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**Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Radio Planning Tool Access (RPTA)
Integration Reference Point (IRP);
Information Service (IS)
(3GPP TS 28.668 version 16.0.0 Release 16)**



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Foreword

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

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

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

28.667 Radio Planning Tool Access (RPTA) Integration Reference Point (IRP); Requirements

28.668 Radio Planning Tool Access (RPTA) Integration Reference Point (IRP): Information Service (IS)

28.669 Radio Planning Tool Access (RPTA) Integration Reference Point (IRP); Solution Set (SS) definitions

1 Scope

The present document specifies the Radio Planning Tool Access (RPTA) management operations as well as support object classes, attributes and relations that can be communicated between the Service Provider in the RPT and one or several Service Consumers in the NM.

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

This IRP allows the NM to read planned site and antenna data from the RPT.

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 TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [3] 3GPP TS 28.632: "Telecommunication management; Inventory Management (IM) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [4] 3GPP TS 28.662: "Telecommunication management; Generic Radio Access Network (RAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [5] 3GPP TS 28.667: "Telecommunication management; Radio Planning Tool Access (RPTA) Integration Reference Point (IRP); Requirements".
- [6] 3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

Radio Planning Tool: See TS 28.667 [5].

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

RPT	Radio Planning Tool
-----	---------------------

RPTA	Radio Planning Tool (RPT) Access
SC	Service Consumer
SP	Service Provider

4 System overview

4.1 System Context

The general definition of the System Context for the present IRP is found in 3GPP TS 32.150 [6], subclause 4.7. The RPT is the SP, the NM is the SC.

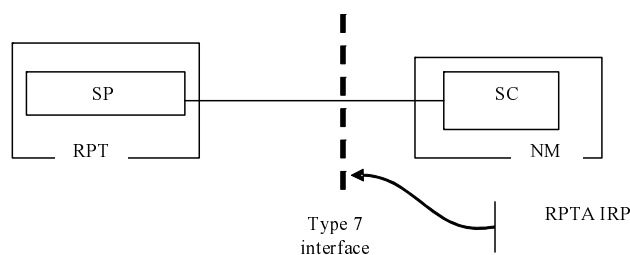


Figure 4.1.1: System Context for Type 7 interface

4.2 Compliance rules

For general definitions of compliance rules related to qualifiers (Mandatory/Optional/Conditional) for *operations*, *notifications* and *parameters* (of operations and notifications) please refer to 3GPP TS 32.150 [6].

A SP that incorporates vendor-specific extensions shall support normal communication with a 3GPP SA5-compliant SC with respect to all Mandatory and Optional managed object classes, attributes, associations, operations, parameters and notifications without requiring the SC to have any knowledge of the extensions.

Given that:

- rules for vendor-specific extensions remain to be fully specified; and
- many scenarios under which SC and SP interwork may exist.

It is recognized that the SC, even though it is not required to have knowledge of vendor-specific extensions, may be required to be implemented with an awareness that extensions can exist and behave accordingly.

5 Information Object Classes

5.1 Imported information entities and local labels

None.

5.2 Class diagram

5.2.1 Attributes and relationships

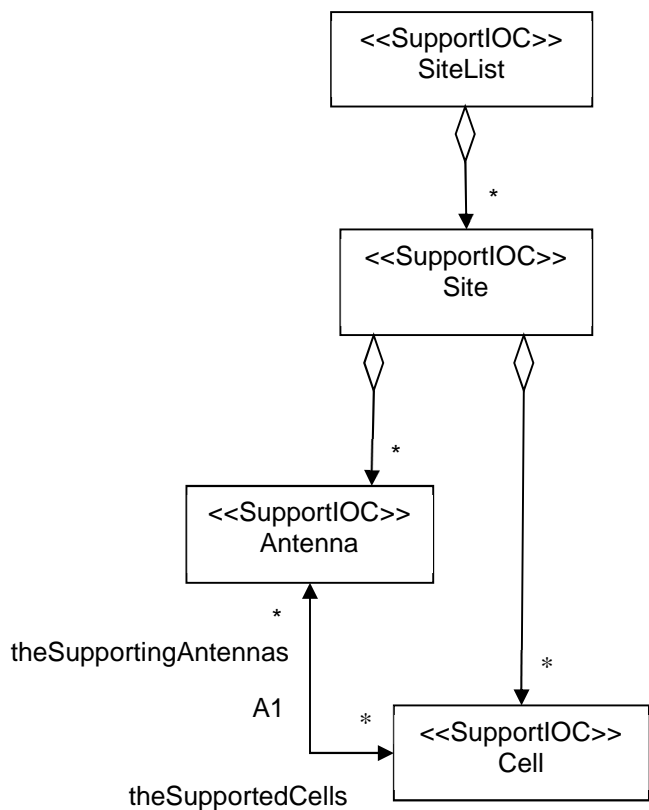


Figure 5.2.1-1: Information Model of the RPTA IRP

5.2.2 Inheritance

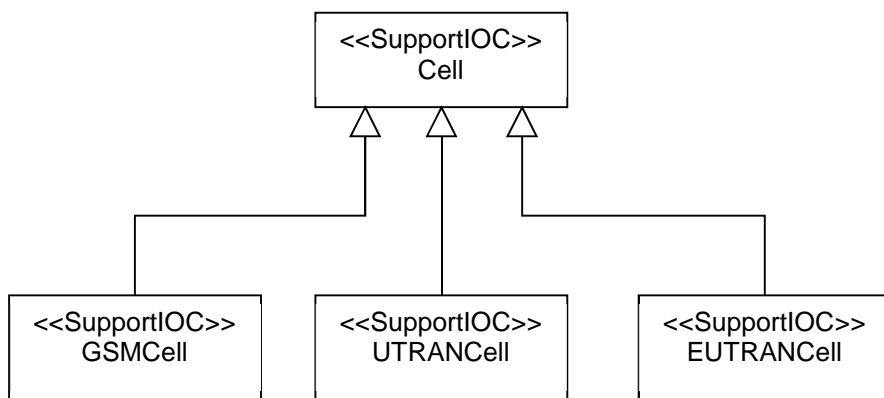


Figure 5.2.2-1: Inheritance diagram

5.3 Information object class definitions

5.3.1 Antenna

5.3.1.1 Definition

This SupportIOC represents an antenna.

Referenced TS	Requirement label	Comment
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-002	
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-003	
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-004	

5.3.1.2 Attributes

Attribute name	Support Qualifier	Read Qualifier	Write Qualifier
antennaId	M	M	-
antennaName	M	M	-
antennaPatternLabel	M	M	-
antennaType	M	M	-
antennaLongitude	M	M	-
antennaLatitude	M	M	-
antennaAltitude	M	M	-
antennaBearing	M	M	-
antennaMechanicalOffset	M	M	-
theSupportedCells	M	M	-

5.3.1.3 Attribute constraints

None.

5.3.1.4 Notifications

None.

5.3.2 Cell

5.3.2.1 Definition

This SupportIOC represents a cell.

Referenced TS	Requirement label	Comment
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-003	
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-004	

5.3.2.2 Attributes

Attribute name	Support Qualifier	Read Qualifier	Write Qualifier
cellId	M	M	-
theSupportingAntennas	M	M	-

5.3.2.3 Attribute constraints

None.

5.3.2.4 Notifications

None.

5.3.3 GSMCell

5.3.3.1 Definition

This SupportIOC represents a GSM cell.

Referenced TS	Requirement label	Comment
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-005	

5.3.3.2 Attributes

Attribute name	Support Qualifier	Read Qualifier	Write Qualifier

5.3.3.3 Attribute constraints

None.

5.3.3.4 Notifications

None.

5.3.4 EUTRANCell

5.3.4.1 Definition

This SupportIOC represents an E-UTRAN cell.

Referenced TS	Requirement label	Comment
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-005	

5.3.4.2 Attributes

Attribute name	Support Qualifier	Read Qualifier	Write Qualifier

5.3.4.3 Attribute constraints

None.

5.3.4.4 Notifications

None.

5.3.5 Site

5.3.5.1 Definition

This SupportIOC represents a site. A site designates the location of the base station (TR 21.905 [1]), and properties associated to the site such as site address, exact location and site name. In case the antenna is not at the same location as the (rest of the) base station, site designates the location of the main base station equipment.

Referenced TS	Requirement label	Comment
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-001	

5.3.5.2 Attributes

Attribute name	Support Qualifier	Read Qualifier	Write Qualifier
siteId	M	M	-
siteAddress	M	M	-
siteName	M	M	-
siteLongitude	M	M	-
siteLatitude	M	M	-
siteAltitude	O	M	-

5.3.5.3 Attribute constraints

None.

5.3.5.4 Notifications

None.

5.3.6 SiteList

5.3.6.1 Definition

This SupportIOC represents a list of sites.

Referenced TS	Requirement label	Comment
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-001	

5.3.6.2 Attributes

Attribute name	Support Qualifier	Read Qualifier	Write Qualifier

5.3.6.3 Attribute constraints

None.

5.3.6.4 Notifications

None.

5.3.7 UTRANCell

5.3.7.1 Definition

This SupportIOC represents a UTRAN cell.

Referenced TS	Requirement label	Comment
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-005	

5.3.7.2 Attributes

Attribute name	Support Qualifier	Read Qualifier	Write Qualifier

5.3.7.3 Attribute constraints

None.

5.3.7.4 Notifications

None.

5.4 Information relationship definitions

5.4.1 A1 (M)

5.4.1.1 Definition

This association represents the bidirectional relation between Antenna and Cell.

Referenced TS	Requirement label	Comment
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-003	
3GPP TS 28.667 [5]	REQ-RPT_NRM-FUN-004	

5.4.1.2 Roles

Name	Definition
theSupportingAntennas	This role represents the Antenna instances supporting a Cell instance.
theSupportedCells	This role represents the Cell instances supported by an Antenna instance.

5.4.1.3 Constraints

None.

5.5 Information attribute definitions

5.5.1 Definition and legal values

The following table defines the attributes that are present in the Support Object Classes of the present document.

Attribute Name	Definition	Information Type / Legal Values
antennaBearing	The bearing that the antenna is pointing to, see TS 23.032 [2] allowedValues: see TS 23.032 [2] NOTE: Identical to TS 28.662 [4] AntennaFunction::bearing	type: Integer
antennaAltitude	The elevation of the antenna above sea level. allowedValues: An integral value representing a number of meters in 0.1 meter increments. NOTE: Identical to TS 28.662 [4] AntennaFunction::height	type: Integer
antennaId	Operator defined antenna identifier allowedValues: N/A	type: String
antennaLatitude	The latitude of the antenna location based on the World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to north of 0 degrees latitude (northern hemisphere). allowedValues: valid values are described in TS 23.032 [2] NOTE: Identical to TS 28.632 [3] AntennaInventoryUnit::latitude Editor's note: The exact definition is ffs, and needs to be aligned with other definitions of latitude/longitude.	type: Real
antennaLongitude	The longitude of the antenna location based on the World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to east of 0 degrees longitude. allowedValues: valid values are described in TS 23.032 [2] NOTE: Identical to TS 28.632 [3] AntennaInventoryUnit::longitude Editor's note: The exact definition is ffs, and needs to be aligned with other definitions of latitude/longitude.	type: Real
antennaMechanicalOffset	This is a value representing a non-adjustable tilt value, which is imparted to the antenna due to the physical installation. The actual tilt at any point in time is the summation of mechanicalOffset and retTiltValue. A single integral value corresponding to an angle in degrees between 0 and 360 with a resolution of 0.1 degrees. allowedValues: N/A NOTE: Identical to TS 28.632 [3] AntennaInventoryUnit::mechanicalOffset	type: Integer
antennaName	Name of the antenna. It is a free text field. allowedValues: N/A	type: String
antennaPatternLabel	The radiation pattern of the antenna, also referred to as antenna pattern. allowedValues: N/A NOTE: Identical to TS 28.632 [3] AntennaInventoryUnit::patternlabel	type: String
antennaType	The type of the antenna. Types are e.g. repeaters, remote antennas, power dividers. allowedValues: N/A	Type: String
cellId	Operator defined cell identifier.	type: String
siteAddress	Address of the site allowedValues: N/A	type: String

Attribute Name	Definition	Information Type / Legal Values
siteAltitude	The elevation of the site above sea level. allowedValues: An integral value representing a number of meters in 0.1 meter increments.	type: Integer
siteId	Operator defined site identifier. allowedValues: N/A	type: String
siteLatitude	The latitude of the site location based on the World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to north of 0 degrees latitude (northern hemisphere). allowedValues: valid values are described in 3GPP TS 23.032 [2] <i>Editor's note: The exact definition is ffs, and needs to be aligned with other definitions of latitude/longitude.</i>	type: Real
siteLongitude	The longitude of the site location based on the World Geodetic System (1984 version) global reference frame (WGS 84). Positive values correspond to east of 0 degrees longitude. allowedValues: valid values are described in 3GPP TS 23.032 [2] <i>Editor's note: The exact definition is ffs, and needs to be aligned with other definitions of latitude/longitude.</i>	type: Real
siteName	Name of the site. It is a free text field. allowedValues: N/A	type: String
Attributes related to role		
theSupportedCells	This attribute carries a set of cellId.	
theSupportingAntennas	This attribute carries a set of antennaId.	

5.5.2 Constraints

None.

6 Interface definitions

6.1 Class diagram representing interfaces

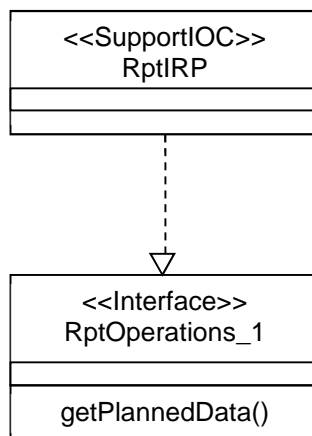


Figure 6.1-1: Class diagram representing interfaces

6.2 Generic rules

Rule 1: Each operation with at least one input parameter supports a pre-condition `valid_input_parameter` which indicates that all input parameters shall be valid with regards to their information type. Additionally, each such operation supports an exception `operation_failed_invalid_input_parameter` which is raised when pre-condition `valid_input_parameter` is false. The exception has the same entry and exit state.

Rule 2: Each operation with at least one optional input parameter supports a set of pre-conditions `supported_optional_input_parameter_xxx` where "xxx" is the name of the optional input parameter and the pre-condition indicates that the operation supports the named optional input parameter. Additionally, each such operation supports an exception `operation_failed_unsupported_optional_input_parameter_xxx` which is raised when (a) the pre-condition `supported_optional_input_parameter_xxx` is false and (b) the named optional input parameter is carrying information. The exception has the same entry and exit state.

Rule 3: Each operation shall support a generic exception `operation_failed_internal_problem` that is raised when an internal problem occurs and that the operation cannot be completed. The exception has the same entry and exit state.

6.3 RptOperations_1 Interface (M)

6.3.1 Operation `getPlannedData` (M)

6.3.1.1 Definition

The NM invokes this operation to read planned data from the RPT.

Referenced TS	Requirement label	Comment
3GPP TS 28.667 [5]	REQ-RPT_NRM-CON-001	

6.3.1.2 Input parameters

Name	Qualifier	Matching Type	Comment
scope	M	Information specifying the scope	This parameter defines the subset of planned data to be returned. In Rel-12 only all planned data can be selected. The absence of an input parameter is equivalent to ALL. The semantics of scope is undefined in Rel-12.

6.3.1.3 Output parameters

Name	Qualifier	Matching Information	Comment
plannedData	M	SiteList	This parameter returns all planned data held by the RPT. The data structure is described by the information model specified in subclause 5.
status	M	ENUM (OperationSucceeded, OperationFailed)	If <code>allScopedPlannedDataReturned</code> is true, status = OperationSucceeded. If <code>operation_failed</code> is true, status = OperationFailed.

6.3.1.4 Pre-condition

`networkPlanned`

Assertion Name	Definition
<code>networkPlanned</code>	The network is planned and the planned data is stored and available for reading in the RPT.

6.3.1.5 Post-condition

allScopedPlannedDataReturned

Assertion Name	Definition
allScopedPlannedDataReturned	All data selected by the scope input parameter is returned. The planned data in the RPT is not affected by this operation.

6.3.1.6 Exception

Assertion Name	Definition
operation_failed	Condition: The pre-condition is false or the post-condition is false. Returned Information: The output parameter status. Exit state: Entry state.

Annex A (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2014-12	SA#66	SP-140793			Presented for approval	1.2.0	2.0.0
					Version after approval	2.0.0	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
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

History

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