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Technical Specification

**Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Universal Terrestrial Radio Access Network (UTRAN)
Network Resource Model (NRM)
Integration Reference Point (IRP);
Information Service (IS)
(3GPP TS 28.652 version 11.1.0 Release 11)**

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Foreword

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Contents

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:

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Ready for Converged Management

This specification is part of a set that has been developed for converged management solutions.

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 32.652: "Telecommunication management; Configuration Management (CM); GERAN network resources Integration Reference Point (IRP): Network Resource Model (NRM)".

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

[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] 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: "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".

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 32.622 [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 32.622 [16].

Managed Element (ME): See definition in TS 32.622 [16].

Managed Object (MO): See definition in TS 32.622 [16].

Management Information Model (MIM): See definition in TS 32.622 [16].

Network Resource Model (NRM): See definition in TS 32.622 [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 32.652 [6], IOC, `ExternalGSMCell`	`ExternalGSMCell`
3GPP TS 32.652 [6], IOC, `GsmCell`	`GsmCell`
3GPP TS 32.652 [6], IOC, `GsmRelation`	`GsmRelation`
3GPP TS 32.672 [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*

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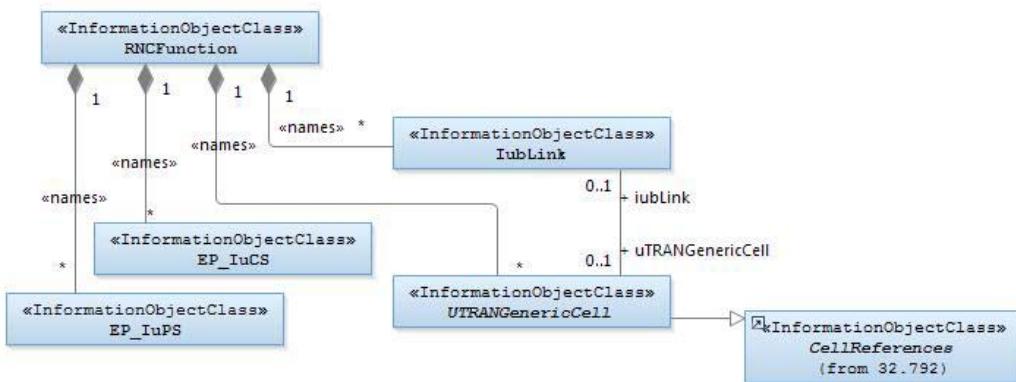
NOTE 1: The listed cardinality numbers, in particular the use of cardinality number zero, do not represent transient states. The transient state is considered an inherent property of all IOC instances and therefore there is no need to represent them by individual IOC cardinality numbers.

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 32.792 [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
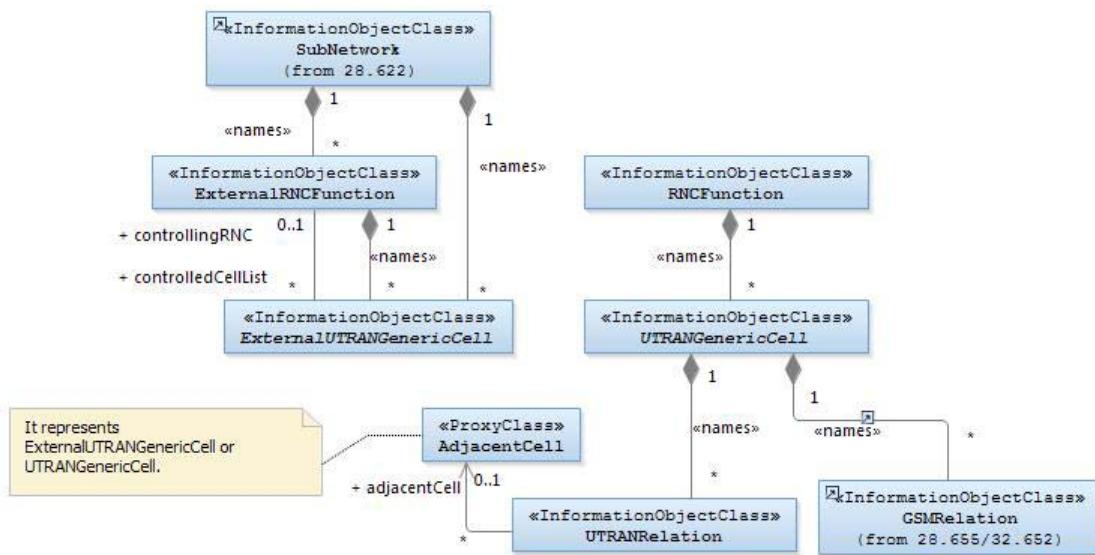
NOTE 1: The listed cardinality numbers, in particular the use of cardinality number zero, do not represent transient states. The transient state is considered an inherent property of all IOC instances and therefore there is no need to represent them by individual IOC cardinality numbers.

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: External*UTRANGenericCell* is contained under SubNetwork or ExternalRncFunction.

Figure 4.2.1-2: Cell view UTRAN NRM Containment/Naming and Association diagram
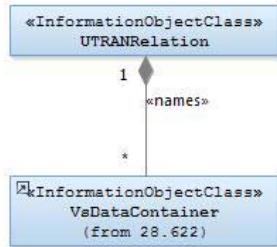
NOTE 1: The listed cardinality numbers, in particular the use of cardinality number zero, do not represent transient states. The transient state is considered an inherent property of all IOC instances and therefore there is no need to represent them by individual IOC cardinality numbers.

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 4.2.1-3: `VsDataContainer` Containment/Naming and Association in UTRAN NRM diagram
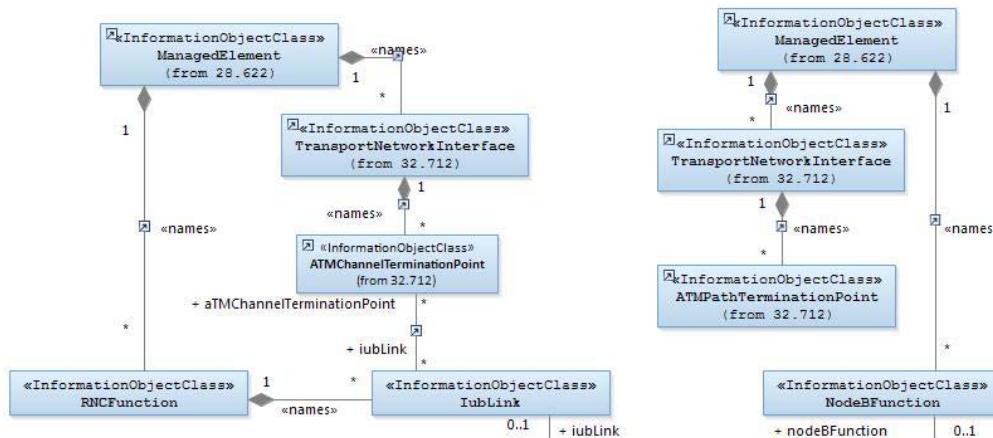
NOTE 1: The `ATMChannelTerminationPoint` is name-contained under IOCs defined in the Transport Network NRM.

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.
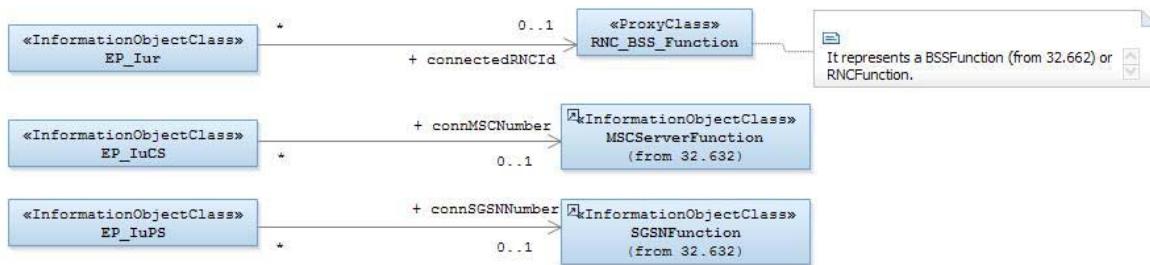
Figure 4.2.1-5: Association diagram of `EP_Iur`, `EP_IuCS` **and** `EP_IuPS`

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.
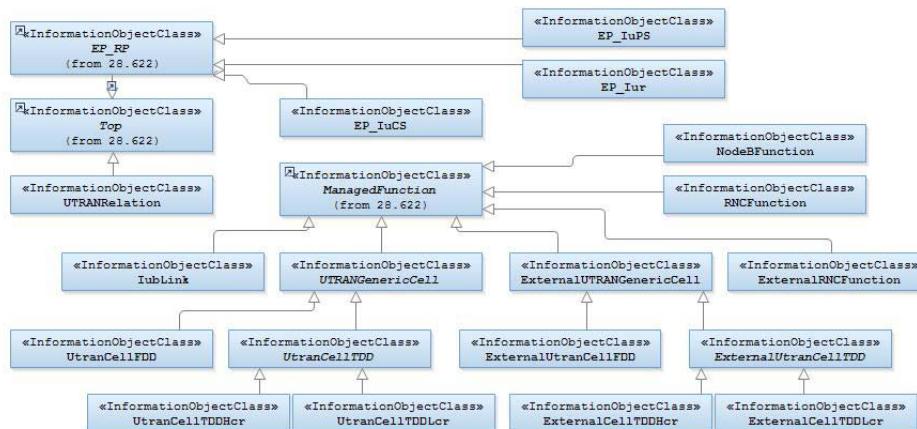
Figure 4.2.2.1: UTRAN NRM Inheritance Hierarchy

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

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.

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

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
Attribute related to role					
relatedAntennaList	CO	M	M	-	M
relatedSectorEquipment	CM	M	-	-	M
relatedTMAList	CO	M	-	-	M
iubLink	M	M	-	-	M

Attribute Name	Support Qualifier	READ	WRITE
operationalState	O	M	–
NOTE: No state propagation shall be implied.			

4.3.6.3 Attribute constraints

Name	*Definition*
`relatedAntennaList` *and* `relatedTMAList` *CO support qualifier*	*The IOC* `SectorEquipmentFunction` *(see 32.792 [17]) is not used*
`relatedSectorEquipment` *CM support qualifier*	*The IOC* `SectorEquipmentFunction` *(see 32.792 [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.*

4.3.6.4 Notifications

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

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

TBD

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

TBD

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

TBD

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

TBD

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

TBD

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

TBD

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

TBD

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

TBD

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: True
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: True
cellCapabilityContainerFDD	Defined in 3GPP TS 25.423. Each bit indicates whether a cell supports a particular functionality. allowedValues: See 'CellCapabilityContainer-FDD' in 3GPP TS 25.423.	type: BITSTRING(32) multiplicity: 0..32 isOrdered: T isUnique: N/A defaultValue: None isNullable: False
cellCapabilityContainerTDD	Defined in 3GPP TS 25.423. Each bit indicates whether a cell supports a particular functionality. allowedValues: See 'CellCapabilityContainer-TDD' in 3GPP TS 25.423.	type: BITSTRING(32) multiplicity: 0..32 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
closedLoopMode1Su pportIndicator	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 lu-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 lur 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 lu-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
dpcModeChangeSupp ortIndicator	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 "Delta$_{Qrxlevmin}$" 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: True

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: True
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: True
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_OFF$_{mbms}$" 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: True
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: True
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
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. 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
primaryScrambling Code	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

sharNetTceMapping InfoList	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 [25].	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
sttdSupportIndica tor	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: 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
tceIDMappingInfoL ist	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
aTMChannelTermina tionPoint	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
controlledCellLis t	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
relatedAntennaLis t	This is an attribute to list the DNs of AntennaFunction(s) (see TS 32.792[17]) that support the *UTRANGenericCell*. See "relatedAntennaList" in TS 32.792 [17] allowedValues: N/A	type: DN multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: True
relatedSectorEqui pment	This is an attribute to the DN of SectorEquipment (see TS 32.792 [17]) that supports the *UTRANGenericCell*). See "relatedSectorEquipment" TS 32.792 [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 32.792 [17]) that support the *UTRANGenericCell*. See "`relatedTmaList`" TS 32.792 [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.
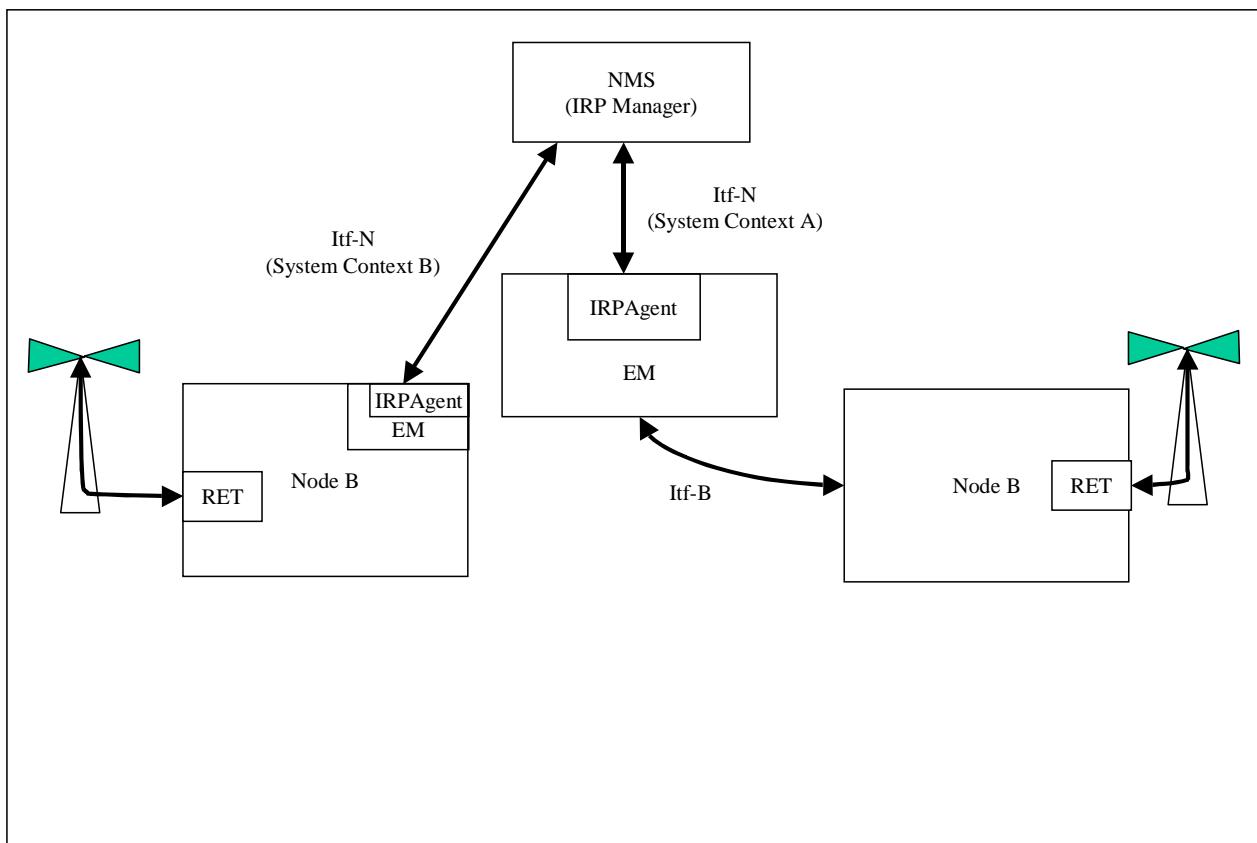

Figure B.1: Overall RET architecture

Annex B (informative): Change history

<table>
<tr><td colspan="9" align="center">**Change history**</td></tr>
<tr><td>**Date**</td><td>**TSG #**</td><td>**TSG Doc.**</td><td>**CR**</td><td>**Rev**</td><td>**Subject/Comment**</td><td>**Cat**</td><td>**Old**</td><td>**New**</td></tr>
<tr><td>2012-10</td><td></td><td></td><td></td><td></td><td>First draft</td><td></td><td></td><td>0.1.0</td></tr>
<tr><td>2012-12</td><td>SA#58</td><td></td><td></td><td></td><td>Presented for information and approval</td><td></td><td>0.1.0</td><td>1.0.0</td></tr>
<tr><td>2012-12</td><td></td><td></td><td></td><td></td><td>New version after approval</td><td></td><td>1.0.0</td><td>11.0.0</td></tr>
<tr><td>2013-03</td><td>SA#59</td><td>SP-130057</td><td>001</td><td>1</td><td>CR R11 28.652 Addition of missing Network Sharing support for MDT</td><td>F</td><td>11.0.0</td><td>11.1.0</td></tr>
</table>

History

Document history		
V11.0.0	January 2013	Publication
V11.1.0	April 2013	Publication