Technical Specification Group Services and System Aspects **TSGS#27(05)0111**
Meeting #27, 14 - 17 March 2005,Tokyo, Japan

Source: **TSG SA WG2**

Title: **CR(s) to 23.251**

Agenda item: **7.2.3**

Document for: **APPROVAL**

S2 Tdoc	Title	Spec	CR	Rev	Cat	C_Ver	Rel	WI
S2-050401	Correction of references	23.251	11	1	F	1	Rel-6	NTShar

3GPP

CR-Form-v7.1

CHANGE REQUEST

| ⌘ | **23.251** CR **011** | ⌘**rev** **1** ⌘ | Current version: | **6.2.0** ⌘ |

*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 ☐   Core Network ☐

Title: ⌘	Correction of references	
Source: ⌘	3GPP TSG_SA WG2	
Work item code:⌘	NTShar	***Date:*** ⌘ 20/01/2005

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

Use one of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
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: ⌘	Erroneous references in appendix A of 23.251, The text refers to TS23.246 (MBMS), but should refer to 23.236 (Iu-flex)
Summary of change:⌘	The number 23.246 is changed to 23.236 in two places of the appendix
Consequences if not approved: ⌘	Erroneous references cause confusion for the reader

Clauses affected: ⌘	Appendix A		

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

Other comments: ⌘	

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

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

Annex A (informative):
Network Resource Indicator (NRI) allocation examples

This annex contains examples for NRI co-ordination in shared networks.

A.1 NRI in shared networks

The Network Resource Identifier (NRI) is specified in Rel-5 for Intra Domain Connection of RAN Nodes to Multiple CN nodes (see 3GPP TS 23.236 [8]). NRI is part of the temporary indentity TMSI (CS domain) or P-TMSI (PS domain), which is assigned by the serving CN node to the MS.

Within the shared network NRIs has to be coordinated between the operators at least due to following reasons:

- to avoid redirection when the non-supporting UE performs LA/RA update.

- to guarantee that correct UE answers to paging (TMSI/P-TMSI shall be unique within shared network).

- to guarantee that a non-supporting UE in visited PLMN will not change network due LA/RA update or Detach/Attach function.

NRI coordination is also required between the shared network and the dedicated networks of the sharing partners:

- to guarantee that non-supporting UE in visited PLMN remain registered in the same operators network when the UE moves from dedicated network to a shared network.

- to avoid redirection when the non-supporting UE in home PLMN performs LA/RA update from dedicated network to a shared network.

In the Figure below operators A, B and C have both shared and dedicated networks, operator D has only dedicated network and operator E only shared network.
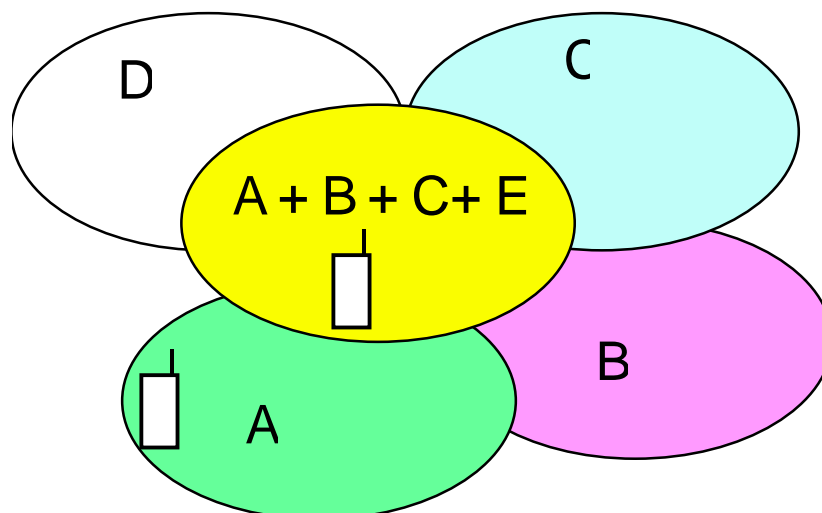

Figure A 1: Shared and Dedicated network example

In the above, one or more of the operators in the shared network may deploy Iu-Flex between that shared radio access network and their core networks. Additionally, operators may deploy Iu-Flex within their dedicated core networks. For non-supporting UEs, NRI coordination is needed not only within the shared network, but also between the shared network and the dedicated networks.

A.2   Alternatives for NRI split

Sharing operators need to coordinate the used NRI, following alternatives are considered:

1)   even split of NRI space, 1…3 most significant bits of NRI is used to identify the CN operator.

2)   individual NRI values used to identify the CN operator.

Alternative 1; even split of NRI space

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CS/ PS		'VLR- restart'						CN operator ID		Non shared NRI for CN operator internal use.																					

A calculation for the possible number of subscribers in this scenario is:

-   With max 4 sharing CN operators, two most significant bits of NRI is required to identify the CN operator.

-   3 bits are used for the restart counter.

-   5 bits of NRI allows 32 independent NRI values for each CN operator.

-   This leaves 20 bits for every MSC that is 1 M non-purged TMSI .

Following aspects need to be considered for this solution

-   If more bits are needed for the restart counter or CN operator ID, each additional bit reduces the available TMSI space half.

-   The basic configuration allows 32 M TMSI values for each CN operator, a lot of TMSI values are wasted if some sharing partners have substantially less subscribers than others.

-   It may not be feasible in large networks that use Iu-Flex for load balancing (see Annex A, network configuration examples in 3GPP TS 23.246 236 [8]).

-   The number of NRI bits used for CN operator ID may need to be fixed in the initial planning. Otherwise configuration of all existing nodes must be changed when new partners join the shared network.

Alternative 2; individual NRI values used to identify the CN operator

This could be considered in the case where a network is shared between one big and many small CN operators.

31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
CS/ PS		'VLR-restart'						Shared NRI space																							

-   The biggest CN operator who needs more pool areas and TMSI space takes NRI values 32…63, [1xxxxx], this means 32M TMSI values when 4 bit is used for restart counter.

-   Rest of shared NRI space is allocated to other CN operators in blocks of 4M TMSI values like NRI = 28 - 31 [0111xx], 24 - 27 [0110xx] …. 0 – 3 [000xx]. Initially gaps can be left between allocated NRI range that can be used for expansion.

Following aspects need to be considered for this solution:

- If more bits are needed for the restart counter or NRI, each additional bit reduces the available TMSI space half.

- The initial planning of NRI length should take into account the pool area configurations of all sharing operators.

TMSI per LA:

Taking the example configurations mentioned above but changing the TMSI allocation per LA would result in an increase of the addressing space, then the same TMSI value can be used multiple times in the same VLR. More considerations with this TMSI per LA approach can be found in 3GPP TS 23.236 [8].