TSG-RAN Working Group 3 meeting #4
Warwick, England, 1st – 4th June 1999

TSGW3#4(99)506

Agenda Item: 7.1, 19.3

Source: Nortel Networks

Title: Iur Transport model for RACH and FACH.

Document for:

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1 Introduction

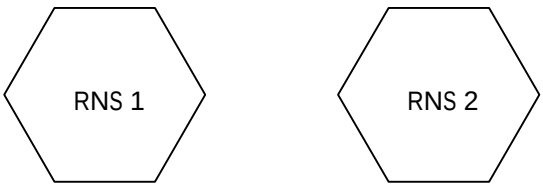
This paper proposes a model of how to transport RACHand FACH over Iur. This model is compatible with one of the possibility currently opened in WG2 to send the cell update message on DCCH and even to make this implicit by using a data message itself to signal to the UTRAN that the UE has changed cell. This model is compatible with contribution [1].

2 Overall model

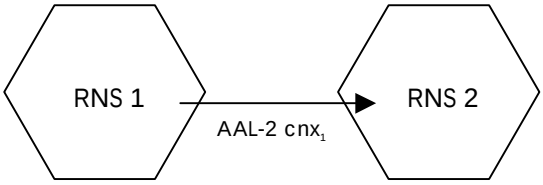
For the transport of RACH and FACH user plane over Iur, the following model is proposed :

- AAL-2 is used to transport MAC-d PDUs over Iur
- Several users can be multiplexed on the same AAL-2 connection
- AAL-2 connections are used in a soft permanent connections fashion :
  - If a AAL-2 connection towards a given RNC exists, any RACH or FACH data flow with a corresponding QoS is multiplexed on this connection.
  - If there is a need to establish a RACH or FACH data flow towards a RNC to which no AAL-2 connection is currently existing, then an AAL-2 connection is dynamically set-up.
  - When there not any more RACH nor FACH data flow between two RNCs, the corresponding AAL-2 connection is torn-down, possibly after a certain time.
- Q.aal-2 is used to set-up and tear down dynamically the AAL-2 connections.
- Some AAL-2 connections can be permanent connections, for example towards the neighbouring RNCs.

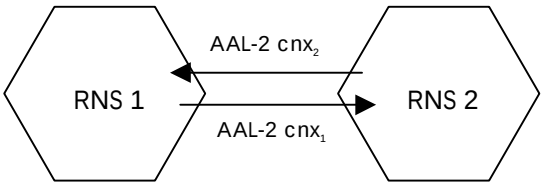
The dynamics of the model is illustrated by the following diagrams :



1. A MAC-d PDU from MAC-c (for instance a cell update or data) occurs in RNS 1 with the SRNC ID RNC-2
2. An AAL-2 connection is set-up from RNC-1 to RNC-2 and is used to transfert this PDU



3. An AAL-2 VC is set-up from RNS 2 to RNS 1



4. Any new MAC-d PDU for the same UE (sent using CRNTI) or a new UE (sent using SRNTI and SRNC ID 2) will be sent to MAC-c using AAL-2 cnx_1.
5. Any MAC PDU for RNC-2 to RNC-1 will be sent using AAL-2 Cnx_2. This include initial access occuring in RNS2 with SRNC ID 1

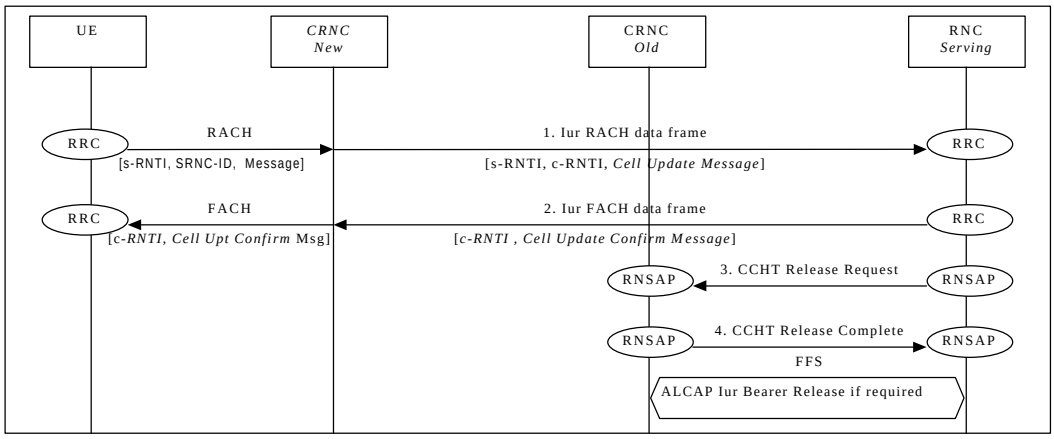
3 Proposal

It is proposed that the model described in section 2 is taken as the transport model for common channels and DSCH over Iur.

It is also proposed to update [2] according to the following :

3.1 Cell Update in RACH/FACH Mode when there already exists an transport bearer between the new CRNC and the SRNC

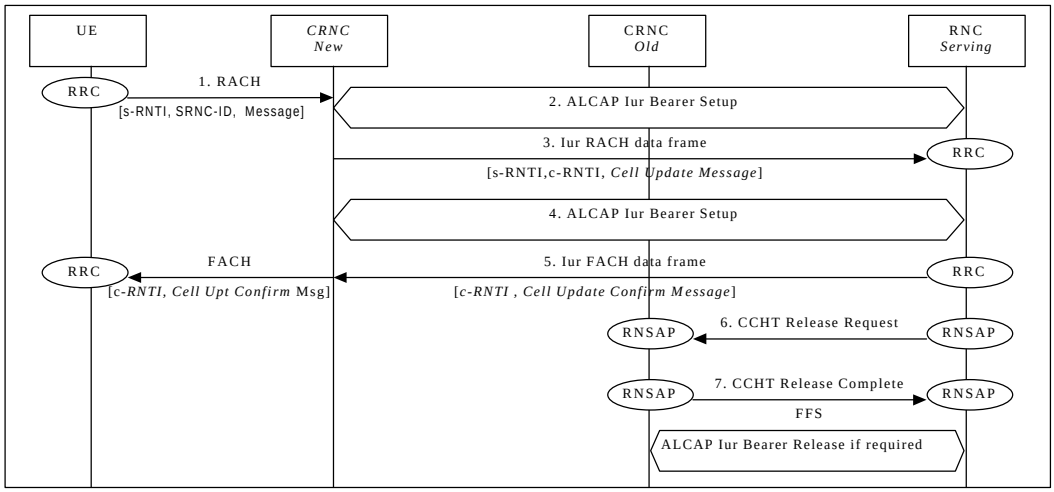
This example shows how a Cell Update is managed when the UE is in RACH/FACH mode and when there is some QoS negotiated on common channels for that UE and that a Iur transport bearer is already established for CCH traffic of other UE between the new CRNC and the SRNC.



1. The UE sends a Cell Update message to its SRNC. This message is sent via a RACH and relayed back to the serving RNC. *Parameters : s-RNTI, c-RNTI, Cell Identification*
2. The SRNC sends a Cell Update Confirm message to the UE. This message is sent to the Controlling RNC via a FACH data frame message and relayed to the UE via a FACH.
3. The SRNC releases the reserved resources on the previous Controlling RNC.
4. The old Controlling RNC acknowledges the release.

3.2 Cell Update in RACH/FACH Mode when no transport bearer between the new CRNC and the SRNC is already existing

This example shows how a Cell Update is managed when the UE is in RACH/FACH mode and when there is some QoS negotiated on common channels for that UE and that no Iur transport bearer is already established for CCH traffic of other UE between the new CRNC and the SRNC.



1. The UE sends a Cell Update message.
2. An Iur transport bearer is setup from the new CRNC to the UE's SRNC.
3. This message is relayed back via a RACH data frame to the serving RNC.
   Parameters : s-RNTI, c-RNTI, Cell Identification
4. An Iur transport bearer is setup from the SRNC to the new CRNC.
5. The SRNC sends a Cell Update Confirm message to the UE. This message is sent to the Controlling RNC via a FACH data frame message and relayed to the UE via a FACH.
6. The SRNC releases the reserved resources on the previous Controlling RNC.
7. The old Controlling RNC acknowledges the release.

4 References

[1] TSGW3#3(99)515 Usage of CCCH, DCCH or DTCH for Cell/URA Update; Consequences on UL & DL signalling Transfer RNSAP messages, source : Alcatel

[2] TS 25.931 v1.0.0, UTRAN functions, examples on signalling procedures.