



**Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Home enhanced Node B (HeNB) Subsystem (HeNS)
Network Resource Model (NRM)
Integration Reference Point (IRP);
Solution Set (SS) definitions
(3GPP TS 28.676 version 16.0.0 Release 16)**



Reference

RTS/TSGS-0528676vg00

Keywords

LTE,UMTS

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Important notice

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the prevailing version of an ETSI deliverable is the one made publicly available in PDF format at www.etsi.org/deliver.

Users of the present document should be aware that the document may be subject to revision or change of status.

Information on the current status of this and other ETSI documents is available at

<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

Copyright Notification

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© ETSI 2020.

All rights reserved.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members.

3GPP™ and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.

oneM2M™ logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners.

GSM® and the GSM logo are trademarks registered and owned by the GSM Association.

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

Legal Notice

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

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found under <http://webapp.etsi.org/key/queryform.asp>.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Intellectual Property Rights	2
Legal Notice	2
Modal verbs terminology.....	2
Foreword.....	4
Introduction	4
1 Scope	5
2 References	5
3 Definitions and abbreviations.....	6
3.1 Definitions	6
3.2 Abbreviations	6
4 Solution Set Definitions	7
Annex A (normative): CORBA Solution Set	8
A.0 General	8
A.1 Architectural features	8
A.1.1 Syntax for Distinguished Names	8
A.1.2 Rules for NRM extensions	8
A.2 Mapping	8
A.2.1 General mappings.....	8
A.2.2 Information Object Class (IOC) mapping	8
A.2.2.1 IOC HeNBGWFunction	8
A.2.2.2 IOC HeNBProfile	9
A.2.2.3 IOC HeMSFunction.....	9
A.3 Solution Set definitions	10
A.3.1 IDL definition structure.....	10
A.3.2 IDL specification "HensNetworkResourcesNRMDefs.idl"	11
Annex B (normative): XML Definitions	12
B.0 General	12
B.1 Architectural features	12
B.1.1 Syntax for Distinguished Names	12
B.2 Mapping	12
B.2.1 General mapping	12
B.2.2 Information Object Class (IOC) mapping	12
B.3 Solution Set definitions	13
B.3.1 XML definition structure.....	13
B.3.2 Graphical Representation	13
B.3.3 XML schema "hensNrm.xsd".....	14
Annex C (informative): Change history	16
History	17

Foreword

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

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
 - 1 presented to TSG for information;
 - 2 presented to TSG for approval;
 - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

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; Configuration Management (CM); as identified below:

- 28.674: Telecommunication management; Home enhanced Node B Subsystem (HeNS) Network Resource Model (NRM) Integration Reference Point (IRP); Requirements.
- 28.675: Telecommunication management; Home enhanced Node 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 is part of an Integration Reference Point (IRP) named HeNS Network Resource Model (NRM) IRP, through which an `IRPAgent` can communicate configuration management information to one or several `IRPManagers` concerning HeNS resources. The HeNS 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 Solution Sets for the HeNS NRM IRP.

This Solution Set specification is related to 3GPP TS 28.675 V14.0.X [2].

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 28.675: "Telecommunication management; Home enhanced Node B (HeNB) Subsystem (HeNS) Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)".
- [3] 3GPP TS 32.616: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): Solution Set (SS) definitions".
- [4] 3GPP TS 32.606: "Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP): Solution Set (SS) definitions".
- [5] W3C REC-xml11-20060816: "Extensible Markup Language (XML) 1.1 (Second Edition)".
- [6] Void
- [7] W3C XML Schema Definition Language (XSD) 1.1 Part 1: Structures.
- [8] W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes.
- [9] W3C REC-xml-names-20060816: "Namespaces in XML 1.1 (Second Edition)".
- [10] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".
- [11] 3GPP TS 28.623: "Generic Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) 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].

XML file: See definition of [11].

XML document: See definition of [11].

XML declaration: See definition of [11]

XML element: See definition of [11].

empty XML element: See definition of [11].

XML content (of an XML element): See definition of [11]

XML start-tag: See definition of [11].

XML end-tag: See definition of [11]

XML empty-element tag: See definition of [11].

XML attribute specification: See definition of [11].

DTD: See definition of [11].

XML schema: See definition of [11].

XML namespace: See definition of [11].

XML complex type: See definition of [11].

XML element type: See definition of [11].

3.2 Abbreviations

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

CM	Configuration Management
CORBA	Common Object Request Broker Architecture
DN	Distinguished Name
DTD	Document Type Definition
HeNB	Home enhanced Node B
HeNS	Home enhanced Node B Subsystem
HeNB-GW	Home enhanced Node B Gateway
IS	Information Service
IDL	Interface Definition Language
IRP	Integration Reference Point
MO	Managed Object
MOC	Managed Object Class
NRM	Network Resource Model
OMG	Object Management Group
SS	Solution Set
XML	eXtensible Markup Language

4 Solution Set Definitions

This specification defines the following 3GPP HeNS NRM IRP Solution Set Definitions:

- 3GPP HeNS NRM IRP CORBA SS (Annex A)
- 3GPP HeNS NRM IRP XML Definitions (Annex B)

Annex A (normative): CORBA Solution Set

A.0 General

This annex contains the CORBA Solution Set for the IRP whose semantics is specified in HeNS NRM IRP: Information Service (TS 32.782 [2]).

A.1 Architectural features

The overall architectural feature of HeNS Network Resources IRP is specified in 3GPP TS 29.675 [2]. This clause specifies features that are specific to the CORBA SS.

A.1.1 Syntax for Distinguished Names

See clause A.1.1 of [11].

A.1.2 Rules for NRM extensions

See clause A.1.1 of [11].

A.2 Mapping

A.2.1 General mappings

See clause A.1.1 of [11].

A.2.2 Information Object Class (IOC) mapping

This SS supports reference attributes for relations other than containment relations between objects. Reference attributes are therefore introduced in each MOC where needed.

A.2.2.1 IOC HeNBGWFunction

IS Attributes	SS Attributes	SS Type
id	henbgwFunctionId	string
henbgwId	henbgwId	long
userLabel	userLabel	string
ipConfigInfo	ipConfigInfo	string
maxNbrHeNBRegistered	maxNbrHeNBRegistered	Integer
maxPacketCapability	maxPacketCapability	integer

A.2.2.2 IOC HeNBProfile

IS Attributes	SS Attributes	SS Type
id	henbProfileId	string
userLabel	userLabel	string
Configuration	configuration	string
Criterion	criterion	string

A.2.2.3 IOC HeMSFunction

IS Attributes	SS Attributes	SS Type
userLabel	userLabel	string

A.3 Solution Set definitions

A.3.1 IDL definition structure

Clause A.3.2 defines the MO classes for the HeNS NRM IRP.

A.3.2 IDL specification “HensNetworkResourcesNRMDefs.idl”

```

//File: HensNetworkResourcesNRMDefs.idl
#ifndef _HENSNETWORKRESOURCESNRMDEFS_IDL_
#define _HENSNETWORKRESOURCESNRMDEFS_IDL_
#include "GenericNetworkResourcesNRMDefs.idl"
#pragma prefix "3gppsa5.org"
/**
 * This module defines constants for each MO class name and
 * the attribute names for each defined MO class.
 */
module HensNetworkResourcesNRMDefs
{

    /**
     * Definitions for MO class HeNBGWFunction
     */
    interface HeNBGWFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
    {
        const string CLASS = "HeNBGWFunction";
        // Attribute Names
        //
        const string henbgwFunctionId = "henbgwFunctionId";
        const string henbgwId = "henbgwId";
        const string ipConfigInfo = "ipConfigInfo";
        const string maxNbrHeNBRegistered = "maxNbrHeNBRegistered";
        const string maxPacketCapability = "maxPacketCapability";
    };

    /**
     * Definitions for MO class HeNBProfile
     */
    interface HeNBProfile : GenericNetworkResourcesNRMDefs::ManagedFunction
    {
        const string CLASS= "HeNBProfile";
        // Attribute Names
        //
        const string henbProfileId = "henbProfileId";
        const string configuration = "configuration";
        const string criterion = "criterion";
    };

    /**
     * Definitions for MO class HeMSFunction
     */
    interface HeMSFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
    {
        const string CLASS= "HeMSFunction";
        // Attribute Names
        //
    };
};

#endif // _HENSETWORKRESOURCESNRMDEFS_IDL_

```

Annex B (normative): XML Definitions

B.0 General

This annex contains the XML Definitions for the HeNS NRM IRP as it applies to Itf-N, in accordance with HeNS NRM IRP Information Service (TS 28.765 [2]).

The XML file formats are based on XML [5], XML Schema [7] [8] and XML Namespace [9] standards.

B.1 Architectural features

The overall architectural feature of HeNS Network Resources IRP is specified in 3GPP TS 28.675 [2]. This clause specifies features that are specific to the Schema definitions.

B.1.1 Syntax for Distinguished Names

The syntax of a Distinguished Name is defined in 3GPP TS 32.300 [10].

B.2 Mapping

B.2.1 General mapping

An IOC maps to an XML element of the same name as the IOC's name in the IS. An IOC attribute maps to a sub-element of the corresponding IOC's XML element, and the name of this sub-element is the same as the attribute's name in the IS.

B.2.2 Information Object Class (IOC) mapping

The mapping is not present in the current version of this specification.

B.3 Solution Set definitions

B.3.1 XML definition structure

Annex B.3.3 of the present document defines the NRM-specific XML schema `hensNrm.xsd` for the HeNS Network Resources IRP NRM defined in 3GPP TS 28.675 [2].

XML schema `hensNrm.xsd` explicitly declares NRM-specific XML element types for the related NRM.

The definition of those NRM-specific XML element types complies with the generic mapping rules defined in 3GPP TS 32.616 [3].

B.3.2 Graphical Representation

The graphical representation is not present in the current version of this specification.

B.3.3 XML schema "hensNrm.xsd"

```

<?xml version="1.1" encoding="UTF-8"?>

<!--
3GPP TS 28.676 HeNS Network Resources IRP
Bulk CM Configuration data file NRM-specific XML schema
hensNrm.xsd
-->

<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/archive/28_series/28.676#hensNrm"
  elementFormDefault="qualified"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:xn=
"http://www.3gpp.org/ftp/specs/archive/28_series/28.623#genericNrm"
  xmlns:un=
"http://www.3gpp.org/ftp/specs/archive/28_series/28.676#hensNrm"
  xmlns:gn=
"http://www.3gpp.org/ftp/specs/archive/28_series/28.656#geranNrm"
  xmlns:sm=
"http://www.3gpp.org/ftp/specs/archive/28_series/28.626#stateManagementIRP"
  xmlns:epc=
"http://www.3gpp.org/ftp/specs/archive/28_series/28.709#epcNrm"
>

  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/28_series/28.656#genericNrm"
  />
  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/28_series/28.656#geranNrm"
  />
  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/28_series/28.709#epcNrm"
  />
  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/28_series/28.626#stateManagementIRP"
  />

  <!-- HeNS network Resources IRP NRM class associated XML elements -->

  <element
    name="HeNBGWFunction"
    substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
            <element name="attributes" minOccurs="0">
              <complexType>
                <all>
                  <element name="henbgwId" type="string"/>
                  <element name="userLabel" type="string"/>
                  <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                  <element name="ipConfigInfo" type="string"/>
                  <element name="maxNbrHeNBRegistered" type="integer"/>
                  <element name="maxPacketCapability" type="integer"/>
                </all>
              </complexType>
            </element>
            <choice minOccurs="0" maxOccurs="unbounded">
              <element ref="epc:EP_RP_EPS"/>
              <element ref="xn:VsDataContainer"/>
            </choice>
          </sequence>
        </extension>
      </complexContent>
    </complexType>
  </element>

  <element name="HeNBProfile">

```

```
<complexType>
  <complexContent>
    <extension base="xn:NrmClass">
      <sequence>
        <element name="attributes" minOccurs="0">
          <complexType>
            <all>
              <element name="userLabel" type="string"/>
              <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
              <element name="configuration" type="string"/>
              <element name="criterion" type="string" minOccurs="0"/>
            </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
    </extension>
  </complexContent>
</complexType>
</element>

<element name="HeMSFunction">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" type="string"/>
                <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:VsDataContainer"/>
            <element ref="un:HeNBProfile"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>
</schema>
```


Annex C (informative): Change history

Change history							
Date	Meeting	TDoc	CR	Rev	Cat	Subject/Comment	New version
06-2014	SA#64	SP-140332	0001	-		Upgrade W3C XML Schema version from 1.0 to 1.1	11.1.0
		SP-140360	0002	-		remove the feature support statements	11.1.0
09-2014	SA#65	SP-140560	0003	-		Update the link from Solution Set to Information Service due to the end of Release 12	12.0.0
01-2016	SA#70					Update to Rel-13(MCC)	13.0.0
2016-06	SA#72	SP-160407	0004	-	F	Update the link from IRP Solution Set to IRP Information Service	13.1.0
2017-03	SA#75	-	-	-		Promotion to Release 14 without technical change	14.0.0
2017-06	SA#76	SP-170514	0005	-	F	Update link from IRP SS to IS	14.1.0
2017-06	SA#76	SP-170510	0006	1	B	Update the XML Schema definitions to align with IS to support Configuration Management for mobile networks that include virtualized network functions	14.1.0
2018-06	-	-	-	-	-	Update to Rel-15 version (MCC)	15.0.0
2020-07	-	-	-	-	-	Update to Rel-16 version (MCC)	16.0.0

History

Document history		
V16.0.0	August 2020	Publication