Source: **SA5 (Telecom Management)**

Title: **Rel-5 CRs 32.642 (UTRAN network resources Integration Reference Point (IRP): Network Resource Model)**

Document for: **Approval**

Agenda Item: **7.5.3**

Doc-1st-	Spec	CR	Rev	Phase	Subject	Cat	Version-	Doc-2nd-	Workitem
SP-020492	32.642	004	-	Rel-5	**Add the new IRP IS methodology defined in 32.102**	F	4.1.0	S5-026717	OAM-NIM
SP-020492	32.642	005	-	Rel-5	**Add State Management**	B	4.1.0	S5-026735	OAM-NIM

CR-Form-v7

CHANGE REQUEST

⌘ | **32.642** CR **004** | ⌘**rev** | **-** | ⌘ | Current version: | **4.1.0** | ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network **X** Core Network ☐

Title: ⌘	Add the new IRP IS methodology defined in 32.102	
Source: ⌘	S5	
Work item code: ⌘	OAM- NIM	***Date:*** ⌘ 23/08/2002
Category: ⌘	**F**	***Release:*** ⌘ Rel-5

Use <u>one</u> of the following categories:
F (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)
Rel-6 (Release 6)

Reason for change: ⌘	The specification is not following the new methodology in Rel-5.
Summary of change: ⌘	The structure of the specification is changed in accordance with 32.102. (Unused abbreviations and definitions have been removed.)
Consequences if not approved: ⌘	The specification will not be in the format of the new Rel-5 methodology.

Clauses affected: ⌘	Introduction, 3.1, 3.2, 4.2, 6.1, 6.2, 6.2.1, 6.2.2, 6.3, 6.3.1, 6.3.1.1, 6.3.1.2, 6.3.2, 6.3.2.1, 6.3.2.2, 6.3.3, 6.3.3.1, 6.3.3.2, 6.3.4, 6.3.4.1, 6.3.4.2, 6.3.5, 6.3.5.1, 6.3.5.2, 6.3.5.3, 6.3.6, 6.3.6.1, 6.3.6.2, 6.4, 6.4.1, 6.4.1.1, 6.4.1.2, 6.4.1.3, 6.4.2, 6.4.2.1, 6.4.2.2, 6.4.2.3, 6.4.3, 6.4.3.1, 6.4.3.2, 6.4.3.3, 6.4.4, 6.4.4.1, 6.4.4.2, 6.4.4.3, 6.5, 6.5.1, 6.5.2 and 6.6.

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments: ⌘	

Introduction

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

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,

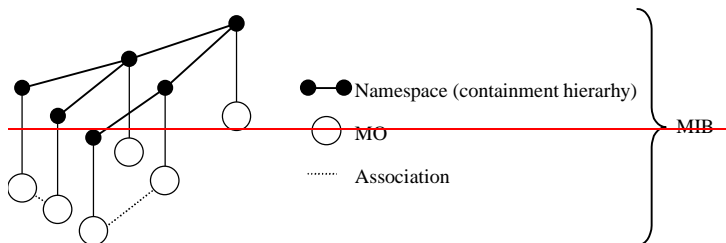(2) reference attributes, and

(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. This class, called **Information Object Class (IOC)**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, the IOC 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). The IOC An MO class may support the emission of 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 identifies and describes the IOCs~~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
IOC	Information Object Class
IRP	Integration Reference Point
ITU-T	International Telecommunication Union, Telecommunication Sector
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
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	UMTS Terrestrial Radio Access Network
~~XML~~	~~eXtensible Mark-up Language~~

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~~ IOC attributes and associations between ~~MOCs~~IOCs, in Solution Sets to the IRP defined by the present document.

Solution Sets to the Basic CM IRP:

- 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.

6　　IRP Information Model

6.1　　Information entities imported and local labels~~Introduction~~

None.

~~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 subclause 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　　Class diagram~~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　　Attributes and relationships

This sub-clause depicts the set of IOCs that encapsulate information relevant for this service. This sub-clause provides the overview of all information object classes in UML. Subsequent sub-clauses provide more detailed specification of various aspects of these information object classes.

Figure 6.2.1.1 show the name-containment relation and other types of relations of the UTRAN NRM.

NOTE:　　The name-containment relations between IOCs are indicated by UML "unidirectional 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 relation between GsmRelation and GsmCell is optional. It may be present if both the UtranCell and the GsmCell are managed by the same management node.

NOTE 3: The UtranRelation and GeranRelation can be name-contained under IOCs defined in other NRMs.

Figure 6.2.1.1: UTRAN NRM Containment/Naming and Association diagram

Each IOC 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 IOC representing a cell could have a format like:

SubNetwork=Sweden,meContext=MEC-Gbg-1,ManagedElement=RNC-Gbg-1, rncFunction=RF-1,utranCell=Gbg-1.

6.2.2 Inheritance~~Inheritance hierarchy~~

This sub-clause depicts the inheritance relationships that exist between IOCs.

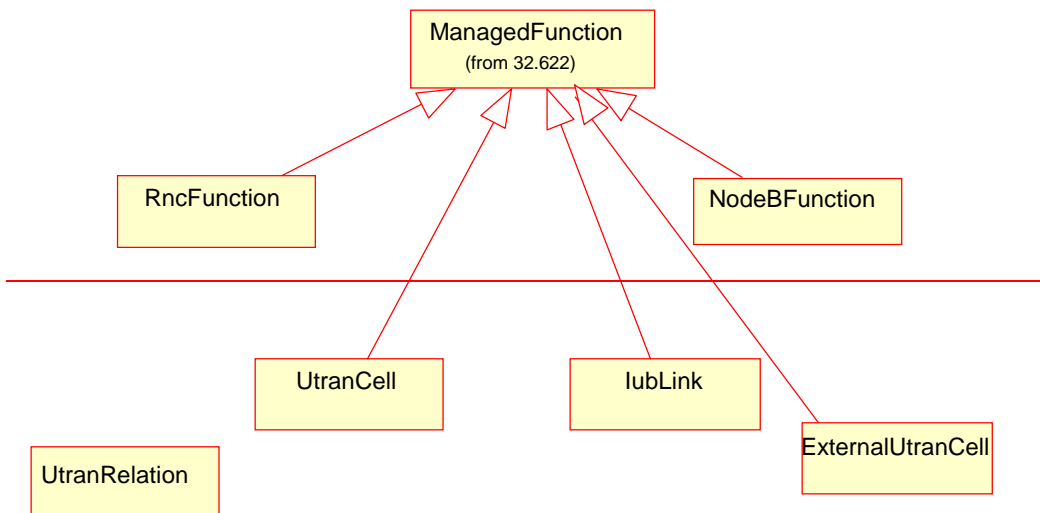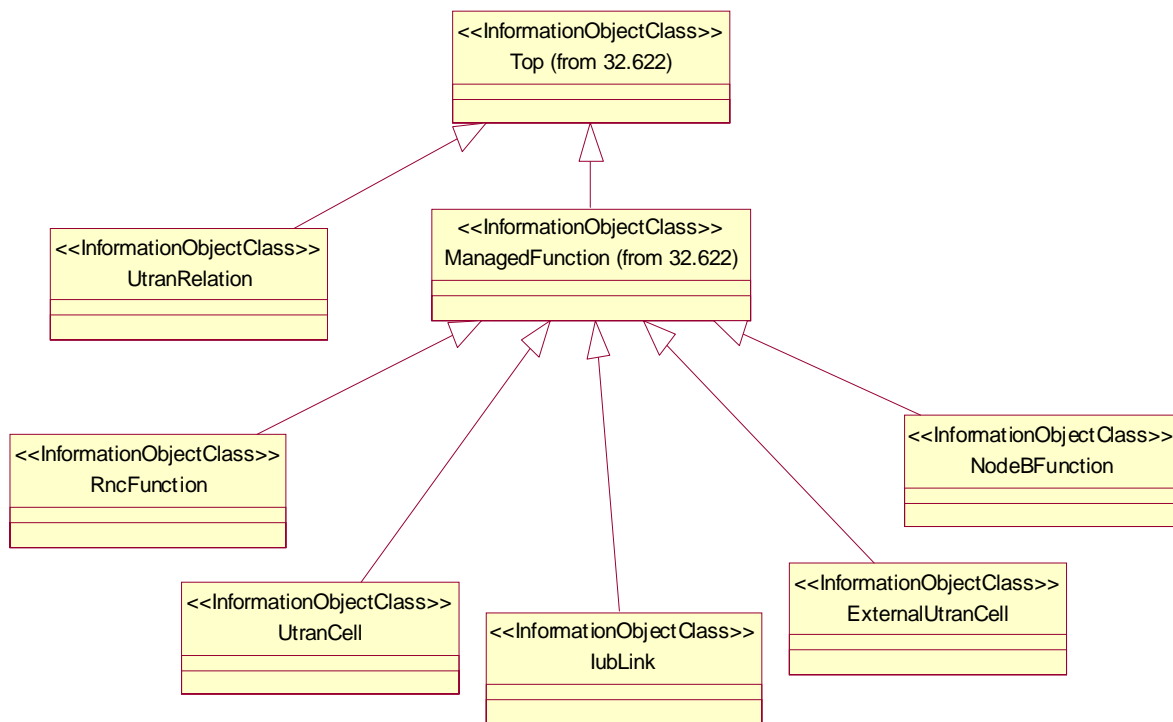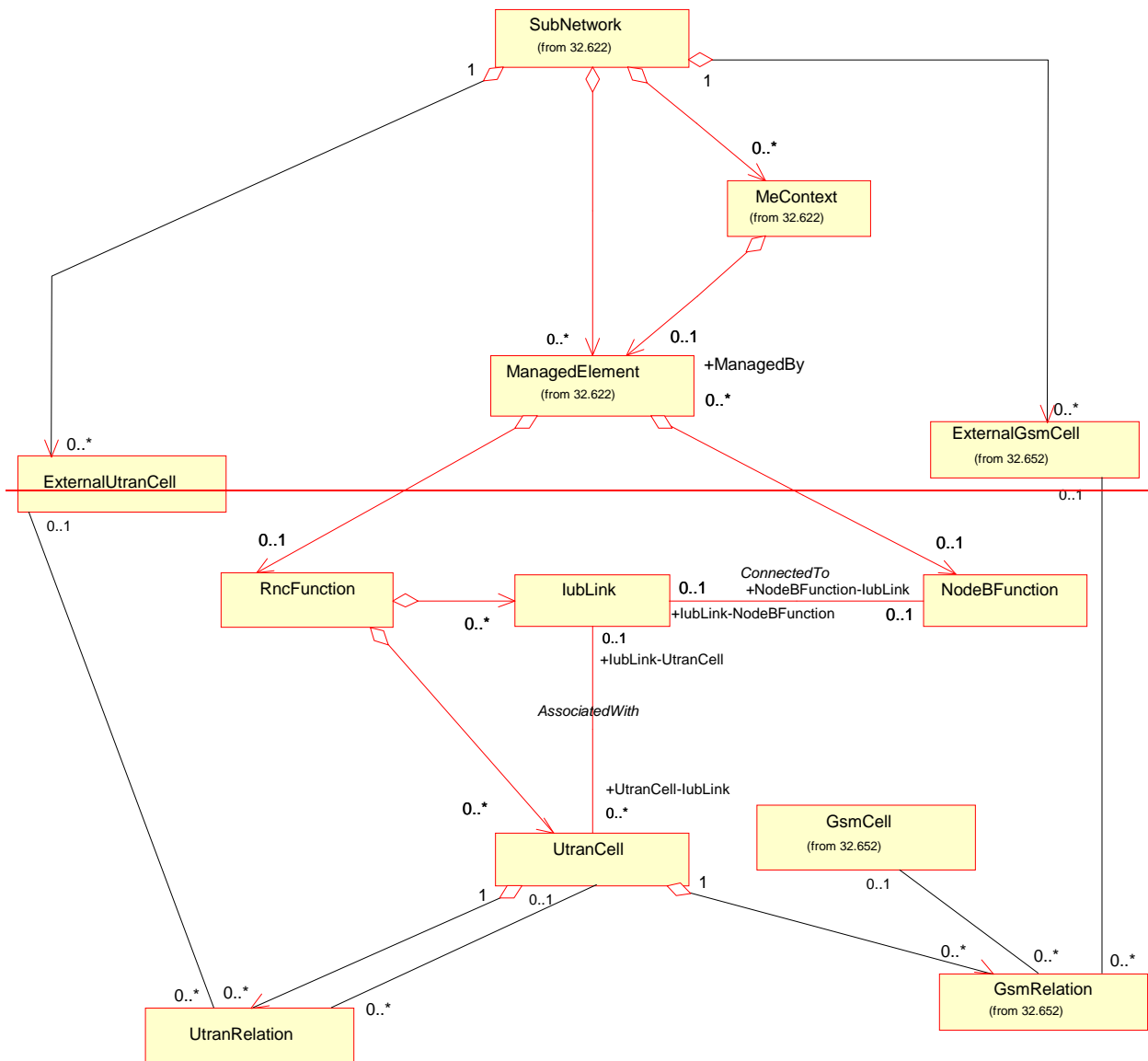Figure 6.2.2 ~~6.1~~ shows the inheritance hierarchy for the UTRAN NRM.

Figure 6.2.2~~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 GeranRelation 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.
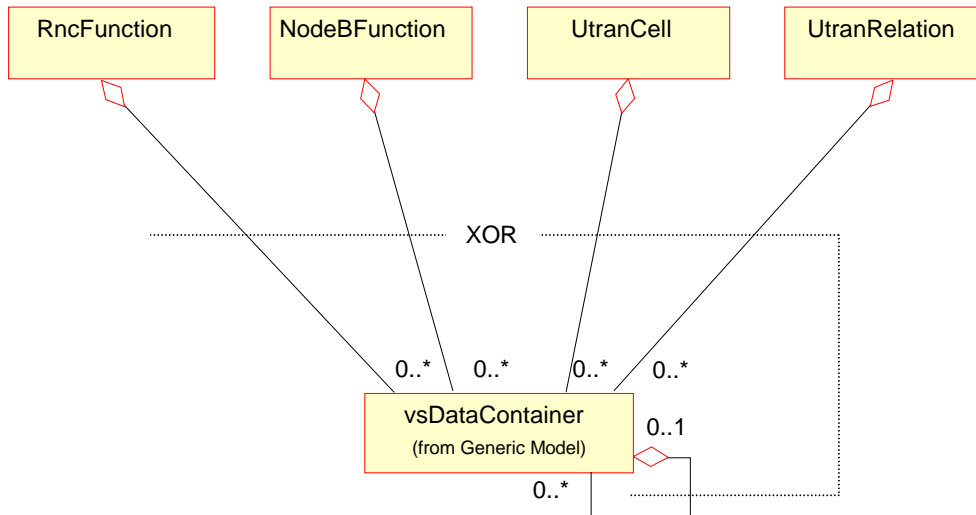
NOTE 2: Each instance of the vsDataContainer shall only be contained under one MOC. The vsDataContainer can be contained under MOCs defined in other NRMs.

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

The vsDataContainer is only used for the Bulk CM IRP.

6.3 Information object classes definition~~Managed Object Class (MOC) definitions~~

6.3.1 ~~MOC~~ RncFunction

6.3.1.1 Definition

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

~~It inherits from ManagedFunction.~~

6.3.1.2 Attributes

Table 1: Attributes of `RncFunction`

Attribute name	Visibility	Support Qualifier	Read Qualifer	Write Qualifier
rncFunctionId	+	M	M	–
userLabel	+	M	M	M
mcc	+	M	M	M

mnc	+	M	M	M
rncId	+	M	M	M

Name	Qualifier	Description
rncFunctionId	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. 3 GPP TS 23.003 [3]).
mnc	READ-WRITE, M	Mobile Network Code, MNC. It is a part of the PLMN Id (Ref. 3 GPP TS 23.003 [3]).
rncId	READ-WRITE, M	Unique RNC ID (Ref. 3 GPP TS 23.003 [3])

Table 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	

6.3.2   ~~MOC~~ NodeBFunction

6.3.2.1   Definition

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

~~It inherits from ManagedFunction.~~

6.3.2.2   Attributes

Table ~~3~~2: Attributes of `NodeBFunction`

Attribute name	Visibility	Support Qualifier	Read Qualifer	Write Qualifier
nodeBFunctionId	+	M	M	–
userLabel	+	M	M	M
nodeBFunction-IubLink	+	M	M	–

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-IubLink	READ-ONLY, M	The value of this attribute shall be the DN of the related IubLink instance. This is a reference attribute modelling the role (of the association ConnectedTo) that this NodeBFunction is connected to 0-1 IubLink.

Table 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	

6.3.3   MOC UtranCell

6.3.3.1   Definition

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

~~It inherits from ManagedFunction.~~

6.3.3.2   Attributes

Table 53: Attributes of UtranCell

Attribute name	Visibility	Support Qualifier	Read Qualifer	Write Qualifier
utranCellId	+	M	M	–
userLabel	+	M	M	M
cId	+	M	M	M
localCellId	+	M	M	M
uarfcnUl	+	M	M	M
uarfcnDl	+	M	M	M
primaryScramblingCode	+	M	M	M
primaryCpichPower	+	M	M	M
maximumTransmissionPower	+	M	M	M
primarySchPower	+	M	M	M
secondarySchPower	+	M	M	M
bchPower	+	M	M	M
lac	+	M	M	M
rac	+	M	M	M
sac	+	M	M	M
ura	+	M	M	M
utranCell-IubLink	+	M	M	–

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. 3 GPP 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. 3 GPP 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. 3 GPP TS 25.433 [5]).
uarfcnDl	READ-WRITE, M	The DL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3 GPP TS 25.433 [5]).
primaryScramblingCode	READ-WRITE, M	The primary DL scrambling code used by the cell (Ref. 3 GPP TS 25.433 [5]).
primaryCpichPower	READ-WRITE, M	The power of the primary CPICH channel in the cell (Ref. 3 GPP TS 25.433 [5]).
maximumTransmissionPower	READ-WRITE, M	The maximum transmission power of a cell, DL Power (Ref. 3 GPP TS 25.433 [5]).
primarySchPower	READ-WRITE, M	The power of the primary synchronisation channel in the cell, DL Power (Ref. 3 GPP TS 25.433 [5]).
secondarySchPower	READ-WRITE, M	The power of the secondary synchronisation channel in the cell, DL Power (Ref. 3 GPP TS 25.433 [5]).
bchPower	READ-WRITE, M	The power of the broadcast channel in the cell (Ref. 3 GPP TS 25.433 [5]).
lac	READ-WRITE, M	Location Area Code, LAC (Ref. 3 GPP TS 23.003 [3])
rac	READ-WRITE, M	Routing Area Code, RAC (Ref. 3 GPP TS 23.003 [3]
sac	READ-WRITE, M	Service Area Code, SAC (Ref. 3 GPP TS 23.003 [3]).
ura	READ-WRITE, M	UTRAN Registration Area, URA (Ref. 3 GPP TS 25.423 [6]).
utranCell-IubLink	READ-ONLY, M	The value of this attribute shall be the DN of the related IubLink instance. This is a reference attribute modelling the role (of the association AssociatedWith) that this UtranCell is associated with 0-1 IubLink.

Table 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	

6.3.4 ~~MOC~~ IubLink

6.3.4.1 Definition

This IOC represents~~The 'Iub link' managed object is~~ the logical link to a Node B as seen from the RNC. For more information about the RNC, see 3GPP TS 23.002 [15].

~~It inherits from ManagedFunction.~~

6.3.4.2   Attributes

Table 74: Attributes of IubLink

Attribute name	Visibility	Support Qualifier	Read Qualifer	Write Qualifier
iubLinkId	+	M	M	–
userLabel	+	M	M	M
iubLink-UtranCell	+	M	M	M
iubLink-NodeBFunction	+	M	M	–

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 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	

6.3.5   ~~MOC~~ UtranRelation

6.3.5.1   Definition

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

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.

6.3.5.2   Attributes

Table 95: Attributes of UtranRelation

Attribute name	Visibility	Support Qualifier	Read Qualifer	Write Qualifier
utranRelationId	+	M	M	–
relationType	+	M	M	M
adjacentCell	+	M	M	M
uarfcnUl	+	O	M	–
uarfcnDl	+	O	M	–
primaryScramblingCode	+	O	M	–
primaryCpichPower	+	O	M	–

lac	+	O	M	-

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.
relationType	READ-WRITE,M	Type of relation: e.g. Intersystem relation, intrafrequency intrasystem relation, interfrequency intrasystem relation.
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. 3 GPP 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. 3 GPP 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. 3 GPP 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. 3 GPP TS 25.433 [5]). See Note for the optional condition.
lac	READ-ONLY, O	Location Area Code, LAC (Ref. 3 GPP 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 10: Notifications of UtranRelation

Name	Qualifier	Notes
notifyAttributeValueChange	O	
notifyObjectCreation	O	
notifyObjectDeletion	O	

6.3.5.3 Attribute constraints

The optionally attributes uarfcnUl, uarfcnDl, primaryScramblingCode, primaryCpichPower and lac shall be included if the EM does not guarantee consistency between the cell definition and what is broadcast on system information. Otherwise they shall not be included.

6.3.6 ~~MOC~~ ExternalUtranCell

6.3.6.1 Definition

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

6.3.6.2 Attributes

Table ~~11~~6: Attributes of `ExternalUtranCell`

Attribute name	Visibility	Support Qualifier	Read Qualifer	Write Qualifier
externalUtranCellId	+	M	M	–
userLabel	+	M	M	M
cId	+	M	M	M
mcc	+	M	M	M
mnc	+	M	M	M
rncId	+	M	M	M
uarfcnUl	+	M	M	M
uarfcnDl	+	M	M	M
primaryScramblingCode	+	M	M	M
primaryCpichPower	+	M	M	M
lac	+	M	M	M
rac	+	M	M	M

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.
cId	READ-WRITE, M	Cid is the identifier of a cell in one RNC (Ref. 3 GPP TS 25.401 [4]).
mcc	READ-WRITE, M	Mobile Country Code, MCC (part of the PLMN Id, Ref. 3 GPP TS 23.003 [3]).
mnc	READ-WRITE, M	Mobile Network Code, MNC (part of the PLMN Id, Ref. 3 GPP TS 23.003 [3]).
rncId	READ-WRITE, M	Unique RNC ID for the drift RNC (Ref. 3 GPP TS 23.003 [3]).
uarfcnUl	READ-WRITE, M	The UL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3 GPP TS 25.433 [5]).
uarfcnDl	READ-WRITE, M	The DL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3 GPP TS 25.433 [5]).
primaryScramblingCode	READ-WRITE, M	The primary DL scrambling code used by the cell (Ref. 3 GPP TS 25.433 [5]).
primaryCpichPower	READ-WRITE, M	The power of the primary CPICH channel in the cell (Ref. 3 GPP TS 25.433 [5]).
lac	READ-WRITE, M	Location Area Code, LAC (Ref. 3 GPP TS 23.003 [3]).
rac	READ-WRITE, M	Routing Area Code, RAC (Ref. 3 GPP TS 23.003 [3]).

Table 12: Notifications of `ExternalUtranCell`

Name	Qualifier	Notes
notifyAttributeValueChange	O	
notifyObjectCreation	O	
notifyObjectDeletion	O	

6.4 Information relationships definition~~Associations~~

6.4.1 ~~Association~~ ConnectedTo (M)

6.4.1.1 Definition

This represents a bi-directional ~~association models the~~ relationship between the IubLink and Node B (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 <u>IOC's</u> role ~~is in the MOC definition~~ mapped to <u>an IOC</u>~~a~~ reference ~~attribute with the same name~~. <u>The names of the reference attribute and the role are the same.</u>

6.4.1.2 Roles

Table 7: Roles of the relation ConnectedTo

Name	Definition
iubLink-nodeBFunction	This role (when present) represents IubLink capability to identify one NodeBFunction. When the role is absent, the IubLink.iubLink-nodeBFunction shall contain no information. When present, it shall contain one NodeBFunction DN.
nodeBFunction-iubLink	This role (when present) represents NodeBFunction capability to identify one IubLink. When the role is absent, the NodeBFunction.nodeBFunction-iubLink shall contain no information. When present, it shall contain one IubLink DN.

6.4.1.3 Constraints

When a particular IubLink identifies a particular NodeBFunction, that particular NodeBFunction must identify the particular IubLink.

6.4.2 ~~Association~~ AssociatedWith (M)

6.4.2.1 Definition

This <u>represents a</u> bi-directional <u>relation</u> ~~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~~ <u>The</u> role <u>of the IOC shall be</u> ~~is~~ ~~in the MOC definition~~ mapped to a reference attribute <u>of the IOC. The name of the reference attribute shall be the role name.</u> ~~with the same name.~~

6.4.2.2 Roles

Table 8: Roles of the relation AssociatedWith

Name	Definition
iubLink-utranCell	This role (when present) represents IubLink capability to identify the set of related UtranCell. IubLink.iubLink-utranCell shall carry the set of UtranCell's DN(s).
utranCell-iubLink	This role (when present) represents UtranCell capability to identify one related IubLink. When the role is absent, the UtranCell.utranCell-iubLink shall contain no information. When it is present, it shall contain one IubLink DN.

6.4.2.3 Constraints

When a particular IubLink identifies a particular UtranCell, that particular UtranCell must have identified the particular IubLink.

6.4.3 ExternalUtranNeighbourCellRelation (M)

6.4.3.1 Definition

This represents a unidirectional relation from UtranRelation to the ExternalUtranCell. The role of the IOC shall be mapped to a reference attribute, named adjacentCell, of the IOC.

6.4.3.2 Roles

Table 9: Roles of the relation ExternalUtranNeighbourCellRelation

Name	Definition
utranRelation-externalUtranNeighbourCell	This role (when present) represents UtranRelation capability to identify one ExternalUtranCell. When this role is present, the UtranRelation.adjacentCelll shall contain one ExternalUtranNeighbourCell DN.

6.4.3.3 Constraints

This role (for a particular UtranRelation) shall be present if the UtranNeighbourCellRelation of this particular UtranRelation is absent. This role shall be absent if the UtranNeighbourCellRelation of this particular UtranRelation is present.

6.4.4 UtranNeighbourCellRelation (M)

6.4.4.1 Definition

This represents the unidirectional relation from the UtranRelation to UtranCell. The role of the IOC shall be mapped to a reference attribute, named adjacentCell, of the IOC.

6.4.4.2 Roles

Table 10: Roles of the relation UtranNeighbourCellRelation

Name	Definition
utranRelation-utranNeighbourCell	This role (when present) represents UtranRelation capability to identify one UtranCell. When this role is present, the UtranRelation.adjacentCell shall contain one UtranCell DN.

6.4.4.3 Constraints

This role (for a particular UtranRelation) shall be present if the ExternalUtranNeighbourCellRelation of this particular UtranRelation is absent. This role shall be absent if the ExternalUtranNeighbourCellRelation of this particular UtranRelation is present.

6.5 Information attributes definition

6.5.1 Definition and legal values

The table below defines the attributes that are present in several information object classes of this TS.

Table 11: Attributes

Attribute Name	Definition	Legal Values
adjacentCell	It carries the DN of the UtranCelll or the ExternalUtranCell.	
bchPower	The power of the broadcast channel in the cell (Ref. 3 GPP TS 25.433 [5]).	
cId	Cid is the identifier of a cell in one RNC (Ref. 3 GPP TS 25.401 [4]).	
externalUtranCellId	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.	
iubLinkId	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.	
lac	IOCs **UtranCell** and **ExternalUtranCell**: Location Area Code, LAC (Ref. 3 GPP TS 23.003 [3]). IOC **UtranRelation**: Location Area Code, LAC (Ref. 3 GPP TS 23.003 [3]), for another UTRAN cell or the external UTRAN Cell that is broadcast in the system information in the Cell.	
localCellId	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. 3 GPP 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.	
maximumTransmissionPower	The maximum transmission power of a cell, DL Power (Ref. 3 GPP TS 25.433 [5]).	
mcc	Mobile Country Code, MCC (part of the PLMN Id, Ref. 3 GPP TS 23.003 [3]).	
mnc	Mobile Network Code, MNC (part of the PLMN Id, Ref. 3 GPP TS 23.003 [3]).	
nodeBFunctionId	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.	
primaryCpichPower	IOCs **UtranCell** and **ExternalUtranCell**: The power of the primary CPICH channel in the cell (Ref. 3 GPP TS 25.433 [5]). IOC **UtranRelation**: The power of the primary CPICH channel in the cell (Ref. 3 GPP TS 25.433 [5]), for another UTRAN cell or the external UTRAN Cell that is broadcast in the system information in the Cell.	
primarySchPower	The power of the primary synchronisation channel in the cell, DL Power (Ref. 3 GPP TS 25.433 [5]).	
primaryScramblingCode	IOCs **UtranCell** and **ExternalUtranCell**: The primary DL scrambling code used by the cell (Ref. 3 GPP TS 25.433 [5]). IOC **UtranRelation**: The primary DL scrambling code used by the cell (Ref. 3 GPP TS 25.433 [5]), for another UTRAN cell or the external UTRAN Cell that is broadcast in the system information in the Cell.	
rac	Routing Area Code, RAC (Ref. 3 GPP TS 23.003 [3]).	
relationType	Type of relation: e.g. Intersystem relation, intrafrequency intrasystem relation, interfrequency intrasystem relation.	

Attribute Name	Definition	Legal Values
rncFunctionId	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.	
rncId	IOC **ExternalUtranCell**: Unique RNC ID for the drift RNC (Ref. 3 GPP TS 23.003 [3]). IOC **RncFunction**: Unique RNC ID (Ref. 3 GPP TS 23.003 [3])	
sac	Service Area Code, SAC (Ref. 3 GPP TS 23.003 [3]).	
secondarySchPower	The power of the secondary synchronisation channel in the cell, DL Power (Ref. 3 GPP TS 25.433 [5]).	
uarfcnDl	IOCs **UtranCell** and **ExternalUtranCell**: The DL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3 GPP TS 25.433 [5]). IOC **UtranRelation**: The DL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3 GPP TS 25.433 [5]), for another UTRAN cell or the external UTRAN Cell that is broadcast in the system information in the Cell.	
uarfcnUl	IOCs **UtranCell** and **ExternalUtranCell**: The UL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3 GPP TS 25.433 [5]). IOC **UtranRelation**: The UL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3 GPP TS 25.433 [5]) for another UTRAN cell or the external UTRAN Cell, that is broadcast in the system information in the Cell	
ura	UTRAN Registration Area, URA (Ref. 3 GPP TS 25.423 [6]).	
userLabel	A user-friendly (and user assigned) name of the associated object. Inherited from ManagedFunction.	
utranCellId	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.	
utranRelationId	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.	

6.5.2   Constraints

None.

6.6   Particular information configurations

Not applicable.

CR-Form-v5

CHANGE REQUEST

| ⌘ | **32.642** CR **005** | ⌘**rev** | **-** | ⌘ | Current version: | **4.1.0** | ⌘ |

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: ⌘	Add State Management	
Source: ⌘	S5	
Work item code: ⌘	OAM-NIM	***Date:*** ⌘ 23/08/2002

Category: ⌘ **B**		***Release:*** ⌘ REL-5	

Use one of the following categories:
   F *(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 one 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: ⌘	The UTRAN NRM needs to include State Management for Release 5 (New TS 32.67x).
Summary of change: ⌘	Adding of the operationalState attribute to the IOC UtranCell.
Consequences if not approved: ⌘	State Management will not be modelled within the Utran NRM.

Clauses affected: ⌘	1, 2, 6.3.3

Other specs affected: ⌘	☐ Other core specifications ⌘	
	☐ Test specifications	
	☐ O&M Specifications	

Other comments: ⌘	

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, i~~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.

Finally, regarding the support of the State Management IRP: IS [19], all NRM's of one release shall support the same State Management IRP version. This NRM specification is related to 3G TS 32.672 V5.0.X.

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: "3G Telecom Management principles and high level requirements".

[2]   3GPP TS 32.102: "3G Telecom 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]	Void
[10]	Void
[11]	3GPP TS 32.111-2: "Telecommunication Management; Fault Management; Part 2: Alarm Integration Reference Point; Information Service Version 1".
[12]	Void
[13]	3GPP TS 32.300: "Name Convention for Managed Objects".
[14]	3GPP TS 32.600: "3G Configuration Management: Concepts and requirements".
[15]	3GPP TS 23.002: "Network Architecture".
[16]	3GPP TS 32.622: "Generic Network Resources IRP: NRM".
[17]	3GPP TS 32.602: "Basic CM IRP: Information Service".
[18]	3GPP TS 32.612: "Bulk CM IRP: Information Service".
[19]	3GPP TS 32.672: "State Management IRP: Information Service".

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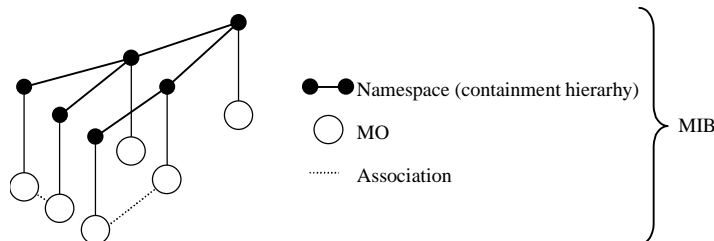
Managed Element (ME): An instance of the Managed Object Class ManagedElement defined in [16].

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 <u>Management Information Tree</u> (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
ITU-T	International Telecommunication Union, Telecommunication Sector
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
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	UMTS Terrestrial Radio Access Network
XML	eXtensible Mark-up Language

# 4 System overview

4.1 System context

Figure 4.1 and 3 identify system contexts of the subject IRP 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 the Basic CM IRP. The IRPAgent can be an Element Manager (EM) or a mediator that interfaces one or more NEs (see Figure 4.1), or it can be a Network Element (NE) (see Figure 4.2). In the former case, the interfaces (represented by a thick dotted line) between the EM and the NEs are not 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.
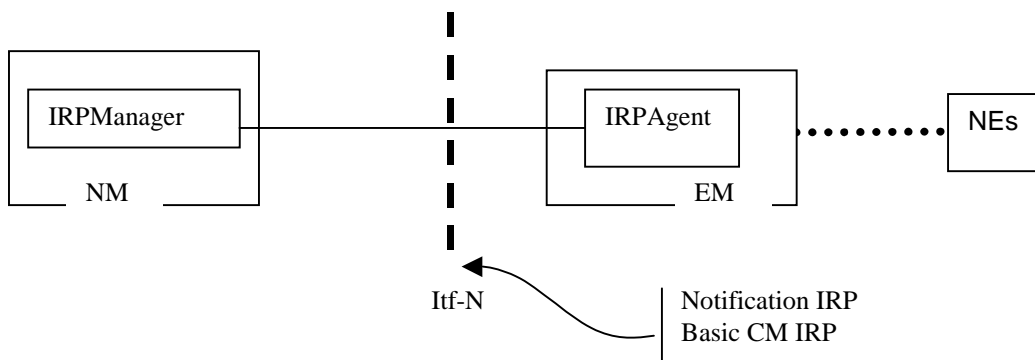
Figure 4.1: System Context A
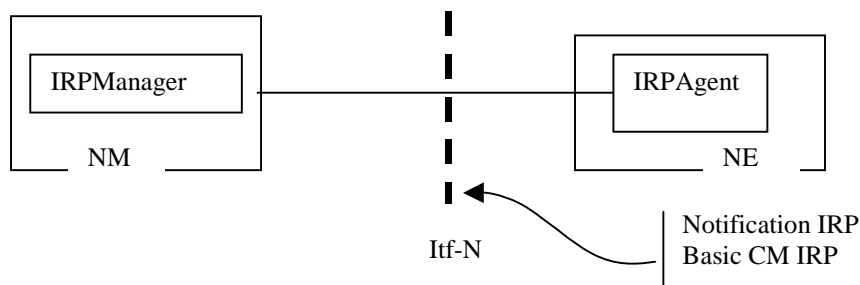
Figure 4.2: System Context B

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 Basic CM IRP:

- 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 subclause 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

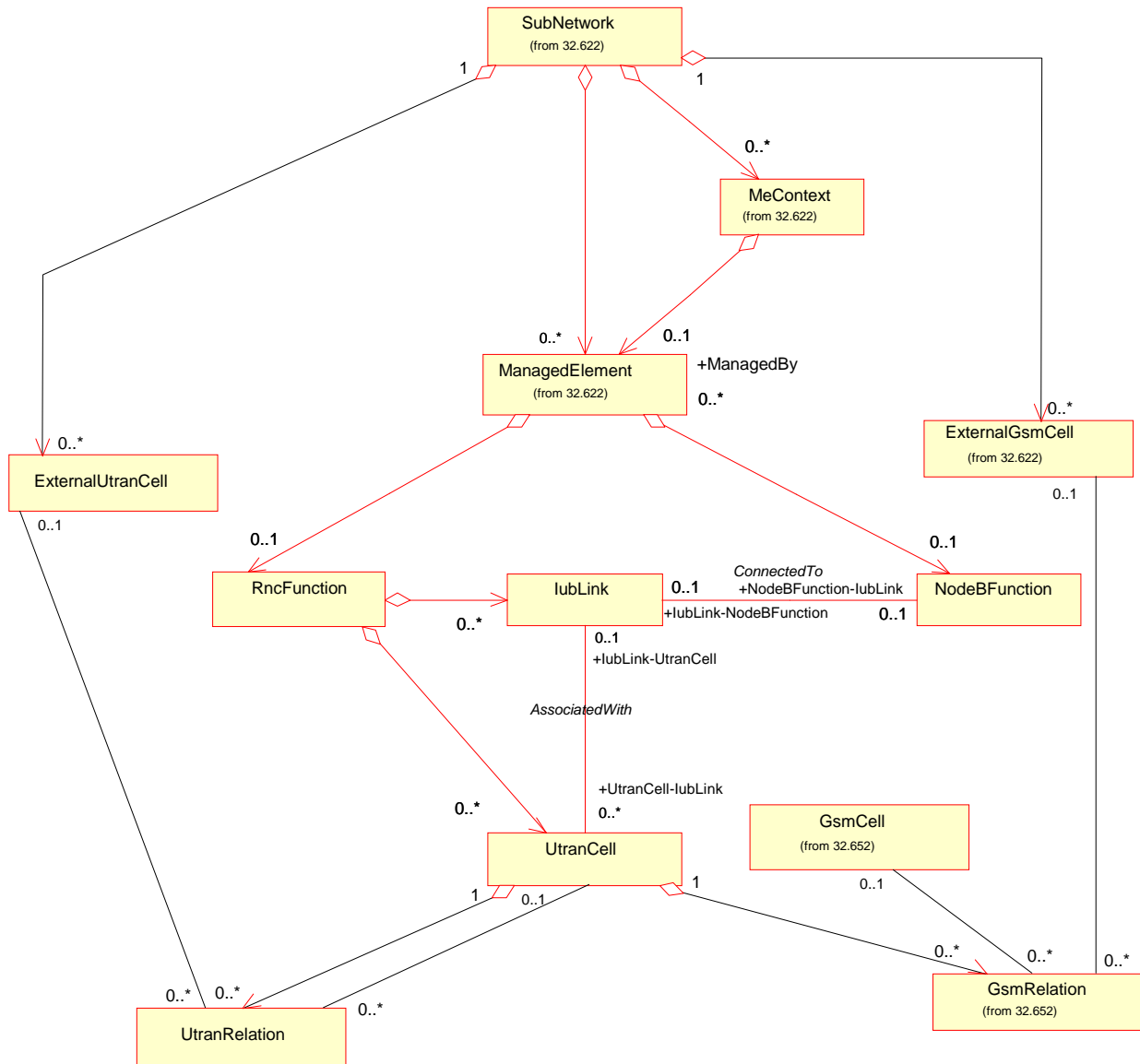Figure 6.1 shows the inheritance hierarchy for the UTRAN NRM.
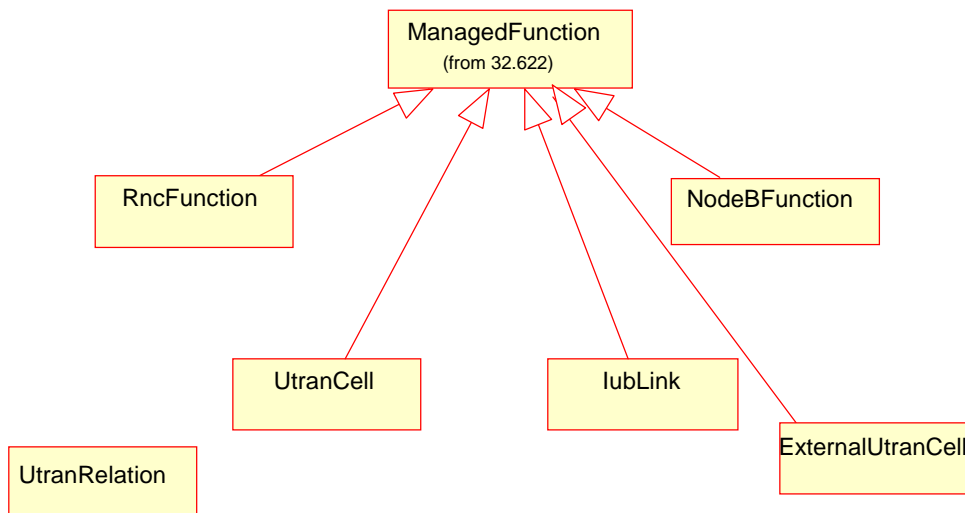
Figure 6.1: UTRAN NRM Inheritance Hierarchy

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").

§

Figure 6.2: UTRAN NRM Containment/Naming and Association diagram

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 GeranRelation can be contained under MOCs defined in other NRMs.

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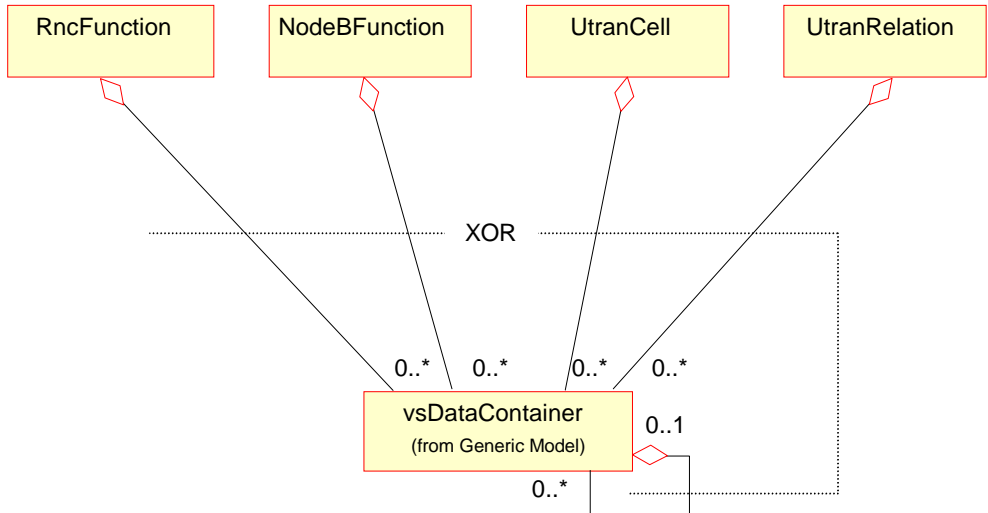
NOTE 1: The listed cardinality numbers represent transient as well as steady-state numbers, and reflect all managed object creation and deletion scenarios.

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 1: Attributes of RncFunction

Name	Qualifier	Description
rncFunctionId	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. 3 GPP TS 23.003 [3]).
mnc	READ-WRITE,M	Mobile Network Code, MNC. It is a part of the PLMN Id (Ref. 3 GPP TS 23.003 [3]).
rncId	READ-WRITE,M	Unique RNC ID (Ref. 3 GPP TS 23.003 [3])

Table 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	

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 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-IubLink	READ-ONLY, M	The value of this attribute shall be the DN of the related IubLink instance. This is a reference attribute modelling the role (of the association ConnectedTo) that this NodeBFunction is connected to 0-1 IubLink.

Table 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	

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 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. 3 GPP 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. 3 GPP 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. 3 GPP TS 25.433 [5]).
uarfcnDl	READ-WRITE, M	The DL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3 GPP TS 25.433 [5]).
primaryScramblingCode	READ-WRITE, M	The primary DL scrambling code used by the cell (Ref. 3 GPP TS 25.433 [5]).
primaryCpichPower	READ-WRITE, M	The power of the primary CPICH channel in the cell (Ref. 3 GPP TS 25.433 [5]).
maximumTransmissionPower	READ-WRITE, M	The maximum transmission power of a cell, DL Power (Ref. 3 GPP TS 25.433 [5]).
primarySchPower	READ-WRITE, M	The power of the primary synchronisation channel in the cell, DL Power (Ref. 3 GPP TS 25.433 [5]).
secondarySchPower	READ-WRITE, M	The power of the secondary synchronisation channel in the cell, DL Power (Ref. 3 GPP TS 25.433 [5]).
bchPower	READ-WRITE, M	The power of the broadcast channel in the cell (Ref. 3 GPP TS 25.433 [5]).
lac	READ-WRITE, M	Location Area Code, LAC (Ref. 3 GPP TS 23.003 [3])
rac	READ-WRITE, M	Routing Area Code, RAC (Ref. 3 GPP TS 23.003 [3])
sac	READ-WRITE, M	Service Area Code, SAC (Ref. 3 GPP TS 23.003 [3]).
ura	READ-WRITE, M	UTRAN Registration Area, URA (Ref. 3 GPP TS 25.423 [6]).
utranCell-IubLink	READ-ONLY, M	The value of this attribute shall be the DN of the related IubLink instance. This is a reference attribute modelling the role (of the association AssociatedWith) that this UtranCell is associated with 0-1 IubLink.

Table 5a: Additional attributes of UtranCell for the support of the State Management IRP

Attribute Name	Support Qualifier	READ	WRITE
operationalState	O	M	–

Note: No state propagation shall be implied.

Table 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	

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 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 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	

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 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.
relationType	READ-WRITE,M	Type of relation: e.g. Intersystem relation, intrafrequency intrasystem relation, interfrequency intrasystem relation.
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 the external UTRAN cell, that is broadcasted in System Information in the UtranCell, UARFCN (Ref. 3 GPP TS 25.433 [5]). See Note for the optional condition.
uarfcnDl	READ-ONLY, O	The DL UTRA absolute Radio Frequency Channel number for the external UTRAN cell, that is broadcasted in System Information in the UtranCell, UARFCN (Ref. 3 GPP TS 25.433 [5]). See Note for the optional condition.
primaryScramblingCode	READ-ONLY, O	The primary DL scrambling code used by the cell for the external UTRAN cell, that is broadcasted in System Information in the UtranCell (Ref. 3 GPP TS 25.433 [5]). See Note for the optional condition.
primaryCpichPower	READ-ONLY, O	The power of the primary CPICH channel for the external UTRAN cell, that is broadcasted in System Information in the UtranCell (Ref. 3 GPP TS 25.433 [5]). See Note for the optional condition.
lac	READ-ONLY, O	Location Area Code, LAC (Ref. 3 GPP TS 23.003 [3]), for the external UTRAN cell, that is broadcasted in System Information in the UtranCell. See Note for the optional condition.

Note: This attribute shall be included if the EM does not garantuee consistency between the cell definition and what is broadcasted on system information.

Table 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 necesssary attributes for inter-system handover. It contains a subset of the attributes of related MOCs controlled by another IRPAgent. The way to -mMaintain consistency between the attribute values of these two MOCs is outside the scope of this document.

Table 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.
cId	READ-WRITE, M	Cid is the identifier of a cell in one RNC (Ref. 3 GPP TS 25.401 [4]).
mcc	READ-WRITE, M	Mobile Country Code, MCC (part of the PLMN Id, Ref. 3 GPP TS 23.003 [3]).
mnc	READ-WRITE, M	Mobile Network Code, MNC (part of the PLMN Id, Ref. 3 GPP TS 23.003 [3]).
rncId	READ-WRITE, M	Unique RNC ID for the drift RNC (Ref. 3 GPP TS 23.003 [3]).
uarfcnUl	READ-WRITE, M	The UL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3 GPP TS 25.433 [5]).
uarfcnDl	READ-WRITE, M	The DL UTRA absolute Radio Frequency Channel number, UARFCN (Ref. 3 GPP TS 25.433 [5]).
primaryScramblingCode	READ-WRITE, M	The primary DL scrambling code used by the cell (Ref. 3 GPP TS 25.433 [5]).
primaryCpichPower	READ-WRITE, M	The power of the primary CPICH channel in the cell (Ref. 3 GPP TS 25.433 [5]).
lac	READ-WRITE, M	Location Area Code, LAC (Ref. 3 GPP TS 23.003 [3]).
rac	READ-WRITE, M	Routing Area Code, RAC (Ref. 3 GPP TS 23.003 [3]).

Table 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.