Agenda Item: 21

Source: **Nortel Networks**

Title: Node B O&M Functional Description: splitting between logical and implementation specific O&M

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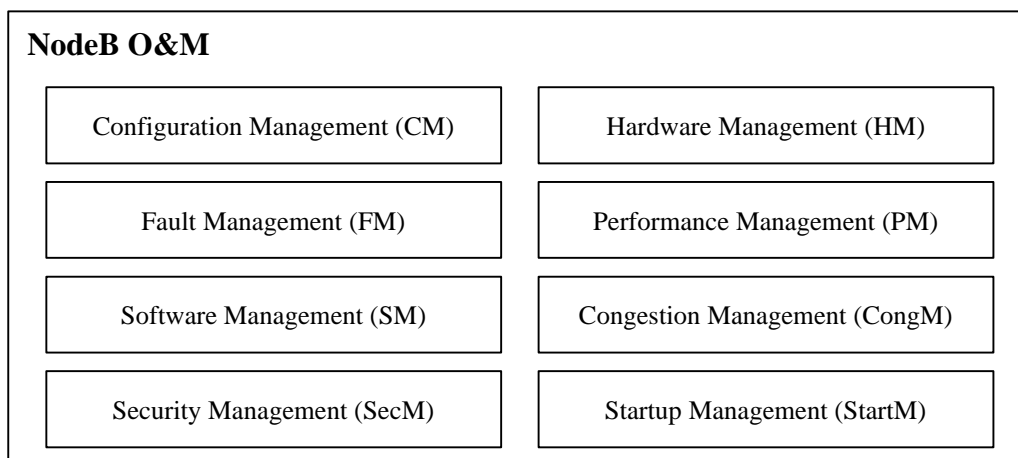
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1   Introduction

This contribution aims at :
- Introducing a clear separation between O&M function and the Managed object model.
- Proposing a functional splitting between logical and implementation specific O&M.
- Proposing procedures relating to the functional model

2   Node B O&M functional description

2.1   Overview

The functional Node B description applies to the Node B Managed Object (MO) model. A MO may support one or several functions. The mapping of function over MOs is FFS. The global Node B MO model is outside the scope of WG3. However, refinement of the Logical part (model described in 25.430) for O&M purposes is FFS. The functions described in this section are generic and may apply to both implementation specific and logical part of the Node B MO model. The diagram below shows the functional O&M functions provided at Node B level:

NodeB O&M

Configuration Management (CM)	Hardware Management (HM)
Fault Management (FM)	Performance Management (PM)
Software Management (SM)	Congestion Management (CongM)
Security Management (SecM)	Startup Management (StartM)

2.2   *Functions description*

2.2.1 Configuration management

The configuration management function provides:
- The mean to create, delete MO instance.
- Identification of MO.
- The way to configure MO.
- The way to request information about Node B configuration data (static or dynamic data).
- A MO state management function indicating the resource state and availability.

Automatic MO creation and configuration is FFS.

2.2.2 Fault management

The fault management function provides:
- alarm management indicating hardware failure, software failure, protocol error link failure...
- Fault correlation: Node B have to provide a way to correlate hardware failures with their supported logical resources state change.
- alarm filtering and the alarm flow management.

2.2.3 Performance management

Performance management provides:
- traffic observation
- resource monitoring
- the network quality observation.
- equipment monitoring.

Information provided by PM may be meaningful at Node B level, RNC level or at Management System level. A synchronisation must be provided in order to correlate information relating to the implementation specific model and information relating to the Node B.

2.2.4 Software management

Software management function provides:

- Software sparing and software redundancy management within Node B.
- Software downloading management.
- Software Upgrade management.

2.2.5 Hardware management

Hardware management provides:

- Maintenance actions
- Tests and diagnostics management
- Hardware sparing management

2.2.6 Congestion management

Congestion management provides:

- Overload management
- Load balancing management

2.2.7 Startup management

Startup management provides:

- Management and initiation of the establishment protocol
- Management of the link and bearers establishment
- RNC with Node B services capacity.

2.2.8 Security management

Security management provides:

- Management of secure access to the Node B

3   Splitting between O&M logical and implementation specific functions

The splitting between implementation specific and logical O&M is performed at MO level. It is proposed to have a clear separation between MO representing Node B logical objects and MO representing Node B implementation specific objects. Each MO is an abstract view of a set of procedures (Methods). This procedures are the result of the application of a function to the MO.
Example: the application of the CM function procedures to the Cell MO gives a Cell creation procedure, a Cell set procedure (cell configuration), a Cell deletion procedure...
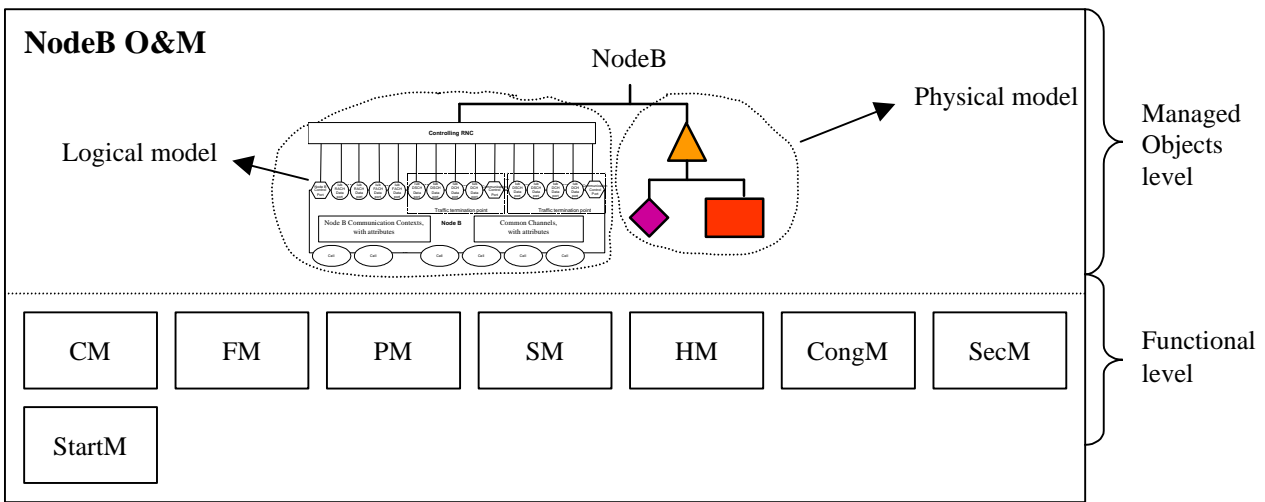
3.1 CM

The configuration management relating to the Node B logical model is part of the logical O&M and managed through the Iub.
The configuration management relating to the Node B implementation specific model is part of the implementation specific O&M and is implementation specific.

3.2 FM

The fault management relating to the Node B logical model is part of the logical O&M and managed through the Iub.
The fault management relating to the Node B implementation specific model is part of the implementation specific O&M and is implementation specific.

3.3 PM

The performance management relating to the Node B logical model is part of the logical O&M and managed through the Iub.
The fault management relating to the Node B implementation specific model is part of the implementation specific O&M and is implementation specific.

3.4 SM

The software management is part of the implementation specific O&M and is implementation specific.

3.5 HM

The hardware management function of Node B only relates to implementation specific MO and is part of the implementation specific O&M.

3.6 StartM

Startup management relating to the Node B startup on Iub is part of the logical O&M.
Startup management relating to the Node B hardware startup and to the Node B/OMC-B interface is part of the implementation specific O&M.

3.7 CongM

Congestion management is part of the implementation specific O&M and is implementation specific.
The state CM management function will be used on Iub to report impact of congestion on logical resources.

3.8 SecM

Security management is part of the implementation specific O&M and is implementation specific.

4 Implementation specific O&M procedures

Implementation specific O&M procedures are out of the scope of SMG3.

5 Logical O&M procedures

The mapping of procedures versus managed objects is FFS.

5.1 protocol procedures

This section describes three generic procedures for transaction acknowledgement, rejection and commit. The target benefits of introducing protocol transactions are:
- to focus on functional procedures in functional procedure description sections
- to avoid the multiplication of protocol procedures.
- to make transaction response homogeneous.

Every NBAP procedure shall be whether accepted or rejected using 5.1.1 or 5.1.2 procedures. In some specific cases, a transaction commit procedure will be required to commit the processing associated to an accepted transaction.

5.1.1 Transaction accept

This procedure is used whether by RNC or by Node B to indicate that a transaction has been accepted. This procedure shall indicate the reference of the acknowledged procedure.

5.1.2 Transaction reject

This procedure is used by whether by RNC or by Node B to refuse a transaction. The rejection shall reference the rejected procedure and indicate as far as possible the rejection cause.

5.1.3 Transaction commit

This procedure is used whether by RNC or by Node B to indicate that the processing associated to an already accepted transaction has been successfully performed.

5.2 CM procedures

5.2.1 Creation of a Managed Object instance

This procedure is used by RNC to create a logical Node B MO.

5.2.2 Deletion of a Managed Object instance

This procedure is used by RNC to delete a logical Node B MO.

5.2.3 Set new parameters values

This procedure is used by RNC to change Node B MO attributes values. The way attributes values are taken into account by Node B is FFS.

5.2.4 Get attributes values

This procedure is used by RNC to get information about the Node B configuration. The following kind of data may be consulted:
- Configuration Data (CD): requesting CD, RNC will be able to check consistency between Node B logical configuration at RNC and at Node B level.
- Dynamic data (DD): requesting DD, RNC will be able to get information about data dynamically managed by Node B.

5.2.5 Attribute value change notification

This procedure is used by Node B to report the change of an attribute value (dynamic data) managed at Node B level.

5.3 FM procedures

5.3.1 Managed Object instance state change notification

This procedure is used by Node B to report a logical Node B MO state change. The possibility of grouping state change notifications is FFS.

5.4 PM procedures

Since PM measurement procedures have been described in [1] , we only list them below.

5.4.1 Measurement Request

5.4.2 Measurement Request Accept

5.4.3 Measurement Request Reject

5.4.4 Measurement Termination

5.4.5 Measurement Report

5.5 SM procedures

There is no Node B logical O&M procedures relating to software management.
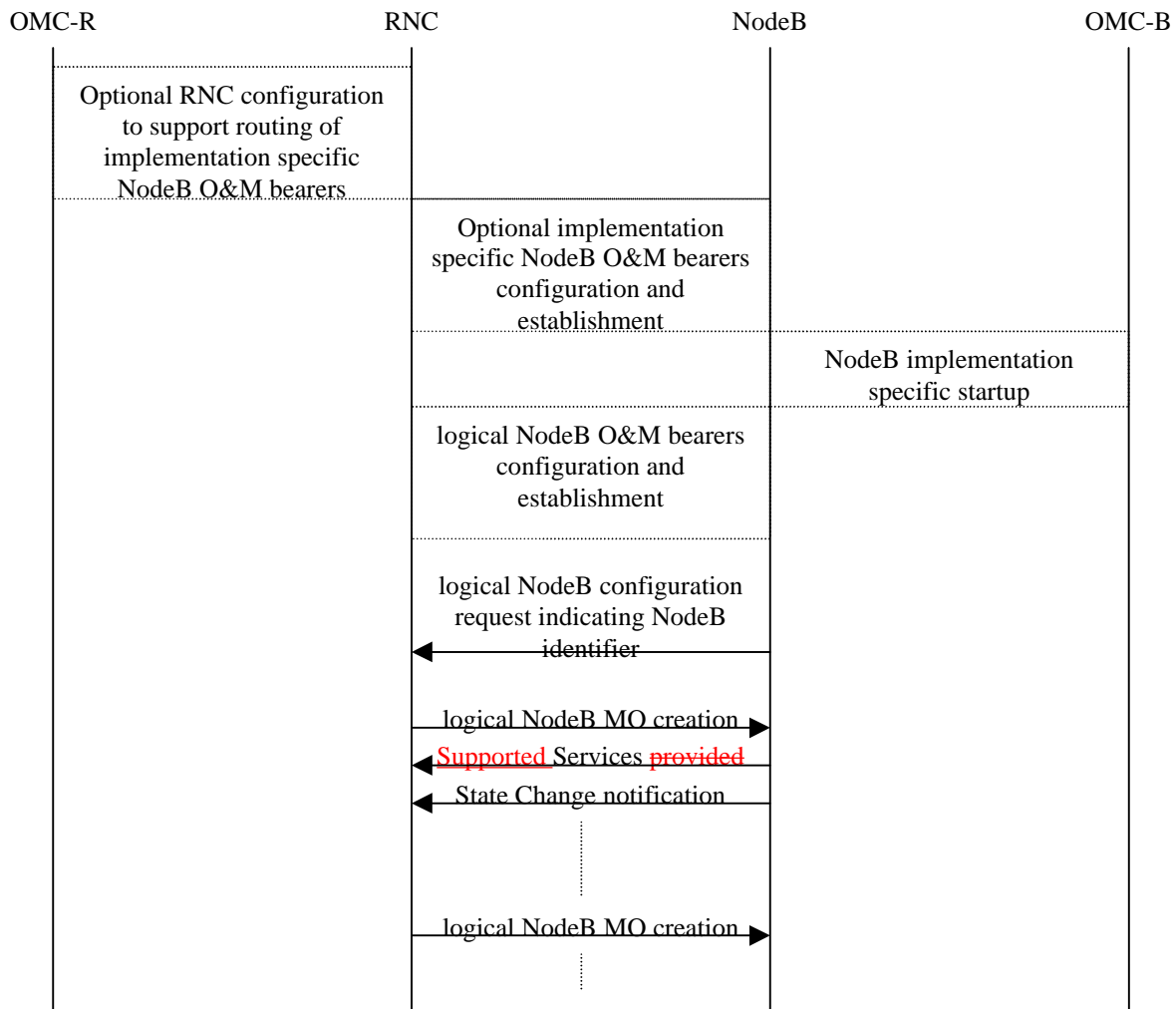
5.6 HM procedures

There is no Node B logical O&M procedures relating to hardware management.

5.7 StartM procedures

5.7.1 Logical Node B startup

The following figure shows the various phase of the startup procedure. No specific messages are required for the startup compared to the one previously described.

OMC-R   RNC   NodeB   OMC-B

Optional RNC configuration
to support routing of
implementation specific
NodeB O&M bearers

Optional implementation
specific NodeB O&M bearers
configuration and
establishment

NodeB implementation
specific startup

logical NodeB O&M bearers
configuration and
establishment

logical NodeB configuration
request indicating NodeB
identifier

logical NodeB MO creation

Supported Services provided

State Change notification

logical NodeB MO creation

5.7.2 Supported services

This procedure is used by Node B to indicate the MO supported services to the RNC. The list of cases when this procedure will be used is FFS. Supported services may be seen as parameters of MO and so consulted by RNC using standard get procedure on that MO.

5.8 CongM procedures

5.8.1 Begin congestion

This procedure is used by Node B to report a beginning of a congestion phase on a logical Node B resource.

5.8.2 End congestion

This procedure is used by Node B to report the end of a congestion phase on a logical Node B resource.

5.9 SecM procedures

There is no Node B logical O&M procedures relating to security management.

6 Proposal

Nortel proposes to insert:
- section 2 of this contribution in section 5 of [2]
- section 3 of this contribution in section 7 and 8 of [2] with the first part of section 3 being put in section 5 of [2]

- section 4 of this contribution in section 8.1 of [1] replacing overlapping sections.

7 References

[1] TS RAN 25.433 V1.0.1   RAN NBAP Specification
[2] TR I3.05 V0.1.0   Node B O&M Functional Description