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Technical Specification

**Universal Mobile Telecommunications System (UMTS);
Telecommunication management;
Configuration Management (CM);
UTRAN network resources Integration Reference Point (IRP):
Network Resource Model (NRM)
(3GPP TS 32.642 version 4.5.0 Release 4)**



Reference

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Foreword

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Foreword

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Introduction

The present document is part of a TS-family covering the 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; Configuration Management (CM), as identified below:

- 32.641: "UTRAN network resources Integration Reference Point (IRP): Requirements".
- 32.642: "UTRAN network resources Integration Reference Point (IRP): Network Resource Model (NRM)".**
- 32.643: "UTRAN network resources Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)".
- 32.644: "UTRAN network resources Integration Reference Point (IRP): Common Management Information Protocol (CMIP) Solution Set (SS)".

Configuration Management (CM), in general, provides the operator with the ability to assure correct and effective operation of the 3G network as it evolves. CM actions have the objective to control and monitor the actual configuration on the Network Elements (NEs) and Network Resources (NRs), and they may be initiated by the operator or by functions in the Operations Systems (OSs) or NEs.

CM actions may be requested as part of an implementation programme (e.g. additions and deletions), as part of an optimisation programme (e.g. modifications), and to maintain the overall Quality of Service (QoS). The CM actions are initiated either as single actions on single NEs of the 3G network, or as part of a complex procedure involving actions on many resources/objects in one or several NEs.

Configuration Management (CM), in general, provides the operator with the ability to assure correct and effective operation of the 3G network as it evolves. CM actions have the objective to control and monitor the actual configuration on the Network Elements (NEs) and Network Resources (NRs), and they may be initiated by the operator or by functions in the Operations Systems (OSs) or NEs.

Due to the growing number of specifications to model new services and Resource Models for Configuration Management (CM), as well as the expected growth in size of each of them from 3GPP Release 4 onwards, a new structure of the specifications is already needed in Release 4. This structure is needed for several reasons, but mainly to enable more independent development and release for each part, as well as a simpler document identification and version handling. Another benefit would be that it becomes easier for bodies outside 3GPP, such as the ITU-T, to refer

to telecom management specifications from 3GPP. The new structure of the specifications does not lose any information or functionality supported by the Release 1999. The restructuring also includes defining new IRPs for the Network Resource Models (Generic, Core Network and UTRAN NRM).

Finally, the Name convention for Managed Objects (in Release 1999: 32.106-8) has been moved to a separate number series used for specifications common between several management areas (e.g. CM, FM, PM).

The following table shows an overview of the mapping between the old Release 1999 and new Release 4 CM specification structure.

Table: Mapping between Release "99 and the new Rel-4 specifications

| R99 Old no. | Old (R99) specification title | Rel-4 New no. | New (Rel-4) specification title |
|-------------|--|---------------|---|
| 32.106-1 | 3G Configuration Management: Concept and Requirements | 32.600 | 3G Configuration Management: Concept and High-level Requirements |
| 32.106-1 | <Notification IRP requirements from 32.106-1 and 32.106-2> | 32.301 | Notification IRP: Requirements |
| 32.106-2 | Notification IRP: IS | 32.302 | Notification IRP: Information Service |
| 32.106-3 | Notification IRP: CORBA SS | 32.303 | Notification IRP: CORBA SS |
| 32.106-4 | Notification IRP: CMIP SS | 32.304 | Notification IRP: CMIP SS |
| 32.106-8 | Name convention for Managed Objects | 32.300 | Name Convention for Managed Objects |
| 32.106-1 | <Basic CM IRP IS requirements from 32.106-1 and 32.106-5> | 32.601 | Basic CM IRP: Requirements |
| 32.106-5 | Basic CM IRP IM (Intro & IS part) | 32.602 | Basic CM IRP: Information Service |
| 32.106-6 | Basic CM IRP CORBA SS (IS related part) | 32.603 | Basic CM IRP: CORBA SS |
| 32.106-7 | Basic CM IRP CMIP SS (IS related part) | 32.604 | Basic CM IRP: CMIP SS |
| 32.106-8 | Name convention for Managed Objects | 32.300 | Name Convention for Managed Objects |
| - | - | 32.611 | Bulk CM IRP: Requirements |
| - | - | 32.612 | Bulk CM IRP: Information Service |
| - | - | 32.613 | Bulk CM IRP: CORBA SS |
| - | - | 32.614 | Bulk CM IRP: CMIP SS |
| | | 32.615 | Bulk CM IRP: XML file format definition |
| 32.106-1 | <Basic CM IRP Generic NRM requirements from 32.106-1 and 32.106-5> | 32.621 | Generic Network Resources IRP: Requirements |
| 32.106-5 | Basic CM IRP IM (Generic NRM part) | 32.622 | Generic Network Resources IRP: NRM |
| 32.106-6 | Basic CM IRP CORBA SS (Generic NRM related part) | 32.623 | Generic Network Resources IRP: CORBA SS |
| 32.106-7 | Basic CM IRP CMIP SS (Generic NRM related part) | 32.624 | Generic Network Resources IRP: CMIP SS |
| 32.106-1 | <Basic CM IRP CN NRM requirements from 32.106-1 and 32.106-5> | 32.631 | Core Network Resources IRP: Requirements |
| 32.106-5 | Basic CM IRP IM (CN NRM part) | 32.632 | Core Network Resources IRP: NRM |
| 32.106-6 | Basic CM IRP CORBA SS (CN NRM related part) | 32.633 | Core Network Resources IRP: CORBA SS |
| 32.106-7 | Basic CM IRP CMIP SS (CN NRM related part) | 32.634 | Core Network Resources IRP: CMIP SS |
| 32.106-1 | <Basic CM IRP UTRAN NRM requirements from 32.106-1 and 32.106-5> | 32.641 | UTRAN Network Resources IRP: Requirements |
| 32.106-5 | Basic CM IRP IM (UTRAN NRM part) | 32.642 | UTRAN Network Resources IRP: NRM |
| 32.106-6 | Basic CM IRP CORBA SS (UTRAN NRM related part) | 32.643 | UTRAN Network Resources IRP: CORBA SS |
| 32.106-7 | Basic CM IRP CMIP SS (UTRAN NRM related part) | 32.644 | UTRAN Network Resources IRP: CMIP SS |
| | | 32.651 | GERAN Network Resources IRP: Requirements |
| | | 32.652 | GERAN Network Resources IRP: NRM |
| | | 32.653 | GERAN Network Resources IRP: CORBA SS |
| | | 32.654 | GERAN Network Resources IRP: CMIP SS |

1 Scope

The present document is part of an Integration Reference Point (IRP) named "UTRAN Network Resources IRP", through which an "IRPAgent" (typically an Element Manager or Network Element) can communicate Configuration Management information to one or several "IRPManagers" (typically Network Managers) concerning UTRAN resources. The "UTRAN Network Resources IRP" comprises a set of specifications defining Requirements, a protocol neutral Network Resource Model (NRM) and corresponding Solution Set(s).

The present document

1. specifies the protocol neutral UTRAN Network Resources IRP: Network Resource Model. It reuses relevant parts of the generic NRM in [16], either by direct reuse or sub-classing, and in addition to that defines UTRAN specific Managed Object Classes.

The Configuration Management (CM) area is very large. The intention is to split the specification of the related interfaces in several IRPs – as described in the Introduction clause above. An important aspect of such a split is that the Network Resource Models (NRMs) defined in different IRPs containing NRMs are consistent, and that NRMs supported by an IRPAgent implementation can be accessed as one coherent model through one IRP Information Service.

To summarize, the present document has the following main purpose:

- (1) to define the applied UTRAN specific Network Resource Model, based on the generic NRM in [16].

Finally, in order to access the information defined by this NRM, an IRP Information Service (IS) is needed, such as the Basic CM IRP: IS [17] or the Bulk CM IRP: IS [18]. However, which Information Service that is applicable is outside the scope of this document.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- | | |
|------|---|
| [1] | 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements". |
| [2] | 3GPP TS 32.102: "Telecommunication management; Architecture". |
| [3] | 3GPP TS 23.003: "Numbering, addressing and identification". |
| [4] | 3GPP TS 25.401: "UTRAN Overall Description" |
| [5] | 3GPP TS 25.433: "UTRAN Iub Interface NBAP Signalling" |
| [6] | 3GPP TS 25.423: "UTRAN Iur Interface RNSAP Signalling" |
| [7] | ITU-T Recommendation X.710 (1991): "Common Management Information Service Definition for CCITT Applications". |
| [8] | Void |
| [9] | 3GPP TS 25.331: Radio Resource Control (RRC); Protocol Specification |
| [10] | Void |

- [11] 3GPP TS 32.111-2: "Telecommunication management; Fault Management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS)".
- [12] Void
- [13] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".
- [14] 3GPP TS 32.600: "Telecommunication management; Configuration Management (CM); Concept and high-level requirements".
- [15] 3GPP TS 23.002: "Network Architecture".
- [16] 3GPP TS 32.622: "Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Network Resource Model (NRM)".
- [17] 3GPP TS 32.602: "Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP): Information Service (IS)".
- [18] 3GPP TS 32.612: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): Information Service (IS)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply. For terms and definitions not found here, please refer to 3GPP TS 32.101 [1], 3GPP TS 32.102 [2] and 3GPP TS 32.600 [14].

Association: In general it is used to model relationships between Managed Objects. Associations can be implemented in several ways, such as:

- (1) name bindings,
- (2) reference attributes, and
- (3) association objects.

This IRP stipulates that containment associations shall be expressed through name bindings, but it does not stipulate the implementation for other types of associations as a general rule. These are specified as separate entities in the object models (UML diagrams). Currently (in R99) however, all (non-containment) associations are modelled by means of reference attributes of the participating MOs.

Managed Element (ME): An instance of the Managed Object Class ManagedElement defined in [16].

Managed Object (MO): In the context of the present document, a Managed Object (MO) is a software object that encapsulates the manageable characteristics and behaviour of a particular Network Resource. The MO is instance of a MO class defined in a MIM/NRM. An MO class has attributes that provide information used to characterize the objects that belong to the class (the term "attribute" is taken from TMN and corresponds to a "property" according to CIM). Furthermore, an MO class can have operations that represent the behaviour relevant for that class (the term "operation" is taken from TMN and corresponds to a "method" according to CIM). An MO class may support notifications that provide information about an event occurrence within a network resource.

Management Information Base (MIB): A MIB is an instance of an NRM and has some values on the defined attributes and associations specific for that instance. In the context of the present document, an MIB consists of:

- (1) a Name space (describing the MO containment hierarchy in the MIB through Distinguished Names),
- (2) a number of Managed Objects with their attributes and
- (3) a number of Associations between these MOs. Also note that TMN (ITU-T Recommendation X.710 [7]) defines a concept of a Management Information Tree (also known as a Naming Tree) that corresponds to the name space (containment hierarchy) portion of this MIB definition. Figure 3.1 depicts the relationships

between a Name space and a number of participating MOs (the shown association is of a non-containment type)

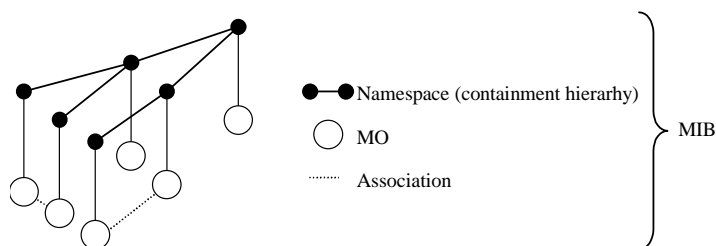


Figure 3.1: Relationships between a Name space and a number of participating MOs

Management Information Model (MIM): Also referred to as NRM – see the definition below.

Name space: A name space is a collection of names. The IRP name convention (see 3GPP TS 32.300 [13]) restricts the name space to a hierarchical containment structure, including its simplest form - the one-level, flat name space.

All Managed Objects in a MIB shall be included in the corresponding name space and the MIB/name space shall only support a strict hierarchical containment structure (with one root object). A Managed Object that contains another is said to be the superior (parent); the contained Managed Object is referred to as the subordinate (child). The parent of all MOs in a single name space is called a Local Root. The ultimate parent of all MOs of all managed systems is called the Global Root.

Network Resource Model (NRM): A model representing the actual managed telecommunications network resources that a System is providing through the subject IRP. An NRM describes Managed Object Classes, their associations, attributes and operations. The NRM is also referred to as "MIM" (see above), which originates from the ITU-T TMN.

Node B: A logical node responsible for radio transmission/reception in one or more cells to/from the User Equipment. It terminates the Iub interface towards the RNC.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

| | |
|-------|---|
| CIM | Common Information Model |
| CMIP | Common Management Information Protocol |
| CN | Core Network |
| CORBA | Common Object Request Broker Architecture |
| DN | Distinguished Name (see 3GPP TS 32.300 [13]) |
| EM | Element Manager |
| FM | Fault Management |
| IRP | Integration Reference Point |
| Iub | Interface between RNC and Node B |
| ME | Managed Element |
| MIB | Management Information Base |
| MIM | Management Information Model |
| MO | Managed Object |
| MOC | Managed Object Class |
| NE | Network Element |
| NM | Network Manager |
| NR | Network Resource |
| NRM | Network Resource Model |
| PM | Performance Management |
| PS | Packet Switched |
| RDN | Relative Distinguished Name (see 3GPP TS 32.300 [13]) |
| RNC | Radio Network Controller |
| SS | Solution Set |
| TMN | Telecommunications Management Network |
| UML | Unified Modelling Language |
| UMTS | Universal Mobile Telecommunications System |
| UTRAN | Universal Terrestrial Radio Access Network |

4 System overview

4.1 System context

Figure 4.1 and 4.2 identify system contexts of the IRP defined by the present document in terms of its implementation called IRPAgent and the user of the IRPAgent, called IRPManager. For a definition of IRPManager and IRPAgent, see 3GPP TS 32.102 [2].

The IRPAgent implements and supports this IRP. The IRPAgent can reside in an Element Manager (EM; for definition see 3GPP TS 32.101 [1]) or a Network Element (NE) (see also [2] clause 8). In the former case, the interface (represented by a thick dotted line) between the EM and the NEs is not the subject of this IRP.

An IRPManager using this IRP shall choose one of the two System Contexts defined here, for each NE. For instance, if an EM is responsible for managing a number of NEs, the NM shall access this IRP through the EM and not directly to those NEs. For another IRP though, the System Context may be different.

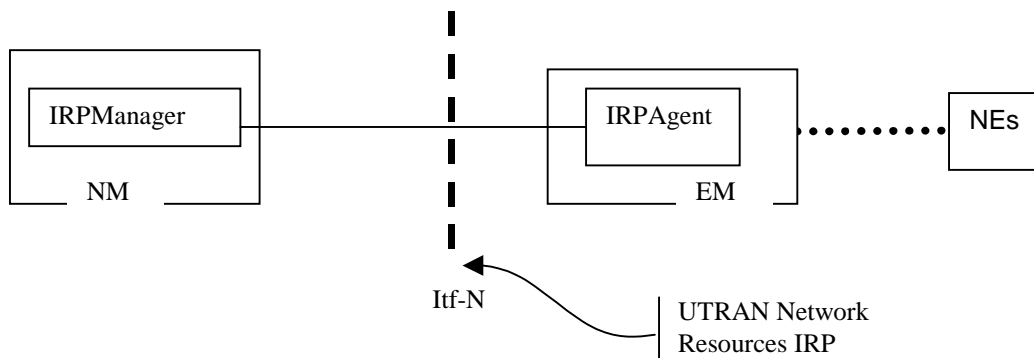


Figure 4.1: System Context A

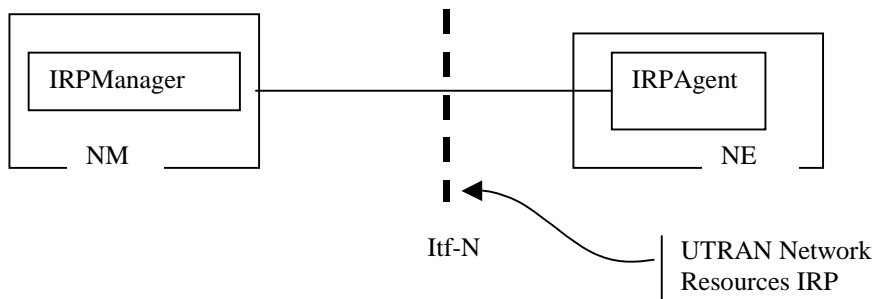


Figure 4.2: System Context B

4.2 Compliance rules

For general definitions of compliance rules related to qualifiers (Mandatory/Optional/Conditional) for *operations, notifications and parameters* (of operations and notifications) please refer to 3GPP TS 32.102 [2].

The following defines the meaning of Mandatory and Optional MOC attributes and associations between MOCs, in Solution Sets to the IRP defined by the present document:

- The IRPManager shall support all mandatory attributes/associations. The IRPManager shall be prepared to receive information related to mandatory as well as optional attributes/associations without failure; however the IRPManager does not have to support handling of the optional attributes/associations.
- The IRPAgent shall support all mandatory attributes/associations. It may support optional attributes/associations.

An IRPAgent that incorporates vendor-specific extensions shall support normal communication with a 3GPP SA5-compliant IRPManager with respect to all Mandatory and Optional managed object classes, attributes, associations, operations, parameters and notifications without requiring the IRPManager to have any knowledge of the extensions.

Given that

- rules for vendor-specific extensions remain to be fully specified, and
- many scenarios under which IRPManager and IRPAgent interwork may exist,

it is recognised that in Release 4/5 the IRPManager, even though it is not required to have knowledge of vendor-specific extensions, may be required to be implemented with an awareness that extensions can exist and behave accordingly.

5 Modelling approach

The modelling approach adopted and used in this IRP is described in the Generic Network Resources IRP: NRM [16].

6 IRP Information Model

6.1 Introduction

As already introduced in the previous clause, the present clause defines the UTRAN Network Resources IRP: Network Resource Model. That is, this model defines UTRAN specific MOCs that shall be contained by the generic MOCs defined in [16].

The managed object classes in this NRM are protocol environment neutral and the model does not define the syntax or encoding of the operations and parameters.

It should be noted that this model allows for combined managed element functionality, where more than one "function MOCs" (inherited from ManagedFunction) modelling more specific managed element functionality may be contained in the ManagedElement MOC.

The Information Service(s) to access managed objects of this NRM is defined elsewhere.

The corresponding Solution Set specifications provide protocol dependent definitions. They provide the actual realization of the operations and notifications defined in this clause in each protocol environment. One may find that the class/attribute definitions in the protocol-neutral model differ from those defined in the Solution Sets (e.g. due to mappings to existing standard models that are applicable for a specific Solution Set).

6.2 Managed Object Class (MOC) diagrams

A general note regarding all the notification tables defined for each MOC below: Each MOC may potentially send the notifications listed in the notification table for the MOC. The notifications with qualifier (M) shall be supported by the MOC, and the notifications with qualifier (O) may be supported by the MOC.

For example: If Notification notifyObjectCreation defined in Basic CM IRP has the qualifier (M), then if a MOC is defined such that it emits such a notification, this notification shall be emitted when appropriate (i.e. when a new object is created). If Notification notifyChangedAlarm has the qualifier (O) in Alarm IRP (see 3GPP TS 32.111-2 [11]), then if a MOC is defined such that it emits such a notification, this notification may or may not be emitted when appropriate. Further, if a notification in the qualifier column (of the MOC notification tables) has a reference to another specification, it means that the qualifier for the notification is specified in the referred specification.

6.2.1 Inheritance hierarchy

Figure 6.1 shows the inheritance hierarchy for the UTRAN NRM.

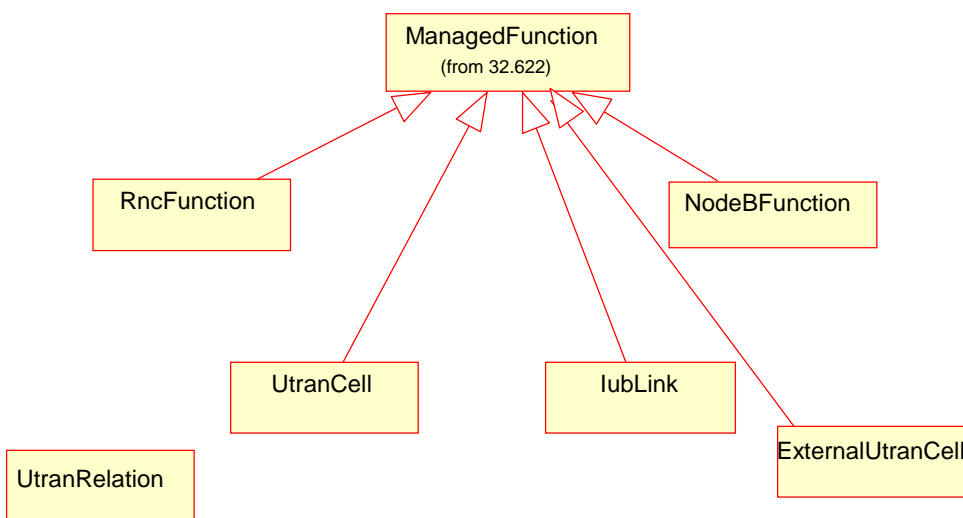
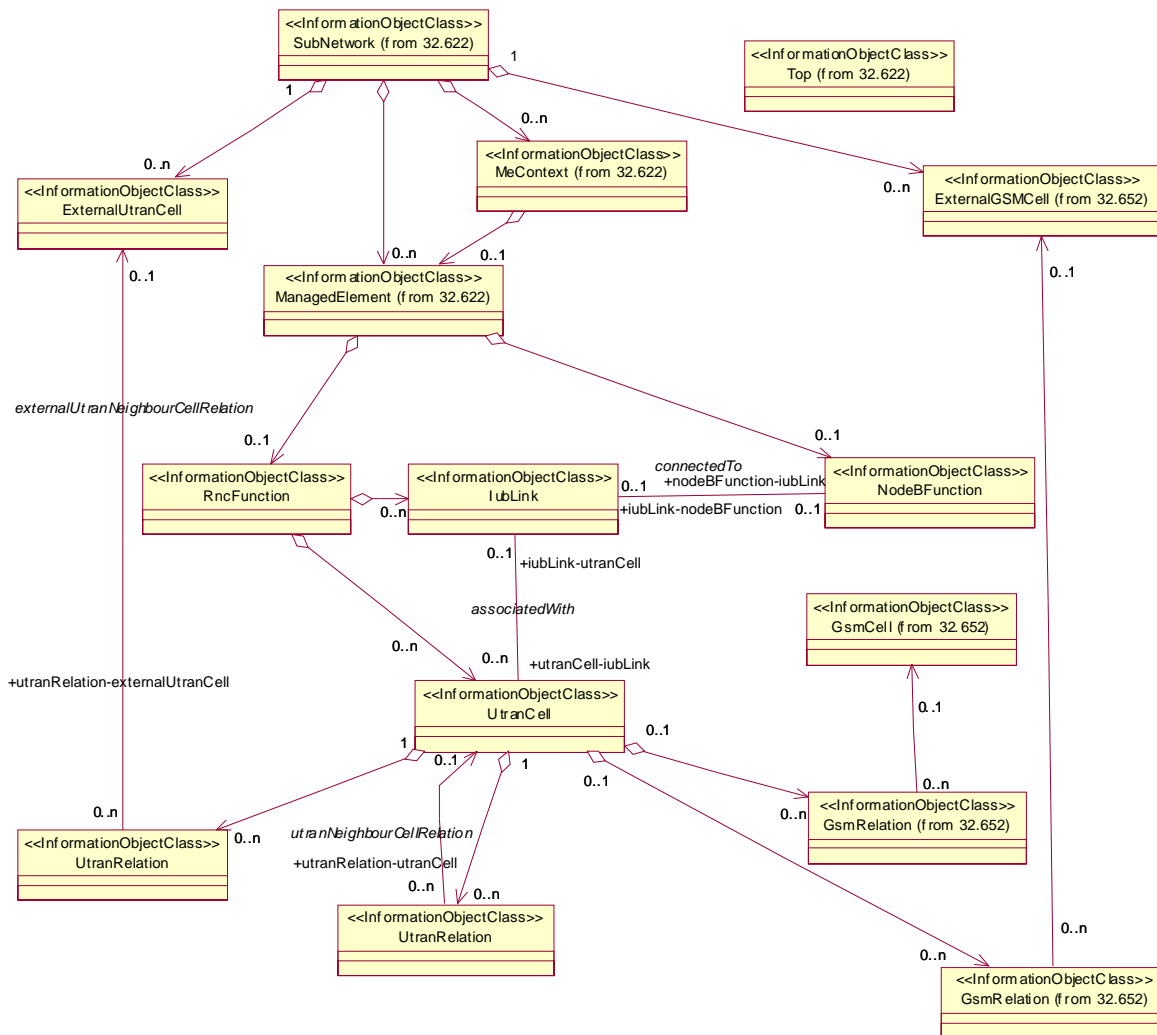


Figure 6.1: UTRAN NRM Inheritance Hierarchy

6.2.2 Containment/Naming and Association diagrams

Figure 6.2 and 6.3 show the containment/naming hierarchy and the associations of the UTRAN NRM.

NOTE: The Managed Object containment/naming relationships are in the diagram(s) below indicated by UML "Aggregation by reference" ("hollow diamonds").

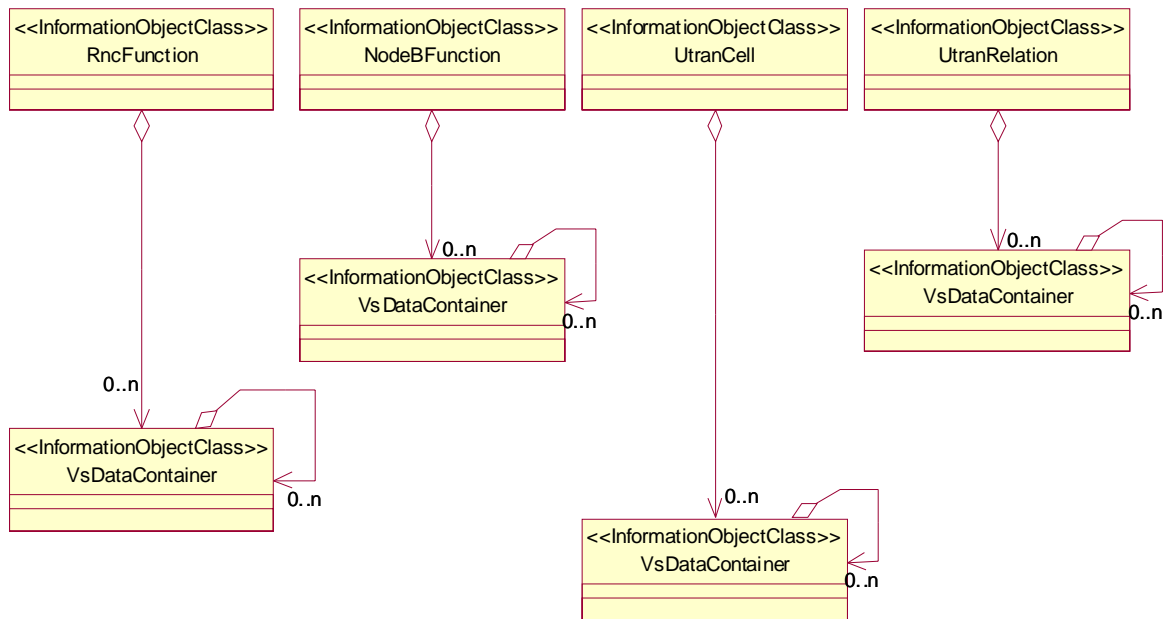


- NOTE 1: The listed cardinality numbers represent transient as well as steady-state numbers, and reflect all managed object creation and deletion scenarios.
- NOTE 2: The association between GsmRelation and GsmCell is optional. It may be valid if both the UtranCell and the GsmCell are managed by the same management node.
- NOTE 3: The UtranRelation and GsmRelation can be contained under MOCs defined in other NRMs.

Figure 6.2: UTRAN NRM Containment/Naming and Association diagram

Each Managed Object is identified with a Distinguished Name (DN) according to 3GPP TS 32.300 [13] that expresses its containment hierarchy. As an example, the DN of a Managed Object representing a cell could have a format like:

SubNetwork=Sweden,MeContext=MEC-Gbg-1,ManagedElement=RNC-Gbg-1, RncFunction=RF-1,UtranCell=Gbg-1.



NOTE 1: The listed cardinality numbers represent transient as well as steady-state numbers, and reflect all managed object creation and deletion scenarios.

NOTE 2: Each instance of the vsDataContainer shall only be contained under one MOC. The vsDataContainer can be contained under MOCs defined in other NRMs.

Figure 6.3: vsDataContainer Containment/Naming and Association in UTRAN NRM diagram

The vsDataContainer is only used for the Bulk CM IRP.

6.3 Managed Object Class (MOC) definitions

6.3.1 MOC RncFunction

This Managed Object Class represents RNC functionality. For more information about the RNC, see 3GPP TS 23.002 [15].

It inherits from ManagedFunction.

Table 6.1: Attributes of RncFunction

| Name | Qualifier | Description |
|--------------|---------------|---|
| rnFunctionId | READ-ONLY, M | An attribute whose "name+value" can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance. |
| userLabel | READ-WRITE, M | A user-friendly (and user assigned) name of the associated object. Inherited from ManagedFunction. |
| mcc | READ-WRITE, M | Mobile Country Code, MCC. It is a part of the PLMN Id (Ref. 3GPP TS 23.003 [3]). |
| mnc | READ-WRITE, M | Mobile Network Code, MNC. It is a part of the PLMN Id (Ref. 3GPP TS 23.003 [3]). |
| rnclId | READ-WRITE, M | Unique RNC ID (Ref. 3GPP TS 23.003 [3]) |

Table 6.2: Notifications of RncFunction

| Name | Qualifier | Notes |
|----------------------------|---------------------------------------|-------|
| notifyAckStateChanged | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyAttributeValueChange | O | |
| notifyChangedAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyClearedAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyNewAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyObjectCreation | O | |
| notifyObjectDeletion | O | |
| notifyComments | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyAlarmListRebuilt | See Alarm IRP (3GPP TS 32.111-2 [11]) | |

6.3.2 MOC NodeBFunction

This Managed Object Class represents NodeB functionality. For more information about the NodeB, see 3GPP TS 23.002 [15].

It inherits from ManagedFunction.

Table 6.3: Attributes of NodeBFunction

| Name | Qualifier | Description |
|-----------------------|---------------|---|
| nodeBFunctionId | READ-ONLY, M | An attribute whose "name+value" can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance. |
| userLabel | READ-WRITE, M | A user-friendly (and user assigned) name of the associated object. Inherited from ManagedFunction. |
| nodeBFunction-lubLink | READ-ONLY, M | The value of this attribute shall be the DN of the related lubLink instance. This is a reference attribute modelling the role (of the association ConnectedTo) that this NodeBFunction is connected to 0-1 lubLink. |

Table 6.4: Notifications of NodeBFunction

| Name | Qualifier | Notes |
|----------------------------|--|-------|
| notifyAckStateChanged | M, See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyAttributeValueChange | O | |
| notifyChangedAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyClearedAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyNewAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyObjectCreation | O | |
| notifyObjectDeletion | O | |
| notifyComments | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyAlarmListRebuilt | See Alarm IRP (3GPP TS 32.111-2 [11]) | |

6.3.3 MOC UtranCell

This Managed Object Class represents a radio cell controlled by the RNC. For more information about radio cells, see 3GPP TS 23.002 [15].

It inherits from ManagedFunction.

Table 6.5: Attributes of UtranCell

| Name | Qualifier | Description |
|--|---------------|--|
| utranCellId | READ-ONLY, M | An attribute whose "name+value" can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance. |
| userLabel | READ-WRITE, M | A user-friendly (and user assigned) name of the associated object. Inherited from ManagedFunction. |
| cId | READ-WRITE, M | Cid is the identifier of a cell in one RNC (Ref. 3GPP TS 25.401 [4]). |
| localCellId | READ-WRITE, M | Local Cell id is used to uniquely identify the set of resources defined in a Node B to support a cell (as defined by a Cid Ref. 3GPP TS 25.401 [4]). It must be unique in Node B at a minimum, but may be unique in UTRAN. It can be used to tie the cell in the RNC to a specific set of resources in the Node B. |
| uarfcnUl | READ-WRITE, M | The UL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3GPP TS 25.433 [5]). |
| uarfcnDl | READ-WRITE, M | The DL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3GPP TS 25.433 [5]). |
| primaryScramblingCode | READ-WRITE, M | The primary DL scrambling code used by the cell (Ref. 3GPP TS 25.433 [5]). |
| primaryCpichPower | READ-WRITE, M | The power of the primary CPICH channel in the cell (Ref. 3GPP TS 25.433 [5]). |
| maximumTransmissionPower | READ-WRITE, M | The maximum transmission power of a cell. It is the maximum power for all downlink channels added together, that is allowed to be used simultaneously in a cell. (Ref. 3GPP TS 25.433 [5]). |
| primarySchPower | READ-WRITE, M | The power of the primary synchronisation channel in the cell, DL Power (Ref. 3GPP TS 25.433 [5]). |
| secondarySchPower | READ-WRITE, M | The power of the secondary synchronisation channel in the cell, DL Power (Ref. 3GPP TS 25.433 [5]). |
| bchPower | READ-WRITE, M | The power of the broadcast channel in the cell (Ref. 3GPP TS 25.433 [5]). |
| lac | READ-WRITE, M | Location Area Code, LAC (Ref. 3GPP TS 23.003 [3]) |
| rac | READ-WRITE, O | Routing Area Code, RAC (Ref. 3GPP TS 23.003 [3]) See Note for the optional condition |
| sac | READ-WRITE, M | Service Area Code, SAC (Ref. 3GPP TS 23.003 [3]). |
| uraList | READ-WRITE, O | A list of UTRAN Registration Area, URA (Ref. 3GPP TS 25.331 (clause 10.3.10) [9]). See Note for the optional condition |
| utranCell-lubLink | READ-ONLY, M | The value of this attribute shall be the DN of the related lubLink instance. This is a reference attribute modelling the role (of the association AssociatedWith) that this UtranCell is associated with 0-1 lubLink. |
| NOTE: The attributes rac and uraList shall be included if the PLMN contains a PS CN. | | |

Table 6.6: Notifications of UtranCell

| Name | Qualifier | Notes |
|----------------------------|---------------------------------------|-------|
| notifyAckStateChanged | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyAttributeValueChange | O | |
| notifyChangedAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyClearedAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyNewAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyObjectCreation | O | |
| notifyObjectDeletion | O | |
| notifyComments | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyAlarmListRebuilt | See Alarm IRP (3GPP TS 32.111-2 [11]) | |

6.3.4 MOC IubLink

The "Iub link" managed object is the logical link to a NodeB as seen from the RNC. For more information about the RNC, see 3GPP TS 23.002 [15].

It inherits from ManagedFunction.

Table 6.7: Attributes of IubLink

| Name | Qualifier | Description |
|-----------------------|---------------|--|
| IubLinkId | READ-ONLY, M | An attribute whose "name+value" can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance. |
| userLabel | READ-WRITE, M | A user-friendly (and user assigned) name of the associated object. Inherited from ManagedFunction. |
| IubLink-UtranCell | READ-WRITE, M | The value of this attribute shall be a list of the DN(s) of the related UtranCell instance(s). This is a reference attribute modelling the role (of the association AssociatedWith) that this IubLink is associated with 0-N UtranCells. |
| IubLink-NodeBFunction | READ-ONLY, M | The value of this attribute shall be the DN of the related NodeBFunction instance. This is a reference attribute modelling the role (of the association ConnectedTo) that this IubLink is connected to 0-1 NodeBFunction. |

Table 6.8: Notifications of IubLink

| Name | Qualifier | Notes |
|----------------------------|---------------------------------------|-------|
| notifyAckStateChanged | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyAttributeValueChange | O | |
| notifyChangedAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyClearedAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyNewAlarm | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyObjectCreation | O | |
| notifyObjectDeletion | O | |
| notifyComments | See Alarm IRP (3GPP TS 32.111-2 [11]) | |
| notifyAlarmListRebuilt | See Alarm IRP (3GPP TS 32.111-2 [11]) | |

6.3.5 MOC UtranRelation

The "UtranRelation" managed object contains radio network related parameters for the relation to the "UtranCell" or "ExternalUtranCell" managed object.

NOTE: In handover relation terms, the cell containing the UTRAN Relation object is the source cell for the handover. The cell referred to in the UTRAN relation object is the target cell for the handover. This defines a one-way handover relation where the direction is *from* source cell *to* target cell.

Table 6.9: Attributes of UtranRelation

| Name | Qualifier | Description |
|--|---------------|--|
| utranRelationId | READ-ONLY, M | An attribute whose "name+value" can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance. |
| adjacentCell | READ-WRITE, M | Pointer to UTRAN cell or external UTRAN cell. Distinguished name of the corresponding object. |
| uarfcnUl | READ-ONLY, O | The UL UTRA absolute Radio Frequency Channel number for another UTRAN cell or the external UTRAN cell, that is broadcast in System Information in the Cell, UARFCN (Ref. 3GPP TS 25.433 [5]). See Note for the optional condition. |
| uarfcnDl | READ-ONLY, O | The DL UTRA absolute Radio Frequency Channel number for another UTRAN cell or the external UTRAN cell, that is broadcast in System Information in the Cell, UARFCN (Ref. 3GPP TS 25.433 [5]). See Note for the optional condition. |
| primaryScramblingCode | READ-ONLY, O | The primary DL scrambling code for another UTRAN cell or the external UTRAN cell, that is broadcast in System Information in the Cell (Ref. 3GPP TS 25.433 [5]). See Note for the optional condition. |
| primaryCpichPower | READ-ONLY, O | The power of the primary CPICH channel for another UTRAN cell or the external UTRAN cell, that is broadcast in System Information in the Cell (Ref. 3GPP TS 25.433 [5]). See Note for the optional condition. |
| lac | READ-ONLY, O | Location Area Code, LAC (Ref. 3GPP TS 23.003 [3]), for another UTRAN cell or the external UTRAN cell, that is broadcast in System Information in the Cell. See Note for the optional condition. |
| NOTE: This attribute shall be included if the EM does not guarantee consistency between the cell definition and what is broadcast on system information. | | |

Table 6.10: Notifications of UtranRelation

| Name | Qualifier | Notes |
|----------------------------|-----------|-------|
| notifyAttributeValueChange | O | |
| notifyObjectCreation | O | |
| notifyObjectDeletion | O | |

6.3.6 MOC ExternalUtranCell

This Managed Object Class represents a radio cell controlled by another IRPAgent. This MOC has necessary attributes for inter-system handover. It contains a subset of the attributes of related MOCs controlled by another IRPAgent. The way to maintain consistency between the attribute values of these two MOCs is outside the scope of this document.

Table 6.11: Attributes of ExternalUtranCell

| Name | Qualifier | Description |
|---|---------------|---|
| externalUtranCellId | READ-ONLY, M | An attribute whose "name+value" can be used as an RDN when naming an instance of this object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance. |
| userLabel | READ-WRITE, M | A user-friendly (and user assigned) name of the associated object. |
| cld | READ-WRITE, M | Cid is the identifier of a cell in one RNC (Ref. 3GPP TS 25.401 [4]). |
| mcc | READ-WRITE, M | Mobile Country Code, MCC (part of the PLMN Id, Ref. 3GPP TS 23.003 [3]). |
| mnc | READ-WRITE, M | Mobile Network Code, MNC (part of the PLMN Id, Ref. 3GPP TS 23.003 [3]). |
| rnclId | READ-WRITE, M | Unique RNC ID for the drift RNC (Ref. 3GPP TS 23.003 [3]). |
| uarfcnUl | READ-WRITE, M | The UL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3GPP TS 25.433 [5]). |
| uarfcnDl | READ-WRITE, M | The DL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3GPP TS 25.433 [5]). |
| primaryScramblingCode | READ-WRITE, M | The primary DL scrambling code used by the cell (Ref. 3GPP TS 25.433 [5]). |
| primaryCpichPower | READ-WRITE, M | The power of the primary CPICH channel in the cell (Ref. 3GPP TS 25.433 [5]). |
| lac | READ-WRITE, M | Location Area Code, LAC (Ref. 3GPP TS 23.003 [3]). |
| rac | READ-WRITE, O | Routing Area Code, RAC (Ref. 3GPP TS 23.003 [3]). See Note for the optional condition |
| NOTE: The attribute rac shall be included if the external cell is connected to a PS CN. | | |

Table 6.12: Notifications of ExternalUtranCell

| Name | Qualifier | Notes |
|----------------------------|-----------|-------|
| notifyAttributeValueChange | O | |
| notifyObjectCreation | O | |
| notifyObjectDeletion | O | |

6.4 Associations

6.4.1 Association ConnectedTo (M)

This bi-directional association models the relationship between the IubLink and NodeB (through the NodeBFunction). It has two roles, named IubLink-NodeBFunction and NodeBFunction-IubLink. These two roles model each MOC's association with the other MOC. Each role is in the MOC definition mapped to a reference attribute with the same name.

6.4.2 Association AssociatedWith (M)

This bi-directional association models the relationship between the IubLink and UtranCell. It has two roles, named IubLink-UtranCell and UtranCell-IubLink. These two roles model each MOC's association with the other MOC. Each role is in the MOC definition mapped to a reference attribute with the same name.

Annex A (informative): Supported UTRAN network configurations

Figure A.1 depicts four typical network configurations, which are supported by the UTRAN NRM over the Itf-N. However, this does not preclude support for other configurations.

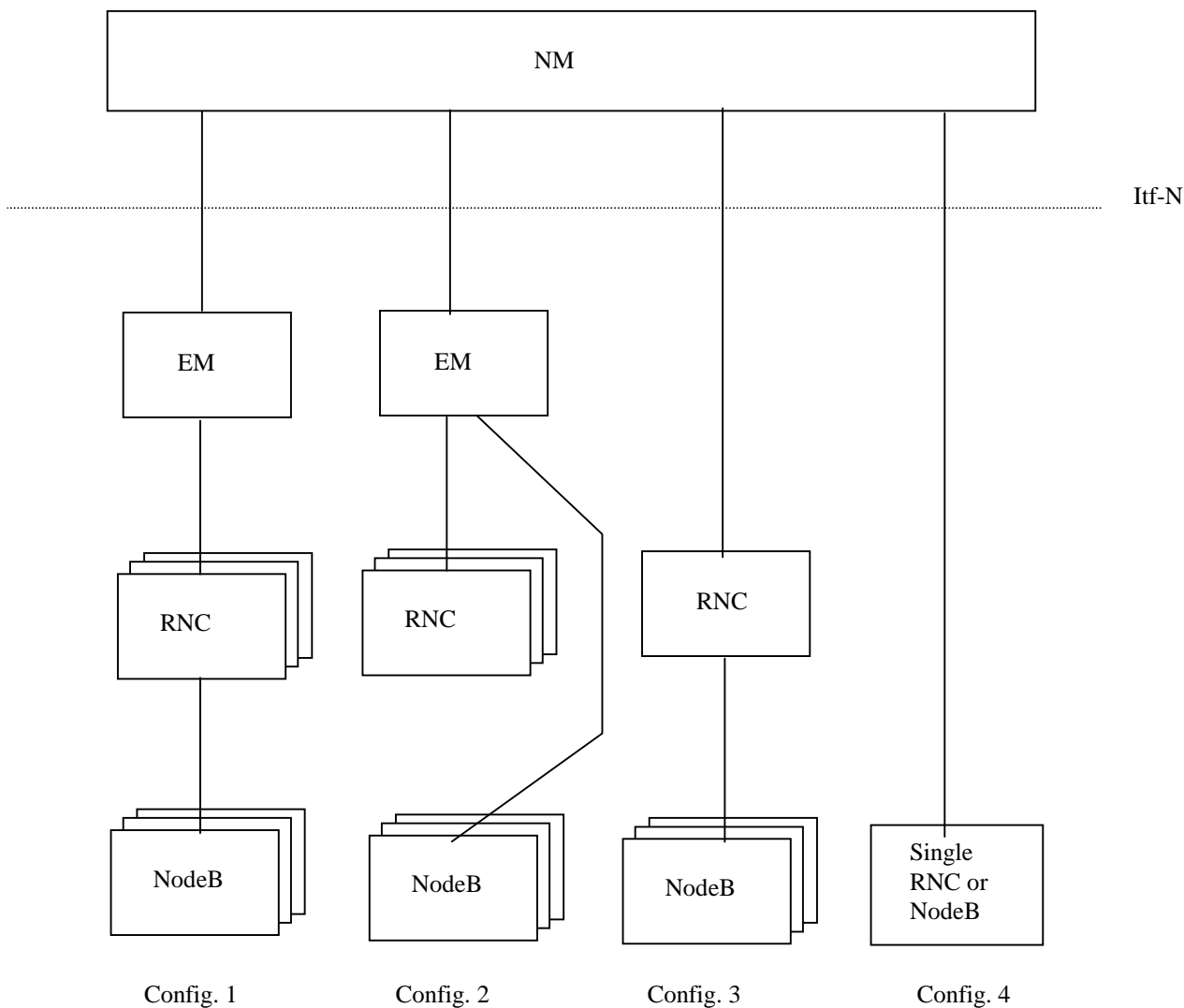


Figure A.1: Typical network configurations supported by the UTRAN NRM

Table A.1 shows the possible number of instances for each network configuration (counted from left to right in figure A.1.):

Table A.1: Number of instances for each example configuration in figure A.1

| MOC | Config. 1 | Config. 2 | Config. 3 | Config. 4 |
|-----------------|-----------|-----------|-----------|-----------|
| SubNetwork | 1 | 1 | 1 | 0..1 |
| ManagementNode | 1 | 1 | 0 | 0 |
| ManagedElement | 1..N | 1..N | 1..N | 1 |
| MeContext | 0..M | 0..M | 0..M | 0..1 |
| RncFunction | 0..P | 0..P | 0..1 | 0..1 |
| NodeBFunction | 0..Q | 0..Q | 0..(N-1) | 0..1 |
| IubLink | 0..Q | 0..Q | 0..(N-1) | 0 |
| UtranCell | 0..R | 0..R | 0..R | 0..R |
| IRPAgent | 1 | 1 | 1 | 1 |
| NotificationIRP | 1 | 1 | 1 | 1 |
| AlarmIRP | 0..1 | 0..1 | 0..1 | 0..1 |
| BasicCmIRP | 0..1 | 0..1 | 0..1 | 0..1 |

Annex B (informative): Change history

| Change history | | | | | | | |
|----------------|-------|-----------|-----|-----|--|-------|-------|
| Date | TSG # | TSG Doc. | CR | Rev | Subject/Comment | Old | New |
| Jun 2001 | S_12 | SP-010283 | -- | -- | Approved at TSG SA #12 and placed under Change Control | 2.0.0 | 4.0.0 |
| Jun 2002 | S_16 | SP-020303 | 001 | -- | Corrections of reference in figure 6.2 and of attribute descriptions in UtranRelation in 32.642 (UTRAN network resources IRP: NRM) | 4.0.0 | 4.1.0 |
| Jun 2002 | S_16 | SP-020304 | 002 | -- | Correction of supported IRP in system context | 4.0.0 | 4.1.0 |
| Sep 2002 | S_17 | SP-020490 | 003 | -- | UML corrections | 4.1.0 | 4.2.0 |
| Jun 2003 | S_20 | SP-030282 | 007 | -- | Add missing notifications from all managed objects (notifyComments, notifyAlarmListRebuilt) | 4.2.0 | 4.3.0 |
| Jun 2003 | S_20 | SP-030282 | 009 | -- | Correction of UML diagram vsDataContainer Containment/Naming and Association in UTRAN NRM | 4.2.0 | 4.3.0 |
| Jun 2003 | S_20 | SP-030283 | 011 | -- | Deletion of UTRAN attribute relationType | 4.2.0 | 4.3.0 |
| Dec 2003 | S_22 | SP-030715 | 013 | -- | Correction in attribute description for "maximumTransmissionPower" to remove dual interpretation – Align with RAN3's TS 25.433 | 4.3.0 | 4.4.0 |
| Dec 2003 | S_22 | SP-030646 | 015 | -- | Correction of the number of possible URAs from 1 to 8 | 4.3.0 | 4.4.0 |
| Mar 2005 | S_27 | SP-050048 | 030 | -- | Align with SA2's 23.221, for allowing only CS CN in a PLMN | 4.4.0 | 4.5.0 |
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History

| Document history | | |
|-------------------------|----------------|-------------|
| V4.0.0 | July 2001 | Publication |
| V4.1.0 | June 2002 | Publication |
| V4.2.0 | September 2002 | Publication |
| V4.3.0 | June 2003 | Publication |
| V4.4.0 | December 2003 | Publication |
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