Technical Specification Group Radio Access Network
Marco Island, USA 4 - 7 June 2002

TSG_Doc_Num	Specification	CR_Num	Revision_Num	3G_Release	CR_Subject	CR_Category	Cur_Ver_Num	New_Ver_Num	Tdoc_Num	WorkItem
RP-020415	25.931	019	1	R99	Addition of pre-emption signalling sequences	F	3.6.0	3.7.0	R3-021516	TEI
RP-020415	25.931	020		Rel-4	Addition of pre-emption signalling sequences	A	4.3.0	4.4.0	R3-021517	TEI
RP-020415	25.931	021		Rel-5	Addition of pre-emption signalling sequences	A	5.0.0	5.1.0	R3-021518	TEI

CR-Form-v3

CHANGE REQUEST

⌘ **25.931** CR **019** ⌘ rev **1** ⌘ 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 **X** Core Network ☐

Title: ⌘	Addition of pre-emption signalling sequences	
Source: ⌘	R-WG3	
Work item code: ⌘	TEI	***Date:*** ⌘ 8 May 02
Category: ⌘	**F**	***Release:*** ⌘ R99

Use <u>one</u> 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 <u>one</u> 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: ⌘	Pre-emption sequences are not included in example signalling sequences.
Summary of change: ⌘	Add pre-emption signalling sequences for RRC Connection establishment
Consequences if not approved: ⌘	Use of pre-emption is not clear from normative TSs, which could cause some interoperability problems. Backwards Compatibility Statement: No impact as 25.931 is an informative document.

Clauses affected: ⌘	4.4, 4.5, 7.3.3, 7.10.5
Other specs Affected: ⌘	**X** Other core specifications ⌘ 25.931 V4.4.0 CR20, 25.931 V5.0.0 CR21 ☐ Test specifications None ☐ O&M Specifications
Other comments: ⌘	

How to create CRs using this form:

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

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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.

4.2   RANAP Procedures & Messages

For a detailed description of RANAP procedures and messages refer to [3]. Only Messages mentioned in the present document are shown. For each message is also given the list of example procedures where the message is used, as provided by this document.

Table 1

Message Name	UTRAN Procedure	Direction
Direct Transfer	Uplink Direct Transfer Downlink Direct Transfer	RNC ⇒ CN CN ⇒ RNC
Initial UE Message	NAS Signalling Connection Establishment	RNC ⇒ CN
Iu Release Command	RRC Connection Release Hard HO with switching in the CN SRNS Relocation UTRAN ⇒ GSM/BSS handover	CN ⇒ RNC CN ⇒ RNC CN ⇒ RNC CN ⇒ RNC
Iu Release Complete	RRC Connection Release Hard HO with switching in the CN SRNS Relocation UTRAN ⇒ GSM/BSS handover	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
Paging	Paging for a UE in RRC Idle Mode Paging for a UE in RRC Connected Mode	CN ⇒ RNC CN ⇒ RNC
Radio Access Bearer Assignment Request	Radio Access Bearer Establishment Radio Access Bearer Release Radio Access Bearer Modification	CN ⇒ RNC CN ⇒ RNC CN ⇒ RNC
Radio Access Bearer Assignment Response	Radio Access Bearer Establishment Radio Access Bearer Release Radio Access Bearer Modification	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
Relocation Command	Hard HO with switching in the CN SRNS Relocation UTRAN ⇒ GSM/BSS handover	CN ⇒ RNC CN ⇒ RNC CN ⇒ RNC
Relocation Complete	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover ⇒ UTRAN	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
Relocation Detect	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover ⇒ UTRAN	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
Relocation Failure	SRNS Relocation	RNC ⇒ CN
Relocation Request	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover ⇒ UTRAN	CN ⇒ RNC CN ⇒ RNC CN ⇒ RNC
Relocation Request Acknowledge	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover ⇒ UTRAN	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
Relocation Required	Hard HO with switching in the CN SRNS Relocation UTRAN ⇒ GSM/BSS handover	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
RAB Release Request	RRC Connection Establishment	RNC ⇒ CN

4.3   SABP Procedures & Messages

For a detailed description of SABP procedures and messages refer to [9]. Only Messages mentioned in the present document are shown. For each message is also given the list of example procedures where the message is used, as provided by this document.

Table 2

Message Name	UTRAN Procedure	Direction
Write-replace	Service Area Broadcast	CN $\Rightarrow$ RNC
Write-replace Complete	Service Area Broadcast	RNC $\Rightarrow$ CN
Write-Replace Failure	Service Area Broadcast	RNC $\Rightarrow$ CN

4.4   RNSAP Procedures & Messages

For a detailed description of RNSAP procedures and messages refer to [4]. Only Messages mentioned in the present document are shown. For each message is also given the list of example procedures where the message is used, as provided by this document.

Table 3

Message Name	UTRAN Procedure	Direction
Common Transport Channel Resources Release	Cell Update	SRNC ⇒ DRNC
Common Transport Channel Resources Initialisation Request	Cell Update	SRNC ⇒ DRNC
Common Transport Channel Resources Initialisation Response	Cell Update	DRNC ⇒ SRNC
DL Power Control Request	Downlink Power Control	SRNC ⇒ DRNC
Downlink Signalling Transfer Request	RRC Connection Re-establishment URA Update	SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Deletion Request	RRC Connection Re-establishment Soft Handover Hard Handover	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Deletion Response	RRC Connection Re-establishment Soft Handover Hard Handover	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Failure Indication	Hard Handover	DRNC ⇒ SRNC
Radio Link Reconfiguration Request	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Reconfiguration Commit	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Reconfiguration Prepare	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Reconfiguration Ready	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Reconfiguration Response	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Restore Indication	Soft Handover Hard Handover Channel and Mobile State Switching on Iur	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Setup Request	RRC Connection Re-establishment Hard Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Setup Response	RRC Connection Re-establishment Hard Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Relocation Commit	SRNS Relocation URA Update	Source RNC ⇒ Target RNC
Uplink Signalling Transfer Indication	RRC Connection Re-establishment URA Update	DRNC ⇒ SRNC DRNC ⇒ SRNC

4.5   NBAP Procedures & Messages

For a detailed description of NBAP procedures and messages refer to [5]. Only Messages mentioned in the present document are shown. For each message is also given the list of example procedures where the message is used, as provided by this document.

Table 4

Message Name	UTRAN Procedure	Direction
DL Power Control Request	Downlink Power Control	RNC ⇒ Node B
Physical Shared Channel Reconfiguration Request	USCH/DSCH Configuration and Capacity Allocation [TDD]	RNC ⇒ Node B
Physical Shared Channel Reconfiguration Response	USCH/DSCH Configuration and Capacity Allocation [TDD]	Node B ⇒ RNC
Radio Link Deletion	RRC Connection Release RRC Connection Re-establishment Hard Handover Soft Handover	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Deletion Response	RRC Connection Release RRC Connection Re-establishment Hard Handover Soft Handover	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Failure Indication	Hard Handover	Node B ⇒ RNC
Radio Link Reconfiguration Commit	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Reconfiguration Prepare	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Reconfiguration Ready	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Reconfiguration Request	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Reconfiguration Response	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Restore Indication	RRC Connection Establishment RRC Connection Re-establishment Soft Handover Hard Handover Channel and Mobile State Switching on Iur	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Setup Request	RRC Connection Establishment RRC Connection Re-establishment Hard Handover Soft Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Setup Response	RRC Connection Establishment RRC Connection Re-establishment Hard Handover Soft Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
System Information Update Request	System Information Broadcasting Service Area Broadcast	RNC ⇒ Node B RNC ⇒ Node B
System Information Update Response	System Information Broadcasting Service Area Broadcast	Node B ⇒ RNC Node B ⇒ RNC
Radio Link Preemption Required Indication	RRC Connection Establishment	Node B ⇒ RNC

<Part ommitted>

7.3.2   RACH/FACH Establishment

This example shows establishment of an RRC connection on the RACH/FACH common transport channel. A prerequisite for this example is that the necessary Iub Data Transport bearer for the RACH/FACH is established prior to this procedure.
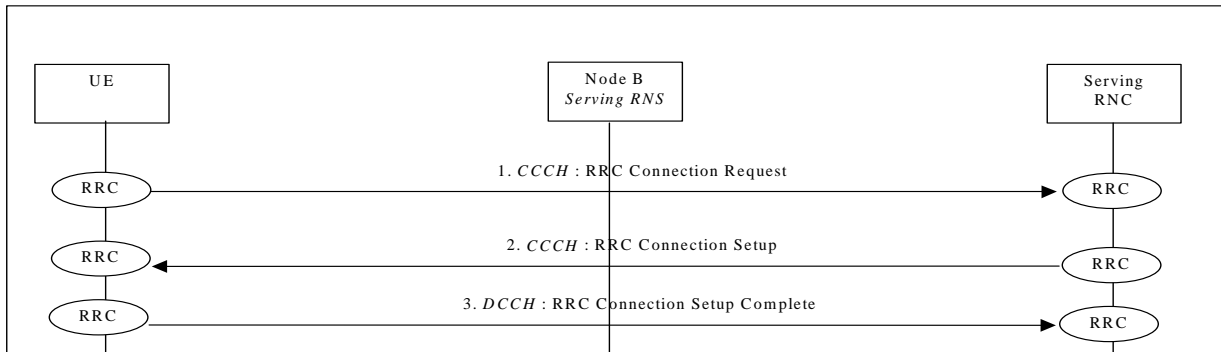

Figure 8b: RRC Connection Establishment – RACH/FACH Establishment

1. The UE initiates set-up of an RRC connection by sending **RRC Connection Request** message on CCCH. Parameters: Initial UE Identity, Establishment cause.
2. The SRNC decides to use RACH/FACH for this RRC connection and allocates both U-RNTI and C-RNTI identifiers. Message **RRC Connection Setup** is sent on CCCH. Parameters: Initial UE Identity, U-RNTI, C-RNTI, Capability update Requirement, frequency (optionally).
3. UE sends **RRC Connection Setup Complete** on a DCCH logical channel mapped on the RACH transport channel. Parameters: Integrity information, ciphering information, UE radio access capability.

7.3.3 DCH Establishment with Pre-emption

This example shows the establishment of an RRC Connection in dedicated transport channel (DCH) state with pre-emption of resouces as a result of Node B Admission Control. This assumes that that the RL(s) pre-empted are the only RL(s) for a RAB that is released.
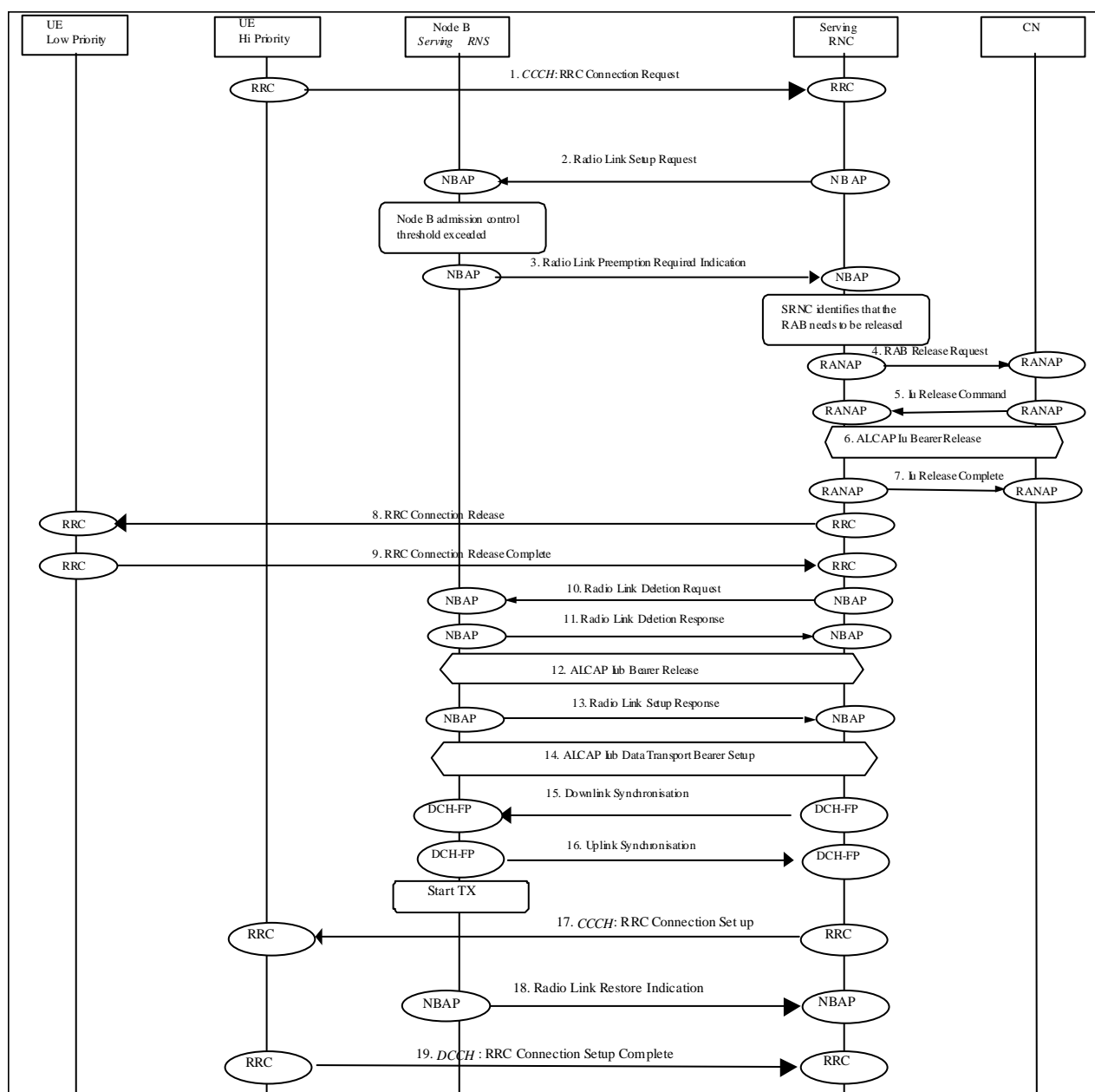
Figure 8c RRC Connection Establishment - DCH Establishment with pre-emption

1. See 7.3.1 Item 1.
2. When a DCH is to be set-up, NBAP message Radio Link Setup Request is sent to the Node B.
3. Node B attempts to allocate resources, but is unable to and responds with NBAP message **Radio Link Preemption Required Indication**, and starts the Tpreempt timer.
    Parameters: RLInformation IE.
4. The SRNC pre-empts a RL and may send a RANAP message **RAB Release Request** to the CN.
    Cause: RAB Pre-empted
5. If the CN agrees to the release of the dedicated Channel it sends the message **Iu Release Command** to the SRNC.
6. The SRNC confirms the release by sending a **Iu Release Complete** message to the CN.
7. The SRNC initiates release of the Iu Data Transport bearer using ALCAP protocol.
8. Message **RRC Connection Release** from SRNC to UE intiates the RRC connection release.
    Parameters: Release Cause - Pre-emptive release
9. Message **RRC Connection Release Complete** from the UE to SRNC to confirm the RRC connection release.
10. The SRNC initiates the release of the link by sending **Radio Link Deletion** to the Node B. The Node B stops the Tpreempt timer.
11. The Node B confirms the release of the link by sending the **Radio Link Deletion Response** to the SRNC
12. The Node B initiates release of the Iub Data Transport Bearer using ALCAP protocol.

13. The Node B responds to Item 2 with NBAP message **Radio Link Setup Response**.
14-20 See 7.3.1 Items 4-9

CR-Form-v3

CHANGE REQUEST

⌘   **25.931** CR **020**   ⌘ rev **-** ⌘   Current version: **4.3.0** ⌘

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

Title: ⌘	Addition of pre-emption signalling sequences	
Source: ⌘	R-WG3	
Work item code: ⌘	TEI	***Date:*** ⌘ 8 May 02
Category: ⌘ **A**		***Release:*** ⌘ REL-4

Use one of the following categories:
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   B *(Addition of feature),*
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   R98   (Release 1998)
   R99   (Release 1999)
   REL-4   (Release 4)
   REL-5   (Release 5)

Reason for change: ⌘	Pre-emption sequences are not included in example signalling sequences.
Summary of change: ⌘	Add pre-emption signalling sequences for RRC Connection establishment
Consequences if not approved: ⌘	Use of pre-emption is not clear from normative TSs, which could cause some interoperability problems. Backwards Compatibility Statement: No impact as 25.931 is an informative document.

Clauses affected: ⌘	4.4, 4.5, 7.3.3, 7.10.5	
Other specs Affected: ⌘	**X** Other core specifications ⌘	25.931 V3.6.0 CR19, 25.931 V5.0.0 CR21
	☐ Test specifications	None
	☐ O&M Specifications	
Other comments: ⌘		

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4.2   RANAP Procedures & Messages

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Message Name	UTRAN Procedure	Direction
Direct Transfer	Uplink Direct Transfer Downlink Direct Transfer	RNC ⇒ CN CN ⇒ RNC
Initial UE Message	NAS Signalling Connection Establishment	RNC ⇒ CN
Iu Release Command	RRC Connection Release Hard HO with switching in the CN SRNS Relocation UTRAN ⇒ GSM/BSS handover	CN ⇒ RNC CN ⇒ RNC CN ⇒ RNC CN ⇒ RNC
Iu Release Complete	RRC Connection Release Hard HO with switching in the CN SRNS Relocation UTRAN ⇒ GSM/BSS handover	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
Paging	Paging for a UE in RRC Idle Mode Paging for a UE in RRC Connected Mode	CN ⇒ RNC CN ⇒ RNC
Radio Access Bearer Assignment Request	Radio Access Bearer Establishment Radio Access Bearer Release Radio Access Bearer Modification	CN ⇒ RNC CN ⇒ RNC CN ⇒ RNC
Radio Access Bearer Assignment Response	Radio Access Bearer Establishment Radio Access Bearer Release Radio Access Bearer Modification	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
Relocation Command	Hard HO with switching in the CN SRNS Relocation UTRAN ⇒ GSM/BSS handover	CN ⇒ RNC CN ⇒ RNC CN ⇒ RNC
Relocation Complete	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover ⇒ UTRAN	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
Relocation Detect	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover ⇒ UTRAN	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
Relocation Failure	SRNS Relocation	RNC ⇒ CN
Relocation Request	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover ⇒ UTRAN	CN ⇒ RNC CN ⇒ RNC CN ⇒ RNC
Relocation Request Acknowledge	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover ⇒ UTRAN	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
Relocation Required	Hard HO with switching in the CN SRNS Relocation UTRAN ⇒ GSM/BSS handover	RNC ⇒ CN RNC ⇒ CN RNC ⇒ CN
RAB Release Request	RRC Connection Establishment	RNC ⇒ CN

4.3   SABP Procedures & Messages

For a detailed description of SABP procedures and messages refer to [9]. Only Messages mentioned in the present document are shown. For each message is also given the list of example procedures where the message is used, as provided by this document.

Table 2

Message Name	UTRAN Procedure	Direction
Write-replace	Service Area Broadcast	CN $\Rightarrow$ RNC
Write-replace Complete	Service Area Broadcast	RNC $\Rightarrow$ CN
Write-Replace Failure	Service Area Broadcast	RNC $\Rightarrow$ CN

4.4   RNSAP Procedures & Messages

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Table 3

Message Name	UTRAN Procedure	Direction
Common Transport Channel Resources Release	Cell Update	SRNC ⇒ DRNC
Common Transport Channel Resources Initialisation Request	Cell Update	SRNC ⇒ DRNC
Common Transport Channel Resources Initialisation Response	Cell Update	DRNC ⇒ SRNC
DL Power Control Request	Downlink Power Control	SRNC ⇒ DRNC
Downlink Signalling Transfer Request	RRC Connection Re-establishment URA Update	SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Deletion Request	RRC Connection Re-establishment Soft Handover Hard Handover	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Deletion Response	RRC Connection Re-establishment Soft Handover Hard Handover	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Failure Indication	Hard Handover	DRNC ⇒ SRNC
Radio Link Reconfiguration Request	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Reconfiguration Commit	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Reconfiguration Prepare	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Reconfiguration Ready	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Reconfiguration Response	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Restore Indication	Soft Handover Hard Handover Channel and Mobile State Switching on Iur	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Setup Request	RRC Connection Re-establishment Hard Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Setup Response	RRC Connection Re-establishment Hard Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Relocation Commit	SRNS Relocation URA Update	Source RNC ⇒ Target RNC
Uplink Signalling Transfer Indication	RRC Connection Re-establishment URA Update	DRNC ⇒ SRNC DRNC ⇒ SRNC

4.5   NBAP Procedures & Messages

For a detailed description of NBAP procedures and messages refer to [5]. Only Messages mentioned in the present document are shown. For each message is also given the list of example procedures where the message is used, as provided by this document.

Table 4

Message Name	UTRAN Procedure	Direction
DL Power Control Request	Downlink Power Control	RNC ⇒ Node B
Physical Shared Channel Reconfiguration Request	USCH/DSCH Configuration and Capacity Allocation [TDD]	RNC ⇒ Node B
Physical Shared Channel Reconfiguration Response	USCH/DSCH Configuration and Capacity Allocation [TDD]	Node B ⇒ RNC
Radio Link Deletion	RRC Connection Release RRC Connection Re-establishment Hard Handover Soft Handover	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Deletion Response	RRC Connection Release RRC Connection Re-establishment Hard Handover Soft Handover	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Failure Indication	Hard Handover	Node B ⇒ RNC
Radio Link Reconfiguration Commit	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Reconfiguration Prepare	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Reconfiguration Ready	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Reconfiguration Request	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Reconfiguration Response	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Restore Indication	RRC Connection Establishment RRC Connection Re-establishment Soft Handover Hard Handover Channel and Mobile State Switching on Iur	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Setup Request	RRC Connection Establishment RRC Connection Re-establishment Hard Handover Soft Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Setup Response	RRC Connection Establishment RRC Connection Re-establishment Hard Handover Soft Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
System Information Update Request	System Information Broadcasting Service Area Broadcast	RNC ⇒ Node B RNC ⇒ Node B
System Information Update Response	System Information Broadcasting Service Area Broadcast	Node B ⇒ RNC Node B ⇒ RNC
Radio Link Preemption Required Indication	RRC Connection Establishment	Node B ⇒ RNC

<Part ommitted>

7.3.2   RACH/FACH Establishment

This example shows establishment of an RRC connection on the RACH/FACH common transport channel. A prerequisite for this example is that the necessary Iub Data Transport bearer for the RACH/FACH is established prior to this procedure.
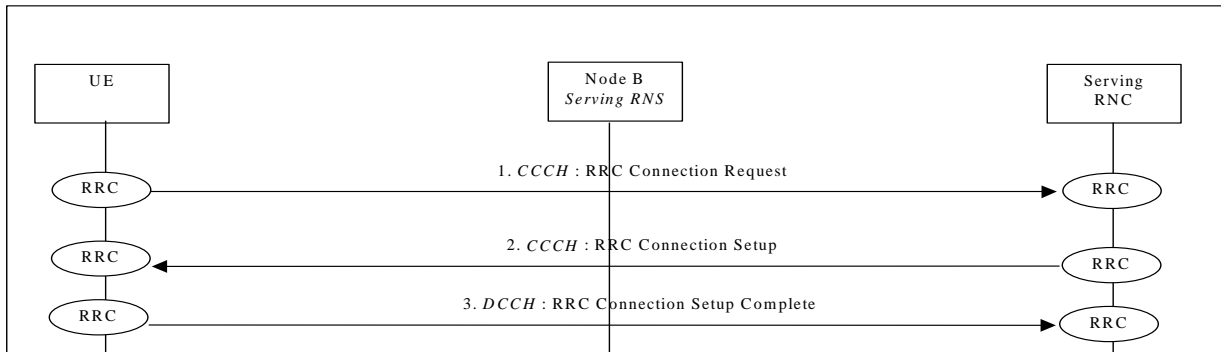

Figure 8b: RRC Connection Establishment – RACH/FACH Establishment

1. The UE initiates set-up of an RRC connection by sending **RRC Connection Request** message on CCCH. Parameters: Initial UE Identity, Establishment cause.
2. The SRNC decides to use RACH/FACH for this RRC connection and allocates both U-RNTI and C-RNTI identifiers. Message **RRC Connection Setup** is sent on CCCH. Parameters: Initial UE Identity, U-RNTI, C-RNTI, Capability update Requirement, frequency (optionally).
3. UE sends **RRC Connection Setup Complete** on a DCCH logical channel mapped on the RACH transport channel. Parameters: Integrity information, ciphering information, UE radio access capability.

7.3.3 DCH Establishment with Pre-emption

This example shows the establishment of an RRC Connection in dedicated transport channel (DCH) state with pre-emption of resouces as a result of Node B Admission Control. This assumes that that the RL(s) pre-empted are the only RL(s) for a RAB that is released.
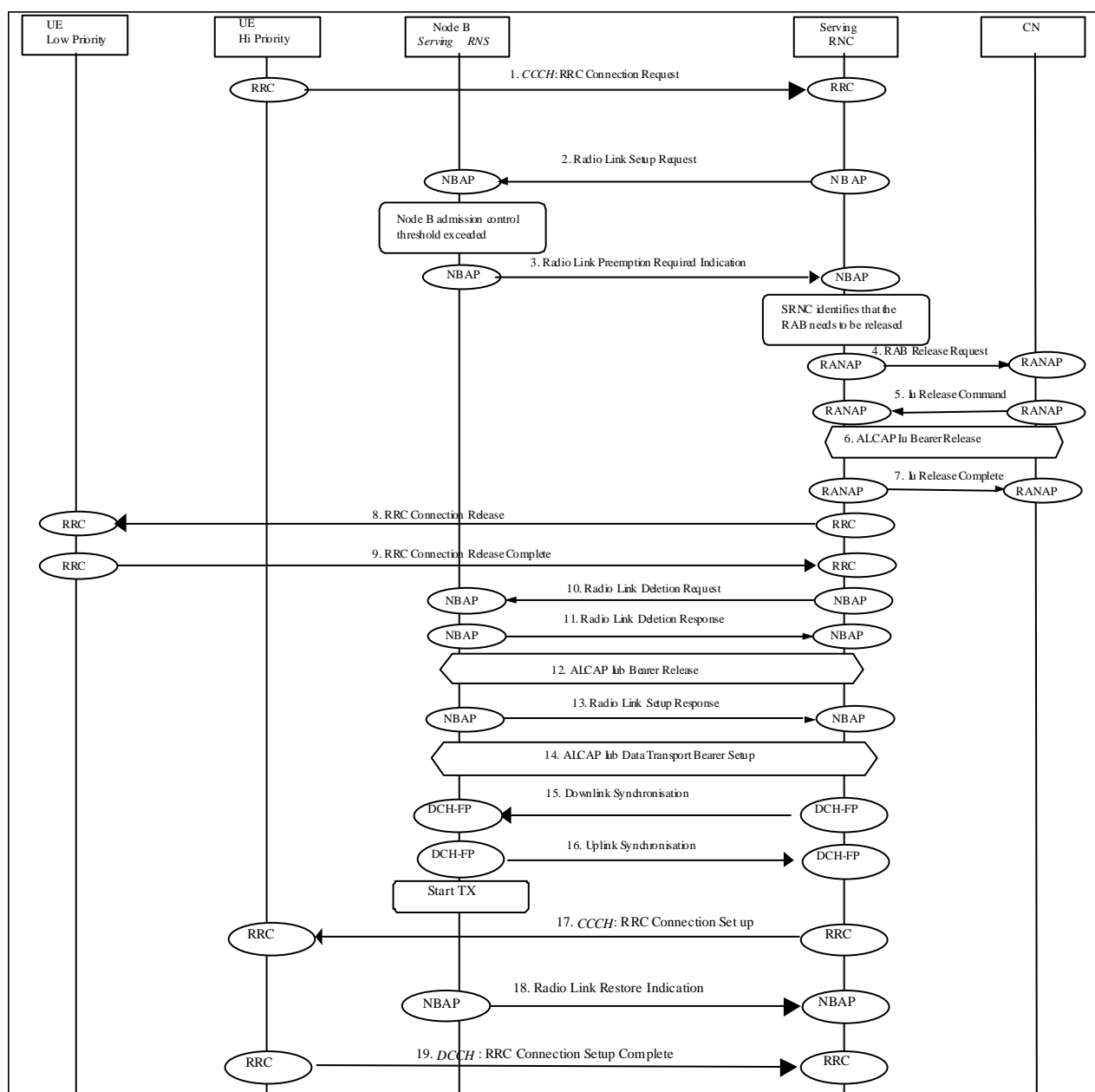
Figure 8c RRC Connection Establishment - DCH Establishment with pre-emption

1. See 7.3.1 Item 1.
2. When a DCH is to be set-up, NBAP message Radio Link Setup Request is sent to the Node B.
3. Node B attempts to allocate resources, but is unable to and responds with NBAP message **Radio Link Preemption Required Indication**, and starts the T$_{preempt}$ timer.
    Parameters: RLInformation IE.
4. The SRNC pre-empts a RL and may send a RANAP message **RAB Release Request** to the CN.
    Cause: RAB Pre-empted
5. If the CN agrees to the release of the dedicated Channel it sends the message **Iu Release Command** to the SRNC.
6. The SRNC confirms the release by sending a **Iu Release Complete** message to the CN.
7. The SRNC initiates release of the Iu Data Transport bearer using ALCAP protocol.
8. Message **RRC Connection Release** from SRNC to UE intiates the RRC connection release.
    Parameters: Release Cause - Pre-emptive release
9. Message **RRC Connection Release Complete** from the UE to SRNC to confirm the RRC connection release.
10. The SRNC initiates the release of the link by sending **Radio Link Deletion** to the Node B. The Node B stops the T$_{preempt}$ timer.
11. The Node B confirms the release of the link by sending the **Radio Link Deletion Response** to the SRNC
12. The Node B initiates release of the Iub Data Transport Bearer using ALCAP protocol.

13. The Node B responds to Item 2 with NBAP message **Radio Link Setup Response**.
14-20 See 7.3.1 Items 4-9

CR-Form-v3

CHANGE REQUEST

⌘ **25.931** CR **021** ⌘ rev **-** ⌘ Current version: **5.0.0** ⌘

*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 **X** Core Network ☐

Title: ⌘	Addition of pre-emption signalling sequences	
Source: ⌘	R-WG3	
Work item code: ⌘	TEI	***Date:*** ⌘ 8 May 02
Category: ⌘ **A**		***Release:*** ⌘ REL-5

Use <u>one</u> of the following categories:	Use <u>one</u> of the following releases:
F *(essential correction)*	*2 (GSM Phase 2)*
A *(corresponds to a correction in an earlier release)*	*R96 (Release 1996)*
B *(Addition of feature),*	*R97 (Release 1997)*
C *(Functional modification of feature)*	*R98 (Release 1998)*
D *(Editorial modification)*	*R99 (Release 1999)*
Detailed explanations of the above categories can	*REL-4 (Release 4)*
be found in 3GPP TR 21.900.	*REL-5 (Release 5)*

Reason for change: ⌘	Pre-emption sequences are not included in example signalling sequences.	
Summary of change: ⌘	Add pre-emption signalling sequences for RRC Connection establishment	
Consequences if not approved: ⌘	Use of pre-emption is not clear from normative TSs, which could cause some interoperability problems. Backwards Compatibility Statement: No impact as 25.931 is an informative document.	

Clauses affected: ⌘	4.4, 4.5, 7.3.3, 7.10.5	
Other specs Affected: ⌘	**X** Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications	25.931 V3.6.0 CR19, 25.931 V4.3.0 CR20 None
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.

4.2   RANAP Procedures & Messages

For a detailed description of RANAP procedures and messages refer to [3]. Only Messages mentioned in the present document are shown. For each message is also given the list of example procedures where the message is used, as provided by this document.

Table 1

Message Name	UTRAN Procedure	Direction
Direct Transfer	Uplink Direct Transfer Downlink Direct Transfer	RNC $\Rightarrow$ CN CN $\Rightarrow$ RNC
Initial UE Message	NAS Signalling Connection Establishment	RNC $\Rightarrow$ CN
Iu Release Command	RRC Connection Release Hard HO with switching in the CN SRNS Relocation UTRAN $\Rightarrow$ GSM/BSS handover	CN $\Rightarrow$ RNC CN $\Rightarrow$ RNC CN $\Rightarrow$ RNC CN $\Rightarrow$ RNC
Iu Release Complete	RRC Connection Release Hard HO with switching in the CN SRNS Relocation UTRAN $\Rightarrow$ GSM/BSS handover	RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN
Paging	Paging for a UE in RRC Idle Mode Paging for a UE in RRC Connected Mode	CN $\Rightarrow$ RNC CN $\Rightarrow$ RNC
Radio Access Bearer Assignment Request	Radio Access Bearer Establishment Radio Access Bearer Release Radio Access Bearer Modification	CN $\Rightarrow$ RNC CN $\Rightarrow$ RNC CN $\Rightarrow$ RNC
Radio Access Bearer Assignment Response	Radio Access Bearer Establishment Radio Access Bearer Release Radio Access Bearer Modification	RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN
Relocation Command	Hard HO with switching in the CN SRNS Relocation UTRAN $\Rightarrow$ GSM/BSS handover	CN $\Rightarrow$ RNC CN $\Rightarrow$ RNC CN $\Rightarrow$ RNC
Relocation Complete	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover $\Rightarrow$ UTRAN	RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN
Relocation Detect	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover $\Rightarrow$ UTRAN	RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN
Relocation Failure	SRNS Relocation	RNC $\Rightarrow$ CN
Relocation Request	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover $\Rightarrow$ UTRAN	CN $\Rightarrow$ RNC CN $\Rightarrow$ RNC CN $\Rightarrow$ RNC
Relocation Request Acknowledge	Hard HO with switching in the CN SRNS Relocation GSM/BSS handover $\Rightarrow$ UTRAN	RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN
Relocation Required	Hard HO with switching in the CN SRNS Relocation UTRAN $\Rightarrow$ GSM/BSS handover	RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN RNC $\Rightarrow$ CN
RAB Release Request	RRC Connection Establishment	RNC $\Rightarrow$ CN

4.3   SABP Procedures & Messages

For a detailed description of SABP procedures and messages refer to [9]. Only Messages mentioned in the present document are shown. For each message is also given the list of example procedures where the message is used, as provided by this document.

Table 2

Message Name	UTRAN Procedure	Direction
Write-replace	Service Area Broadcast	CN $\Rightarrow$ RNC
Write-replace Complete	Service Area Broadcast	RNC $\Rightarrow$ CN
Write-Replace Failure	Service Area Broadcast	RNC $\Rightarrow$ CN

4.4   RNSAP Procedures & Messages

For a detailed description of RNSAP procedures and messages refer to [4]. Only Messages mentioned in the present document are shown. For each message is also given the list of example procedures where the message is used, as provided by this document.

Table 3

Message Name	UTRAN Procedure	Direction
Common Transport Channel Resources Release	Cell Update	SRNC ⇒ DRNC
Common Transport Channel Resources Initialisation Request	Cell Update	SRNC ⇒ DRNC
Common Transport Channel Resources Initialisation Response	Cell Update	DRNC ⇒ SRNC
DL Power Control Request	Downlink Power Control	SRNC ⇒ DRNC
Downlink Signalling Transfer Request	RRC Connection Re-establishment URA Update	SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Deletion Request	RRC Connection Re-establishment Soft Handover Hard Handover	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Deletion Response	RRC Connection Re-establishment Soft Handover Hard Handover	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Failure Indication	Hard Handover	DRNC ⇒ SRNC
Radio Link Reconfiguration Request	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Reconfiguration Commit	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Reconfiguration Prepare	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Reconfiguration Ready	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Reconfiguration Response	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Restore Indication	Soft Handover Hard Handover Channel and Mobile State Switching on Iur	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Radio Link Setup Request	RRC Connection Re-establishment Hard Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	SRNC ⇒ DRNC SRNC ⇒ DRNC SRNC ⇒ DRNC
Radio Link Setup Response	RRC Connection Re-establishment Hard Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	DRNC ⇒ SRNC DRNC ⇒ SRNC DRNC ⇒ SRNC
Relocation Commit	SRNS Relocation URA Update	Source RNC ⇒ Target RNC
Uplink Signalling Transfer Indication	RRC Connection Re-establishment URA Update	DRNC ⇒ SRNC DRNC ⇒ SRNC

4.5 NBAP Procedures & Messages

For a detailed description of NBAP procedures and messages refer to [5]. Only Messages mentioned in the present document are shown. For each message is also given the list of example procedures where the message is used, as provided by this document.

Table 4

Message Name	UTRAN Procedure	Direction
DL Power Control Request	Downlink Power Control	RNC ⇒ Node B
Physical Shared Channel Reconfiguration Request	USCH/DSCH Configuration and Capacity Allocation [TDD]	RNC ⇒ Node B
Physical Shared Channel Reconfiguration Response	USCH/DSCH Configuration and Capacity Allocation [TDD]	Node B ⇒ RNC
Radio Link Deletion	RRC Connection Release RRC Connection Re-establishment Hard Handover Soft Handover	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Deletion Response	RRC Connection Release RRC Connection Re-establishment Hard Handover Soft Handover	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Failure Indication	Hard Handover	Node B ⇒ RNC
Radio Link Reconfiguration Commit	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Reconfiguration Prepare	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Reconfiguration Ready	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration Radio Access Bearer Modification	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Reconfiguration Request	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Reconfiguration Response	Radio Access Bearer Establishment Radio Access Bearer Release Physical Channel Reconfiguration Transport Channel Reconfiguration	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Restore Indication	RRC Connection Establishment RRC Connection Re-establishment Soft Handover Hard Handover Channel and Mobile State Switching on Iur	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
Radio Link Setup Request	RRC Connection Establishment RRC Connection Re-establishment Hard Handover Soft Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B RNC ⇒ Node B
Radio Link Setup Response	RRC Connection Establishment RRC Connection Re-establishment Hard Handover Soft Handover USCH/DSCH Configuration and Capacity Allocation [TDD]	Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC Node B ⇒ RNC
System Information Update Request	System Information Broadcasting Service Area Broadcast	RNC ⇒ Node B RNC ⇒ Node B
System Information Update Response	System Information Broadcasting Service Area Broadcast	Node B ⇒ RNC Node B ⇒ RNC
Radio Link Preemption Required Indication	RRC Connection Establishment	Node B ⇒ RNC

<Part ommitted>

7.3.2   RACH/FACH Establishment

This example shows establishment of an RRC connection on the RACH/FACH common transport channel. A prerequisite for this example is that the necessary Iub Data Transport bearer for the RACH/FACH is established prior to this procedure.
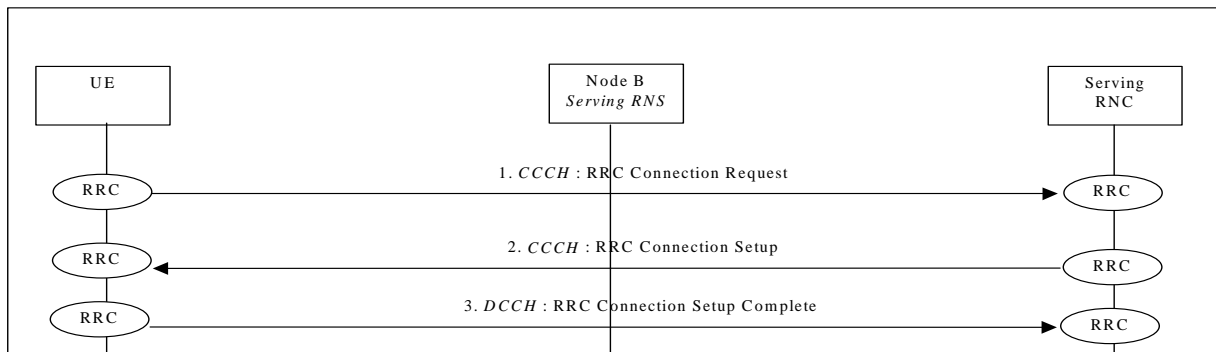

Figure 8b: RRC Connection Establishment – RACH/FACH Establishment

1. The UE initiates set-up of an RRC connection by sending **RRC Connection Request** message on CCCH. Parameters: Initial UE Identity, Establishment cause.
2. The SRNC decides to use RACH/FACH for this RRC connection and allocates both U-RNTI and C-RNTI identifiers. Message **RRC Connection Setup** is sent on CCCH. Parameters: Initial UE Identity, U-RNTI, C-RNTI, Capability update Requirement, frequency (optionally).
3. UE sends **RRC Connection Setup Complete** on a DCCH logical channel mapped on the RACH transport channel. Parameters: Integrity information, ciphering information, UE radio access capability.

7.3.3 DCH Establishment with Pre-emption

This example shows the establishment of an RRC Connection in dedicated transport channel (DCH) state with pre-emption of resouces as a result of Node B Admission Control. This assumes that that the RL(s) pre-empted are the only RL(s) for a RAB that is released.
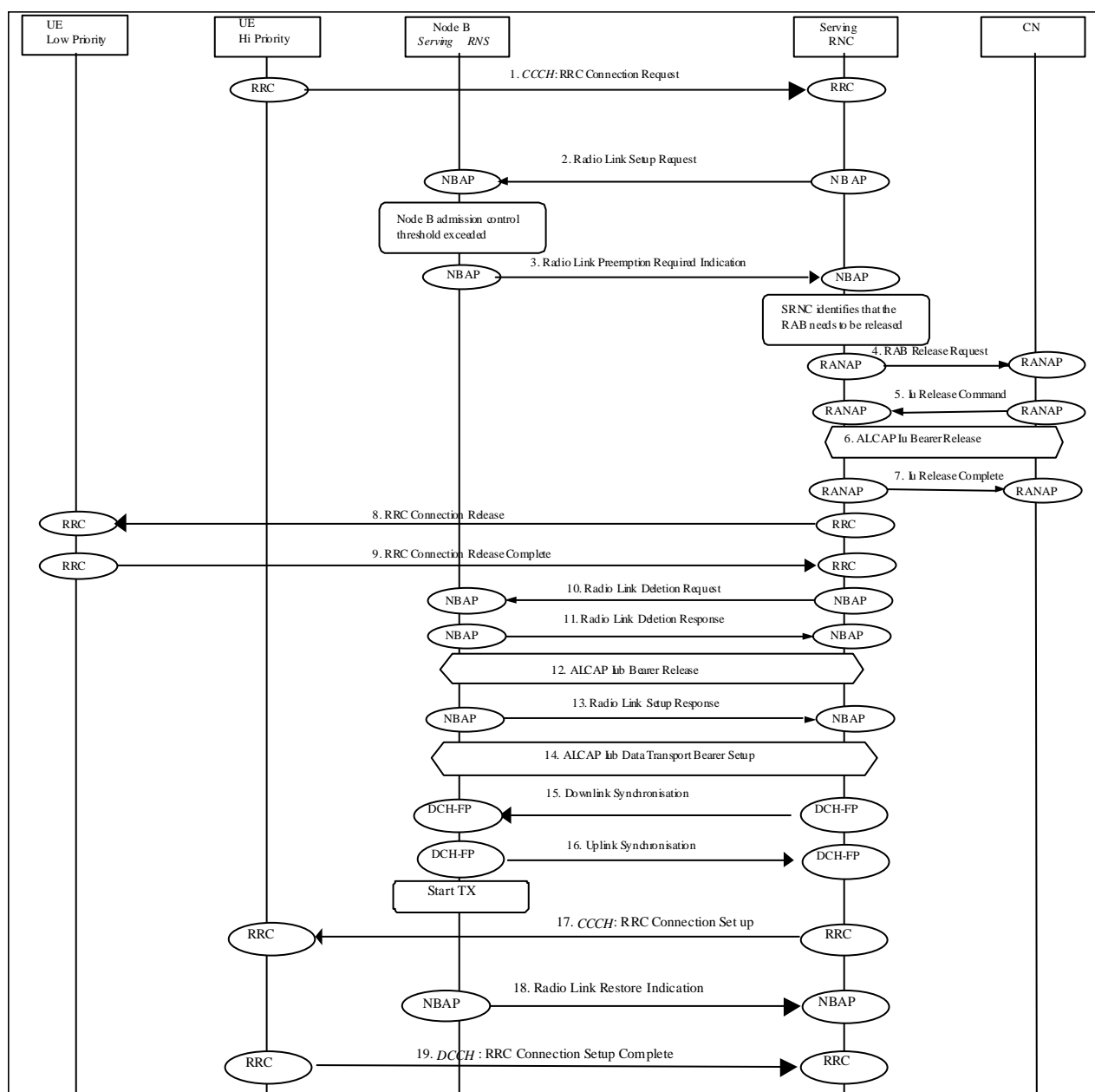
Figure 8c RRC Connection Establishment - DCH Establishment with pre-emption

1. See 7.3.1 Item 1.
2. When a DCH is to be set-up, NBAP message Radio Link Setup Request is sent to the Node B.
3. Node B attempts to allocate resources, but is unable to and responds with NBAP message **Radio Link Preemption Required Indication**, and starts the $T_{preempt}$ timer.
    Parameters: RLInformation IE.
4. The SRNC pre-empts a RL and may send a RANAP message **RAB Release Request** to the CN.
    Cause: RAB Pre-empted
5. If the CN agrees to the release of the dedicated Channel it sends the message **Iu Release Command** to the SRNC.
6. The SRNC confirms the release by sending a **Iu Release Complete** message to the CN.
7. The SRNC initiates release of the Iu Data Transport bearer using ALCAP protocol.
8. Message **RRC Connection Release** from SRNC to UE intiates the RRC connection release.
    Parameters: Release Cause - Pre-emptive release
9. Message **RRC Connection Release Complete** from the UE to SRNC to confirm the RRC connection release.
10. The SRNC initiates the release of the link by sending **Radio Link Deletion** to the Node B. The Node B stops the $T_{preempt}$ timer.
11. The Node B confirms the release of the link by sending the **Radio Link Deletion Response** to the SRNC
12. The Node B initiates release of the Iub Data Transport Bearer using ALCAP protocol.

13. The Node B responds to Item 2 with NBAP message **Radio Link Setup Response**.
14-20 See 7.3.1 Items 4-9