

Agenda Item: 10.1

Source: Nokia

Title: **Radio Access Bearer Assignment Procedure**

Document for: Decision

1 Introduction

This contribution presents the outcome of the study item to create a new text proposal for the RAB Assignment procedure defined in TS 25.413. The text is updated according to comments and proposals from the mail reflector. Chapter 2 contains the proposed text, revision marks indicating the differences compared to the current text in TS 25.413.

2 Proposed text

2.1 Radio Access Bearer Assignment

2.1.1 Normal operation

This procedure is triggered from CN and is used to modify the list of Radio Access Bearers established over lu interface for the given UE. All messages belonging to RAB Assignment procedure are transferred over lu by utilising the connection oriented mode of the established lu signalling bearer. Figure X shows a general signalling flow of this procedure.

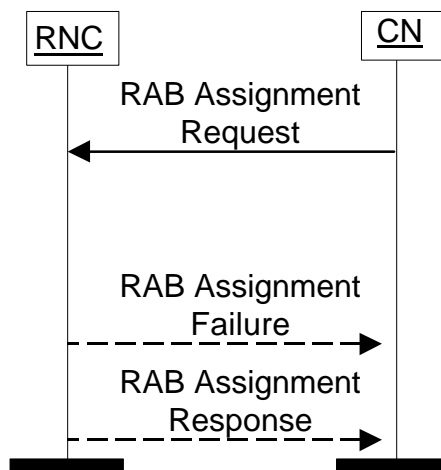


Figure 1. RAB Assignment Procedure.

The procedure is started by the CN sending a RAB ASSIGNMENT REQUEST message. Message contains the information required by the UTRAN to build the new radio access bearer configuration. This may comprise :

- The list of the RABs to establish, with their description ;
- The list of RABs to modify, with their description
- The list of the RABs to release

For each radio access bearer to establish, the following information is provided :

- A reference for the radio access bearer

- The characteristics of the UE-CN RAB including information of possible RAB subflows. Some characteristics may include negotiable values (ffs.).
- Priority level and pre-emption indication
- Iu user plane mode of operation
- NAS Information (a bit string to be sent to UE at Uu interface radio access bearer establishment)
- Iu transport bearer information (transport association or/and transport address)

For each radio access bearer to modify, the parameters to be modified are provided.

For each radio access bearer to release the radio access bearer reference is provided.

Upon reception of the RAB ASSIGNMENT REQUEST message UTRAN tries to build the requested UE-UTRAN radio access bearer configuration.

UTRAN shall report to CN the changes of configuration when effective, failed or when put in queue. This can be done in one or several messages, depending on the case, and on UTRAN choice.

RAB ASSIGNMENT RESPONSE message is used to report successful changes in configuration and RAB ASSIGNMENT FAILURE message is used to report outcomes of which not all are successful. To indicate queuing a separate RANAP procedure Queuing Indication is used.

Each message is a response for only those RABs whose reference is included in the message, the status of the not referenced RABs can not be deduced by CN. The procedure can be considered to be terminated normally in CN when UTRAN has once referenced all RABs, that were referenced in RAB ASSIGNMENT REQUEST, either in RAB ASSIGNMENT RESPONSE or RAB ASSIGNMENT FAILURE message.

If a radio access bearer list modification requires Transport Network Control Plane signalling to setup a new or modify existing Iu transport bearer, the specific modification of radio access bearer list can be considered to be successfully completed only after the necessary transport network control plane signalling has been successfully executed.

If some existing RABs (related to the same or to another UE) have to be released due to the received RAB ASSIGNMENT REQUEST (in case of pre-emption for example) RAB Release Request procedure shall be used.

RAB ASSIGNMENT RESPONSE message contains information of the made changes to the RAB configuration. This may comprise of following:

- The list of radio access bearers established, with their description (ffs.)
- The list of radio access bearers modified, with their description (ffs.)
- The list of radio access bearers released
- Localisation data, when the RNC got more information on where is the UE while running the procedure

[Authors Note: Following two bullet points can be removed and the information can be moved to message contents chapter as proper parameters.]

To ensure the necessary load sharing on the Iu-PS interface,

- *When the CN sends RAB ASSIGNMENT REQUEST for all Radio Access Bearers (associated with PDP contexts) of an UE, the CN specifies the IP address of the packet processing function allocated to this / each of these PDP context(s) in the CN.*
- *In the response to the CN request, i.e. in RAB ASSIGNMENT RESPONSE, the RNC specifies the IP address of the packet processing function allocated to this / each of these Radio Access Bearer(s) in the RNC.*

RAB ASSIGNMENT FAILURE is sent to CN when at least part of the request is unsuccessfully completed. In addition to the unsuccessful outcome(s) RAB ASSIGNMENT FAILURE message may contain information of successfully made changes to the RAB configuration. Message may thus comprise following:

- The list of radio access bearers established, with their description (ffs.)
- The list of radio access bearers that are not and will not be established with cause value
- The list of radio access bearers modified, with their description (ffs.)
- The list of radio access bearers that are not and will not be modified with cause value
- The list of radio access bearers released
- Localisation data, when the RNC got more information on where is the UE while running the procedure

2.1.2 Abnormal Conditions

2.1.2.1 Abnormal Conditions in CN

Abnormal conditions in CN are ffs.

2.1.2.2 Abnormal Conditions in UTRAN

Abnormal conditions in UTRAN are ffs.

2.2 RAB Release Request

This procedure is used to request a release of one or several radio access bearers from UTRAN side. Procedure is initiated by RNC generating a RAB RELEASE REQUEST message towards the CN.

This message indicates the list of RABs requested to be released and cause value for each release request. On receipt of a RAB RELEASE REQUEST the CN shall initiate RAB Assignment procedure requesting indicated RABs to be released.



Figure 4. RAB Release Request procedure.

2.3 Queuing Indication

2.3.1 General

The purpose of the QUEUING INDICATION procedure is to inform the CN about a delay in the allocation of the necessary UTRAN resources.

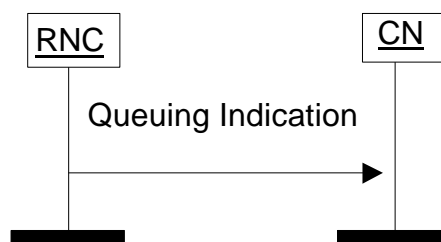


Figure 5. Queuing Indication procedure

2.3.2 Operation of the procedure in case of RAB Assignment procedure

When UTRAN decides to put the requested configuration change of one or several RABs to establish or modify into a queue the QUEUING INDICATION message indicating the RAB(s) put in to queue shall be returned to the CN and the timer T_{QUEUING} shall be started in RNC for each referenced RAB. The timer value specifies the maximum queuing delay and it is determined by the operator. Due to one RAB Assignment procedure several Queuing Indication procedures referencing different RABs may be triggered by UTRAN.

The queuing procedure shall be terminated for each RAB at latest on timer T_{QUEUING} expiry with a successful or unsuccessful assignment of the required UTRAN resources by sending RAB ASSIGNMENT RESPONSE or/and RAB ASSIGNMENT FAILURE message(s), respectively, to the CN.

2.3.3 Operation of the procedure in case of Relocation Resource Allocation procedure

TBD