

# ETSI TS 128 706 V18.0.0 (2024-05)



**Universal Mobile Telecommunications System (UMTS);  
LTE;  
Telecommunication management;  
IP Multimedia Subsystem (IMS)  
Network Resource Model (NRM)  
Integration Reference Point (IRP);  
Solution Set (SS) definitions  
(3GPP TS 28.706 version 18.0.0 Release 18)**



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**Reference**

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**Keywords**

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# Introduction

The present document is part of a TS-family covering the 3<sup>rd</sup> Generation Partnership Project Technical Specification Group Services and System Aspects, Telecommunication management; as identified below:

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 V14.0.X [3].

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TS 32.101: "Telecommunication management; Principles and high level requirements".
- [2] 3GPP TS 32.102: "Telecommunication management; Architecture".
- [3] 3GPP TS 28.705: "Telecommunication management; IP Multimedia Subsystem (IMS) Network 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".
- [6] 3GPP TS 32.300 "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".
- [7] W3C REC-xml-names-20060816: "Namespaces in XML 1.1 (Second Edition)".
- [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)".
- [11] Void
- [12] W3C XML Schema Definition Language (XSD) 1.1 Part 1: Structures.
- [13] W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes.

---

## 3 Definitions and abbreviations

### 3.1 Definitions

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:

**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)



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# 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

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 <code>asFunction</code> in TS 28.705 [3] | SS Attributes             | SS Type  | Qualifier    |
|--|---------------------------|--|--------------|
| <code>id</code>  | <code>asFunctionId</code> | <code>string</code>  | Read-Only, M |
| <code>linkList</code>                                      | <code>linkList</code>     | <code>GenericNetworkResourcesIRPSystem::AttributeTypes::LinkListSet</code> | 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::AttributeTypes::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::AttributeTypes::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::AttributeTypes::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  | imsMgwFunctionId | string  | Read-Only, M |
| linkList  | linkList         | GenericNetworkResourcesIRPSystem::AttributeTypes::LinkListSet | Read-Only, O |

### A.2.2.6 IOC MGCFFunction

#### Mapping from NRM IOC MGCFFunction attributes to SS equivalent MOC MGCFFunction

| Attributes of IOC MGCFFunction in TS 28.705 [3] | SS Attributes  | SS Type   | Qualifier    |
|---|----------------|---|--------------|
| id  | mgcfFunctionId | string  | Read-Only, M |
| linkList  | linkList       | GenericNetworkResourcesIRPSystem::AttributeTypes::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::AttributeTypes::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  | mrfpFunctionId | string  | Read-Only, M |
| linkList  | linkList       | GenericNetworkResourcesIRPSystem::AttributeTypes::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::AttributeTypes::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"

/**
 * 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
    };
    /**
     * 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";
    };
    /**
     * 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
 */
interface MGCFFunction : 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";
};
/**
 * 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
 */
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

### B.0 General

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

#### B.1.0 Introduction

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
  imsNrm.xsd
-->

<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"/>

  <!--IMS NRM IRP IS class associated XML elements -->

  <element
    name="ASFunction"
    substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
    <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="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="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                  <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>

```

```

    </complexType>
  </element>

  <element
    name="OSASCSASFunction"
    substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
    <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="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="SIPASFunction"
    substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
    <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="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"
    substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
    <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="linkList" type="xn:linkListType" minOccurs="0"/>
                </all>
              </complexType>
            </element>
            <choice minOccurs="0" maxOccurs="unbounded">
              <element ref="im:BGCFFunctionOptionallyContainedNrmClass"/>
            </choice>
          </sequence>
        </extension>
      </complexContent>
    </complexType>
  </element>

```

```

        <element ref="xn:VsDataContainer" />
      </choice>
    </sequence>
  </extension>
</complexContent>
</complexType>
</element>

<element
  name="ICSCFFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
>
  <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="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="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <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"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
>
  <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="linkList" type="xn:linkListType" minOccurs="0"/>
              </all>
            </complexType>
          </element>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

```

```

        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="im:MGCFFunctionOptionallyContainedNrmClass"/>
          <element ref="xn:VsDataContainer"/>
        </choice>
      </sequence>
    </extension>
  </complexContent>
</complexType>
</element>

<element
  name="MRFCFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
>
  <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="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="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <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="PCSCFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
>
  <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="im:PCSCFunctionOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

```



```

        <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="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <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="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
                <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
  name="SLFFunction"
  substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
>
  <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="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">
  <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">
            <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" 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_SLFOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="Link_BGCF_BGCF" 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">
        <element ref="im:Link_BGCF_BGCFOptionallyContainedNrmClass"/>
        <element ref="xn:VsDataContainer"/>
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    </sequence>
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</complexContent>
</complexType>
</element>

<element name="Link_BGCF_MGCF" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
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                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string"/>
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                <element name="protocolVersion" type="string" minOccurs="0"/>
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<element name="Link_ICSCF_MGCF"
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>
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            <element ref="xn:VsDataContainer"/>
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  </complexType>
</element>
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  substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
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    <complexContent>
      <extension base="xn:NrmClass">
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    </extension>
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                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string"/>
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            <element ref="xn:VsDataContainer"/>
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                <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"/>
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            </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>
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            <complexType>
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                <element name="linkType" type="xn:linkType" minOccurs="0"/>
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                <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="im:Link_IMSMGW_MGCFOptionallyContainedNrmClass"/>
        <element ref="xn:VsDataContainer"/>
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    </sequence>
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</complexType>
</element>

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                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string"/>
                <element name="zEnd" type="xn:dn"/>
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            </complexType>
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          <choice minOccurs="0" maxOccurs="unbounded">
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            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
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                <element name="protocolVersion" type="string" minOccurs="0"/>
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          <choice minOccurs="0" maxOccurs="unbounded">
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                <element name="protocolVersion" type="string" minOccurs="0"/>
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        </sequence>
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    </complexContent>
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</element>

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        </complexType>
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                <element name="protocolVersion" type="string" minOccurs="0"/>
                <element name="userLabel" type="string"/>
                <element name="zEnd" type="xn:dn"/>
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          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
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        </sequence>
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</element>

<element name="Link_SCSCF_SLF" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
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            <complexType>
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                <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>
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name="HSSFunction"
substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
>
  <complexType>
    <complexContent>
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        <element name="vnfParametersList" type="xn:vnfParametersListType" minOccurs="0"/>
        <element name="linkList" type="xn:linkListType" minOccurs="0"/>
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    <element ref="xn:VsDataContainer"/>
</choice>
</sequence>
</extension>
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</complexType>
</element>

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                            <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_HSS_SCSCFOptionallyContainedNrmClass"/>
                        <element ref="xn:VsDataContainer"/>
                    </choice>
                </sequence>
            </extension>
        </complexContent>
    </complexType>
</element>

<element name="Link_HSS_ICSCF" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
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        <complexContent>
            <extension base="xn:NrmClass">
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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_HSS_ICSCFOptionallyContainedNrmClass"/>
                        <element ref="xn:VsDataContainer"/>
                    </choice>
                </sequence>
            </extension>
        </complexContent>
    </complexType>
</element>

<element name="Link_HSS_SIPAS" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
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            <extension base="xn:NrmClass">
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                            <all>
                                <element name="aEnd" type="xn:dn"/>
                            </all>
                        </complexType>
                    </element>
                </sequence>
            </extension>
        </complexContent>
    </complexType>
</element>

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        <element name="linkType" type="xn:linkType" minOccurs="0"/>
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        <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_HSS_OSASCSAS" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
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        <complexContent>
            <extension base="xn:NrmClass">
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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_HSS_OSASCSASOptionallyContainedNrmClass"/>
                        <element ref="xn:VsDataContainer"/>
                    </choice>
                </sequence>
            </extension>
        </complexContent>
    </complexType>
</element>

<element name="Link_CAMELIMSSFAS_HSS"
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>

<element name="Link_AS_ICSCF" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
    <complexType>
        <complexContent>
            <extension base="xn:NrmClass">
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    <element name="attributes" minOccurs="0">
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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">
      <element ref="im:Link_AS_ICSCFOptionallyContainedNrmClass"/>
      <element ref="xn:VsDataContainer"/>
    </choice>
  </sequence>
</extension>
</complexContent>
</complexType>
</element>

<element name="Link_PCSCF_ECSCF"
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">
            <element ref="im:Link_PCSCF_ECSCFOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="Link_BGCF_ECSCF"
substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass"
>
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    <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_ECSCFOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

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</element>

<element name="Link_MGCF_ECSCF"
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  >
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    <complexContent>
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            <complexType>
              <all>
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                <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="ASFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="SIPASFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="OSASCSASFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="CAMELIMSSFASFunctionOptionallyContainedNrmClass" type="xn:NrmClass"
abstract="true"/>
  <element name="BGCFFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="ICSCFFunctionOptionallyContainedNrmClass" type="xn:NrmClass"
abstract="true"/>
  <element name="IMSMGWFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="MGCFFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="MRFCFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="MRFPFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="PCSCFFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="SCSCFFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="SLFFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="ECSCFFunctionOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_AS_SCSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_AS_SLFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_BGCF_BGCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_BGCF_MGCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_BGCF_SCSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_ICSCF_SCSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_ICSCF_MGCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_ICSCF_PCSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_PCSCF_SCSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_ICSCF_SLFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
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  <element name="Link_MGCF_SCSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_MRFC_MRFPOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_MRFC_SCSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_SCSCF_SCSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_SCSCF_SLFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
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  <element name="Link_HSS_SCSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_HSS_ICSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_HSS_SIPASOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_HSS_OSASCSASOptionallyContainedNrmClass" type="xn:NrmClass"
abstract="true"/>
  <element name="Link_CAMELIMSSFAS_HSSOptionallyContainedNrmClass" type="xn:NrmClass"
abstract="true"/>
  <element name="Link_AS_ICSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_PCSCF_ECSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_BGCF_ECSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
  <element name="Link_MGCF_ECSCFOptionallyContainedNrmClass" type="xn:NrmClass" abstract="true"/>
</schema>
```

## Annex C (informative): Change history

| Change history |         |           |      |     |     |   |               |
|----------------|---------|-----------|------|-----|-----|---|---------------|
| Date           | Meeting | TDoc      | CR   | Rev | Cat | Subject/Comment   | New version   |
| 2014-06        | 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        |
| 2014-09        | SA#65   | SP-140560 | 0003 | -   |     | Update the link from Solution Set to Information Service due to the end of Release 12   | 12.0.0        |
| 2016-01        | SA#70   |           |      |     |     | Update to Rel-13 (MCC)  | 13.0.0        |
| 2016-03        | SA#71   | SP-160031 | 0006 | -   |     | Make the XML schema well formed   | 13.1.0        |
| 2016-06        | SA#72   | SP-160407 | 0004 | -   | F   | Update the link from IRP Solution Set to IRP Information Service  | 13.2.0        |
| 2017-03        | SA#75   | -         | -    | -   |     | Promotion to Release 14 without technical change  | 14.0.0        |
| 2017-06        | SA#76   | SP-170514 | 0008 | -   | F   | Update the link from IRP Solution Set to IRP Information Service  | 14.1.0        |
| 2017-06        | SA#76   | SP-170510 | 0009 | -   | 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)  | <b>15.0.0</b> |
| 2020-07        | -       | -         | -    | -   | -   | Update to Rel-16 version (MCC)  | <b>16.0.0</b> |
| 2022-03        | -       | -         | -    | -   | -   | Update to Rel-17 version (MCC)  | <b>17.0.0</b> |
| 2024-04        | -       | -         | -    | -   | -   | Update to Rel-18 version (MCC)  | <b>18.0.0</b> |

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# History

| <b>Document history</b> |          |             |
|-------------------------|----------|-------------|
| V18.0.0                 | May 2024 | Publication |
|                         |          |             |
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|                         |          |             |
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