

Agenda Item: 15.4
Source: Alcatel
Title: Eb/No parameters in RNSAP messages
(Resubmission of tdoc R3-99d28)
Document for: Decision

1 Introduction

In some RNSAP messages such as RL SETUP, RL ADDITION, RADIO LINK RECONFIGURATION PREPARE, RADIO LINK RECONFIGURATION REQUEST, there are parameters linked to the performances of a base station such as Eb/No. It is proposed to replace these parameters by parameters linked to the user QOS requirements.

2 Discussion

On two different base stations, depending on the performances and the configuration of these base stations, the BER can be different for the same Eb/No (assuming we have the same channel coding).

When a RAB is requested by a user, it can be constituted of several DCHs (e.g. for speech), each DCH having BER/FER constraints. So, what is important from a SRNC point of view is the target BER at transport level, not the target Eb/No.

The correspondence between Eb/No and BER/FER is a base station characteristic. There may be some variations between two base stations. So, the SRNC cannot rely on the Eb/No parameter for establishing a service that is characterised by the BER/FER per DCH.

We have to distinguish BER at user level from BER at transport level because the RLC layer in Acknowledged mode lowers the BER/FER by means of retransmissions.

The transport level BER/FER cannot be a characteristic of the RAB because a RAB may be made of several DCHs with different BER/FER. For example, AMR speech is made of 3 DCHs that correspond to the different Unequal Error Protection classes. The BER/FER is a DCH characteristic.

When the DRNC receives the BER/FER target per DCH, it is able to derive the Eb/No for each DCH and take the best value for the Target SIR.

Therefore, it is proposed to replace Eb/No at physical layer by "Transport Frame Erasure Rate" for each DCH.

3 Proposal

It is proposed to modify the contents of following RNSAP messages in section 9.1 of TS 25.423 [1]:

9.1.2 RADIO LINK SETUP REQUEST

9.1.2.1 FDD Message

Information Element	Reference	Type
Message Type		M
Transaction ID		M
S-RNTI		M
D-RNTI		O
Allowed Queuing Time		O
DCH Information		M
DCH ID		M
DCH Combination Indicator		O
DCH Allocation/Retention Priority		M
DCH Frame Handling Priority		M
Transport Format Set (DL)		M
Transport Format Set (UL)		M
TFCS (UL)		M
TFCS (DL)		M
Uplink Scrambling Code		M
<u>Target Transport Frame Erasure Rate</u>		<u>M</u>
UL Channelisation Codes		M
Channelisation Code Length (UL)		M
DL Channelisation Codes		M
Channelisation Code Length (DL)		M
RL Information		M
RL-ID		M
UTRAN Cell Identifier (UC-Id)		M
Frame Offset		M
Chip offset		M
Diversity Control Field		C2
Primary CCPCH Ec/Io		M
Propagation Delay		O
<u>Uplink Eb/No Target</u>		<u>M</u>
<u>Maximum Uplink Eb/No</u>		<u>M</u>
<u>Minimum Uplink Eb/No</u>		<u>M</u>
DL Reference Power		O
DSCH Information		O
RL ID		M
MACd-MACsh Transport Format Set		M

C2=present only if # of RL >1

Editor's note

This DSCH Information is agreed as a working assumption (RAN WG3 #5).

9.1.2.2 TDD Message

Information Element	Reference	Type
Message type		M
Transaction ID		M
S-RNTI		M
D-RNTI		O
Allowed Queuing Time		O
DCH information		M
DCH ID		M
DCH Combination Indicator		O
DCH Allocation/Retention Priority		M
DCH Frame Handling Priority		M
Transport Format Set (DL)		M
Transport Format Set (UL)		M
<u>Target Transport Frame Erasure Rate</u>		<u>M</u>
UL CCH Information		M
CCH ID		M
TFCS (UL)		M
DL CCH Information		M
CCH ID		M
TFCS (DL)		M
RL-ID		M
UTRAN Cell Identifier (UC-Id)		M
Primary CCPCH Ec/Io		FFS
<u>Uplink Eb/No Target</u>		<u>⊖</u>
<u>Maximum Uplink Eb/No</u>		<u>FFS</u>
<u>Minimum Uplink Eb/No</u>		<u>FFS</u>
DSCH Information		O
RL ID		M
MACd-MACsh Transport Format Set		M

[Editor's note: The following modifications have been made to the above message (apart from the ones agreed at RAN WG3 #6 in Sophia Antipolis):

1. The DCH Allocation/Retention Priority and DCH Frame Handling Priority parameters have replaced the DCH Priority parameter as for the FDD message.
2. The parameters D-RNTI and Allowed Queuing Time have been included as described in other contributions (the same as for the FDD message).

This editor's note shall be deleted when the above message is approved.]

[Editor's note: The editor could not judge

1. whether or not the Propagation Delay parameter is valid for TDD. This parameter has thus not been included.
2. ~~whether or not the Maximum and Minimum Uplink Eb/No parameters should be Mandatory as for FDD. The parameters are thus still described as FFS.~~

This editor's note shall be deleted when the above message is approved.]

Editor's note:

This DSCH Information is agreed as a working assumption (RAN WG3 #5).

9.1.5 RADIO LINK ADDITION

9.1.5.1 FDD Message

Information Element	Reference	Type
Message Type		M
Transaction ID		M
RL information		M
RL-ID		M
UTRAN Cell Identifier (UC-Id)		M
Frame Offset		M
Chip Offset		M
Diversity Control Field		M
Primary CCPCH Ec/Io		M
Uplink Eb/No Target		M

9.1.5.2 TDD Message

DL Reference Power		O
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Information Element	Reference	Type
Message Type		M
Transaction ID		M
RL-ID		M
UTRAN Cell Identifier (UC-Id)		M
Primary CCPCH Ec/Io		FFS
Uplink Eb/No Target		Ø
Maximum Uplink Eb/No		FFS
Minimum Uplink Eb/No		FFS

[Editor's note: The above message is the editor's proposal on messages for TDD. The basis for the message has been a) the agreements on the message RL SETUP REQUEST for TDD and b) the message present in the Italtel / Siemens contribution R3-99A46. This editor's note shall be deleted when the above message is approved.]

~~[Editor's note: The editor could not judge whether or not the Maximum and Minimum Uplink Eb/No parameters should be deleted as for FDD. The parameters are thus still described as FFS. This editor's note shall be deleted when the above message is approved.]~~

9.1.10 RADIO LINK RECONFIGURATION PREPARE

9.1.10.1 FDD Message

Information Element	Reference	Type
Message Type		M
Transaction ID		M
Allowed Queuing Time		O
DCHs to Modify		O
DCH ID		M
DCH Allocation/Retention Priority		O
DCH Frame Handling Priority		O
Transport Format Set (DL)		O
Transport Format Set (UL)		O
DCHs to Add		O
DCH ID		M
DCH Combination Indicator		O
DCH Allocation/Retention Priority		M
DCH Frame Handling Priority		M
Transport Format Set (DL)		M
Transport Format Set (UL)		M
<u>Target Transport Frame Erasure Rate</u>		<u>M</u>
DCHs to Delete		O
DCH ID		M
TFCS (DL)		M
TFCS (UL)		M
Uplink Scrambling code		O
UL Channelisation Codes		O
Channelisation Code (UL)		M
DL Channelisation Codes		O
Channelisation Code Length (DL)		M
Uplink Maximum Eb/No		M
Uplink Minimum Eb/No		M
DSCH Information		O
RL ID		M
MACd-MACsh Transport Format Set		M

Editor's note:

This DSCH Information is agreed as a working assumption (RAN WG3 #5).

9.1.10.2 TDD Message

Information Element	Reference	Type
Message Type		M
Transaction ID		M
Allowed Queuing Time		O
DCHs to Modify		O
DCH ID		M
DCH Allocation/Retention Priority		O
DCH Frame Handling Priority		O
Transport Format Set (DL)		O
Transport Format Set (UL)		O
<u>Target Transport Frame Erasure Rate</u>		<u>M</u>
DCHs to Add		O
DCH ID		M
DCH Combination Indicator		O
DCH Allocation/Retention Priority		M
DCH Frame Handling Priority		M
Transport Format Set (DL)		M
Transport Format Set (UL)		M
<u>Target Transport Frame Erasure Rate</u>		<u>M</u>
DCHs to Delete		O
DCH ID		M
DL CCH Information		O
CCH ID		M
TFCS (DL)		M
UL CCH Information		O
CCH ID		M
TFCS (UL)		M
UL DPCH Information		M
DPCH ID		M
<u>Uplink Maximum Eb/No</u>		<u>FFS</u>
<u>Uplink Minimum Eb/No</u>		<u>FFS</u>
DSCH Information		O
RL ID		M
MACd-MACsh Transport Format Set		M

[Editor's note: The following modifications have been made to the above message (apart from the ones agreed at RAN WG3 #6 in Sophia Antipolis):

1. The DCH Allocation/Retention Priority and DCH Frame Handling Priority parameters have replaced the DCH Priority parameter as for the FDD message.
2. The parameter Allowed Queuing Time has been included as described in other contributions (the same as for the FDD message).]

[Editor's note: The editor could not judge whether or not the Maximum and Minimum Uplink Eb/No parameters should be Mandatory as for FDD. The parameters are thus still described as FFS.]

[Editor's note:

This DSCH Information is agreed as a working assumption (RAN WG3 #5).

9.1.15 RADIO LINK RECONFIGURATION REQUEST

9.15.1 FDD messages

Information Element	Reference	Type
Message Type		M
Transaction ID		M
Allowed Queuing Time		O
DCHs to Modify		O
DCH ID		M
DCH Allocation/Retention Priority		O
DCH Frame Handling Priority		O
Transport Format Set (DL)		O
Transport Format Set (UL)		O
<u>Target Transport Frame Erasure Rate</u>		<u>M</u>
DCHs to Add		O
DCH ID		M
DCH Combination Indicator		O
DCH Allocation/Retention Priority		M
DCH Frame Handling Priority		M
Transport Format Set (DL)		M
Transport Format Set (UL)		M
<u>Target Transport Frame Erasure Rate</u>		<u>M</u>
DCHs to Delete		O
DCH ID		M
TFCS (DL)		O
TFCS (UL)		O
<u>Uplink Maximum Eb/No</u>		<u>M</u>
<u>Uplink Minimum Eb/No</u>		<u>M</u>
DSCH Information		O
RL ID		M
MACd-MACsh Transport Format Set		M

Editor's note

This DSCH Information is agreed as a working assumption (RAN WG3 #5).

9.15.2 TDD messages

Information Element	Reference	Type (TDD)
Message Type		M
Transaction ID		M

Allowed Queuing Time		O
DCHs to Modify		O
DCH ID		M
DCH Allocation/Retention Priority		FFS
DCH Frame Handling Priority		FFS
Transport Format Set (DL)		O
Transport Format Set (UL)		O
<u>Target Transport Frame Erasure Rate</u>		<u>M</u>
DCHs to Add		O
DCH ID		M
DCH Combination Indicator		O
DCH Allocation/Retention Priority		FFS
DCH Frame Handling Priority		FFS
Transport Format Set (DL)		M
Transport Format Set (UL)		M
<u>Target Transport Frame Erasure Rate</u>		<u>M</u>
DCHs to Delete		O
DCH ID		M
DL CCTrCH Information		O
CCTrCH ID		M
TFCS (DL)		M
UL CCTrCH Information		O
CCTrCH ID		M
TFCS (UL)		M
<u>Uplink Maximum Eb/No</u>		<u>FFS</u>
<u>Uplink Minimum Eb/No</u>		<u>FFS</u>
DSCH Information		O
RL ID		M
MACd-MACsh Transport Format Set		M

[Editor's note: The following modifications have been made to the above message (apart from the ones agreed at RAN WG3 #6 in Sophia Antipolis):

1. The DCH Allocation/Retention Priority and DCH Frame Handling Priority parameters have replaced the DCH Priority parameter just as for the FDD message with the exception that the priority parameters are defined as FFS as in the original proposal.
2. The parameter Allowed Queuing Time has been included as described in other contributions (the same as for the FDD message).]

[Editor's note: The editor could not judge whether or not the Maximum and Minimum Uplink Eb/No parameters should be Mandatory as for FDD. The parameters are thus still described as FFS.]

[Editor's note

This DSCH Information is agreed as a working assumption (RAN WG3 #5).]

4 References

[1] TS 25.423 V1.3.1 RNSAP Signalling Specification