

Agenda Item: 10
Source: Nokia
Title: Message contents for the RNSAP RL Setup/addition/deletion procedures
Document for: Approval

1 Introduction

This contribution proposes the message contents and the description of the information elements for the RNSAP procedures Radio Link Setup, Radio Link Addition and Radio Link Deletion.

The proposal is based on the current description of the procedure in [S3.23], and on the message contents proposed by TTC, reported in [S3.23] and marked as FFS. Other parameters to be inserted in the messages are FFS.

2 Message contents

2.1 Notation

An information element can be of the following *types*:

M	The information element is mandatory, i.e. always present in the message
O	The information element is optional, i.e. may or may not be present in the message independently on the presence or value of other information elements in the same message
C#	The presence of the information element is conditional to the presence or to the value of another information element, as reported in the correspondent note below the message description.

In case of an information element group, the group is preceded by a name for the info group (in bold). It is also indicated whether the group is mandatory, optional or conditional. Each group may be also repeated within one message. The presence field of the information elements inside one group defines if the information element is mandatory, optional or conditional if the group is present.

Note 1: The proposed tables with the message contents do not include the length and direction columns proposed by TTC.

Note 2: The proposed message structure does not include the 'length' and 'compatibility information' parameters that are proposed by TTC, because they will be specified by the formal language.

2.2 Radio Link Setup Request

This message is sent from the serving RNC to the drift RNC via the relevant SCCP connection in order to request the drift RNC to assign radio resources for new branches.

Information element	Reference	Type
Message type		M
Transaction ID		M
S-RNTI		M
DCH information		M
DCH ID		M
DCH Type		M
Transport format set (DL)		M
Transport format set (UL)		M
TFCS (UL)		M
TFCS (DL)		M
Uplink scrambling code		M
UL Channelisation Codes		M
Channelisation code length (UL)		M
DL Channelisation Codes		M
Channelisation code length (DL)		M
RL information		M
RL-ID		M
Cell-ID		M
Frame offset		M
Chip offset		M
Diversity control field		C2
Perch channel Ec/Io		M
Uplink Eb/No Setpoint		M
Uplink Eb/No Adjustment parameters		M
Minimum Uplink Eb/No		M
Minimum Uplink Eb/No		M
DL reference power		M

C2=present only if # of RL >1

2.3 RL Setup Response

RL SETUP RESPONSE is sent as a response to the RL SETUP from the serving RNC when at least one RL has been successfully setup. The transaction ID for this message is taken from the corresponding RL SETUP message.

Information element	Reference	Type
Message type		M
Transaction ID		M
C-RNTI		M
RL successfully setup		M
RL-ID		M
Diversity Indication		C1
Reference RL-ID		C2
DL Scrambling code		C3
DL Channelisation Codes		C3
DL Channelisation code		M
DCH successfully setup		C3
DCH ID		M
Binding ID		M
AESA		O
Neighbouring cell information		O
Cell ID		O
UARFCN		M
Primary CCPCH scrambling code		M
Frame Offset		O
RL not setup		O
RL-ID		M
RL Failure cause		M

C1=present only if # of RL >1

C2=present only if Diversity Indication is 'ON'

C3= present only if Diversity Indication is 'OFF'

2.4 RL Setup Failure

RL SETUP FAILURE is sent from the drift RNC to the Serving RNC if the RL SETUP can not be fulfilled. The transaction ID for this message is taken from the corresponding RL SETUP message.

Information element	Reference	Type
Message type		M
Transaction ID		M
RL not setup		M
RL ID		M
RL Failure Cause		M

Note: the RL SETUP FAILURE message is similar to the RL SETUP RESPONSE message with '# of RL successfully setup' = 0. Thus a separate RL SETUP FAILURE message may not be needed.

2.5 Radio Link Addition

This message is sent from the serving RNC to the drift RNC via the relevant SCCP connection in order to request the drift RNC to assign radio resources for additional branches in the DRNS. If the PC parameters are not specified, the value already in use is maintained.

Information element	Reference	Type
Message type		M
Transaction ID		M
RL information		M
RL-ID		M
Cell-ID		M
Frame offset		M
Chip offset		M
Diversity Control field		M
Perch channel Ec/Io		M
Uplink Eb/No Setpoint		O
Uplink Eb/No Adjustment parameters		O
Uplink Maximum Eb/No		O
Uplink Minimum Eb/No		O
DL reference power		O

2.6 RL Addition Response

RL ADDITION RESPONSE is sent as a response to the RL ADDITION from the serving RNC. The transaction ID for this message is taken from the corresponding RL ADDITION message.

Information element	Reference	Type
Message type		M
Transaction ID		M
RL successfully setup		M
RL-ID		M
Diversity Indication		M
Reference RL-ID		C1
DL Scrambling code		C2
DL Channelisation Codes		C2
DL Channelisation code		M
DCH successfully setup		C2
DCH ID		M
Binding ID		M
AESA		O
Neighbouring cell information		O
Cell ID		M
UARFCN		M
Primary CCPCH scrambling code		M
Frame Offset		O
RL not setup		M
RL-ID		M
RL Failure cause		M

C1=present only if *Diversity Indication* is 'ON'

C2= present only if *Diversity Indication* is 'OFF'

2.7 RL Addition Failure

RL ADDITION FAILURE is sent from the drift RNC to the Serving RNC if the RL addition can not be fulfilled. The transaction ID for this message is taken from the corresponding RL ADDITION message.

Information element	Reference	Type
Message type		M
Transaction ID		M
RL not setup		M
RL-ID		M
RL Failure cause		M

Note1: The message has the same contents of the RL SETUP FAILURE message, and may be not needed.

Note2: the RL ADDITION FAILURE message is similar to the RL ADDITION RESPONSE message with '# of RL successfully setup' = 0. Thus a separate RL ADDITION FAILURE message may not be needed.

2.8 RL Deletion

RL DELETION is sent from the serving RNC to the drift RNC in order to delete one branch controlled by the drift RNC.

Information element	Reference	Type
Message type		M
Transaction ID		M
RL to delete		M
RL-ID		M

2.9 RL Deletion Response

RL DELETION RESPONSE is sent to acknowledge the receipt of the RL DELETION. The transaction ID for this message is taken from the corresponding RL DELETION message.

Information element	Reference	Type
Message type		M
Transaction ID		M

3 Description of Information Elements

3.1 Transaction ID

Transaction ID is a unique identifier among all the messages having the same message type and which are sent using the same SCCP connection (SCCP connection oriented service). The identifier must be unique among those messages that are in pending state, i.e. messages that can still be references to in a forthcoming message. Transaction Id for complete-, proceeding-, acknowledge- and confirm-type of messages is the same transaction ID that was used in the message for which the above mentioned type message is related to.

3.2 RL-ID

RL ID is an identifier for the corresponding Radio Link for one UE. RL ID is allocated by the serving RNC during the branch allocation, and it should be stored both to the serving- and drift RNCs as long as the said

RL exists. RL ID can be used later as a reference to the said RL between the serving- and the drift RNC. RL ID should be unique for each active RL among the active RLs simultaneously allocated for the same UE.

3.3 s-RNTI

s-RNTI is the UE context identifier in the SRNC. It is allocated by the SRNC and maintained for all the time the RRC connection is terminating in the SRNC.

3.4 c-RNTI

C-RNTI is the UE context identifier in the DRNC. It is unique in the DRNC and it is released when the UE is not using anymore resources in that DRNS.

3.5 Cell-ID

Cell ID is an identifier for a cell. A cell is associated to one BCCH (thus cannot include different carriers). A cell may have different DL scrambling code, or use different DL scrambling code offset.

3.6 Frame offset

Frame offset describes the desired offset between dedicated channel downlink transmission frames (CFN, connection frame number) compared to the broadcast channel frame offset (cell frame number). The frame offset value is UE and cell specific.

3.7 Chip offset

Defines the radio timing offset inside a radio frame. The precision is at chip level.

3.8 Channelisation code length

Channelisation code length defines the level of the related channelisation code in the channelisation code tree.

3.9 DCH ID

DCH ID is an identifier for an active dedicated transport channel. DCH ID should be unique for each active DCH among the active DCHs simultaneously allocated for the same UE.

3.10 DCH Type

Specify the use of the transport channel: Emergency call, Real Time Bearer, NRT bearer, or the Signalling Radio Bearer, and defines a priority level.

3.11 Transport format set

Transport format set is a set of transport formats allocated for a DCH. Each transport format defines one combination of parameters that describes 1) the format of the MAC PDU to be transmitted over Iur 2) The procedures that should be done at layer 1 for the MAC-PDUs upon reception.

3.12 TFCS

The Transport Format Combinations Set defines the allowed combinations of the transport formats of the transport channels.

3.13 UARFCN

The UTRAN Absolute Radio Frequency Number defines the frequency of the cell

3.14 Primary CCPCH scrambling code

Defines the scrambling code used by the cell to broadcast the BCCH

3.15 Uplink Scrambling Code

Uplink scrambling code is the scrambling code that is used by the UE.

3.16 DL Scrambling Code

DL scrambling code to be used by the RL. One cell may have more DL scrambling codes available.

3.17 Channelisation Code

Channelisation code can be defined e.g. by indicating the level and branch in the code tree.

3.18 Diversity control field

Indicates if the RL may, must not (or must, FFS) be combined with the others.

3.19 Diversity Indication

Indicates if the RL has been (ON) or has been not (OFF) combined with another RL.

3.20 Reference RL ID

ID of the RL which the RL in question has been combined with.

3.21 Perch channel Ec/Io

Signal-to-interference ratio per chip of the perch channel measured by the terminal.

3.22 Uplink Eb/No setpoint

Indicates the UL Eb/No target to be used by the UL closed loop power control.

3.23 Uplink Eb/No Adjustment parameters

Indicates the steps to be used to increase or decrease the Eb/No setpoint for the outer loop power control. The increase/decrease commands are carried by the FP.

3.24 Maximum uplink Eb/No

Indicate the maximum allowed Eb/No to be used by the UL inner loop power control.

3.25 Minimum uplink Eb/No

Indicate the maximum allowed Eb/No to be used by the UL inner loop power control.

3.26 AESA

ATM End System Address.

3.27 Binding ID

Binding ID is an identifier for an user data stream. The Binding ID is allocated by the Drift RNC and it should be unique among all active legs to/from the related drift RNC.

3.28 DL Reference power

Reference transmission power which is used by the fast downlink closed loop power control to eliminate the power drifting problem.

4 Proposals

1. To replace sections 9.1.1...9.1.9 in [S3.23] with sections 2.1 to 2.9 (except the text in Italic)
2. To add in 8.1 and 8.2 of [S3.23] the following sentence:
"The DRNC sends the RL SETUP (ADDITION) RESPONSE if at least one of the RL is successfully setup. If all the RLs are unsuccessfully setup, the DRNC responds with the RL SETUP (ADDITION) FAILURE".
3. To insert in section 9.2 of [S3.23] the contents of chapter 3. The 'reference' column in the message description need to be filled accordingly.

5 Reference

[S3.23]: *RNSAP Protocol*, v.0.0.2. source: Editor