TSG-RAN Working Group 3 meeting #8 *TSGR3#8(99)D71*
Abiko, Japan, 25th – 29th of October 1999

Agenda Item:

Source: Ericsson

Title: **Service Area**

Document for: Decision

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1. Introduction

In the RANAP messages INITIAL UE MESSAGE and LOCATION REPORT there is an IE called Area Identity Code. There is, however, no definition of the contents of this IE. This contribution proposes a solution for this.

2. Description

For location purposes, there is a need to be able to indicate areas smaller than Location Area over Iu. A Location Area consists of a number of cells, but since the cell structure within a RAN is to be kept invisible to the Core Network, cell can not be used for this purpose. It is thus suggested to introduce a new area concept called Service Area (SA). Such a Service Area can be mapped onto one ore more cells within a Location Area. This mapping onto cells is, however, invisible to Core Network and will be handled within UTRAN. The mapping between Service Areas and cells must be updated when the cell structure within a RAN changes in order for the Service Area to always cover the same geographical area.

A cell shall be allowed to belong to more than one Service Area, that is overlapping Service Areas shall be allowed.

It is suggested that a Service Area is identified with a Service Area Code (SAC) with a length of two octets and that is unique within the Location Area. A Service Area Identifier (SAI) will then have the following structure:

MCC + MNC + LAC + SAC

3. Service Area Identifier

The Service Area Identifier (SAI) is used to uniquely identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area and can be used for indicating the location of a UE to the CN.

The Service Area Code (SAC) together with the PLMN-Id and the LAC will constitute the Service Area Identifier.

SAI = PLMN-Id + LAC + SAC

4. SAC

This information element is used to uniquely identify a Service Area within a Location Area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SAC	M		Bit string (16)	

5. SAI

This information element is used to uniquely identify an area consisting of one or more cells belonging to the same Location Area. Such an area is called a Service Area and can be used for indicating the location of a UE to the CN.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
SAI				
PLMNdigit	M	5	INTEGER (0..9)	
LAC	M		Bit string (16)	0000 and FFFF not allowed
SAC	M		Bit string (16)	

6. Area Identity

This information element is used for indicating the location of a UE and is either a Service Area or geographical co-ordinates. *The latter is FFS.*

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice **Area Identity**				
Service Area				
PLMNdigit	M	5	INTEGER (0..9)	
LAC	M		Bit string (16)	0000 and FFFF not allowed
SAC	M		Bit string (16)	
Geographical co-ordinates				
FFS				

7. Proposal

7.1 Proposed changes to Ref. 1

- For the message INITIAL UE MESSAGE (9.1.29), Area Identity Code shall be changed to SAC:

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Message Type	M		9.2.1.1	
CN Domain Indicator	M		9.2.1.7	
LAI	M		9.2.3.7	
RAC	C - ifPS		9.2.3.8	
~~Area Identity Code~~SAC	M		9.2.3.n	
NAS-PDU	M		9.2.3.6	

Condition	Explanation
ifPS	This IE is only present for RABs towards the PS domain.

- The IE Area Identity Code (9.2.3.9) shall be renamed to Area Identity and the description shall be according to section 6 above. This means that the message LOCATION REPORT will look like:

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Message Type	M		9.2.1.1	
Area Identity ~~Code~~	O		9.2.3.9	
Cause	O		9.2.1.4	

- The IE Request Type (9.2.1.20) shall be able to take the values Service Area and Geographical Co-ordinates. *The latter is FFS.*

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Request Type				
Event	M		ENUMERATED(Stop, Direct, Change of area, ...)	
Report area	M		ENUMERATED(~~Location Area, Routing Area~~Service Area, Geographical Co-ordinates, ...)	

- Description of SAC according to section 4 above shall be added to section 9.2.3.

- The IE Source ID shall be changed as follows:

Source ID identifies the source for the relocation of SRNS. The Source ID may be e.g. Source RNC-ID or ~~serving cell ID~~Service Area.

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Choice **Source ID**	M			
Source RNC-Id				
PLMNdigit	M	5	INTEGER (0..9)	
RNC-Id	M		Bit string (16)	
~~**Serving Cell ID**~~**Service Area**				
PLMNdigit	M	5	INTEGER (0..9)	
LAC	M		Bit string (16)	0000 and FFFF not allowed
SAC	M		Bit string (16)	

- In 8.12 and 8.13: “Area Identity Code” shall be changed to “Service Area”.

- Last sentence in paragraph two in 8.13.1 shall be changed from:
  ... the Area Identity Code which indicates one of the cells from which the UE is consuming radio resources.
  to:
  ... the Service Area which includes one or more cells from which the UE is consuming radio resources.

- Last bullet in bullet list for 8.15 shall be changed from:
  Area Identity Code indicating one of the cells from which the UE is consuming radio resources.
  to:
  Service Area including one or more cells from which the UE is consuming radio resources.

7.2 Proposed changes to Ref. 2

The SAI shall be added to the following messages (both FDD and TDD):

RL SETUP RESPONSE (as a mandatory parameter per RL)
RL SETUP FAILURE (as a mandatory parameter per RL)
RL ADDITION RESPONSE (as a mandatory parameter per RL)
RL ADDITION FAILURE (as a mandatory parameter per RL)
UPLINK SIGNALLING TRANSFER INDICATION (as a mandatory parameter)

Description of SAI according to section 5 above shall be added to section 9.2.

7.3 Proposed changes to Ref. 3

Section 3 above shall be added to section 6.1.

8. References

1 25.413, UTRAN Iu Interface RANAP Signalling

2 25.423, UTRAN Iur Interface RNSAP Signalling

3 25.401, UTRAN Overall Description