3GPP TSG-SA Meeting #26 **TSGS#26(04)0756**
13th – 16th December 2004. Athens, Greece.

Source: **TSG SA WG2**
Title: **CRs on 23.236 (Iu\A\Gb-Flex)**
Agenda item: **7.2.3**
Document for: **APPROVAL**

The following CRs have been agreed by TSG SA WG2 and are requested to be approved by TSG SA plenary #26.

Note: *the source of all these CRs is now SA2, even if the name of the originating company(ies) is still reflected on the cover page of all the attached CRs.*

Tdoc	Title	Spec	CR	Rev	Cat	C_Ver	Rel	WI
S2-043731	Clarification of NRI position within (P)-TMSI	23.236	13	1	F	5.2.0	Rel-5	TEI5
S2-043830	Clarification of BSC behavior in Gb-flex	23.236	14	1	F	5.2.0	Rel-5	TEI5

3GPP TSG-SA WG2 Meeting #43
Seoul, Korea 15 - 19 November 2004.

Draft *Tdoc* ⌘*S2-043731*

CR-Form-v7.1

CHANGE REQUEST

⌘ **23.236** **CR** **013** ⌘**rev** **1** ⌘ Current version: **5.2.0** ⌘

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

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

Title:	⌘	Clarification of NRI position within (P)-TMSI
Source:	⌘	Nokia, Ericsson, Siemens, Nortel
Work item code:	⌘	TEI
Date:	⌘	09/11/2004
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:
Ph2 *(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)*
Rel-7 *(Release 7)*

Reason for change:	⌘	The recent studies of the specifications show that in case NRI is less than full 10 bits, it's position within (P)-TMSI is ambiguous. It is not clear from which bit position the NRI start and which direction it is extended to it's full length.
Summary of change:	⌘	It is clarified that the NRI shall be coded in bits 23 to 14. An NRI shorter that 10 bits is adjusted so that the most significant bit of the NRI field is bit 23.
Consequences if not approved:	⌘	If the position of NRI is not clearly specified it may cause interoperability problems in multivendor networks.

Clauses affected:	⌘	4.3; Annex A

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	TS 23.003
			X	Test specifications		
			X	O&M Specifications		

Other comments:	⌘	

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

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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.

4.3 Pool-Area and Network Resource Identification

A pool-area is an area within which an MS may roam without a need to change the serving CN node. A pool-area is served by one or more CN nodes in parallel. The complete service area of a RAN node (RNC or BSC) belongs to the same one or more pool-area(s). A RAN node service area may belong to multiple pool-areas, which is the case when multiple overlapping pool-areas include this RAN node service area. The pool-areas of the CS and of the PS domain are configured independently with the granularity of RAN node service areas. Therefore, all uniqueness statements below apply to each of the domains (CS/PS) separately. If LAs or RAs span over multiple RAN node service areas then all these RAN node service areas have to belong to the same pool-area.

The Network Resource Identifier (NRI) identifies uniquely an individual CN node out of all CN nodes, which serve in parallel a pool-area. The length of the NRI shall be the same in all nodes of a domain in one pool-area. In areas where pool-areas overlap the NRI identifies uniquely a CN node out of all CN nodes, which serve all these overlapping pool-areas, i.e. an NRI identifies uniquely a CN node within a RAN node. In case of overlapping pool-areas the NRI length shall be configured to be the same in all the nodes of a specific domain serving these pool-areas. Note again, that the NRIs of the CS and the PS domain are independent of each other as the PS and the CS domain CN nodes are addressed independently. More than one NRI may be assigned to a CN node.

The NRI is part of the temporary identity TMSI (CS domain) or P-TMSI (PS domain), which is assigned by the serving CN node to the MS. Each CN node which supports the "Intra Domain Connection of RAN Nodes to Multiple CN Nodes" is configured with its specific one or more NRI(s). The (P-)TMSI allocation mechanism in the CN node generates (P-)TMSIs which contain a configured NRI in the relevant bit positions. The NRI has a flexible length between 10 and 0 bits (0 bits means the NRI is not used and the feature is not applied).

In Iu mode the MS provides an Intra Domain NAS Node Selector (IDNNS) [5] in the AS part of the RRC-Initial-direct-transfer message to the RAN node (RNC or BSC). The IDNNS contains a routing parameter with a fixed length of 10 bits. This routing parameter transports the NRI value. In addition the IDNNS contains an indication from which identity (TMSI, IMSI, IMEI, ...) the routing parameter is derived. The RAN node masks the significant bits out of the routing parameter part of the IDNNS to determine the NRI which is relevant to identify the CN node. The most significant bit of the NRI shall correspond with the most significant bit of the routing parameter in the IDNNS. When the IDNNS is derived from the IMSI, the IDNNS has a value (V) from the range 0 to 999 as defined in TS 25.331: "Radio Resource Control (RRC) Protocol Specification" [5]. The RAN node shall be configured to use the value (V) to select a CN node. Each value (V) corresponds a single CN node. Typically many values of (V) may point to the same CN node.In A/Gb mode

In A/Gb-mode for the A interface the RAN node derives the NRI from any initial NAS signalling message. The RAN node masks the significant bits out of the TMSI to determine the NRI, which identifies the CN node. In A/Gb-mode for the Gb interface the RAN node derives the NRI from the TLLI. The RAN node masks the significant bits out of the TLLI to determine the NRI, which identifies the CN node.

For all three cases, Iu, A interface and Gb mode, it is configured in the RAN node which bits out of the information elements provided by the MS are significant for the NRI. The NRI is coded in bits 23 to 14 of TMSI or P-TMSI. Regardless of the NRI length the most significant bit of the NRI is always in bit 23 of TMSI or P-TMSI (examples of NRI position are given in annex A.2), see also 3GPP TS 23.003 [18].

The whole network may be configured as one pool-area, a network may configure multiple pool-areas and the configuration of pool-areas may be combined with MSC or SGSN service areas which are not belonging to pool-areas. The change of a pool-area is not visible to the MS. In general there is no need to detect a pool-area change. It may be advantageous for load balancing purposes to detect pool-area changes in the network to distribute MSs entering a pool-area to CN nodes with an appropriate load status. MSs changing a pool-area may be detected by configuration of different NRI values for adjacent pool-areas. The pool-area change information potentially provided in the IDNNS by an MS in Iu mode is ignored by the network.

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Seoul, Korea, 15th - 19th Nov 2004.

Tdoc ⌘S2-043830

CR-Form-v7

CHANGE REQUEST

⌘ **23.236** **CR** **014** ⌘ **rev** **1** ⌘ Current version: **5.2.0** ⌘

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

Title:	⌘	Clarification of BSC behaviour in Gb-flex
Source:	⌘	Ericsson
Work item code:	⌘	TEI5
Date:	⌘	22/10/2004
Category:	⌘	**F**
Release:	⌘	Rel-5

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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:	⌘	The reception of TLLI in LLC frames is incorrect. It is not included in every LLC frame
Summary of change:	⌘	Text in subclause 5.3.2 is clarified.
Consequences if not approved:	⌘	Inconsistent with TS 44.060

Clauses affected:	⌘	2, 5.3.2			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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5.3.2 Gb mode

The BSC provides the NAS Node Selection Function. The MS sends the TLLI to the BSC. The NRI is part of the P-TMSI and therefore also contained in the 'local TLLI' or in the 'foreign TLLI'. The number of bits out of the TLLI which are significant for the NRI is configured in the BSC (O&M).

A 'local TLLI' indicates to the BSC that the TLLI is derived from a P-TMSI which was assigned for the current RA, i.e. the 'local TLLI' contains an NRI which is valid for routing to an SGSN. A 'foreign TLLI' indicates to the BSC that the TLLI is derived from a P-TMSI which was assigned for another RA than the current RA. The BSC does not know whether the other RA and therefore the related P-TMSI belongs to the same pool-area or not unless this is configured in the BSC (which is not intended). Consequently, the BSC assumes, that the 'foreign TLLI' contains a NRI which is valid for routing to an SGSN.

For 'local TLLIs' and for 'foreign TLLIs' the BSC masks the NRI out of the TLLI ~~which is indicated in each LLC frame~~. The BSC routes the uplink LLC frame to the relevant SGSN if an SGSN address is configured in the BSC for the specific NRI. The association between NRI values and SGSN addresses is configured in the BSC (O&M).

If no SGSN address is configured in the BSC for the requested NRI, which may happen for NRIs masked out of a 'foreign TLLI', or if the BSC received a 'random TLLI' which contains no NRI at all then the RNC routes the uplink LLC frame to an SGSN selected from the available SGSNs. The selection mechanism is implementation dependent and should enable load balancing between the available SGSNs.

Note: For the selection mechanism in the BSC it is probably sufficient, that the algorithm is 'slow moving'. If the selection algorithm changes the SGSN to be assigned for 'random TLLIs' or for 'foreign TLLIs' whose NRI value is not used in the current SGSN pool area during a MS's Attach procedure or RA update procedure, then the Attach procedure or RA update procedure is likely to fail, but the MS will reattempt the procedure at T3310/T3330 expiry (=15 seconds).

As more than one SGSN may send downlink data at the same time for a cell or a BVCI, the BSC has to share the total possible downlink traffic between the SGSNs that can access a cell. The BSC should use the existing flow control procedure on cell level to control each of the SGSNs in a way not to violate the total possible traffic for the cell. How the BSC decides to share the downlink traffic between each of the SGSNs is an implementation specific issue; e.g. the possible downlink traffic can be equally shared between the SGSNs, or the share of each SGSN can be proportional to the capacity of the SGSN. In case a MSC sends a paging-request with IMSI via Gs-interface the SGSN has to add the MSC/VLR-identity to the paging-request message. The NAS node selection function in the BSC/RNC shall upon reception temporarily store the MSC/VLR-identity.

End of Changes