ETSI TS 128 667 V15.0.0 (2018-07)

Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Radio Planning Tool Access (RPTA)
Integration Reference Point (IRP);
Requirements
(3GPP TS 28.667 version 15.0.0 Release 15)

Reference
RTS/TSGS-0528667vf00

Keywords
LTE,UMTS

ETSI

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Foreword

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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 requirements of the Radio Planning Tool Access (RPTA) Integration Reference Point (IRP). This IRP allows to read site and antenna data from RPTs.

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 32.101: "Telecommunication management; Principles and high level requirements".

[3] 3GPP TS 32.501: "Telecommunication management; Self-configuration of network elements; Concepts and requirements".

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: The tool which is used for radio network planning, where the planning process typically includes radio frequencies assigning, sites and site locations determination, traffic planning, interference analysis, and configuration parameters planning to provide sufficient coverage and capacity for a radio network.

Planned Data: It is the data exposed by the RPT for read access by the NM.

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].

NMLS	Network Management Layer Service
RPT	Radio Planning Tool
RPTA	Radio Planning Tool Access (RPTA)
SC	Service Consumer
SP	Service Provider

4 Concepts and background

4.1 General

The initial planning of radio parameters is typically done with specialized tools called Radio Planning Tools (RPTs). RPTs generate throughput and capacity estimations as well as predictions for coverage and interference maps. RPTs utilize site and antenna (equipment) information, as well as geographic data (e.g. terrain data, type of land usage, building data and road data). This data has to be entered into the tools.

In order to improve the initial network planning, planned site and antenna data are adjusted until the estimated system performance meets the requirements within the given deployment constraints.

Information about the sites and antennas is needed also by other applications, like SON applications or CM applications on NM level. For this reason it is beneficial if this data can be read via standardized interfaces.
In contrast to configuration information it is normally not possible to read this data from the network elements.
The only place where this data is available in many deployment scenarios is in the RPT. Though this data represents initial planning, site data and antenna data are not likely to be changed very often, so that there is a fair chance that the data stored by the RPT represents also the actual situation in the network.

For this reason it is beneficial to have a read access to site and antenna data stored by the RPT.

It is to be noted that this TS series is only about the read access to site and antenna data. It is not concerned with any other functionality the RPT might have, nor with how the read data is used, nor if the read data represents the actual information about the network or if the data is outdated. Reading of site and antenna data stored by the RPT is hence the only use case in scope.

4.2 Architecture

The RPT is a kind of NMLS (see TS 32.101 [2]).

4.3 Functionality

The RPT offers a capability allowing read access to site and antenna data. The RPT is a Service Provider (SP) and the NM a Service Consumer (SC). The RPTA IRP specifies the information model exposed by the RPT, and the operations to access it.

5 Business level requirements

5.1 Requirements

REQ-RPT_NRM-CON-001: The RPT shall support a capability allowing the NM to retrieve planned data from the RPT.

5.2 Actor roles

The function at the NM requesting to read planned data from the RPT.

5.3 Telecommunications resources

RPT: The Radio Planning Tool storing the planned data and exposing it by its Service Provider (SP) function.

NM: The Network Manager requesting the planned data by its Service Consumer (SC) function.

SP in the RPT: The Service Provider (SP) in the RPT offering read access to planned data in the RPT.

SC in the NM: The Service Consumer (SC) in the NM using services offered by the RPT.

5.4 High-level use cases

5.4.1 Use Case: Read planned data from the RPT

Use case stage	Evolution/Specification	<<Uses>> Related use
Goal	The NM reads planned data from the RPT.	
Actors and Roles	The function in the NM requesting to read planned data from the RPT.	
Telecom resources	RPT, NM, SP in the RPT, SC in the NM.	
Assumptions	Connectivity exists between RPT SP and the NM SC, so that SP and SC can communicate.	
Pre-conditions	The network is planned and the planned data is stored and available in the RPT.	
Begins when	The NM SC requests the RPT SP to provide certain planned data stored in the RPT by sending an appropriate request message to the RPT SP.	
Step 1 (M)	The RPT SP receives the request message.	
Step 2 (M)	The RPT processes the request message, identifies the requested planned data and retrieves the requested planned data.	
Step 3 (M)	The RPT SP sends back to the NM SC the requested planned data in a response message.	
Ends when	The NM SC has received the requested planned data.	
Exceptions	The NM SC does not receive the requested planned data. Numerous failure reasons may be indicated.	
Post-conditions	The requested planned data has been returned. The planned data stored in RPT before and after the exchange of the request/response messages are identical.	
Traceability	Requirement **REQ-RPT_NRM-CON-001** in clause 5.1.	

6 Specification level requirements

6.1 Requirements

REQ-RPT_NRM-FUN-001: The RPT shall support a capability allowing the NM to retrieve planned site data (e.g. site latitude, site longitude) from the RPT.

REQ-RPT_NRM-FUN-002: The RPT shall support a capability allowing the NM to retrieve planned antenna data (e.g. antenna latitude, antenna longitude, antenna type, pattern label, antenna tilt) from the RPT.

REQ-RPT_NRM-FUN-003: The RPT shall support a capability allowing the NM to find out the planned antennas supporting a planned cell.

REQ-RPT_NRM-FUN-004: The RPT shall support a capability allowing the NM to find out the planned cells supported by a planned antenna.

REQ-RPT_NRM-FUN-005: The RPT shall support a capability allowing the NM to find out the RAT of a planned cell.

6.2 Actor roles

See clause 5.2.

6.3 Telecommunications resources

See clause 5.3.

6.4 Use cases

6.4.1 Use Case 1: Read planned site data

The use case in clause 5.4.1 describes in generic fashion the use case on reading planned data from the RPT. In the use case "Read planned site data" this information is planned site data.

6.4.2 Use Case 2: Read planned antenna data

The use case in clause 5.4.1 describes in generic fashion the use case on reading planned data from the RPT. In the use case "Read planned antenna data" this information is planned antenna data.

6.4.3 Use Case 3: Find out the planned antennas supporting a planned cell

The use case in clause 5.4.1 describes in generic fashion the use case on reading planned data from the RPT. In the use case "Find out the planned antennas supporting a planned cell" this information is data about which planned antennas support a planned cell. The data returned contains thus for each cell identifier a set of antenna identifiers.

6.4.4 Use Case 4: Find out the planned cells supported by a planned antenna

The use case in clause 5.4.1 describes in generic fashion the use case on reading planned data from the RPT. In the use case "Find out the planned cells supported by a planned antenna" this information is data about which planned cells are supported by a planned antenna. The data returned contains thus for each antenna identifier a set of cell identifiers.

6.4.5 Use Case 5: Find out the RAT of a planned cell

The use case in clause 5.4.1 describes in generic fashion the use case on reading planned data from the RPT. In the use case "Find out the RAT of a planned cell" this information is data about the RATs of the planned cells.

Annex A (informative): Relation of RPT Planned Data, ARCF data and configuration data

There are several kinds of data defined in 32- and 28-series standards.

ARCF data are the data which are required for successful activation (of e.g. cell, eNB) that require coordination between several cells and cannot be generated below Itf-N. Some of the ARCF data may be used directly as eNodeB configuration data and some of the ARCF data may be used to generate more other eNodeB configuration data. eNodeB will use the ARCF data together with other configuration data as initial eNodeB radio configuration data. The eNodeB initial radio configuration data will be used for self-configuration.

Configuration data are normally defined as NRM IRP data.

Planned Data, which is the data exposed by the RPT for read access by the NM, may be different from those used during NM normal operation of the actual network.

The relation between different kinds of data is:

1) The Planned Data are stored in RPT. NM or other NM layer applications can retrieve Planned Data from RPT. Some of the Planned Data retrieved from RPT can be used directly as configuration data or ARCF data (e.g. antenna data like antennaAzimuth and antennaTilt).

2) Some of the ARCF data are used as configuration data directly and other ARCF data are used to generate more other configuration data, see TS 32.501 [3].

Annex B (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2014-12	SA#66	SP-140792			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**

History

Document history		
V15.0.0	July 2018	Publication