

Agenda Item: 14.4
Source: Ericsson
Title: Use of RLC mode for RRC messages
Document for: Decision

1 Introduction

This contribution concerns a proposal of how RRC should use the services provided by RLC. The main objective is to propose the related text to be inserted in the RRC message specifications, clause 10 of the 25.331.

For most messages this contribution endorses the current specifications. However, this document also includes proposals for messages for which the RLC transfer mode has not yet been specified, is FFS or is inconsistently specified in [1] & [2]. Finally, this document proposes a few modifications of the specified mode.

2 Discussion

2.1 Mode to be used on CCCH

On common channels the choice is between the TM and UM modes. It is not possible to support both modes.

For UL, there is only one option: TM should be used (it does not make sense to use UM – segmentation is impossible since the UE's can not coordinate the use of RLC SN's)

For DL, the choice is between UM & TM. The current standard specifies that UM is used for most of these messages, while in some cases TM is specified as an option. The proposal is to use UM for the following reasons:

- For the messages carried across CCCH, flexible message formats/ structures are desirable e.g. there are optional message parameters that are needed only for certain features/ procedures
- RLC procedures for segmentation and concatenation are already specified

2.2 Mode to be used on PCCH

PCCH is used to transfer the Paging type 1 and the Notification message. Although the current standard specifies that UM is used for both of these messages, it seems that for these relatively simple messages the additional flexibility is not worth the cost of overhead of UM. Hence, the proposal is to apply TM rather than UM.

3 Proposal

The proposal is to include the RLC- SAP in the message specifications of 25.331 by updating clause 10 as specified in the following.

NOTE The System Information message is handled in another contribution [4].

10.1.1.1 ACTIVE SET UPDATE

<Functional description of this message to be included here>

RLC-SAP: ~~t.b.d.~~AM

Logical channel: DCCH

10.1.1.2 ACTIVE SET UPDATE COMPLETE

<Functional description of this message to be included here>

RLC-SAP: ~~t.b.d.~~AM

Logical channel: DCCH

Direction: UE→UTRAN

10.1.1.3 CELL UPDATE

This message is used by the UE to initiate a cell update procedure.

RLC-SAP: ~~t.b.d.~~ TM

Logical channel: t.b.d.

Direction: UE→UTRAN

10.1.1.4 CELL UPDATE CONFIRM

This message confirms the cell update procedure and can be used to reallocate new RNTI information for the UE valid in the new cell.

RLC-SAP: ~~t.b.d.~~ AM

Logical channel: t.b.d.

Direction: UTRAN→UE

10.1.1.5 HANDOVER COMMAND

<Functional description of this message to be included here>

RLC-SAP: ~~t.b.d.~~ AM

Logical channel: DCCH

Direction: UTRAN → UE

10.1.1.6 HANDOVER COMPLETE

<Functional description of this message to be included here>

RLC-SAP: ~~t.b.d.~~ AM

Logical channel: DCCH

Direction: UE → UTRAN

10.1.1.7 INTER-SYSTEM HANDOVER COMMAND

This message is used for handover from UMTS to another system e.g. GSM. One or several messages from the other system can be included in the Inter-System message information element in this message. These messages are structured and coded according to that systems specification.

RLC-SAP: ~~t.b.d.~~ AM

Logical channel: DCCH

Direction: UTRAN→UE

10.1.1.8 INTER-SYSTEM HANDOVER FAILURE

This message is sent on the RRC connection used before the Inter-System Handover was executed. The message indicates that the UE has failed to seize the new channel in the other system.

RLC-SAP: ~~t.b.d.~~ AM

Logical channel: DCCH

Direction: UE→UTRAN

10.1.1.9 URA UPDATE

This message is used by the UE to initiate a URA update procedure.

RLC-SAP: ~~t.b.d.~~ TM

Logical channel: t.b.d.

Direction: UE→UTRAN

10.1.1.10 URA UPDATE CONFIRM

*<Functional description of this message to be included here>*This message confirms the URA update procedure and can be used to reallocate new RNTI information for the UE valid after the URA update.

RLC-SAP: ~~t.b.d.~~ UM.

Logical channel: t.b.d.

Direction: UTRAN→UE

10.1.1.11 RNTI REALLOCATION

<Functional description of this message to be included here>

RLC-SAP: ~~t.b.d.~~ AM or UM

Logical channel: t.b.d.

Direction: UTRAN→UE

10.1.1.12 RNTI REALLOCATION COMPLETE

This message is used to confirm the new RNTI information for the UE.

RLC-SAP: ~~t.b.d.~~ AM

Logical channel: DCCH

Direction: UE→UTRAN

10.1.2.1 MEASUREMENT CONTROL

<Functional description of this message to be included here>

RLC-SAP: ~~t.b.d.~~ AM

Logical channel: DCCH

Direction: UTRAN→UE

10.1.2.2 MEASUREMENT REPORT

<Functional description of this message to be included here>

RLC-SAP: ~~t.b.d.~~ AM or UM, as configured by UTRAN within measurement control

Logical channel: DCCH

Direction: UE→UTRAN

10.1.3.1 NOTIFICATION

<Functional description of this message to be included here>

RLC-SAP: ~~t.b.d.~~ TM

Logical channel: PCCH

Direction: UTRAN → UE

10.1.3.2 PAGING TYPE 1

This message is used to send information on the paging channel. One or several UEs, in idle or connected mode, can be paged in one message, which also can contain other information.

RLC-SAP: ~~t.b.d.~~ TM

Logical channel: PCCH

Direction: UTRAN → UE

10.1.3.3 PAGING TYPE 2

This message is used to page an UE in connected mode, when using the DCCH for CN originated paging.

RLC-SAP: ~~t.b.d.~~ AM

Logical channel: DCCH

Direction: UTRAN → UE

10.1.4.1 RRC CONNECTION RE-ESTABLISHMENT

<Functional description of this message to be included here>

RLC-SAP: ~~t.b.d.~~ UM

Logical channel: t.b.d.

Direction: UTRAN → UE

10.1.4.2 RRC CONNECTION RE-ESTABLISHMENT COMPLETE

<Functional description of this message to be included here>

RLC-SAP: ~~t.b.d.~~ AM

Logical channel: DCCH

Direction: UE → UTRAN

10.1.4.3 RRC CONNECTION RE-ESTABLISHMENT REQUEST

<Functional description of this message to be included here>

RLC-SAP: ~~t.b.d.~~ TM

Logical channel: t.b.d

Direction: UE → UTRAN

10.1.4.4 RRC CONNECTION RELEASE

<Functional description of this message to be included here>

RLC-SAP: ~~t-b-d~~ UM

Logical channel: DCCH

Direction: UTRAN→UE

10.1.4.5 RRC CONNECTION RELEASE COMPLETE

<Functional description of this message to be included here>

RLC-SAP: ~~t-b-d~~ AM in case of release without dedicated channel and UM in case of release with dedicated channel

Logical channel: DCCH

Direction: UE → UTRAN

10.1.4.6 RRC CONNECTION REQUEST

RRC Connection Request is the first message transmitted by the UE when setting up an RRC Connection to the network.

RLC-SAP: ~~t-b-d~~ TM

Logical channel: CCCH

Direction: UE → UTRAN

10.1.4.7 RRC CONNECTION SETUP

This message is used by the network to accept the establishment of an RRC connection for an UE, including assignment of signalling link information, transport channel information and optionally physical channel information.

RLC-SAP: ~~t-b-d~~ UM

Logical channel: CCCH

Direction: UTRAN → UE

10.1.4.8 RRC CONNECTION SETUP COMPLETE

This message confirms the establishment of the RRC Connection by the UE.

RLC-SAP: ~~t-b-d~~ AM

Logical channel: DCCH

Direction: UE → UTRAN

10.1.4.9 RRC CONNECTION REJECT

This message is transmitted by the network when the requested RRC connection cannot be accepted.

RLC-SAP: ~~t-b-d~~ UM

Logical channel: CCCH

Direction: UTRAN → UE

10.1.4.10 RRC STATUS

This message is transmitted by the network when the network requests UE to release one of several signalling connections.

RLC-SAP: ~~t-b-d~~ UM

Logical channel: DCCH

Direction: UTRAN → UE

10.1.4.11 RRC STATUS ACK

This message is transmitted by UE as an acknowledgement for RRC STATUS message.

RLC-SAP: ~~t-b-d~~ UM

Logical channel: DCCH

Direction: UE → UTRAN

10.1.5.1 PHYSICAL CHANNEL RECONFIGURATION

This message is used by UTRAN to assign, replace or release a set of physical channels used by a UE.

RLC-SAP: ~~t-b-d~~ AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

10.1.5.2 PHYSICAL CHANNEL RECONFIGURATION COMPLETE

This message is sent from the UE when a physical channel reconfiguration has been done.

RLC-SAP: ~~t-b-d:~~ AM

Logical channel: DCCH

Direction: UE → UTRAN

10.1.5.3 RADIO ACCESS BEARER RECONFIGURATION

This message is sent from UTRAN to reconfigure parameters related to a change of QoS. This procedure can also change the multiplexing of MAC, reconfigure transport channels and physical channels.

RLC-SAP: ~~t-b-d:~~ AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

10.1.5.4 RADIO ACCESS BEARER RECONFIGURATION COMPLETE

This message is sent from the UE when a RAB and signalling link reconfiguration has been done.

RLC-SAP: ~~t-b-d:~~ AM

Logical channel: DCCH

Direction: UE → UTRAN

10.1.5.5 RADIO ACCESS BEARER RELEASE

<Functional description of this message to be included here>

RLC-SAP: ~~t-b-d:~~ AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

10.1.5.6 RADIO ACCESS BEARER RELEASE COMPLETE

<Functional description of this message to be included here>

RLC-SAP: ~~t-b-d:~~ AM

Logical channel: DCCH

Direction: UE → UTRAN

10.1.5.7 RADIO ACCESS BEARER SETUP

<Functional description of this message to be included here>

RLC-SAP: ~~t-b-d:~~ AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

10.1.5.8 RADIO ACCESS BEARER SETUP COMPLETE

<Functional description of this message to be included here>

RLC-SAP: ~~t-b-d:~~ AM

Logical channel: DCCH

Direction: UE → UTRAN

10.1.5.9 TRANSPORT CHANNEL RECONFIGURATION

This message is used by UTRAN to configure the transport channel of a UE. This also includes a possible reconfiguration of physical channels. The message can also be used to assign a TFC subset and reconfigure physical channel.

RLC-SAP: ~~t-b-d:~~ AM or UM

Logical channel: DCCH

Direction: UTRAN → UE

10.1.5.10 TRANSPORT CHANNEL RECONFIGURATION COMPLETE

This message is sent from the UE when a transport channel reconfiguration has been done.

RLC-SAP: ~~t-b-d:~~ AM

Logical channel: DCCH

Direction: UE → UTRAN

10.1.5.11 TRANSPORT FORMAT COMBINATION CONTROL

<Functional description of this message to be included here>
RLC-SAP: ~~t.b.d.~~ AM or UM
Logical channel: DCCH
Direction: UTRAN→UE

10.1.7.1 UE CAPABILITY INFORMATION

<Functional description of this message to be included here>
RLC-SAP: ~~t.b.d.~~ UM
Logical channel: DCCH
Direction: UE → UTRAN

10.1.7.2 UE CAPABILITY INFORMATION CONFIRM

<Functional description of this message to be included here>
RLC-SAP: ~~t.b.d.~~ UM
Logical channel: DCCH
Direction: UTRAN → UE

10.1.7.3 DIRECT TRANSFER

<Functional description of this message to be included here>
RLC-SAP: ~~t.b.d.~~ AM
Logical channel: DCCH
Direction: both

4 References

- [1] 3GPP TS 25.331 V1.1.0, "RRC Protocol Specification", 1999-06
- [2] 3GPP TS 25.303 V2.1.0: "UE Procedures in Connected Mode", 1999-05
- [3] 3GPP TS 25.304 V1.1.2: "UE Procedures in Idle Mode", 1999-06
- [4] 3GPP TSGR2#6(99)817: System information blocks