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Network Resource Model (NRM)
Integration Reference Point (IRP);
Information Service (IS)
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Foreword

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Ready for Converged Management

This specification is part of a set that has been developed for converged management solutions.

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

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.

convention for Managed Objects"

[12]

• 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*.

Release as th	he 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

Integration Reference Point (IRP): Information Service (IS)".

3GPP TS 32.111-2: "Telecommunication management; Fault Management; Part 2: Alarm

[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://broadbandforum.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

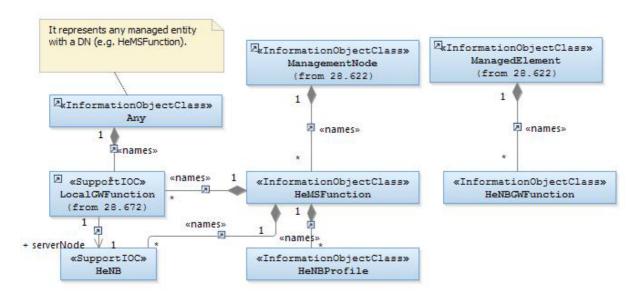
4.1 Imported information entities and local labels

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	Тор
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

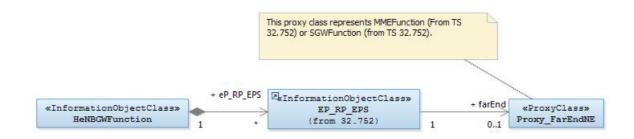
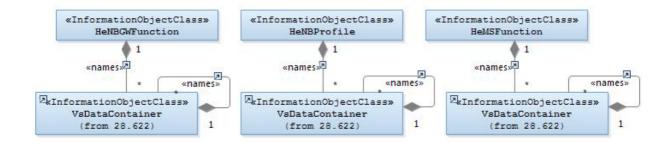


Figure 4.2.1-2 HeNS NRM Containment/Naming



- 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.

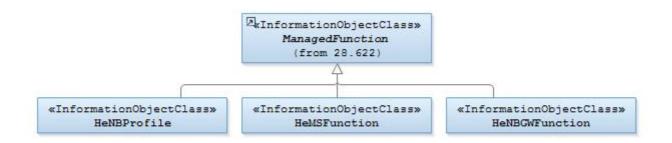


Figure 4.2.2-1: HeNS NRM Inheritance Hierarchy

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	-	1	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	0	M		-	М

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

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]
maxNbrHeNBRegister ed	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]
maxPacketCapabilit Y	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(s) 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;	type: see [18] multiplicity: see [18] isOrdered: see [18] isUnique: see [18] defaultValue: see [18] isNullable: see [18]
	of the data set identified by configuration; else not". allowedValues: 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	0	
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	0	
notifyObjectDeletion	0	•
notifyComments	See Alarm IRP (3GPP TS 32.111-2 [12])	

4.5.2 Configuration notifications

None.

Annex A (informative): Change history

	Change history							
Date	te TSG # TSG Doc. CR Rev Subject/Comment Cat Old New							
2012-11					First draft			0.1.0
2012-12	SA#58				Presented for information and approval		0.1.0	1.0.0
2012-12					New version after approval		1.0.0	11.0.0

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