3GPP TSG CN Plenary Meeting #19   **NP-030114**
12th – 14th March 2003 Birmingham, UK.

Source: TSG CN WG4

Title: Corrections on Location Service Rel-6.

Agenda item: 9.11.

Document for: APPROVAL

Spec	CR	Rev	Doc-2nd-Level	Phase	Subject	Cat	Ver_C
29.002	529		N4-030054	Rel-6	Addition of LCS Capability Set 4	F	6.0.0
29.002	566	1	N4-030222	Rel-6	Introduction of MSC Number as a new parameter in MAP-SEND-IDENTIFICATION operation	F	6.0.0
29.060	390	1	N4-030224	Rel-6	Introduction of SGSN Number in SGSN Context Request message	B	5.4.0
29.060	403		N4-030265	Rel-6	Introduction of SGSN Number in the Forward Relocation Response message	B	5.4.0

CR-Form-v7

CHANGE REQUEST

⌘ | **29.002** CR **529** | ⌘**rev** | **-** | ⌘ | Current version: | **6.0.0** | ⌘

*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 Capability Set 4	
Source: ⌘	Nokia	
Work item code: ⌘	LCS2	***Date:*** ⌘ 31/01/2003
Category: ⌘	**F**	***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: ⌘	New capability set 4 is needed for MSC/SGSN to be able to indicate that it supports new Rel-6 LCS architecture, e.g. the privacy check can be done by H-GMLC/PPR instead of MSC/SGSN.
Summary of change: ⌘	New Capability Set 4 bit added to the Supported LCS Capability Sets definition.
Consequences if not approved: ⌘	MSC/SGSN can not indicate the support for new Rel-6 LCS architecture.

Clauses affected: ⌘	17.7.1

	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:
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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   ****

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                  [2]  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),
    lcsCapabilitySet4 (3) } (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.
-- Core network signalling capability set4 indicates LCS Release6 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.
```

CR-Form-v7

CHANGE REQUEST

| ⌘ | **29.002** CR | **566** | ⌘rev | **1** | ⌘ | Current version: | **6.0.0** | ⌘ |

*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:	⌘	Introduction of MSC Number as a new parameter in MAP-SEND-IDENTIFICATION operation

Source:	⌘	CN4

Work item code:	⌘	LCS2	**Date:**	⌘	10/02/2003

Category:	⌘	**F**		**Release:**	⌘	Rel-6

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R97   (Release 1997)
R98   (Release 1998)
R99   (Release 1999)
Rel-4   (Release 4)
Rel-5   (Release 5)
Rel-6   (Release 6)

Reason for change:	⌘	There is an inconsistency between stage-2 3GPP TS 23.271 and stage-3 3GPP TS 29.002 for release-6. According to the stage-2 3GPP TS 23.271V6.2.0 chapter 9.1.8.2 for the Mobile Terminating Deferred Location, the MSC may have the ability to transfer the new MSC address to the GMLC in case UE is moved to another MSC. In order to fulfil the requirement, the "new" MSC must optionally provide this information to the "old" MSC. But according to the current stage-3 specification 3GPP TS 29.002 V6.0.0 the new MSC address is not provided in the MAP-SEND-IDENTIFICATION operation.

Summary of change:	⌘	In order to align stage-3 with stage 2 TSs, the "MSC address" has been added in the MAP-SEND-IDENTIFICATION operation. Since MAP-SEND-IDENTIFICATION is one of the options to retrieve MS identification, a sentence is added under 8.1.4.1 to indicate that this method is the preferred method for the "new" MSC to retrieve MS identification.

Consequences if not approved:	⌘	If 3GPP TS 29.002 will not be updated accordingly then there will not be a standardized way to fulfil the requirement of transferring the new MSC address to the GMLC. This will lead to always invoke an HLR interrogation in order to get the new MSC address. Therefore, reduction of the signalling cannot be achieved. The inconsistency between stage-2 and stage-3 TSs will remain.

Clauses affected:	⌘	8.1.4.1, 8.1.4.2, 8.1.4.3 and 17.7.1

		Y	**N**	
Other specs	⌘		**X**	Other core specifications	⌘

affected:		**X**	Test specifications	
		X	O&M Specifications	
Other comments:	⌘	\	In SendIdentificationRes the authenticationSetList was not in the right shape. Due to this, the fully expanded ASN.1 in Annex B1 for this message is not correct.	

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*** For Information ***

TS 23.271 V6.2.0

9.1.8.2   Location Report Procedure

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 reference number that was included in the Provide Subscriber Location and the information that MT-LR must be re-initiated against the new SGSN/MSC. The address of the new SGSN/MSC is included in Subscriber Location Report if available. (If new SGSN/MSC address was included, the GMLC continues at step 1 above, otherwise it continues with an interrogation against HLR as described in 9.1.1.)
If V-GMLC is noticed that the UE has moved to another PLMN while it is waiting for the requested event to happen, a location report message shall be sent to the H-GMLC from V-GMLC with the information that MT-LR must be re-initiated against the new VPLMN. The H-GMLC continues with an interrogation against HLR/HSS as described in 9.1.1.

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 check related action fails, a Subscriber Location Report with the reference number that was included in the Provide Subscriber Location is returned with appropriate error cause indicating termination of the deferred location request.

6)   When location information has been obtained from the RAN, the SGSN/MSC returns the Subscriber Location Report. The report shall indluced the reference number that was included in the Provide Subscriber Location and 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 with the reference number that was included in the Provide Subscriber Location will be returned with an appropriate error cause indicating termination of the deferred location request.

7)   GMLC then returns the LCS Service Response to the LCS Client via H-GMLC and R-GMLC as in 9.1.1.

*** First Modification ***

8.1.4   MAP_SEND_IDENTIFICATION service

8.1.4.1   Definition

The MAP_SEND_IDENTIFICATION service is used between a VLR and a previous VLR to retrieve IMSI and authentication data for a subscriber registering afresh in that VLR.

It may also be used to send the MSC number from a VLR to a previous VLR.

The MAP_SEND_IDENTIFICATION service is a confirmed service using the service primitives defined in table 8.1/4.

8.1.4.2   Service primitives

Table 8.1/4: MAP_SEND_IDENTIFICATION

Parameter name	Request	Indication	Response	Confirm
Invoke Id	M	M(=)	M(=)	M(=)
TMSI	M	M(=)		
Number of requested vectors	M	M(=)		
Segmentation prohibited indicator	C	C-(=)		
MSC Number	U	C(=)		
IMSI			C	C(=)
Authentication set			U	C(=)
Current Security Context			U	C(=)
User error			C	C(=)
Provider error				O

8.1.4.3 Parameter definitions and use

<u>Invoke Id</u>

See definition in clause 7.6.1.

<u>TMSI</u>

See definition in clause 7.6.2.

If multiple service requests are present in a dialogue then this parameter shall be present in every service request.

<u>Number of requested vectors</u>

A number indicating how many authentication vectors the new VLR is prepared to receive. The previous VLR shall not return more vectors than indicated by this parameter.

This parameter shall be present in the first (or only) request of the dialogue. If multiple service requests are present in a dialogue then this parameter shall not be present in any service request other than the first one

<u>Segmentation prohibited indicator</u>

This parameter indicates if the new VLR or SGSN allows segmentation of the response at MAP user level.

This parameter may be present only in the first request of the dialogue.

<u>IMSI</u>

See definition in clause 7.6.2. The IMSI is to be returned if the service succeeds.

If multiple service requests are present in a dialogue and the service succeeds then this parameter shall not be present in any service response other than the first one

<u>MSC Number</u>

This is the ISDN number assigned to the MSC currently serving the MS.

<u>Authentication set</u>

See definition in clause 7.6.7. If the service succeeds a list of up to five authentication sets is returned, if there are any available.

<u>Current Security Context</u>

See definition in clause 7.6.7. If the service succeeds, a list of either GSM or UMTS Security Context parameters can be returned.

<u>User error</u>

This parameter is mandatory if the service fails. The following error cause defined in clause 7.6.1 may be used, depending on the nature of the fault:

-    unidentified subscriber.

<u>Provider error</u>

For definition of provider errors see clause 7.6.1.

*** *Next Modification* ***

17.7   MAP constants and data types

17.7.1   Mobile Service data types

...

```
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,
    ...,
    msc-Number                         ISDN-AddressString                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
```

*** End of the Document ***

CR-Form-v7

CHANGE REQUEST

⌘ **29.060** CR **390** ⌘**rev** **1** ⌘ Current version: **5.4.0** ⌘

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

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

Title: ⌘	Introduction of SGSN Number in SGSN Context Request message
Source: ⌘	CN4

Work item code: ⌘	LCS2	***Date:*** ⌘	10/02/2003

Category: ⌘ **B**

Use <u>one</u> of the following categories:
  F *(correction)*
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  B *(addition of feature),*
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Release: ⌘ Rel-6

Use <u>one</u> 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)*
  Rel-6   *(Release 6)*

Reason for change: ⌘	As identified by SA2 there is an inconsistency between stage-2 TS 23.271 and stage-3 TS 29.060. According to 23.271v.6.2.0 sub clause 9.1.8.2 for the Mobile Terminating Deferred Location, the old SGSN may have the ability to transfer the new SGSN address to the GMLC in case UE has performed an inter SGSN RAU.

The current understanding in SA2 has been that the SGSN address, as already supported by GTP messages, could be sent to GMLC for this purpose. But when going into stage 3 details it was made clear that this SGSN address only contains the IP address to be used between GSN nodes, and by that not suitable for MAP routing as needed by GMLC.

In order to fulfil the stage 2 requirements, the new SGSN must therefore optionally even provide information about the "SGSN Number" to the old SGSN in addition to the "SGSN Address" as already sent. |
| ***Summary of change:*** ⌘ | The optional SGSN Number IE has been introduced in the SGSN Context Request message. |
| ***Consequences if not approved:*** ⌘ | Increased signalling in the core network as the GMLC has to interrogate HLR every time to get the address of the new SGSN, before a re-activation of the Location Request can be performed. |

Clauses affected: ⌘	2, 3.2, 7.5.3, 7.7, 7.7.x (new)

	Y	**N**		
Other specs ⌘		**X**	Other core specifications ⌘	
affected:		**X**	Test specifications	

	X	O&M Specifications	
Other comments:	⌘	For more information see SA2 LS N4-030175 (S2-030429)	

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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.

****   START OF MODIFICATION   ****

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   3GPP TR 21.905: "3G Vocabulary".

[2]   3GPP TS 23.003: "Numbering, addressing and identification".

[3]   3GPP TS 23.007: "Restoration Procedures".

[4]   3GPP TS 23.060: "General Packet Radio Service (GPRS); Service Description; Stage 2".

[5]   3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols-Stage 3".

[6]   3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[7]   3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[8]   3GPP TS 33.102: "Security Architecture".

[9]   3GPP TS 43.020: " Security related network functions".

[10]   3GPP TS 43.064: " Overall description of the GPRS Radio Interface; Stage 2".

[11]   3GPP TS 44.064: " Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) Layer Specification".

[12]   STD 0005: "Internet Protocol", J. Postel.

[13]   STD 0006: "User Datagram Protocol", J. Postel.

[14]   RFC 1700: "Assigned Numbers", J. Reynolds and J. Postel.

[15]   RFC 2181: "Clarifications to the DNS Specification", R. Elz and R. Bush.

[16]   3GPP TS 23.007: "Restoration Procedures".

[17]   3GPP TS 23.121: "Architectural Requirements for Release 1999".

[18]   3GPP TS 32.215 : "Charging data description for the packet switched domain".

[19]   3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes".

[20]   3GPP TS 48.018: "Base Station System (BSS) - Serving GPRS Support Node (SGSN); BSS GPRS Protocol (BSSGP)".

[21]   3GPP TR 44.901: "External Network assisted Cell Change; (Release 5)"

[22]   3GPP TS 33.210: "Network Domain Security".

[23]   3GPP TS 25.414: "UTRAN Iu Interface Data Transport and Transport Signalling".

[xx]   3GPP TS 23.271: " Technical Specification Group Services and System Aspects; Functional stage 2 description of LCS; (Release 6)"

****   END OF MODIFICATION   ****

****   START OF MODIFICATION   ****

3.2   Abbreviations

Abbreviations used in the present document are listed in 3GPP TS 21.905.

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

BB	Backbone Bearer
DF	Don't Fragment
FFS	For Further Study
GMLC	Gateway Mobile Location Centerre
GTP	GPRS Tunnelling Protocol
GTP-C	GTP Control
GTP-U	GTP User
IANA	Internet Assigned Number Authority
ICMP	Internet Control Message Protocol
IE	Information Element
IP	Internet Protocol
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
MTU	Maximum Transmission Unit
NACC	Network Assisted Cell Change
QoS	Quality of Service
RAN	Radio Access Network
RANAP	Radio Access Network Application Part
RIM	RAN Information Management
RNC	Radio Network Controller
TEID	Tunnel Endpoint IDentifier
TFT	Traffic Flow Template
UDP	User Datagram Protocol
UTRAN	UMTS Terrestrial Radio Access Network
Gn interface	Interface between GPRS Support Nodes (GSNs) within a PLMN
Gp interface	Interface between GPRS Support Nodes (GSNs) in different PLMNs

****   END OF MODIFICATION   ****

****   START OF MODIFICATION   ****

7.5.3   SGSN Context Request

The new SGSN shall send an SGSN Context Request to the old SGSN to get the MM and PDP Contexts for the MS.

For Intra Domain Connection of RAN Nodes to Multiple CN Nodes, where the old SGSN belongs to an SGSN pool, the new SGSN cannot in the general case determine the old SGSN. The new SGSN shall in this case send the SGSN Context Request message to an SGSN based on the old RAI, as usual. If an SGSN within an SGSN pool receives an SGSN Context Request message for an MS that has been attached to another SGSN of the same SGSN pool, the SGSN shall relay the SGSN Context Request message unchanged to the old SGSN. The SGSN within an SGSN pool can determine if the received SGSN Context Request message was meant for itself or for another SGSN of the SGSN pool by looking at the Network Resource Identifier contained in the P-TMSI parameter, or alternatively in the TLLI parameter. See 3GPP TS 23.003 [2] for details on the coding of the P-TMSI and see 3GPP TS 23.236 [18] for details on SGSN pool.

Note that an SGSN relaying the SGSN Context Request message shall not supervise the SGSN Context Response message.

 The MS is identified in the old SGSN by its old RAI and old TLLI/old P-TMSI values. The TLLI/P-TMSI and RAI is a foreign TLLI/P-TMSI and an RAI in the old SGSN. Exactly one of the TLLI, P-TMSI or IMSI information fields shall be present.

The old SGSN responds with an SGSN Context Response.

The new SGSN shall include a SGSN Address for control plane. The old SGSN shall store this SGSN Address and use it when sending control plane messages for the MS to the new SGSN in the SGSN context transfer procedure.

The new SGSN may include a~~a~~its SGSN number. ~~T~~If the old SGSN receives the SGSN number of the new SGSN it shall include this number when informing interworking core network nodes that there is a need to re-route previously sent requests against the new SGSN, e.g. in LCS the GMLC will use this SGSN number to re-activate the Location Request to the new SGSN (3GPP TS 23.271 [xx]).

The Tunnel Endpoint Identifier Control Plane field specifies a Tunnel Endpoint Identifier for control plane messages, which is chosen by the new SGSN. The old SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent control plane messages that are sent from the old SGSN to the new SGSN and related to the PDP context(s) requested.

The MS Validated indicates that the new SGSN has successfully authenticated the MS. IMSI shall be included if MS Validated indicates 'Yes'.

The P-TMSI Signature is conditionally provided by the MS to the new SGSN for identification checking purposes as defined in GSM 3GPP TS 23.060 and 3GPP TS 24.008. If the MS has provided the P-TMSI Signature, the new SGSN shall include this parameter in the SGSN Context Request message.

The optional Private Extension contains vendor or operator specific information.

Table 26: Information Elements in a SGSN Context Request

Information element	Presence requirement	Reference
IMSI	Conditional	7.7.2
Routeing Area Identity (RAI)	Mandatory	7.7.3
Temporary Logical Link Identifier (TLLI)	Conditional	7.7.4
Packet TMSI (P-TMSI)	Conditional	7.7.5
P-TMSI Signature	Conditional	7.7.9
MS Validated	Optional	7.7.10
Tunnel Endpoint Identifier Control Plane	Mandatory	7.7.14
SGSN Address for Control Plane	Mandatory	7.7.32
SGSN Number	Optional	7.7.x
Private Extension	Optional	7.7.46

****   END OF MODIFICATION   ****

****   START OF MODIFICATION   ****

7.7   Information Elements

A GTP Signalling message may contain several information elements. The TLV (Type, Length, Value) or TV (Type, Value) encoding format shall be used for the GTP information elements. The information elements shall be sorted, with the Type fields in ascending order, in the signalling messages. The Length field contains the length of the information element excluding the Type and Length field.

For all the length fields, bit 8 of the lowest numbered octet is the most significant bit and bit 1 of the highest numbered octet is the least significant bit.

Within information elements, certain fields may be described as spare. These bits shall be transmitted with the value defined for them. To allow for future features, the receiver shall not evaluate these bits.

The most significant bit in the Type field is set to 0 when the TV format is used and set to 1 for the TLV format.
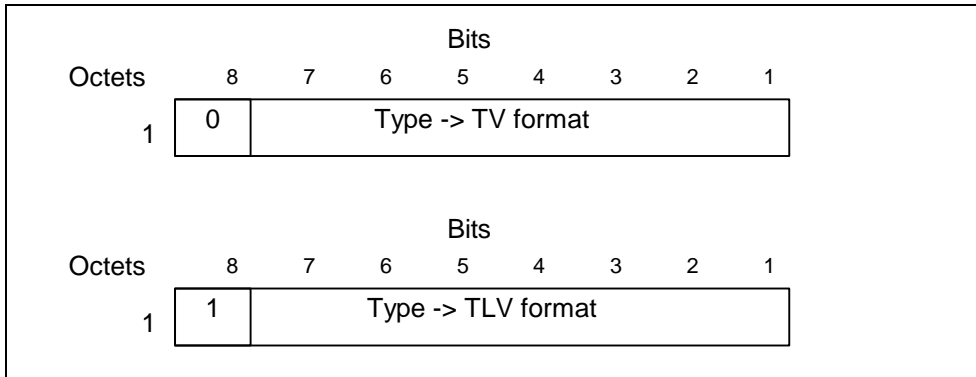
Figure 8: Type field for TV and TLV format

Table 37: Information Elements

IE Type Value	Format	Information Element	Reference
1	TV	Cause	7.7.1
2	TV	International Mobile Subscriber Identity (IMSI)	7.7.2
3	TV	Routeing Area Identity (RAI)	7.7.3
4	TV	Temporary Logical Link Identity (TLLI)	7.7.4
5	TV	Packet TMSI (P-TMSI)	7.7.5
6-7	Spare		
8	TV	Reordering Required	7.7.6
9	TV	Authentication Triplet	7.7.7
10	Spare		
11	TV	MAP Cause	7.7.8
12	TV	P-TMSI Signature	7.7.9
13	TV	MS Validated	7.7.10
14	TV	Recovery	7.7.11
15	TV	Selection Mode	7.7.12
16	TV	Tunnel Endpoint Identifier Data I	7.7.13
17	TV	Tunnel Endpoint Identifier Control Plane	7.7.14
18	TV	Tunnel Endpoint Identifier Data II	7.7.15
19	TV	Teardown Ind	7.7.16
20	TV	NSAPI	7.7.17
21	TV	RANAP Cause	7.7.18
22	TV	RAB Context	7.7.19
23	TV	Radio Priority SMS	7.7.20
24	TV	Radio Priority	7.7.21
25	TV	Packet Flow Id	7.7.22
26	TV	Charging Characteristics	7.7.23
27	TV	Trace Reference	7.7.24
28	TV	Trace Type	7.7.25
29	TV	MS Not Reachable Reason	7.7.25A
30	TV	Radio Priority LCS	7.7.25B
117-126	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215)		
127	TV	Charging ID	7.7.26
128	TLV	End User Address	7.7.27
129	TLV	MM Context	7.7.28
130	TLV	PDP Context	7.7.29
131	TLV	Access Point Name	7.7.30
132	TLV	Protocol Configuration Options	7.7.31
133	TLV	GSN Address	7.7.32
134	TLV	MS International PSTN/ISDN Number (MSISDN)	7.7.33
135	TLV	Quality of Service Profile	7.7.34
136	TLV	Authentication Quintuplet	7.7.35
137	TLV	Traffic Flow Template	7.7.36
138	TLV	Target Identification	7.7.37
139	TLV	UTRAN Transparent Container	7.7.38
140	TLV	RAB Setup Information	7.7.39
141	TLV	Extension Header Type List	7.7.40
142	TLV	Trigger Id	7.7.41
143	TLV	OMC Identity	7.7.42
144	TLV	RAN Transparent Container	7.7.43
145	TLV	PDP Context Prioritization	7.7.45
146	TLV	Additional RAB Setup Information	7.7.45A
Yyy	TLV	SGSN Number	7.7.x
239-250	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215)		
251	TLV	Charging Gateway Address	7.7.44
252-254	Reserved for the GPRS charging protocol (see GTP' in 3GPP TS 32.215)		
255	TLV	Private Extension	7.7.46

**** END OF MODIFICATION ****

**** START OF MODIFICATION ****

7.7.x SGSN Number

The SGSN number refers to the ISDN number of a SGSN. The SGSN Number is defined in 3GPP TS 23.003 [2].
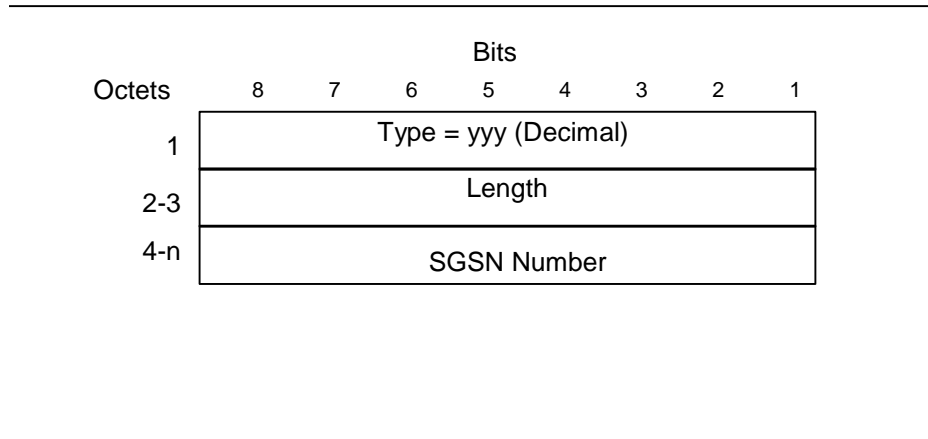
	Bits
Octets	8 7 6 5 4 3 2 1
1	Type = yyy (Decimal)
2-3	Length
4-n	SGSN Number

Figure xx: SGSN Number Information Element

**** END OF MODIFICATION ****

CR-Form-v7

CHANGE REQUEST

⌘ **29.060 CR 403** ⌘ **rev** **-** ⌘ Current version: **5.4.0** ⌘

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

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

Title: ⌘	Introduction of SGSN Number in the Forward Relocation Response message	
Source: ⌘	CN4	
Work item code: ⌘	LCS2	***Date:*** ⌘ 12/02/2003
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: ⌘	As identified by SA2 there is an inconsistency between stage-2 TS 23.271 and stage-3 TS 29.060. According to 23.271v.6.2.0 sub clause 9.1.8.2 for the Mobile Terminating Deferred Location, the old SGSN may have the ability to transfer the new SGSN address to the GMLC in case UE has moved to another SGSN (SA2 LS N4-030175).

The current understanding in SA2 has been that the SGSN address, as already supported by GTP messages, could be sent to GMLC for this purpose. But when going into stage 3 details it was made clear that this SGSN address only contains the IP address to be used between GSN nodes, and by that not suitable for MAP routing as needed by GMLC.

In order to fulfil the stage 2 requirements, the new SGSN must therefore optionally even provide information about the "SGSN Number" to the old SGSN in addition to the "SGSN Address" as already sent.

Hence, similar with the introduction of the SGSN number in the SGSN Context Request message (CR# 390, N4-030224), the SGSN number should optionally be provided in the Forward Relocation Response message. |
Summary of change: ⌘	The optional SGSN Number IE has been introduced in the Forward Relocation Response message.
Consequences if not approved: ⌘	Increased signalling in the core network, as the GMLC has to interrogate HLR every time to get the address of the new SGSN, before a re-activation of the Location Request can be performed.
Clauses affected: ⌘	7.5.7

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

Other comments:	⌘	See also CR#390 (N4-030224)

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.

**** START OF MODIFICATION ****

7.5.7 Forward Relocation Response

The new SGSN shall send a Forward Relocation Response to the old SGSN as a response to a previous Forward Relocation Request.

Possible Cause values is:

- 'Request Accepted'.

- 'System failure'.

- 'Mandatory IE incorrect'.

- 'Mandatory IE missing'.

- 'Optional IE incorrect'.

- 'No resources available'.

- 'Invalid message format'.

- 'Relocation failure'.

RANAP Cause is mandatory if cause value is contained in RANAP message.

RAB Setup Information, UTRAN transparent container and RANAP Cause are information from the target RNC in the new SGSN.

One or more RAB Setup Information parameters may be sent in this message. This information element shall be included if the Cause contains the value 'Request accepted' and there is at least one RAB assigned in the new SGSN.

The new SGSN shall include a SGSN Address for control plane. The old SGSN shall store this SGSN Address and use it when sending control plane messages for the MS to the new SGSN in the SRNS Relocation Procedure.

The Tunnel Endpoint Identifier Control Plane field specifies a Tunnel Endpoint Identifier that is chosen by the new SGSN. The old SGSN shall include this Tunnel Endpoint Identifier in the GTP header of all subsequent signalling messages that are sent from the old SGSN to the new SGSN. This information element shall be included if the Cause contains the value 'Request accepted'.

One or more Additional RAB Setup Information parameters may be sent in this message for IPv6. This information element shall be included if the Cause contains the value 'Request accepted' and there is at least one RAB assigned in the new SGSN.

The new SGSN may include its SGSN number. If the old SGSN receives the SGSN number of the new SGSN it shall include this number when informing interworking core network nodes that there is a need to re-route previously sent requests against the new SGSN, e.g. in LCS the GMLC will use this SGSN number to re-activate the Location Request to the new SGSN (3GPP TS 23.271 [xx]).

The optional Private Extension contains vendor or operator specific information.

Table 30: Information Elements in a Forward Relocation Response

Information element	Presence requirement	Reference
Cause	Mandatory	7.7.1
Tunnel Endpoint Identifier Control Plane	Conditional	7.7.14
RANAP Cause	Conditional	7.7.18
SGSN Address for Control plane	Conditional	7.7.32
UTRAN transparent container	Optional	7.7.38
RAB Setup Information	Conditional	7.7.39
Additional RAB Setup Information	Conditional	7.7.45A
SGSN Number	Optional	7.7.x
Private Extension	Optional	7.7.46

**** END OF MODIFICATION ****