TSG-RAN Working Group 2 (Radio layer 2 and Radio layer 3) *TSGR2#2(99)138*
Stockholm 8th to 11th March 1999

Agenda Item: 7.7

Source: Siemens AG

Title: RRC Connection Establishment and Release for TDD

Document for: Decision

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1 Introduction

This document contains deltas which may be added to S2.03, ”UE Functions and Interlayer Procedures in Connected Mode” [2].

The document shows the RRC Connection Establishment and Release procedures needed for TDD operation.

The described procedures have strong similarities with FDD, but we think that the differences caused by the different physical layers do not allow to have combined figures for both modes, within the TDD mode the position of an allocated grid (defined by timeslots and codes) in the time domain is known.

Proposal:
It is proposed to
- add the figure as well as the text from *chapter 2 of this Tdoc* as chapter 9.1.1.1, ”RRC connection establishment for TDD mode” into S2.03, and
- add the figure and the text from *chapter 3 of this Tdoc* as chapter 9.1.4.3, ”RRC connection release for TDD mode” into S2.03.

2 RRC Connection Establishment for TDD mode

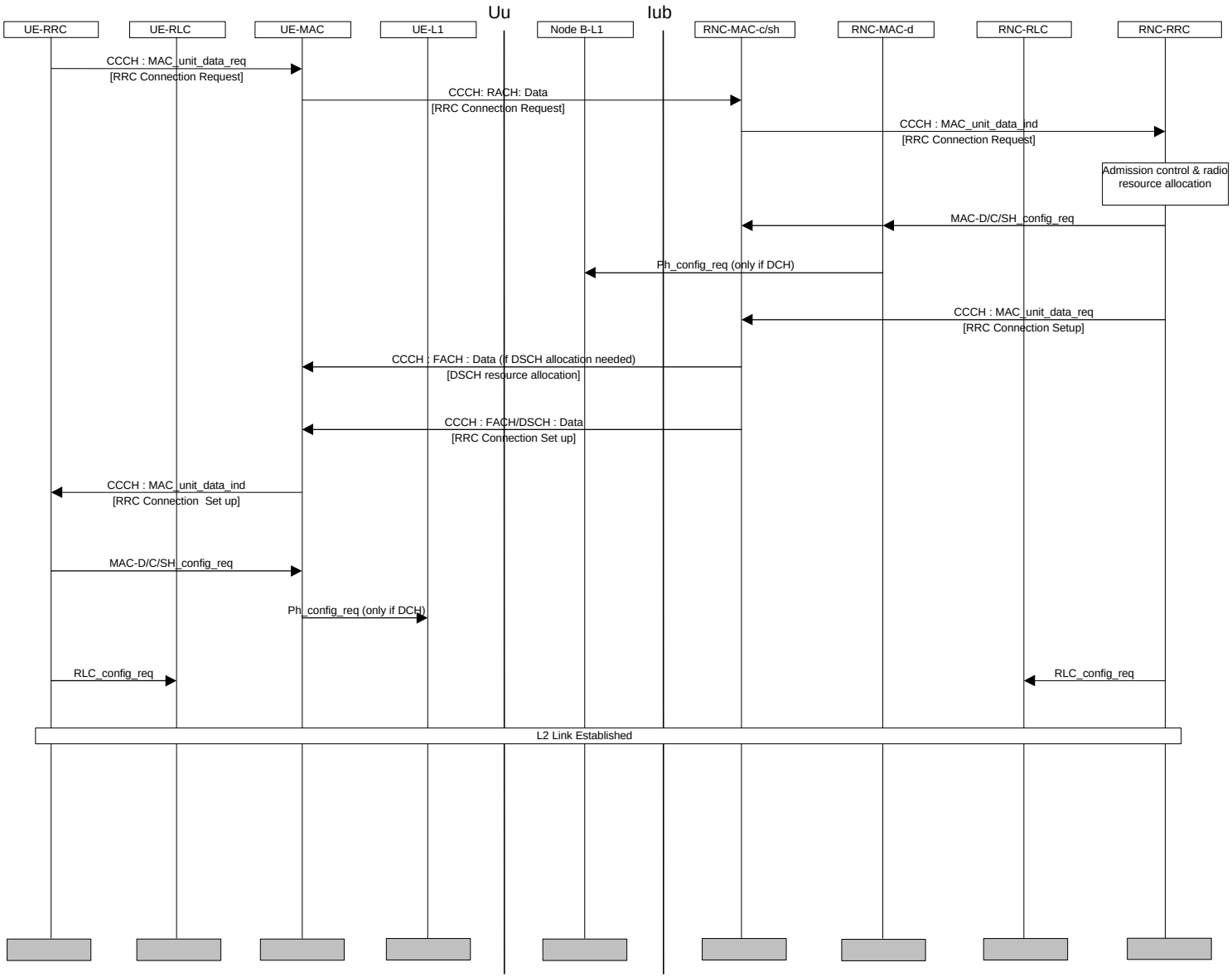
In the following, only the differences to FDD are described.

At the RNC side, the configuration of RNC-MAC-d and RNC-MAC-c/sh is done with *one message* MAC-D/C/SH_config_req because these MAC entities are assumed to be in the same RNC and one message is therefore sufficient.

The configuration of NodeB-L1 in case of DCH is done by SRNC-*MAC* using the message ”Ph_config_req”.

For transmission of the ”RRC Connection Set Up” message, either the FACH or the DSCH can be used. If the DSCH is used, there will be a DSCH resource allocation message in the FACH before.

In the UE, the configuration of UE-L1 in case of DCH is done by the UE-MAC using the message ”Ph_config_req”. Any L1 synch procedure during channel set up is not required in TDD.


Uu
Iub
UE-RRC
UE-RLC
UE-MAC
UE-L1
Node B-L1
RNC-MAC-c/sh
RNC-MAC-d
RNC-RLC
RNC-RRC
CCCH : MAC_unit_data_req
[RRC Connection Request]
CCCH: RACH: Data
[RRC Connection Request]
CCCH : MAC_unit_data_ind
[RRC Connection Request]
Admission control & radio resource allocation
MAC-D/C/SH_config_req
Ph_config_req (only if DCH)
CCCH : MAC_unit_data_req
[RRC Connection Setup]
CCCH : FACH : Data (if DSCH allocation needed)
[DSCH resource allocation]
CCCH : FACH/DSCH : Data
[RRC Connection Set up]
CCCH : MAC_unit_data_ind
[RRC Connection Set up]
MAC-D/C/SH_config_req
Ph_config_req (only if DCH)
RLC_config_req
RLC_config_req
L2 Link Established

3 RRC Connection Release for TDD mode

The RRC connection release for TDD is similar to the ”RRC connection release without Dedicated Physical Channel” in FDD because in TDD, the RNC-RRC expects the ”RRC Connection Release Complete” message from the UE as an acknowledgement and does not rely on the ”MPH_out_of_sync_ind” to see that the DCH has been terminated.

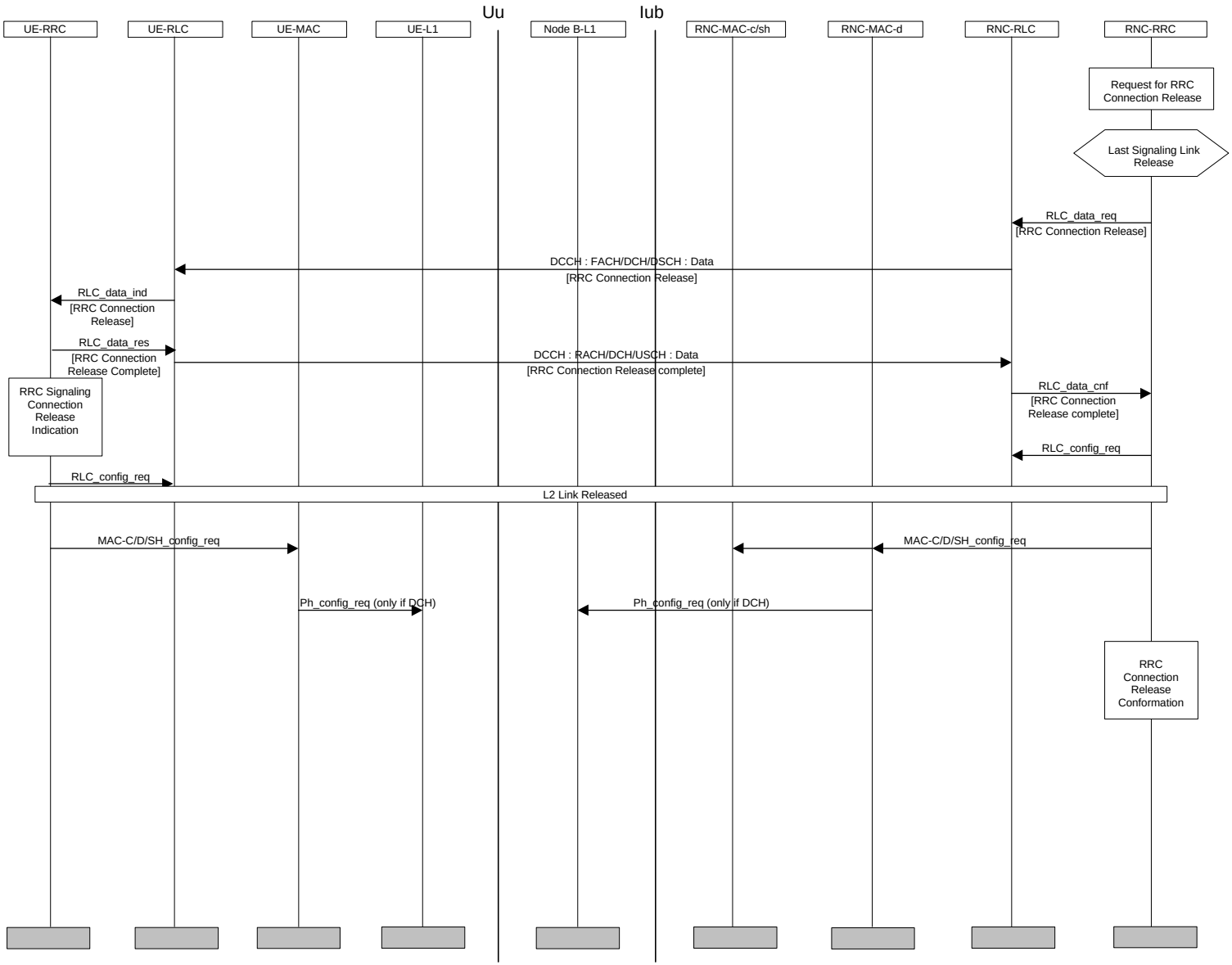
In the following, only the differences of the TDD RRC Connection Release procedure compared to the ”RRC connection release without Dedicated Physical Channel” procedure in FDD are described.

The ”RRC Connection Release” message from RNC to UE is sent as ”Unacknowledged data” because the acknowledgement is expected at RRC level, not at RLC level.

The UE responds by sending the ”RRC Connection Release Complete” message as ”Unacknowledged data”.

At the RNC side, the release of the MAC connection is performed with one primitive ”MAC-D/C/SH_config_req” from RRC to MAC because the several MAC entities serving the UE are all located in the same RNC.

A potential release of L1 in case of DCH is performed on both sides by MAC-d using a ”Ph_config_req”.


Uu
Iub
UE-RRC
UE-RLC
UE-MAC
UE-L1
Node B-L1
RNC-MAC-c/sh
RNC-MAC-d
RNC-RLC
RNC-RRC
Request for RRC Connection Release
Last Signaling Link Release
RLC_data_req [RRC Connection Release]
DCCH : FACH/DCH/DSCH : Data [RRC Connection Release]
RLC_data_ind [RRC Connection Release]
RLC_data_res [RRC Connection Release Complete]
DCCH : RACH/DCH/USCH : Data [RRC Connection Release complete]
RRC Signaling Connection Release Indication
RLC_data_cnf [RRC Connection Release complete]
RLC_config_req
RLC_config_req
L2 Link Released
MAC-C/D/SH_config_req
MAC-C/D/SH_config_req
Ph_config_req (only if DCH)
Ph_config_req (only if DCH)
RRC Connection Release Conformation

4 Conclusions

Changes to the document S2.03 [2] are proposed as stated in the introduction.

5 References

[1] 3GPP S2.01 Radio Interface Protocol Architecture
[2] 3GPP S2.03 UE Functions and Interlayer Procedures in Connected Mode, V0.0.1, 1999-1.
[3] 3GPP S2.21 MAC Protocol Specification
[4] 3GPP RAN WG2 TDocs 31,32,33/99 Uplink Shared Channel (USCH), Motorola