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3rd Generation Partnership Project;

Technical Specification Group Services and System Aspects;

Telecommunication management;

Universal Terrestrial Radio Access Network (UTRAN)

Network Resource Model (NRM)

Integration Reference Point (IRP);

Information Service (IS)

(Release 16)

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Contents

[Foreword 6](#__RefHeading___Toc340599105)

[Introduction 6](#__RefHeading___Toc340599106)

[1 Scope 7](#__RefHeading___Toc340599107)

[2 References 7](#__RefHeading___Toc340599108)

[3 Definitions and abbreviations 9](#__RefHeading___Toc340599109)

[3.1 Definitions 9](#__RefHeading___Toc340599110)

[3.2 Abbreviations 10](#__RefHeading___Toc340599111)

[4 Model 11](#__RefHeading___Toc340599112)

[4.1 Imported information entities and local labels 11](#__RefHeading___Toc340599113)

[4.2 Class diagrams 12](#__RefHeading___Toc340599114)

[4.2.1 Relationships 12](#__RefHeading___Toc340599115)

[4.2.2 Inheritance 15](#__RefHeading___Toc340599116)

[4.3 Class definitions 16](#__RefHeading___Toc340599117)

[4.3.1 RNCFunction 16](#__RefHeading___Toc340599118)

[4.3.1.1 Definition 16](#__RefHeading___Toc340599119)

[4.3.1.2 Attributes 16](#__RefHeading___Toc340599120)

[4.3.1.3 Attribute constraints 16](#__RefHeading___Toc340599121)

[4.3.1.4 Notifications 16](#__RefHeading___Toc340599122)

[4.3.2 NodeBFunction 16](#__RefHeading___Toc340599123)

[4.3.2.1 Definition 16](#__RefHeading___Toc340599124)

[4.3.2.2 Attributes 16](#__RefHeading___Toc340599125)

[4.3.2.3 Attribute constraints 16](#__RefHeading___Toc340599126)

[4.3.2.4 Notifications 16](#__RefHeading___Toc340599127)

[4.3.3 IubLink 17](#__RefHeading___Toc340599128)

[4.3.3.1 Definition 17](#__RefHeading___Toc340599129)

[4.3.3.2 Attributes 17](#__RefHeading___Toc340599130)

[4.3.3.3 Attribute constraints 17](#__RefHeading___Toc340599131)

[4.3.3.4 Notifications 17](#__RefHeading___Toc340599132)

[4.3.4 UtranRelation 17](#__RefHeading___Toc340599133)

[4.3.4.1 Definition 17](#__RefHeading___Toc340599134)

[4.3.4.2 Attributes 17](#__RefHeading___Toc340599135)

[4.3.4.3 Attribute constraints 18](#__RefHeading___Toc340599136)

[4.3.4.4 Notifications 18](#__RefHeading___Toc340599137)

[4.3.5 ExternalRncFunction 18](#__RefHeading___Toc340599138)

[4.3.5.1 Definition 18](#__RefHeading___Toc340599139)

[4.3.5.2 Attributes 18](#__RefHeading___Toc340599140)

[4.3.5.3 Attribute constraints 18](#__RefHeading___Toc340599141)

[4.3.5.4 Notifications 18](#__RefHeading___Toc340599142)

[4.3.6 *UtranGenericCell* 18](#__RefHeading___Toc340599143)

[4.3.6.1 Definition 18](#__RefHeading___Toc340599144)

[4.3.6.2 Attributes 18](#__RefHeading___Toc340599145)

[4.3.6.3 Attribute constraints 20](#__RefHeading___Toc340599146)

[4.3.6.4 Notifications 20](#__RefHeading___Toc340599147)

[4.3.7 ExternalUTRANGenericCell 20](#__RefHeading___Toc340599148)

[4.3.7.1 Definition 20](#__RefHeading___Toc340599149)

[4.3.7.2 Attributes 20](#__RefHeading___Toc340599150)

[4.3.7.3 Attribute constraints 21](#__RefHeading___Toc340599151)

[4.3.7.4 Notifications 21](#__RefHeading___Toc340599152)

[4.3.8 UtranCellFDD 21](#__RefHeading___Toc340599153)

[4.3.8.1 Definition 21](#__RefHeading___Toc340599154)

[4.3.8.2 Attributes 21](#__RefHeading___Toc340599155)

[4.3.8.3 Attribute constraints 22](#__RefHeading___Toc340599156)

[4.3.8.4 Notifications 22](#__RefHeading___Toc340599157)

[4.3.9 UtranCellTDD 22](#__RefHeading___Toc340599158)

[4.3.9.1 Definition 22](#__RefHeading___Toc340599159)

[4.3.9.2 Attributes 22](#__RefHeading___Toc340599160)

[4.3.9.3 Attribute constraints 22](#__RefHeading___Toc340599161)

[4.3.9.4 Notifications 22](#__RefHeading___Toc340599162)

[4.3.10 UtranCellTDDLcr 23](#__RefHeading___Toc340599163)

[4.3.10.1 Definition 23](#__RefHeading___Toc340599164)

[4.3.10.2 Attributes 23](#__RefHeading___Toc340599165)

[4.3.10.3 Attribute Constraints 23](#__RefHeading___Toc340599166)

[4.3.10.4 Notifications 23](#__RefHeading___Toc340599167)

[4.3.11 UtranCellTDDHcr 23](#__RefHeading___Toc340599168)

[4.3.11.1 Definition 23](#__RefHeading___Toc340599169)

[4.3.11.2 Attributes 23](#__RefHeading___Toc340599170)

[4.3.11.3 Attribute constraints 23](#__RefHeading___Toc340599171)

[4.3.11.4 Notifications 23](#__RefHeading___Toc340599172)

[4.3.12 ExternalUtranCellFDD 23](#__RefHeading___Toc340599173)

[4.3.12.1 Definition 23](#__RefHeading___Toc340599174)

[4.3.12.2 Attributes 24](#__RefHeading___Toc340599175)

[4.3.12.3 Attribute constraints 24](#__RefHeading___Toc340599176)

[4.3.12.4 Notifications 24](#__RefHeading___Toc340599177)

[4.3.13 ExternalUtranCellTDD 24](#__RefHeading___Toc340599178)

[4.3.13.1 Definition 24](#__RefHeading___Toc340599179)

[4.3.13.2 Attributes 24](#__RefHeading___Toc340599180)

[4.3.13.3 Attribute constraints 24](#__RefHeading___Toc340599181)

[4.3.13.4 Notifications 24](#__RefHeading___Toc340599182)

[4.3.14 ExternalUtranCellTDDHcr 25](#__RefHeading___Toc340599183)

[4.3.14.1 Definition 25](#__RefHeading___Toc340599184)

[4.3.14.2 Attributes 25](#__RefHeading___Toc340599185)

[4.3.14.3 Attribute constraints 25](#__RefHeading___Toc340599186)

[4.3.14.4 Notifications 25](#__RefHeading___Toc340599187)

[4.3.15 ExternalUtranCellTDDLcr 25](#__RefHeading___Toc340599188)

[4.3.15.1 Definition 25](#__RefHeading___Toc340599189)

[4.3.15.2 Attributes 25](#__RefHeading___Toc340599190)

[4.3.15.3 Attribute constraints 25](#__RefHeading___Toc340599191)

[4.3.15.4 Notifications 25](#__RefHeading___Toc340599192)

[4.3.16 EP\_IuCS 26](#__RefHeading___Toc340599193)

[4.3.16.1 Definition 26](#__RefHeading___Toc340599194)

[4.3.16.2 Attributes 26](#__RefHeading___Toc340599195)

[4.3.16.3 Attribute constraints 26](#__RefHeading___Toc340599196)

[4.3.16.4 Notifications 26](#__RefHeading___Toc340599197)

[4.3.17 EP\_IuPS 26](#__RefHeading___Toc340599198)

[4.3.17.1 Definition 26](#__RefHeading___Toc340599199)

[4.3.17.2 Attributes 26](#__RefHeading___Toc340599200)

[4.3.17.3 Attribute constraints 26](#__RefHeading___Toc340599201)

[4.3.17.4 Notifications 26](#__RefHeading___Toc340599202)

[4.3.18 EP\_Iur 26](#__RefHeading___Toc340599203)

[4.3.18.1 Definition 26](#__RefHeading___Toc340599204)

[4.3.18.2 Attributes 27](#__RefHeading___Toc340599205)

[4.3.18.3 Attribute constraints 27](#__RefHeading___Toc340599206)

[4.3.18.4 Notifications 27](#__RefHeading___Toc340599207)

[4.4 Attribute definitions 28](#__RefHeading___Toc340599208)

[4.4.1 Attribute properties 28](#__RefHeading___Toc340599209)

[4.4.2 Constraints 38](#__RefHeading___Toc340599210)

[4.5 Common notifications 38](#__RefHeading___Toc340599211)

[4.5.1 Alarm notifications 38](#__RefHeading___Toc340599212)

[4.5.2 Configuration notifications 38](#__RefHeading___Toc340599213)

[Annex A (informative): RET Control Architecture 39](#__RefHeading___Toc340599214)

[Annex B (informative): Change history 40](#__RefHeading___Toc340599215)

# Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

# 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:

28.651: "UTRAN Network Resource Model (NRM) Integration Reference Point (IRP); Requirements".

**28.652: "UTRAN Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS) ".**

28.653: "UTRAN Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions".

# 1 Scope

The present document specifies the UTRAN Network Resource Model (NRM) that can be communicated between an IRPAgent and an IRPManager for telecommunication network management purposes, including management of converged networks.

The present document specifies the semantics and behaviour of information object class attributes and relations visible across the reference point in a protocol and technology neutral way. It does not define their syntax and encoding.

# 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 28.655: "Telecommunication management; GSM/EDGE Radio Access Network (GERAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".

[7] 3GPP TS 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Information Service (IS)".

[8] 3GPP TS 28.625: "Telecommunication management; State Management Data Definition Integration Reference Point (IRP): Information Service (IS)".

[9] 3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification".

[10] 3GPP TS 32.662: "Telecommunication management; Configuration Management (CM); Kernel CM Information Service (IS)".

[11] 3GPP TS 32.111-2: "Telecommunication management; Fault Management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS)".

[12] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".

[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 28.622: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".

[17] 3GPP TS 28.662: “Telecommunication management; Generic Radio Access Network (RAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)”.

[18] 3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[19] 3GPP TS 25.466: "UTRAN Iuant interface: Application Part".

[20] 3GPP TS 28.732: " Telecommunication management; Transport Network (TN) interface Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".

[21] 3GPP TS 28.702: " Telecommunication management; Core Network (CN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS) ".

[22] 3GPP TS 32.130: " Telecommunication management; Network sharing; Concepts and requirements".

# 3 Definitions and abbreviations

## 3.1 Definitions

For the purposes of the present document, the following definitions apply. For definitions and not found here, please refer to 3GPP TS 32.101 [1], 3GPP TS 32.102 [2], 3GPP TS 28.622 [16] 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 A for more detail.

**Association**: See definition in TS 28.622 [16].

**Managed Element (ME)**: See definition in TS 28.622 [16].

**Managed Object (MO)**: See definition in TS 28.622 [16].

**Management Information Model (MIM)**: See definition in TS 28.622 [16].

**Network Resource Model (NRM)**: See definition in TS 28.622 [16].

**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**: See TS 25.466 [19].

**Tower Mounted Amplifier:** See TS 25.466 [19].

## 3.2 Abbreviations

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

CN Core Network

DN Distinguished Name (see 3GPP TS 32.300 [13])

FDD Frequency Division Duplex

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

NRM Network Resource Model

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

UML Unified Modelling Language

UTRA Universal Terrestrial Radio Access

UTRAN Universal Terrestrial Radio Access Network

# 4 Model

## 4.1 Imported information entities and local labels

|  |  |
| --- | --- |
| Label reference | Local label |
| 3GPP TS 28.622 [16], IOC, ManagedElement | ManagedElement |
| 3GPP TS 28.622 [16], IOC, ManagedFunction | ManagedFunction |
| 3GPP TS 28.622 [16], IOC, MeContext | MeContext |
| 3GPP TS 28.622 [16], IOC, SubNetwork | SubNetwork |
| 3GPP TS 28.622 [16], IOC, Top | Top |
| 3GPP TS 28.622 [16], IOC, VsDataContainer | VsDataContainer |
| 3GPP TS 28.622 [16], IOC, EP\_RP | EP\_RP |
| 3GPP TS 28.655 [6], IOC, ExternalGSMCell | ExternalGSMCell |
| 3GPP TS 28.655 [6], IOC, GsmCell | GsmCell |
| 3GPP TS 28.655 [6], IOC, GsmRelation | GsmRelation |
| 3GPP TS 28.625 [8], attribute, operationalState | operationalState |
| 3GPP TS 28.662 [17], IOC, AntennaFunction | AntennaFunction |
| 3GPP TS 28.662 [17], IOC, TmaFunction | TmaFunction |
| 3GPP TS 28.662 [17], IOC, SectorEquipmentFunction | SectorEquipmentFunction |
| 3GPP TS 28.662 [17], IOC, *CellReferences* | *CellReferences* |
| 3GPP TS 28.702 [21], IOC, MscServerFunction | MscServerFunction |
| 3GPP TS 28.702 [21], IOC, SGSNFunction | SGSNFunction |
| 3GPP TS 28.732 [20], IOC, TransportNetworkInterface | TransportNetworkInterface |
| 3GPP TS 28.732 [20], IOC, ATMChannelTerminationPoint | ATMChannelTerminationPoint |
| 3GPP TS 28.732 [20], IOC, ATMPathTerminationPoint | ATMPathTerminationPoint |

## 4.2 Class diagrams

4.2.1 Relationships

This clause depicts the set of classes (e.g. IOCs) that encapsulates information relevant for this IRP. This subclause provides the overview of the relationships of relevant classes in UML. Subsequent clauses provide more detailed specification of various aspects of these 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.

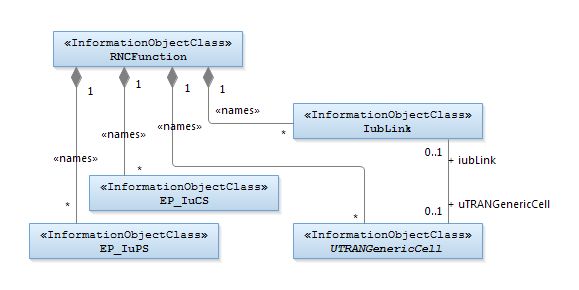


Figure 4.2.1-1: Transport view UTRAN NRM Containment/Naming and Association diagram

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 AntennaFunction instances (referenced by a role-attribute of IOC CellReferences inherited by *UTRANGenericCell*) is required when supporting RET. For a description and clarification of RET, please refer to Annex A.

NOTE 3: The AntennaFunction Instances can be associated with a particular NodeBFunction instance (via IubLink and *UTRANGenericCell*). These AntennaFunction instances and NodeBFunction instance must be contained by the same ManagedElement instance.

NOTE 4: The TmaFunction Instances can be associated with a particular NodeBFunction instance (via IubLink and *UTRANGenericCell*). These TmaFunction Instances and NodeBFunction instance must be contained by the same ManagedElement instance.

NOTE 5: Please see TS 28.662 [17] for the definitions of the five associations between a) *UtranGenericCell* and AntennaFunction b) between *UtranGenericCell* and SectorEquipmentFunction c) between *UtranGenericCell* and TmaFunction d) between SectorEquipmentFunction and AntennaFunction and e) between SectorEquipmentFunction and TmaFunction.

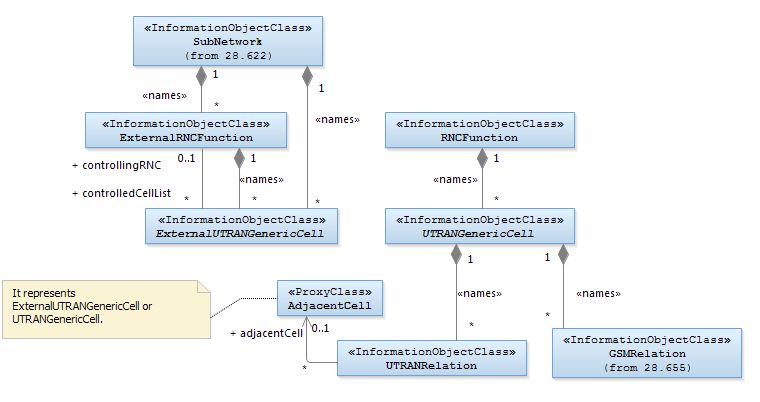


Figure 4.2.1-1: Transport view UTRAN NRM Containment/Naming and Association diagram

NOTE 6: 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 7: 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 8: The UtranRelation and GsmRelation can be name-contained under IOCs defined in other NRMs.

NOTE 9: *ExternalUTRANGenericCell* is contained under SubNetwork or ExternalRncFunction.

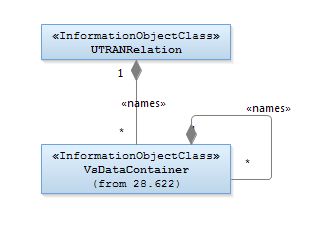


Figure 4.2.1-2: Cell view UTRAN NRM Containment/Naming and Association diagram

NOTE 10: 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 11: Each instance of the VsDataContainer shall only be contained under one IOC.   
The VsDataContainer can be contained under IOCs defined in other NRMs.

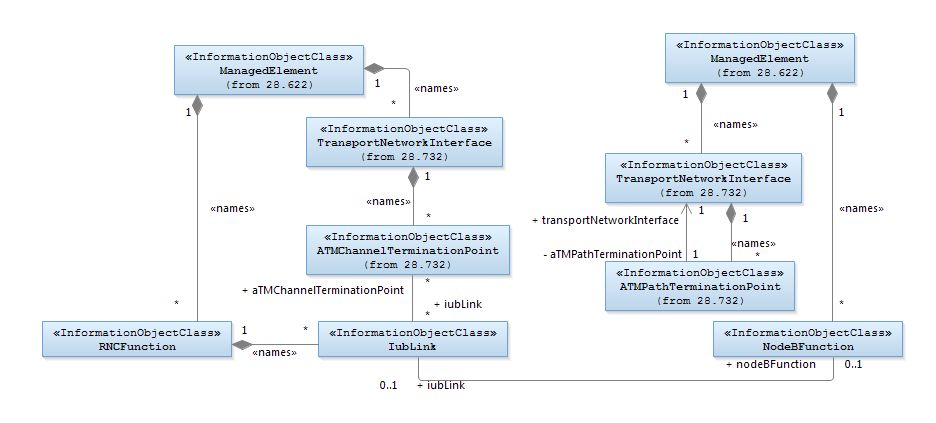


Figure 4.2.1-3: VsDataContainer Containment/Naming and Association in UTRAN NRM diagram

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 4.2.1-4: UTRAN Transport Network NRM Containment/Naming and Association diagram

The VsDataContainer is only used for the Bulk CM IRP.

Each IOC instance 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.

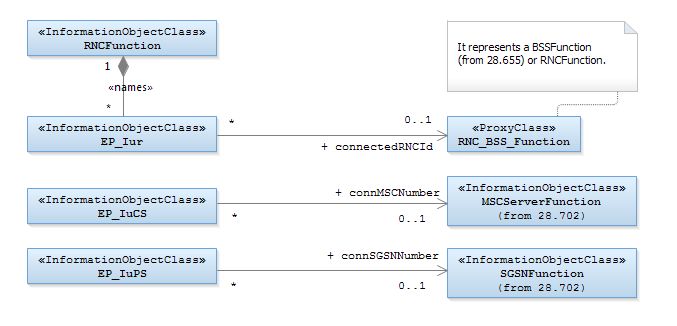
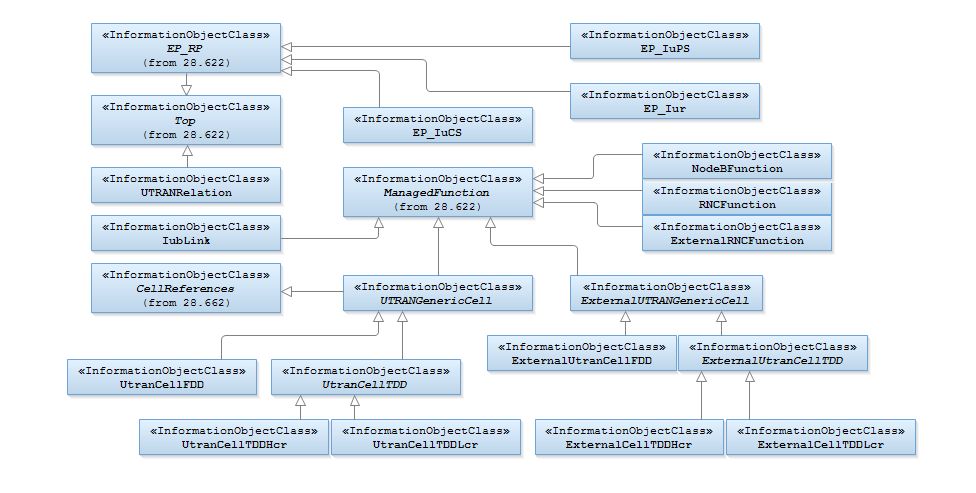


Figure 4.2.1-5: Association diagram of EP\_Iur, EP\_IuCS and EP\_IuPS

4.2.2 Inheritance

This clause depicts the inheritance relationships that exist between IOCs.

Figure 4.2.2.1 shows the inheritance hierarchy for the UTRAN NRM.

Figure 4.2.2.1: UTRAN NRM Inheritance Hierarchy

## 4.3 Class definitions

4.3.1 RNCFunction

#### 4.3.1.1 Definition

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

#### 4.3.1.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| mcc | M | M | M | - | M |
| mnc | M | M | M | - | M |
| rncId | M | M | M | - | M |
| siptoSupported | M | M | - | - | M |
| tceIDMappingInfoList | CM | M | M | - | M |
| sharNetTceMappingInfoList | CM | M | M | - | M |

#### 4.3.1.3 Attribute constraints

|  |  |
| --- | --- |
| **Name** | **Definition** |
| tceIDMappingInfoList | The condition is “MDT function is supported” and only one PLMN is supported |
| sharNetTceMappingInfoList | The condition is “MDT function and several PLMNs are supported” |

#### 4.3.1.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

4.3.2 NodeBFunction

#### 4.3.2.1 Definition

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

#### 4.3.2.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
|  |  |  |  |  |  |
| **Attribute related to role** |  |  |  |  |  |
| iubLink | M | M | - | - | M |

#### 4.3.2.3 Attribute constraints

|  |  |
| --- | --- |
| Name | Definition |
| nodeBFunction-IubLink M support qualifier | When a particular IubLink identifies this particular NodeBFunction, this particular NodeBFunction must identify the particular IubLink. |

#### 4.3.2.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

4.3.3 IubLink

#### 4.3.3.1 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].

#### 4.3.3.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
|  |  |  |  |  |  |
| **Attribute related to role** |  |  |  |  |  |
| uTRANGenericCell | M | M | M | - | M |
| nodeBFunction | M | M | - | - | M |
| aTMChannelTerminationPoint | M | M | - |  |  |

#### 4.3.3.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *iubLink-UTRANCell M support qualifier* | *When a particular IubLink identifies a particular UTRANGenericCell derivative, that particular UTRANGenericCell derivative must have identified this particular IubLink.* |
| *iubLink-NodeBFunction M support qualifier* | *When a particular IubLink identifies a particular NodeBFunction, that particular NodeBFunction must identify this particular IubLink.* |
| *iubLink-ATMChannelTerminationPoint* | *When a particular IubLink identifies a particular ATMChannelTerminationPoint, that particular ATMChannelTerminationPoint must identify this particular IubLink.* |

#### 4.3.3.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

4.3.4 UtranRelation

#### 4.3.4.1 Definition

The UtranRelation IOC 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.

#### 4.3.4.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| id | M | M | - | M | - |
| **Attribute related to role** |  |  |  |  |  |
| adjacentCell | M | M | M | - | M |

#### 4.3.4.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *adjacentCell M support qualifier* | *This attribute can hold either an UTRANGenericCell (or its derivative) DN or an ExternalUTRANGenericCell (or its derivative) DN or no information.* |

#### 4.3.4.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

4.3.5 ExternalRncFunction

#### 4.3.5.1 Definition

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

#### 4.3.5.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| mcc | M | M | M | - | M |
| mnc | M | M | M | - | M |
| rncId | M | M | M | - | M |
| **Attribute related to role** |  |  |  |  |  |
| controlledCellList | O | M | - | - | M |

#### 4.3.5.3 Attribute constraints

None.

#### 4.3.5.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

4.3.6 *UtranGenericCell*

#### 4.3.6.1 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.

#### 4.3.6.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| cId | M | M | M | - | M |
| localCellId | M | M | M | - | M |
| maximumTransmissionPower | M | M | M | - | M |
| pichPower | CM | M | O | - | M |
| pchPower | CM | M | O | - | M |
| fachPower | CM | M | O | - | M |
| cellMode | M | M | - | - | M |
| lac | M | M | M | - | M |
| rac | CM | M | M | - | M |
| sac | M | M | M | - | M |
| uraList | CM | M | M | - | M |
| hsFlag | CM | M | - | - | M |
| hsEnable | CM | M | M | - | M |
| numOfHspdschs | CM | M | M | - | M |
| numOfHsscchs | CM | M | M | - | M |
| frameOffset | CO | M | - | - | M |
| cellIndividualOffset | CO | M | - | - | M |
| hcsPrio | CO | M | - | - | M |
| maximumAllowedUlTxPower | CO | M | - | - | M |
| snaInformation | CO | M | - | - | M |
| qrxlevMin | CO | M | - | - | M |
| deltaQrxlevmin | CO | M | - | - | M |
| qhcs | CO | M | - | - | M |
| penaltyTime | CO | M | - | - | M |
| referenceTimeDifferenceToCell | CO | M | - | - | M |
| readSFNIndicator | CO | M | - | - | M |
| restrictionStateIndicator | CO | M | - | - | M |
| dpcModeChangeSupportIndicator | CO | M | - | - | M |
| operationalState (See Note 1) | O | M | - | - | M (see Note 2) |
| nsPlmnIdList | CM | M | M | - | M |
| **Attribute related to role** |  |  |  |  |  |
| relatedAntennaList | CO | M | M | - | M |
| relatedSectorEquipment | CM | M | - | - | M |
| relatedTMAList | CO | M | - | - | M |
| iubLink | M | M | - | - | M |
| Note 1: No state propagation shall be implied.  Note 2: The attribute value change is conveyed by the notifyStateChange notification. | | | | | |

#### 4.3.6.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *relatedAntennaList and relatedTMAList CO support qualifier* | *The IOC SectorEquipmentFunction (see 28.662 [17]) is not used* |
| *relatedSectorEquipment CM support qualifier* | *The IOC SectorEquipmentFunction (see 28.662 [17]) is used* |
| *uTRANGenericCell-IubLink M support qualifier* | *When a particular UtranGenericCell derivative identifies a particular IubLink, that particular IubLink must have identified this particular UtranGenericCell derivative.* |
| *rac and uraList CM support qualifier* | *The PLMN contains a PS CN.* |
| *hsFlag, hsEnable, numOfHspdschs and numOfHsscchs CM support qualifier* | *The HSDPA feature is not supported by vendor specific extension mechanisms.* |
| *pichPower, pchPower and fachPower CM support qualifier* | *The attributes pichPower, pchPower and fachPower are not supported by vendor specific extension mechanisms.* |
| *frameOffset, cellIndividualOffset, hcsPrio, maximumAllowedUlTxPower, snaInformation, qrxlevMin, deltaQrxlevmin, qhcs, penaltyTime, referenceTimeDifferenceToCell, readSFNIndicator, restrictionStateIndicator and dpcModeChangeSupportIndicator CO support qualifier* | *Itf-p2p is supported.* |
| *nsPlmnIdList CM support qualifier* | *Network sharing is supported (see 32.130 [22])* |

#### 4.3.6.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC. In addition, the following set of notification, defined in 3GPP TS 32.662 [10], is also valid.

| Name | Qualifier | Notes |
| --- | --- | --- |
| notifyStateChange | O |  |

4.3.7 *ExternalUTRANGenericCell*

#### 4.3.7.1 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.

#### 4.3.7.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| cId | M | M | M | - | M |
| mcc | M | M | M | - | M |
| mnc | M | M | M | - | M |
| rncId | M | M | M | - | M |
| cellMode | M | M | - | - | M |
| lac | M | M | M | - | M |
| rac | CM | M | M | - | M |
| hsFlag | CM | M | - | - | M |
| frameOffset | CO | M | - | - | M |
| cellIndividualOffset | CO | M | - | - | M |
| hcsPrio | CO | M | - | - | M |
| maximumAllowedUlTxPower | CO | M | - | - | M |
| qrxlevMin | CO | M | - | - | M |
| deltaQrxlevmin | CO | M | - | - | M |
| qhcs | CO | M | - | - | M |
| penaltyTime | CO | M | - | - | M |
| referenceTimeDifferenceToCell | CO | M | - | - | M |
| readSFNIndicator | CO | M | - | - | M |
| restrictionStateIndicator | CO | M | - | - | M |
| dpcModeChangeSupportIndicator | CO | M | - | - | M |
| snaInformation | CO | M | - | - | M |
| **Attribute related to role** |  |  |  |  |  |
| controllingRNC | O | M | - | - | M |

#### 4.3.7.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *rac CM support qualifier* | *The PLMN contains a PS CN.* |
| *hsFlag CM support qualifier* | *The HSDPA feature is not supported by vendor specific extension mechanisms.* |
| frameOffset,cellIndividualOffset, hcsPrio, maximumAllowedUlTxPower, qrxlevMin, deltaQrxlevmin, qhcs, penaltyTime, referenceTimeDifferenceToCell, readSFNIndicator, restrictionStateIndicator, dpcModeChangeSupportIndicator and snaInformation CO support qualifier | Itf-p2p is supported. |

#### 4.3.7.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

4.3.8 UtranCellFDD

#### 4.3.8.1 Definition

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

#### 4.3.8.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| uarfcnUl | O | M | M | - | M |
| uarfcnDl | O | M | M | - | M |
| primaryScramblingCode | O | M | M | - | M |
| primaryCpichPower | O | M | M | - | M |
| primarySchPower | O | M | M | - | M |
| secondarySchPower | O | M | M | - | M |
| bchPower | O | M | M | - | M |
| aichPower | O | M | - | - | M |
| qqualMin | CO | M | - | - | M |
| cellCapabilityContainerFDD | CO | M | - | - | M |
| txDiversityIndicator | CO | M | - | - | M |
| temporaryOffset1 | CO | M | - | - | M |
| temporaryOffset2 | CO | M | - | - | M |
| sttdSupportIndicator | CO | M | - | - | M |
| closedLoopMode1SupportIndicator | CO | M | - | - | M |

#### 4.3.8.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *aichPower CM support qualifier* | *The attribute aichPower is not supported by vendor specific extension mechanisms.* |
| *qqualMin, cellCapabilityContainerFDD, txDiversityIndicator temporaryOffset1, temporaryOffset2, sttdSupportIndicator and closedLoopMode1SupportIndicator CO support qualifier* | *Itf-p2p is supported.* |

#### 4.3.8.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

4.3.9 UtranCellTDD

#### 4.3.9.1 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].

#### 4.3.9.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Attribute name** | **Support Qualifier** | **isReadable** | **isWritable** | **isInvariant** | **isNotifyable** |
| uarfcn | O | M | M | - | M |
| cellParameterId | O | M | M | - | M |
| primaryCcpchPower | O | M | M | - | M |
| cellCapabilityContainerTDD | CO | M | - | - | M |
| sctdIndicator | CO | M | - | - | M |
| dpchConstantValue | CO | M | - | - | M |

#### 4.3.9.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *cellCapabilityContainerTDD, sctdIndicator and dpchConstantValue CO support qualifier* | *Itf-p2p is supported.* |

#### 4.3.9.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

4.3.10 UtranCellTDDLcr

#### 4.3.10.1 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].

#### 4.3.10.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| uarfcnLCRList | O | M | M | - | M |
| fpachPower | O | M | O | - | M |
| dwPchPower | O | M | M | - | M |
| tstdIndicator | CO | M | - | - | M |
| timeSlotLcrList | O | M | M | - | M |

#### 4.3.10.3 Attribute Constraints

|  |  |
| --- | --- |
| Name | Definition |
| tstdIndicator CO support qualifier | Itf-p2p is supported. |

#### 4.3.10.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

4.3.11 UtranCellTDDHcr

#### 4.3.11.1 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].

#### 4.3.11.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| schPower | O | M | M | - | M |
| temporaryOffset1 | CO | M | - | - | M |
| syncCase | CO | M | - | - | M |
| timeSlotForSch | CO | M | - | - | M |
| schTimeSlot | CO | M | - | - | M |
| timeSlotHcrList | O | M | M | - | M |

#### 4.3.11.3 Attribute constraints

|  |  |
| --- | --- |
| Name | Definition |
| temporaryOffset1, syncCase, timeSlotForSch and schTimeSlot CO support qualifier | Itf-p2p is supported. |

#### 4.3.11.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

4.3.12 ExternalUtranCellFDD

#### 4.3.12.1 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].

#### 4.3.12.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| uarfcnUl | O | M | M | - | M |
| uarfcnDl | O | M | M | - | M |
| primaryScramblingCode | O | M | M | - | M |
| primaryCpichPower | O | M | M | - | M |
| qqualMin | CO | M | - | - | M |
| cellCapabilityContainerFDD | CO | M | - | - | M |
| txDiversityIndicator | CO | M | - | - | M |
| temporaryOffset1 | CO | M | - | - | M |
| temporaryOffset2 | CO | M | - | - | M |
| sttdSupportIndicator | CO | M | - | - | M |
| closedLoopMode1SupportIndicator | CO | M | - | - | M |

#### 4.3.12.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *qqualMin, cellCapabilityContainerFDD, txDiversityIndicator, temporaryOffset1, temporaryOffset2, sttdSupportIndicator and closedLoopMode1SupportIndicator CO support qualifier* | *Itf-p2p is supported.* |

#### 4.3.12.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

4.3.13 ExternalUtranCellTDD

#### 4.3.13.1 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].

#### 4.3.13.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| uarfcn | O | M | M | - | M |
| cellParameterId | O | M | M | - | M |
| primaryCcpchPower | O | O | O | - | M |
| cellCapabilityContainerTDD | CO | M | - | - | M |
| sctdIndicator | CO | M | - | - | M |
| dpchConstantValue | CO | M | - | - | M |

#### 4.3.13.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *cellCapabilityContainerTDD, sctdIndicator and dpchConstantValue CO support qualifier* | *Itf-p2p is supported.* |

#### 4.3.13.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

4.3.14 ExternalUtranCellTDDHcr

#### 4.3.14.1 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].

#### 4.3.14.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| temporaryOffset1 | CO | M | - | - | M |
| syncCase | CO | M | - | - | M |
| timeSlotForSch | CO | M | - | - | M |
| schTimeSlot | CO | M | - | - | M |
| timeSlotHcrList | O | M | - | - | M |

#### 4.3.14.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *temporaryOffset1, syncCase, timeSlotForSch and schTimeSlot CO support qualifier* | *Itf-p2p is supported.* |

#### 4.3.14.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

4.3.15 ExternalUtranCellTDDLcr

#### 4.3.15.1 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].

#### 4.3.15.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| tstdIndicator | CO | M | - | - | M |
| timeSlotLcrList | O | M | - | - | M |

#### 4.3.15.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *tstdIndicator CO support qualifier* | *Itf-p2p is supported.* |

#### 4.3.15.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

4.3.16 EP\_IuCS

#### 4.3.16.1 Definition

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

#### 4.3.16.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| connMscNumber | CO | M | - | - | M |

#### 4.3.16.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *connMscNumber CO support qualifier* | *The farEndEntity is supported* |

#### 4.3.16.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

4.3.17 EP\_IuPS

#### 4.3.17.1 Definition

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

#### 4.3.17.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
| connSgsnNumber | CO | M | - | - | M |

#### 4.3.17.3 Attribute constraints

|  |  |
| --- | --- |
| *Name* | *Definition* |
| *connSgsnNumber CO support qualifier* | *The farEndEntity is supported* |

#### 4.3.17.4 Notifications

The common notifications defined in subclause 4.5 are valid for this IOC, without exceptions or additions.

4.3.18 EP\_Iur

#### 4.3.18.1 Definition

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

#### 4.3.18.2 Attributes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
|  |  |  |  |  |  |
| **Attribute related to role** |  |  |  |  |  |
| connectedRNCId | CO | M | - | - | M |

#### 4.3.18.3 Attribute constraints

|  |  |
| --- | --- |
| Name | Definition |
| connectedRNCId CO support qualifier | The far end entity is supported.  When supported, It either  a) identifies one connected RNC; in such case, it contains one RNC-Id or  b) identifies one connected BSC; in such case, it contains one RNC-Id to indentify BSC. (See “RNC-Id” in TS 23.003 [3]). |

#### 4.3.18.4 Notifications

The common configuration notifications defined in subclause 4.5.2 are valid for this IOC, without exceptions or additions.

## 4.4 Attribute definitions

4.4.1 Attribute properties

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

| Attribute Name | Documentation and Allowed Values | Properties |
| --- | --- | --- |
| aichPower | The Power of the the AICHchannel in an FDD cell, "AICH Power" in TS 25.433 [5].  allowedValues: See "AICH Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| bchPower | The power of the broadcast channel in the FDD mode cell, "BCH Power" in TS 25.433 [5].  allowedValues: See "DL Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| cellCapabilityContainerFDD | Defined in 3GPP TS 25.423.  This attribute has 32 bits. Each bit indicates whether a cell supports a particular functionality.  allowedValues: See ‘CellCapabilityContainer-FDD’ in 3GPP TS 25.423. | type: BitString  multiplicity: 1  isOrdered: T  isUnique: N/A  defaultValue: None  isNullable: False |
| cellCapabilityContainerTDD | Defined in 3GPP TS 25.423.  This attribute has 32 bits. Each bit indicates whether a cell supports a particular functionality.  allowedValues: See ‘CellCapabilityContainer-TDD’ in 3GPP TS 25.423. | type: BitString  multiplicity: 1  isOrdered: T  isUnique: N/A  defaultValue: None  isNullable: False |
| cellIndividualOffset | Defined in 3GPP TS 25.331 (25.423). Attribute relevant for HO decision. Used to offset measured quantity value.  allowedValues: See "Cell individual offset" in TS 25.331 [9]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| cellMode | An attribute that identifies the cell mode.  allowedValues: FDD mode", "1.28McpsTDD mode", "3.84McpsTDD mode", "7.68McpsTDD mode". | type: <<enumeration>>  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None isNullable: True |
| 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 TS 25.433 [5]  allowedValues: See "Cell Parameter ID" in TS 25.433 [5]. | type: Integer  multiplicity: 0..1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| cId | The attribute is the identifier of a cell in one RNC, "C-id" in TS 25.401 [4] and "C-ID" in TS 25.433 [5].  allowedValues: see "C-ID" in TS 25.433 [5]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| closedLoopMode1SupportIndicator | Power control, defined in 3GPP TS 25.423  The Closed Loop Mode1 Support Indicator indicates whether the particular cell is capable to support Closed loop mode1 or not.  allowedValues: supported, not supported | type: <<enumeration>>  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| connMscNumber | The MSC number of the far end MSC Server connected by the Iu-CS interface for which the end point is modelled, “MSC number” in TS 23.003 [3].  allowedValues: See “MSC number” in TS 23.003 [3] | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| connectedRNCId | The RNC-Id of the far end RNC or BSC connected by the Iur interface for which the end point is modelled, “RNC-Id” in TS 23.003 [3].  allowedValues: See “RNC-Id” in TS 23.003 [3] | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| connSgsnNumber | The SGSN number of the far end SGSN connected by the Iu-PS interface for which the end point is modelled, “SGSN number” in TS 23.003 [3].  allowedValues: See “SGSN number” in TS 23.003 [3] | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| dpcModeChangeSupportIndicator | Power control, defined in 3GPP TS 25.423  The DPC Mode Change Support Indicator IE indicates that the particular cell is capable to support DPC mode change.  allowedValues: supported, not supported | type: <<enumeration>>  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| deltaQrxlevmin | Cell (re)selection, defined in 3GPP TS 25.331 If present, the actual value of Qrxlevmin = Qrxlevmin + DeltaQrxlevmin.  allowedValues: See "DeltaQrxlevmin" in TS 25.331 [9]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| 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].  allowedValues: See "Constant Value" in TS 25.433 [5]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| dwPchPower | DwPCH Power is the power that shall be used for transmitting the DwPCH in a 1.28 Mcps TDD cell, "DwPCH Power" in TS 25.433 [5].  allowedValues: See "DwPCH Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| 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].  allowedValues: See "DL Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| fpachPower | The maximum power of the FPACH channel that shall be used in TDD cell, "FPACH Power" in TS 25.433 [5].  allowedValues: See "FPACH Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| frameOffset | Neighbouring cells monitoring, defined in TS 25.423 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.  allowedValues: 0..255 | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| hcsPrio | Cell (re)selection for HCS Defined in TS 25.331 [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.  allowedValues: See "HCS\_OFFmbms" in TS 25.331 [9]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| 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: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  allowedValues: 0,1  isNullable: True |
| 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.  allowedValues: 0,1 | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| 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. | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  allowedValues: N/A  isNullable: False |
| lac | Location Area Code, "LAC" in TS 23.003 [3].  allowedValues: See "LAC" in TS 25.413 [18]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| 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" TS 25.401 [4], "Local Cell ID" in 3GPP TS 25.433 [5].  allowedValues: See "Local Cell ID" in TS 25.433 [5]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| maximumAllowedUlTxPower | Cell (re)selection, defined in TS 25.331 [9]. This information element indicates the maximum allowed uplink transmit power.  allowedValues: See "Maximum allowed UL TX power" in TS 25.331 [9].  A single integral value in dBm. Range: (-50..33). | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| 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 TS 25.433 [5].  allowedValues: See "Maximum Transmission Power" in TS 25.433 [5]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| mcc | Mobile Country Code, MCC (part of the PLMN Identifier") in, TS 23.003 [3].  allowedValues: See "MCC" in "PLMN identity" in TS 25.413 [19]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| mnc | Mobile Network Code, "MNC" (part of the PLMN Identity") in TS 23.003 [3].  allowedValues: See "MNC" in "PLMN identity" in TS 25.413 [18]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| nsPlmnIdList | List of unique identities for PLMN. Each element of the list is a tuple made up of mcc and mnc.  allowedValues: A list of up to five entries of PLMN Identifiers.  Note: A cell can broadcast up to 6 PLMN-id's. This is to support the case that one cell can be used by up to 6 operators’ core networks.  In case a cell is not shared, this attribute shall contain no information.  In case a cell is shared (see TS 32.130 [22]):  1) this attribute shall contain the PLMN Id’s of the Participating Operators;  2) the Master Operator PLMN Id is captured at RNCFunction level (attributes mcc and mnc).  In case the Master Operator is also a Participating Operator, its PLMN Id is captured only at RNCFunction level.  The PLMN Identifier is composed of a Mobile Country Code (MCC) and a Mobile Network Code (MNC).  See TS 23.003 [3] subclause 2.2 and 12.1.  See also TS 25.331 [9] sections 10.3.1.11 and 10.3.1.7a. | type: <<datatype>>  multiplicity: 0..5  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| numOfHspdschs | In FDD: the number of codes at the defined spreading factor(SF=16), within the complete code tree. See TS 25.433 [5].  In TDD: the number of HS-PDSCHs in a Cell; TS 25.433 [5].  allowedValues:  1. Range: (0..15) for FDD mode,  2. Range: (0..95) for TDD mode | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| numOfHsscchs | The number of HS-SCCHs for one cell. See TS 25.433 [5].  allowedValues: 1..32 | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| pchPower | The power of PCH transport channel in the cell, "PCH Power" in Ref 3GPP TS 25.433 [5].  allowedValues: See "DL Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| penaltyTime | Cell (re)selection for HCS, defined in 3GPP TS 25.331 (TS 25.304) This specifies the time duration for which the TEMPORARY\_OFFSET is applied for a neighbouring cell.  allowedValues: See "Penalty\_time" in TS 25.331 [9]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| pichPower | The Power of the PICH channel in the cell, "PICH Power" in TS 25.433 [5].  allowedValues: See "PICH Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| primaryCcpchPower | The power of the primary CCPCH channel in the TDD cell, "PCCPCH Power" in TS 25.433 [5].  allowedValues: See "PCCPCH Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| primaryCpichPower | The power of the primary CPICH channel in the FDD mode cell, "Primary CPICH Power" in  TS 25.433 [5].  allowedValues: See "Primary CPICH Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| primarySchPower | The power of the primary synchronisation channel in the FDD mode cell, "Primary SCH Power” in  TS 25.433 [5].  allowedValues: See "DL Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| primaryScramblingCode | The primary DL scrambling code used by the FDD mode cell, "Primary Scrambling Code" in TS 25.433 [5].  allowedValues: See "Primary Scrambling Code" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| qhcs | Cell (re)selection for HCS, defined in TS 25.331 [9]. This specifies the quality threshold levels for applying prioritised hierarchical cell re-selection.  allowedValues: See "Qhcs" in TS 25.331 [9] | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| qqualMin | Cell (re)selection, defined in TS 25.331 [9]. This specifies the minimum required quality level in the cell in dB. It is only applicable for FDD cells.  allowedValues: See "QqualMin" in TS 25.331 [9]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| qrxlevMin | Cell (re)selection, defined in TS 25.331 [9]. This specifies the minimum required RX level in the cell in dBm.  allowedValues: See "QrxlevMin" in TS 25.331 [9]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| rac | Routing Area Code, "RAC” in TS 23.003 [3].  allowedValues: See "RAC" in TS 25.413 [18]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| readSFNIndicator | Neighbouring cells monitoring, defined in TS 25.331 [9].  allowedValues: See "Read SFN indicator" in TS 25.331 [9] | type: Boolean  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| referenceTimeDifferenceToCell | Neighbouring cells monitoring, defined in TS 25.331 [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.  allowedValues:  1. See "Reference time difference to cell" in TS 25.331 [9].  2. A single integral value in chips. Range: (0..38400) by steps of 40, 256 or 2560. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| restrictionStateIndicator | Cell Access Control, defined in TS 25.423  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.  allowedValues: cell reserved for operation, cell accessible | type: <<enumeration>>  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| rncId | IOC *ExternalUTRANGenericCell* and ExternalRncFunction:  Unique RNC ID for the associated RNC, "RNC Id" in  TS 23.003 [3].  IOC RncFunction:  Unique RNC ID, "RNC Id" in TS 23.003 [3].  allowedValues: See "RNC-ID" in TS 25.413 [18]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNujllable: True |
| sac | Service Area Code, "SAC” in TS 23.003 [3].  allowedValues: See "SAC" in TS 25.413 [18]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| schPower | The power of the synchronisation channel in 3.84 Mcps TDD cell.  allowedValues: See "DL Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| 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.  allowedValues: See "SCH Time Slot" in TS 25.433 [5]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| sctdIndicator | This attribute indicates whether SCTD is used, "SCDT Indicator" in  TS 25.433 [5].  See "SCDT Indicator" in TS 25.433 [5].  allowedValues: active, inactive | type: <<enumeration>>  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| secondarySchPower | The power of the secondary synchronisation channel in the FDD mode cell, "Secondary SCH Power in  TS 25.433 [5].  allowedValues: See "DL Power" in TS 25.433 [5]. | type: Real  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| sharNetTceMappingInfoList | This attribute includes a list of elements. Each element is a tuple of shared PLMN Id (called "PLMN Target"), TCE ID and the corresponding TCE IP address.  In case of network sharing and Logged MDT, this attribute is used to translate from the TCE IP Address to TCE ID when a Logged MDT is ordered to the UE and to translate the TCE ID to TCE IP address when the UE has sent the log to the network.  Each element is a tuple of shared PLMN Id (called "PLMN Target"), TCE ID and the corresponding TCE IP address.  allowedValues: See "PLMN Target","Trace Collection Entity Address" and "Trace Collection Entity Id" in 3GPP TS 32.422 [12]. | type: <<dataType>>  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| siptoSupported | This attribute indicates whether the RNC supports SIPTO function. A value of 0 represents that SIPTO is not supported and a value of 1 represents that SIPTO is supported (by the RNC).  allowedValues: 0..1 | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| snaInformation | Shared Networks Access Control, defined in 3GPP TS 25.423 [5].  This information element contains a list of Shared Network Areas, identified by the Shared Network Area Code (SNAC) which a certain cell belongs to.  allowedValues: See “shared networks access control” defined in 3GPP TS 25.423 [5]. | type: <<dataType>>  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| sttdSupportIndicator | Power control, defined in 3GPP TS 25.423.  The STTD Support Indicator indicates whether the STTD can be applied to DL DPCH and F-DPCH in the cell or not.  allowedValues: active, inactive | type: <<enumeration>>  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| 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  See "Synch Case" in TS 25.433 [5].  allowedValues: See "Sync Case" in TS 25.433 [5]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| tceIDMappingInfoList | This attribute includes a list of TCE ID and the corresponding TCE IP address. It is used in Logged MDT case to provide the information to the RNC to get the corresponding TCE IP address when there is an MDT log received from the UE.  This attribute is used if only one PLMN is supported.  allowedValues: See “Trace Collection Entity Address” and “Trace Collection Entity Id” in 3GPP TS 32.422 [12]. | type: <<dataType>>  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| temporaryOffset1 | Cell (re)selection for HCS, defined in 3GPP TS 25.331 (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.  allowedValues: See "Temporary\_offset1" in TS 25.331 [9]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| temporaryOffset2 | Cell (re)selection for HCS, defined in 3GPP TS 25.331 (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.  allowedValues: See "Temporary\_offset2" in TS 25.331 [9.] | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| timeSlotForSch | The Time Slot represents the time interval assigned to a Physical Channel referred to the start of a Radio Frame,  allowedValues: See "SCH Time Slot" in TS 25.433 [5]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| timeSlotHcrList | 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.  allowedValues:  An item has three parts: timeSlotId, timeSlotDirection, timeSlotStatus. ( TS 25.433 [5]) where:  timeSlotId:  type: Integer  allowedValues: 0..14;  timeSlotDirection:  type: <<enumeration>>  allowedValues: Ul, Dl;  timeSlotStatus:  type: <<enumeration>>  allowedValues: Active, Not active; | type: <<dataType>>  multiplicity: 15  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| timeSlotLcrList | 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.  allowedValues:  An item has three parts: timeSlotId, timeSlotDirection, timeSlotStatus, corresponding to Time Slot LCR, Time Slot Direction, Time Slot Status ( TS 25.433 [5]).  If multiple frequencies exist within the cell, the timeSlotList indicates the Time Slot configuration of Primary Frequency.  timeSlotId:  type: Integer  allowedValues: 0..6;  timeSlotDirection:  type: <<enumeration>>  allowedValues: Ul, Dl;  timeSlotStatus:  Type: <<enumeration>>  allowedValues: Active, Not active; | type: <<dataType>>  multiplicity: 7  isOrdered: False  isUnique: True  defaultValue: None  isNullable: False |
| tmaFunctionList | This is a referential attribute to list the DNs of TmaFunction(s) that support the *UTRANGenericCell*.  allowedValues: See TS 32.300 [13] for definition of DN. | type: DN  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: True |
| tstdIndicator | This attribute indicates whether TSTD is used. See `"TSDT Indicator" in TS 25.433 [5].  allowedValues: active, inactive | type: <<enumeration>>  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| txDiversityIndicator | Defined in 3GPP TS 25.331 (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  allowedValues: See "TX Diversity Indicator" in TS 25.331 [9] | type: <<enumeration>>  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| uarfcn | The UTRA absolute Radio Frequency Channel number for TDD mode cell, UARFCN ( TS 25.433 [5]). For 1.28Mcps TDD, if multiple frequencies exist within the cell, the uarfcn indicates the frequency of Primary Frequency.  allowedValues: 0..16383 | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| uarfcnLCRList | For 1.28 Mcps TDD, if multiple frequencies exist within the cell, this is a list of items (the UARFCN and Time Slot configuration information of the Secondary Frequencies).  allowedValues:  1. An item has two parts: uarfcn and timeSlotListLcr. The second part is a list of elements which have the sub-elements: timeSlotId, timeSlotDirection, timeSlotStatus.  2. These attributes correspond to “UARFCN, Time Slot LCR, Time Slot Direction, Time Slot Status” (TS 25.433 [5]).  3. For “uarfcn, timeSlotId, timeSlotDirection, timeSlotStatus”, see “UARFCN, Time Slot LCR, Time Slot Direction, Time Slot Status” in TS 25.433 [5].  4. For maximum number of the Secondary Frequencies per cell, see "maxFrequencyinCell-1" in TS 25.433 [5]. | type: See note.  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: True |
| uarfcnDl | The DL UTRA absolute Radio Frequency Channel number for FDD mode cell.  allowedValues: See "UARFCN" in TS 25.433 [5]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| uarfcnUl | The UL UTRA absolute Radio Frequency Channel number for FDD mode cell.  allowedValues: See "UARFCN" in TS 25.433 [5]. | type: Integer  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: False |
| uraList | A list of UTRAN Registration Area identities that an UtranCell can belong to.  allowedValues:  1. For URA, see "URA identity" in TS 25.331[9], subclause 10.3.2.6.  2. For maximum number of URAs per cell, see "maxURA" in TS 25.331 [9], subclause 10.3.10. | type: Integer  multiplicity: 1..\*  isOrdered: False  isUnique: True  defaultValue: None  isNullable: True |
| **Attribute related to role** |  |  |
| iubLink | This attribute carries a IubLink DN.  allowedValues: N/A | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| aTMChannelTerminationPoint | This attribute carries the set of ATMChannelTerminationPoint‘s DN(s).  allowedValues: N/A | type: DN  multiplicity: 1..\*  isOrdered: F  isUnique: T  defaultValue: None  isNullable: True |
| nodeBFunction | This attribute carries a NodeBFunction DN.  allowedValues: N/A | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| uTRANGenericCell | This attribute carries the set of related *UTRANGenericCell* derivatives’ DN(s).  allowedValues: N/A | type: DN  multiplicity: 1..\*  isOrdered: F  isUnique: T  defaultValue: None  isNullable: True |
| adjacentCell | It carries the DN of the UtranGenericCell or the *ExternalUTRANGenericCell*.  allowedValues: N/A | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| controlledCellList | This attribute carries a set of DNs of derivatives of *ExternalUTRANGenericCell*.  allowedValues: N/A | type: DN  multiplicity: 1..\*  isOrdered: F  isUnique: T  defaultValue: None  isNullable: True |
| relatedAntennaList | This is an attribute to list the DNs of AntennaFunction(s) (see TS 28.662 [17]) that support the *UTRANGenericCell*.  See “relatedAntennaList” in TS 28.662 [17]  allowedValues: N/A | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| relatedSectorEquipment | This is an attribute to the DN of SectorEquipment (see TS 28.662 [17]) that supports the *UTRANGenericCell*).  See “relatedSectorEquipment” TS 28.662 [17].  allowedValues: N/A | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| relatedTMAList | This is an attribute to list the DNs of TmaFunction(s) (see TS 28.662 [17]) that support the *UTRANGenericCell*.  See “relatedTmaList”  TS 28.662 [17].  allowedValues: N/A | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| iubLink | This attribute carries a IubLink DN.  allowedValues: N/A | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |
| controllingRNC | This attribute carries one ExternalRNCFunction DN.  allowedValues: N/A | type: DN  multiplicity: 1  isOrdered: N/A  isUnique: N/A  defaultValue: None  isNullable: True |

4.4.2 Constraints

None.

## 4.5 Common notifications

4.5.1 Alarm notifications

This subclause presents a list of notifications, defined in [11], that IRPManager can receive. The notification header attribute objectClass/objectInstance, defined in [7], would capture the DN of an instance of an IOC defined in this IRP specification.

| Name | Qualifier | Notes |
| --- | --- | --- |
| notifyAckStateChanged | See Alarm IRP (3GPP TS 32.111-2 [11]) |  |
| 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]) |  |
| 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]) |  |

4.5.2 Configuration notifications

This subclause presents a list of notifications, defined in [10], that IRPManager can receive. The notification header attribute objectClass/objectInstance, defined in [7], would capture the DN of an instance of an IOC defined in this IRP specification.

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

Annex A (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 B (informative):  
Change history

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Change history | | | | | | | | |
| **Date** | **TSG #** | **TSG Doc.** | **CR** | **Rev** | **Subject/Comment** | **Cat** | **Old** | **New** |
| 2013-03 | SA#59 | SP-130057 | 001 | 1 | CR R11 28.652 Addition of missing Network Sharing support for MDT | F | 11.0.0 | 11.1.0 |
| 2013-09 | SA#61 | SP-130433 | 002 | 1 | UTRAN NRM Correction of wrong import references | F | 11.1.0 | 11.2.0 |
| 2014-06 | SA#64 | SP-140332 | 003 | 2 | Correction of operationalState attribute definitions | F | 11.2.0 | 11.3.0 |
| 004 | 1 | Correct synCase attribute description and usage of BITSTRING(32) data type | F |
| SP-140359 | 005 | - | remove the feature support statements | F |
| 2014-09 |  |  |  |  | Correction of editorial issues(MCC) |  | 11.3.0 | 11.3.1 |
| 2014-09 |  |  |  |  | Upgrade to Rel-12 (MCC) |  | 11.3.1 | 12.0.0 |
| 2014-12 | SA#66 | SP-140800 | 008 | 2 | Add support for sharing of UTRAN | B | 12.0.0 | 12.1.0 |
| 2015-06 | SA#68 | SP-150316 | 011 | - | Add missing IOC notification support | A | 12.1.0 | 12.2.0 |
| 013 | - | Correct IsNullable properties for power attributes | A |
| 2015-12 | SA#70 | SP-150691 | 014 | 1 | Align id attribute definitions | A | 12.2.0 | 12.3.0 |
| 2016-01 | SA#70 |  |  |  | Upgrade to Rel-13(MCC) |  | 12.3.0 | 13.0.0 |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Change history** | | | | | | | |
| **Date** | **Meeting** | **TDoc** | **CR** | **Rev** | **Cat** | **Subject/Comment** | **New version** |
| 2017-03 | SA#75 |  |  |  |  | Promotion to Release 14 without technical change | 14.0.0 |
| 2018-06 | - | - | - | - | - | Update to Rel-15 version (MCC) | **15.0.0** |
| 2020-07 | - | - | - | - | - | Update to Rel-16 version (MCC) | **16.0.0** |