

Sophia Antipolis, France, 20<sup>th</sup> – 24<sup>th</sup> September 1999

Agenda Item: 16.2

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Title: RNSAP Support for URAs Extending over RNC Borders

Document for: Decision

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## 1 INTRODUCTION

The present specifications allow a URA to extend over more than one RNC, i.e. the cells in a URA can be controlled by more than one CRNC. However, the present specifications do not provide the means to page a UE from the SRNC within any URA in an efficient way.

This contribution proposes some modifications to the RNSAP specification in order to support paging of a full URA from the SRNC in an efficient way. This requires changes to the procedure Uplink Signalling Transfer and to the UPLINK SIGNALLING TRANSFER INDICATION message.

This proposal is based on the **assumption** that when receiving a URA Update there is no UE Context in the DRNC, i.e. in URA/PCH mode there is no UE Context in the DRNC. **If this assumption is invalid** then the proposal on *the procedure text have to be modified slightly but the proposal on the message will be the same*. The modification is that the RNC Identity of all other RNCs that are having at least one cell within the URA where the UE message was received needs to be sent in all UPLINK SIGNALLING TRANSFER INDICATION messages sent over Iur. This means that the parameter shall be included only if there are cells in the URA controlled by other RNCs, i.e. the parameter is still defined as *Optional* (as in the proposal).

## 2 DISCUSSION

Presently a URA can consist of cells in several RNCs. However, it is not clearly described how the paging of a whole URA can be achieved.

Consider the case where a URA Update is received from one a DRNC (conveyed by the UPLINK SIGNALLING TRANSFER INDICATION message). If the network would like to transfer downlink data to the UE it needs to page the UE in the URA where it is registered. The problem is for the SRNC to know which RNCs (apart from the RNC from which the URA Update was received) to request paging in, i.e. the RNCs having at least one cell in the URA where the UE is registered.

This can be solved in (at least two ways):

1. The SRNC stores information of the URA configuration of the whole UTRAN.
2. The SRNC stores information of which other RNCs that are having at least one cell in a URA that exists in the RNC itself.

Alternative 1 requires that the operator store the URA configuration of the whole UTRAN in each RNC. This would of course lead to changes in all RNCs any time the URA configuration is changed somewhere in the network. It does not seem to be a practical alternative.

Alternative 2 requires that the SRNC receives information on the “URA Configuration”, i.e. which RNCs that are having cells in the URA, dynamically from the RNC receiving the URA Update from the UE. This would give the same way of handling RNCs not being neighbouring RNCs to the SRNC as for the case of DCHs and DSCHs, i.e. the DRNC provides the information that is not on a permanent basis stored in the SRNC.

### 3 CONCLUSION

The conclusion is that alternative 2 is the alternative which is the most reasonable since it gives less O&M for the operator and a consistent handling of this problem for all UE states (Cell/DCH, Cell/FACH, Cell/PCH, and URA/PCH states).

### 4 PROPOSAL

1. It is proposed to make the following change to the Uplink Signalling Transfer procedure in ref. 1.

The Uplink Signalling Transfer message is used to transfer radio interface messages containing s-RNTI and SRNC ID as UE addressing information from the CRNC to the Serving RNC. The message contains the message received L3 Information, S-RNTI, D-RNTI, C-RNTI, and the UTRAN Cell Identifier (UC-Id) (the RRC message reception cell). The message further more includes the identifier for the CRNC. If the message received from the UE was the first message from that UE in the DRNC the UPLINK SIGNALLING TRANSFER INDICATION message further more includes:

- the identifiers for the CN CS Domain and CN PS Domain that the CRNC is connected to. These CN Domain Identifiers are based on the LAC and RAC respectively of the cell where the message was received from the UE.
- the RNC Identity of all other RNCs that are having at least one cell within the URA where the UE message was received.

2. It is proposed to make the following change to the UPLINK SIGNALLING TRANSFER INDICATION message in ref. 1.

Information element	Reference	Type
Message type		M
Transaction ID		M
UTRAN Cell Identifier (UC-Id)		M

C-RNTI		M	
S-RNTI		M	
D-RNTI		O	
L3 Information		M	
CN PS Domain Identifier		O	
CN CS Domain Identifier		O	
<u>RNCs with Cells in the Accessed URA</u>		<u>O</u>	
<u>_RNC Id</u>		<u>M</u>	

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REFERENCES

1. UMTS 25.423, UTRAN Iur Interface RNSAP Signalling