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Solution Set (SS) definitions
(3GPP TS 28.706 version 11.2.0 Release 11)



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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:

28.704: IP Multimedia Subsystem (IMS) Network Resource Model (NRM) Integration Reference Point (IRP); Requirements

28.705: IP Multimedia Subsystem (IMS) Network Resource Model (NRM) Integration Reference Point (IRP); Information Service (IS)

28.706: IP Multimedia Subsystem (IMS) Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions

1 Scope

The present document specifies the Solution Sets for the IMS NRM IRP.

The Solution Set definition is related to 3GPP TS 28.705 V11.0.X [3].

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.
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- [1] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements". [2] 3GPP TS 32.102: "Telecommunication management; Architecture". 3GPP TS 28.705: "Telecommunication management; IP Multimedia Subsystem (IMS) Network [3] Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)". [4] 3GPP TS 32.306: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): Solution Set (SS) definitions". [5] 3GPP TS 28.623: "Telecommunication management; Generic Network Resource Model (NRM) Integration Reference Point (IRP); Solution Set (SS) definitions". 3GPP TS 32.300 "Telecommunication management; Configuration Management (CM); Name [6] convention for Managed Objects". W3C REC-xml-names-20060816: "Namespaces in XML 1.1 (Second Edition)". [7] [8] 3GPP TS 32.612: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP); Information Service (IS)". [9] 3GPP TS 32.616: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP); Solution Set (SS) definitions". [10] W3C REC-xml11-20060816: "Extensible Markup Language (XML) 1.1 (Second Edition)".

3 Definitions and abbreviations

3.1 Definitions

Void

[11]

[12]

[13]

For terms and definitions please refer to TS 32.101 [1], TS 32.102 [2] and TS 28.705 [3].

For the purposes of the present document, the following XML terms and definitions apply:

W3C XML Schema Definition Language (XSD) 1.1 Part 1: Structures.

W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes.

XML file: See definition of [5].

XML document: See definition of [5].

XML declaration: See definition of [5].

XML element: See definition of [5].

empty XML element: See definition of [5].

XML content (of an XML element): See definition of [5].

XML start-tag: See definition of [5].

XML end-tag: See definition of [5].

XML empty-element tag: See definition of [5].

XML attribute specification: See definition of [5].

DTD: See definition of [5].

XML schema: See definition of [5].

XML namespace: See definition of [5].

XML complex type: See definition of [5].

XML element type: See definition of [5].

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

EDGE Enhanced Data for GSM Evolution
GERAN GSM/EDGE Radio Access Network
GSM Global System for Mobile communication
IDL Interface Definition Language (OMG)

IMS IP Multimedia Subsystem IOC Information Object Class IRP Integration Reference Point

IS Information Service
MGW Media GateWay
MO Managed Object
MOC Managed Object Class
NRM Network Resource Model
OMG Object Management Group

SS Solution Set

UMTS Universal Mobile Telecommunications System
UTRAN Universal Terrestrial Radio Access Network

XML eXtensible Markup Language

4 Solution Set definitions

This specification defines the following 3GPP IMS NRM IRP Solution Set definitions:

- 3GPP IMS NRM IRP CORBA SS (Annex A)

- 3GPP IMS 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 IMS NRM IRP: Information Service (TS 28.705 [3]).

A.1 Architectural Features

A.1.0 General

The overall architectural feature of IMS NRM IRP is specified in 3GPP TS 28.705[3].

This clause specifies features that are specific to the CORBA SS.

A.1.1 Syntax for Distinguished Names

See clause A.1.1 of [5].

A.1.2 Rules for NRM extensions

See clause A.1.2 of [5].

A.1.3 Notifications

Notifications are sent according to the Notification IRP: CORBA SS (see 3GPP TS 32.306 [4]).

A.2 Mapping

A.2.1 General mappings

See clause A.2.1 of [5].

A.2.2 Information Object Class (IOC) mapping

A.2.2.1 IOC ASFunction

Mapping from NRM IOC ASFunction attributes to SS equivalent MOC ASFunction

Attributes of IOC ASFunction in TS 28.705 [3]	SS Attributes	SS Type	Qualifier
id	asFunctionId	string	Read-Only, M
linkList	linkList	GenericNetworkResourcesIRPSystem::Attrib uteTypes::LinkListSet	Read-Only, O

A.2.2.2 IOC BGCFFunction

Mapping from NRM IOC BGCFFunction attributes to SS equivalent MOC BGCFFunction

Attributes of IOC BGCFFunction in TS 28.705 [3]	SS Attributes	SS Type	Qualifier
id	bgcfFunctionId	string	Read-Only, M
linkList	linkList	GenericNetworkResourcesIRPSystem::Attrib uteTypes::LinkListSet	Read-Only, O

A.2.2.3 IOC CSCFFunction

Mapping from NRM IOC CSCFFunction attributes to SS equivalent MOC CSCFFunction

Attributes of IOC CSCFFunction in TS 28.705 [3]	SS Attributes	SS Type	Qualifier
id	cscfFunctionId	string	Read-Only, M
linkList	linkList	GenericNetworkResourcesIRPSystem::Attrib uteTypes::LinkListSet	Read-Only, O

A.2.2.4 IOC HSSFunction

Mapping from NRM IOC HSSFunction attributes to SS equivalent MOC HSSFunction

Attributes of IOC HSSFunction in TS 28.705 [3]	SS Attributes	SS Type	Qualifier
id	hssFunctionId	string	Read-Only, M
linkList	linkList	GenericNetworkResourcesIRPSystem::Attrib uteTypes::LinkListSet	Read-Only, O

A.2.2.5 IOC IMSMGWFunction

Mapping from NRM IOC IMSMGWFunction attributes to SS equivalent MOC IMSMGWFunction attributes

Attributes of IOC IMSMGWFunction in TS 28.705 [3]	SS Attributes	SS Type	Qualifier
id	imsMgwFunctionI	string	Read-Only, M
	d		
linkList	linkList	GenericNetworkResourcesIRPSystem::Attrib uteTypes::LinkListSet	Read-Only, O

A.2.2.6 IOC MGCFFunction

Mapping from NRM IOC MGCFFunction attributes to SS equivalent MOC MGCFFunction

Attributes of IOC SS Attributes MGCFFunction in TS 28.705 [3]		SS Type	Qualifier
id	mgcfFunctionId	string	Read-Only, M
linkList	linkList	GenericNetworkResourcesIRPSystem::Attrib uteTypes::LinkListSet	Read-Only, O

A.2.2.7 IOC MRFCFunction

Mapping from NRM IOC MRFCFunction attributes to SS equivalent MOC MRFCFunction

Attributes of IOC MRFCFunction in TS 28.705 [3]	SS Attributes	SS Type	Qualifier
id	mrfcFunctionId	string	Read-Only, M
linkList	linkList	GenericNetworkResourcesIRPSystem::Attrib uteTypes::LinkListSet	Read-Only, O

A.2.2.8 IOC MRFPFunction

Mapping from NRM IOC MRFPFunction attributes to SS equivalent MOC MRFPFunction

Attributes of IOC MRFPFunction in TS 28.705 [3]	SS Attributes	SS Type	Qualifier
id	mrfpFunctionI d	string	Read-Only, M
linkList	linkList	GenericNetworkResourcesIRPSystem::Attrib uteTypes::LinkListSet	Read-Only, O

A.2.2.9 IOC SLFFunction

Mapping from NRM IOC SLFFunction attributes to SS equivalent MOC SLFFunction

Attributes of IOC SLFFunction in TS 28.705 [3]	SS Attributes	SS Type	Qualifier
id	slfFunctionId	string	Read-Only, M
linkList	linkList	GenericNetworkResourcesIRPSystem::Attrib uteTypes::LinkListSet	Read-Only, O

A.2.2.10 IOC Link CAMELIMSSFAS HSS

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.11 IOC Link_AS_ICSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.12 IOC Link_AS_SCSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.13 IOC Link AS SLF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.14 IOC Link BGCF BGCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.15 IOC Link BGCF MGCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.16 IOC Link_BGCF_SCSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.17 IOC Link HSS ICSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.18 IOC Link ICSCF SCSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.19 IOC Link_ICSCF_MGCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.20 IOC Link_ICSCF_PCSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.21 IOC Link PCSCF SCSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.22 IOC Link_HSS_SCSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.23 IOC Link ICSCF SLF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.24 IOC Link_IMSMGW_MGCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.25 IOC Link_MGCF_SCSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.26 IOC Link MRFC MRFP

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.27 IOC Link_MRFC_SCSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.28 IOC Link_SCSCF_SCSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.29 IOC Link SCSCF SLF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.30 IOC Link HSS SIPAS

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.31 IOC Link_HSS_OSASCSAS

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.32 IOC Link PCSCF ECSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.33 IOC Link_BGCF_ECSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5].

A.2.2.34 IOC Link_MGCF_ECSCF

All attributes are inherited from Link. See mapping of attributes for Link IOC in 3GPP TS 28.623 [5]. document may not be subclassed or extended. New interfaces may be defined with vendor-specific methods.

A.3 Solution Set definitions

A.3.1 IDL definition structure

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

A.3.2 IDL specification "IMSNRMDefs.idl"

```
// File: IMSNRMDefs.idl
#ifndef _IMSNRMDEFS_IDL_
#define _IMSNRMDEFS_IDL_
#include "GenericNetworkResourcesNRMDefs.idl"
#pragma prefix "3gppsa5.org"
\mbox{\ensuremath{^{\star}}} This module defines constants for each MO class name and
* the attribute names for each defined MO class.
module IMSNRMDefs
       * Definitions for MO class ASFunction
      interface ASFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
         const string CLASS = "ASFunction";
         // Attribute Names
         const string asFunctionId = "asFunctionId";
         const string linkList = "linkList";
      };
       * Definitions for MO class SIPASFunction
      interface SIPASFunction : ASFunction
         const string CLASS = "SIPASFunction";
         // All Attributes inherited from ASFunction
      };
       {}^{\star}{}^{\phantom{\dagger}} Definitions for MO class OSASCSASFunction
      interface OSASCSASFunction : ASFunction
         const string CLASS = "OSASCSASFunction";
         // All Attributes inherited from ASFunction
      };
       * Definitions for MO class CAMELIMSSFASFunction
       * /
      interface CAMELIMSSFASFunction : ASFunction
         const string CLASS = "CAMELIMSSFASFunction";
         // All Attributes inherited from ASFunction
      };
       * Definitions for MO class BGCFFunction
      interface BGCFFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
         const string CLASS = "BGCFFunction";
         // Attribute Names
         const string bgcfFunctionId = "bgcfFunctionId";
         const string linkList = "linkList";
      };
       ^{\star} Definitions for MO class CSCFFunction
      interface CSCFFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
         const string CLASS = "CSCFFunction";
         // Attribute Names
         const string cscfFunctionId = "cscfFunctionId";
         const string linkList = "linkList";
```

```
};
* Definitions for MO class ICSCFFunction
interface ICSCFFunction : CSCFFunction
  const string CLASS = "ICSCFFunction";
   // All Attributes inherited from CSCFFunction
};
   Definitions for MO class IMSMGWFunction
* /
interface IMSMGWFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
{
   const string CLASS = "IMSMGWFunction";
   // Attribute Names
  const string imsMgwFunctionId = "imsMgwFunctionId";
  const string linkList = "linkList";
};
* Definitions for MO class MGCFFunction
\verb|interface MGCFF| unction : GenericNetworkResourcesNRMDefs:: ManagedFunction| \\
   const string CLASS = "MGCFFunction";
   // Attribute Names
   const string mgcfFunctionId = "mgcfFunctionId";
  const string linkList = "linkList";
};
* Definitions for MO class MRFCFunction
* /
interface MRFCFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
   const string CLASS = "MRFCFunction";
   // Attribute Names
   //
  const string mrfcFunctionId = "mrfcFunctionId";
   const string linkList = "linkList";
};
{\rm \star} Definitions for MO class MRFPFunction
* /
interface MRFPFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
{
   const string CLASS = "MRFPFunction";
  // Attribute Names
  const string mrfpFunctionId = "mrfpFunctionId";
   const string linkList = "linkList";
};
* Definitions for MO class PCSCFFunction
* /
interface PCSCFFunction : CSCFFunction
   const string CLASS = "PCSCFFunction";
  // All Attributes inherited from CSCFFunction
};
/**
* Definitions for MO class SCSCFFunction
* /
interface SCSCFFunction : CSCFFunction
{
  const string CLASS = "SCSCFFunction";
   // All Attributes inherited from CSCFFunction
  //
};
```

```
* Definitions for MO class SLFFunction
interface SLFFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
   const string CLASS = "SLFFunction";
   // Attribute Names
   const string slfFunctionId = "slfFunctionId";
   const string linkList = "linkList";
};
 * Definitions for MO class ECSCFFunction
 * /
interface ECSCFFunction : CSCFFunction
   const string CLASS = "ECSCFFunction";
   // All Attributes inherited from CSCFFunction
 * Definitions for MO class Link_AS_SCSCF
interface Link_AS_SCSCF : GenericNetworkResourcesNRMDefs::Link
   const string CLASS = "Link_AS_SCSCF";
   // All Attributes inherited from Link
};
 * Definitions for MO class Link_AS_SLF
 * /
interface Link_AS_SLF : GenericNetworkResourcesNRMDefs::Link
   const string CLASS = "Link_AS_SLF";
   // All Attributes inherited from Link
 * Definitions for MO class Link_BGCF_BGCF
interface Link_BGCF_BGCF : GenericNetworkResourcesNRMDefs::Link
   const string CLASS = "Link_BGCF_BGCF";
   // All Attributes inherited from Link
};
 * Definitions for MO class Link_BGCF_MGCF
interface Link_BGCF_MGCF : GenericNetworkResourcesNRMDefs::Link
   const string CLASS = "Link_BGCF_MGCF";
   // All Attributes inherited from Link
};
 * Definitions for MO class Link_BGCF_SCSCF
 * /
interface Link_BGCF_SCSCF : GenericNetworkResourcesNRMDefs::Link
   const string CLASS = "Link_BGCF_SCSCF";
   // All Attributes inherited from Link
};
/**
   Definitions for MO class Link_SCSCF_ICSCF
 * /
interface Link_SCSCF_ICSCF: GenericNetworkResourcesNRMDefs::Link
{
   const string CLASS = "Link_SCSCF_ICSCF";
   // All Attributes inherited from Link
};
 * Definitions for MO class Link_ICSCF_Mgcf
```

```
interface Link_ICSCF_Mgcf: GenericNetworkResourcesNRMDefs::Link
{
   const string CLASS = "Link_ICSCF_Mgcf";
   // All Attributes inherited from Link
* Definitions for MO class Link_ICSCF_PCSCF
 * /
interface Link_ICSCF_PCSCF: GenericNetworkResourcesNRMDefs::Link
   const string CLASS = "Link_ICSCF_PCSCF";
   // All Attributes inherited from Link
   Definitions for MO class Link_PCSCF_SCSCF
 * /
interface Link_PCSCF_SCSCF: GenericNetworkResourcesNRMDefs::Link
   const string CLASS = "Link_PCSCF_SCSCF";
   // All Attributes inherited from Link
};
 * Definitions for MO class Link_ICSCF_SLF
\verb|interface Link_ICSCF_SLF|: GenericNetworkResourcesNRMDefs:: Link|\\
   const string CLASS = "Link_ICSCF_SLF";
   // All Attributes inherited from Link
};
   Definitions for MO class Link_IMSMGW_MGCF
 * /
interface Link_IMSMGW_MGCF : GenericNetworkResourcesNRMDefs::Link
   const string CLASS = "Link_IMSMGW_MGCF";
   // All Attributes inherited from Link
};
   Definitions for MO class Link_MGCF_SCSCF
interface Link_MGCF_SCSCF : GenericNetworkResourcesNRMDefs::Link
{
   const string CLASS = "Link_MGCF_SCSCF";
   // All Attributes inherited from Link
};
   Definitions for MO class Link_MRFC_MRFP
interface Link_MRFC_MRFP : GenericNetworkResourcesNRMDefs::Link
   const string CLASS = "Link_MRFC_MRFP";
   // All Attributes inherited from Link
};
 * Definitions for MO class Link_MRFC_SCSCF
 * /
interface Link_MRFC_SCSCF : GenericNetworkResourcesNRMDefs::Link
   const string CLASS = "Link_MRFC_SCSCF";
   // All Attributes inherited from Link
};
/**
   Definitions for MO class Link_SCSCF_SCSCF
interface Link_SCSCF_SCSCF : GenericNetworkResourcesNRMDefs::Link
{
   const string CLASS = "Link_SCSCF_SCSCF";
   // All Attributes inherited from Link
   Definitions for MO class Link_SCSCF_SLF
```

```
* /
interface Link_SCSCF_SLF : GenericNetworkResourcesNRMDefs::Link
  const string CLASS = "Link_SCSCF_SLF";
  // All Attributes inherited from Link
  Definitions for MO class HSSFunction
interface HSSFunction : GenericNetworkResourcesNRMDefs::ManagedFunction
  const string CLASS = "HSSFunction";
  // Attribute Names
  const string hssFunctionId = "hssFunctionId";
  const string linkList = "linkList";
  Definitions for MO class Link_HSS_SCSCF
* /
interface Link_HSS_SCSCF : GenericNetworkResourcesNRMDefs::Link
  const string CLASS = "Link_HSS_SCSCF";
  // All Attributes inherited from Link
};
  Definitions for MO class Link_HSS_ICSCF
interface Link_HSS_ICSCF : GenericNetworkResourcesNRMDefs::Link
  const string CLASS = "Link_HSS_ICSCF";
  // All Attributes inherited from Link
};
* Definitions for MO class Link_HSS_SIPAS
interface Link_HSS_SIPAS : GenericNetworkResourcesNRMDefs::Link
  const string CLASS = "Link_HSS_SIPAS";
  // All Attributes inherited from Link
};
 * Definitions for MO class Link_HSS_OSASCSAS
interface Link_HSS_OSASCSAS : GenericNetworkResourcesNRMDefs::Link
{
  const string CLASS = "Link_HSS_OSASCSAS";
  // All Attributes inherited from Link
};
* Definitions for MO class Link_CAMELIMSSFAS_HSS
interface Link_CAMELIMSSFAS_HSS : GenericNetworkResourcesNRMDefs::Link
  const string CLASS = "Link_CAMELIMSSFAS_HSS";
  // All Attributes inherited from Link
};
  Definitions for MO class Link_AS_ICSCF
interface Link_AS_ICSCF : GenericNetworkResourcesNRMDefs::Link
  const string CLASS = "Link_AS_ICSCF";
  // All Attributes inherited from Link
};
   Definitions for MO class Link_PCSCF_ECSCF
```

```
interface Link_PCSCF_ECSCF : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_PCSCF_ECSCF";

    // All Attributes inherited from Link
};

/**

* Definitions for MO class Link_BGCF_ECSCF

*/
interface Link_BGCF_ECSCF : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_BGCF_ECSCF";

    // All Attributes inherited from Link
};

/**

* Definitions for MO class Link_MGCF_ECSCF

*/
interface Link_MGCF_ECSCF : GenericNetworkResourcesNRMDefs::Link
{
    const string CLASS = "Link_MGCF_ECSCF";

    // All Attributes inherited from Link
};

#endif // _IMSNRMDEFS_IDL_
```

Annex B (normative): XML definitions

This annex provides the NRM-specific part related to the IMS NRM IRP [3] of the XML file format definition for the Bulk Configuration Management IRP IS [8].

The main part of this XML file format definition is provided by 3GPP TS 32.616 [9].

The XML file formats are based on XML [10], XML Schema [12] [13] and XML Namespace [7] standards.

B.1 Architectural features

The overall architectural feature of IMS NRM IRP is specified in 3GPP TS 28.705 [3].

This clause specifies features that are specific to the XML Schema definitions.

B.1.1 Syntax for Distinguished Names

The syntax of a Distinguished Name is defined in 3GPP TS 32.300 [6].

B.2 Mapping

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

B.3 Solution Set definitions

B.3.1 XML definition structure

The overall description of the file format of configuration data XML files is provided by 3GPP TS 32.616 [9].

B.3.2 of the present document defines the NRM-specific XML schema imsNrm.xsd for the IMS NRM IRP IS defined in 3GPP TS 28.705 [3].

XML schema imsNrm.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 [9].

B.3.2 XML Schema "imsNrm.xsd"

```
<?xml version="1.1" encoding="UTF-8"?>
<!--
 3GPP TS 28.706 IMS NRM IRP
 Bulk CM Configuration data file NRM-specific XML schema
<schema
 targetNamespace="http://www.3gpp.org/ftp/specs/archive/28_series/28.706#imsNrm"
 elementFormDefault="qualified"
 attributeFormDefault="unqualified"
 xmlns="http://www.w3.org/2001/XMLSchema"
 xmlns:xn="http://www.3gpp.org/ftp/specs/archive/28_series/28.623#genericNrm"
 xmlns:im="http://www.3gpp.org/ftp/specs/archive/28_series/28.706#imsNrm"
 <import namespace="http://www.3gpp.org/ftp/specs/archive/28_series/28.623#genericNrm"/>
 <!-- TMS NRM TRP TS class associated XMI elements -->
   name="ASFunction"
   substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
     <complexContent>
       <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
               <element name="userLabel" type="string"/>
               <element name="linkList" type="xn:linkListType" minOccurs="0"/>
             </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="im:ASFunctionOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
       </extension>
     </complexContent>
   </complexType>
 </element>
 <element
   name="CAMELIMSSFASFunction"
   substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
   <complexType>
     <complexContent>
       <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
             <all>
               <element name="userLabel" type="string"/>
<element name="linkList" type="xn:linkListType" minOccurs="0"/>
             </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="im:ASFunctionOptionallyContainedNrmClass"/>
            <element ref="im:CAMELIMSSFASFunctionOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
       </extension>
     </complexContent>
   </complexType>
  </element>
```

```
<element
 name="OSASCSASFunction"
 \verb|substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"|
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
      <sequence>
        <element name="attributes" minOccurs="0">
          <complexType>
            <all>
             <element name="userLabel" type="string"/>
             <element name="linkList" type="xn:linkListType" minOccurs="0"/>
            </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:ASFunctionOptionallyContainedNrmClass"/>
          <element ref="im:OSASCSASFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
 </complexType>
</element>
<element
 name="STPASFunction"
 \verb|substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"|
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
      <sequence>
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          <complexType>
           <all>
             <element name="userLabel" type="string"/>
              <element name="linkList" type="xn:linkListType" minOccurs="0"/>
            </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:ASFunctionOptionallyContainedNrmClass"/>
          <element ref="im:SIPASFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
 </complexType>
</element>
<element
 name="BGCFFunction"
 \verb|substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"|
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
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          <complexType>
            <all>
             <element name="userLabel" type="string"/>
             <element name="linkList" type="xn:linkListType" minOccurs="0"/>
           </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:BGCFFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
```

```
</complexType>
</element>
<element
 name="ICSCFFunction"
 substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
      <sequence>
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          <complexType>
            <all>
             <element name="userLabel" type="string"/>
             <element name="linkList" type="xn:linkListType" minOccurs="0"/>
           </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:ICSCFFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
 </complexType>
</element>
<element
 name="IMSMGWFunction"
 substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
      <sequence>
        <element name="attributes" minOccurs="0">
          <complexType>
            <all>
             <element name="userLabel" type="string"/>
             <element name="linkList" type="xn:linkListType" minOccurs="0"/>
           </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:IMSMGWFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
 </complexType>
</element>
<element
 name="MGCFFunction"
 \verb|substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"|
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
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          <complexType>
            <all>
             <element name="userLabel" type="string"/>
             <element name="linkList" type="xn:linkListType" minOccurs="0"/>
           </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:MGCFFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
```

```
</complexType>
</element>
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 substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
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            <all>
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             <element name="linkList" type="xn:linkListType" minOccurs="0"/>
           </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:MRFCFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
 </complexType>
</element>
<element
 name="MRFPFunction"
 substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
      <sequence>
        <element name="attributes" minOccurs="0">
          <complexType>
            <all>
             <element name="userLabel" type="string"/>
             <element name="linkList" type="xn:linkListType" minOccurs="0"/>
           </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:MRFPFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
 </complexType>
</element>
<element
 name="PCSCFFunction"
 \verb|substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"|
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
      <sequence>
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          <complexType>
            <all>
             <element name="userLabel" type="string"/>
             <element name="linkList" type="xn:linkListType" minOccurs="0"/>
           </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:PCSCFFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
```

```
</complexType>
</element>
<element
 name="SCSCFFunction"
 substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
      <sequence>
        <element name="attributes" minOccurs="0">
          <complexType>
            <all>
             <element name="userLabel" type="string"/>
             <element name="linkList" type="xn:linkListType" minOccurs="0"/>
           </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:SCSCFFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
 </complexType>
</element>
<element
 name="ECSCFFunction"
 substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
      <sequence>
        <element name="attributes" minOccurs="0">
          <complexType>
            <all>
             <element name="userLabel" type="string"/>
             <element name="linkList" type="xn:linkListType" minOccurs="0"/>
           </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:ECSCFFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
 </complexType>
</element>
<element
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 \verb|substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"|
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
      <sequence>
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          <complexType>
            <all>
             <element name="userLabel" type="string"/>
             <element name="linkList" type="xn:linkListType" minOccurs="0"/>
           </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:SLFFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
     </extension>
   </complexContent>
```

```
</complexType>
</element>
<element name="Link_AS_SCSCF" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
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          <complexContent>
              <extension base="xn:NrmClass">
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                      <element name="attributes" minOccurs="0">
                          <complexType>
                               <all>
                                   <element name="aEnd" type="xn:dn"/>
                                   <element name="linkType" type="xn:linkType" minOccurs="0"/>
                                   <element name="protocolName" type="string" minOccurs="0"/>
                                   <element name="protocolVersion" type="string" minOccurs="0"/>
                                   <element name="userLabel" type="string"/>
                                   <element name="zEnd" type="xn:dn"/>
                               </all>
                           </complexType>
                      </element>
                      <choice minOccurs="0" maxOccurs="unbounded">
                           <element ref="im:Link_AS_SCSCFOptionallyContainedNrmClass"/>
                           <element ref="xn:VsDataContainer"/>
                      </choice>
                  </sequence>
              </extension>
          </complexContent>
      </complexType>
  </element>
  <element name="Link_AS_SLF" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
      <complexType>
          <complexContent>
              <extension base="xn:NrmClass">
                  <sequence>
                      <element name="attributes" min0ccurs="0">
                          <complexType>
                               <all>
                                   <element name="aEnd" type="xn:dn"/>
                                   <element name="linkType" type="xn:linkType" minOccurs="0"/>
                                   <element name="protocolName" type="string" minOccurs="0"/>
                                   <element name="protocolVersion" type="string" minOccurs="0"/>
                                   <element name="userLabel" type="string"/>
                                   <element name="zEnd" type="xn:dn"/>
                               </all>
                          </complexType>
                      </element>
                      <choice minOccurs="0" maxOccurs="unbounded">
                           <element ref="im:Link_AS_SLFOptionallyContainedNrmClass"/>
                          <element ref="xn:VsDataContainer"/>
                      </choice>
                  </sequence>
              </extension>
          </complexContent>
      </complexType>
  </element>
  <element name="Link_BGCF_BGCF" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
      <complexTvpe>
          <complexContent>
              <extension base="xn:NrmClass">
                  <sequence>
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                          <complexType>
                               <all>
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                                   <element name="linkType" type="xn:linkType" minOccurs="0"/>
                                   <element name="protocolName" type="string" minOccurs="0"/>
                                   <element name="protocolVersion" type="string" minOccurs="0"/>
                                   <element name="userLabel" type="string"/>
                                   <element name="zEnd" type="xn:dn"/>
                               </all>
                           </complexType>
                      </element>
                      <choice minOccurs="0" maxOccurs="unbounded">
                          <element ref="im:Link_BGCF_BGCFOptionallyContainedNrmClass"/>
                           <element ref="xn:VsDataContainer"/>
```

```
</choice>
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              </extension>
          </complexContent>
      </complexType>
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              <extension base="xn:NrmClass">
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                               <all>
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                                   <element name="linkType" type="xn:linkType" minOccurs="0"/>
                                   <element name="protocolName" type="string" minOccurs="0"/>
                                   <element name="protocolVersion" type="string" minOccurs="0"/>
                                   <element name="userLabel" type="string"/>
                                   <element name="zEnd" type="xn:dn"/>
                               </all>
                           </complexType>
                       </element>
                       <choice minOccurs="0" maxOccurs="unbounded">
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                           <element ref="xn:VsDataContainer"/>
                       </choice>
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      </complexType>
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          <complexContent>
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                           <complexType>
                               <all>
                                   <element name="aEnd" type="xn:dn"/>
                                   <element name="linkType" type="xn:linkType" minOccurs="0"/>
                                   <element name="protocolName" type="string" minOccurs="0"/>
                                   <element name="protocolVersion" type="string" minOccurs="0"/>
<element name="userLabel" type="string"/>
                                   <element name="zEnd" type="xn:dn"/>
                               </all>
                           </complexType>
                       </element>
                       <choice minOccurs="0" maxOccurs="unbounded">
                           <element ref="im:Link_BGCF_SCSCFOptionallyContainedNrmClass"/>
                           <element ref="xn:VsDataContainer"/>
                       </choice>
                   </sequence>
              </extension>
          </complexContent>
      </complexType>
  </element>
<element name="Link_ICSCF_SCSCF"</pre>
 substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
 <complexType>
   <complexContent>
     <extension base="xn:NrmClass">
      <sequence>
        <element name="attributes" minOccurs="0">
            <complexType>
             <all>
              <element name="aEnd" type="xn:dn"/>
              <element name="linkType" type="xn:linkType" minOccurs="0"/>
              <element name="protocolName" type="string" minOccurs="0"/>
              <element name="protocolVersion" type="string" minOccurs="0"/>
              <element name="userLabel" type="string"/>
              <element name="zEnd" type="xn:dn"/>
            </all>
```

```
</complexType>
             </element>
          <choice minOccurs="0" maxOccurs="unbounded">
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            <element ref="xn:VsDataContainer"/>
          </choice>
         </sequence>
       </extension>
     </complexContent>
   </complexType>
 </element>
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   \verb|substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"|
   <complexType>
     <complexContent>
       <extension base="xn:NrmClass">
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                 <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
<element name="userLabel" type="string"/>
                <element name="zEnd" type="xn:dn"/>
               </all>
            </complexType>
            </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="im:Link_ICSCF_MGCFOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
       </extension>
     </complexContent>
   </complexType>
 </element>
 <element name="Link_ICSCF_PCSCF"</pre>
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
   <complexType>
     <complexContent>
       <extension base="xn:NrmClass">
        <sequence>
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               <complexType>
               <all>
                <element name="aEnd" type="xn:dn"/>
                <element name="linkType" type="xn:linkType" minOccurs="0"/>
                <element name="protocolName" type="string" minOccurs="0"/>
                <element name="protocolVersion" type="string" minOccurs="0"/>
<element name="userLabel" type="string"/>
                <element name="zEnd" type="xn:dn"/>
               </all>
            </complexType>
             </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="im:Link_ICSCF_PCSCFOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
       </extension>
     </complexContent>
   </complexType>
 </element>
<element name="Link_PCSCF_SCSCF"</pre>
  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
   <complexType>
     <complexContent>
       <extension base="xn:NrmClass">
          <element name="attributes" minOccurs="0">
               <complexType>
```

```
<all>
              <element name="aEnd" type="xn:dn"/>
              <element name="linkType" type="xn:linkType" minOccurs="0"/>
              <element name="protocolName" type="string" minOccurs="0"/>
              <element name="protocolVersion" type="string" minOccurs="0"/>
<element name="userLabel" type="string"/>
              <element name="zEnd" type="xn:dn"/>
            </all>
          </complexType>
          </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:Link_PCSCF_SCSCFOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
    </extension>
   </complexContent>
 </complexType>
</element>
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      <complexType>
          <complexContent>
              <extension base="xn:NrmClass">
                   <sequence>
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                           <complexType>
                               <all>
                                   <element name="aEnd" type="xn:dn"/>
                                   <element name="linkType" type="xn:linkType" minOccurs="0"/>
                                   <element name="protocolName" type="string" minOccurs="0"/>
                                   <element name="protocolVersion" type="string" minOccurs="0"/>
                                   <element name="userLabel" type="string"/>
                                   <element name="zEnd" type="xn:dn"/>
                               </all>
                           </complexType>
                       </element>
                       <choice minOccurs="0" maxOccurs="unbounded">
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                           <element ref="xn:VsDataContainer"/>
                      </choice>
                   </sequence>
              </extension>
          </complexContent>
      </complexType>
  </element>
  <element name="Link_IMSMGW_MGCF" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
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          <complexContent>
              <extension base="xn:NrmClass">
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                           <complexType>
                                   <element name="aEnd" type="xn:dn"/>
                                   <element name="linkType" type="xn:linkType" minOccurs="0"/>
                                   <element name="protocolName" type="string" minOccurs="0"/>
                                   <element name="protocolVersion" type="string" minOccurs="0"/>
                                   <element name="userLabel" type="string"/>
                                   <element name="zEnd" type="xn:dn"/>
                               </all>
                           </complexType>
                      </element>
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Annex C (informative): Change history

	Change history						
Date	Date TSG # TSG Doc. CR Rev Subject/Comment Old						New
2014-06	SA#64	SP-140332	001	-	Upgrade W3C XML Schema version from 1.0 to 1.1	11.0.0	11.1.0
		SP-140360	002	-	remove the feature support statements		
2016-03	SA#71	SP-160031	004	1	Make the XML schema well formed	11.1.0	11.2.0

History

Document history		
V11.0.0	January 2013	Publication
V11.1.0	July 2014	Publication
V11.2.0	April 2016	Publication