

Meeting #7

Sophia-Antipolis, France 20 - 24 September

1999

Agenda Item: 15.3, and 16.2
Source: NTT DoCoMo
Title: Association between UE and events in UTRAN nodes
Document for: Discussion

(This contribution is exactly the same as R3-99983 proposed in R3 #6 meeting)

1. Abstract

At the R3 meeting #4 in Warwick, it has been agreed with the functionality of association mechanism between failures and the specific (involved) UE.

This contribution proposes to add a new information element "Event Identity" to some of NBAP and RNSAP messages in order to incorporate the requirement, and explains what each node is supposed to do upon reception of such information element.

2. Discussion

As having been proposed in [1], there is a requirement from operators' points of view that UTRAN shall provide a mechanism to associate specific UE with failures. In cases when a connection is failed due to HW problem in the NW, the operator is responsible for explaining to the subscriber why such disconnection has occurred.

The following story shows how the association mechanism works by introducing “Event Identity”.

1. Figure 1 shows a situation when SRNC for a specific UE is about to create a new Radio Link toward NodeB1 via RNC2.
2. In normal cases, upon reception of RNSAP: Radio Link Setup Request message, the RNC 2 creates UE context in itself and starts deploying DRNC. Then DRNC perform internal procedures within RNC2. The DRNC then send NBAP: Radio Link Setup Request message to NodeB. The NodeB also creates UE context in itself.
3. As the creation is completed, the NodeB sends back NBAP: Radio Link Setup Response message to the DRNC
4. DRNC sends RNSAP: Radio Link Setup Response message to the SRNC. In this case the procedure is normally performed, and the Event Identity does not have to be informed to the SRNC.

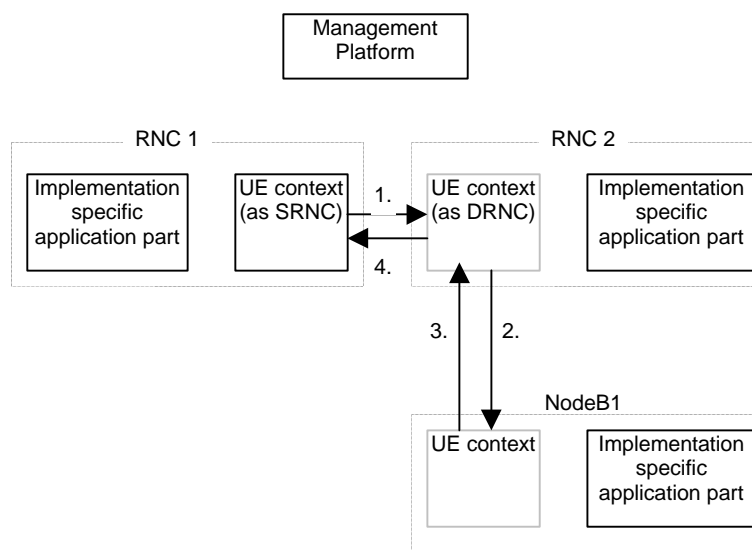
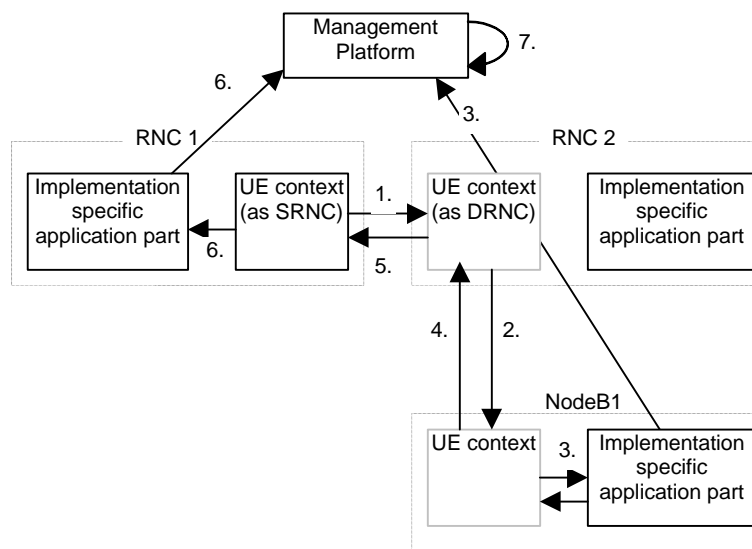


Figure 1 SRNC in RNC1 attempts to create a new Radio Link toward NodeB1 via RNC2

1. 2. On the other hand, Figure 2 shows what is going to happen if any failure occurs. This figure shows a case when RNC2 attempts to create a new Radio Link toward NodeB, but fails.
3. In such, in the NodeB, the UE context will inform to the Implementation specific application part internally that an event (e.g. hardware error, overload, lack of physical resources, etc.) has occurred. For distinction, this event will be assigned an Event identity by the implementation specific application part and the implementation specific application part will inform the Event Identity to the UE context. Along with this, Implementation application part will inform the event (with Event Identity) to the management platform. The format of this Event Identity is up to the vendor but should be limit to a few octet lengths (e.g. 8oct)
4. 5. As NodeB acknowledges that the internal procedure has not succeeded, UE context then sends NBAP: Radio Link Setup Failure message to the DRNC. In this message, the Event Identity is also carried toward DRNC. Upon reception of the message, DRNC then sends RNSAP: Radio Link Setup Failure to the SRNC. In this message, the Event Identity is also carried toward SRNC. It must be noted that the DRNC does not interpret the contents of Event Identity; DRNC just transfers to SRNC
6. As SRNC receives the RNSAP: Radio Link Setup Failure message. SRNC performs a certain set of internal logical procedures. Along with that, SRNC internally transfers the received Event Identity with UE identity (e.g. IMSI, since SRNC is always given an IMSI of the UE) to the implementation specific application part. The implementation part will then report the Event Identity to the Management Platform along with UE Identity.
7. Management Platform can now refer to both the events in NodeB and the involved UE Identity by referring Event Identity as a common reference.

It must be noticed that procedure 3, 6, and 7 are out of scope of standardisation. Moreover, should any logical node not support such function, it should be specified that the logical part of the function (NodeB and SRNC, in this case) are requested to discard this information in order to provide compatibility with non-supporting UTRAN nodes for multi-vendor cases.



Since desired event reports are usually the failure events, the following RNSAP and NBAP messages shall contain the Event Identity:

[RNSAP]

- Radio Link Setup Failure
- Radio Link Addition Failure
- Radio Link Reconfiguration Failure
- Radio Link Failure Indication
- Physical Channel Reconfiguration Failure
- Dedicated Measurement Initiation Failure
- Dedicated Measurement Failure Indication
- Radio Link Deletion Response

[NBAP]

- Radio Link Setup Failure
- Radio Link Addition Failure
- Radio Link Reconfiguration Failure
- Radio Link Failure Indication
- Radio Link Deletion Response

It is also proposed to add Event Identity to Radio Link Deletion Response messages. This is effective in cases when SRNC detects that the specific Radio Link is not functioning as expected through Iur/Iub in-band signalling. In such situation, the SRNC usually decides to delete the Radio Link, but the operators are keen to know why the Radio Link is not functioning properly. If Radio Link Deletion Response message contains Event Identity, the operator will be able to find out the cause later in association with UE.

In conjunction with proposal above, it is also proposed to add a new information element "cause for deletion" to RNSAP/NBAP: Radio Link Deletion Request message. If "cause for deletion" is "normal", Either the DRNC or NodeB does not have to send back any Event Identity to the SRNC. But if "cause for deletion" is other than "normal", the DRNC and/or NodeB have to send back Event Identity to the SRNC for further investigation.

3. Proposal

It is proposed to reflect the following changes to corresponding baseline documents:

[25.423 RNSAP specification V1.2.2]

9.1.4 RADIO LINK SETUP FAILURE

Information element	Reference	Type
Message type		M
Transaction ID		M
CN PS Domain Identifier		C4
CN CS Domain Identifier		C4
RL not setup		M
RL ID		M
RL Failure Cause		M
<u>Event Identity</u>		<u>O</u>
RL information response (RL successfully setup)		O
RL-ID		M
Diversity Indication		C1
Reference RL-ID		C2
DL Scrambling code		M
DL Channelisation Codes		M
DL Channelisation code		M
DCH successfully setup		C3
DCH ID		M
Binding ID		M
Transport Address		O
Neighbouring cell information		O
UTRAN Cell Identifier (UC-Id)		M
CN PS Domain Identifier		O
CN CS Domain Identifier		O
Primary CCPCH Radio Resource Information		M
UARFCN		M
Primary CCPCH scrambling code		M
Primary CCPCH TX Power		O
Frame Offset		O

C1=present only if # of RL >1

C2=present only if Diversity Indication is "ON"

C3= present only if Diversity Indication is "OFF"

C4= the parameter **may** be present if there is any RL being successfully set-up.

9.1.7. RADIO LINK ADDITION FAILURE

Information element	Reference	Type
Message type		M
Transaction ID		M
RL not setup		M
RL-ID		M
RL Failure cause		M
<u>Event Identity</u>		<u>O</u>
RL information response (RL successfully setup)		M
RL-ID		M
Diversity Indication		M
Reference RL-ID		C1
DL Scrambling code		M
DL Channelisation Codes		M
DL Channelisation code		M
DCH information response		C2
DCH ID		M
Binding ID		M
Transport Address		O
Neighbouring cell information		O
UTRAN Cell Identifier (UC-Id)		M
CN PS Domain Identifier		O
CN CS Domain Identifier		O
Primary CCPCH Radio Resource Information		M
UARFCN		M
Primary CCPCH scrambling code		M
Primary CCPCH TX Power		O
Frame Offset		O

9.1.8. ~~9.1.8.~~ RADIO LINK DELETION

Information element	Reference	Type
Message type		M
Transaction ID		M
RL to delete		M
RL-ID		M
<u>Cause for Deletion</u>		<u>M</u>

9.1.9. ~~9.1.9.~~ RADIO LINK DELETION RESPONSE

Information element	Reference	Type
Message type		M
Transaction ID		M
<u>Event Identity</u>		<u>O</u>

9.1.13. RADIO LINK RECONFIGURATION FAILURE

Information element	Reference	Type
Message type		M
Transaction ID		M
Cause1		M
RLs not reconfigured		O
RL ID		M
Cause2		M
<u>Event Identity</u>		<u>O</u>

9.1.17. RADIO LINK FAILURE

Information element	Reference	Type
Message type		M
Transaction ID		M
RLs Unavailable		M
RL ID		M
Cause for RL failure		M
<u>Event Identity</u>		<u>O</u>

9.1.21. PHYSICAL CHANNEL RECONFIGURATION FAILURE

Information element	Reference	Type
Message type		M
Transaction ID		M
Cause		FFS
<u>Event Identity</u>		<u>O</u>

9.1.28. DEDICATED MEASUREMENT INITIATION FAILURE

[Editor's note:

This Cause parameter has a very general name. This parameter may have to be renamed to be distinguished from other cause parameters.]

Information element	Reference	Type
Message type		M
Transaction ID		M
Measurement ID		M
Cause		M
<u>Event Identity</u>		<u>O</u>

9.1.31. DEDICATED MEASUREMENT FAILURE INDICATION

[Editor's note:

This Cause parameter has a very general name. This parameter may have to be renamed to be distinguished from other cause parameters.]

Information element	Reference	Type
Message type		M
Transaction ID		M
Measurement ID		M

Cause		M
<u>Event Identity</u>		<u>O</u>

[25.433 NBAP specification V1.1.2]

9.1.4. RADIO LINK SETUP FAILURE

This message is sent from Node B to CRNC as response to the Radio Link Setup REQUEST message when at least one RL has not been successfully setup.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
Node B Communication Context ID		M
Communication Control Port ID		O
Transaction ID		M
Successful RL Information Response		O
RL ID		M
Diversity Indication		C ¹
Reference RL ID		C ²
DCH Information Response		C³
DCH ID		M
Binding ID		M
Transport Layer Address		FFS
Unsuccessful RL Information Response		M
RL ID		M
RL Failure Cause		M
<u>Event Identity</u>		<u>O</u>

9.1.7. RADIO LINK ADDITION FAILURE

This message is sent from Node B to CRNC as response to the Radio Link Addition REQUEST message when at least one RL has not been successfully added.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
Transaction ID		M
Successful RL Information Response		O

¹ This Information Element is present for all the radio links except the first radio link in the Node B.

² This Information Element is present when the Diversity Indication Information Element indicates combining.

³ This Information Element is present when the Diversity Indication Information Element indicates non-combining.

RL ID		M
Diversity Indication		M
Reference RL ID		C ⁴
DCH Information Response		C⁵
DCH ID		M
Binding ID		M
Transport Layer Address		FFS
Unsuccessful RL Information Response		M
RL ID		M
RL Failure Cause		M
<u>Event Identity</u>		<u>Q</u>

9.1.8. RADIO LINK DELETION REQUEST

This message is sent from CRNC to Node B in order to delete radio link(s) for the UE in the Node B.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
Node B Communication Context ID		M
Transaction ID		M
RL Information		M
RL ID		M
<u>Cause for Deletion</u>		<u>M</u>

9.1.9. RADIO LINK DELETION RESPONSE

This message is sent from Node B to CRNC as response to the Radio Link Deletion REQUEST message.

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
Transaction ID		M
<u>Event Identity</u>		<u>Q</u>

9.1.13. RADIO LINK RECONFIGURATION FAILURE

Information element	Reference	Type
Message Discriminator		M
Message type		M
CRNC Communication Context ID		M

⁴ This Information Element is present when the Diversity Indication Information Element indicates combining.

⁵ This Information Element is present when the Diversity Indication Information Element indicates non-combining.

Transaction ID		M
Cause1		M
RLs causing reconfiguration failure		O
RL ID		M
Cause2		M
<u>Event Identity</u>		<u>O</u>

9.1.24. RADIO LINK FAILURE INDICATION

Information Element	Reference	Type
Message Discriminator		M
Message Type		M
CRNC Communication Context ID		M
Transaction ID		M
RL ID		M
Radio Link Failure Cause		M
<u>Event Identity</u>		<u>O</u>

4. Reference

- [1] R3-99510 associating failures with UEs
- [2] 25.423 RNSAP specification V1.2.2
- [3] 25.433 NBAP specification V1.1.2