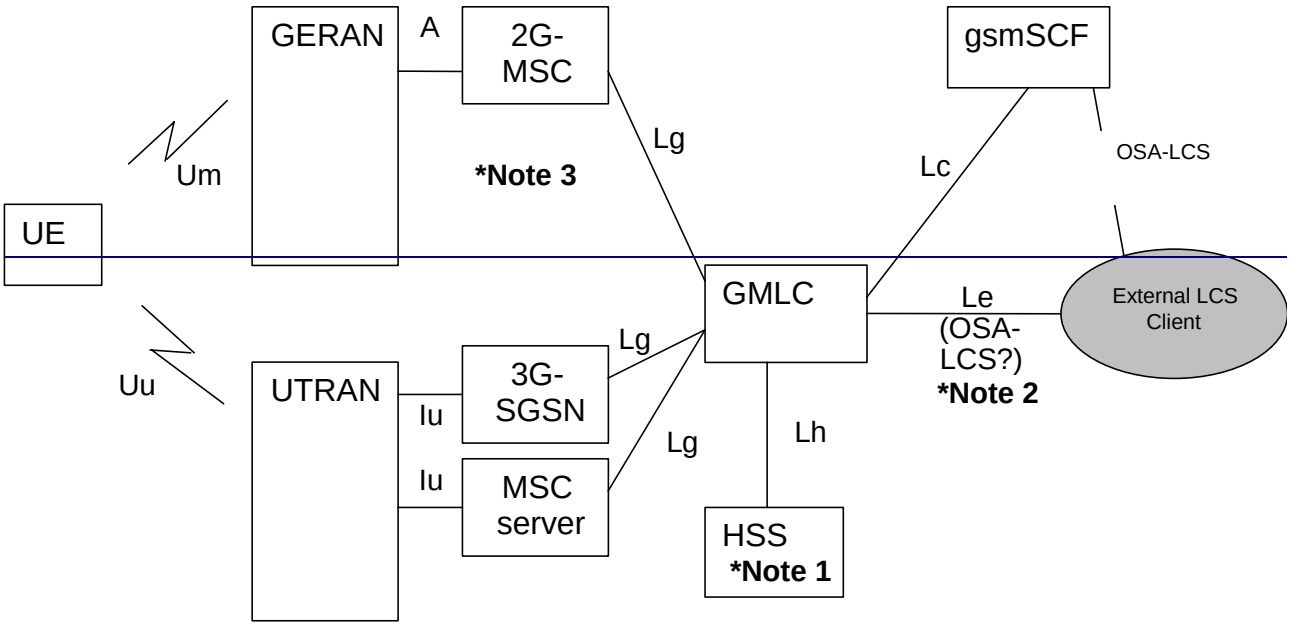
6 LCS Architecture

Figure 6.1 shows the general arrangement of the Location Service feature in GSM and UMTS. This illustrates, generally, the relation of LCS Clients and servers in the core network with the GERAN and UTRAN Access Networks. The LCS entities within the Access Network communicate with the Core Network (CN) across the A, Gb and Iu interfaces. Communication among the Access Network LCS entities makes use of the messaging and signaling capabilities of the Access Network.

As part of their service or operation, the LCS Clients may request the location information of UE. There may be more than one LCS client. These may be associated with the GSM/UMTS networks or the Access Networks operated as part of a UE application or accessed by the UE through its access to an application (e.g. through the Internet).

The clients make their requests to a LCS Server. There may be more than one LCS Server. The client must be authenticated and the resources of the network must be co-ordinated including the UE and the calculation functions, to estimate the location of the UE and result returned to the client. As part of this process, information from other systems (other Access Networks) can be used. As part of the location information returned to the client, an estimate of the accuracy of the estimate and the time-of-day the measurement was made may be provided.





NOTE 1: HSS includes both 2G-HLR and 3G-HLR functionality. LCS is~~should be~~ included in the overall network architecture in TS 23.002 [**Error! Reference source not found.**].
NOTE 2: The Le interface is FFS. S1 agreed that LCS shall support OSA-API.
~~NOTE 3: In GSM (Rel-4), positioning is only supported on the A interface~~

Figure 6.1: General arrangement of LCS

6.1 Schematic functional description of LCS operations

The allocation of LCS functional blocks to the Client, LCS server, Core Network, Access Network and UE is based on the schematic functional description below. The detailed functions and interactions are specified later in the present document and in TS 25.305 [**Error! Reference source not found.**] for UTRAN, in TS 43.059 [**Error! Reference source not found.**] for GERAN and in corresponding Stage 3 specifications.

The operation begins with a LCS Client requesting location information for a UE from the LCS server. The LCS server will pass the request to the LCS functional entities in the core network. The LCS functional entities in the core network shall then:

- verify that the LCS Client is authorized to request the location of the UE or subscriber;
- verify that LCS is supported by the UE;
- establish whether it is allowed to locate the UE or subscriber, for privacy or other reasons;
- establish which network element in the Access Network should receive the Location request;
- request the Access Network (via the A, Gb or Iu interface) to provide location information for an identified UE, with indicated QoS;
- receive information about the location of the UE from the Access Network and forward it to the Client;
- send appropriate accounting information to an accounting function.

The Access Network LCS functional entities shall determine the position of the target UE according to TS 25.305 [**Error! Reference source not found.**] for UTRAN and TS 43.059 [**Error! Reference source not found.**] for GERAN.

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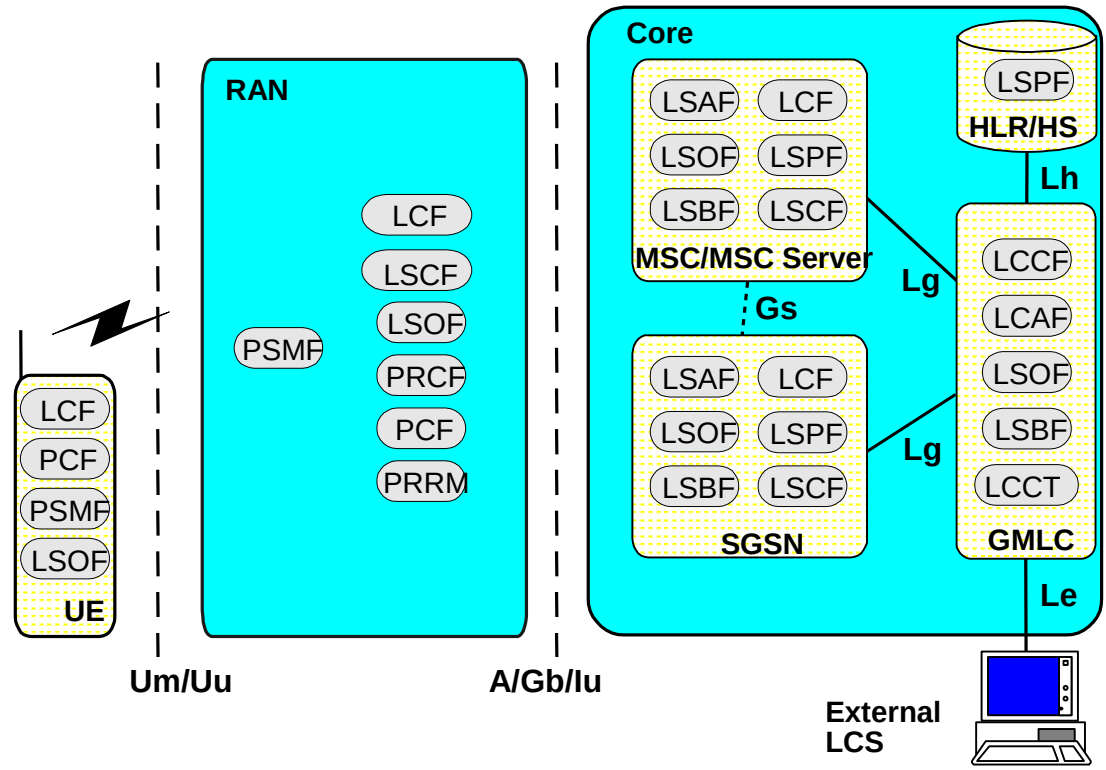

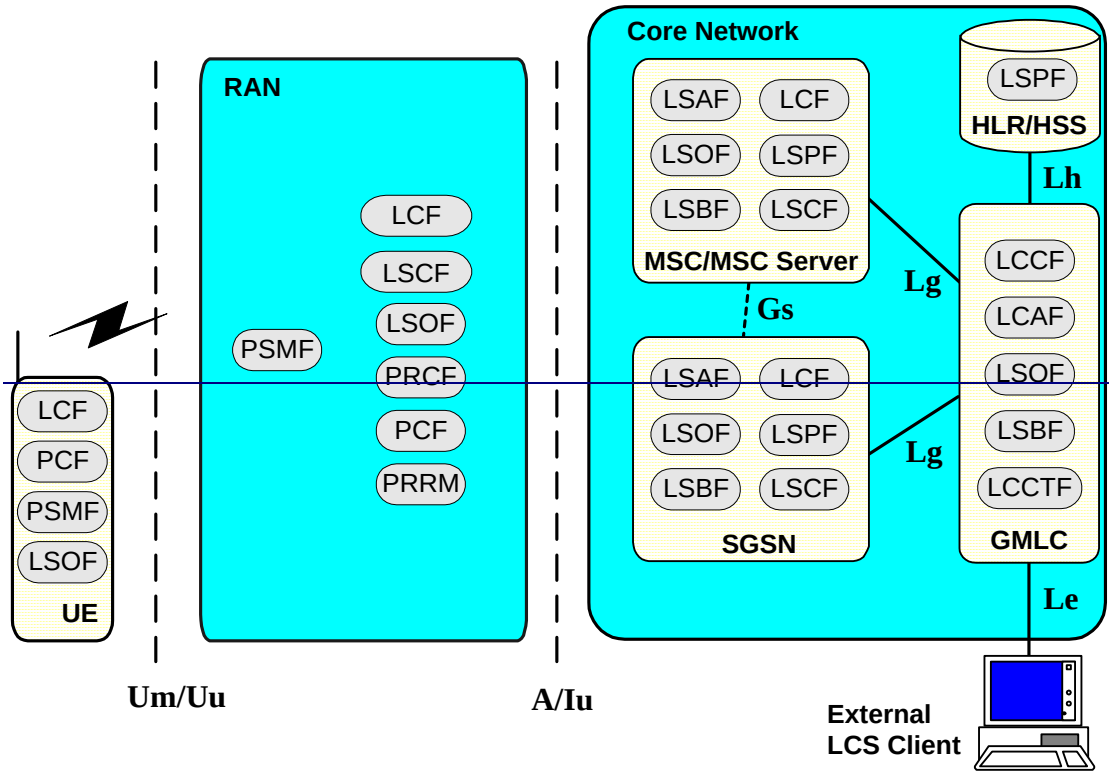

Figure 6.2: Generic LCS Logical Architecture

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6.3.7 SGSN

~~In UMTS, t~~The ~~3G~~ SGSN contains functionality responsible for UE subscription authorization and managing positioning requests of LCS. The ~~3G~~ SGSN is accessible to the GMLC via the Lg interface. The LCS functions of ~~3G~~ SGSN are related to charging and billing, LCS co-ordination, location request, authorization and operation of the LCS services.

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

<< next modified section>>

7 Signaling and Interfaces

7.1 LCS signaling between Access and Core Networks

The core network sends location requests to the access network, which then sends the corresponding responses back to the core network.

Communication between access and core networks is accomplished through Iu interface in UMTS whereas the A, Gb and Iu ~~ps~~ interfaces are~~is~~ used for the purpose in GSM (see TS 25.305 [**Error! Reference source not found.**] and TS 43.059 [**Error! Reference source not found.**]).

<< added new section>>

8.6 Gb interface mapping of target UE

The pre-requisite for LCS procedures on the Gb interface is that UE is in "ready state".

<< next modified section>>

9.1 Mobile Terminating Location Request

9.1.1 MT-LR routing procedure in PS and CS domain

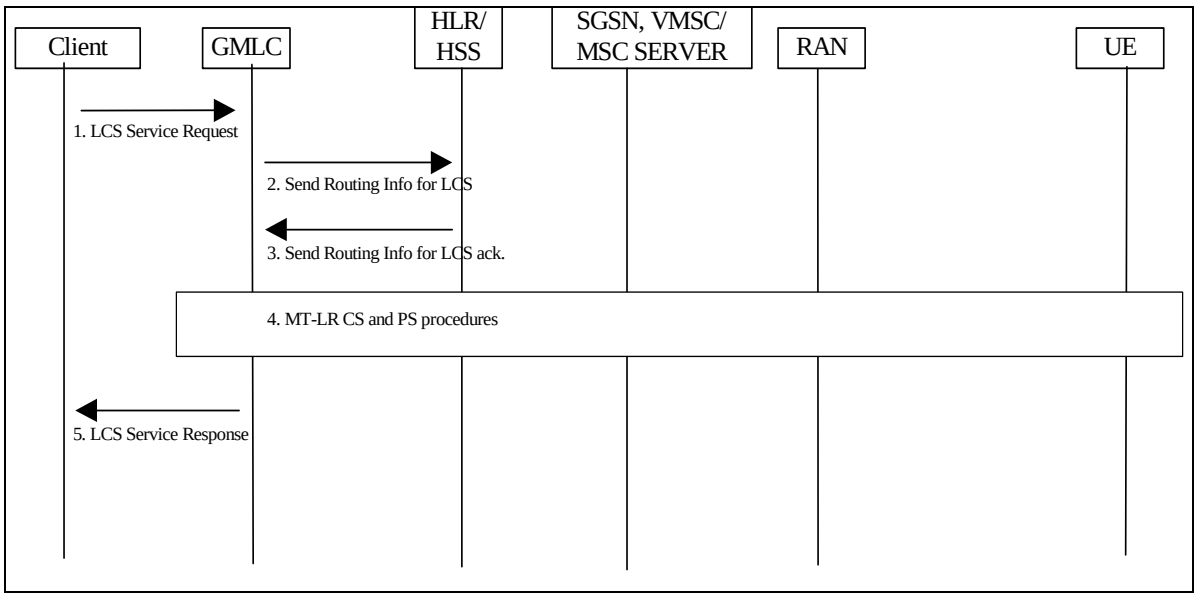

Figure 9.1: General Network Positioning for a MT-LR

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 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 or session related location request, the GMLC obtains and authenticates the called party number of the LCS client. If location is required for more than one UE, or if periodic location is requested, the steps following below may be repeated.
Note: This means that GMLC handles the periodicity of location requests as requested by the LCS client both in CS and PS domain.

2) If the GMLC already knows both the VMSC/MSC server or SGSN ~~(Note: only applicable to 3G SGSN in Rel-4)~~ location and IMSI for the particular MSISDN or PDP address, (e.g. from a previous location request), this step and step 3 may be skipped. Otherwise, the 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.

<< next modified section>>

9.1.6.1 Location Preparation Procedure

1) Common PS and CS MT-LR procedure as described in 9.1.1.

2) GMLC sends a Provide Subscriber Location message to the SGSN indicated by the HLR/HSS. This message carries the type of location information requested (e.g. current location), the UE subscriber's IMSI, LCS QoS information (e.g. accuracy, response time) and an indication of whether the LCS client has the override capability. For a session related location request, the message also carries the APN to which the user has established the session. For a value added LCS client, the message shall carry the client name and the external identity of the LCS client. For a PLMN operator LCS client, the message shall carry the internal identity of the LCS client.

3) If the GMLC is located in another PLMN or another country, the SGSN first authenticates that a location request is allowed from this PLMN or from this country. If not, an error response is returned. The SGSN then verifies LCS barring restrictions in the UE user's subscription profile in the SGSN. 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 LCS is to be barred without notifying the target UE and a LCS client accessing a GMLC in the same country does not have the override capability, an error response is returned to the GMLC.
Otherwise, if the UE is in idle mode, the SGSN performs paging. The paging procedure is defined in TS 23.060[15].

> FFS: The UE may be paged for location services even when in UMTS a signaling connection between mobile station and the network is established and in GSM when in Ready Mode. This makes it possible for the UE to start preparing an anticipated location service coming later by e.g. starting to measure GPS signals.

<< next modified section>>

9.1.6.2 Positioning Measurement Establishment Procedure

8) If the requested location information and the location accuracy within the QoS can be satisfied based on parameters received from the SGSN and the parameters obtained by the RAN e.g. cell coverage and timing information (i.e. RTT or TA), the RAN may send a Location Report immediately. Otherwise, the RAN determines the positioning method and instigates the particular message sequence for this method in UTRAN Stage 2 TS 25.305 and in GERAN Stage 2 TS 43.059. If the position method returns position measurements, the RAN uses them to compute a location estimate. If there has been a failure to obtain position measurements, the RAN may use the current cell information and, if available, RTT or TA value to derive an approximate location estimate. If an already computed location estimate is returned for an UE based position method, the RAN may verify consistency with the current cell and, if available, RTT or TA. If the location estimate so obtained does not satisfy the requested accuracy and sufficient response time still remains, the RAN may instigate a further

location attempt using the same or a different position method. If a vertical location co-ordinate is requested but the RAN can only obtain horizontal co-ordinates, these may be returned.

<< next modified section>>

9.1.7.1 Positioning Measurement Establishment Procedure

2) If the requested location information and the location accuracy within the QoS can be satisfied based on parameters received from the SGSN and the parameters obtained by the RAN e.g. cell coverage and timing information (i.e. RTT or TA), the RAN may send a Location Report immediately. Otherwise, the RAN determines the positioning method and instigates the particular message sequence for this method. If the position method returns position measurements, the RAN uses them to compute a location estimate. If there has been a failure to obtain position measurements, the RAN may use the current cell information and, if available, RTT or TA value to derive an approximate location estimate. If an already computed location estimate is returned for an UE based position method, the RAN may verify consistency with the current cell and, if available, RTT or TA value. If the location estimate so obtained does not satisfy the requested accuracy and sufficient response time still remains, the RAN may instigate a further location attempt using the same or a different position method. If a vertical location co-ordinate is requested but the RAN can only obtain horizontal co-ordinates, these may be returned.

<< next modified section>>

9.2.2.1 Location Preparation Procedure

1) In UMTS, if the UE is in idle mode, the UE requests a PS signaling connection and sends a Service request indicating signaling to the SGSN via the RAN. If the UE already has PS signaling connection, the UE does not need to send Service request. Security functions may be executed. These procedures are described in TS 23.060 [**Error! Bookmark not defined.**]. In GSM this signaling step is not needed.

<< next modified section>>

9.2.2.2 Positioning Measurement Establishment Procedure

4) If the UE is requesting its own location, the actions described in UTRAN Stage 2, TS 25.305 [**Error! Bookmark not defined.**] or GERAN stage 2 TS 43.059 [**Error! Bookmark not defined.**] are performed. If the UE is instead requesting location assistance data, the RAN transfers this data to the UE as described in subsequent clauses. The RAN determines the exact location assistance data to transfer according to the type of data specified by the UE, the UE location capabilities and the current cell.

<< next modified section>>

9.4.3 Procedures in the ~~3G~~ SGSN

After the SGSN has requested a location service for a particular UE from RAN, certain events may occur that may temporarily or permanently interfere with the location service attempt. For each such event notified to the SGSN, the SGSN shall employ one of the following error recovery actions.

Restart the Location Service

This action shall be employed for any event that temporarily impedes a location service attempt and cannot be delayed until the location service attempt is complete. When such an event is notified to the SGSN, it shall immediately cancel

the location service attempt and the associated signaling dialogue with RAN, if this still exists by sending a "stop reporting" message to RAN. The "stop reporting" message shall contain the reason for the location procedure cancellation.

After aborting the location request dialogue with RAN, the SGSN may queue the location service request until the event causing the restart has terminated (if not already terminated). The SGSN may optionally wait for an additional time period (e.g. if the queuing delay is minimal) to ensure that any resources allocated in and by RAN have time to be released. The SGSN may then send another location service request to RAN associated with the target UE.

Abort the Location Service

This action shall be employed for any event that permanently impedes a location service attempt, such as loss of the radio channel to the target UE. When such an event is notified to the SGSN, it shall cancel the current location service attempt and the associated signaling dialogue with RAN, if still existing, by sending a "stop reporting" message to RAN. The "stop reporting" message shall contain the reason for the location procedure cancellation. The SGSN shall then return an error response to the client or network entity from which the location request was originally received. The SGSN shall also release all resources specifically allocated for the location attempt.

The following table indicates the appropriate error recovery procedure for certain events. For events not listed in the table, the SGSN need take no action.

Table 9.2: LCS Error Recovery Procedures in the SGSN for certain Events

Event	SGSN Error Recovery
Release of radio channel to the UE	Abort
Any error response from RAN causing unavailable signalling connections	Abort
SRNC relocation (UMTS only)	[Note: This is being discussed in RAN WG2 and RAN WG3.]
Suspend of GPRS services (GSM only) (*During CS connection for class B UE*)	Abort