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Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects;
Telecommunication management;
Inventory Management (IM) Network Resource Model (NRM)
Integration Reference Point (IRP);
Bulk CM eXtensible Markup Language (XML)
file format definition
(Release 9)**

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Foreword

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

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

Version x.y.z

where:

x   the first digit:

1   presented to TSG for information;

2   presented to TSG for approval;

3   or greater indicates TSG approved document under change control.

y   the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z   the third digit is incremented when editorial only changes have been incorporated in the document.

Introduction

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

32.690:   Inventory Management (IM); Requirements

32.691:   Inventory Management (IM) network resources Integration Reference Point (IRP); Requirements

32.692:   Inventory Management (IM) network resources Integration Reference Point (IRP); Network Resource Model (NRM)

32.695:   Inventory Management (IM) network resources Integration Reference Point (IRP); eXtensible Markup Language (XML) file format definition

Inventory Management (IM), in general, provides the operator with the ability to assure correct and effective operation of the 3G network as it evolves. IM actions have the objective to monitor the actual configuration on the Network Elements (NEs) and Network Resources (NRs), and they may be initiated by the operator or by functions in the Operations Systems (OSs) or NEs. The final goal of IM is the establishment of an accurate and timely model of the actual inventory in the NEs or NRs.

The present document covers the Inventory Management (IM) Network Resource Model (NRM) Integration Reference Point (IRP): eXtensible Markup Language (XML) file format definition.

1 Scope

The present document provides the NRM-specific part related to the Inventory Management NRM IRP IS in 3GPP TS 32.692 [1] of the XML file format definition for the Bulk Configuration Management IRP IS in 3GPP TS 32.612 [2].

The main part of this XML file format definition is provided by 3GPP TS 32.615 [3].

Inventory Management XML file formats are based on XML [4], XML Schema [5] [6] [7] and XML Namespace [8] standards.

This File Format Definition specification is related to 3GPP TS 32.692 V9.0.X.

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 32.692: " Telecommunication management; Inventory Management (IM) Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)".

[2]   3GPP TS 32.612: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): Information Service (IS)".

[3]   3GPP TS 32.615: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): eXtensible Markup Language (XML) file format definition".

[4]   W3C REC-xml-20001006: "Extensible Markup Language (XML) 1.0 (Second Edition)".

[5]   W3C REC-xmlschema-0-20010502: "XML Schema Part 0: Primer".

[6]   W3C REC-xmlschema-1-20010502: "XML Schema Part 1: Structures".

[7]   W3C REC-xmlschema-2-20010502: "XML Schema Part 2: Datatypes".

[8]   W3C REC-xml-names-19990114: "Namespaces in XML".

3 Definitions and abbreviations

3.1 Definitions

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

XML file: file containing an XML document

XML document: composed of the succession of an optional XML declaration followed by a root XML element

NOTE: See [4]; in the scope of the present document.

XML declaration: it specifies the version of XML being used

NOTE: See [4].

XML element: has a type, is identified by a name, may have a set of XML attribute specifications and is either composed of the succession of an XML start-tag followed by the XML content of the XML element followed by an XML end-tag, or composed simply of an XML empty-element tag; each XML element may contain other XML elements

NOTE: See [4].

empty XML element: having an empty XML content; an empty XML element still possibly has a set of XML attribute specifications; an empty XML element is either composed of the succession of an XML start-tag directly followed by an XML end-tag, or composed simply of an XML empty-element tag

NOTE: See [4].

XML content (of an XML element): empty if the XML element is simply composed of an XML empty-element tag; otherwise the part, possibly empty, of the XML element between its XML start-tag and its XML end-tag

XML start-tag: the beginning of a non-empty XML element is marked by an XML start-tag containing the name and the set of XML attribute specifications of the XML element.

NOTE: See [4].

XML end-tag: the end of a non-empty XML element is marked by an XML end-tag containing the name of the XML element

NOTE: See [4].

XML empty-element tag: an empty XML element is composed simply of an empty-element tag containing the name and the set of XML attribute specifications of the XML element

NOTE: See [4].

XML attribute specification: has a name and a value

NOTE: See [4].

DTD: defines structure and content constraints to be respected by an XML document to be valid with regard to this DTD

NOTE: See [4].

XML schema: more powerful than a DTD, an XML schema defines structure and content constraints to be respected by an XML document to conform with this XML schema; through the use of XML namespaces several XML schemas can be used together by a single XML document; an XML schema is itself also an XML document that shall conform with the XML schema for XML schemas

NOTE: See [5], [6] and [7].

XML namespace: enables qualifying element and attribute names used in XML documents by associating them with namespaces identified by different XML schemas

NOTE: See [8], in the scope of the present document.

XML complex type: defined in an XML schema; cannot be directly used in an XML document; can be the concrete type or the derivation base type for an XML element type or for another XML complex type; ultimately defines constraints for an XML element on its XML attribute specifications and/or its XML content

NOTE: See [5], [6] and [7].

XML element type: declared by an XML schema; can be directly used in an XML document; as the concrete type of an XML element, directly or indirectly defines constraints on its XML attribute specifications and/or its XML content; can also be the concrete type or the derivation base type for another XML element type

NOTE: See [5], [6] and [7].

3.2 Abbreviations

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

IM	Inventory Management
DTD	Document Type Definition
EDGE	Enhanced Data rates for GSM Evolution
IRP	Integration Reference Point
IS	Information Service
NRM	Network Resource Model
XML	eXtensible Markup Language
XSD	XML Schema Definition

4 Structure and content of inventory data XML files

The overall description of the file format of inventory data XML files is provided by 3GPP TS 32.615 [3].

Annex A (normative) of the present document defines the NRM-specific XML schema `inventoryNrm.xsd` for the Inventory Management NRM IRP IS defined in 3GPP TS 32.692 [1].

XML schema `inventoryNrm.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 32.615 [3].

Annex A (normative):
Inventory data file NRM-specific XML schema
(file name "`inventoryNrm.xsd`")

The following XML schema `inventoryNrm.xsd` is the NRM-specific schema for the Inventory Management NRM IRP IS defined in 3GPP TS 32.692 [1].

```xml
<?xml version="1.0" encoding="UTF-8"?>

<!--
  3GPP TS 32.695 Inventory Management NRM IRP
  Inventory data file NRM-specific XML schema
  inventoryNrm.xsd
-->

<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.695#inventoryNrm"
  elementFormDefault="qualified"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:xn=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.625#genericNrm"
  xmlns:in=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.695#inventoryNrm"
>

  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.625#genericNrm"
  />

  <!-- Inventory Management NRM IRP NRM class associated XML elements -->

  <element
    name="InventoryUnit"
    substitutionGroup="xn:ManagedElementOptionallyContainedNrmClass"
  >
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
            <element
              name="attributes"
              minOccurs="0">
              <complexType>
                <all>
                  <element
                    name="inventoryUnitType"
                    type="string"
                    minOccurs="0"
                  />
                  <element
                    name="vendorUnitFamilyType"
                    type="string"
                    minOccurs="0"
                  />
                  <element
                    name="vendorUnitTypeNumber"
                    type="string"
                    minOccurs="0"
                  />
                  <element
                    name="vendorName"
                    type="string"
                    minOccurs="0"/>
                  <element
                    name="serialNumber"
                    type="string"
                    minOccurs="0"/>
                  <element
                    name="dateOfManufacture"
                    type="date"
```

```
                        minOccurs="0"/>
                      <element
                        name="dateOfLastService"
                        type="date"
                        minOccurs="0"/>
                      <element
                        name="unitPosition"
                        type="string"
                        minOccurs="0"/>
                      <element
                        name="manufacturerData"
                        type="string"
                        minOccurs="0"/>
                      <element
                        name="versionNumber"
                        type="string"
                        minOccurs="0"/>
                    </all>
                  </complexType>
                </element>
                <choice minOccurs="0" maxOccurs="unbounded">
                  <element ref="in:InventoryUnit"/>
                  <element ref="xn:VsDataContainer"/>
                </choice>
              </sequence>
            </extension>
          </complexContent>
        </complexType>
      </element>

</schema>
```

Annex B (informative):
Void

Annex C (informative):
Change history

					Change history			
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Cat**	**Old**	**New**
Sep 2003	SA_21	SP-030427	--	--	Submitted to TSG SA#21 for Information	--	1.0.0	--
Dec 2004	SA_26	SP-040817	--	--	Submitted to SA#26 for Approval	--	2.0.0	6.0.0
Jun 2006	SA_32	SP-060257	0001	--	Correction of InventoryUnit missing VsDataContainer and Version Number - XSD definition	F	6.0.0	6.1.0
Jun 2007	SA_36	--	--	--	Automatic upgrade to Rel-7 (no CR) at freeze of Rel-7. Deleted reference to CMIP SS, discontinued from R7 onwards.	--	6.1.0	7.0.0
Dec 2008	SA_42	--	--	--	Upgrade to Release 8	--	7.0.0	8.0.0
Dec 2009	SA_46	SP-090719	0002	--	Discontinue from Rel-9 onwards the XML schema extraction and storage	F	8.0.0	9.0.0