3GPP TSG CN Plenary Meeting #14 **NP-010659**
Kyoto, Japan, 12th -14th December 2001

Source: **TSG CN WG 1**

Title: **CRs to Rel-5 on Work Item MULCN towards 23.009, 24.008 and 29.018**

Agenda item: **9.10**

Document for: **APPROVAL**

Introduction:

This document contains **4** CRs on **Rel-5 to** Work Item **"MULCN"**, that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #14 for approval.

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc-2nd-Level
23.009	052	3	Rel-5	Introduction of Intra Domain Connection of RAN	C	4.2.0	5.0.0	N1-012042
24.008	493	2	Rel-5	Usage of TMSI in Intra Domain Connection of RAN Nodes to Multiple CN Nodes	C	5.1.0	5.2.0	N1-011621
29.018	024	1	Rel-5	Introduction of Intra Domain Connection of RAN	C	4.1.0	5.0.0	N1-011992
29.018	025	1	Rel-5	Intra-Domain Connection of RAN Nodes to Multiple CN Nodes	F	4.1.0	5.0.0	N1-011981

Tdoc N1-012042
Tdoc N1-011991
Tdoc N1-011812
Tdoc N1-011492

3GPP TSG-CN1 Meeting #21
Cancun, Mexico, 26 - 30 November 2001

CR-Form-v4

CHANGE REQUEST

⌘ **23.009** **CR** **052** ⌘ ev **R3** ⌘ 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:	⌘	Introduction of Intra Domain Connection of RAN
Source:	⌘	Ericsson
Work item code:	⌘	IUFLEX
Date:	⌘	2001-11-30
Category:	⌘	**C**
Release:	⌘	REL-5

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)*

Reason for change:	⌘	TSG-SA #13 approved the 3GPP TS 23.236 v5.0.0 “Intra Domain Connection of RAN Nodes to Multiple CN Nodes” for REL-5. According to 23.236 target RAN node can be connected to more than one CN node. This needs to be reflected in 23.009.
Summary of change:	⌘	A reference to 23.236 is introduced. It is specified that (3G)MSC-A can have multiple target CN nodes for each handover target in a pool-area.
Consequences if not approved:	⌘	23.009 would be incomplete.

Clauses affected:	⌘	References, 1, 4.1.1, 4.2.1, 4.3.1, 4.4.1		
Other specs affected:	⌘	☒ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	24.008, 23.003, 29.002, 29.018
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://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.

****** First Modified Section ******

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] ITU-T Recommendation Q.118: "Abnormal conditions - Special release arrangements".

[2] 3GPP TS 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2a] 3GPP TS 21.905: "3G Vocabulary".

[3] 3GPP TS 03.68: "Digital cellular telecommunications system (Phase 2+); Voice Group Call Service (VGCS); Stage 2".

[4] 3GPP TS 05.08: "Digital cellular telecommunications system (Phase 2+); Radio Subsystem Link Control".

[5] 3GPP TS 08.08: "Digital cellular telecommunications system (Phase 2+); Mobile Switching Centre - Base Station System (MSC-BSS) Interface Layer 3 specification".

[6] 3GPP TS 08.58: "Digital cellular telecommunications system (Phase 2+); Base Station Controler - Base Transceiver Station (BSC-BTS) Interface Layer 3 specification".

[7] 3GPP TS 09.08: "Digital cellular telecommunications system (Phase 2+); Application of the Base Station System Application Part (BSSAP) on the E-interface".

[8] 3GPP TS 29.010: "Information Element Mapping between Mobile Station - Base Station System (MS-BSS) and Base Station System - Mobile-services Switching Centre (BSS-MSC); Signalling procedures and the Mobile Application Part (MAP)".

[9] 3GPP TS 22.129: "Handover Requirements between UMTS and GSM or other Radio Systems".

[10] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[11] 3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[12] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[13] 3GPP TS 25.303: "UE functions and inter-layer procedures in connected mode".

[14] 3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

[15] 3GPP TS 29.108: "Application of the Radio Access Network Application Part (RANAP) on the E-interface".

[16] ITU-T Recommendation G.711: "Pulse code modulation (PCM) of voice frequencies".

[17] 3GPP TS 23.135: "Multicall supplementary service; Stage 2".

[18] 3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes"

[19] 3GPP TS 23.221: "Architectural Requirements"

****** Next Modified Section ******

1 Scope

The present document contains a detailed description of the handover procedures to be used in PLMNs. The purpose of the handover procedures, as described in the present document, are to ensure that the connection to the Mobile Station (MS) or User Equipment (UE) is maintained as it moves from one cell or radio network to another. The document defines the circuit switched handover functionality based on the service requirements in 3GPP TS 22.129 [9].

The present document considers the following four cases:

i) handover between Base Stations connected to the same MSC, this is termed an Intra-MSC handover;

ii) handover between Radio Network Subsystems connected to the same 3G_MSC, this is termed an Intra-3G_MSC handover/relocation. This case also includes inter-system handover between RNS and BSS if the 3G_MSC supports the A-interface;

iii) handover between Base Stations connected to different MSCs, this is termed an Inter-MSC handover. This category can be sub-divided into three further procedures:

   a) the Basic Inter-MSC Handover procedure, where the MS is handed over from a controlling MSC (MSC-A) to another MSC (MSC-B);

   b) the Subsequent Inter-MSC Handover procedure, where the MS is handed over from MSC-B to a third MSC (MSC-B');

   c) the Subsequent Inter-MSC handback, where the MS is handed back from MSC-B to MSC-A.

iv) handover between Radio Network Subsystems connected to different 3G_MSCs, this is termed an Inter-3G_MSC handover/relocation. This category can be divided into three further sub-procedures:

   a) the Inter-3G_MSC Handover procedure from UMTS to GSM, where the UE/MS is handed over from a controlling 3G_MSC (3G_MSC-A) to an MSC (MSC-B);

   b) the Inter-3G_MSC Handover procedure from GSM to UMTS, where the UE/MS is handed over from a controlling MSC (MSC-A) to a 3G_MSC (3G_MSC-B);

   c) the Inter-3G_MSC Relocation procedure, where the UE is relocated from 3G_MSC-A to 3G_MSC-B. This procedure can also be combined with a hard change of radio resources (Hard Handover with switch in the core network).

The MSC in this category can optionally be a 3G_MSC supporting the A-interface. The three sub-procedures do also cover subsequent handover/relocation to a third MSC-B' or 3G_MSC-B' and subsequent handover/relocation back to MSC-A or 3G_MSC-A.

In both cases i) and iii) the same procedures as defined in the 3GPP TS 08.08 [5] and the 3GPP TS 24.008 [10] shall be used on the A-interface and on the Radio Interface, respectively.

In case ii) the same procedures as defined in the 3GPP TS 25.413 [11] and the 3GPP TS 24.008 [10] shall be used on the Iu-interface. If the 3G_MSC in case ii) also supports the A-interface, the 3GPP TS 08.08 [5] and the 3GPP TS 24.008 [10] shall be used on the A-interface.

In case iii) the handover procedures shall transport the A-interface messages between MSC-A and MSC-B described in the Mobile Application Part (MAP), 3GPP TS 29.002 [12].

In case iv) the handover procedures shall transport the A-interface messages between 3G_MSC and MSC described in the Mobile Application Part (MAP), 3GPP TS 29.002 [12].

In case iv) the relocation procedure shall transport the Iu-interface messages between 3G_MSC-A and 3G_MSC-B described in the Mobile Application Part (MAP), 3GPP TS 29.002 [12].

The interworking between the 3GPP TS 29.002 [12] protocol and the 3GPP TS 08.08 [5] protocol is described in the 3GPP TS 29.010 [8].

Handovers, which take place on the same MSC are termed Intra-MSC handovers; this includes both Inter-BSS and Intra-BSS handovers.

Handovers, which take place on the same 3G_MSC are termed Intra-3G_MSC handovers; this includes Inter-RNS handovers and optionally RNS to BSS and BSS to RNS handovers.

"Flexible Iu interface for handover/relocation" Option (see 3GPP TS 23.221 [19], subclause 4.2.1): Up to release 99 an RNS can be connected only to one 3G_MSC. From release 4 onwards, as a network option, an RNS can have Iu interfaces to more than one MSC. Such an additional Iu interface may be selected by an MSC during an intra-PLMN relocation or intra-PLMN BSS to RNS handover procedure. This allows the MSC to use an Intra-3G_MSC handover procedure according to case ii) instead of an Inter-3G_MSC handover procedure according to case iv). The decision whether to use the Intra-3G_MSC handover procedure is implementation and configuration dependent. In a network implementing this option, a global title based on the Global RNC-Id may optionally be used for the addressing of the Iu interface messages.

"Intra Domain Connection of RAN Nodes to Multiple CN Nodes" Option (see 3GPP TS 23.236 [18]): when applied, a BSS or an RNS can be connected to more than one MSC.

The present document also covers the requirements for handover in ongoing GSM voice group calls, directed retry and handover without a circuit connection between (U)MSCs. The present document does not consider the case of handovers between radio channels on the same BSS (Intra-BSS handover) or the handover of packet radio services. The Inter-RNS handover case that results in a relocation is covered by the present document but not other Inter-RNS or Intra-RNS handover cases.

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****** Next Modified Section ******

4 Role, functional composition of MSCs and interfaces for handover

4.1 MSC-A

4.1.1 Role of MSC-A

In the Intra-MSC handover case, the MSC-A (simply termed MSC) controls the call, the mobility management and the radio resources before, during and after an Intra-MSC handover. When BSSAP procedures have to be performed, they are initiated and driven by MSC-A.

In the Inter-MSC handover case, MSC-A is the MSC which controls the call and the mobility management of the Mobile during the call, before, during and after a basic or subsequent handover. When BSSAP procedures related to dedicated resources have to be performed towards the MS, they are initiated and driven by MSC-A. The MSC-A - MSC-B interface works as a MSC - BSS interface for a subset of BSSMAP procedures. These BSSMAP procedures, described in 3GPP TS 09.08 [7] are only those related to dedicated resources. The DTAP signalling is relayed transparently by MSC-B between MSC-A and the MS.

During a basic handover, MSC-A initiates and controls all the handover procedure, from its initiation (reception of Handover Required from BSS-A on A-interface) until its completion (reception of Handover Complete from MSC-B on E-interface).

For handover to an area where "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is applied, MSC-A can have multiple target CN nodes for each handover target in a pool-area as specified in 3GPP TS 23.236 [18].

During a subsequent handover back to MSC-A, MSC-A acts as a BSS towards MSC-B, which controls the handover procedure until the termination in MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to MSC-B from MSC-A). Then all handover related messages shall terminate at MSC-A (e.g. Handover Detect/Complete from BSS-B, Handover Failure from BSS-A).

During a subsequent handover to a third MSC, MSC-A works towards MSC-B' as described above in the basic handover paragraph and towards MSC-B as described above in subsequent handover paragraph.

In the Inter-System, inter-MSC handover case, MSC-A is the MSC which controls the call and the mobility management of the Mobile during the call, before, during and after a basic or subsequent handover. When BSSAP procedures related to dedicated resources have to be performed towards the MS, they are initiated and driven by MSC-A. The MSC-A - 3G_MSC-B interface works as a MSC - BSS interface for a subset of BSSMAP procedures. These BSSMAP procedures, described in 3GPP TS 09.08 [7] are only those related to dedicated resources. The DTAP signalling is relayed transparently by 3G_MSC-B between MSC-A and the MS.

During a basic inter-system handover, MSC-A initiates and controls all the handover procedure, from its initiation (reception of Handover Required from BSS-A on A-interface) until its completion (reception of Handover Complete from 3G_MSC-B on E-interface).

During a subsequent inter-system handover back to MSC-A, MSC-A acts as a BSS towards 3G_MSC-B, which controls the handover procedure until the termination in MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to 3G_MSC-B from MSC-A). Then all handover related messages shall terminate at MSC-A (e.g. Handover Detect/Complete from BSS-B, Handover Failure from BSS-A).

During a subsequent inter-system handover to a third MSC, MSC-A works towards 3G_MSC-B' as described above in the basic inter-system handover paragraph and towards 3G_MSC-B as described above in subsequent inter-system handover paragraph.

****** Next Modified Section ******

4.2.1 Role of MSC-B

In the Intra-MSC handover case, the MSC-B keeps the control of the whole Intra-MSC handover procedure.

MSC-B notifies MSC-A or 3G_MSC-A of successful intra -MSC-B handover completion by using the A_HANDOVER_PERFORMED message.

In the Inter-MSC handover case, the role of MSC-B (MSC-B') is only to provide radio resources control within its area. This means that MSC-B keeps control of the radio resources connection and release towards BSS-B. MSC-B will do some processing on the BSSMAP information received on the E-interface or A-interface whereas it will relay the DTAP information transparently between A-interface and E-interface. MSC-A initiates and drives a subset of BSSMAP procedures towards MSC-B, while MSC-B controls them towards its BSSs to the extent that MSC-B is responsible for the connections of its BSSs. The release of the dedicated resources between MSC-B and BSS-B is under the responsibility of MSC-B and BSS-B, and is not directly controlled by MSC-A. When clearing is to be performed due to information received from BSS-B, MSC-B shall transfer this clearing indication to MSC-A, to clear its connection with BSS-B, to terminate the dialogue with MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its BSS-B, is initiated by MSC-B, when the dialogue with MSC-A ends normally and a release is received from the circuit connection with MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by MSC-B for the circuit connection with MSC-A then MSC-B shall release the circuit connection.

In the Inter-system Inter-MSC handover case, the role of MSC-B (MSC-B') is only to provide radio resources control within its area. This means that MSC-B keeps control of the radio resources connection and release towards BSS-B. MSC-B will do some processing on the BSSMAP information received on the E-interface or A-interface whereas it will relay the DTAP information transparently between A-interface and E-interface. 3G_MSC-A initiates and drives a subset of BSSMAP procedures towards MSC-B, while MSC-B controls them towards its BSSs to the extent that MSC-B is responsible for the connections of its BSSs. The release of the dedicated resources between MSC-B and BSS-B is under the responsibility of MSC-B and BSS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from BSS-B, MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with BSS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with 3G_MSC-A, if any. In the same way, the release of the connection to its BSS-B, is initiated by MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by MSC-B for the circuit connection with 3G_MSC-A then MSC-B shall release the circuit connection.

For subsequent inter-MSC handover to an area where "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is applied, MSC-B can have multiple target CN nodes for each handover target in a pool-area as specified in 3GPP TS 23.236 [18].

****** Next Modified Section ******

4.3.1 Role of 3G_MSC-A

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-A (simply termed 3G_MSC) controls the call, the mobility management and the radio resources before, during and after an Intra-3G_MSC handover/relocation. When RANAP or BSSMAP procedures have to be performed, they are initiated and driven by 3G_MSC-A.

In a network implementing the "Flexible Iu interface for handover/relocation" option, 3G_MSC-A may optionally use a global title based on the Global RNC-Id for the addressing of the Iu interface messages towards the target RNC.

For handover/relocation to an area where "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is applied, 3G_MSC-A can have multiple target CN nodes for each handover/relocation target in a pool-area as specified in 3GPP TS 23.236 [18].

In the case of intra-MSC handover of a speech call, 3G_MSC-A controls the transcoder in the core network. The 3G_MSC-A determines if a transcoder is required to be inserted or released in the CN.

In the case of Inter-3G_MSC relocation, 3G_MSC-A links out the transcoder.

In the Inter-3G_MSC relocation case, 3G_MSC-A is the 3G_MSC that controls the call and the mobility management of the UE during the call, before, during and after a basic or subsequent relocation. When RANAP procedures related to dedicated resources have to be performed towards the UE, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A - 3G_MSC-B interface works as a 3G_MSC - RNS interface for the RANAP procedures. The Direct Transfer signalling is relayed transparently by 3G_MSC-B between 3G_MSC-A and the UE.

During a successful relocation the order to perform location reporting at change of Service Area is not transferred to the target RNS. In the Intra-3G_MSC-A relocation case, the 3G_MSC-A re-issues the Location Reporting Control towards the target RNS. In the Inter-3G_MSC relocation case, 3G_MSC-A keeps the control of the Location Report Control procedure. However, re-issuing the Location Reporting Control messages due to subsequent Intra-3G_MSC-B relocations is the responsibility of 3G_MSC-B.

During a basic relocation, 3G_MSC-A initiates and controls all the relocation procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Relocation Complete from 3G_MSC-B on E-interface).

During a subsequent relocation back to 3G_MSC-A, 3G_MSC-A acts as an RNS towards 3G_MSC-B, which controls the relocation procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Relocation Request Acknowledge to 3G_MSC-B from 3G_MSC-A). Then all relocation related messages shall terminate at 3G_MSC-A (e.g. Relocation Detect/Complete from RNS-B, Relocation Cancel from RNS-A).

During a subsequent relocation to a third 3G_MSC, 3G_MSC-A works towards 3G_MSC-B' as described above in the basic relocation paragraph and towards 3G_MSC-B as described above in subsequent relocation paragraph.

In the Inter-System, inter-3G_MSC handover case, 3G_MSC-A is the 3G_MSC which controls the call and the mobility management of the UE/MS during the call, before, during and after a basic or subsequent inter-system handover. When BSSAP procedures related to dedicated resources have to be performed towards the UE/MS, they are initiated and driven by 3G_MSC-A. The 3G_MSC-A – MSC-B interface works as a 3G_MSC – BSS interface for a subset of BSSMAP procedures. These BSSMAP procedures described in 3GPP TS 09 08 [7] are those related to dedicated resources. The DTAP signalling is relayed transparently by MSC-B between 3G_MSC-A and the UE/MS.

During a basic inter-system UMTS to GSM handover, 3G_MSC-A initiates and controls all the handover procedure, from its initiation (reception of Relocation Required from RNS-A on Iu-interface) until its completion (reception of Handover Complete from MSC-B on E-interface).

During a subsequent inter-system UMTS to GSM handover back to 3G_MSC-A, 3G_MSC-A acts as a BSS towards 3G_MSC-B, which controls the handover procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to 3G_MSC-B from 3G_MSC-A). Then all handover related messages shall terminate at 3G_MSC-A (e.g. Handover Detect/Complete from BSS-B, Relocation Cancel from RNS-A).

During a subsequent inter-system UMTS to GSM handover to a third 3G_MSC, 3G_MSC-A works towards MSC-B' as described above in the basic inter-system handover paragraph and towards 3G_MSC-B as described above in subsequent inter-system handover paragraph.

During a basic inter-system GSM to UMTS handover, 3G_MSC-A initiates and controls all the handover procedure, from its initiation (reception of Handover Required from BSS-A on A-interface) until its completion (reception of Handover Complete from 3G_MSC-B on E-interface).

During a subsequent inter-system GSM to UMTS handover back to 3G_MSC-A, 3G_MSC-A acts as an RNS towards MSC-B, which controls the handover procedure until the termination in 3G_MSC-A of the handover radio resources allocation (sending of the Handover Request Acknowledge to MSC-B from 3G_MSC-A). Then all handover related messages shall terminate at 3G_MSC-A (e.g. Relocation Detect/Complete from RNS-B, Handover Failure from BSS-A).

During a subsequent inter-system GSM to UMTS handover to a third 3G_MSC, 3G_MSC-A works towards 3G_MSC-B' as described above in the basic inter-system handover paragraph and towards MSC-B as described above in subsequent inter-system handover paragraph.

If 3G_MSC-A supports the optional supplementary service Multicall (See 3GPP TS 23.135) and UE is engaged with multiple bearers the following description applies:

- In the Intra-3G_MSC relocation case, the 3G-MSC-A tries to relocate all bearers to a new RNS.
- In the basic relocation case, the 3G-MSC-A tries to relocate all bearers to 3G_MSC-B. If 3G_MSC-A receives an indication that the 3G_MSC-B does not support multiple bearers, then 3G_MSC-A shall be able to select one bearer to be handed over according to the priority level defined as RAB parameters in 3GPP TS 25.413 and tries again to relocate the selected bearer.
- In the subsequent relocation to a third 3G_MSC-B' case, the 3G-MSC-A tries to relocate all bearers to 3G_MSC-B'. If 3G_MSC-A receives an indication that the 3G_MSC-B' does not support multiple bearers, then 3G_MSC-A shall be able to select one bearer to be handed over according to the priority level defined as RAB parameters in 3GPP TS 25.413 [11] and tries again to relocate the selected bearer.
- In the Intra-3G_MSC inter-system UMTS to GSM handover case and the basic inter-system UMTS to GSM handover case, the 3G_MSC-A shall be able to select one bearer to be handed over according to the priority level defined as RAB parameters in 3GPP TS 25.413 [11] and tries to handover the selected bearer.
- In all cases described above, 3G_MSC-A shall release some calls which has been carried by the bearers failed to set up in new RNS or the bearers not to be handed over.

****** Last Modified Section ******

4.4.1 Role of 3G_MSC-B

In the Intra-3G_MSC handover/relocation case, the 3G_MSC-B keeps the control of the whole Intra-3G_MSC handover/relocation procedure. 3G_MSC-B notifies MSC-A or 3G_MSC-A of intra-3G_MSC-B InterSystem handover and intra GSM handovers, by using the A_HANDOVER_PERFORMED message.

In case of intra-3G_MSC-B SRNSrelocation, if security algorithms have been changed:

a) When encapsulated BSSAP is used on the E interface, the A_HANDOVER_PERFORMED message shall be sent.

b) When encapsulated RANAP is used on the E interface, the LOCATION REPORT message shall be sent.

On reception of an order to perform location reporting at change of Service Area from 3G_MSC-A, 3G_MSC-B shall be responsible to re-issue the Location Reporting Control message after subsequent Intra-3G_MSC-B

relocations/handovers. This shall be performed immediately after the successful completion of the Relocation Resource Allocation procedure.

In both cases, the selected UMTS algorithm(s) shall be indicated in the MAP_PROCESS_ACCESS_SIGNALLING_REQUEST.

In a network implementing the "Flexible Iu interface for handover/relocation" option, in the Intra-3G_MSC handover/relocation case, 3G_MSC-B may optionally use a global title based on the Global RNC-Id for the addressing of the Iu interface messages towards the target RNC.

For subsequent inter-MSC handover/relocation to an area where "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is applied, 3G_MSC-B can have multiple target CN nodes for each handover target in a pool-area as specified in 3GPP TS 23.236 [18].

The role of 3G_MSC-B is also to provide transcoder resources.

In the Inter-3G_MSC relocation case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the RANAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. 3G_MSC-A initiates and drives RANAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with RNS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with 3G_MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the 3G_MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system UMTS to GSM Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards BSS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the BSSMAP information received on the A-interface whereas it will relay the DTAP information transparently between A-interface and E-interface. 3G_MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its BSSs to the extent that 3G_MSC-B is responsible for the connections of its BSSs. The release of the dedicated resources between 3G_MSC-B and BSS-B is under the responsibility of 3G_MSC-B and BSS-B, and is not directly controlled by 3G_MSC-A. When clearing is to be performed due to information received from BSS-B, 3G_MSC-B shall transfer this clearing indication to 3G_MSC-A, to clear its connection with BSS-B, to terminate the dialogue with 3G_MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its BSS-B, is initiated by 3G_MSC-B, when the dialogue with 3G_MSC-A ends normally and a release is received from the circuit connection with 3G_MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with 3G_MSC-A then 3G_MSC-B shall release the circuit connection.

In the Inter-system GSM to UMTS Inter-3G_MSC handover case, the role of 3G_MSC-B (3G_MSC-B') is only to provide radio resources control within its area. This means that 3G_MSC-B keeps control of the radio resources connection and release towards RNS-B. 3G_MSC-B will do some processing on the BSSMAP information received on the E-interface or the RANAP information received on the Iu-interface whereas it will relay the Direct Transfer information transparently between Iu-interface and E-interface. MSC-A initiates and drives a subset of BSSMAP procedures towards 3G_MSC-B, while 3G_MSC-B controls them towards its RNSs to the extent that 3G_MSC-B is responsible for the connections of its RNSs. The release of the dedicated resources between 3G_MSC-B and RNS-B is under the responsibility of 3G_MSC-B and RNS-B, and is not directly controlled by MSC-A. When clearing is to be performed due to information received from RNS-B, 3G_MSC-B shall transfer this clearing indication to MSC-A, to clear its connection with RNS-B, to terminate the dialogue with MSC-A through the E-interface, and to release its circuit connection with MSC-A, if any. In the same way, the release of the connection to its RNS-B, is initiated by 3G_MSC-B, when the dialogue with MSC-A ends normally and a release is received from the circuit connection with MSC-A, if any, or when the dialogue with the MSC-A ends abnormally.

When a release is received by 3G_MSC-B for the circuit connection with MSC-A then 3G_MSC-B shall release the circuit connection.

If 3G_MSC-B does not support the optional supplementary service Mutlicall (see 3GPP TS 23.135) and 3G_MSC-A requests to relocate multiple bearers, 3G_MSC-B shall indicate that it does not support multiple bearers to 3G_MSC-A.

If 3G_MSC-B supports the optional supplementary service Multicall (see 3GPP TS 23.135) and UE is engaged with multiple bearers the following description applies:

- In the basic relocation case, the 3G_MSC-B shall be able to allocate an Handover Number for each bearer. The 3G-MSC-B shall also be able to select some bearers so that the number of bearers will fulfill the maximum number of bearers supported by the 3G_MSC-B.

- In the Intra-3G_MSC relocation case, the 3G-MSC-B tries to relocate all bearers to a new RNS.

- In the subsequent relocation back to the 3G_MSC-A or to a third 3G_MSC-B' case, the 3G-MSC-B tries to request to the 3G_MSC-A to relocate all bearers to the 3G_MSC-A or to the 3G_MSC-B'.

- In the Intra-3G_MSC inter-system UMTS to GSM handover case and the subsequent inter-system UMTS to GSM handover back to the 3G_MSC-A or to a third MSC-B' case, the 3G_MSC-B shall be able to select one bearer to be handed over according to the priority level defined as RAB parameters in 3GPP TS 25.413 [11] and tries to handover the selected bearer.

3GPP TSG-CN1 Meeting #20
Brighton, England, 15.-19. October 2001

Tdoc N1-011621
Rev of N1-011595
Rev of N1-011491

CR-Form-v4

CHANGE REQUEST

⌘ **24.008** **CR** **493** ⌘ ev **2** ⌘ Current version: **5.1.0** ⌘

*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:	⌘	Usage of TMSI in Intra Domain Connection of RAN Nodes to Multiple CN Nodes
Source:	⌘	Vodafone, Ericsson, Siemens
Work item code:	⌘	IUFLEX
Date:	⌘	2001-10-18
Category:	⌘	**C**
Release:	⌘	REL-5

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)

Reason for change:	⌘	SA2 has completed the architectural work on this feature .TSG-SA #13 approved the 3GPP TS 23.236 v2.1.0 “Intra Domain Connection of RAN Nodes to Multiple CN Nodes” for REL-5. According to 23.236 usage of TMSI is mandatory for nodes which are in a pool. This contribution introduces the necessary changes to 24.008 in order to reflect the usage of TMSI in the CN node that belongs to a pool.
Summary of change:	⌘	A reference to 23.236 is intoduced. It is specified that TMSI usage is mandatory as specified in 23.236 if the CN node belongs to a pool.
Consequences if not approved:	⌘	It will not be clear that if a core network node belong to a pool, the TMSI usage is mandatory.

Clauses affected:	⌘			
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	23.003, 29.002, 24.007, 23.009, 29.018
Other comments:	⌘			

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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://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.

****** First Modified Section ******

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 TS 01.02: "Digital cellular telecommunications system (Phase 2+); General description of a GSM Public Land Mobile Network (PLMN)".

[2] 3GPP TS 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2a] 3GPP TS 21.905 "3G Vocabulary for 3GPP Specifications"

[3] 3GPP TS 22.002: "Digital cellular telecommunications system (Phase 2+); Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".

[4] 3GPP TS 22.003: "Teleservices supported by a GSM Public Land Mobile Network (PLMN)".

[5] 3GPP TS 02.09: "Digital cellular telecommunications system (Phase 2+); Security aspects".

[6] 3GPP TS 22.011: "Digital cellular telecommunications system (Phase 2+); Service accessibility".

[7] 3GPP TS 02.17: "Digital cellular telecommunications system (Phase 2+); Subscriber identity modules Functional characteristics".

[8] 3GPP TS 02.40: "Digital cellular telecommunications system (Phase 2+); Procedures for call progress indications".

[9] 3GPP TS 03.01: "Digital cellular telecommunications system (Phase 2+); Network functions".

[10] 3GPP TS 23.003: "Digital cellular telecommunications system (Phase 2+); Numbering, addressing and identification".

[11] 3GPP TS 03.13: "Digital cellular telecommunications system (Phase 2+); Discontinuous Reception (DRX) in the GSM system".

[12] 3GPP TS 23.014: "Digital cellular telecommunications system (Phase 2+); Support of Dual Tone Multi-Frequency signalling (DTMF) via the GSM system".

[12a] 3GPP TS 23.071: "Digital cellular telecommunications system (Phase 2+); Location Services; Functional description – Stage 2".

[13] 3GPP TS 03.20: "Digital cellular telecommunications system (Phase 2+); Security related network functions".

[14] 3GPP TS 23.122: "NAS Functions related to Mobile Station (MS) in idle mode".

[15] 3GPP TS 24.002: "GSM-UMTS Public Land Mobile Network (PLMN) access reference configuration".

[16] 3GPP TS 44.003: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface Channel structures and access capabilities".

[17] 3GPP TS 44.004: "Digital cellular telecommunications system (Phase 2+); layer 1 General requirements".

[18] 3GPP TS 44.005: "Digital cellular telecommunications system (Phase 2+); Data Link (DL) layer General aspects".

[19] 3GPP TS 44.006: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface Data Link (DL) layer specification".

[20] 3GPP TS 24.007: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3 General aspects".

[21] 3GPP TS 24.010: "Digital cellular telecommunications system ; Mobile radio interface layer 3 Supplementary services specification General aspects".

[22] 3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[23] 3GPP TS 24.012: "Short Message Service Cell Broadcast (SMSCB) support on the mobile radio interface".

[23a] 3GPP TS 24.071: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 location services specification.

[23b] 3GPP TS 04.31 "Digital cellular telecommunication system (Phse 2+);Location Services;Mobile Station (MS) – Serving Mobile Location Centre (SMLC); Radio Resource LCS Protocol (RRLP)".

[23c] 3GPP TS 25.331 : "3rd Generation Partnership Project;Technical Specification Group Radio Access Network; RRC Protocol Specification"

[24] 3GPP TS 24.080: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 supplementary services specification Formats and coding".

[25] 3GPP TS 24.081: "Digital cellular telecommunications system (Phase 2+); Line identification supplementary services - Stage 3".

[26] 3GPP TS 24.082: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services - Stage 3".

[27] 3GPP TS 24.083: "Digital cellular telecommunications system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 3".

[28] 3GPP TS 24.084: "Digital cellular telecommunications system (Phase 2+); MultiParty (MPTY) supplementary services - Stage 3".

[29] 3GPP TS 24.085: "Digital cellular telecommunications system (Phase 2+); Closed User Group (CUG) supplementary services - Stage 3".

[30] 3GPP TS 24.086: "Digital cellular telecommunications system (Phase 2+); Advice of Charge (AoC) supplementary services - Stage 3".

[31] 3GPP TS 24.088: "Call Barring (CB) supplementary services - Stage 3".

[32] 3GPP TS 05.02: "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path".

[33] 3GPP TS 05.05: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception".

[34] 3GPP TS 05.08: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".

[35] 3GPP TS 05.10: "Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronization".

[36] 3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[37] 3GPP TS 29.002: "Digital cellular telecommunications system (Phase 2+); Mobile Application Part (MAP) specification".

[38] 3GPP TS 29.007: "Digital cellular telecommunications system (Phase 2+); General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[39] 3GPP TS 11.10: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformity specification".

[40] 3GPP TS 11.21: "Digital cellular telecommunications system (Phase 2); The GSM Base Station System (BSS) equipment specification".

[41] ISO/IEC 646 (1991): "Information technology - ISO 7-bit coded character set for information interchange".

[42] ISO/IEC 6429: "Information technology - Control functions for coded character sets".

[43] ISO 8348 (1987): "Information processing systems - Data communications - Network service definition".

[44] ITU-T Recommendation E.163: "Numbering plan for the international telephone service".

[45] ITU-T Recommendation E.164: "Numbering plan for the ISDN era".

[46] ITU-T Recommendation E.212: "Identification plan for land mobile stations".

[47] ITU-T Recommendation F.69 (1993): "Plan for telex destination codes".

[48] ITU-T Recommendation I.330: "ISDN numbering and addressing principles".

[49] ITU-T Recommendation I.440 (1989): "ISDN user-network interface data link layer - General aspects".

[50] ITU-T Recommendation I.450 (1989): "ISDN user-network interface layer 3 General aspects".

[51] ITU-T Recommendation I.500 (1993): "General structure of the ISDN interworking recommendations".

[52] ITU-T Recommendation T.50: "International Alphabet No. 5".

[53] ITU Recommendation Q.931: ISDN user-network interface layer 3 specification for basic control".

[54] ITU-T Recommendation V.21: "300 bits per second duplex modem standardized for use in the general switched telephone network".

[55] ITU-T Recommendation V.22: "1200 bits per second duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[56] ITU-T Recommendation V.22bis: "2400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[57] Void.

[58] ITU-T Recommendation V.26ter: "2400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[59] ITU-T Recommendation V.32: "A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits".

[60] ITU-T Recommendation V.110: "Support of data terminal equipments (DTEs) with V-Series interfaces by an integrated services digital network".

[61] ITU-T Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[62] ITU-T Recommendation X.21: "Interface between data terminal equipment (DTE) and data circuit-terminating equipment (DCE) for synchronous operation on public data networks".

[63] Void.

[64] Void.

[65] ITU-T Recommendation X.30: "Support of X.21, X.21 bis and X.20 bis based data terminal equipments (DTEs) by an integrated services digital network (ISDN)".

[66] ITU-T Recommendation X.31: "Support of packet mode terminal equipment by an ISDN".

[67] Void.

[68] Void.

[69] ITU-T Recommendation X.121: "International numbering plan for public data networks".

[70] ETSI ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications for basic call control".

[71] ETSI ETS 300 102-2: "Integrated Services Digital Network (ISDN); User-network interface layer 3 Specifications for basic call control".

[72] ISO/IEC10646: "Universal Multiple-Octet Coded Character Set (UCS)"; UCS2, 16 bit coding.

[73] 3GPP TS 22.060: "General Packet Radio Service (GPRS); Service Description; Stage 1".

[74] 3GPP TS 23.060: "General Packet Radio Service (GPRS); Service Description; Stage 2".

[75] 3GPP TS 03.64: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2".

[76] 3GPP TS 44.060: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station - Base Station System (MS-BSS) interface; Radio Link Control and Medium Access Control (RLC/MAC) layer specification".

[77] IETF RFC 1034: "Domain names - Concepts and Facilities " (STD 7).

[78] 3GPP TS 44.065: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Subnetwork Dependent Convergence Protocol (SNDCP)".

[79] ITU Recommendation I.460: "Multiplexing, rate adaption and support of existing services".

[80] 3GPP TS 26.111: "Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324"

[81] 3GPP TS 23.107: "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; QoS Concept and Architecture"

[82] 3GPP TS 03.22: " Digital cellular telecommunications system (Phase 2+); Functions related to Mobile Station (MS) in idle mode and group receive mode".

[83] 3GPP TS 26.103: "3rd Generation Partnership Project; TSG-SA Codec Working Group; Speech Codec List for GSM and UMTS"

[84] 3GPP TS 44.018: "3rd Generation Partnership Project; Technical Specification Group GSM EDGE Radio Access Network; Mobile radio interface layer 3 specification, Radio Resource Control Protocol (Release 4)"

[85] 3GPP TS 48.008: "3rd Generation Partnership Project; Technical Specification Group GSM EDGE Radio Access Network; Mobile-services Switching Centre – Base Station System (MSC – BSS) interface; layer 3 specification (Release 4)"

[86] 3GPP TS 48.018: "3rd Generation Partnership Project; Technical Specification Group GSM EDGE Radio Access Network; General Packet Radio Service (GPRS); Base Station System (BSS) – Serving GPRS Support Node (SGSN); BSS GPRS Protocol (BSSGP) (Release 4)".

[87] 3GPP TS 03.55: "Dual Transfer Mode; Stage 2".

[88] 3GPP TS 23.067: "enhanced Multi-Level Precedence and Pre-emption service (eMLPP) - Stage 2"

[89] 3GPP TS 23.226: "Global Text Telephony; Stage 2 "

[90] 3GPP TS 26.226: "Cellular Text Telephone Modem (CTM), General Description "

[91] 3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes"

2.1 Definitions and abbreviations

****** Next Modified Section ******

4.3.1 TMSI reallocation procedure

The purpose of the TMSI reallocation procedure is to provide identity confidentiality , i.e. to protect a user against being identified and located by an intruder (see 3GPP TS 02.09, 03.20 and TS 33.102).

If the identity confidentiality service is applied for an IMSI, a Temporary Mobile Subscriber Identity (TMSI) is used for identification within the radio interface signalling procedures.

In a network supporting the feature 'Intra domain connection of RAN nodes to multiple CN nodes' a TMSI shall be allocated to each IMSI attached mobile station. See 3GPP TS 23.236 [91], chapter 4.3.

The structure of the TMSI is specified in 3GPP TS 23.003. The TMSI has significance only within a location area. Outside the location area it has to be combined with the Location Area Identifier (LAI) to provide for an unambiguous identity.

Usually the TMSI reallocation is performed at least at each change of a location area. (Such choices are left to the network operator).

The reallocation of a TMSI can be performed either by a unique procedure defined in this section or implicitly by a location updating procedure using the TMSI. The implicit reallocation of a TMSI is described together with that procedure.

If a TMSI provided by a mobile station is unknown in the network e.g. due to a data base failure, the network may require the mobile station to provide its International Mobile Subscriber Identity (IMSI). In this case the identification procedure (see section 4.3.3) should be used before the TMSI reallocation procedure may be initiated.

The TMSI reallocation can be initiated by the network at any time whilst a RR connection exists between the network and the mobile station.

NOTE 1: Usually the TMSI reallocation is performed in ciphered mode.

NOTE 2: Normally the TMSI reallocation will take place in conjunction with another procedure, e.g. at location updating or at call setup (see 3GPP TS 29.002).

4.3.1.1 TMSI reallocation initiation by the network

Tdoc N1-011992
3GPP TSG-CN1 Meeting #21 ***Tdoc N1-011813***
Cancun, Mexico, 26.-30. November 2001

CR-Form-v4

CHANGE REQUEST

⌘ **29.018** **CR** **024** ⌘ ev **1** ⌘ Current version: **4.1.0** ⌘

*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:	⌘	Introduction of Global CN-ID definition
Source:	⌘	Ericsson
Work item code:	⌘	IUFLEX
Date:	⌘	2001-11-27
Category:	⌘	**C**
Release:	⌘	REL-5

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)

Reason for change:	⌘	3GPP SA#13 has recently approved 3GPP TS 23.236 v.5.0.0 for "Intra Domain Connection of RAN nodes to multiple CN nodes". For the support of paging via the GS interface it is stated in 23.236 that "the SGSN should include the MSC/VLR-id in the paging / paging-request message to RNC/BSC". The global-CN-id is seen as an appropriate identifier to support this
Summary of change:	⌘	Add the global-CN-id in the BSSAP+_paging-request message as an optional parameter to support IMSI paging in networks using Iu-Flexibility
Consequences if not approved:	⌘	Paging with IMSI will fail in networks using Iu-Flexibility

Clauses affected:	⌘	17.1.19, 19.5, 18.3, 18.4.27
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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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://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.

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

17.1.19 BSSAP+-PAGING-REQUEST message

This message is sent from the VLR to the SGSN and contains sufficient information to allow the paging message to be transmitted by the correct cells at the correct time.

Table 17.1.19/3GPP TS 29.018: BSSAP+-PAGING_REQUEST message content

Information Element	Type/Reference	Presence	Format	Length
Message type	Message type 18.2	M	V	1
IMSI	IMSI 18.4.10	M	TLV	6-10
VLR number	VLR number 18.4.26	M	TLV	5-11
TMSI	TMSI 18.4.23	O	TLV	6
Location area identifier	Location area identifier 18.4.14	O	TLV	7
Channel needed	Channel needed 18.4.2	O	TLV	3
eMLPP Priority	eMLPP Priority 18.4.4	O	TLV	3
Global CN-Id	Global CN-Id 18.4.27	O	TLV	7

17.1.19.1 TMSI

This element is omitted in the exceptional case where the IMSI is used instead of the TMSI as a paging address at the radio interface.

17.1.19.2 Location area identifier

If the location area identifier is not included, then the SGSN shall page the MS in all the cells served by the VLR and the SGSN, unless the SGSN has reliable information about the location of the MS.

17.1.19.3 Channel needed

If the Channel needed Information Element is not present, then the default value is assumed to be "any channel".

17.1.19.4 eMLPP priority

This information element may be included when the subscriber has a subscription for eMLPP.

****** NEW SECTION ******

17.1.19.5 Global CN-Id

If the network supports the Intra Domain Connection of RAN Nodes to multiple CN Nodes functionality, this information element shall be included when MSC/VLR initiates paging by IMSI, via the Gs interface.

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

18.3 Information Element Identifiers

The next list shows the coding of the Information Element Identifiers used in the present document.

Table 18.3/3GPP TS 29.018: Information Element Identifier coding

8 7 6 5 4 3 2 1	Information element	Reference
0 0 0 0 0 0 0 1	IMSI	18.4.10
0 0 0 0 0 0 1 0	VLR number	18.4.26
0 0 0 0 0 0 1 1	TMSI	18.4.23
0 0 0 0 0 1 0 0	Location area identifier	18.4.14
0 0 0 0 0 1 0 1	Channel Needed	18.4.2
0 0 0 0 0 1 1 0	eMLPP Priority	18.4.4
0 0 0 0 0 1 1 1	TMSI status	18.4.24
0 0 0 0 1 0 0 0	Gs cause	18.4.7
0 0 0 0 1 0 0 1	SGSN number	18.4.22
0 0 0 0 1 0 1 0	GPRS location update type	18.4.6
0 0 0 0 1 0 1 1	~~*Unassigned:* treated as an unknown IEI.~~*Global CN-Id*	~~18&16~~18.4.27
0 0 0 0 1 1 0 0	*Unassigned:* treated as an unknown IEI.	18&16
0 0 0 0 1 1 0 1	Mobile station classmark 1	18.4.18
0 0 0 0 1 1 1 0	Mobile identity	18.4.17
0 0 0 0 1 1 1 1	Reject cause	18.4.21
0 0 0 1 0 0 0 0	IMSI detach from GPRS service type	18.4.11
0 0 0 1 0 0 0 1	IMSI detach from non-GPRS service type	18.4.12
0 0 0 1 0 0 1 0	Information requested	18.4.13
0 0 0 1 0 0 1 1	PTMSI	18.4.20
0 0 0 1 0 1 0 0	IMEI	18.4.8
0 0 0 1 0 1 0 1	IMEISV	18.4.9
0 0 0 1 0 1 1 0	*Unassigned:* treated as an unknown IEI.	18&16
0 0 0 1 0 1 1 1	MM information	18.4.16
0 0 0 1 1 0 0 0	Cell Global Identity	18.4.1
0 0 0 1 1 0 0 1	Location information age	18.4.15
0 0 0 1 1 0 1 0	Mobile station state	18.4.19
0 0 0 1 1 0 1 1	Erroneous message	18.4.5
0 0 0 1 1 1 0 0	Downlink Tunnel Payload Control and Info	18.4.3
0 0 0 1 1 1 0 1	Uplink Tunnel Payload Control and Info	18.4.25
0 0 0 1 1 1 1 0	Service Area Identification	18.4.21b
0 0 0 1 1 1 1 1 to 1 1 1 1 1 1 1 1	*Unassigned:* treated as an unknown IEI.	18&16

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

18.4 Information elements

18.4.1 Cell global identity

This information element uniquely identifies one cell.

	8	7	6	5	4	3	2	1
Octet 1	IEI							
Octet 2	Length indicator							
Octet 3 to Octet 10	The rest of the information element is coded as the the value part of the cell global id IE defined in 3GPP TS 08.18 (not including 3GPP TS 08.18 IEI and 3GPP TS 08.18 length indicator).							

Figure 18.4.1/3GPP TS 29.018: Cell global identity IE

…

18.4.26 VLR number

The VLR number is coded as a sequence of TBCD digits (as specified in 29.002), compressed two into each octet. The Number is in international E.164 format as indicated by Octet 3 which coding is specified in 3GPP TS 29.002. This is a variable length information element, and includes a length indicator. The value part of the VLR number information element (not including IEI, length indicator and Octet 3), shall not exceed 15 digits.

Table 18.4.26/3GPP TS 29.018: VLR number IE

	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	IEI							
Octet 2	Length indicator							
Octet 3	1	0	0	1	0	0	0	1
Octet 4	digit 2				digit 1			
Octet n	digit i+1				digit i			

18.4.27 Global CN-Id

The Global CN-Id consists of a PLMN-Id and a CN-Id, see 3GPP TS 23.003. The PLMN-Id consists of MCC and MNC coded according to Location Area Identification in 3GPP TS 24.008. The CN-Id is an integer defined by O&M.

Table 18.4.27/3GPP TS 29.018: Global CN-Id IE

	8	**7**	**6**	**5**	**4**	**3**	**2**	**1**
Octet 1	**IEI**							
Octet 2	**Length indicator**							
Octet 3	PLMN-Id Coded as octets 2 to 4 of the Location Area Identification IE, defined in 3GPP TS 24.008 (not including 3GPP TS 24.008 IEI and LAC).							
Octet 4								
Octet 5								
Octet 6	CN-Id (INTEGER 0..4095)							
Octet 7								

****** END OF MODIFICATIONS ******

3GPP TSG-CN1 Meeting #21 ***Tdoc N1-011981***
Cancun, Mexico, 26.- 30. November 2001 **(revision of N1-011939)**

CR-Form-v4

CHANGE REQUEST

⌘ **29.018** **CR** **025** ⌘ ev **1** ⌘ Current version: **4.1.0** ⌘

*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:	⌘	Intra-Domain Connection of RAN Nodes to Multiple CN Nodes
Source:	⌘	Vodafone
Work item code:	⌘	IUFLEX
Date:	⌘	21-11-2001
Category:	⌘	**F**
Release:	⌘	REL-5

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)

Reason for change:	⌘	3GPP SA#13 has recently approved 3GPP TS 23.236 v.5.0.0 for "Intra Domain Connection of RAN Nodes to Multiple CN Nodes." As a result, 3GPP TS 29.018 needs correcting in order to align it with the stage 2 for this feature.
Summary of change:	⌘	The way in which the SGSN derives the VLR number is modified in the case that the network is running the 'Intra Domain Connection of RAN Nodes to Multiple CN Nodes' feature.
Consequences if not approved:	⌘	Misalignment between the stage two and the stage three specifications

Clauses affected:	⌘	2.1, 6.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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

2.1 Normative references

[1] 3GPP TS 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[1a] 3GPP TS 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 02.06: "Digital cellular telecommunications system (Phase 2+); Types of Mobile Stations (MS)".

[3] 3GPP TS 02.07: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) features".

[4] 3GPP TS 22.060: "General Packet Radio Service (GPRS); Service description; Stage 1".

[5] 3GPP TS 23.003: "Numbering, addressing and identification".

[6] 3GPP TS 23.007: "Digital cellular telecommunications system (Phase 2+); Restoration procedures".

[7] 3GPP TS 23.122: "Functions related to Mobile Station (MS) in idle mode and group receive mode".

[8] 3GPP TS 23.060: " General Packet Radio Service (GPRS); Service description; Stage 2".

[9] 3GPP TS 03.64: "Digital cellular telecommunications system (Phase 2+); Overall description of the General Packet Radio Service (GPRS) Radio interface; Stage 2".

[10] 3GPP TS 24.007: " Mobile radio interface signalling layer 3; General aspects".

[11] 3GPP TS 24.008: " Mobile radio interface layer 3 specification (CC and MM parts)".

[12] 3GPP TS 04.64: "Digital cellular telecommunications system (Phase 2+), General Packet Radio Service (GPRS); Logical Link Control (LLC)".

[13] 3GPP TS 04.65: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Subnetwork Dependent Convergence Protocol (SNDCP)".

[14] 3GPP TS 08.08: "Digital cellular telecommunications system (Phase 2+); Mobile Switching Centre - Base Station System (MSC - BSS) interface: Layer 3 specification".

[15] 3GPP TS 08.18: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Serving GPRS Support Node (SGSN) - Base Station System (BSS): BSS GPRS Protocol (BSSGP)".

[16] 3GPP TS 08.60: "Digital cellular telecommunications system (Phase 2+); Inband control of remote transcoders and rate adaptors for Enhanced Full Rate (EFR) and full rate traffic channels."

[17] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[18] 3GPP TS 09.08: "Digital cellular telecommunications system (Phase 2+); Application of Base Station System Application Part (BSSAP) on the E-interface".

[19] 3GPP TS 29.010: "General Packet Radio Service (GPRS); Serving GPRS Support Node (SGSN) - Visitors Location Register (VLR): Gs interface Layer 2 specification".

[20] 3GPP TS 29.016: "Serving GPRS Support Node (SGSN) - Visitors Location Register (VLR): Gs interface Layer 2 specification".

[21] CCITT Recommendation E.164: "Numbering plan for the ISDN era".

[22] 3GPP TS 25.413: " UTRAN Iu Interface RANAP Signalling ".

[23] 3GPP TS 23.236: “Intra-domain connection of Radio Access Network (RAN) nodes to multiple Core Network (CN) nodes.”

6.2.1 Location Update Initiation

If timer T6-1 is not running, the SGSN shall start the Location Update for non-GPRS service procedure when it receives from the MS:

- An Attach request indicating combined IMSI and GPRS attach;
- An Attach request indicating IMSI only attach;
- A Routeing Area Update request indicating that the Location Area has changed; or
- A Routeing Area Update request when the SGSN serving the MS has changed.

For networks not supporting the feature ‘Intra Domain Connection of RAN Nodes to Multiple CN Nodes’ ~~T~~the number of the VLR is derived from the RAI where the MS is camping.~~,~~ For networks supporting the feature ‘Intra Domain Connection of RAN Nodes to Multiple CN Nodes’, the VLR number is derived as described in 3GPP TS23.236 [23]. The SGSN starts Timer T6-1. The BSSAP+-LOCATION-UPDATE-REQUEST message includes the old Location Area Identifier received from the MS. The SGSN shall also include the new Location Area Identifier where the MS is currently camping. The new LAI is derived from the RAI.

The BSSAP+-LOCATION-UPDATE-REQUEST message includes the type of location update performed by the MS in the GPRS location update type IE. If the MS has performed an attach request, the SGSN indicates 'IMSI attach', otherwise the SGSN indicates 'Normal location update'.

The BSSAP+-LOCATION-UPDATE-REQUEST message shall include the TMSI status if received from the MS.

If timer T6-1 is running:

If the SGSN receives from the MS:

- An Attach request indicating combined IMSI and GPRS attach;
- An Attach request indicating IMSI only attach; or
- A Routeing Area Update request indicating that the Location Area has changed.

Then:

- If the new LAI is the same as in the outstanding request, the SGSN shall not process this new request and shall wait for the VLR's response to the ongoing procedure; or
- If the new LAI is different but is in the same VLR as the outstanding request:
  - any response from the VLR to the oustanding request is ignored;
  - Timer T6-1 shall stopped and reset; and
  - The SGSN shall start the Location Update for non-GPRS service procedure; or
- If the new LAI is different, and is in a different VLR to the outstanding request:
  - Any response from the previously addressed VLR to the oustanding request is ignored;

- Timer T6-1 shall stopped and reset; and
- the SGSN shall start the Location Update for non-GPRS service procedure.

When the SGSN receives from the MS a Routeing Area Update request and the SGSN serving the MS has changed, the SGSN shall stop and reset timer T6-1.