

**Technical Specification Group Services and System Aspects TSGS#10(00)0592
Meeting #10, Bangkok, Thailand, 11-14 December 2000**

Source: TSG SA WG2
Title: CRs on 23.121 v.3.4.0
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 #10.

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.

CRs on 23.121 v.3.4.0

<i>Spec</i>	<i>Rel</i>	<i>CR #</i>	<i>Cat</i>	<i>Title</i>	<i>Input</i>	<i>Output</i>	<i>S2 tdoc #</i>
23.121	R99	063	F	Removal of Combined update towards the HLR for a combined 3G (MSC/VLR+SGSN) configuration	3.4.0	3.5.0	S2-001808

CR-Form-v3

CHANGE REQUEST

⌘ **23.121 CR CR 063** ⌘ rev **-** ⌘ 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

Title:	⌘	Removal of Combined update towards the HLR for a combined 3G-(MSC/VLR+SGSN) configuration		
Source:	⌘	Lucent Technologies		
Work item code:	⌘			
		Date: ⌘ 08/11/00		
Category:	⌘	F		
		Release: ⌘ R99		
		<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><i>Use one of the following categories:</i></p> <p>F (essential correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (Addition of feature),</p> <p>C (Functional modification of feature)</p> <p>D (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p> </td> <td style="width: 50%; vertical-align: top;"> <p><i>Use one of the following releases:</i></p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>REL-4 (Release 4)</p> <p>REL-5 (Release 5)</p> </td> </tr> </table>	<p><i>Use one of the following categories:</i></p> <p>F (essential correction)</p> <p>A (corresponds to a correction in an earlier release)</p> <p>B (Addition of feature),</p> <p>C (Functional modification of feature)</p> <p>D (Editorial modification)</p> <p>Detailed explanations of the above categories can be found in 3GPP TR 21.900.</p>	<p><i>Use one of the following releases:</i></p> <p>2 (GSM Phase 2)</p> <p>R96 (Release 1996)</p> <p>R97 (Release 1997)</p> <p>R98 (Release 1998)</p> <p>R99 (Release 1999)</p> <p>REL-4 (Release 4)</p> <p>REL-5 (Release 5)</p>
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Reason for change:	⌘	Capabilities were never implemented in release 99, and text in this specification does not provide for a complete specification for implementation
Summary of change:	⌘	Deletion of subclause 4.3.15 and its subclauses
Consequences if not approved:	⌘	Unimplementable material will exist in specification

Clauses affected:	⌘	4.3.15, 4.3.15.1, 4.3.15.2, 4.3.15.3, 4.3.15.4, 4.3.15.5, 4.3.15.6, 4.3.15.7									
Other specs affected:	⌘	<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;"><input type="checkbox"/> Other core specifications</td> <td style="width: 10%;">⌘</td> <td style="width: 60%;"></td> </tr> <tr> <td><input type="checkbox"/> Test specifications</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> O&M Specifications</td> <td></td> <td></td> </tr> </table>	<input type="checkbox"/> Other core specifications	⌘		<input type="checkbox"/> Test specifications			<input type="checkbox"/> O&M Specifications		
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Other comments:	⌘										

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/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.

4.3.14.4 Issues for further study

List of issues that are for further study related to this chapter and is the following:

- more details are required with regards to the differences with regards to the "IP-domain" MM compared to GPRS MM, especially considering roaming and handover to/from UMTS to GSM/GPRS;
- more details should be provided with regards to the logical relations between UE-CN and UTRAN-CN, and how these relate to the physical interconnection between UTRAN and the CN nodes(s), namely whether one logical/physical Iu can be used to interconnect the UTRAN with the CN.

4.3.15 ~~Combined update towards the HLR for a combined 3G-(MSC/VLR+SGSN) configuration~~void

~~NOTE: Combined location update procedures are not a high priority architectural requirement for UMTS R99.~~

4.3.15.1 ~~Motivation~~

~~In order to optimise the signalling load within the network, reduce operating and maintenance costs and creating the possibility to combine cs and ps handover it is essential to open the door in the specifications for combined 3G-(MSC/VLR+SGSN) solutions.~~

4.3.15.2 ~~Technical description~~

~~For the area concept discussed for the time being, four different cases have to be distinguished:~~

- ~~— change of UTRAN Registration Area (URA) within the same Routing Area (RA);~~
- ~~— change of URA and RA within the same Location Area (LA);~~
- ~~— change of URA, RA, or LA within the same node;~~
- ~~— change of URA, RA, or LA, and node.~~

~~For a combined 3G-(MSC/VLR+SGSN) node only in case 4 the UE's HLR has to be updated. If the UE is idle mode for the packet and circuit switched traffic a combined 3G-(MSC/VLR+SGSN) node will run the location update procedure jointly for the UE's CS and PS domain resulting in one combined location update message, see figure 4.32.~~

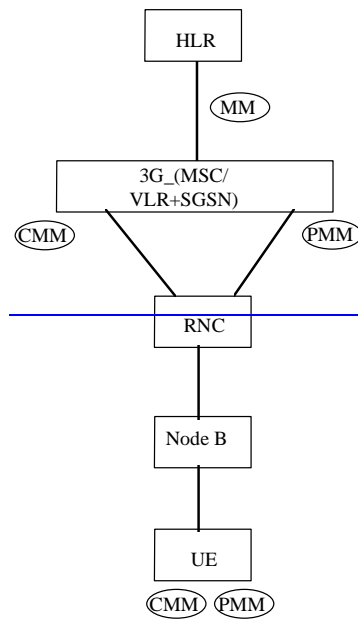


Figure 4.32: Combined MM Instance For a Combined 3G-(MSC/VLR+SGSN) Node

Split nodes may have to run one specific location update procedure for any of the two domains resulting in two separate location update messages, see figure 4.33.

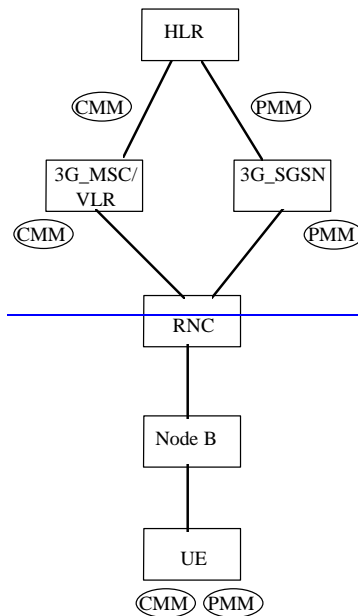


Figure 4.33: Split MM Instances for Separate Nodes

4.3.15.3 Requirements on UTRAN

The provision of location information by the UE to the core network must be independently of whether the 3G-MSC/VLR and 3G-SGSN are implemented as separate entities or as a combined node. It shall be possible to use a combined update procedure between serving node and HLR irrespective of the update procedure used between the UE and the serving node.

4.3.15.4 List of MAP services for location management between the HLR and MSC-VLR/SGSN for GSM/GPRS

Table 4.1 shows the MAP services used for location management between the SGSN and MSC/VLR and the HLR as defined in GSM/GPRS release 98.

Table 4.1: List of Location management services between the HLR and MSC/VLR and SGSN

MAP-service	Comment
MAP_UPDATE_LOCATION service	Updates VLR and MSC number in the HLR
MAP_UPDATE_GPRS_LOCATION service	Updates SGSN number and address in the HLR
MAP_INSERT_SUBSCRIBER_DATA service	Inserts subscriber data for GSM or GPRS
MAP_SEND_AUTHENTICATION_INFO service	To send authentication triplets to VLR or SGSN
MAP_CANCEL_LOCATION service	Cancels location in VLR or SGSN
MAP_PURGE_MS service	Marks user as unreachable in HLR. Common service for both GSM and GPRS

From the above table, it is clear that only minor modifications are required to MAP services between the MSC/VLR and SGSN and the HLR. A new service combining the MAP_UPDATE_LOCATION and MAP_UPDATE_GPRS_LOCATION services will need to be defined. All other services are common for both GSM and GPRS and can be used with minor modifications in the "conditional" parameter list.

4.3.15.5 Signalling procedures for combined update towards HLR

4.3.15.6 Combined attach case where the previous attach was towards 2 CN elements

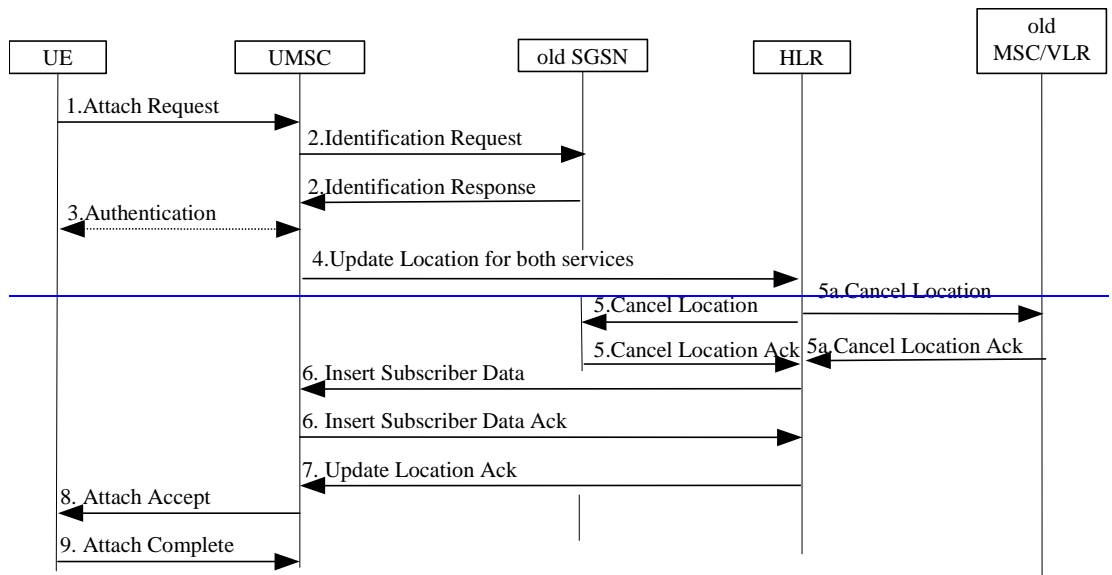


Figure 4.34: Combined attach procedure when the Ms moves from 2 CN element to a UMSC

- 1) The UE initiates the attach procedure by the transmission of an Attach Request (IMSI or P-TMSI and old RAI, Attach Type, old P-TMSI Signature) message to the UMSC. Attach Type indicates which type of attach that is to be performed, i.e. PS attach only, CS attach only, or combined attach (the example given is for combined attach).

- ~~2) If the UE identifies itself with P-TMSI and the 3G-SGSN/UMSC has changed since detach, the new UMSC sends an Identification Request (P-TMSI, old-RAI, old-P-TMSI-Signature) to the old-SGSN to request the IMSI. The old-SGSN responds with Identification Response (IMSI, Authentication Triplets). If the UE is not known in the old-SGSN, the old-SGSN responds with an appropriate error cause. The old-SGSN also validates the old-P-TMSI-Signature and responds with an appropriate error cause if it does not match the value stored in the old-SGSN.~~
- ~~3) The authentication functions are optional and may be used for example if P-TMSI signature authentication was not successful. If the UMSC-number has changed since the detach, or if it is the very first attach, routing/location-area update procedures are executed.~~
- ~~4) The UMSC sends a Combined Update-Location (UMSC-Number, UMSC-Address, IMSI) to the HLR.~~
- ~~5) The HLR sends Cancel-Location (IMSI, Cancellation-Type) to the old-SGSN and MSC. The old-SGSN and MSC acknowledges with Cancel-Location-Ack (IMSI).~~
- ~~6) The HLR sends Insert-Subscriber-Data (IMSI, PS and CS-subscription data) to the new UMSC. The new UMSC validates the UE's presence in the (new)-RA. If all checks are successful then the UMSC constructs an MM-context for the UE and returns an Insert-Subscriber-Data-Ack (IMSI) message to the HLR.~~
- ~~7) The HLR acknowledges the Update-Location message by sending an Update-Location-Ack to the UMSC. If the Update-Location is rejected by the HLR, the UMSC rejects the Attach-Request from the UE with an appropriate cause.~~
- ~~8) The UMSC sends an Attach-Accept (P-TMSI, TMSI, P-TMSI-Signature) to the UE.~~
- ~~9) If P-TMSI or TMSI was changed, the UE acknowledges the received TMSI(s) with Attach-Complete (P-TMSI, TMSI).~~

~~If the Attach-Request cannot be accepted, the UMSC returns an Attach-Reject (IMSI, Cause) message to the UE.~~

4.3.15.7 Combined location/routing area update where the previous LA/RA belonged to a 2 CN element

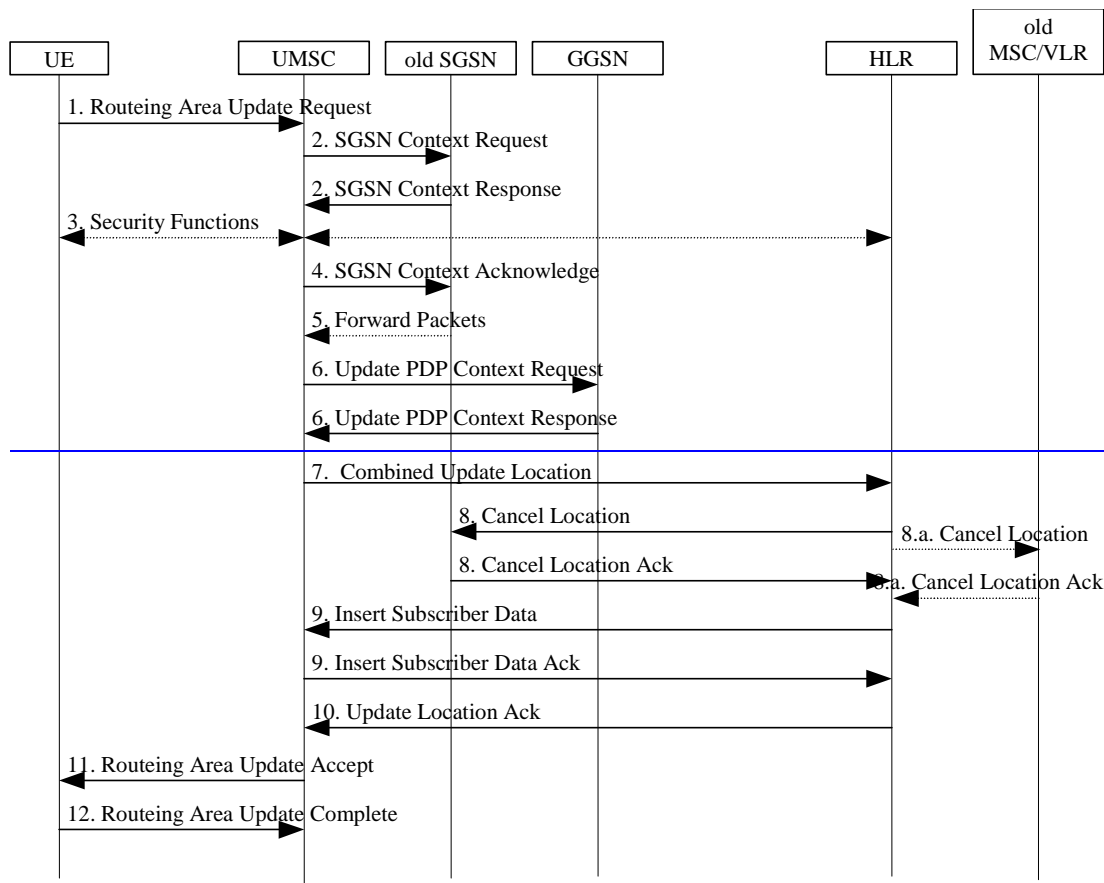


Figure 4.35: Combined LA/RA update when the MS moves from 2 CN element to UMSC

The UE sends a Routing Area Update Request (old RAI, old P-TMSI Signature, Update Type) to the new UMSC. Update Type example given here is for combined RA / LA update.

The new UMSC sends SGSN Context Request (old RAI, P-TMSI, old P-TMSI Signature, New UMSC Address) to the old SGSN to get the MM and PDP contexts for the UE. The old SGSN validates the old P-TMSI Signature and responds with an appropriate error cause if it does not match the value stored in the old SGSN. This should initiate the security functions in the new UMSC.

Security functions may be executed. These procedures are defined in subclause "Security Function".

If the user has at least one activated PDP context, then the new UMSC shall send an SGSN Context Acknowledge message to the old SGSN. This informs the old SGSN that the new UMSC is ready to receive data packets belonging to the activated PDP contexts.

The old SGSN starts tunnelling of buffered N-PDUs to the new UMSC. However, the possibility of this happening is remote since the UE is in MM-idle indicating that it was not in active communication.

The new UMSC sends Update PDP Context Request to the GGSNs concerned. The GGSNs update their PDP context fields and return an Update PDP Context Response (TEID).

~~The new UMSC informs the HLR of the change of SGSN/MSC by sending Combined Update Location (UMSC Number, UMSC Address, IMSI) to the HLR. The HLR sends Cancel Location (IMSI, Cancellation Type) to the old SGSN and MSC. The old SGSN acknowledges with Cancel Location Ack (IMSI). The HLR sends Insert Subscriber Data (IMSI, PS and CS subscription data) to the new UMSC. The new UMSC validates the UE's presence in the (new) RA. If due to regional subscription the UE is rejected, the UMSC rejects the Attach Request with an appropriate cause and returns an Insert Subscriber Data Ack (IMSI, UMSC Area Restricted Due To Regional Subscription) message to the HLR. If all checks are successful then the UMSC constructs an MM context for the UE and returns an Insert Subscriber Data Ack (IMSI) message to the HLR. The HLR acknowledges the Update Location by sending Update Location Ack (IMSI) to the new UMSC. The new UMSC validates the UE's presence in the new RA. If due to regional, national or international restrictions the UE is not allowed to attach in the RA or subscription checking fails, then the UMSC rejects the routing area update with an appropriate cause. If all checks are successful then the new UMSC establishes MM and PDP contexts for the UE. The new UMSC responds to the UE with Routing Area Update Accept (P-TMSI, TMSI, P-TMSI Signature). The UE confirms the reallocation of the TMSIs by sending Routing Area Update Complete to the UMSC.~~

4.3.16 UTRAN coordination

The UTRAN coordinates the resource allocation of an UE attached to both PS and CS services. The UTRAN shall reject or downgrade a connection which cannot be granted [3]. The cause might be congestion on the radio interface, or the existence of other connections between this UE and the other CN.

The UTRAN use the IMSI to identify a UE. The IMSI is transferred from the Core Network to the UTRAN with the common ID procedure. When an Iu connection is established, the Core Network shall perform the RANAP common ID procedure toward UTRAN as soon as the UE is identified (IMSI). The IMSI is only stored in the UTRAN for the duration of the RRC Connection.