TSG-RAN Working Group 3 meeting #4 *TSGR3#3(99)436*
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Agenda Item: 21

Source: Mannesmann Mobilfunk

Title: Support of automatic NodeB configuration

Document for: Approval

This contribution is focused on one O&M procedure, the installation of a new NodeB. Starting from a description of this procedure requirements to logical and implementations specific O&M will be derived.

Rationale

The installation of a new NodeB includes apart from the physical installation the setting of all required parameters. Additionally the NodeB has to be attached to the appropriate RNC and all links have to be dimensioned accordingly. It should be assumed that during the planning process the location and infrastructure as well as any configuration data has been prepared. The following steps after the physical installation can be identified:

1. Establishment of links to RNC
2. Configuration of NodeB according to radio related configuration data and implementation specific configuration data.
3. Self-test and result report (notification of available resources).

Since the installation of NodeBs can be expected to be one of the most frequent procedures, each of the above listed steps should be evaluated with respect to possible optimisation. The automation of some steps can reduce the required effort for this procedure and can reduce the probability of errors caused mainly by manual configuration.

There are three initial connections that have to be established:

1. Signalling bearer for ALCAP
2. Signalling bearer for NBAP
3. Signalling bearer for implementation specific O&M (in case of routing via the RNC)

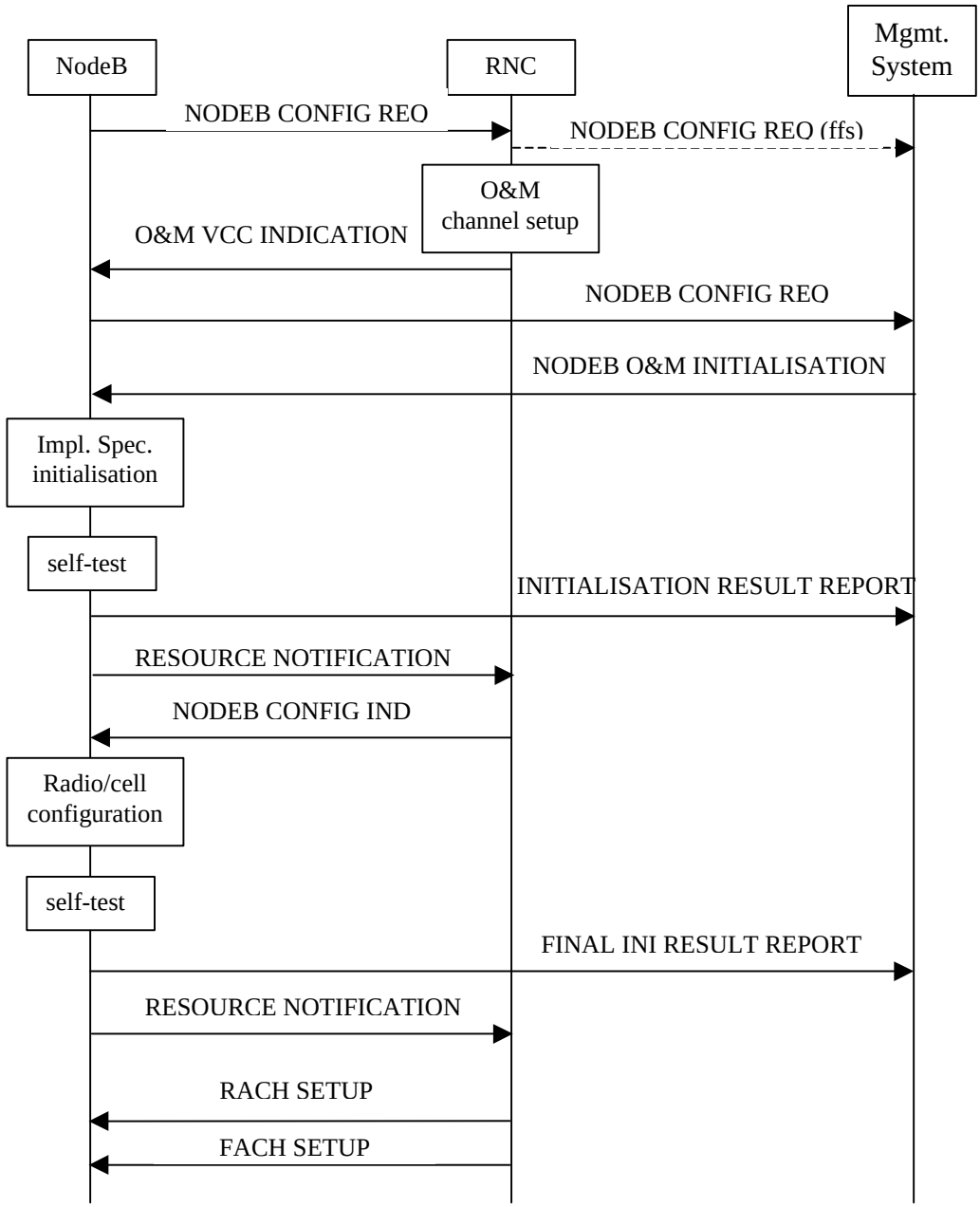
While it has to be investigated whether an automatic establishment of AAL5 connections for 1. and 2. will be possible, the VCC for implementation specific transport can be established by NBAP (Iub signalling bearer management).

After this initial link set-up the NodeB has to be provided with all required parameters. One solution is the manual download of a data file containing this information. Afterwards the NodeB can be configured manually according to the downloaded data file. This step can potentially be optimised by automatic download and configuration. Assuming that the configuration data can be separated into radio related data and implementation specific data, the NodeB can automatically obtain appropriate configuration data from the RNC via NBAP and from the Management System via the previously established implementation specific O&M transport channel. The NodeB may send an initial configuration request message to the RNC

via NBAP. After receiving the configuration request message the RNC sends the required cell configuration information, e.g. RF parameters or cell identification, to the NodeB. NBAP already contains a common procedure "Cell Configuration Management". It has to be investigated whether the RNC should trigger the implementation specific O&M configuration by a notification message to the Management System or whether the NodeB triggers implementation specific O&M initialisation by a separate message via the according signalling bearer.

After the configuration of the NodeB some self-test may be performed. The result of these self-tests should by communicated to the Management System via implementation specific O&M. As the RNC is in charge of managing common channels the NodeB should also inform the RNC about the finalisation of it's self-tests. After the receipt of a finalisation message the RNC establishes the common channels, e.g. RACH and FACH, with the according AAL2 connection on Iub.

The following figure shows one possible NodeB initialisation signalling:



From this description and the figure on the possible NodeB initialisation signalling requirements will be derived that should be used only as basis for the identification of necessary NBAP messages. Also requirements to implementation specific signalling will be derived. But since RAN3 is only responsible for the provision of the transport mechanism for implementation specific O&M the list of implementation specific requirements is only intended to be informative in order to clarify the whole O&M procedure.

Proposal

Mannesmann Mobilfunk proposes to add the following list of requirements to the O&M procedures chapter of I3.05 in the BTS Installation paragraph.

- After the physical installation of NodeB including all wired and wireless connections to RNC and/or Management System the signalling bearers for NBAP according to [1] and ALCAP according to [2] and [3] have to be established.

[Note: It is ffs whether the signalling bearers have to be established manually or whether an automatic establishment is possible.]

- Following to the successful establishment of the NBAP signalling bearer the NodeB initiates it's configuration by sending a configuration request to the RNC.

- Since the RNC knows the address of the new NodeB, the RNC establishes the signalling bearer intended for implementation specific O&M link from Node B to it’s Management System (only in case of routing the implementation specific O&M signalling via the RNC).

- The successful establishment of the implementation specific O&M signalling bearer is communicated to the new NodeB including all required addresses and interface descriptions.

- The NodeB requests it's implementation specific and therefore manufacturer dependent initialisation from the Management System.

[Note: It is ffs. Whether the RNC can trigger the NodeB initialisation.]

- After receiving the configuration request from the NodeB the vendor specific part of the Management System sends all required initialisation parameters to the NodeB.

- The NodeB performs a self-test after the implementation specific configuration and sends a result report to the Management System and a resource notification to the RNC indicating that the NodeB is ready to operate.

- After receiving the resource notification (following to the initial configuration request) the RNC send all required radio and cell parameters to the NodeB.

- The NodeB performs a self-test after the radio/cell configuration and sends a final result report to the Management System and a resource notification to the RNC indicating the successful radio/cell configuration.

- When the RNC receives the notification that the NodeB is configured accordingly the RNC establishes the common channels required for operation.

[1] 3GPP TS 25.432 UTRAN Iub interface signalling transport
[2] 3GPP TS 25.426 UTRAN Iur and Iub interface data transport and transport signalling for DCH data streams
[3] 3GPP TS 25.434 UTRAN Iub interface data transport and transport signalling for CCH data streams