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TECHNICAL SPECIFICATION

**Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Home enhanced Node B (HeNB) Subsystem (HeNS)
Network Resource Model (NRM)
Integration Reference Point (IRP);
Information Service (IS)
(3GPP TS 28.675 version 14.0.0 Release 14)**

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Contents

Foreword

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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:

   28.674:   Telecommunication management; Home eNode B Subsystem (HeNS) Network Resource Model (NRM) Integration Reference Point (IRP): Requirements.

   28.675.:   Telecommunication management; Home eNode B Subsystem (HeNS) Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS).

   28.676:   Telecommunication management; Home enhanced Node B Subsystem (HeNS) Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions.

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1 Scope

The present document specifies the Home enhanced Node B (HeNB) Subsystem (HeNS) Network Resource Model (NRM) IRP 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.

In order to access the information defined by this NRM, an IRP IS is needed, such as the Basic CM IRP IS (3GPP TS 32.602 [6]) or the Bulk CM IRP IS (3GPP TS 32.612 [7]). However, which IS that is applicable is outside the scope of the present document.

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 32.102: "Telecommunication management; Architecture".

[4]   3GPP TS 32.600: "Telecommunication management; Configuration Management (CM); Concept and high-level requirements".

[5]   3GPP TS 28.622: "Telecommunication Telecommunication management;; Generic Network Resource Model (NRMs) Integration Reference Point (IRP):Information Service" (IS)"..

[6]   3GPP TS 32.602: "Telecommunication management; Configuration Management (CM); Basic Configuration Management Integration Reference Point (IRP): Information Service (IS)".

[7]   3GPP TS 32.612: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): Information Service (IS)".

[8]   3GPP TS 28.702: "Telecommunication management; Core Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)"

[9]   3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA), Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description; stage 2"

[10]   3GPP TS 32.593: "Home eNode B (HeNB) Operations, Administration, Maintenance and Provisioning (OAM&P); Procedure flows for Type 1 Interface HeNB to HeNB Management System (HeMS)"

[11]   3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects"

[12]   3GPP TS 32.111-2: "Telecommunication management; Fault Management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS)".

[13]   3GPP TS 28.708: "Telecommunication management; Evolved Packet Core (EPC) Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)".

[14]   3GPP TS 28.672: "Telecommunication management; Home Node B Subsystem (HNS) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)".

[15]   3GPP TS 28.652:"UTRAN Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)".

[16]   3GPP TS 32.111-2: "Telecommunication management; Fault Management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS)".

[17]   3GPP TS 32.302: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Information Service (IS)".

[18]   TR-196, "Femto Access Point Device Data Model", Broadband Forum, 2009, http://broadband-forum.org/technical/download/TR-196.pdf.

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the following definitions and abbreviations apply. For definitions and abbreviations not found here, please refer to to 3GPP TS 32.101 [2], 3GPP TS 32.102 [3] and 3GPP TS 32.600 [5].

Association: See definition in TS 28.622 [6].

Management Information Model (MIM): also referred to as NRM - see the definition below.

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

3.2   Abbreviations

For the purposes of the present document, the following abbreviations apply:

GW   Gateway
HeNB   Home enhanced Node B
HeNS   Home enhanced Node B Subsystem
IOCs   Information Object Classes

4 Model

4.1 Imported information entities and local labels

Label reference	Local label
3GPP TS 28.622 [5], IOC, `ManagedElement`	`ManagedElement`
3GPP TS 28.622 [5], IOC, `ManagedFunction`	`ManagedFunction`
3GPP TS 28.622 [5], IOC, `MeContext`	`MeContext`
3GPP TS 28.622 [5], IOC, `SubNetwork`	`SubNetwork`
3GPP TS 28.622 [5], IOC, `Top`	`Top`
3GPP TS 28.622 [5], IOC, `VsDataContainer`	`VsDataContainer`
3GPP TS 28.622 [5], IOC, `ManagementNode`	`ManagementNode`
3GPP TS 28.708 [13], IOC, `EP_RP_EPS`	`EP_RP_EPS`
3GPP TS 28.672 [14], IOC, `LocalGWFunction`	`LocalGWFunction`

4.2 Class diagram

4.2.1 Relationships

This clause depicts the set of IOCs that encapsulate information relevant for this service. This clause provides the overview of all information object classes in UML. Subsequent clauses provide more detailed specification of various aspects of these information object classes.
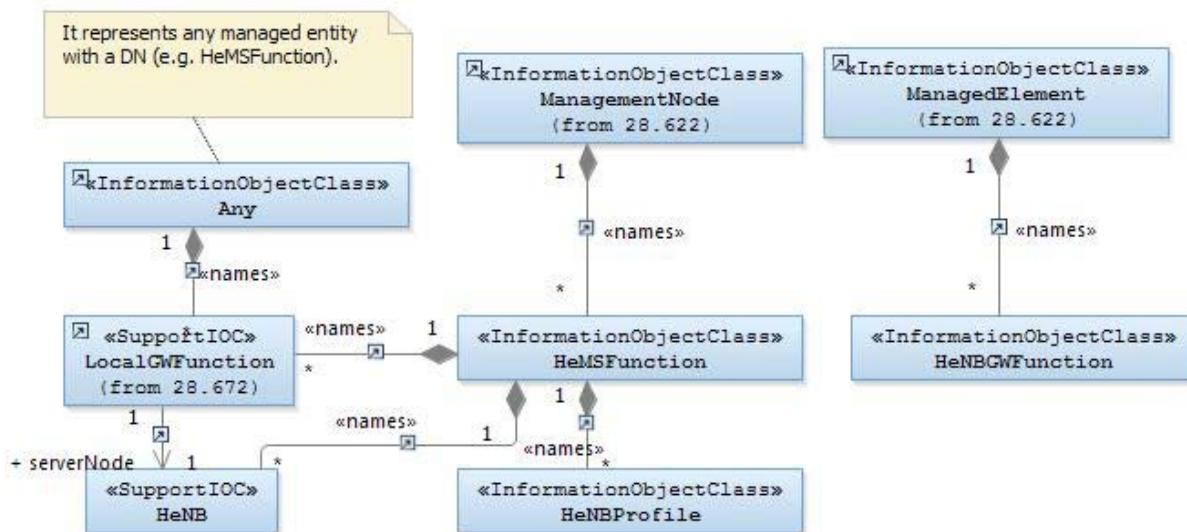
NOTE 1: The listed cardinality numbers, in particular the use of cardinality number zero, do not represent transient states. The transient state is considered an inherent property of all IOC instances and therefore there is no need to represent them by individual IOC cardinality numbers.

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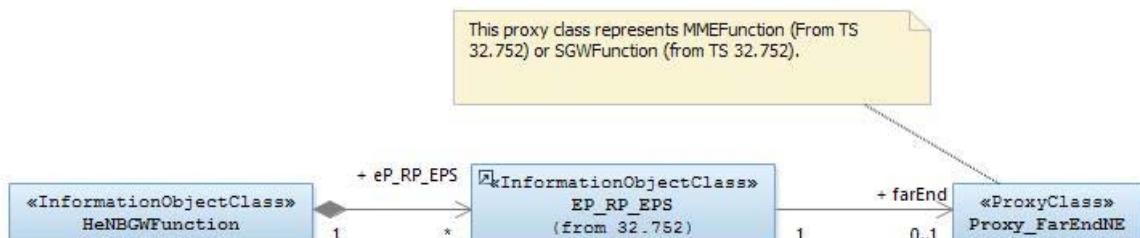
Figure 4.2.1-2 HeNS NRM Containment/Naming
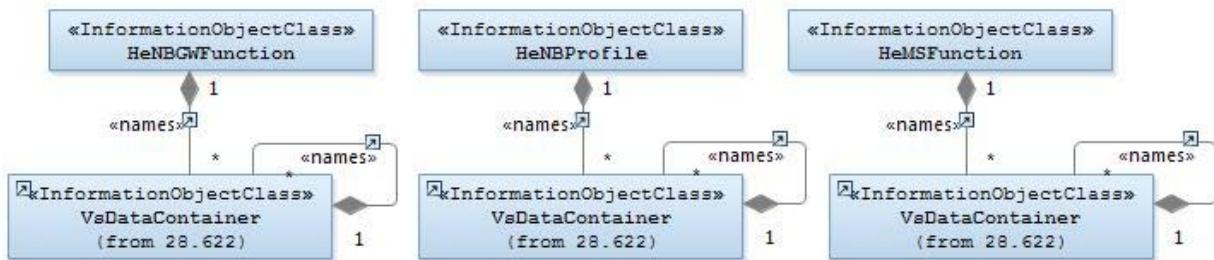
NOTE 1: The listed cardinality numbers, in particular the use of cardinality number zero, do not represent transient states. The transient state is considered an inherent property of all IOC instances and therefore there is no need to represent them by individual IOC cardinality numbers.

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

The VsDataContainer is only used for the Bulk CM IRP.

Each IOC is identified with a Distinguished Name (DN) according to 3GPP TS 32.300 [11] that expresses its containment

4.2.2 Inheritance

This clause depicts the inheritance relationships that exist between IOCs.
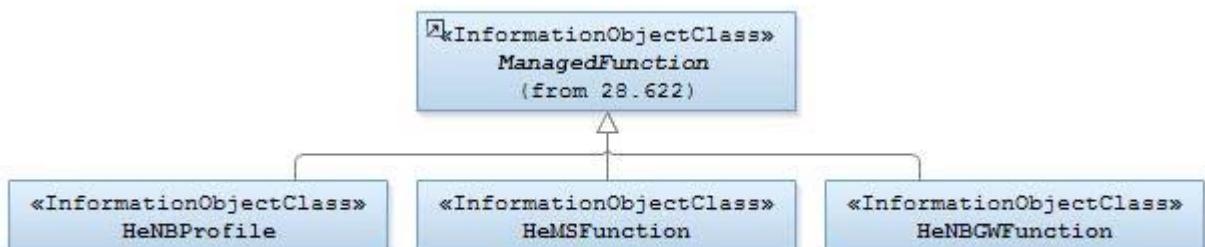
Figure 4.2.2-1: HeNS NRM Inheritance Hierarchy

4.3 Class definitions

4.3.1 HeNBGWFunction

4.3.1.1 Definition

This IOC represents HeNB GW functionality. For more information about the HeNB GW, see 3GPP TS 36.300[9]

4.3.1.2   Attributes

| Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
henbGwId	M	M	-	-	M
iPConfigInfo	M	M	-	-	M
maxNbrHeNBRegistered	M	M	-	-	M
maxPacketCapability	M	M	-	-	M

4.3.1.3   Notifications

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

4.3.2   HeMSFunction

4.3.2.1   Definition

This IOC represents HeMS functionality. For more information about HeMS, see 3GPP TS 32.593[10].

4.3.2.2   Attributes

None.

4.3.2.3   Notifications

There are no Notifications defined.

4.3.3   HeNBProfile

4.3.3.1   Definition

The `HeNBProfile` is a representation of information that a) identifies a specific set of HeNB devices and b) the related configuration parameters (and their values) that are required to be configured in those identified HeNB devices during HeNB registration procedure [10].

It contains `userLabel`, an attribute inherited from `ManagedFunction`. This is a user friendly label assigned by operator. Examples can be "VIP configuration", "Gold Tier configuration", "device vendor XYZ software version 3.4", "camel", etc.

4.3.3.2   Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
configuration	M	M	--	-	M
criterion	O	M	--	-	M

4.3.3.3   Notifications

There are no Notifications defined.

4.3.4   HeNB

4.3.4.1   Definition

This class represents `HeNB` functionality. For more information about the `HeNB`, see 3GPP TS 36.300 [9].

The Home eNodeB, represented by the <<SupportIOC>> `HeNB`, has registered itself with one node represented by `HeMSFunction`.

4.3.4.2   Attributes

Attribute name	Support Qualifier	isReadable	isWritable	isInvariant	isNotifyable
id	M	-	-	-	M

4.3.4.3   Notifications

The common notifications defined in clause 4.5 are not valid for this class. The set of notifications defined in the following table is valid.

Name	Qualifier	Notes
notifyAckStateChanged	See Alarm IRP (3GPP TS 32.111-2 [12])	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [12])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [12])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [12])	

4.4 Attribute definitions

4.4.1 Attribute Properties

This table defines the attributes that are present in several Information Object Classes (IOCs) of the present document.

Attribute Name	Documentation and Allowed Values	Properties
`id`	An attribute whose 'name+value' can be used as an RDN when naming an instance of the IOC. This RDN uniquely identifies the object instance within the scope of its containing (parent) object instance. allowedValues: format of allowed values to be conformant with TS 32.300[11]	type: String multiplicity:1 isOrdered: False isUnique: True defaultValue:None isNullable: False
`henbGwId`	Unique HeNB GW ID. Ref. 3GPP TS 36.300 [9] specifies that HeNB GW acts as a concentrated node to the existing EPC network using existing S1 interface. allowedValues: see [18]	type: see [18] multiplicity: see [18] isOrdered: see [18] isUnique: see [18] defaultValue: see [18] isNullable: see [18]
`iPConfigInfo`	The IP address, subnetwork mask, default gateway for HeNB GW. allowedValues: see [18]	type: see [18] multiplicity: see [18] isOrdered: see [18] isUnique: see [18] defaultValue: see [18] isNullable: see [18]
`maxNbrHeNBRegistered`	Maximum number of registered HeNB means maximum number of HeNB allowed to be registered. allowedValues: see [18]	type: see [18] multiplicity: see [18] isOrdered: see [18] isUnique: see [18] defaultValue: see [18] isNullable: see [18]
`maxPacketCapability`	The HeNB GW's ability of forwarding packets, such as maximum number of forwarded packets per second. allowedValues: see [18]	type: see [18] multiplicity: see [18] isOrdered: see [18] isUnique: see [18] defaultValue: see [18] isNullable: see [18]
`farEndNeIpAddr`	The IP address(es) of the far end network entity to which the reference point is related.This is an IPv4 or an IPv6 address. allowedValues: see [18]	type: see [18] multiplicity: see [18] isOrdered: see [18] isUnique: see [18] defaultValue: see [18] isNullable: see [18]
`configuration`	It is a location of a data set. The data set is a set of HeNB attributes (with values) needed to be loaded into the HeNB. The data set does not contain all configuration data needed for a device to operate. Some configuration parameters are autonomously and dynamically calculated by the serving HeMS. allowedValues: see [18]	type: see [18] multiplicity: see [18] isOrdered: see [18] isUnique: see [18] defaultValue: see [18] isNullable: see [18]

criterion	It is a criterion that determines if a HeNB should or should not be loaded with a particular `configuration`. The syntax and semantics of `criterion` is vendor-specific. Example 1: The syntax and semantics can be "If the HeNB ID range is between ABC and DEF then APPLY the related `configuration`". Example 2: The syntax is a list of strings where each string is a "attribute == value" pair. An attribute represents a TR-196 parameter. Its value is the corresponding attribute value. The semantics is "if all pairs found in `criterion` are also found in the home devices, then the determination is positive in that the home device should be loaded with information of the data set identified by `configuration`; else not". allowedValues: see [18]	type: see [18] multiplicity: see [18] isOrdered: see [18] isUnique: see [18] defaultValue: see [18] isNullable: see [18]

4.4.2 Constraints

None.

4.5 Common Notifications

4.5.1 Alarm notifications

This subclause presents a list of notifications, defined in [16], that IRPManager can receive. The notification header attribute `objectClass/objectInstance`, defined in [17], 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 [12])	
notifyAttributeValueChange	O	
notifyChangedAlarm	See Alarm IRP (3GPP TS 32.111-2 [12])	
notifyClearedAlarm	See Alarm IRP (3GPP TS 32.111-2 [12])	
notifyNewAlarm	See Alarm IRP (3GPP TS 32.111-2 [12])	
notifyObjectCreation	O	
notifyObjectDeletion	O	
notifyComments	See Alarm IRP (3GPP TS 32.111-2 [12])	

4.5.2 Configuration notifications

None.

Annex A (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>2014-06</td><td>SA#64</td><td>SP-140360</td><td>001</td><td>-</td><td>remove the feature support statements</td><td>F</td><td>11.0.0</td><td>11.1.0</td></tr>
<tr><td>2014-10</td><td>-</td><td>-</td><td>-</td><td>-</td><td>Update to Rel-12 version (MCC)</td><td></td><td>11.1.0</td><td>12.0.0</td></tr>
<tr><td>2016-01</td><td>-</td><td>-</td><td>-</td><td>-</td><td>Update to Rel-13 version (MCC)</td><td></td><td>12.0.0</td><td>13.0.0</td></tr>
<tr><td>2017-03</td><td>SA#75</td><td>-</td><td>-</td><td>-</td><td>Promotion to Release 14 without technical change</td><td></td><td>13.0.0</td><td>14.0.0</td></tr>
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History

Document history		
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