

# ETSI TS 128 655 V17.0.0 (2022-04)



**Universal Mobile Telecommunications System (UMTS);  
LTE;  
Telecommunication management;  
GSM/EDGE Radio Access Network (GERAN)  
Network Resource Model (NRM)  
Integration Reference Point (IRP);  
Information Service (IS)  
(3GPP TS 28.655 version 17.0.0 Release 17)**



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**Reference**

RTS/TSGS-0528655vh00

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**Keywords**

LTE,UMTS

**ETSI**

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# Foreword

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

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# Introduction

The present document is part of a TS-family covering the 3<sup>rd</sup> Generation Partnership Project; Technical Specification Group Services and System Aspects; Telecommunication management; as identified below:

28.654: GSM/EDGE Radio Access Network (GERAN) Network Resource Model (NRM) Integration Reference Point (IRP); Requirements

**28.655: GSM/EDGE Radio Access Network (GERAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)**

28.656: GSM/EDGE Radio Access Network (GERAN) Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions

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# 1 Scope

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

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

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# 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 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".
- [4] 3GPP TS 44.018: "Mobile radio interface layer 3 specification; Radio Resource Control (RRC) protocol".
- [5] 3GPP TS 45.008: "Radio subsystem link control".
- [6] 3GPP TS 45.002: "Multiplexing and multiple access on the radio path".
- [7] 3GPP TS 23.002: "Network architecture".
- [8] 3GPP TS 23.003: "Numbering, Addressing and Identification".
- [9] 3GPP TS 28.652: "Telecommunication management; Configuration Management (CM); UTRAN Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [10] 3GPP TS 28.658: "Telecommunication management; Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [11] 3GPP TS 32.111-2: "Telecommunication management; Fault Management (FM); Part 2: Alarm Integration Reference Point (IRP); Information Service (IS)".
- [12] 3GPP TS 28.662: "Telecommunication management; Generic Radio Access Network (RAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [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 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP); Information Service (IS)".

- [16] 3GPP TS 28.622: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)".
- [17] 3GPP TS 32.662: "Telecommunication management; Configuration Management (CM); Kernel CM; Information service (IS)".
- [18] 3GPP TS 28.625: "Telecommunication Management; State Management Data Definition Integration Reference Point (IRP): Information Service (IS)".
- [19] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [19], 3GPP TS 32.101 [1], 3GPP TS 32.102 [2] and 3GPP TS 32.600 [14] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [19], 3GPP TS 32.101 [1], 3GPP TS 32.102 [2] and 3GPP TS 32.600 [14].

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

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

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

### 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [19] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [19].

DN	Distinguished Name (see 3GPP TS 32.300 [13])
IOC	Information Object Class
IRP	Integration Reference Point
ME	Managed Element
NR	Neighbour cell Relation
RDN	Relative Distinguished Name (see 3GPP TS 32.300 [13])



## 4 Model

### 4.1 Imported information entities and local labels

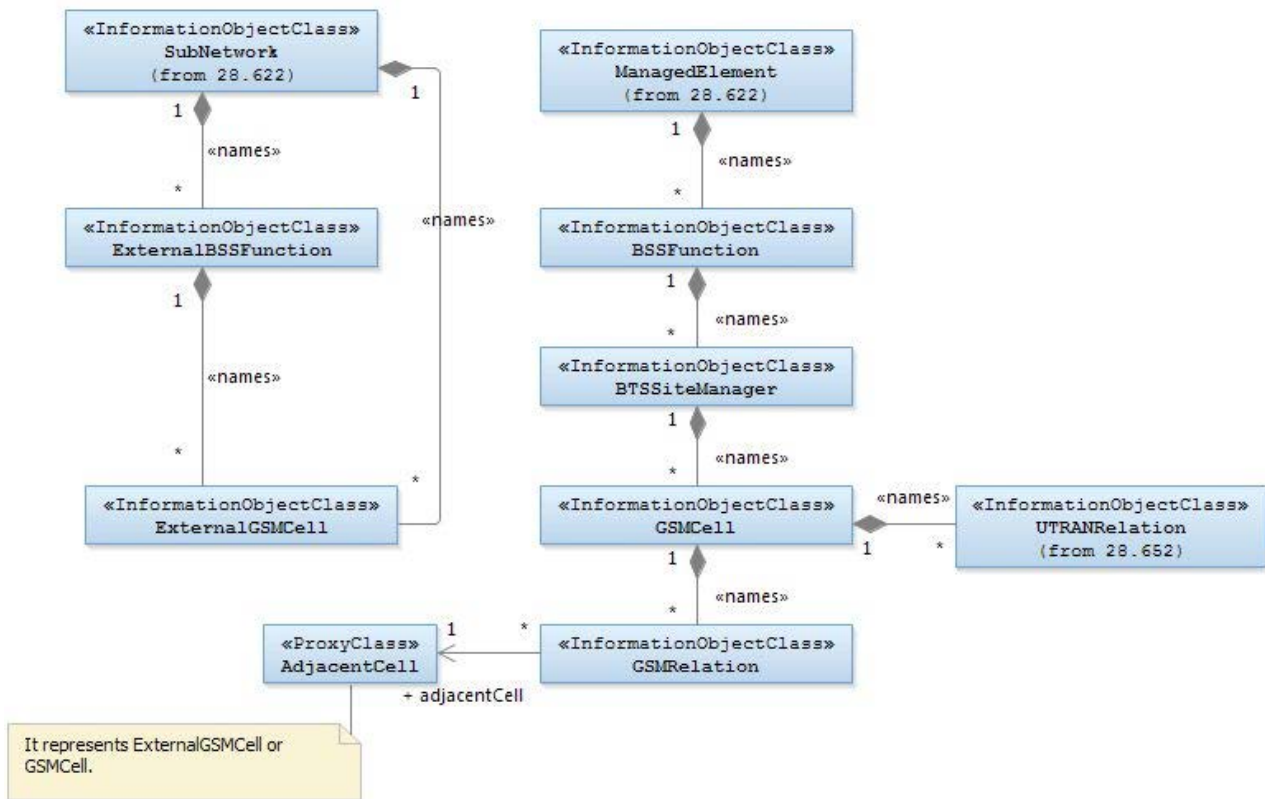
Label reference	Local label
3GPP TS 28.622 [16], information object class, ManagedElement	ManagedElement
3GPP TS 28.622 [16], information object class, ManagedFunction	ManagedFunction
3GPP TS 28.622 [16], information object class, SubNetwork	SubNetwork
3GPP TS 28.622 [16], information object class, Top	Top
3GPP TS 28.622 [16], information object class, VsDataContainer	VsDataContainer
3GPP TS 28.652 [9], information object class, UTRANRelation	UTRANRelation
3GPP TS 28.658 [10], information object class, EUTRANRelation	EUTRANRelation
3GPP TS 28.625 [18], attribute, operationalState	operationalState

### 4.2 Class diagram

#### 4.2.1 Relationships

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

The figures below show the containment/naming hierarchy and the associations of the GERAN NRM.



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

NOTE 2: The ExternalBSSFunction is used in the Core Network NRM.

**Figure 4.2.1-1: GERAN NRM Containment/Naming and Association diagram**

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

SubNetwork =Sweden, MeContext =MEC-Gbg-1, ManagedElement =RNC-Gbg-1, BSSFunction=BSS1.



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

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

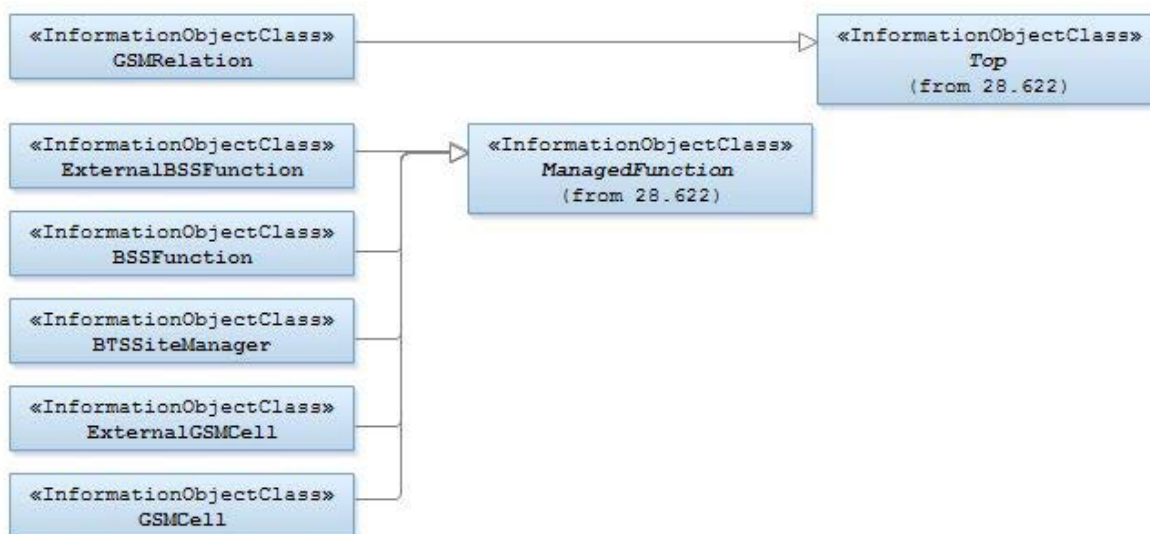
**Figure 4.2.1-2: GERAN NRM Containment/Naming and Association diagram**

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

## 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 GERAN NRM.



**Figure 4.2.2-1: GERAN NRM Inheritance Hierarchy**

## 4.3 Class definitions

### 4.3.1 BSSFunction

#### 4.3.1.1 Definition

This IOC represents BSS functionality. For more information about the BSS, see Ref 3GPP TS 23.002 [7].

#### 4.3.1.2 Attributes

None.

#### 4.3.1.3 Attribute constraints

None.

#### 4.3.1.4 Notifications

The common notifications defined in subclause 4.5.1 are valid for this IOC, without exceptions or additions.

## 4.3.2 BTSSiteMgr

### 4.3.2.1 Definition

This IOC contains site specific information for a BTS site.

### 4.3.2.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
latitude	O	M	M	-	O
longitude	O	M	M	-	O
operationalState (see NOTE 1)	CM	M	-	-	M (see NOTE 2)
NOTE 1: No state propagation shall be implied.					
NOTE 2: The attribute value change is conveyed by the notifyStateChange notification.					

### 4.3.2.3 Attribute constraints

Name	Definition
operationalState CM support qualifier	The State Management IRP is supported.

### 4.3.2.4 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 [17], is also valid.

Name	Qualifier	Notes
notifyStateChange	O	

## 4.3.3 GSMCell

### 4.3.3.1 Definition

This IOC represents the GSM radio cell. The applicability of instantiation of this class is depending on the ME type. It may only be instantiated under ME of type BSC.

### 4.3.3.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
cellIdentity	M	M	M	-	M
cellAllocation	M	M	M	-	M
ncc	M	M	M	-	M
bcc	M	M	M	-	M
lac	M	M	M	-	M
mcc	M	M	M	-	M
mnc	M	M	M	-	M
rac	CM	M	M	-	M
racc	CM	M	M	-	M
tsc	CM	M	M	-	M
rxLevAccessMin	M	M	M	-	M
msTxPwrMaxCCH	M	M	M	-	M
rfHoppingEnabled	M	M	M	-	M
hoppingSequenceList	M	M	M	-	M
plmnPermitted	M	M	M	-	M

### 4.3.3.3 Attribute constraints

Name	Definition
rac CM support qualifier	GPRS is supported in the cell.
racc CM support qualifier	GPRS is supported in the cell.
tsc CM support qualifier	RET, TMA etc. are not modelled according to Ref 3GPP TS 28.662 [12].

### 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 GSMRelation

### 4.3.4.1 Definition

This IOC contains a Neighbour Cell Relation (NCR) from a source cell to a target cell, where the target cell is a `GSMCell` or `ExternalGSMCell` instance.

**NOTE:** In handover relation terms, the cell containing the `GSMRelation` object is the source cell for the handover. The cell referred to in the `GSMRelation` 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.

The source cell can be a `GSMCell` instance. This is the case for an Intra-GERAN NCR.

The source cell can be a `UTRANGenericCell` instance. This is the case for Inter-RAT NCR from UTRAN to GERAN. See 3GPP TS 28.652 [9].

The source cell can be an `EUTRANGenericCell` instance. This is the case for Inter-RAT NCR from E-UTRAN to GERAN. See 3GPP TS 28.658 [10].

#### 4.3.4.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifiable
bcchFrequency	CM	M	-	-	M
ncc	CM	M	-	-	M
bcc	CM	M	-	-	M
lac	CM	M	-	-	M
isHOAllowed	CM	M	M	-	M
isRemoveAllowed	CM	M	M	-	M
isESCoveredBy	CM	M	M	-	M
<b>Attribute related to role</b>					
adjacentCell	CM	M	-	-	M

#### 4.3.4.3 Attribute constraints

Name	Definition
bcchFrequency CM support qualifier	The EM does not guarantee consistency between the cell definition and what is broadcast on system information and RET, TMA etc. are not modelled according to Ref 3GPP TS 28.662 [12].
ncc CM support qualifier	The EM does not guarantee consistency between the cell definition and what is broadcast on system information.
bcc CM support qualifier	The EM does not guarantee consistency between the cell definition and what is broadcast on system information.
lac CM support qualifier	The EM does not guarantee consistency between the cell definition and what is broadcast on system information.
isRemoveAllowed Support Qualifier	The condition is "Inter-RAT ANR function is supported in the source cell, and the source cell is an EUTRANGenericCell or a UTRANGenericCell".
isHOAllowed Support Qualifier	The condition is "Inter-RAT ANR function is supported in the source cell, and the source cell is an EUTRANGenericCell or a UTRANGenericCell".
isESCoveredBy Support Qualifier	The condition is "The source cell is an E-UTRAN or UTRAN cell which supports Inter-RAT Energy Saving".
adjacentCell Support Qualifier	<p>The conditions are:</p> <p>“The target cell and the serving cell (name-containing this GSMRelation) are managed by different IRPAgent” or “the target cell and the serving cell (name-containing this GSMRelation) are managed by the same IRPAgent”.</p> <p>When former condition is true, the role-attribute holds the DN of an ExternalGSMCell instance. When the latter condition is true, the role-attribute holds the DN of a GSMCell instance.</p>

#### 4.3.4.4 Notifications

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

### 4.3.5 ExternalGSMCell

#### 4.3.5.1 Definition

This IOC represents a radio cell controlled by another IRPAgent. This IOC has necessary attributes for inter-system handover. It contains a subset of the attributes of related IOCs controlled by another IRPAgent. To maintain the consistency between the attribute values of these two IOCs is outside the scope of this document.

#### 4.3.5.2 Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
cellIdentity	M	M	M	-	M
bcchFrequency	M	M	M	-	M
ncc	M	M	M	-	M
bcc	M	M	M	-	M
lac	M	M	M	-	M
mcc	M	M	M	-	M
mnc	M	M	M	-	M
rac	CM	M	M	-	M
racc	CM	M	M	-	M

#### 4.3.5.3 Attribute constraints

Name	Definition
rac CM support qualifier	GPRS is supported in the cell.
racc CM support qualifier	GPRS is supported in the cell.

#### 4.3.5.4 Notifications

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

### 4.3.6 ExternalBSSFunction

#### 4.3.6.1 Definition

This IOC represents a BSSFunction controlled by another IRPAgent. It contains a subset of the attributes of related IOCs controlled by another IRPAgent. To maintain the consistency between the attribute values of these two IOCs is outside the scope of the present document.

#### 4.3.6.2 Attributes

None.

#### 4.3.6.3 Attribute constraints

None.

#### 4.3.6.4 Notifications

The common 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 properties of attributes specified in the present document.

**Table 4.4.1: Attributes**



Attribute Name	Documentation and Allowed values	Properties
GSMCell.bcc	Base station colour code, BCC (part of BSIC). Ref 3GPP TS 44.018 [4].  See Ref 3GPP TS 44.018 [4].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
ExternalGSMCell.bcc	Base station colour code, BCC (part of BSIC). Ref 3GPP TS 44.018 [4].  See Ref 3GPP TS 44.018 [4].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
GSMRelation.bcc	Base station colour code, BCC (part of BSIC. Ref 3GPP TS 44.018 [4]) for another GSM cell or the external GSM cell, that is broadcast in System Information in the Cell.  See Ref 3GPP TS 44.018 [4].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
ExternalGsmCell.bcchFrequency	This attribute contains the absolute radio frequency channel number of the BCCH channel of the GSM cell.  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
GSMRelation.bcchFrequency	This attribute contains the absolute radio frequency channel number of the BCCH channel of another GSM cell or the external GSM cell, that is broadcast in System Information in the Cell.  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
cellAllocation	This attribute defines the set of radio frequencies allocated and available to a cell, the first element sets the BCCH frequency, Ref 3GPP TS 44.018 [4].  See Ref 3GPP TS 44.018 [4].  allowedValues: N/A	type: Integer multiplicity: 0..* isOrdered: False isUnique: True defaultValue: None isNullable: False
cellIdentity	Cell Identity (Ref 3GPP TS 24.008 [3]).  See Ref 3GPP TS 24.008 [3].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
hoppingSequenceList	This attribute defines a sequence of structures. Each structure has two elements. One element carries the MA as defined in 44.018 [4] and the other element carries the HSN as defined in 45.502 [6].  allowedValues: N/A	type: <<datatype>> multiplicity: 1 isOrdered: False isUnique: True defaultValue: None isNullable: False

Attribute Name	Documentation and Allowed values	Properties
isESCoveredBy	<p>The value of the attribute is configured by the IRPManager and is not changed by the IRPAgent. It indicates whether the adjacentCell according to this planning provides no, partial or full Inter-RAT coverage for the cell which name-contains the GSMRelation instance.</p> <p>Adjacent cells with this attribute equal to “yes” are recommended to be considered as candidate cells to take over the coverage when the original cell is about to be transferred to energySaving state.</p> <p>The entirety of adjacent cells with this property equal to “partial” are recommended to be considered as entirety of candidate cells to take over the coverage when the original cell is about to be transferred to energySaving state.</p> <p>allowedValues: No, partial, yes</p>	<p>type: ENUM multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
GSMCell.lac	<p>Location Area Code (LAC). Ref 3GPP TS 24.008 [3].</p> <p>See Ref 3GPP TS 24.008 [3].</p> <p>allowedValues: N/A</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
GSMRelation.lac	<p>Location Area Code, LAC (Ref 3GPP TS 24.008 [3]) for another GSM cell or the external GSM cell, that is broadcast in System Information in the Cell.</p> <p>See Ref 3GPP TS 24.008 [3].</p> <p>allowedValues: N/A</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
latitude	<p>The latitude of the site manager location based on World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to the northern hemisphere.</p> <p>allowedValues: -90.0000 to +90.0000</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
longitude	<p>The longitude of the site manager location based on World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to degrees east of 0 degrees longitude.</p> <p>allowedValues: -180.0000 to +180.0000</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>
mcc	<p>Mobile Country Code, MCC (part of the PLMN Id, Ref. 3GPP TS 23.003 [8]).</p> <p>See Ref 3GPP TS 24.008 [3].</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None allowedValues: N/A isNullable: False</p>
mnc	<p>Mobile Network Code, MNC (part of the PLMN Id, Ref. 3GPP TS 23.003 [8]).</p> <p>See Ref 3GPP TS 24.008 [3].</p> <p>allowedValues: N/A</p>	<p>type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False</p>

Attribute Name	Documentation and Allowed values	Properties
msTxPwrMaxCCH	Maximum Transmission Power for a Mobile Station on a CCH. Attribute description Ref 3GPP TS 45.008 [5] (MS_TXPWR_MAX_CCH).  See Ref 3GPP TS 45.008 [5].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
GSMCell.ncc	Network Colour Code, NCC (part of BSIC). Ref 3GPP TS 44.018 [4].  See Ref 3GPP TS 44.018 [4].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
ExternalGSMCell.ncc	Network Colour Code, NCC (part of BSIC. Ref 3GPP TS 44.018 [4]) for another GSM cell or the external GSM cell, that is broadcast in System Information in the Cell.  See Ref 3GPP TS 44.018 [4].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
plmnPermitted	Network Colour Code Permitted. Attribute description reference 3GPP TS 45.008 [5] (NCC_PERMITTED).  See Ref 3GPP TS 45.008 [5].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
rac	Routing Area Code, RAC. Ref 3GPP TS 44.018 [4].  See Ref 3GPP TS 44.018 [4].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
racc	Routing Area Colour Code, RACC. Ref 3GPP TS 44.018 [4].  See Ref 3GPP TS 44.018 [4].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
rfHoppingEnabled	Indicates if frequency hopping is enabled.  Boolean value false represents 'disabled'; true represents 'enabled'.  allowedValues: False, True.	type: Boolean multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
rxLevAccessMin	Minimum Access Level. Attribute description Ref 3GPP TS 45.008 [5] (RXLEV_ACCESS_MIN)  See Ref 3GPP TS 45.008 [5].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False
tsc	Training Sequence Code, an attribute of the class channel in Ref 3GPP TS 44.018 [4].  See Ref 3GPP TS 44.018 [4].  allowedValues: N/A	type: Integer multiplicity: 1 isOrdered: N/A isUnique: N/A defaultValue: None isNullable: False

Attribute Name	Documentation and Allowed values	Properties
isHOAllowed	<p>This indicates if HO is allowed or prohibited.</p> <p>If true, handover is allowed from source cell to target cell. The source cell is identified by the name-containing UTRANGenericCell or EUTRANGenericCell of the GSMRelation that has the isHOAllowed. The target cell is referenced by the GSMRelation that has this isHOAllowed.</p> <p>If false, handover shall not be allowed.</p> <p>allowedValues: False, True.</p>	<p>type: Boolean</p> <p>multiplicity: 1</p> <p>isOrdered: N/A</p> <p>isUnique: N/A</p> <p>defaultValue: None</p> <p>isNullable: False</p>
isRemoveAllowed	<p>This indicates if the subject GSMRelation can be removed (deleted) or not.</p> <p>If true, the subject GSMRelation instance can be removed (deleted).</p> <p>If false, the subject GSMRelation instance shall not be removed (deleted) by any entity but an IRPManager.</p> <p>allowedValues: False, True.</p>	<p>type: Boolean</p> <p>multiplicity: 1</p> <p>isOrdered: N/A</p> <p>isUnique: N/A</p> <p>defaultValue: None</p> <p>isNullable: False</p>
<b>Attribute related to role</b>		
adjacentCell	<p>This holds the DN of GSMCell or ExternalGSMCell.</p> <p>allowedValues: N/A</p>	<p>type: DN</p> <p>multiplicity: 1</p> <p>isOrdered: N/A</p> <p>isUnique: N/A</p> <p>defaultValue: None</p> <p>isNullable: False</p>

## 4.4.2 Constraints

None.

## 4.5 Common notifications

### 4.5.1 Alarm notifications

This clause presents a list of notifications, defined in 3GPP TS 32.111-2 [11], that IRPManager can receive. The notification header attribute `objectClass/objectInstance`, defined in 3GPP TS 32.302 [15], would capture the DN of an instance of an IOC defined in this IRP specification.

Name	Qualifier	Notes
<code>notifyAckStateChanged</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyChangedAlarm</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyClearedAlarm</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyNewAlarm</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyComments</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyAlarmListRebuilt</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	
<code>notifyPotentialFaultyAlarmList</code>	See Alarm IRP (3GPP TS 32.111-2 [11])	

### 4.5.2 Configuration notifications

This clause presents a list of notifications, defined in 3GPP TS 32.662 [17], that IRPManager can receive. The notification header attribute `objectClass/objectInstance`, defined in 3GPP TS 32.302 [15], would capture the DN of an instance of an IOC defined in this IRP specification.

<b>Name</b>	<b>Qualifier</b>	<b>Notes</b>
notifyAttributeValueChange	O	
notifyObjectCreation	O	
notifyObjectDeletion	O	

## Annex A (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2014-06	SA#64	SP-140332	001	1	Correct hopping sequence list data type	11.0.0	11.1.0
		SP-140359	002	-	remove the feature support statements		
2014-09	SA#65	SP-140558	004	-	Correction of operationalState attribute definitions	11.1.0	11.2.0
2014-09					Automatic upgrade (MCC)	11.2.0	12.0.0
2016-01	SA#70				Upgrade to Rel-13 (MCC)	12.0.0	13.0.0

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
2016-06	SA#72	SP-160408	0008	-	A	The attributes "longitude" and "latitude" are lacking detailed definition	13.1.0
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
2019-09	SA#85	SP-190751	0009	-	F	Correction of NR to NCR and Remove not needed abbreviations	15.1.0
2020-07	-	-	-	-	-	Update to Rel-16 version (MCC)	<b>16.0.0</b>
2022-03	-	-	-	-	-	Update to Rel-17 version (MCC)	<b>17.0.0</b>

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# History

<b>Document history</b>		
V17.0.0	April 2022	Publication