TSG-RAN Meeting #11 *RP-010021*
Palm Springs, CA, USA, 13 - 16 March 2001

Title: **Agreed CRs (Release ’99) to TS 25.303**

Source: **TSG-RAN WG2**

Agenda item: **5.2.3**

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version	Versio
R2-010218	agreed	25.303	041	1	R99	Text corrections	F	3.6.0	3.7.0
R2-010144	agreed	25.303	042		R99	SRNS relocation	F	3.6.0	3.7.0
R2-010676	agreed	25.303	044		R99	Clean-up	F	3.6.0	3.7.0

3GPP TSG-RAN WG2 Meeting #18 ***Tdoc R2-010218***

Edinburgh, UK, 15-19 January 2001

CR-Form-v3

CHANGE REQUEST

⌘ **25.303** **CR** **041** ⌘ rev **r1** ⌘ Current version: **3.6.0.** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Text corrections
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	***Date:*** ⌘ 09th January 01
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
- ***F*** *(essential correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
- ***D*** *(Editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	FAUSCH is not part of release 1999. Fig. 21 is not correct. Fig. 40 and associated text is not correct.
Summary of change:	⌘	Fig. 21 is corrected (TFI1 is replaced by TFI2, which was obviously a mistake) Fig. 40 and associated text is corrected (Since the UE is paged via the DCCH, it should be a Paging Request Type 2, not Type 1) FAUSCH is removed from the text.
Consequences if not approved:	⌘	Erroneous description.

Clauses affected:	⌘	4, 6.1.1, 6.2.3.1, 6.3.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

4 General Description of Connected Mode

The connected mode is entered when the RRC connection is established. The UE is assigned a radio network temporary identity (RNTI) to be used as UE identity on common transport channels. Two types of RNTI exist. The Serving RNC allocates an s-RNTI for all UEs having an RRC connection. The combination of s-RNTI and an RNC-ID is unique within a PLMN. c-RNTI is allocated by each Controlling RNC through which UE is able to communicate on DCCH. c-RNTI is always allocated by UTRAN when a new UE context is created to an RNC, but the UE needs its c-RNTI only for communicating on common transport channels.

The UE leaves the connected mode and returns to idle mode when the RRC connection is released or at RRC connection failure.

Within connected mode the level of UE connection to UTRAN is determined by the quality of service requirements of the active radio bearers and the characteristics of the traffic on those bearers.

The UE-UTRAN interface is designed to support a large number of UEs using packet data services by providing flexible means to utilize statistical multiplexing. Due to limitations, such as air interface capacity, UE power consumption and network h/w availability, the dedicated resources cannot be allocated to all of the packet service users at all times.

Variable rate transmission provides the means that for services of variable rate the data rate is adapted according to the maximum allowable output power.

The UE state in the connected mode defines the level of activity associated to the UE. The key parameters of each state are the required activity and resources within the state and the required signalling prior to the data transmission. The state of the UE shall at least be dependent on the application requirement and the period of inactivity.

Common Packet Channel (CPCH) uplink resources are available to UEs with an access protocol similar to the RACH. The CPCH resources support uplink packet communication for numerous UEs with a set of shared, contention-based CPCH channels allocated to the cell.

~~Packet Services can be supported also using the FAUSCH, by means of which a dedicated transport channel can be allocated for data transmission.~~

The different levels of UE connection to UTRAN are listed below:

- No signalling connection exists
  The UE is in idle mode and has no relation to UTRAN, only to CN. For data transfer, a signalling connection has to be established.

- Signalling connection exists
  When at least one signalling connection exists, the UE is in connected mode and there is normally an RRC connection between UE and UTRAN. The UE position can be known on different levels:

  - UTRAN Registration Area (URA) level
    The UE position is known on URA level. The URA is a set of cells

  - Cell level
    The UE position is known on cell level. Different transport channel types can be used for data transfer:

  - Common transport channels (RACH / FACH, DSCH, CPCH)

  - Dedicated transport channels (DCH) ~~(FAUSCH can be used to allocate a dedicated transport channel for data transmission.)~~

Assuming that there exists an RRC connection, there are two basic families of RRC connection mobility procedures, URA updating and handover. Different families of RRC connection mobility procedures are used in different levels of UE connection (cell level and URA level):

- URA updating is a family of procedures that updates the UTRAN registration area of a UE when an RRC connection exists and the position of the UE is known on URA level in the UTRAN;

- handover is a family of procedures that adds or removes one or several radio links between one UE and UTRAN when an RRC connection exists and the position of the UE is known on cell level in the UTRAN.

[…]

6.1.1 RRC connection establishment

RRC connection establishment (see /5/) is shown in figure 1 (protocol termination for common channels is shown according to former case A, case C can be found for comparison in annex A). The RRC layer in the UE leaves the idle mode and initiates an RRC connection establishment by sending an RRC Connection Request message using the MAC SAP for the CCCH logical channel. MAC transmits the L3 message on the RACH transport channel.

On the network side, upon the reception of RRC Connection Request, the RRC layer performs admission control, assigns an s-RNTI for the RRC connection and selects radio resource parameters (such as transport channel type, transport format sets etc). If a DCH is to be established, CPHY-RL-Setup and CPHY-TrCH-Config request primitives (transmitted as one RADIO LINK SETUP PDU) are sent to all Node Bs which would be involved in the channel establishment. The physical layer operation is started and confirmation primitives are returned from each Node B. RRC configures parameters on layer 2 to establish the DCCH logical channel locally. The selected parameters including the RNTI, are transmitted to the UE in an RRC Connection Setup message using the MAC SAP for the CCCH logical channel.

Upon reception of the RRC Connection Setup message, the RRC layer in the UE configures the L1 and L2 using these parameters to locally establish the DCCH logical channel. In case of DCH, layer 1 indicates to RRC when it has reached synchronisation.

The RLC signalling link is locally established on both sides. The establishment can be mapped on either RACH / FACH, ~~RACH+FAUSCH / FACH~~ or DCH by MAC. When the UE has established the RLC signalling link, it transmits an RRC Connection Setup Complete message to the network using acknowledged mode on the DCCH.

[…]

6.2.3 Physical Channel Reconfiguration

For physical channel reconfiguration, both synchronised and unsynchronised procedures are applicable.

6.2.3.1 UE-Originated DCH Activation

Figure 14 illustrates an example of a procedure for a switch from common channels (CELL_FACH) to dedicated (CELL_DCH) channels.

In the UE the traffic volume measurement function decides to send a MEASUREMENT REPORT message to the network. In the network this measurement report could trigger numerous different actions. For example the network could do a change of transport format set, channel type switching or, if the system traffic is high, no action at all. In this case a switch from CELL_FACH to CELL_DCH is initiated.

Whether the report should be sent with acknowledged or unacknowledged data transfer is configured by the network.

First, the modifications on L1 are requested and confirmed on the network side with CPHY-RL-Setup primitives.

The RRC layer on the network side sends a PHYSICAL CHANNEL RECONFIGURATION message to its peer entity in the UE (acknowledged or unacknowledged transmission optional to the network). This message is sent on DCCH mapped to FACH. The message includes information about the new physical channel, such as codes and the period of time for which the DCH is activated (note).

NOTE: This message does not include new transport formats. If a change of these is required due to the change of transport channel, this is done with the separate procedure Transport Channel Reconfiguration. This procedure only handles the change of transport channel.

When the UE has detected synchronisation on the new dedicated channel L2 is configured on the UE side and a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message can be sent on DCCH mapped on DCH to RRC in the network. Triggered by either the NW CPHY_sync_ind or the L3 complete message, the RNC-L1 and L2 configuration changes are executed in the NW.

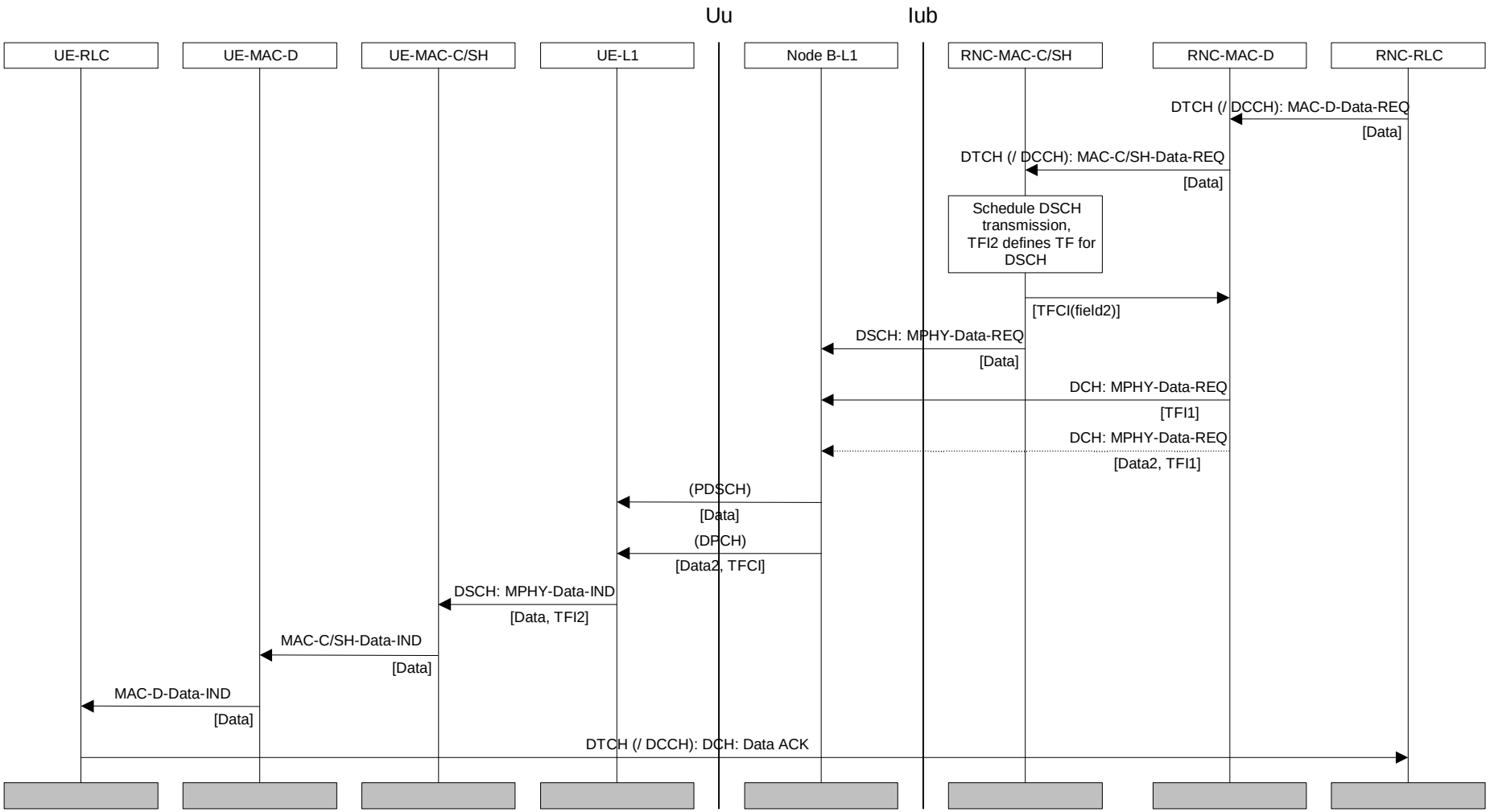
~~When applying the FAUSCH, the "DCCH: RACH: MEASUREMENT REPORT" is replaced by a "DCCH: FAUSCH: DCH REQUEST" message that is transmitted on the FAUSCH in unacknowledged mode. In this case rather than giving a measurement report for the NW to process, the FAUSCH indicates a request for a DCH of predefined capacity.~~

6.3.2 Acknowledged-mode data transmission on DSCH using logical split of TFCI-word

NOTE: For release-99 this example is only valid in the case where SRNC = CRNC.

Figure 21 shows an example of acknowledged-mode data transmission on DSCH. First RLC in SRNC requests data transmission from MAC-d. MAC-d passes the data on to MAC-c/sh, which schedules the DSCH transmission and determines the TFI2 for the data. TFCI(field2) and CFN (connection frame number) for transmission are given back to MAC-d.

MAC-c/sh transmits the DSCH data while MAC-d transmits all TFIs synchronised with the transmission of any DCH data and TFIs intended for transmission in the same frame. TFCI(field2)for the DSCH and TFCI(field1)for the DCH are combined into the same TFCI on the physical layer using 'logical' split of TFCI-word and transmitted on the DPCCH (dedicated physical control channel) of the associated DPCH (dedicated physical channel). The DSCH data is transmitted separately on the PDSCH (physical downlink shared channel). TFCI(field2)is used to decode DSCH data, which is then forwarded through MAC-c/sh and MAC-d to the receiving RLC. An acknowledgement is eventually sent by the UE-RLC mapped to a DCH, unless the DCH is released before the acknowledgement.


Uu
Iub
UE-RLC
UE-MAC-D
UE-MAC-C/SH
UE-L1
Node B-L1
RNC-MAC-C/SH
RNC-MAC-D
RNC-RLC
DTCH (/ DCCH): MAC-D-Data-REQ
[Data]
DTCH (/ DCCH): MAC-C/SH-Data-REQ
[Data]
Schedule DSCH transmission, TFI2 defines TF for DSCH
[TFCI(field2)]
DSCH: MPHY-Data-REQ
[Data]
DCH: MPHY-Data-REQ
[TFI1]
DCH: MPHY-Data-REQ
[Data2, TFI1]
(PDSCH)
[Data]
(DPCH)
[Data2, TFCI]
DSCH: MPHY-Data-IND
[Data, TFI2]
MAC-C/SH-Data-IND
[Data]
MAC-D-Data-IND
[Data]
DTCH (/ DCCH): DCH: Data ACK

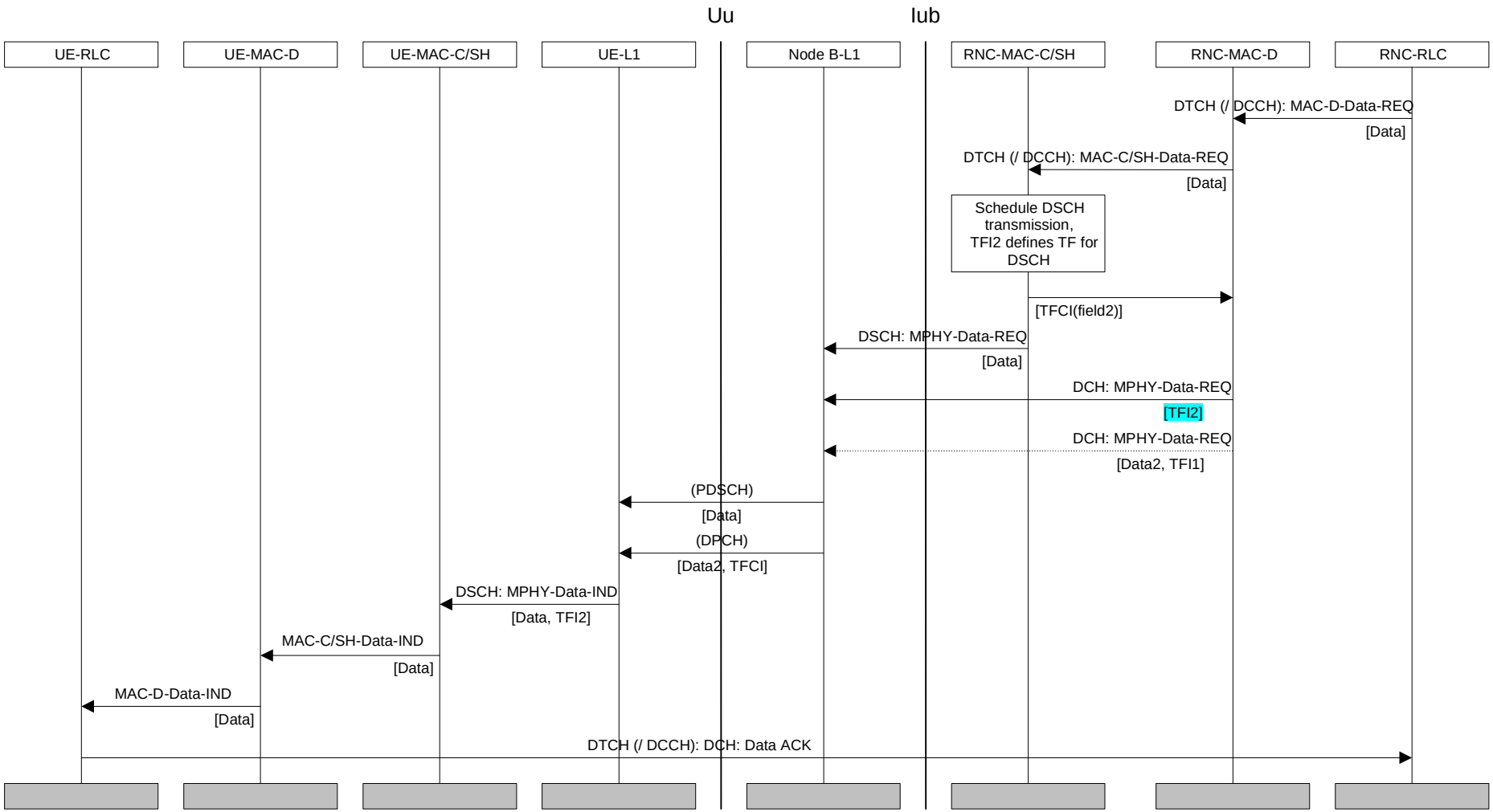


Figure 21: Example of acknowledged-mode data transmission on DSCH

[…]

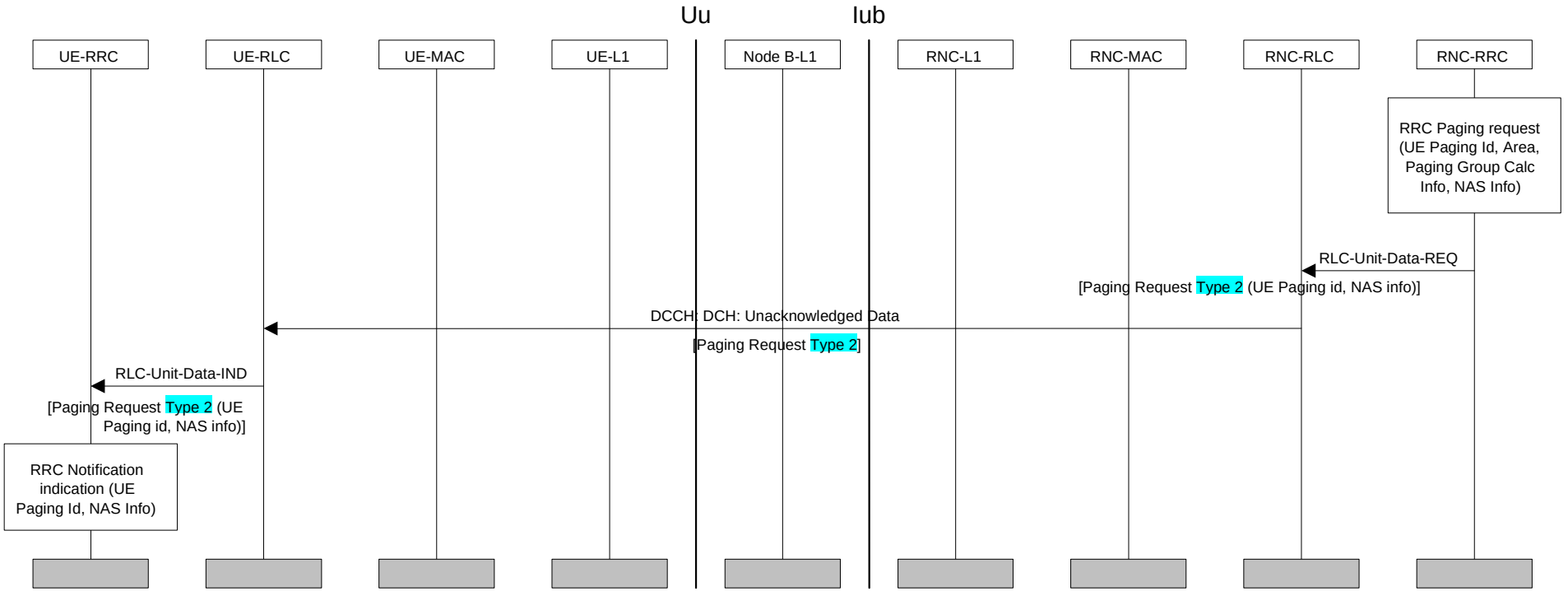


Figure 40: Example sequence of CN initiated paging request using DCCH

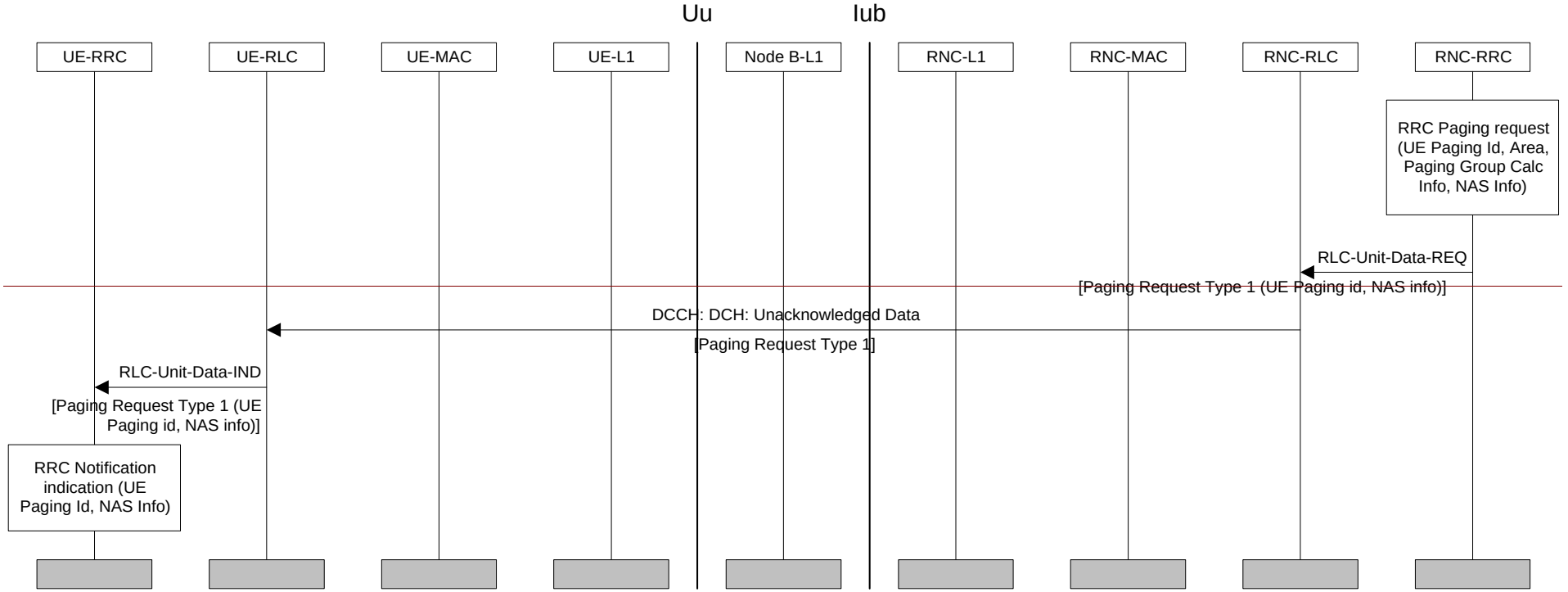


Figure 40: Example sequence of CN initiated paging request using DCCH

The above sequence illustrates a CN originated paging request, when the UE is in connected mode and can be reached on the DCCH. The coordination of the paging request with the existing RRC connection is done in UTRAN.

The entity above RRC on the network side requests paging of a UE over the Nt-SAP. The request contains a UE paging identity, an area where the page request is to be broadcast, information for calculation of the paging group and NAS information to be transparently transmitted to the UE by the paging request.

Since the UE can be reached on the DCCH, the RRC layer formats a Paging Request Type ~~1~~ 2 message containing the UE paging identity and the NAS information, and the message is transmitted directly to the UE using unacknowledged data transfer.

3GPP TSG-RAN WG2 Meeting #18
Edinburgh, UK, 15 - 19 Jan. 2001

R2-010144

CR-Form-v3

CHANGE REQUEST

⌘ **25.303** **CR** **042** ⌘ rev **-** ⌘ Current version: **3.6.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	SRNS relocation
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	***Date:*** ⌘ 12 Jan. 2001
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	- During SRNS relocation the START values need to be sent from the UE to the target RNC to re-synchronise ciphering on radio bearers using UM and AM RLC. Also integrity protection on signalling radio bearers is re-synchronised with START. - The current description of SRNS relocation covers only the lossless radio bearers. A description of seamless SRNS relocation has been added.
Summary of change:	⌘	
Consequences if not approved:	⌘	The description of SRNS relocation remains incomplete.

Clauses affected:	⌘	6.4.8, 6.4.8.1, 6.4.8.2, 6.4.8.3 (new), 6.4.8.4 (new)
Other specs Affected:	⌘	**X** Other core specifications ⌘ TS 25.331 ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6.4.8 SRNS Relocation

The SRNS relocation procedure can be divided into two phases. The first phase is relocation preparation; where the resources are reserved, new RABs are established while the second phase is the transfer of the Serving RNS from source to target RNC.

There are three cases in which an SRNS relocation can be performed:

- Serving SRNS relocation: This is used to move the UTRAN to CN connection point at the UTRAN side from the source SRNC to the target RNC.
- Combin~~d~~ed Hard Handover and SRNS relocation: This is used to move the UTRAN to CN connection point at the UTRAN side from the source SRNC to the target RNC, while performing a hard handover decided by the UTRAN.
- Combined Cell/URA update and SRNS relocation: This is used to move the UTRAN to CN connection point at the UTRAN side from the source SRNC to the target RNC, while performing a cell re-selection in the UTRAN.

and these are described in subclause 6.4.8.1~~, and~~ 6.4.8.2 (for lossless radio bearers), 6.4.8.3, 6.4.8.4 (for seamless radio bearers), and in more detail in TS 23.060 [6].

6.4.8.1 Serving and Combined Cell/URA Update SRNS relocation (lossless radio bearers)

The procedure is initiated by the source RNC deciding to perform a Serving SRNS relocation. Case I represents the situation when the UE is not involved and this is shown in Figure 35. Case II represents the situation when the UE is involved and a Combined Cell/URA update and SRNS relocation is performed, also shown in Figure 35.

A RANAP Relocation Command is received by the source RNC from the CN, indicating the RABs to be released and the RABs that are subject to data forwarding. Lossless SRNS relocation is always, and only, configured for RABs that are subject to data forwarding. The PDCP layer shall support PDCP sequence numbering when lossless SRNS relocation is supported [7].

For the affected radio bearers, the RLC entity is suspended and the PDCP sequence numbers are retrieved by RRC. The PDCP send and receive sequence numbers are then transferred in the RNSAP Relocation Commit message from source to target RNC for RABs that support lossless SRNS relocation. The target RNC becomes the serving RNC when the RANAP Relocation Detect message is sent.

The target RNC then sends a UTRAN MOBILITY INFORMATION (Case I) or a CELL/URA UPDATE CONFIRM (Case II); which configures the UE with the new U-RNTI and indicates the uplink receive PDCP sequence number for each radio bearer configured to support lossless SRNS relocation. The UE compares the uplink receive PDCP sequence number with the UE uplink send PDCP sequence number. If this confirms PDCP SDUs successfully transferred before the start of relocation ie already received by the source RNC then these are discarded by the UE.

If the UE has successfully configured itself, it shall send~~;~~ a UTRAN MOBILITY INFORMATION CONFIRM (Case I and Case II). These messages contain the START values and the downlink receive PDCP sequence number for each radio bearer configured to support lossless SRNS relocation. UTRAN compares the downlink receive PDCP sequence number with the downlink send PDCP sequence number For the affected radio bearers, The RLC entity is re-established [2] with the current configuration.

In case of failure; the UE shall send a UTRAN MOBILITY INFORMATION FAILURE (Case I) or CELL/URA UPDATE FAILURE (Case II) message.

Upon reception of the UTRAN MOBILITY INFORMATION CONFIRM/FAILURE (Case I and Case II) or CELL/URA UPDATE COMPLETE/FAILURE (Case II) message, UTRAN shall start the PDCP entity and the relocation procedure ends.

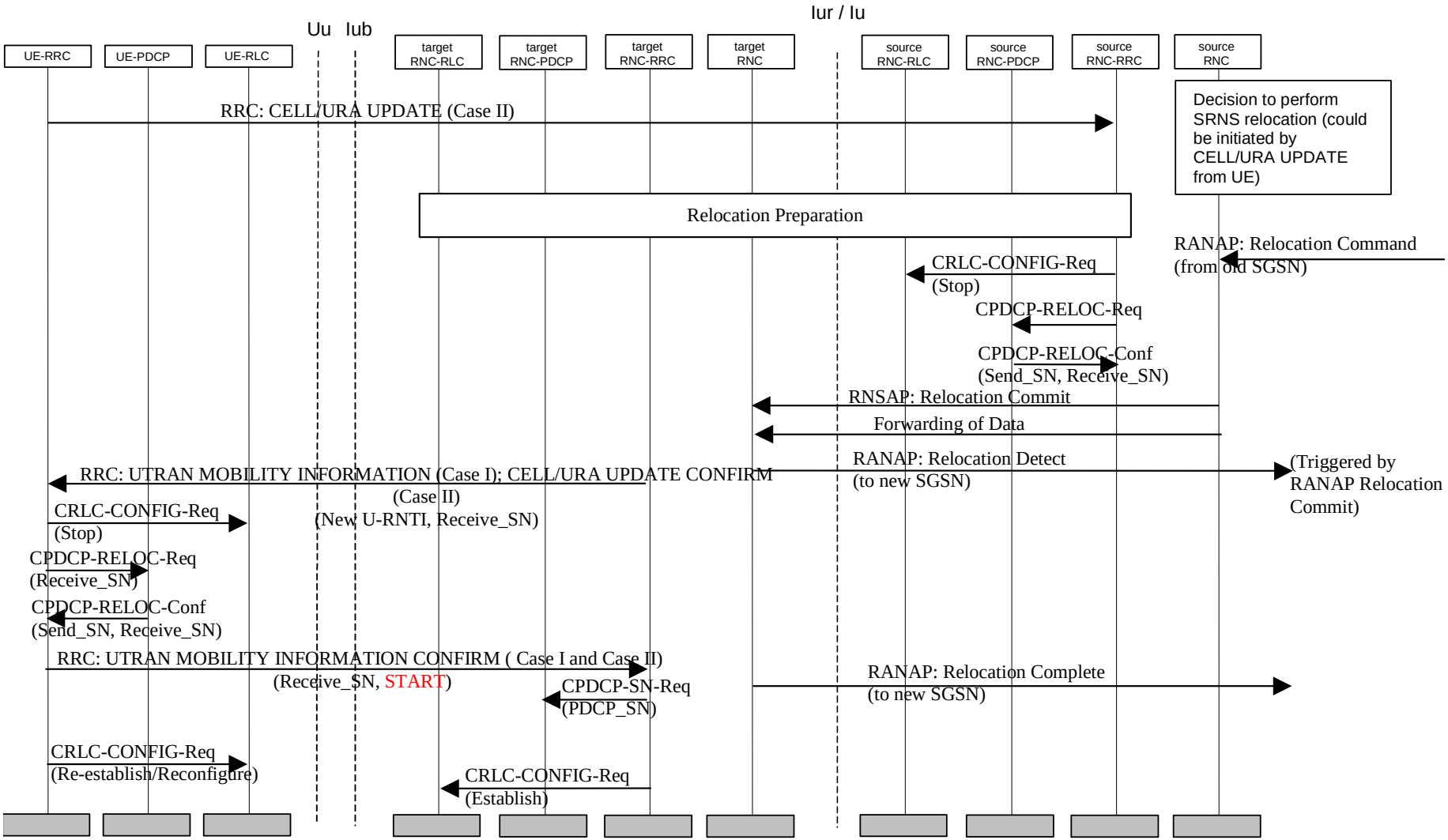


Figure 35: Serving and Combined Cell/URA Update SRNS relocation (lossless radio bearers)

6.4.8.2 Combined Hard Handover and SRNS relocation (lossless radio bearers)

Based on measurement results and knowledge of the UTRAN topology, the source SRNC decides to initiate a combined hard handover and SRNS relocation. The UE is still under control of the SRNC but is moving to a location controlled by the target RNC.

A RANAP Relocation Command is received by the source RNC from the CN, indicating the RABs to be released, the Target RNC to Source RNC Transparent Container and the RABs that are subject to data forwarding. Lossless SRNS relocation is always, and only, configured for RABs that are subject to data forwarding. The PDCP layer shall support PDCP sequence numbering when lossless SRNS relocation is supported [7].

The Target RNCSNC to Source RNC Transparent Container includes the RRC message (XXX) for hard handover. Upon reception of the RANAP Relocation Command, the source RNC triggers the execution of the relocation of SRNS by sending message XXX to the UE. This message includes the new U-RNTI and the uplink receive PDCP sequence number for each radio bearer configured to support lossless SRNS relocation. The UE compares the uplink receive PDCP sequence number with the uplink send PDCP sequence number. If this confirms PDCP SDUs successfully transferred before the start of relocation ie already received by the source RNC then these are discarded by the UE.

For the affected radio bearers, the RLC entity is suspended and the PDCP sequence numbers are retrieved by RRC. The PDCP send and receive sequence numbers are then transferred during the forwarding of SRNS contexts via the CN phase from source to target RNC for RABs that support lossless SRNS relocation. The target RNC becomes the serving RNC when the RANAP Relocation Detect message is sent.

If the UE has successfully configured itself, it shall send a XXX COMPLETE message to the target RNC. This message contains the START values and the downlink receive PDCP sequence number for each radio bearer configured to support lossless SRNS relocation. UTRAN compares the downlink receive PDCP sequence number with the downlink send PDCP sequence number. For the affected radio bearers, the RLC entity is re-established [2] with the current configuration.

In case of failure, the UE shall send a XXX FAILURE message to the sourcetarget RNC.

Upon reception of the XXX COMPLETE/FAILURE, UTRAN shall start the PDCP entity and the relocation procedure ends.

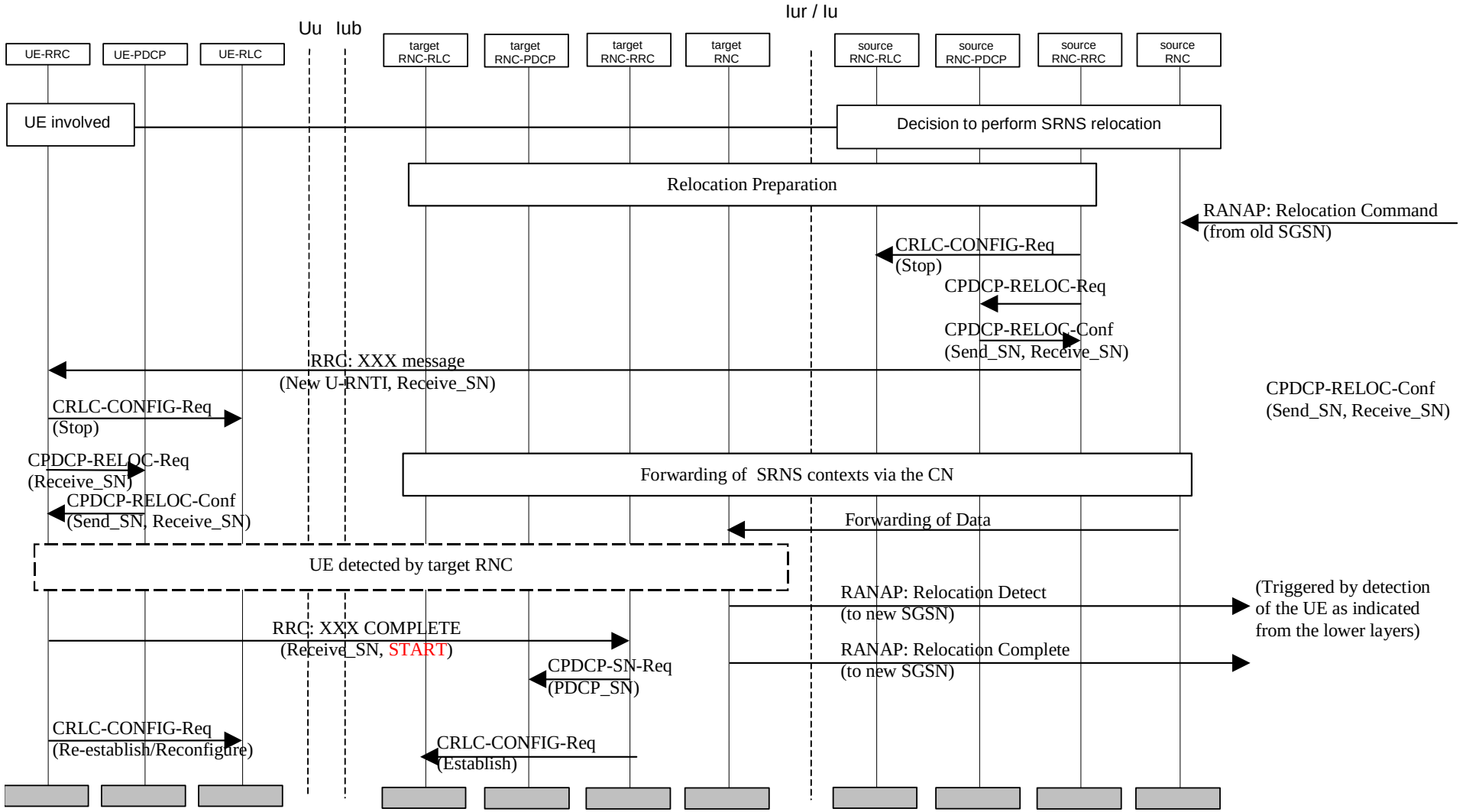


Figure 36: Combined Hard Handover and SRNS relocation (lossless radio bearers)

6.4.8.3 Serving and Combined Cell/URA Update SRNS relocation (seamless radio bearers)

The procedure is initiated by the source RNC deciding to perform a Serving SRNS relocation. Case I represents the situation when the UE is not involved and this is shown in Figure xx. Case II represents the situation when the UE is involved and a Combined Cell/URA update and SRNS relocation is performed, also shown in Figure xx.

A RANAP Relocation Command is received by the source RNC from the CN, indicating the RABs to be released. The source RNC continues the downlink data transmission on radio bearers supporting seamless SRNS relocation until the target RNC becomes the serving RNC. The target RNC becomes the serving RNC when the RANAP Relocation Detect message is sent.

The target RNC sends a UTRAN MOBILITY INFORMATION (Case I) or a CELL/URA UPDATE CONFIRM (Case II); which configures the UE with the new U-RNTI.

If the UE has successfully configured itself, it shall send a UTRAN MOBILITY INFORMATION CONFIRM (Case I and Case II). These messages contain the START values (to be used in integrity protection and in ciphering on radio bearers using UM and AM RLC). For the affected radio bearers, the RLC entity is re-established [2] with the current configuration.

In case of failure; the UE shall send a UTRAN MOBILITY INFORMATION FAILURE (Case I) or CELL/URA UPDATE FAILURE (Case II) message.

Upon reception of the UTRAN MOBILITY INFORMATION CONFIRM/FAILURE (Case I and Case II) or CELL/URA UPDATE COMPLETE/FAILURE (Case II) message in the UTRAN the relocation procedure ends.

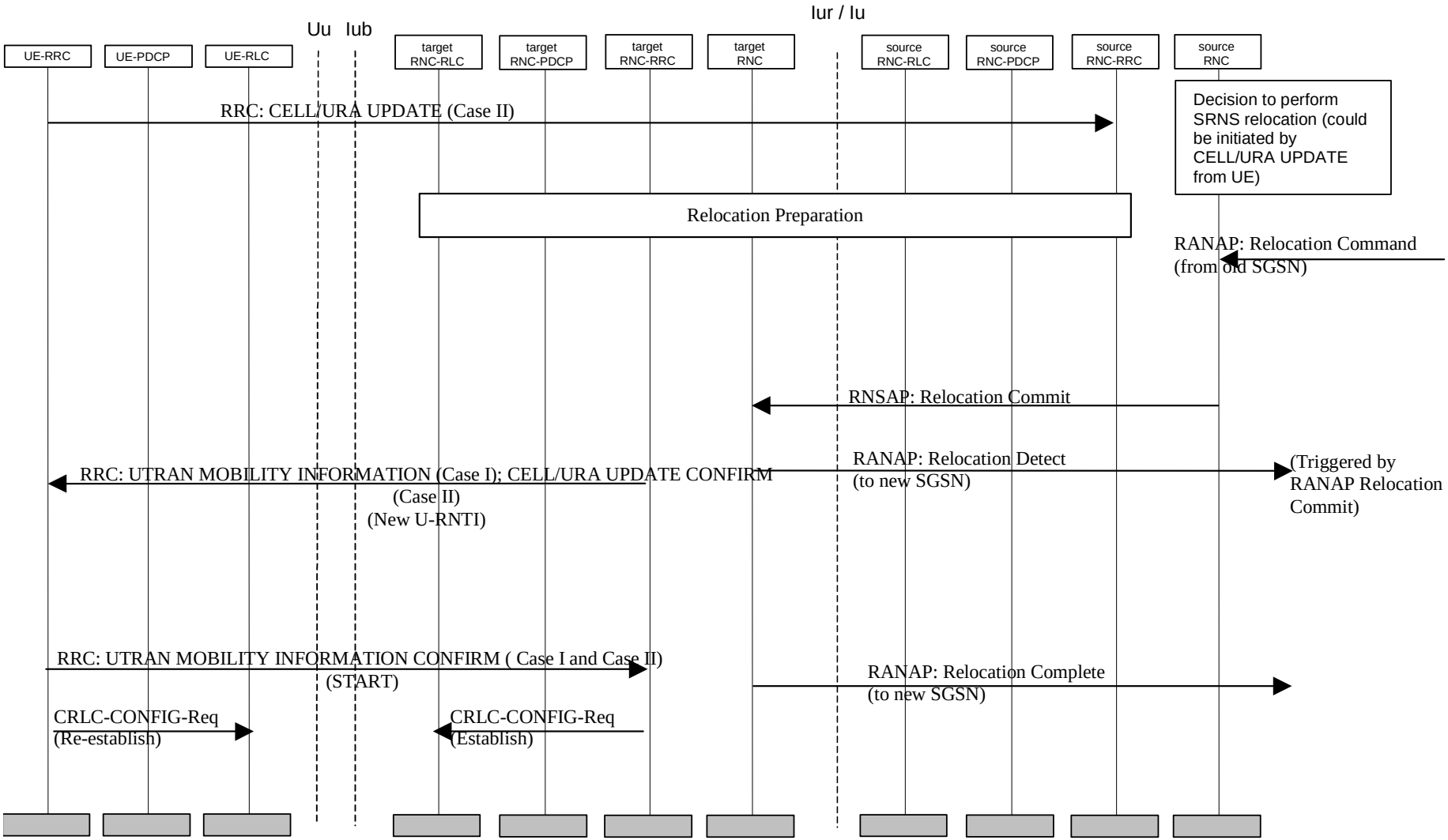


Figure xx: Serving and Combined Cell/URA Update SRNS relocation (seamless radio bearers)

6.4.8.4 Combined Hard Handover and SRNS relocation (seamless radio bearers)

Based on measurement results and knowledge of the UTRAN topology, the source SRNC decides to initiate a combined hard handover and SRNS relocation. The UE is still under control of the SRNC but is moving to a location controlled by the target RNC.

The source RNC continues the downlink data transmission on radio bearers supporting seamless SRNS relocation until the target RNC becomes the serving RNC.The target RNC becomes the serving RNC when the RANAP Relocation Detect message is sent.

A RANAP Relocation Command is received by the source RNC from the CN, indicating the RABs to be released. The Target RNC to Source RNC Transparent Container includes the RRC message (XXX) for hard handover. Upon reception of the RANAP Relocation Command, the source RNC triggers the execution of the relocation of SRNS by sending message XXX to the UE. This message includes the new U-RNTI.

If the UE has successfully configured itself, it shall send a XXX COMPLETE message to the target RNC. This message contains the START values (to be used in integrity protection and in ciphering on radio bearers using UM and AM RLC). For the affected radio bearers, the RLC entity is re-established [2] with the current configuration.

In case of failure, the UE shall send a XXX FAILURE message to the source RNC.

Upon reception of the XXX COMPLETE/FAILURE in the UTRAN the relocation procedure ends.

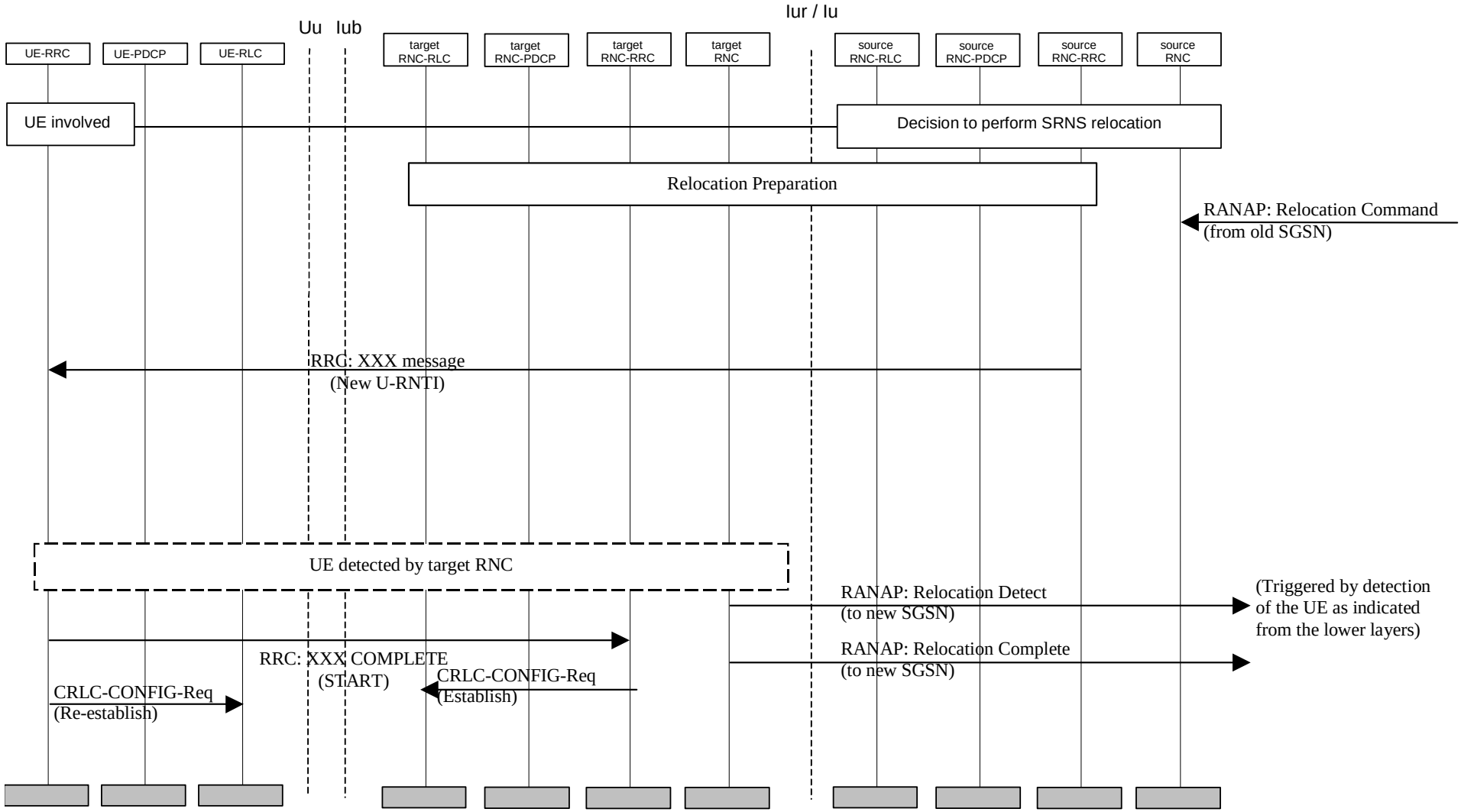


Figure yy: Combined Hard Handover and SRNS relocation (seamless radio bearers)

3GPP TSG-RAN WG2 Meeting #19
Sophia Antipolis, France, 19.-23.2.2001

Tdoc R2-010676

CR-Form-v3

CHANGE REQUEST

⌘ **25.303** **CR** **044** ⌘ rev **-** ⌘ Current version: **3.6.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network ☐ Core Network ☐

Title:	⌘	Clean-up
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	***Date:*** ⌘ 22.2.2001
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
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Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Cleanup of the R99 specification to migrate to release 4. All changes have been made in such a way that they are valid also in R99
Summary of change:	⌘	☐ References to specific releases (99 and 00) removed ☐ Asymmetric reconfiguration procedure (not part of either release) removed ☐ Informative annex on protocol termination, that is no longer used, is removed ☐ Minor editorial corrections
Consequences if not approved:	⌘	25.303 is inconsistent in relation to release 4.

Clauses affected:	⌘	1, 5.1, 6.2.2.2, 6.3.2, 6.4.4, 6.4.5, 6.4.7, Annex A
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

1 Scope

The present document describes all procedures that assign, reconfigure and release radio resources. Included are e.g. procedures for transitions between different states and substates, handovers and measurement reports. The emphasis is on showing the combined usage of both peer-to-peer messages and interlayer primitives to illustrate the functional split between the layers, as well as the combination of elementary procedures for selected examples. The peer-to-peer elementary procedure descriptions are described in the related protocol descriptions /1, 2, 3/ and they are thus not within the scope of the present document.

The interlayer procedures in the present document are informative.

~~Following items are considered for releases beyond release 99:~~

- ~~asymmetric Transport Channel Reconfiguration;~~
- ~~support of downlink shared channel in FDD-mode using one TFCI-word on the physical layer when SRNC <> CRNC.~~

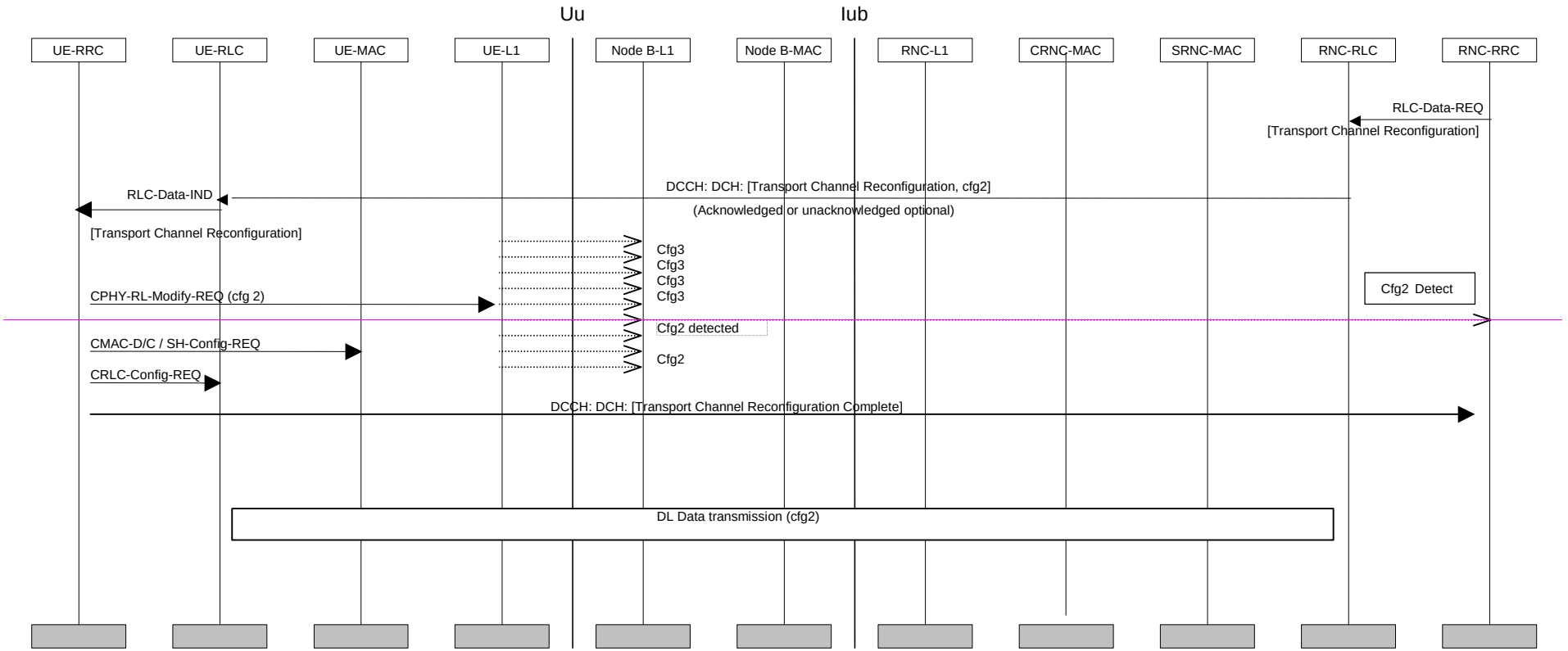
5 Radio Bearer Control – Overview of Procedures

5.1 Configurable parameters

The following layer 1, MAC and RLC parameters should be ~~able to configure~~ configurable by RRC. The list is not complete.

- Radio bearer parameters, e.g.
  - RLC parameters per RLC link (radio bearer), which may include e.g. PDU size and timeout values. Used by RLC.
  - Multiplexing priority per DCCH/DTCH. Used by MAC in case of MAC multiplexing of logical channels.
- Transport channel parameters, e.g.
  - Scheduling priority per transport channel. Used by MAC in case of layer 1multiplexing of transport channels.
  - Transport format set (TFS) per transport channel. Used by MAC and L1.
  - Transport format combination set (TFCS) per UE. Used by MAC and L1.
  - Allowed subset of TFCS per UE. Used by MAC.
  - CPCH access parameters per CPCH channel. Used by MAC and L1.
- Physical channel parameters, which may include e.g. carrier frequency and codes. Used by L1.

~~6.2.2.2 Asymmetric transport channel reconfiguration~~



~~Figure 13: Asymmetric DCH Reconfiguration~~

~~NOTE: This procedure is considered for Release 00.~~

~~The RNC has initially sent one or more channel configurations (cfg1, cfg2, cfg3...) to each Node B and to the UE, e.g. at RB Setup.~~

~~When a DCH configuration is to be modified, the RNC sends a TRANSPORT CHANNEL RECONFIGURATION message to the UE, indicating the new configuration to be applied (e.g. change from cfg3 to cfg2). Each Node B can then configure its physical layer to receive in the new configuration mode at a given radio frame number.~~

~~Upon reception of the TRANSPORT CHANNEL RECONFIGURATION message, the UE reconfigures uplink L1 and L2 resources and starts to transmit data with the new configuration. In downlink, the UE can switch to the new configuration after a certain time which corresponds basically to the round trip delay. The UE may also avoid any data loss by temporarily performing double decoding.~~

~~When a Node B detects the new configuration at the specified radio frame, this is signalled to the RNC over the Iub. If the expected configuration is not detected, then the Node B can revert back to the old configuration. When the RNC detects, from one or more Node Bs, that the new configuration is applied by the UE on the uplink, it starts sending to every Node B, downlink DCH Iub frames with an indication of the new mode to be applied.~~

6.3.2 Acknowledged-mode data transmission on DSCH using logical split of TFCI-word

NOTE: ~~For release 99~~For this release of the specification this example is only valid in the case where SRNC = CRNC.

Figure 21 shows an example of acknowledged-mode data transmission on DSCH. First RLC in SRNC requests data transmission from MAC-d. MAC-d passes the data on to MAC-c/sh, which schedules the DSCH transmission and determines the TFI2 for the data. TFCI(field2) and CFN (connection frame number) for transmission are given back to MAC-d.

MAC-c/sh transmits the DSCH data while MAC-d transmits all TFIs synchronised with the transmission of any DCH data and TFIs intended for transmission in the same frame. TFCI(field2)for the DSCH and TFCI(field1)for the DCH are combined into the same TFCI on the physical layer using 'logical' split of TFCI-word and transmitted on the DPCCH (dedicated physical control channel) of the associated DPCH (dedicated physical channel). The DSCH data is transmitted separately on the PDSCH (physical downlink shared channel). TFCI(field2)is used to decode DSCH data, which is then forwarded through MAC-c/sh and MAC-d to the receiving RLC. An acknowledgement is eventually sent by the UE-RLC mapped to a DCH, unless the DCH is released before the acknowledgement.

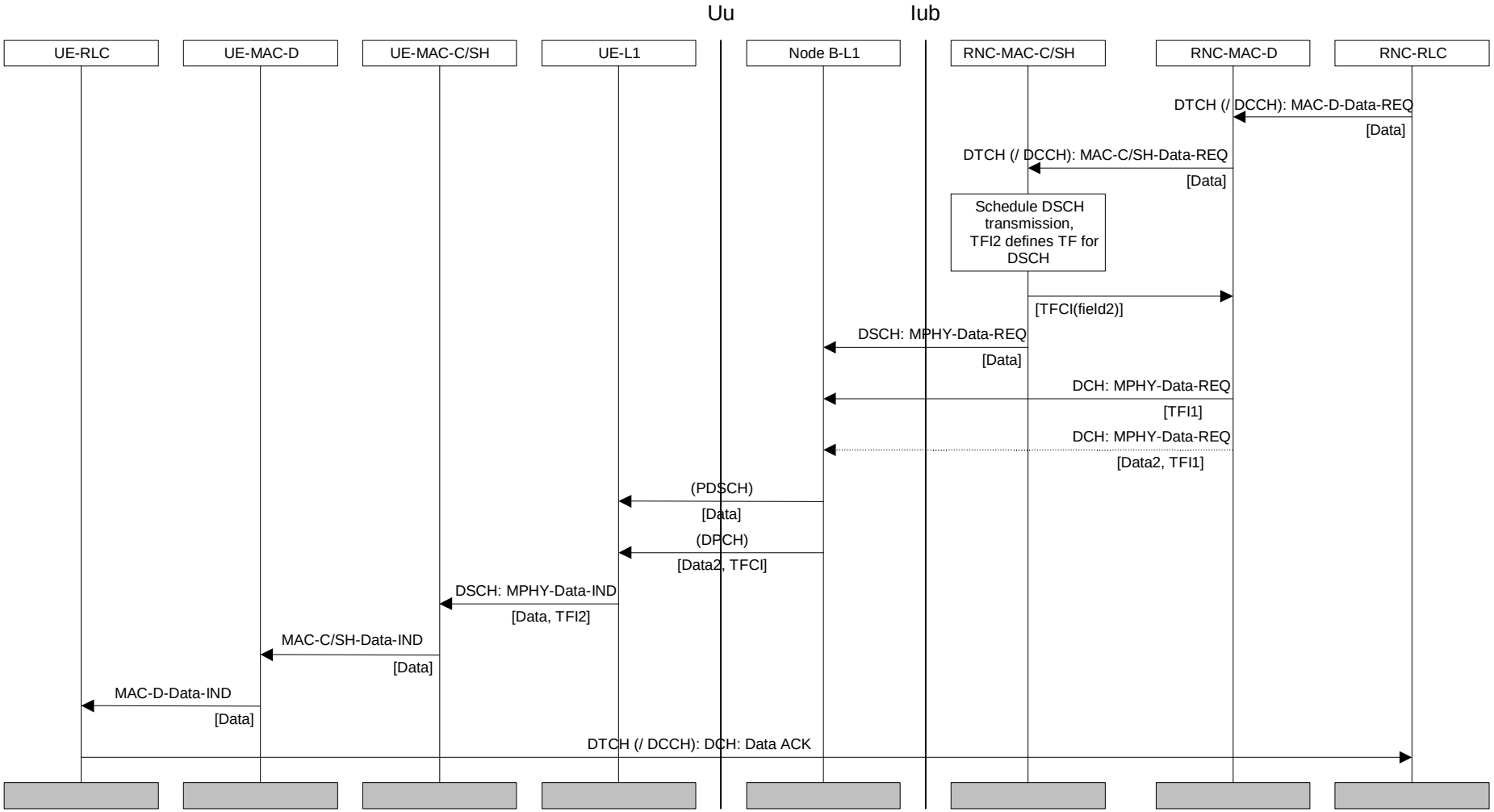


Figure 21: Example of acknowledged-mode data transmission on DSCH

6.4.4 Radio Link Addition (FDD ~~soft-add~~)

~~NOTE: TDD soft-add is an option supported on the condition that L1 supports it.~~

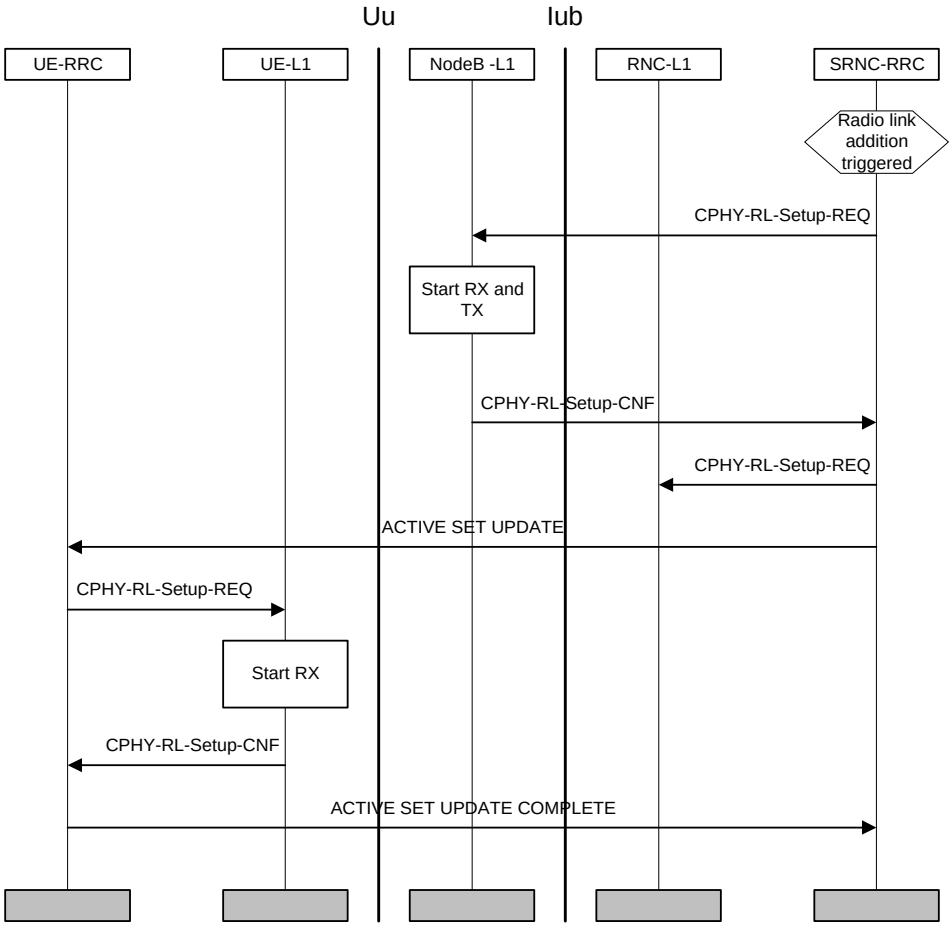


Figure 31: Radio Link Addition

Figure 31 illustrates a radio link addition procedure. Radio link addition is triggered in the network RRC layer by measurement reports sent by the UE. The NW RRC first configures the new radio link on the physical layer in Node B. Transmission and reception begin immediately. The NW RRC then sends an RRC ACTIVE SET UPDATE message to the UE RRC. The UE RRC configures layer 1 to begin reception.

After confirmation from the physical layer in UE an ACTIVE SET UPDATE COMPLETE message is sent to the RNC-RRC.

6.4.5 Radio Link Removal (FDD ~~soft-drop~~)

~~NOTE: TDD soft-drop is an option supported on the condition that L1 supports it.~~

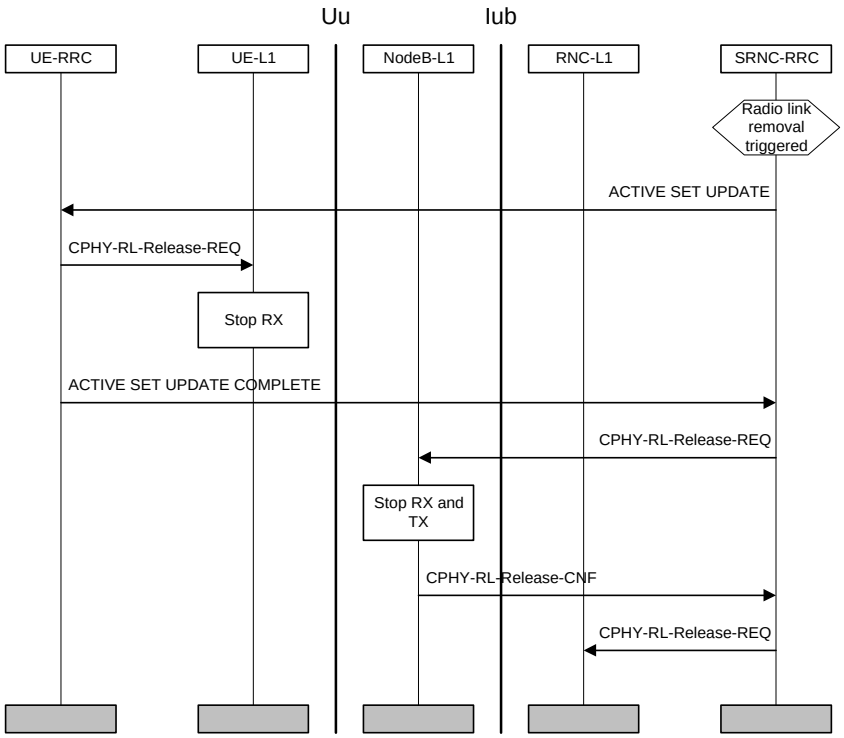


Figure 32: Radio link removal

Figure 32 illustrates a radio link removal procedure. Radio link removal is triggered by an algorithm in the network RRC layer by measurement reports sent by the UE. Radio link removal may also be triggered in the NW due to load control algorithms. The radio link is first deactivated by the UE and then in the NW.

The NW RRC sends an ACTIVE SET UPDATE message to the UE RRC. The UE RRC requests UE L1 to terminate reception of the radio link(s) to be removed. After this the UE RRC acknowledges radio link removal with an ACTIVE SET UPDATE COMPLETE message to the NW RRC. The NW RRC proceeds to request the NW L1 in both Node B and the RNC to release the radio link.

6.4.7 Hard Handover (FDD and TDD ~~hard~~)

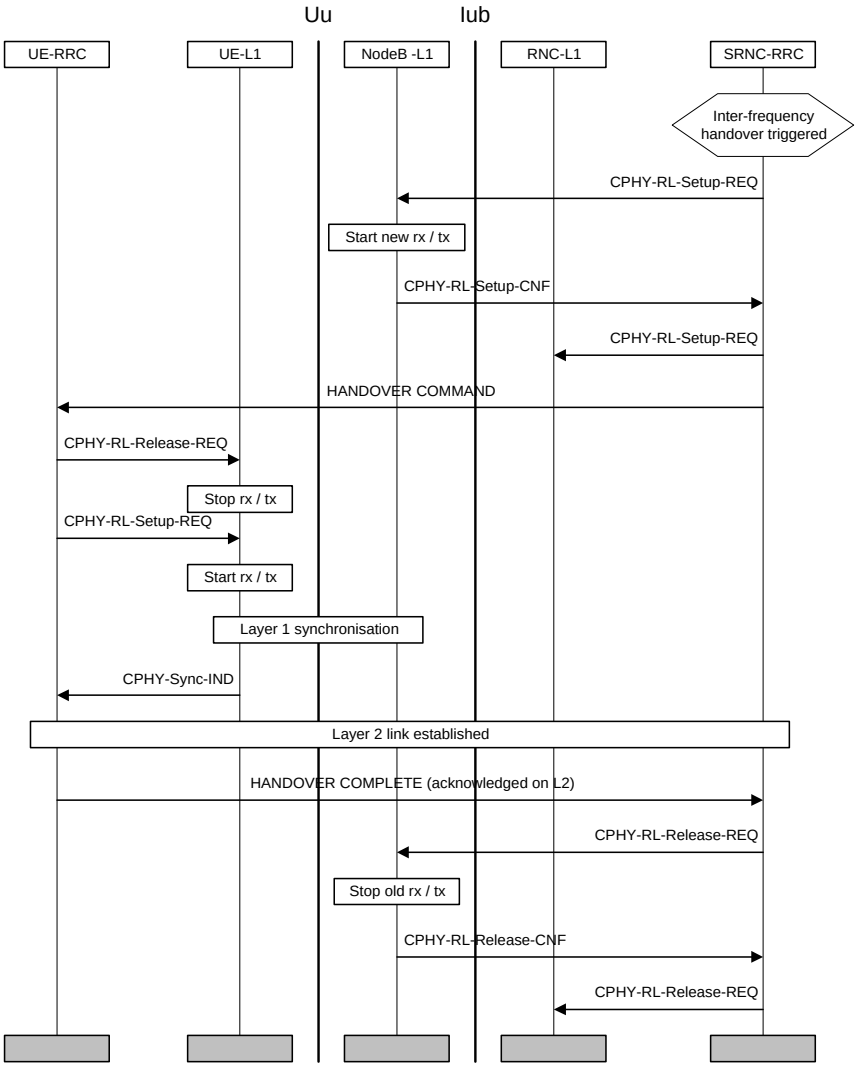


Figure 34: Hard handover

Figure 34 illustrates a hard handover. The NW RRC determines the need for hard handover based on received measurement reports or load control algorithms.

For inter-frequency handover the measurements are assumed to be performed in slotted mode.

The NW RRC first configures the NW L1 to activate the new radio links. The NW L1 begins transmission and reception on the new links immediately. The NW RRC then sends the UE RRC a HANDOVER COMMAND message. The message indicates the radio resources that should be used for the new radio link. The UE RRC configures the UE L1 to terminate reception on the old radio link and begin reception on the new radio link.

After the UE L1 has achieved downlink synchronisation on the new frequency, a L2 link is established and the UE RRC sends a HANDOVER COMPLETE message to the NW RRC. After having received the L3 acknowledgement, the NW RRC configures the NW L1 to terminate reception and transmission on the old radio link.

~~Annex A (informative):~~
~~RRC Connection Establishment - Case C~~

~~This protocol termination case has been excluded from the initial UMTS release, thus the procedure is captured here for information.~~

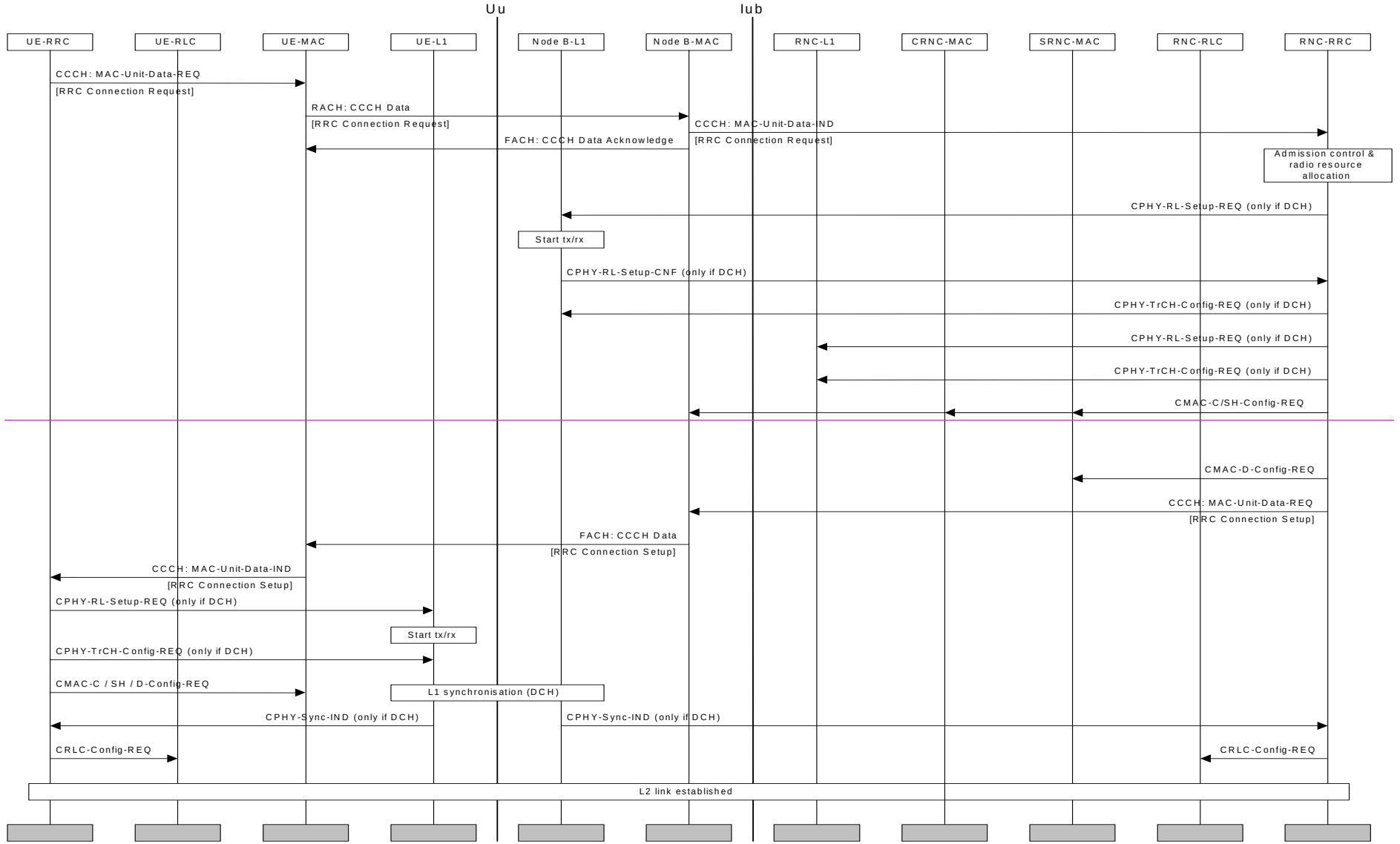


Figure A.1: RRC connection establishment with common channel termination case C

~~The difference between case A and case C common channel termination points is that in case C RACH and FACH transport channels are terminated in Node B. An Access Acknowledgement message is sent from Node B to the UE to acknowledge the reception of the Access request. Similarly, the Access Grant message from the network is transmitted via the Node-B MAC.~~