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Technical Specification

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LTE;
Telecommunication management;
Configuration Management (CM);
UTRAN network resources Integration Reference Point (IRP);
Network Resource Model (NRM)
(3GPP TS 32.642 version 9.1.0 Release 9)**



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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
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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; as identified below:

- 32.641: "Configuration Management (CM); UTRAN network resources Integration Reference Point (IRP): Requirements".
- 32.642: "Configuration Management (CM); UTRAN network resources Integration Reference Point (IRP): Network Resource Model (NRM)".**
- 32.643: "Configuration Management (CM); UTRAN network resources Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)".
- 32.645: "Configuration Management (CM); UTRAN network resources Integration Reference Point (IRP): Bulk CM eXtensible Markup Language (XML) file format definition"

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.

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 NEs and NRs, and they may be initiated by the operator or by functions in the OSs or NEs.

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 specifies the protocol neutral UTRAN Network Resources IRP: Network Resource Model. It reuses relevant parts of the generic NRM in TS 32.622 [16], either by direct reuse or sub-classing, and in addition to that defines UTRAN specific Information 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 (IS).

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

to define the applied UTRAN specific NRM, based on the generic NRM in 3GPP TS 32.622 [16].

In order to access the information defined by this NRM, an IRP IS is needed, such as the Basic CM IRP IS (3GPP TS 32.602 [17]) or the Bulk CM IRP IS (3GPP TS 32.612 [18]). However, which IS that is applicable is outside the scope of the present document.

The present document (NRM specification) is related to the IS in 3GPP TS 32.672 [8].

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 32.652: "Telecommunication management; Configuration Management (CM); GERAN network resources Integration Reference Point (IRP): Network Resource Model (NRM)".
- [7] Void.
- [8] 3GPP TS 32.672: "Telecommunication management; Configuration Management (CM); State Management Integration Reference Point (IRP): Information Service (IS)".
- [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)".
- [19] Void
- [20] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [21] 3GPP TS 25.466: "UTRAN Iuant interface: Application Part".
- [22] 3GPP TS 25.463 UTRAN Iuant Interface: Remote Electrical Tilting (RET) antennas Application Part (RETAP) signalling.
- [23] 3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

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].

Antenna: Within the present document an Antenna is the set of radiating elements involved in the transmission and reception of Radio Frequency energy to support the Uu interface of a UTRAN cell. See Annex B for more detail.

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).

Managed Element (ME): An instance of the Information Object Class ManagedElement defined in TS 32.622 [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)** 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 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 may support the emission of notifications that provide information about an event occurrence within a network resource.

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

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, 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.

TMA Subunit: See TS 25.466 [21].

Tower Mounted Amplifier: See TS 25.466 [21].

3.2 Abbreviations

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

| | |
|-------|---|
| CIM | Common Information Model |
| CN | Core Network |
| DN | Distinguished Name (see 3GPP TS 32.300 [13]) |
| EM | Element Manager |
| FDD | Frequency Division Duplex |
| FM | Fault Management |
| IOC | Information Object Class |
| IRP | Integration Reference Point |
| Iub | Interface between RNC and Node B |
| Mcps | Mega-chips per second |
| ME | Managed Element |
| MIM | Management Information Model |
| MO | Managed Object |
| 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]) |
| RET | Remote control of Electrical Tilting (RET) antenna |
| RNC | Radio Network Controller |
| TDD | Time Division Duplex |
| TMA | Tower Mounted Amplifier |
| TMN | Telecommunications Management Network |
| UML | Unified Modelling Language |
| UMTS | Universal Mobile Telecommunications System |
| UTRA | Universal Terrestrial Radio Access |
| UTRAN | Universal Terrestrial Radio Access Network |

4 System overview

4.1 Void

4.2 Compliance rules

The following defines the meaning of Mandatory and Optional IOC attributes and associations between IOCs, 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 information object classes, attributes and associations 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 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 TS 32.622 [16].

6 Information Object Classes

6.1 Information entities imported and local labels

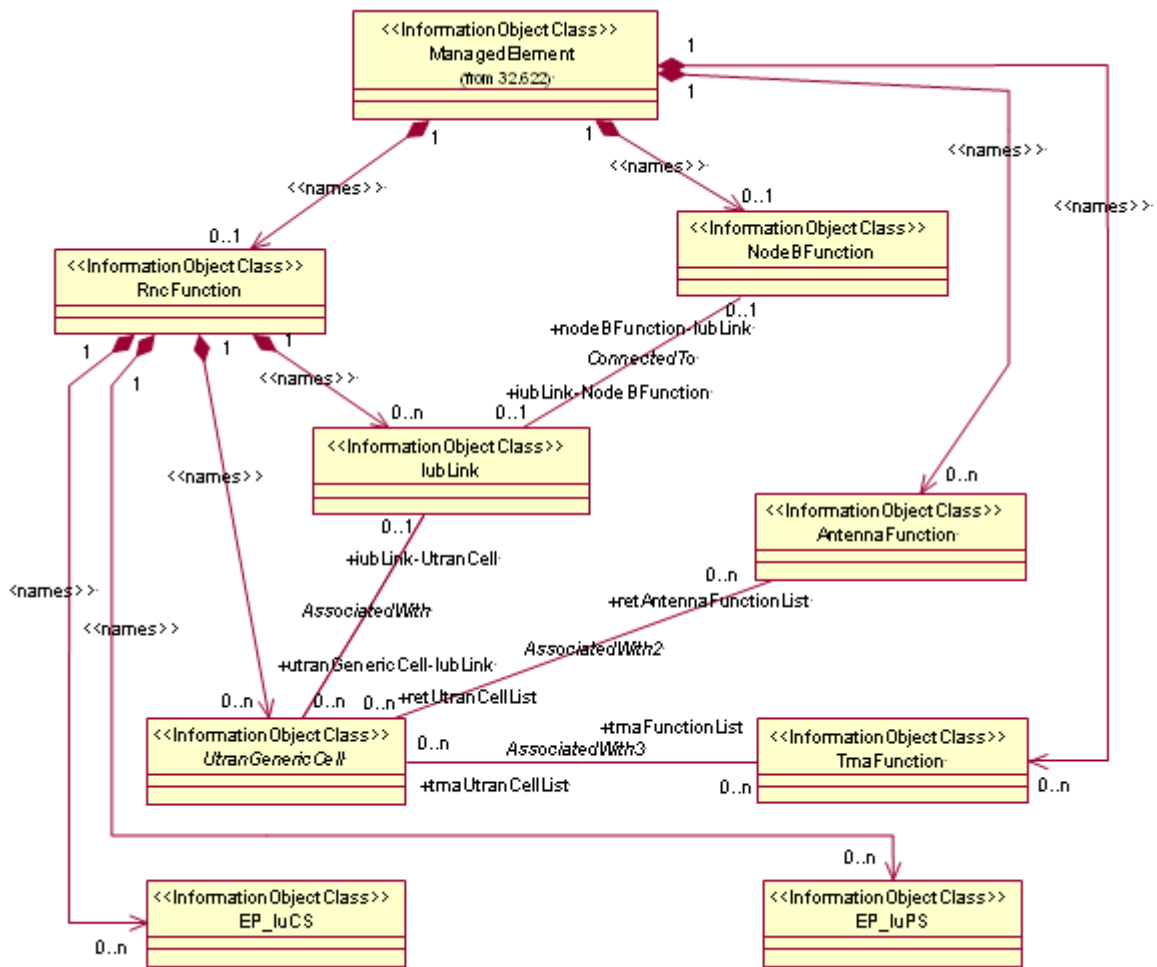
| Label reference | Local label |
|--|----------------------------------|
| 3GPP TS 32.622 [16], IOC, ManagedElement | ManagedElement |
| 3GPP TS 32.622 [16], IOC, ManagedFunction | ManagedFunction |
| 3GPP TS 32.622 [16], IOC, MeContext | MeContext |
| 3GPP TS 32.622 [16], IOC, SubNetwork | SubNetwork |
| 3GPP TS 32.622 [16], IOC, Top | Top |
| 3GPP TS 32.622 [16], IOC, VsDataContainer | VsDataContainer |
| 3GPP TS 32.622 [16], IOC, EP_RP | EP_RP |
| 3GPP TS 32.652 [6], IOC, ExternalGSMCell | ExternalGSMCell |
| 3GPP TS 32.652 [6], IOC, GsmCell | GsmCell |
| 3GPP TS 32.652 [6], IOC, GsmRelation | GsmRelation |
| 3GPP TS 32.652 [6], relation, ExternalGsmNeighbourCellRelation | ExternalGsmNeighbourCellRelation |
| 3GPP TS 32.652 [6], relation, GsmNeighbourCellRelation | GsmNeighbourCellRelation |
| 3GPP TS 32.672 [8], attribute, operationalState | operationalState |

6.2 Class diagram

6.2.1 Attributes and relationships

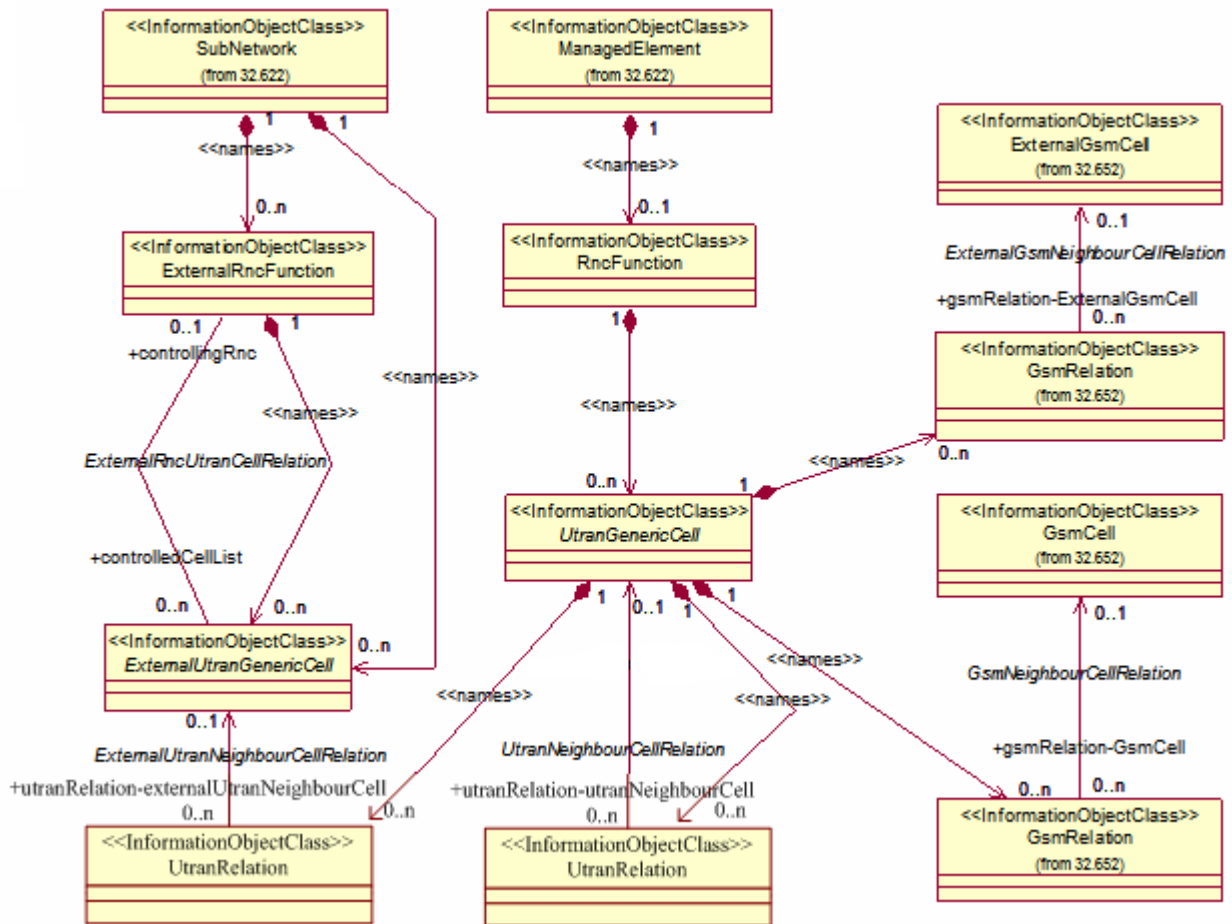
This clause depicts the set of IOCs that encapsulate information relevant for this service. This clause provides the overview of all information object classes in UML. Subsequent clauses provide more detailed specification of various aspects of these information object classes.

The following figures show the containment/naming hierarchy and the associations of the information object classes defined in the present document. They are split in several figures only for a readability purpose.



- NOTE 1: The listed cardinality numbers, in particular the use of cardinality number zero, do not represent transient states. The transient state is considered an inherent property of all IOC instances and therefore there is no need to represent them by individual IOC cardinality numbers.
- NOTE 2: The IOC AntennaFunction is required when supporting RET, For a description and clarification of RET, please refer to Annex B.
- NOTE 3: The instances of the AntennaFunction associated with a particular instance of NodeBFunction shall be contained by the same ManagedElement instance.
- NOTE 4: The instances of the TmaFunction associated with a particular instance of NodeBFunction shall be contained by the same ManagedElement instance.

Figure 6.2.1.1: Transport view UTRAN NRM Containment/Naming and Association diagram



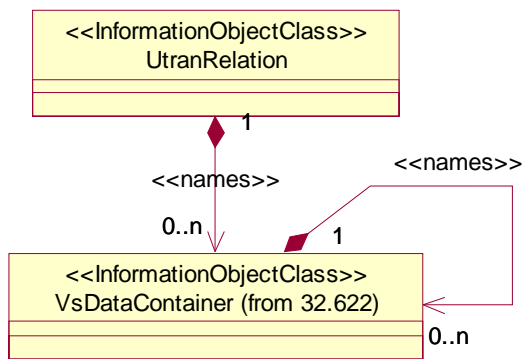
NOTE 1: The listed cardinality numbers, in particular the use of cardinality number zero, do not represent transient states. The transient state is considered an inherent property of all IOC instances and therefore there is no need to represent them by individual IOC cardinality numbers.

NOTE 2: The relation between GsmRelation and GsmCell is optional. It may be present if both the UtranGenericCell and the GsmCell are managed by the same management node.

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

NOTE 4: ExternalUtranGenericCell is contained under SubNetwork or ExternalRncFunction.

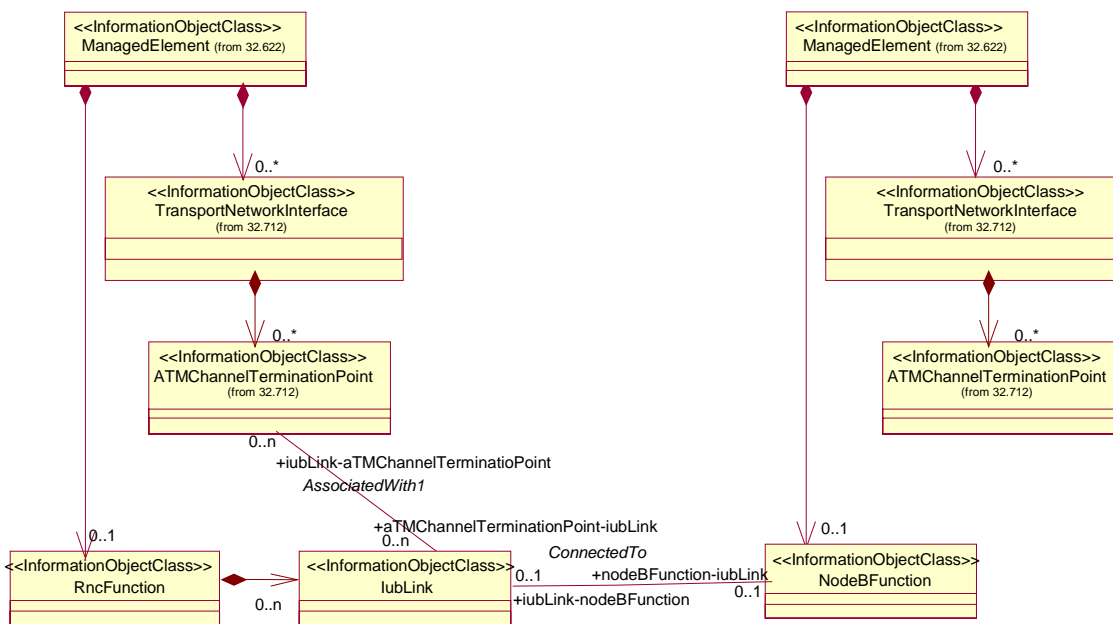
Figure 6.2.1.2: Cell view UTRAN NRM Containment/Naming and Association diagram



NOTE 1: The listed cardinality numbers, in particular the use of cardinality number zero, do not represent transient states. The transient state is considered an inherent property of all IOC instances and therefore there is no need to represent them by individual IOC cardinality numbers.

NOTE 2: Each instance of the `VsDataContainer` shall only be contained under one IOC. The `VsDataContainer` can be contained under IOCs defined in other NRMs.

Figure 6.2.1.3: `VsDataContainer` Containment/Naming and Association in UTRAN NRM diagram



NOTE 1: The `ATMChannelTerminationPoint` is name-contained under IOCs defined in the Transport Network NRM.

NOTE 2: The group of `ATMChannelTerminationPoints` associated with an `IubLink` (the relation `AssociatedWith1`) represent the RNC end of the ATM Virtual Channel Connections (transport connection) between an RNC and a NodeB.

NOTE 3: An `ATMChannelTerminationPoint` can be associated with more than one `IubLink` for the case of AAL2 multiplexing/switching. I.e. to allow an ATM Channel at the RNC to be connected to multiple NodeBs.

Figure 6.2.1.4: UTRAN Transport Network NRM Containment/Naming and Association diagram

The `VsDataContainer` is only used for the Bulk CM IRP.

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 an IOC instance 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

This clause depicts the inheritance relationships that exist between IOCs.

Figure 6.2.2.1 shows the inheritance hierarchy for the UTRAN NRM.

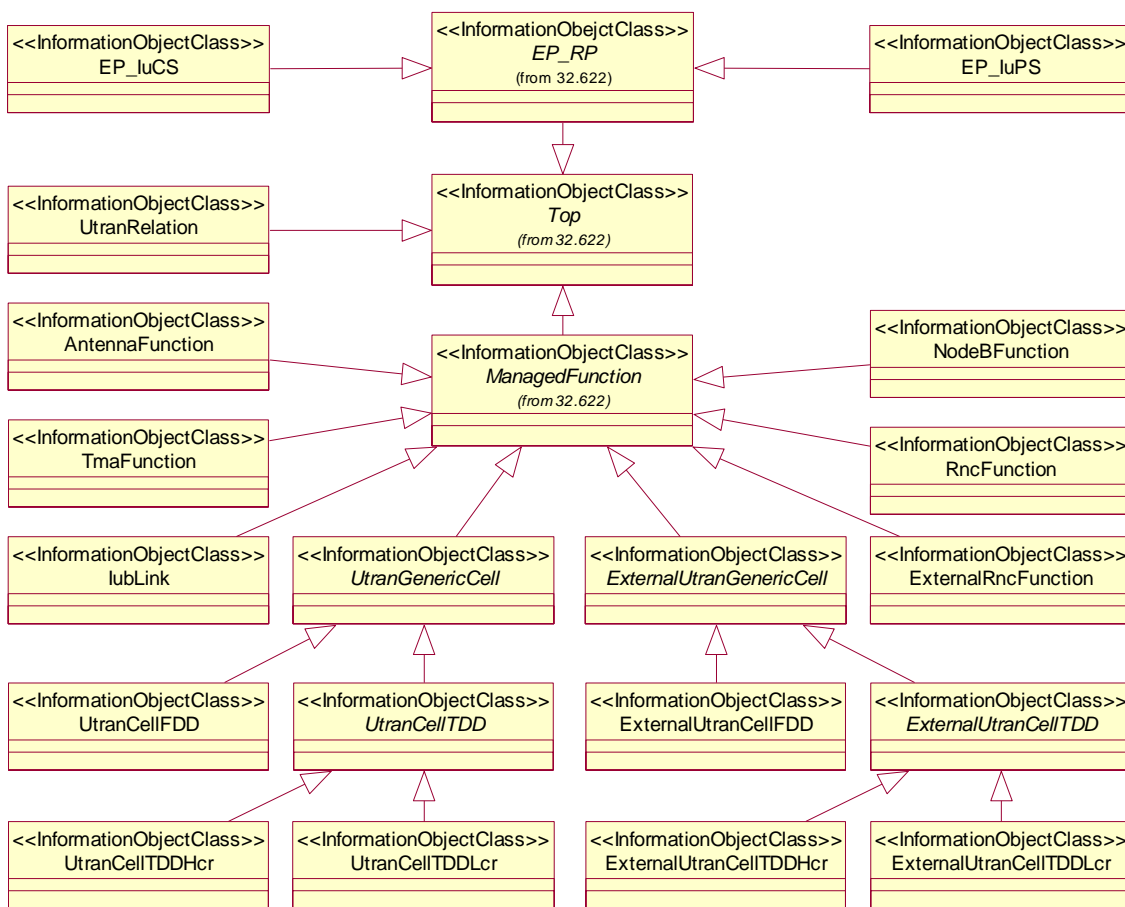


Figure 6.2.2.1: UTRAN NRM Inheritance Hierarchy

6.3 Information object class definitions

6.3.1 RncFunction

6.3.1.1 Definition

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

6.3.1.2 Attributes

Attributes of RncFunction

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|----------------|-------------------|----------------|-----------------|
| id | M | M | - |
| userLabel | M | M | M |
| mcc | M | M | M |
| mnc | M | M | M |
| rncId | M | M | M |

6.3.1.3 Notifications

See clause 6.7.1 Alarm and configuration notifications.

6.3.2 NodeBFunction

6.3.2.1 Definition

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

6.3.2.2 Attributes

Attributes of NodeBFunction

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|-----------------------|-------------------|----------------|-----------------|
| id | M | M | - |
| userLabel | M | M | M |
| nodeBFunction-IubLink | M | M | - |

6.3.2.3 Notifications

See clause 6.7.1 Alarm and configuration notifications.

6.3.3 Void

6.3.4 IubLink

6.3.4.1 Definition

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

6.3.4.2 Attributes

Attributes of IubLink

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|------------------------------------|-------------------|----------------|-----------------|
| id | M | M | - |
| userLabel | M | M | M |
| iubLink-UtranCell | M | M | M |
| iubLink-NodeBFunction | M | M | - |
| iubLink-ATMChannelTerminationPoint | M | M | - |

6.3.4.3 Notifications

See clause 6.7.1 Alarm and configuration notifications.

6.3.5 UtranRelation

6.3.5.1 Definition

The `UtranRelationIOC` contains radio network related parameters for the relation to the `UtranGenericCell` or `ExternalUtranGenericCell` IOC.

The `UtranGenericCell` and the `ExternalUtranGenericCell` may be an FDD mode cell, a lcr (low chip rate) 1.28 Mcps TDD mode cell or a hcr (high chip rate) 3.84 (7.68) Mcps TDD mode cell.

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

Attributes of UtranRelation

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|----------------|-------------------|----------------|-----------------|
| id | M | M | - |
| adjacentCell | M | M | M |

6.3.5.3 Attribute constraints

Void.

6.3.5.4 Notifications

See clause 6.7.2 Configuration notifications.

6.3.6 Void

6.3.7 AntennaFunction

6.3.7.1 Definition

This optional IOC represents an array of radiating elements that may be tilted to adjust the RF coverage of a cell(s).

6.3.7.2 Attributes

Attributes of AntennaFunction

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|------------------|-------------------|----------------|-----------------|
| id | M | M | - |
| userLabel | O | M | M |
| retUtranCellList | O | M | M |
| retTiltValue | O | M | M |
| bearing | O | M | M |
| maxTiltValue | O | M | M |
| minTiltValue | O | M | M |
| mechanicalOffset | O | M | M |
| retGroupName | O | M | M |
| height | O | M | M |
| baseElevation | O | M | O |
| latitude | O | M | O |
| longitude | O | M | O |
| maxAzimuthValue | O | M | M |
| minAzimuthValue | O | M | M |
| horizBeamwidth | O | M | M |
| vertBeamwidth | O | M | M |
| patternLabel | O | M | O |

6.3.7.3 Notifications

See clause 6.7.1 Alarm and configuration notifications.

6.3.8 ExternalRncFunction

6.3.8.1 Definition

This IOC represents an RNC function controlled by another IRPAgent. For more information about the RNC, see 3GPP TS 23.002 [15].

6.3.8.2 Attributes

Attributes of ExternalRncFunction

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|--------------------|-------------------|----------------|-----------------|
| id | M | M | - |
| userLabel | M | M | M |
| mcc | M | M | M |
| mnc | M | M | M |
| rnclId | M | M | M |
| controlledCellList | O | M | - |

6.3.8.3 Notifications

See clause 6.7.2 Configuration notifications.

6.3.9 UtranGenericCell

6.3.9.1 Definition

This abstract IOC represents the common properties of radio cells of different types (FDD, TDD) controlled by an RNC. For more information about radio cells, see 3GPP TS 23.002 [15].

The IOC UtranCellFDD and UtranCellTDD (1,28 Mcps TDD mode cell or a 3.84 (7.68) Mcps TDD mode cell) inherit from that abstract IOC.

The second table lists the additional attributes of UtranGenericCell for the support of State Management.

6.3.9.2 Attributes

Attributes of UtranGenericCell

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|-------------------------------|-------------------|----------------|-----------------|
| id | M | M | - |
| userLabel | M | M | M |
| cId | M | M | M |
| localCellId | M | M | M |
| retAntennaFunctionList | O | M | M |
| maximumTransmissionPower | M | M | M |
| pichPower | O | M | O |
| pchPower | O | M | O |
| fachPower | O | M | O |
| cellMode | M | M | - |
| lac | M | M | M |
| rac | O | M | M |
| sac | M | M | M |
| uraList | O | M | M |
| utranGenericCell-IubLink | M | M | - |
| hsFlag | O | M | - |
| hsEnable | O | M | M |
| numOfHspdschs | O | M | M |
| numOfHsscchs | O | M | M |
| frameOffset | CO | M | - |
| cellIndividualOffset | CO | M | - |
| hcsPrio | CO | M | - |
| maximumAllowedUlTxPower | CO | M | - |
| snaInformation | CO | M | - |
| qrxlevMin | CO | M | - |
| deltaQrxlevmin | CO | M | - |
| qhcs | CO | M | - |
| penaltyTime | CO | M | - |
| referenceTimeDifferenceToCell | CO | M | - |
| readSFNIndicator | CO | M | - |
| restrictionStateIndicator | CO | M | - |
| dpcModeChangeSupportIndicator | CO | M | - |
| tmaFunctionList | O | M | - |

| Attribute Name | Support Qualifier | READ | WRITE |
|------------------|-------------------|------|-------|
| operationalState | O | M | - |

NOTE: No state propagation shall be implied.

6.3.9.3 Attribute Constraints

The optional attributes `rac` and `uraList` shall be included if the PLMN contains a PS CN.

The optional attribute `hsFlag` shall only be supported over Itf-N, if the functionality it provides is not supported by vendor specific extension mechanisms.

The optional attributes `hsEnable`, `numOfHspdschs` and `numOfHsscchs` shall only be supported, if the functionality they provide is not supported by vendor specific extension mechanisms while the HSDPA feature is supported in the UTRAN cell.

The following optional attributes shall be supported over Itf-N, if they are not supported by vendor specific extension mechanisms: `pichPower`, `pchPower` and `fachPower`.

The constraint for conditional/ optional (CO) attributes is "visible over Itf-p2p".

6.3.9.4 Notifications

See clause 6.7.1 Alarm and configuration notifications.

6.3.10 ExternalUtranGenericCell

6.3.10.1 Definition

This abstract IOC represents the properties of a radio cell controlled by another IRPAgent. This IOC contains necessary attributes for inter-system and intra-system handover. It also contains a subset of the attributes of related IOCs controlled by another IRPAgent. The way to maintain consistency between the attribute values of these IOCs is outside the scope of the present document.

6.3.10.2 Attributes

Attributes of ExternalUtranGenericCell

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|-------------------------------|-------------------|----------------|-----------------|
| id | M | M | - |
| userLabel | M | M | M |
| cId | M | M | M |
| Mcc | M | M | M |
| Mnc | M | M | M |
| rncId | M | M | M |
| cellMode | M | M | - |
| lac | M | M | M |
| rac | O | M | M |
| controllingRnc | O | M | - |
| hsFlag | O | M | - |
| frameOffset | CO | M | - |
| cellIndividualOffset | CO | M | - |
| hcsPrio | CO | M | - |
| maximumAllowedULTxPower | CO | M | - |
| qrxlevMin | CO | M | - |
| deltaQrxlevmin | CO | M | - |
| qhcs | CO | M | - |
| penaltyTime | CO | M | - |
| referenceTimeDifferenceToCell | CO | M | - |
| readSFNIndicator | CO | M | - |
| restrictionStateIndicator | CO | M | - |
| dpcModeChangeSupportIndicator | CO | M | - |
| snaInformation | CO | M | - |

6.3.10.3 Attribute Constraints

The optional attribute `rac` shall be included if the external cell is connected to a PS CN.

The optional attribute `hsFlag` shall only be supported over Itf-N, if the functionality it provides is not supported by vendor specific extension mechanisms.

The constraint for conditional/ optional (CO) attributes is "visible over Itf-p2p".

6.3.10.4 Notifications

See clause 6.7.2 Configuration notifications.

6.3.11 UtranCellFDD

6.3.11.1 Definition

This IOC represents a FDD radio cell controlled by an RNC. For more information about radio cells, see 3GPP TS 23.002 [15].

6.3.11.2 Attributes

Attributes of UtranCellFDD

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|---------------------------------|-------------------|----------------|-----------------|
| uarfcnUl | O | M | M |
| uarfcnDl | O | M | M |
| primaryScramblingCode | O | M | M |
| primaryCpichPower | O | M | M |
| primarySchPower | O | M | M |
| secondarySchPower | O | M | M |
| bchPower | O | M | M |
| aichPower | O | M | - |
| qqualMin | CO | M | - |
| cellCapabilityContainerFDD | CO | M | - |
| txDiversityIndicator | CO | M | - |
| temporaryOffset1 | CO | M | - |
| temporaryOffset2 | CO | M | - |
| stdSupportIndicator | CO | M | - |
| closedLoopModelSupportIndicator | CO | M | - |

6.3.11.3 Attribute Constraints

The following optional attribute `aichPower` shall be supported over Itf-N, if it is not supported by vendor specific extension mechanisms.

The constraint for conditional/ optional (CO) attributes is "visible over Itf-p2p".

6.3.12 UtranCellTDD

6.3.12.1 Definition

This IOC is an abstract class representing the common properties of TDD high chip rate (hcr) and TDD low chip rate (lcr) radio cells controlled by an RNC. For more information about radio cells, see 3GPP TS 23.002 [15].

6.3.12.2 Attributes

Attributes of UtranCellTDD

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|----------------------------|-------------------|----------------|-----------------|
| Uarfcn | O | M | M |
| cellParameterId | O | M | M |
| primaryCcpchPower | O | M | M |
| cellCapabilityContainerTDD | CO | M | - |
| sctdIndicator | CO | M | - |
| dpchConstantValue | CO | M | - |

6.3.12.3 Attribute Constraints

The constraint for conditional/ optional (CO) attributes is "visible over Itf-p2p".

6.3.13 UtranCellTDDLcr

6.3.13.1 Definition

This IOC represents a TDD low chip rate (lcr) radio cell controlled by an RNC. For more information about radio cells, see 3GPP TS 23.002 [15].

6.3.13.2 Attributes

Attributes of UtranCellTDDLcr

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|-----------------|-------------------|----------------|-----------------|
| uarfcnLCRList | O | M | M |
| fpachPower | O | M | O |
| dwPchPower | O | M | M |
| tstdIndicator | CO | M | - |
| timeSlotListLcr | O | M | M |

6.3.13.3 Attribute Constraints

The constraint for conditional/ optional (CO) attributes is "visible over Itf-p2p".

6.3.14 UtranCellTDDHcr

6.3.14.1 Definition

This IOC represents a TDD high chip rate (hcr) radio cell controlled by an RNC. For more information about radio cells, see 3GPP TS 23.002 [15].

6.3.14.2 Attributes

Attributes of UtranCellTDDHcr

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|------------------|-------------------|----------------|-----------------|
| schPower | O | M | M |
| temporaryOffset1 | CO | M | - |
| syncCase | CO | M | - |
| timeSlotForSch | CO | M | - |
| schTimeSlot | CO | M | - |
| timeSlotListHcr | O | M | M |

6.3.14.3 Attribute Constraints

The constraint for conditional/ optional (CO) attributes is "visible over Itf-p2p".

6.3.15 ExternalUtranCellFDD

6.3.15.1 Definition

This IOC represents a FDD radio cell controlled by another IRP agent. For more information about radio cells, see 3GPP TS 23.002 [15].

6.3.15.2 Attributes

Attributes of ExternalUtranCellFDD

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|---------------------------------|-------------------|----------------|-----------------|
| uarfcnUl | O | M | M |
| uarfcnDl | O | M | M |
| primaryScramblingCode | O | M | M |
| primaryCpichPower | O | M | M |
| qqualMin | CO | M | - |
| cellCapabilityContainerFDD | CO | M | - |
| txDiversityIndicator | CO | M | - |
| temporaryOffset1 | CO | M | - |
| temporaryOffset2 | CO | M | - |
| sttdSupportIndicator | CO | M | - |
| closedLoopModelSupportIndicator | CO | M | - |

6.3.15.3 Attribute Constraints

The constraint for conditional/ optional (CO) attributes is "visible over Itf-p2p".

6.3.16 ExternalUtranCellTDD

6.3.16.1 Definition

This IOC is an abstract class representing the common properties of TDD high chip rate (hcr) and TDD low chip rate (lcr) radio cells controlled by another IRP agent. For more information about radio cells, see 3GPP TS 23.002 [15].

6.3.16.2 Attributes

Attributes of ExternalUtranCellTDD

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|----------------------------|-------------------|----------------|-----------------|
| uarfcn | O | M | M |
| cellParameterId | O | M | M |
| primaryCcpchPower | O | O | O |
| cellCapabilityContainerTDD | CO | M | - |
| sctdIndicator | CO | M | - |
| dpchConstantValue | CO | M | - |

6.3.16.3 Attribute Constraints

The constraint for conditional/ optional (CO) attributes is "visible over Itf-p2p".

6.3.17 ExternalUtranCellTDDHcr

6.3.17.1 Definition

This IOC represents a TDD high chip rate (hcr) radio cell controlled by another IRPagent. For more information about radio cells, see 3GPP TS 23.002 [15].

6.3.17.2 Attributes

Attributes of ExternalUtranCellTDDHcr

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|------------------|-------------------|----------------|-----------------|
| temporaryOffset1 | CO | M | - |
| syncCase | CO | M | - |
| timeSlotForSch | CO | M | - |
| schTimeSlot | CO | M | - |
| timeSlotListHcr | O | M | - |

6.3.17.3 Attribute Constraints

The constraint for conditional/ optional (CO) attributes is "visible over Itf-p2p".

6.3.18 ExternalUtranCellTDDLcr

6.3.18.1 Definition

This IOC represents a TDD low chip rate (lcr) radio cell controlled by another IRPagent. For more information about radio cells, see 3GPP TS 23.002 [15].

6.3.18.2 Attributes

Attributes of ExternalUtranCellTDDLcr

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|-----------------|-------------------|----------------|-----------------|
| tstdIndicator | CO | M | - |
| timeSlotListLcr | O | M | - |

6.3.18.3 Attribute Constraints

The constraint for conditional/ optional (CO) attributes is "visible over Itf-p2p".

6.3.19 TmaFunction

6.3.19.1 Definition

This IOC represents a Tower Mounted Amplifier or a number of TMA subunits within one TMA, each separately addressable by a specific index at the application layer.

6.3.19.2 Attributes

Attributes of TmaFunction

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|--------------------------------------|-------------------|----------------|-----------------|
| tmaFunctionId | M | M | - |
| userLabel | M | M | M |
| tmaSubunitNumber | M | M | M |
| tmaStateFlag | M | M | O |
| tmaFunctionFlag | M | M | M |
| tmaMinGain | M | M | - |
| tmaMaxGain | M | M | - |
| tmaResolution | M | M | - |
| tmaGainFigure | M | M | O |
| tmaNumberOfSubunits | M | M | - |
| tmaNumberOfNon-LinearGainValues | M | M | - |
| tmaNon-LinearGainValue | M | M | M |
| tmaUtranCellList | M | M | M |
| tmaAdditionalDataFieldNumber | CO | M | CO |
| tmaAntennaModelNumber | CO | M | CO |
| tmaAntennaSerialNumber | CO | M | CO |
| tmaAntennaOperatingBands | CO | M | CO |
| tmaBeamwidthForEachOpBandInBandOrder | CO | M | CO |
| tmaGainForEachOpBandInBandOrder | CO | M | CO |
| tmaInstallationDate | CO | M | CO |
| tmaInstallersId | CO | M | CO |
| tmaBaseStationId | CO | M | CO |
| tmaSectorId | CO | M | CO |
| tmaAntennaBearing | CO | M | CO |
| tmaInstalledMechanicalTilt | CO | M | CO |
| tmaSubunitType | CO | M | CO |
| tmaSubunitRxFrequencyBand | CO | M | CO |
| tmaSubunitTxFrequencyBand | CO | M | CO |
| tmaMaxSupportedGain | CO | M | CO |
| tmaMinSupportedGain | CO | M | CO |
| tmaGainResolution | CO | M | CO |

6.3.19.3 Notifications

See clause 6.7.1 Alarm and configuration notifications.

6.3.19.4 Attribute Constraints

The constraint for the Conditional/Optional (CO) support qualifier of the attributes tmaAdditionalDataFieldNumber through tmaGainResolution is the following: "The TMA subunit supports the read operation in TS 25.466 [21]".

The constraint for the conditional/optional (CO) write qualifier of the attributes tmaAdditionalDataFieldNumber through tmaGainResolution is the following: "The TMA subunit supports the write operation in TS 25.466 [21]".

6.3.20 EP_IuCS

6.3.20.1 Definition

This IOC represents an end point of the Iu-CS interface. For more information Iu-CS interface, see 3GPP TS 23.002 [15].

6.3.20.2 Attributes

Attributes of EP_IuCS

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|----------------|-------------------|----------------|-----------------|
| connMscNumber | CO | M | - |

6.3.20.3 Attribute Constraints

The constraint for conditional/ optional (CO) attributes connMscNumber is "farEndEntity is supported".

6.3.20.4 Notifications

Notifications of EP_IuCS

| 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]) | |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [11]) | |

6.3.21 EP_IuPS

6.3.21.1 Definition

This IOC represents an end point of the Iu-PS interface. For more information Iu-PS interface, see 3GPP TS 23.002 [15].

6.3.21.2 Attributes

Attributes of EP_IuPS

| Attribute name | Support Qualifier | Read Qualifier | Write Qualifier |
|----------------|-------------------|----------------|-----------------|
| connSgsnNumber | CO | M | - |

6.3.21.3 Attribute Constraints

The constraint for conditional/ optional (CO) attributes connSgsnNumber is "farEndEntity is supported".

6.3.21.4 Notifications

Notifications of EP_IuPS

| 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]) | |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [11]) | |

6.4 Information relationship definitions

6.4.1 ConnectedTo (M)

6.4.1.1 Definition

This represents a bi-directional relationship between the `IubLink` and Node B (through the `NodeBFunction`).
The role of the relation shall be mapped to a reference attribute of the IOC. The names of the reference attribute and the role are the same.

6.4.1.2 Roles

Roles of the relation `ConnectedTo`

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

6.4.2.1 Definition

This represents a bi-directional relation between the `IubLink` and `UtranGenericCell`. The role of the relation shall be mapped to a reference attribute of the IOC. The name of the reference attribute shall be the role name.

6.4.2.2 Roles

Roles of the relation `AssociatedWith`

| Name | Definition |
|--------------------------|---|
| iubLink-UtranCell | This role (when present) represents the <code>IubLink</code> capability to identify the set of related child classes of <code>UtranGenericCell</code> . <code>IubLink.iubLink-UtranCell</code> shall carry the set of DN(s) of the child classes of <code>UtranGenericCell</code> . |
| utranGenericCell-IubLink | This role (when present) represents <code>UtranGenericCell</code> capability to identify one related <code>IubLink</code> . When the role is absent, the <code>UtranGenericCell.utranGenericCell-IubLink</code> shall contain no information. When it is present, it shall contain one <code>IubLink</code> DN. |

6.4.2.3 Constraints

When a particular `IubLink` identifies a particular child class of `UtranGenericCell`, that particular `UtranGenericCell` 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 `ExternalUtranGenericCell`. The role of the relation shall be mapped to a reference attribute, named `adjacentCell`, of the IOC.

6.4.3.2 Roles

Roles of the relation `ExternalUtranNeighbourCellRelation`

| Name | Definition |
|---|---|
| <code>utranRelation-externalUtranNeighbourCell</code> | This role (when present) represents the <code>UtranRelation</code> capability to identify one child class of <code>ExternalUtranGenricCell</code> . When this role is present, the <code>UtranRelation.adjacentCell</code> shall contain a DN of one child class of <code>ExternalUtranNeighbourCell</code> . |

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 `UtranGenericCell`. The role of the relation shall be mapped to a reference attribute, named `adjacentCell`, of the IOC.

6.4.4.2 Roles

Roles of the relation `UtranNeighbourCellRelation`

| Name | Definition |
|---|--|
| <code>utranRelation-utranNeighbourCell</code> | This role (when present) represents the <code>UtranRelation</code> capability to identify one <code>UtranGenericCell</code> . When this role is present, the <code>UtranRelation.adjacentCell</code> shall contain one DN of a child class of <code>UtranGenericCell</code> . |

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.

6.4.5 AssociatedWith1 (M)

6.4.5.1 Definition

This represents a bi-directional relation between the `IubLink` and `ATMChannelTerminationPoint`. The roles of the relation shall be mapped to a reference attribute of the IOCs. The name of the reference attribute shall be the role name.

6.4.5.2 Roles

Roles of the relation AssociatedWith1

| Name | Definition |
|---|--|
| <code>iubLink-ATMChannelTerminationPoint</code> | This role (when present) represents <code>IubLink</code> capability to identify the set of related <code>ATMChannelTerminationPoint</code> . It shall carry the set of <code>ATMChannelTerminationPoint</code> 's DN(s). |
| <code>atmChannelTerminationPoint-IubLink</code> | This role (when present) represents <code>ATMChannelTerminationPoint</code> capability to identify one related <code>IubLink</code> . When the role is absent, the <code>ATMChannelTerminationPoint-IubLink</code> shall contain no information. When it is present, it shall contain one <code>IubLink</code> DN. |

6.4.5.3 Constraints

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

6.4.6 AssociatedWith2 (O)

6.4.6.1 Definition

This represents a bi-directional relation between a `UtranGenericCell` and an `AntennaFunction`. The roles of the relation shall be mapped to a reference attribute of the IOC. The name of the reference attribute shall be the role name

6.4.6.2 Roles

Roles of the relation AssociatedWith2

| Name | Definition |
|------------------------|---|
| retAntennaFunctionList | This role (when present) allows navigation from a <code>UtranGenericCell</code> to the <code>AntennaFunction(s)</code> which are supporting the <code>UtranGenericCell</code> . |
| retUtranCellList | This role (when present) allows navigation from an <code>AntennaFunction</code> to the <code>UtranGenericCell(s)</code> it is supporting. |

6.4.6.3 Constraints

| Name | Definition |
|---------------------|---|
| inv_antennaInstance | The referential attributes <code>retAntennaFunctionList</code> , and <code>retUtranCellList</code> are to be populated when instances of the IOC <code>AntennaFunction</code> are instantiated. |

6.4.7 ExternalRncUtranCellRelation (O)

6.4.7.1 Definition

This represents the bi-directional relation between the `ExternalUtranGenericCell` and `ExternalRncFunction`. The roles of the relation shall be mapped to a reference attribute of the IOCs. The name of the reference attribute shall be the role name.

6.4.7.2 Roles

Roles of the relation `ExternalRncUtranCellRelation`

| Name | Definition |
|---------------------------------|---|
| <code>controllingRnc</code> | This role (when present) represents the <code>ExternalUtranGenericCell</code> capability to identify one related <code>ExternalRncFunction</code> . When it is present, it shall contain one <code>ExternalRncFunction</code> DN. |
| <code>controlledCellList</code> | This role (when present) represents the <code>ExternalRncFunction</code> capability to identify the set of related child classes of <code>ExternalUtranCell</code> . When it is present, it shall contain the set of DNs of child classes of <code>ExternalUtranGenericCell</code> . |

6.4.8 AssociatedWith3 (M)

6.4.8.1 Definition

This represents a bi-directional relation between a `UtranGenericCell` and a `TmaFunction`. The roles of the relation shall be mapped to a reference attribute of the IOCs. The name of the reference attribute shall be the role name

6.4.8.2 Roles

Roles of the relation `AssociatedWith3`

| Name | Definition |
|-------------------------------|--|
| <code>tmaFunctionList</code> | This role allows navigation from a <code>UtranGenericCell</code> to the <code>TmaFunction(s)</code> which are supporting the <code>UtranGenericCell</code> . |
| <code>tmaUtranCellList</code> | This role allows navigation from a <code>TmaFunction</code> to the <code>UtranGenericCell(s)</code> it is supporting. |

6.4.8.3 Constraints

When a particular `UtranGenericCell` identifies a particular `TmaFunction`, that particular `TmaFunction` must have identified the particular `UtranGenericCell`.

6.5 Information attribute definitions

6.5.1 Definition and legal values

The following table defines the attributes that are present in several Information Object Classes (IOCs) of the present document.

| Attributes | | |
|---------------------------------|--|---|
| Attribute Name | Definition | Legal Values |
| adjacentCell | It carries the DN of the <code>UtranGenericCell</code> or the <code>ExternalUtranGenericCell</code> . | |
| aichPower | The Power of the the AICHchannel in an FDD cell, "AICH Power" in Ref. 3GPP TS 25.433 [5]. | See "AICH Power" in Ref. 3GPP TS 25.433 [5]. |
| baseElevation | The elevation in meters above sea level at the base of the antenna structure. This value, when subtracted from <code>height</code> , provides the height of the antenna above the ground. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the luan interface according to Ref. 3GPP TS 25.463 [22]. | An integral value representing a number of meters in 0.1 meter increments. |
| bchPower | The power of the broadcast channel in the FDD mode cell, "BCH Power" in Ref. 3GPP TS 25.433 [5]. | See "DL Power" in Ref. 3GPP TS 25.433 [5]. |
| bearing | The bearing in degrees that the antenna is pointing in. Antenna bearing" in Ref. 3GPP TS 25.463 [20]. | See "Antenna bearing" in Ref. 3GPP TS 25.463 [20]. |
| cellCapabilityContainerFDD | Defined in 3GPP TS25.423 Each bit indicates whether a cell supports a particular functionality. | BITSTRING(32) |
| cellCapabilityContainerTDD | Defined in 3GPP TS25.423 Each bit indicates whether a cell supports a particular functionality. | BITSTRING(32) |
| cellIndividualOffset | Defined in 3GPP TS25.331 (25.423). Attribute relevant for HO decision Used to offset measured quantity value. | See "Cell individual offset" in Ref. 3GPP TS 25.331 [9]. |
| cellMode | An attribute that identifies the cell mode. | Type: Enumerated value Range: ("FDD mode", "1.28McpsTDD mode", "3.84McpsTDD mode", "7.68McpsTDD mode") |
| cellParameterId | This attribute identifies unambiguously the TDD mode cell: 3.84 and 7.68 Mcps TDD - Code Groups, Scrambling Codes, Midambles and Toffset, or 1.28 Mcps TDD - SYNC-DL and SYNC-UL sequences, the scrambling codes and the midamble codes. "Cell Parameter ID" in Ref. TS 25.433 [5] | See "Cell Parameter ID" in Ref. 3GPP TS 25.433 [5]. |
| cId | The attribute is the identifier of a cell in one RNC, "C-id" in Ref. 3GPP TS 25.401 [4] and "C-ID" in Ref. 3GPP TS 25.433 [5]. | See "C-ID" in Ref. 3GPP TS 25.433 [5]. |
| closedLoopModelSupportIndicator | Power control, defined in 3GPP TS25.423 The Closed Loop Mode1 Support Indicator indicates whether the particular cell is capable to support Closed loop mode1 or not. | ENUMERATED |
| connMscNumber | The MSC number of the far end MSC Server connected by the lu-CS interface for which the end point is modelled, "MSC number" in Ref. 3GPP TS 23.003 [3] | See "MSC number" in Ref. 3GPP TS 23.003 [3] |

| | | |
|-------------------------------|---|---|
| connSgsnNumber | The SGSN number of the far end SGSN connected by the lu-PS interface for which the end point is modelled, "SGSN number" in Ref. 3GPP TS 23.003 [3] | See "SGSN number" in Ref. 3GPP TS 23.003 [3] |
| dpcModeChangeSupportIndicator | Power control, defined in 3GPP TS25.423 The DPC Mode Change Support Indicator IE indicates that the particular cell is capable to support DPC mode change. | ENUMERATED |
| deltaQrxlevmin | Cell (re)selection, defined in 3GPP TS25.331 If present, the actual value of Qrxlevmin = Qrxlevmin + DeltaQrxlevmin | See "Delta _{Qrxlevmin} " in Ref. 3GPP TS 25.331 [9]. |
| dpchConstantValue | DPCH Constant Value is the power margin in dB used by a UE to set the proper uplink power, "DPCH Constant Value" in Ref. TS 25.433 [5]. | See "Constant Value" in Ref. 3GPP TS 25.433 [5]. |
| dwpchPower | DwPCH Power is the power that shall be used for transmitting the DwPCH in a 1.28 Mcps TDD cell, "DwPCH Power" in Ref. 3GPP TS 25.433 [5]. | See "DwPCH Power" in Ref. 3GPP TS 25.433 [5]. |
| fachPower | The maximum power of the FACH transport channel that may be used in the cell, "Max FACH Power" in Ref 3GPP TS 25.433 [5]. | See "DL Power" in Ref. 3GPP TS 25.433 [5]. |
| fpachPower | The maximum power of the FPACH channel that shall be used in TDD cell, "FPACH Power" in Ref. 3GPP TS 25.433 [5]. | See "FPACH Power" in Ref. 3GPP TS 25.433 [5]. |
| frameOffset | Neighbouring cells monitoring, defined in 3GPP TS25.423 Frame Offset is the required offset between the dedicated channel downlink transmission frames (CFN, Connection Frame Number) and the broadcast channel frame offset (Cell Frame Number). The Frame Offset is used in the translation between Connection Frame Number (CFN) on Iub/Iur and least significant 8 bits of SFN (System Frame Number) on Uu. The Frame Offset is UE and cell specific. | INTEGER(0..255) |
| hcsPrio | Cell (re)selection for HCS Defined in Ref. 3GPP TS25.331 [9]. This specifies the HCS priority level (0-7) for serving cell and neighbouring cells. HCS priority level 0 means lowest priority and HCS priority level 7 means highest priority. | See "HCS_OFF _{mbms} " in Ref. 3GPP TS 25.331 [9]. |
| height | The height of an antenna above sea level. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the luan interface according to Ref. 3GPP TS 25.463 [22]. | An integral value representing a number of metres in 0.1 meter increments. |
| horizBeamwidth | The 3 dB power beamwidth of the antenna pattern in the horizontal plane. A value of 360 indicates an omni-directional antenna. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the luan interface according to Ref. 3GPP TS 25.463 [22]. | A single integral value corresponding to an angle in degrees between 0 and 360. |
| hsEnable | A label indicating whether or not HSDPA is enabled in the UTRAN cell. A value of 0 represents that HSDPA is not enabled and a value of 1 represents that HSDPA is enabled. | Type: Integral numeric value Range: (0..1) |
| hsFlag | A label indicating whether or not HSDPA is supported in the UTRAN cell. A value of 0 indicates that HSDPA is not supported and a value of 1 indicates that HSDPA is supported. | Type: Integral numeric value Range: (0..1) |
| id | An attribute whose "name+value" can be used as an RDN when naming an instance of the object class. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance. | |
| lac | Location Area Code, "LAC" in Ref. 3GPP TS 23.003 [3]. | See "LAC" in Ref. 3GPP TS 25.413 [23]. |

| | | |
|--------------------------|---|--|
| latitude | The latitude of the antenna location based on World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to the northern hemisphere. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the luan interface according to Ref. 3GPP TS 25.463 [22]. | Valid values described in 3GPP TS23.032 [20]. |
| localCellId | The Local Cell id is used to uniquely identify the set of resources defined in a Node B to support a cell. It must be unique in Node B at a minimum, but may be unique in UTRAN. . Local Cell Identifier" Ref. 3GPP TS 25.401 [4], "Local Cell ID" in 3GPP TS 25.433 [5]. | See "Local Cell ID" in Ref. 3GPP TS 25.433 [5]. |
| longitude | The longitude of the antenna location based on World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to degrees east of 0 degrees longitude. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the luan interface according to Ref. 3GPP TS 25.463 [22]. | Valid values described in 3GPP TS23.032.[20] |
| maximumAllowedULTxPower | Cell (re)selection, defined in Ref. 3GPP TS25.331 [9]. This information element indicates the maximum allowed uplink transmit power. | See "Maximum allowed UL TX power" in Ref. 3GPP TS 25.331 [9] |
| maxAzimuthValue | The maximum amount of change of azimuth the RET system can support. This is the change in degrees clockwise from bearing. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the luan interface according to Ref. 3GPP TS 25.463 [22]. | A single integral value corresponding to an angle in degrees between 0 and 360 with a resolution of 0.1 degrees, see Note. |
| maxTiltValue | The maximum amount of tilt the RET system can support. "Maximum supported tilt" in Ref. 3GPP TS 25.463 [20]. | See "Maximum supported tilt" in Ref. 3GPP TS 25.463 [22]. |
| maximumTransmissionPower | 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, "Maximum Transmission Power" in Ref. 3GPP TS 25.433 [5]. | See "Maximum Transmission Power" in Ref. 3GPP TS 25.433 [5]. |
| mcc | Mobile Country Code, MCC (part of the PLMN Identifier") in, Ref. 3GPP TS 23.003 [3]. | See "MCC" in "PLMN identity" in Ref. 3GPP TS 25.413 [21]. |
| mechanicalOffset | This is a value representing a non-adjustable tilt value, which is imparted to the antenna due to the physical installation. The actual tilt at any point in time is the summation of <code>mechanicalOffset</code> and <code>retTiltValue</code> . Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the luan interface according to Ref. 3GPP TS 25.463 [22]. | A single integral value corresponding to an angle in degrees between 0 and 360 with a resolution of 0.1 degrees. |
| minAzimuthValue | The minimum amount of change of azimuth the RET system can support. This is the change in degrees counter-clockwise from bearing. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the luan interface according to Ref. 3GPP TS 25.463 [22]. | A single integral value corresponding to an angle in degrees between 0 and 360 with a resolution of 0.1 degrees. |
| minTiltValue | The minimum amount of tilt the RET system can support, "Minimum supported tilt" in Ref. 3GPP TS 25.463 [22]. | See "Minimum supported tilt" in Ref. 3GPP TS 25.463 [22]. |
| mnc | Mobile Network Code, "MNC" (part of the PLMN Identity") in Ref. 3GPP TS 23.003 [3]. | See "MNC" in "PLMN identity" in Ref. 3GPP TS 25.413 [23]. |
| numOfHspdschs | In FDD: the number of codes at the defined spreading factor(SF=16), within the complete code tree. See Ref. 3GPP TS 25.433 [5]. In TDD: the number of HS-PDSCHs in a Cell; Ref. 3GPP TS 25.433 [5]. | Type: INTEGER Range: (0..15) for FDD mode, Range: (0..95) for TDD mode |

| | | |
|-------------------------------|--|--|
| numOfHsscchs | The number of HS-SCCHs for one cell. Ref. 3GPP TS 25.433 [5]. | Type: INTEGER Range: (1..32) |
| patternLabel | The pattern name is a textual, alpha-numeric string to allow identification of the antenna pattern along with the antenna vendor information such as model number, etc. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the Luant interface according to Ref. 3GPP TS 25.463 [22]. | |
| pchPower | The power of PCH transport channel in the cell, "PCH Power" in Ref 3GPP TS 25.433 [5]. | See "DL Power" in Ref. 3GPP TS 25.433 [5]. |
| penaltyTime | Cell (re)selection for HCS, defined in 3GPP TS25.331 (TS 25.304) This specifies the time duration for which the TEMPORARY_OFFSET is applied for a neighbouring cell. | See "Penalty_time" in Ref. 3GPP TS 25.331 [9]. |
| pichPower | The Power of the PICH channel in the cell, "PICH Power" in Ref. 3GPP TS 25.433 [5]. | See "PICH Power" in Ref. 3GPP TS 25.433 [5]. |
| primaryCcpchPower | The power of the primary CCPCH channel in the TDD cell, "PCCPCH Power" in Ref. 3GPP TS 25.433 [5]. | See "PCCPCH Power" in Ref. 3GPP TS 25.433 [5]. |
| primaryCpichPower | The power of the primary CPICH channel in the FDD mode cell, "Primary CPICH Power" in Ref. 3GPP TS 25.433 [5]. | See "Primary CPICH Power" in Ref. 3GPP TS 25.433 [5]. |
| primarySchPower | The power of the primary synchronisation channel in the FDD mode cell, "Primary SCH Power" in Ref. 3GPP TS 25.433 [5]. | See "DL Power" in Ref. 3GPP TS 25.433 [5]. |
| primaryScramblingCode | The primary DL scrambling code used by the FDD mode cell, "Primary Scrambling Code" in Ref. 3GPP TS 25.433 [5]. | See "Primary Scrambling Code" in Ref. 3GPP TS 25.433 [5]. |
| qhcs | Cell (re)selection for HCS, defined in Ref. 3GPP TS25.331 [9]. This specifies the quality threshold levels for applying prioritised hierarchical cell re-selection | See "Qhcs" in Ref. 3GPP TS 25.331 [9] |
| qqualMin | Cell (re)selection, defined in Ref. 3GPP TS25.331 [9]. This specifies the minimum required quality level in the cell in dB. It is only applicable for FDD cells. | See "QqualMin" in Ref. 3GPP TS 25.331 [9]. |
| qrxlevMin | Cell (re)selection, defined in Ref. 3GPP TS25.331 [9]. This specifies the minimum required RX level in the cell in dBm. | See "QrxlevMin" in Ref. 3GPP TS 25.331 [9]. |
| rac | Routing Area Code, "RAC" in Ref. 3GPP TS 23.003 [3]. | See "RAC" in Ref. 3GPP TS 25.413 [23]. |
| readSFNIndicator | Neighbouring cells monitoring, defined in Ref. 3GPP TS25.331 [9]. | See "Read SFN indicator" in Ref. 3GPP TS 25.331 [9] |
| referenceTimeDifferenceToCell | Neighbouring cells monitoring, defined in Ref. 3GPP TS25.331 [9]. In the System Information message, the reference time difference to cell indicates the timing difference between the primary CCPCH of the current cell and the primary CCPCH of a neighbouring cell. In the Measurement Control message, the reference time difference to cell indicates the timing difference between UE uplink transmission timing and the primary CCPCH of a neighbouring cell. | See "Reference time difference to cell" in Ref. 3GPP TS 25.331 [9] |
| restrictionStateIndicator | Cell Access Control, defined in 3GPP TS25.423 The Restriction state indicator is the identifier indicates whether the cell is "Cell Reserved for Operator Use" or not. It is provided by DRNS and reported to SRNC. | ENUMERATED |
| retAntennaFunctionList | This is a referential attribute to list the DNS of AntennaFunction(s) that support the UtranGenericCell. | |

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|----------------------|--|---|
| retGroupName | The group name is a textual, alpha-numeric string to define a logical grouping of antennas which may be in different cells. This attribute permits the definition of a logical grouping of the antennas. This may be defined either at installation time, or by management activity to provisioning the group name via the Itf-N. | Type: string bounded to 80 characters. |
| retTiltValue | The electrical tilt setting of the antenna, "Tilt value" in Ref. 3GPP TS 25.463 [22]. | See "Tilt value" in Ref. 3GPP TS 25.463 [22]. |
| retUtranCellList | This is a list of UtranGenericCell DNs to record the relationship between the AntennaFunction instance and the UtranGenericCell(s) which are supported by the antenna. | |
| rncId | IOC ExternalUtranGenericCell and ExternalRncFunction: Unique RNC ID for the associated RNC, "RNC Id" in Ref. 3GPP TS 23.003 [3]. IOC RncFunction: Unique RNC ID, "RNC Id" in Ref. 3GPP TS 23.003 [3]. | See "RNC-ID" in Ref. 3GPP TS 25.413 [23]. |
| sac | Service Area Code, "SAC" in Ref. 3GPP TS 23.003 [3]. | See "SAC" in Ref. 3GPP TS 25.413 [23]. |
| schPower | The power of the synchronisation channel in 3.84 Mcps TDD cell, "SCH Power" in Ref. 3GPP TS 25.433 [5]. | See "DL Power" in Ref. 3GPP TS 25.433 [5]. |
| schTimeSlot | The SCH Time Slot IE represents the first time slot (k) of a pair of time slots inside a Radio Frame that is assigned to the Physical Channel SCH, "SCH Time Slot" in Ref. 3GPP TS 25.433 [5]. | See "SCH Time Slot" in Ref. 3GPP TS 25.433 [5]. |
| sctdIndicator | This attribute indicates whether SCTD is used, "SCDT Indicator" in Ref. 3GPP TS 25.433 [5]. | See "SCDT Indicator" in Ref. 3GPP TS 25.433 [5]. |
| secondarySchPower | The power of the secondary synchronisation channel in the FDD mode cell, "Secondary SCH Power" in Ref. 3GPP TS 25.433 [5]. | See "DL Power" in Ref. 3GPP TS 25.433 [5]. |
| snaInformation | Shared Networks Access Control, defined in 3GPP TS25.423. This information element contains a list of Shared Network Areas, identified by the Shared Network Area Code (SNAC) which a certain cell belongs to. | |
| sttdSupportIndicator | Power control, defined in 3GPP TS25.423 The STTD Support Indicator indicates whether the STTD can be applied to DL DPCH and F-DPCH in the cell or not. | ENUMERATED |
| syncCase | The SCH and PCCPCH in a TDD cell are mapped on one or two downlink slots per frame. There are two cases of Sync Case as follows: SCH and PCCPCH allocated in a single TS#k SCH allocated in two TS: TS#k and TS#k+8. PCCPCH allocated in TS#k "Synch Case" in Ref. 3GPP TS 25.433 [5]. | See "Sync Case" in Ref. 3GPP TS 25.433 [5]. |
| temporaryOffset1 | Cell (re)selection for HCS, defined in 3GPP TS25.331 (TS 25.304) This specifies the offset applied to the H and R criteria for a neighbouring cell for the duration of PENALTY_TIME. It is used for TDD and GSM cells and for FDD cells in case the quality measure for cell selection and re-selection is set to CPICH RSCP | See "Temporary_offset1" in Ref. 3GPP TS 25.331 [9]. |
| temporaryOffset2 | Cell (re)selection for HCS, defined in 3GPP TS25.331 (TS 25.304) This specifies the offset applied to the H and R criteria for a neighbouring cell for the duration of PENALTY_TIME. It is used for FDD cells in case the quality measure for cell selection and re-selection is set to CPICH Ec/No. | See "Temporary_offset2" in Ref. 3GPP TS 25.331 [9]. |
| timeSlotForSch | The Time Slot represents the time interval assigned to a Physical Channel referred to the start of a Radio Frame, "SCH Time Slot" in Ref. 3GPP TS 25.433 [5]. | See "SCH Time Slot" in Ref. 3GPP TS 25.433 [5]. |

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|--------------------------------------|--|--|
| timeSlotListHcr | This attribute defines the time slot configuration information in the TDD cell. It is a list which contains 15 (for 3.84 or 7.68 Mcps TDD cell) items. Within each item there are three parts: timeSlotId, timeSlotDirection, timeSlotStatus. (Ref. 3GPP TS 25.433 [5]). | timeSlotId: Type: Integral numeric value Range: (0..14); timeSlotDirection: Type: Enumerated value Range: (UI, DI); timeSlotStatus: Type: Enumerated value Range: (Active, Not active) |
| timeSlotListLcr | This attribute defines the time slot configuration information in the TDD cell. It is a list which contains 7 (for 1.28 Mcps TDD cell) items. Within each item there are three parts: timeSlotId, timeSlotDirection, timeSlotStatus, corresponding to Time Slot LCR, Time Slot Direction, Time Slot Status (Ref. 3GPP TS 25.433 [5]). If multiple frequencies exist within the cell, the timeSlotList indicates the Time Slot configuration of Primary Frequency. | timeSlotId: Type: Integral numeric value Range: (0..6); timeSlotDirection: Type: Enumerated value Range: (UI, DI); timeSlotStatus: Type: Enumerated value Range: (Active, Not active) |
| tmaAdditionalDataFieldNumber | This attribute identifies a standard data field which has no operational impact. Used by the procedures SetDeviceData and GetDevedata. Defined in Table B.3 of 3GPP TS 25.466 [21]. | Defined in TS 25.466 [21] |
| tmaAntennaBearing | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaAntennaModelNumber | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaAntennaOperatingBands | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaAntennaSerialNumber | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaBaseStationId | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaBeamwidthForEachOpBandInBandOrder | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaFunctionFlag | Defined in 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaFunctionList | This is a referential attribute to list the DNs of TmaFunction(s) that support the UtranGenericCell. | A list of DNs as defined in TS 32.300 [13]. |
| tmaGainFigure | Defined in 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaGainForEachOpBandInBandOrder | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaGainResolution | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaInstallationDate | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaInstalledMechanicalTilt | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaInstallersId | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaMaxGain | Defined in 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaMaxSupportedGain | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaMinGain | Defined in 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaMinSupportedGain | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |

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| tmaNon-LinearGainValue | Defined in 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaNumberOfNon-LinearGainValues | Defined in 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaNumber OfSubunits | Defined in 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaResolution | Defined in 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaSectorId | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaStateFlag | Defined in 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaSubunitNumber | Defined in 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaSubunitType | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaSubunitRxFrequencyBand | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaSubunitTxFrequencyBand | A data field defined in Table B.3 of 3GPP TS 25.466 [21] | Defined in TS 25.466 [21] |
| tmaUtranCellList | This is a list of UtranGenericCell DNs to record the relationship between the TmaFunction instance and the UtranGenericCell (s) which are supported by the TMA. | |
| tstdIndicator | This attribute indicates whether TSTD is used, TSDT Indicator" in Ref. 3GPP TS 25.433 [5]. | See "TSDT Indicator" in Ref. 3GPP TS 25.433 [5]. |
| txDiversityIndicator | Defined in 3GPP TS25.331 (25.423) This attribute indicates whether following conditions are satisfied: Primary CPICH is broadcast from two antennas STTD is applied to Primary CCPCH TSTD is applied to Primary SCH and Secondary SCH | See "TX Diversity Indicator" in Ref. 3GPP TS 25.331 [9] |
| uarfcn | The UTRA absolute Radio Frequency Channel number for TDD mode cell, UARFCN (Ref. 3GPP TS 25.433 [5]). For 1.28Mcps TDD, if multiple frequencies exist within the cell, the uarfcn indicates the frequency of Primary Frequency. | Type : Integral numeric Value Range: (0..16383) |
| uarfcnLCRList | For 1.28 Mcps TDD, if multiple frequencies exist within the cell, this is a list of the UARFCN and Time Slot configuration information of the Secondary Frequencies. Specifically, within each item in the list there are two main parts: uarfcn and timeSlotListLcr. The second part is a list of elements which have the sub-elements: timeSlotId, timeSlotDirection, timeSlotStatus. These attributes correspond to "UARFCN, Time Slot LCR, Time Slot Direction, Time Slot Status" (Ref. 3GPP TS 25.433 [5]). | For "uarfcn, timeSlotId, timeSlotDirection, timeSlotStatus", see "UARFCN, Time Slot LCR, Time Slot Direction, Time Slot Status" in Ref. 3GPP TS 25.433 [5]. For maximum number of the Secondary Frequencies per cell, see "maxFrequencyinCell-1" in Ref. 3GPP TS 25.433 [5]. |
| uarfcnDl | The DL UTRA absolute Radio Frequency Channel number for FDD mode cell, "UARFCN" in Ref. 3GPP TS 25.433 [5]. | See "UARFCN" in Ref. 3GPP TS 25.433 [5]. |
| uarfcnUl | The UL UTRA absolute Radio Frequency Channel number for FDD mode cell, "UARFCN" in Ref. 3GPP TS 25.433 [5]. | See "UARFCN" in Ref. 3GPP TS 25.433 [5]. |
| uraList | A list of UTRAN Registration Area identities, that an UtranCell can belong to, "URA identity" in Ref. 3GPP TS 25.331 [9]. | For URA, see "URA identity" in Ref. 3GPP TS 25.331[9], subclause 10.3.2.6. For maximum number of URAs per cell, see "maxURA" in Ref. 3GPP TS 25.331 [9], subclause 10.3.10. |
| userLabel | User assigned information Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. | |

| | | |
|---------------|---|---|
| vertBeamwidth | The 3 dB power beamwidth of the antenna pattern in the vertical plane. Note: The value of this attribute has no operational impact on the network, e.g. the NE behavior is not affected by the value setting of this attribute. Note as well that this attribute is not supported over the luan interface according to Ref. 3GPP TS 25.463 [22]. | A single integral value corresponding to an angle in degrees between 0 and 180. |
|---------------|---|---|

6.5.2 Constraints

None.

6.6 Particular information configurations

Not applicable.

6.7 Common Notifications

6.7.1 Alarm and configuration notifications

| 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]) | |
| notifyPotentialFaultyAlarmList | See Alarm IRP (3GPP TS 32.111-2 [11]) | |

Note that these notifications are issued based on occurrences on the IRPagent IOC and not on occurrences on other IOCs.

6.7.2 Configuration notifications

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

Note that these notifications are issued based on occurrences on the IRPAgent IOC and not on occurrences on other IOCs.

Annex A (informative):
Void

Annex B (informative): RET Control Architecture

The Itf-N provides an abstraction of resources to allow the monitor and control of physical resource from the network level management systems. For RET, the antenna tilt is controlled via a control unit which is located within the NodeB (from a management perspective). The control unit sends commands to actuators located at the tower top, in order to read, and to adjust antenna tilt values.

The AntennaFunction class will report failures and malfunctions of either the control unit, or the tilt.

There are several configurations of antennae. Some support the transmission of several frequencies from a single radome while others are deployed as an array in order to provide effective coverage.

Hence in the UTRAN model there is an N:M relationship between the UtranCell class and the AntennaFunction class, permitting the model to support all possibilities. The figure B.1 below illustrates the RET architecture.

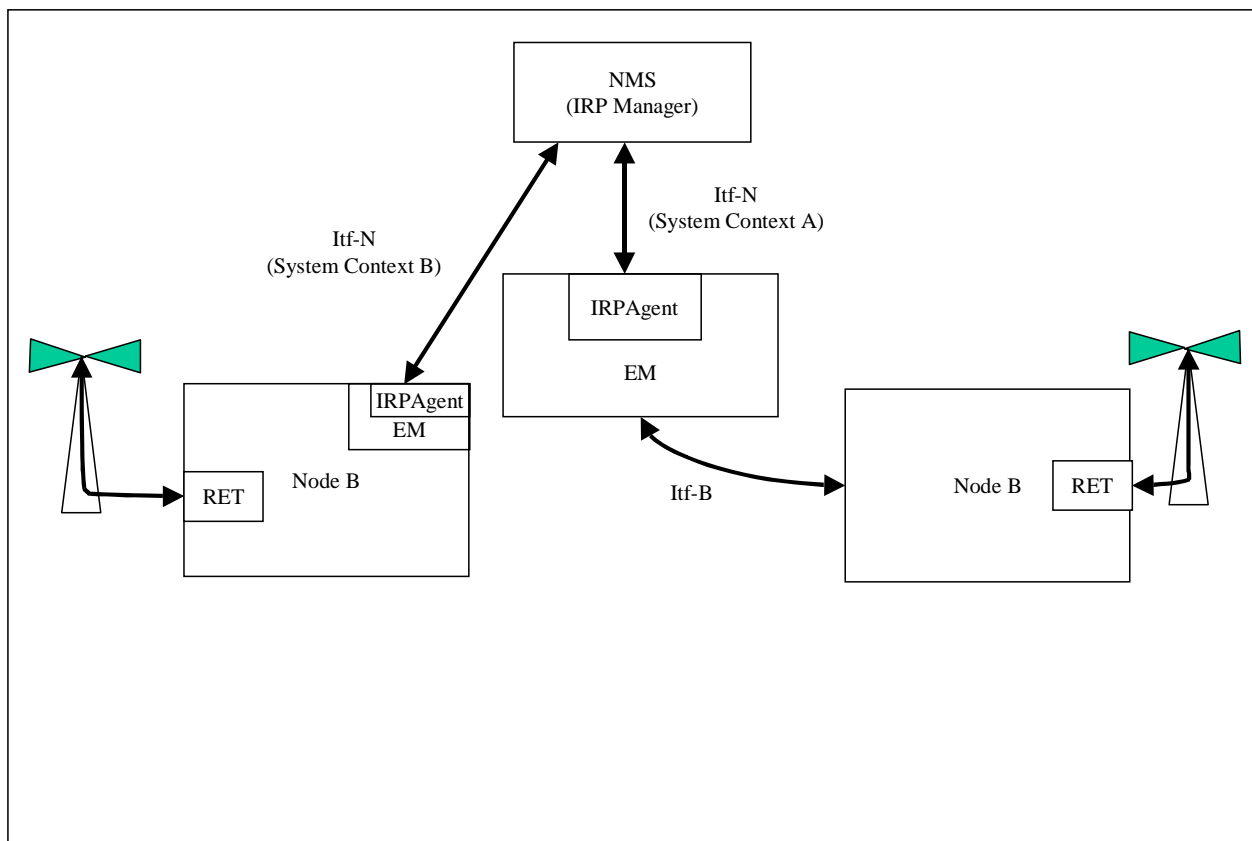


Figure B.1: Overall RET architecture

Annex C (informative): Change history

| Change history | | | | | | | | |
|----------------|-------|-----------|-------|-----|--|-----|-------|-------|
| Date | TSG # | TSG Doc. | CR | Rev | Subject/Comment | Cat | Old | New |
| Jun 2001 | SP-12 | SP-010283 | -- | -- | Approved at TSG SA #12 and placed under Change Control | -- | 2.0.0 | 4.0.0 |
| Jun 2002 | SP-16 | SP-020303 | 0001 | -- | Corrections of reference in figure 6.2 and of attribute descriptions in UtranRelation in 32.642 (UTRAN network resources IRP: NRM) | F | 4.0.0 | 4.1.0 |
| Jun 2002 | SP-16 | SP-020304 | 0002 | -- | Correction of supported IRP in system context | F | 4.0.0 | 4.1.0 |
| Sep 2002 | SP-17 | SP-020490 | 0003 | -- | UML corrections | F | 4.1.0 | 4.2.0 |
| Sep 2002 | SP-17 | SP-020492 | 0004 | -- | Add the new IRP IS methodology defined in 32.102 | F | 4.2.0 | 5.0.0 |
| Sep 2002 | SP-17 | SP-020492 | 0005 | -- | Add State Management | B | 4.2.0 | 5.0.0 |
| Dec 2002 | SP-18 | SP-020748 | 0006 | -- | Inclusion of valid values and ranges for UTRAN Cell parameters | F | 5.0.0 | 5.1.0 |
| Jan 2003 | -- | -- | -- | -- | Accepted all revision marks | -- | 5.1.0 | 5.1.1 |
| Jun 2003 | SP-20 | SP-030282 | 0008 | -- | Include notification tables | A | 5.1.1 | 5.2.0 |
| Jun 2003 | SP-20 | SP-030282 | 0010 | -- | Correction of UML diagram vsDataContainer Containment/Naming and Association in UTRAN NRM | A | 5.1.1 | 5.2.0 |
| Jun 2003 | SP-20 | SP-030283 | 0012 | -- | Deletion of UTRAN attribute relationType | A | 5.1.1 | 5.2.0 |
| Dec 2003 | SP-22 | SP-030715 | 0014 | -- | Correction in attribute description for "maximumTransmissionPower" to remove dual interpretation - Align with RAN3's 25.433 | A | 5.2.0 | 5.3.0 |
| Dec 2003 | SP-22 | SP-030646 | 0016 | -- | Correction of the number of possible URAs from 1 to 8 | A | 5.2.0 | 5.3.0 |
| Dec 2003 | SP-22 | SP-030641 | 0017 | -- | Add missing notification notifyPotentialFaultyAlarmlist | F | 5.2.0 | 5.3.0 |
| Dec 2003 | SP-22 | SP-030643 | 0018 | -- | Remove redundant VsDataContainer Containment UML - Now covered by 32.622 | F | 5.2.0 | 5.3.0 |
| Mar 2004 | SP-23 | SP-040129 | 0019 | -- | Addition of new attributes for support of both FDD and TDD modes | B | 5.3.0 | 6.0.0 |
| Jun 2004 | SP-24 | SP-040254 | 0021 | -- | Correction of the supported UMTS frequencies | A | 6.0.0 | 6.1.0 |
| Sep 2004 | SP-25 | SP-040584 | 0022 | -- | Add support for the state change notification in UTRAN network resources IRP NRM | B | 6.1.0 | 6.2.0 |
| Sep 2004 | SP-25 | SP-040595 | 0023 | -- | Include ATM in CM UTRAN network resources IRP NRM | B | 6.1.0 | 6.2.0 |
| Sep 2004 | SP-25 | SP-040585 | 0026 | -- | Align with the IRP IS template (32.151) and IRP IS UML repertoire (32.152) | F | 6.1.0 | 6.2.0 |
| Sep 2004 | SP-25 | SP-040587 | 0027 | -- | Add support for Remote control of Electrical Tilting (RET) antenna CR not implementable (UML conflict) New CR028 SA#26 approved | B | 6.1.0 | 6.2.0 |
| Dec 2004 | SP-26 | SP-040810 | 0028 | -- | Add AntennaFunction class and attributes to support RET (Remote control of Electrical Tilting) | B | 6.2.0 | 6.3.0 |
| Dec 2004 | SP-26 | SP-040810 | 0029 | -- | Add support for the state change notification | B | 6.2.0 | 6.3.0 |
| Mar 2005 | SP-27 | SP-050048 | 0032 | -- | Align with SA2's 23.221, for allowing only CS CN in a PLMN | A | 6.3.0 | 6.4.0 |
| Mar 2005 | SP-27 | SP-050048 | 0033 | -- | Add missing definition of IOC ExternalRncFunction | F | 6.3.0 | 6.4.0 |
| Mar 2005 | SP-27 | SP-050048 | 0034 | -- | Amendments to UTRAN NRM for RET | F | 6.3.0 | 6.4.0 |
| Sep 2005 | SP-29 | SP-050461 | 0035 | -- | Add attributes for RET antennas systems - Align with TR 32.804 & RAN specs | F | 6.4.0 | 6.5.0 |
| Mar 2006 | SP-31 | SP-060102 | 0036 | -- | Correct relationships for external Information Object Classes (IOCs) | F | 6.5.0 | 6.6.0 |
| Jun 2006 | SP-32 | SP-060415 | 0037 | 1 | Correct the definition of longitude | F | 6.6.0 | 6.7.0 |
| Jun 2006 | SP-32 | SP-060259 | 0038 | -- | Add configuration parameters for radio channel power | B | 6.6.0 | 7.0.0 |
| Mar 2007 | SP-35 | SP-070046 | 0020a | -- | Revise the Object Model in UTRAN network resources IRP Network Resource Model | B | 7.0.0 | 7.1.0 |
| Jun 2007 | SP-36 | SP-070282 | 0039 | -- | Add control and configuration of Tower Mounted Amplifiers - Align with RAN3 25.466 | B | 7.1.0 | 7.2.0 |
| Jun 2007 | SP-36 | SP-070276 | 0040 | -- | Add missing attribute descriptions to the Utran NRM - All attributes visible only over ltf-p2p are marked CO (conditional/ optional) | F | 7.1.0 | 7.2.0 |
| Dec 2007 | SP-38 | SP-070733 | 0043 | -- | Add write support for TMA Additional Data | F | 7.2.0 | 7.3.0 |
| Dec 2007 | SP-38 | SP-070740 | 0044 | -- | Correct cardinality numbers regarding transient states - Align with 32.152 | C | 7.3.0 | 8.0.0 |
| Mar 2008 | SP-39 | SP-080058 | 0046 | -- | Correct wrongly supported RET attributes - Align with 25.463 | A | 8.0.0 | 8.1.0 |
| Mar 2008 | SP-39 | SP-080058 | 0048 | -- | Add missing multi-frequency attributes for 1.28Mcps TDD - Align with 25.433 | A | 8.0.0 | 8.1.0 |
| Jun 2008 | SP-40 | SP-080328 | 0050 | -- | Correction of UTRAN Cell attributes - Align with 25.433 | A | 8.1.0 | 8.2.0 |
| Jun 2008 | SP-40 | SP-080329 | 0051 | -- | Add end point model for lu-CS and lu-PS interfaces | B | 8.1.0 | 8.2.0 |
| Dec 2009 | SP-46 | SP-090719 | 0052 | -- | Correction of association diagrams and the role of 'AssociatedWith' | F | 8.2.0 | 9.0.0 |
| Sep 2010 | SP-49 | SP-100487 | 0055 | -- | Correcting inconsistencies in the specification | A | 9.0.0 | 9.1.0 |

History

| Document history | | |
|-------------------------|--------------|-------------|
| V9.0.0 | January 2010 | Publication |
| V9.1.0 | October 2010 | Publication |
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