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**Universal Mobile Telecommunications System (UMTS);  
LTE;  
Telecommunication management;  
Evolved Universal Terrestrial Radio Access Network (E-  
UTRAN) Network Resource Model (NRM) Integration Reference  
Point (IRP);  
Information Service (IS)  
(3GPP TS 28.658 version 15.6.0 Release 15)**



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**Keywords**LTE,UMTS

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## Foreword

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

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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:

TS 28.657 Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Network Resource Model (NRM) Integration Reference Point (IRP); Requirements

**TS 28.658 Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)**

TS 28.659 Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions

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# 1 Scope

The present document specifies the E-UTRAN network resource information that can be communicated between an IRPAgent and an IRPManager for telecommunication network management purposes, including management of converged networks.

This 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.

The E-UTRAN NRM IRP comprises a set of specifications defining Requirements, a protocol neutral Information Service and one or more Solution Set(s).

The present document specifies the protocol neutral E-UTRAN NRM IRP: Information Service (IS). It reuses relevant parts of the Generic NRM IRP: IS in 3GPP TS 28.622 [6], either by direct reuse or sub-classing, and in addition to that defines E-UTRAN specific Information Object Classes.

In order to access the information defined by this NRM, an Interface IRP such as the "Basic CM IRP" is needed (3GPP TS 32.602 [7]). However, which Interface IRP is applicable is outside the scope of the present document.

The present document also specifies the ng-eNB network resource information that can be communicated among NG-RAN management system, including management of MR-DC operations which ng-eNB is involved in.

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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 23.003: "Numbering, addressing and identification".
- [4] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".
- [5] 3GPP TS 28.628: "Self-Organizing Networks (SON) Policy Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [6] 3GPP TS 28.622: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [7] 3GPP TS 32.602: "Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP) Information Service (IS)".
- [8] 3GPP TS 36.321: "Universal Terrestrial Access Network (UTRAN); Medium Access Control (MAC) protocol specification".
- [9] 3GPP TS 23.401: "General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access".
- [10] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA) Radio Resource Control (RRC); Protocol specification".

- [11] 3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; Stage 2".
- [12] 3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation"
- [13] 3GPP TS 36.101: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio transmission and reception"
- [14] 3GPP TS 36.104: "Evolved Universal Terrestrial Radio Access (E-UTRA); Base Station (BS) radio transmission and reception"
- [15] 3GPP TS 32.500: "Telecommunication Management; Self-Organizing Networks (SON); Concepts and requirements"
- [16] 3GPP TS 32.150: "Telecommunication management; Integration Reference Point (IRP) Concept and definitions"
- [17] 3GPP TS 21.905: "Vocabulary for 3GPP Specifications"
- [18] 3GPP TS 32.111-2: "Telecommunication management; Fault Management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS)"
- [19] 3GPP TS 23.002: "Network Architecture"
- [20] 3GPP TS 32.652: "Telecommunication management; Configuration Management (CM); GERAN network resources Integration Reference Point (IRP); Network Resource Model (NRM)"
- [21] 3GPP TS 28.652: "Telecommunication management; Universal Terrestrial Radio Access Network (UTRAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)"
- [22] 3GPP2 S.S0028-D "OAM&P for cdma2000 (Overview, 3GPP R7 Delta Specification, 3GPP2 Network Resource Model IRP)"
- [23] 3GPP TS 28.708: "Telecommunication management; Evolved Packet Core (EPC) Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)"
- [24] 3GPP TS 36.423: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN); X2 application protocol (X2AP)".
- [25] 3GPP TS 36.213: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical layer procedures".
- [26] 3GPP TS 28.625: "Telecommunication management; State Management Data Definition Integration Reference Point (IRP); Information Service (IS)".
- [27] 3GPP TS 36.413: "Evolved Universal Terrestrial Access Network (E-UTRAN); S1 Application Protocol (S1AP)".
- [28] 3GPP TS 36.443: "Evolved Universal Terrestrial Access Network (E-UTRAN); M2 Application Protocol (M2AP)".
- [29] 3GPP TS 22.011: "Service accessibility".
- [30] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management".
- [31] 3GPP TS 28.662: "Telecommunication management; Generic Radio Access Network (RAN) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".
- [32] 3GPP TS 32.662: "Telecommunication management; Configuration Management (CM); Kernel CM; Information service (IS)".
- [33] 3GPP TS 23.203: "Policy and charging control architecture".
- [34] 3GPP TS 23.207: "End-to-end Quality of Service (QoS) concept and architecture".

- [35] RFC 2474: "Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers".
- [36] 3GPP TS 45.008: "Technical Specification Group GSM/EDGE Radio Access Network; Radio subsystem link control".
- [37] 3GPP TS 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Information Service (IS)".
- [38] 3GPP TS 36.133: "Universal Terrestrial Access Network (UTRAN); Requirements for support of radio resource management".
- [39] 3GPP TS 28.657: "Evolved Universal Terrestrial Radio Access Network (E-UTRAN) Network Resource Model (NRM) Integration Reference Point (IRP); Requirements".
- [40] 3GPP TS 28.541: "Management and orchestration of 5G networks Network Resource Model (NRM); Stage 2 and stage 3".
- [41] 3GPP TS 38.300: "NR; Overall description; Stage-2".
- [42] 3GPP TS 23.501: "System Architecture for the 5G System".

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## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in TS 32.150 [16], TS 32.101 [1], TS 32.102 [2] and TS 21.905 [17] and the following apply:

**Association:** See definition in TS 28.622 [6].

**Network Resource Model (NRM):** See definition in TS 28.622 [6].

**eNodeB:** A logical node responsible for radio transmission/reception in one or more cells to/from the User Equipment. It terminates the S1 interface towards the EPC.

### 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in TS 32.150 [16], TS 32.101 [1], TS 32.102 [2] and TS 21.905 [17] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TS 28.657 [39], TS 32.150 [16], TS 32.101 [1], TS 32.102 [2] and TS 21.905 [17], in that order.

DeNB	Donor eNodeB
DN	Distinguished Name (see 3GPP TS 32.300 [4])
E-UTRA	Evolved Universal Terrestrial Radio Access
E-UTRAN	Evolved Universal Terrestrial Radio Access Network
MBSFN	Multimedia Broadcast multicast service Single Frequency Network
NCR	Neighbour Cell Relation
PM	Performance Management
RDN	Relative Distinguished Name (see 3GPP TS 32.300 [4])
RN	Relay Node

## 4 Model

### 4.1 Imported and associated information

#### 4.1.1 Imported information entities and local labels

Label reference	Local label
3GPP TS 28.625 [26], attribute, administrativeState	administrativeState
3GPP TS 28.625 [26], attribute, availabilityStatus	availabilityStatus
3GPP TS 28.625 [26], attribute, operationalState	operationalState
3GPP TS 28.622 [6], IOC, ManagedFunction	ManagedFunction
3GPP TS 28.622 [6], IOC, Link	Link
3GPP TS 28.708 [23], IOC, MMEFunction	MMEFunction
3GPP TS 28.708 [23], IOC, ExternalMMEFunction	ExternalMMEFunction
3GPP TS 28.708 [23], IOC, ServingGwFunction	ServingGwFunction
3GPP TS 28.708 [23], IOC, ServingGwCFunction	ServingGwCFunction
3GPP TS 28.708 [23], IOC, ExternalServingGwCFunction	ExternalServingGwCFunction
3GPP TS 28.652 [21], IOC, UtranRelation	UtranRelation
3GPP TS 28.662 [31], IOC, AntennaFunction	AntennaFunction
3GPP TS 28.662 [31], IOC, TmaFunction	TmaFunction
3GPP TS 32.652 [20], IOC, GsmRelation	GsmRelation
3GPP2 TS S.S0028 [22], IOC, ExternalSector	ExternalSector
3GPP TS 28.708 [23], IOC, EP_RP_EPS	EP_RP_EPS
3GPP TS 28.708 [23], IOC, QCISet	QCISet
3GPP TS 28.662 [31], IOC, SectorEquipmentFunction	SectorEquipmentFunction
3GPP TS 28.628 [5], IOC, EnergySavingProperties	EnergySavingProperties
3GPP TS 28.541 [40], IOC, EP_X2C	EP_X2C
3GPP TS 28.541 [40], IOC, EP_X2U	EP_X2U
3GPP TS 28.541 [40], IOC, EP_XnC	EP_XnC
3GPP TS 28.541 [40], IOC, EP_XnU	EP_XnU
3GPP TS 28.541 [40], IOC, EP_NgC	EP_NgC
3GPP TS 28.541 [40], IOC, EP_NgU	EP_NgU
3GPP TS 28.541 [40], IOC, AMFFunction	AMFFunction
3GPP TS 28.541 [40], IOC, UPFFunction	UPFFunction
3GPP TS 28.541 [40], IOC, GNBCUCPFunction	GNBCUCPFunction
3GPP TS 28.541 [40], IOC, GNBCUUPFunction	GNBCUUPFunction
3GPP TS 28.541 [40], attribute, sNSSAIIList	sNSSAIIList
3GPP TS 28.622 [6], IOC, EP_RP	EP_RP
3GPP TS 28.541 [40], IOC, NRCellRelation	NRCellRelation
3GPP TS 28.541 [40], IOC, NRReqRelation	NRReqRelation
3GPP TS 28.541 [40], IOC, NRFrequency	NRFrequency
3GPP TS 28.541 [40], IOC, NRNetwork	NRNetwork
3GPP TS 28.541 [40], IOC, EUTranNetwork	EUTranNetwork
3GPP TS 28.541 [40], attribute, cellIndividualOffset	cellIndividualOffset
3GPP TS 28.541 [40], attribute, blackListEntry	blackListEntry
3GPP TS 28.541 [40], attribute, blackListEntryIdleMode	blackListEntryIdleMode
3GPP TS 28.541 [40], attribute, cellReselectionPriority	cellReselectionPriority
3GPP TS 28.541 [40], attribute, cellReselectionSubPriority	cellReselectionSubPriority
3GPP TS 28.541 [40], attribute, pMax	pMax
3GPP TS 28.541 [40], attribute, qOffsetFreq	qOffsetFreq
3GPP TS 28.541 [40], attribute, qQualMin	qQualMin
3GPP TS 28.541 [40], attribute, qRxLevMin	qRxLevMin
3GPP TS 28.541 [40], attribute, threshXHighP	threshXHighP
3GPP TS 28.541 [40], attribute, threshXHighQ	threshXHighQ
3GPP TS 28.541 [40], attribute, threshXLowP	threshXLowP
3GPP TS 28.541 [40], attribute, threshXLowQ	threshXLowQ
3GPP TS 28.541 [40], attribute, tReselectionEutraSfHigh	tReselectionEutraSfHigh
3GPP TS 28.541 [40], attribute, tReselectionEutraSfMedium	tReselectionEutraSfMedium

### 4.1.2 Associated information entities and local labels

Label reference	Local label
3GPP TS 28.622 [6], IOC, <i>Top</i>	<i>Top</i>
3GPP TS 28.622 [6], IOC, ManagedElement	ManagedElement
3GPP TS 28.622 [6], IOC, SubNetwork	SubNetwork

## 4.2 Class diagram

### 4.2.1 Relationships

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

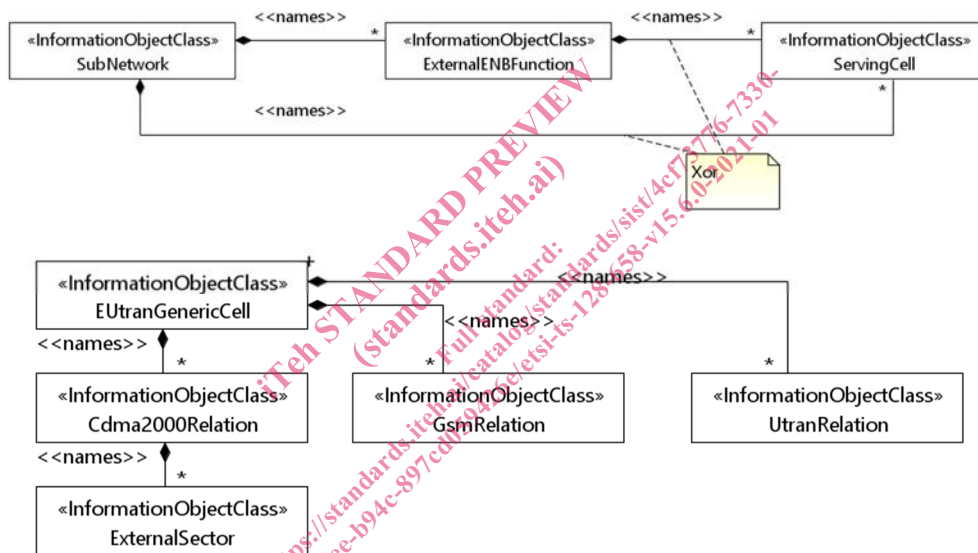


Figure 4.2.1-1: Cell relation view

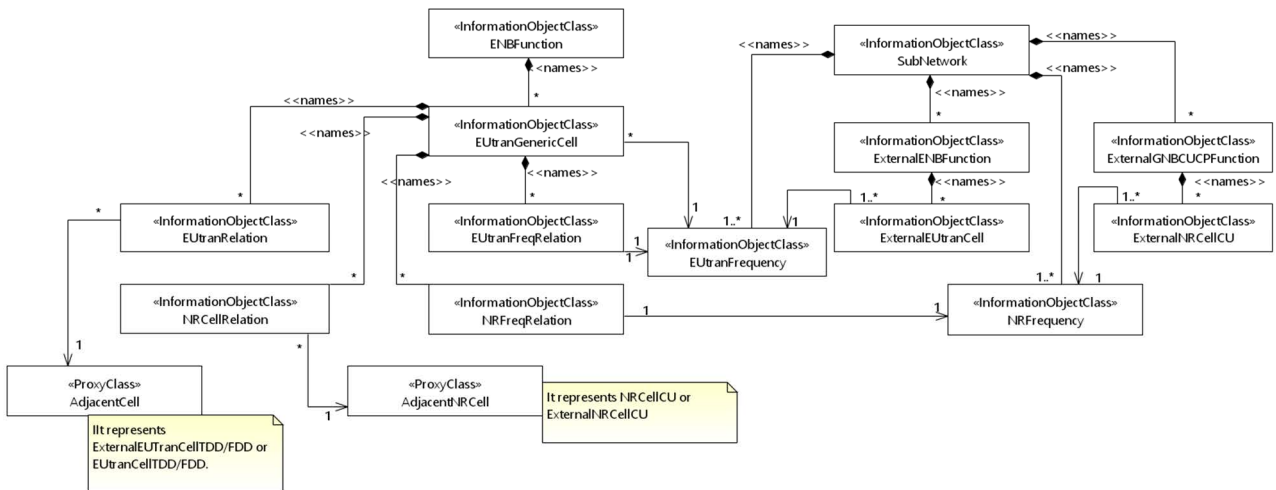


Figure 4.2.1.1-1a: Cell and frequency relation view

NOTE A: The above NRM fragment uses SubNetwork to hold both NR and LTE external entities and frequencies.

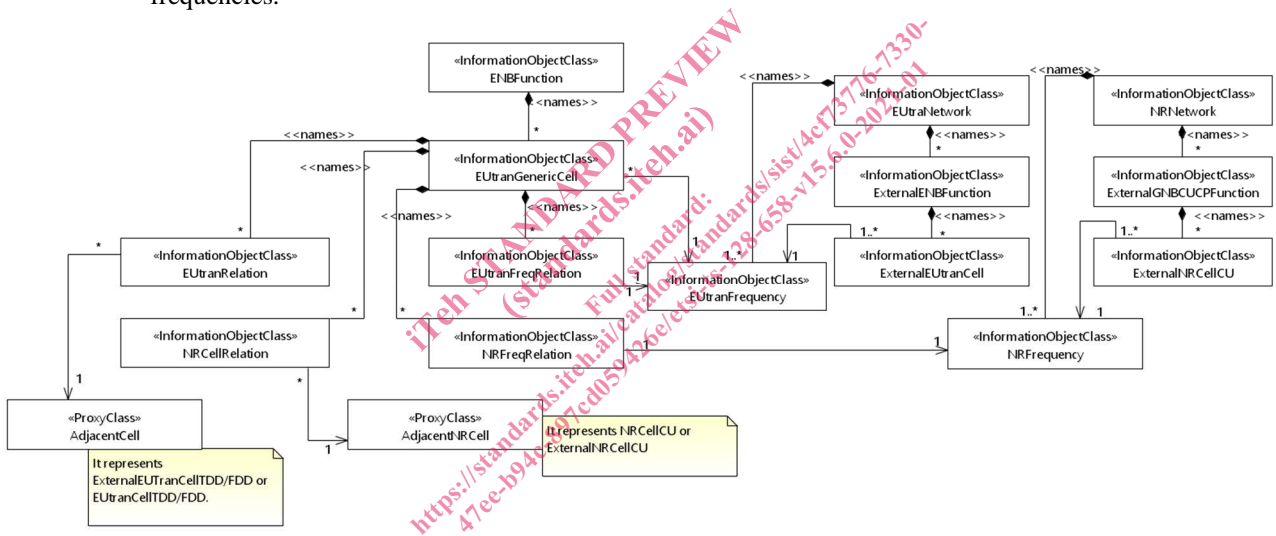


Figure 4.2.1.1-1b: Cell and frequency relation view

NOTE B: The above NRM fragment uses NRNetwork to hold NR external entities and frequency and using EUTraNetwork to hold LTE external entities and frequency. The NRNetwork and EUTraNetwork are subclasses of SubNetwork (defined in TS 28.622[6]) with no additional attributes. The reason using NRNetwork and EUTraNetwork is for a clean separation of NR external entities and frequency and LTE external entities and frequency.