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Presentation of Technical Specification to TSG SA

Presentation to: TSG SA Meeting #21
Document for presentation: TS 32.695, Version 1.0.0
Inventory Management NRM IRP:
XML File Format Definitions
Presented for: Information

Abstract of document:

Work done against the WID contained in SP-020754 (Work Item ID: OAM-NIM).

This TS defines the XML File Format Definitions for the Inventory Management NRM IRP (32.692).

Purpose of These Specifications:

The purpose of this specification is to provide the XML File Format Definitions for Inventory Management Network Resource Model IRP (32.692).

Changes since last presentation to TSG-SA:

New.

Outstanding Issues:

None.

Contentious Issues:

None.

3GPP TS 32.695 V1.0.0 (2003-09)

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):
eXtensible Markup Language (XML) file format definition
(Release 6)**



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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;
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- 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

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 base part of the Inventory Management XML file format definition;
- the NRM-specific part related to 3GPP TS 32.692 [2] of the XML file format definition.

Inventory Management XML file formats are based on XML [3], XML Schema [4] [5] [6] and XML Namespace [7] standards.

This File Format Definition specification is related to 3GPP TS 32.692 (V6.0.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] Void.
- [2] 3GPP TS 32.692: " Telecommunication management; Inventory Management (IM) network resources Integration Reference Point (IRP): Network Resource Model (NRM)".
- [3] W3C REC-xml-20001006: "Extensible Markup Language (XML) 1.0 (Second Edition)".
- [4] W3C REC-xmlschema-0-20010502: "XML Schema Part 0: Primer".
- [5] W3C REC-xmlschema-1-20010502: "XML Schema Part 1: Structures".
- [6] W3C REC-xmlschema-2-20010502: "XML Schema Part 2: Datatypes".
- [7] 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 [3]; in the scope of the present document.

XML declaration: it specifies the version of XML being used

NOTE: See [3].

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 [3].

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 [3].

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 [3].

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 [3].

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 [3].

XML attribute specification: has a name and a value

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

NOTE: See [3].

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 [4], [5] and [6].

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

NOTE: See [7], 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 [4], [5] and [6].

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 [4], [4] and [6].

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

Annex A (normative) of the present document defines the base XML schema `inventData.xsd` for inventory data XML files.

Annex B (normative) of the present document defines the NRM-specific XML schema `inventNrm.xsd` for the Inventory Management Network Resources IRP NRM defined in 3GPP TS 32.692 [2].

Annex C (informative) presents an example of inventory data XML file.

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

Annex A (normative): Inventory data file base XML schema inventData.xsd

The following XML schema inventData.xsd is the base XML schema for inventory data XML files.

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

<!--
  3GPP TS 32.695 Inventory Management Network Resources IRP
  Inventory data file base XML schema
  inventData.xsd
-->

<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/latest/rel-6/32_series/32695-600.zip#inventData"
  elementFormDefault="qualified"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:in=
"http://www.3gpp.org/ftp/specs/latest/rel-6/32_series/32695-600.zip#inventNrm"
>

  <import
    namespace=
"http://www.3gpp.org/ftp/specs/latest/rel-6/32_series/32695-600.zip#inventNrm"
    />

  <!-- Inventory data file root XML element -->

  <element name="inventoryDataFile">
    <complexType>
      <sequence>
        <element name="fileHeader">
          <complexType>
            <sequence>
              <element name="fileSender">
                <complexType>
                  <attribute name="localDn" type="string" use="required"/>
                  <attribute name="elementType" type="string" use="optional"/>
                </complexType>
              </element>
            </sequence>
            <attribute name="fileFormatVersion" type="string" use="required"/>
            <attribute name="vendorName" type="string" use="required"/>
            <attribute name="dnPrefix" type="string" use="optional"/>
          </complexType>
        </element>
        <element name="inventoryData" minOccurs="0" maxOccurs="unbounded">
          <complexType>
            <sequence>
              <element ref="in:ManagedElement"
                minOccurs="0" maxOccurs="unbounded"/>
            </sequence>
          </complexType>
        </element>
        <element name="fileFooter">
          <complexType>
            <attribute name="fileDateTime" type="dateTime" use="required"/>
          </complexType>
        </element>
      </sequence>
    </complexType>
  </element>

```

```
    </sequence>  
  </complexType>  
</element>  
  
</schema>
```

Annex B (normative): Inventory data file NRM-specific XML schema inventNrm.xsd

The following XML schema `inventNrm.xsd` is the NRM-specific schema for the Inventory Management Network Resources IRP NRM defined in 3GPP TS 32.692 [2].

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

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

<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/latest/rel-6/32_series/32695-600.zip#inventNrm"
  elementFormDefault="qualified"
  xmlns="http://www.w3.org/2001/XMLSchema"
  xmlns:in=
"http://www.3gpp.org/ftp/specs/latest/rel-6/32_series/32695-600.zip#inventNrm"
>

  <!-- Inventory data file ManagedElement XML element -->

  <element name="ManagedElement">
    <complexType>
      <sequence>
        <element name="attributes">
          <complexType>
            <all>
              <element name="managedElementType"/>
              <element name="userLabel" type="string"/>
              <element name="vendorName" type="string"/>
            </all>
          </complexType>
        </element>
        <choice minOccurs="0" maxOccurs="unbounded">
          <element ref="in:InventoryUnit"/>
        </choice>
      </sequence>
      <attribute name="localDn" type="string" use="required"/>
    </complexType>
  </element>

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

  <element name="InventoryUnit">
    <complexType>
      <sequence>
        <element name="attributes">
          <complexType>
            <all>
              <element name="inventoryUnitType" type="string"/>
              <element name="vendorUnitFamilyType" type="string"/>
              <element name="vendorUnitTypeNumber" type="string"/>
            </all>
          </complexType>
        </element>
      </sequence>
    </complexType>
  </element>

```

```
<element name="vendorName" type="string"/>
<element name="serialNumber" type="string"/>
<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"/>
</all>
</complexType>
</element>
<choice minOccurs="0" maxOccurs="unbounded">
  <element ref="in:InventoryUnit"/>
</choice>
</sequence>
<attribute name="id" type="string" use="required"/>
</complexType>
</element>

</schema>
```

Annex C (informative): Inventory data file NRM-specific XML schema instance

The following XML document is an example of inventory data XML file.

```
<?xml version="1.0" encoding="UTF-8"?>
<inventoryDataFile
  xmlns=
"http://www.3gpp.org/ftp/specs/latest/rel-6/32_series/32695-600.zip#inventData"
  xmlns:in=
"http://www.3gpp.org/ftp/specs/latest/rel-6/32_series/32695-600.zip#inventNrm"
>
  <fileHeader
    fileFormatVersion="32.695 V6.0"
    vendorName="Company NN"
    dnPrefix="DC=a1.companyNN.com,SubNetwork=1,IRPAgent=1">
    <fileSender
      localDn="SubNetwork=CountryNN,ManagementNode=EM-Chcg-1"
      elementType="EM"/>
    </fileHeader>
    <inventoryData>
      <in:ManagedElement localDn="SubNetwork=CountryNN,ManagedElement=NB-Chcg-1">
        <in:attributes>
          <in:managedElementType>NodeB</in:managedElementType>
          <in:userLabel>Chicago 1</in:userLabel>
          <in:vendorName>Company NN</in:vendorName>
        </in:attributes>
        <in:InventoryUnit id="001">
          <in:attributes>
            <in:inventoryUnitType>HW</in:inventoryUnitType>
            <in:vendorUnitFamilyType>CAGE</in:vendorUnitFamilyType>
            <in:vendorUnitTypeNumber>BSR-CAGE</in:vendorUnitTypeNumber>
            <in:vendorName>Company NN</in:vendorName>
            <in:serialNumber>123456</in:serialNumber>
            <in:dateOfManufacture>2001-09-01</in:dateOfManufacture>
          </in:attributes>
        </in:InventoryUnit>
        <in:InventoryUnit id="002">
          <in:attributes>
            <in:inventoryUnitType>HW</in:inventoryUnitType>
            <in:vendorUnitFamilyType>SHELF</in:vendorUnitFamilyType>
            <in:vendorUnitTypeNumber>BSR-SHELF</in:vendorUnitTypeNumber>
            <in:vendorName>Company NN</in:vendorName>
            <in:serialNumber>234567</in:serialNumber>
            <in:dateOfManufacture>2001-10-01</in:dateOfManufacture>
          </in:attributes>
        </in:InventoryUnit>
        <in:InventoryUnit id="003">
          <in:attributes>
            <in:inventoryUnitType>HW</in:inventoryUnitType>
            <in:vendorUnitFamilyType>CARD</in:vendorUnitFamilyType>
            <in:vendorUnitTypeNumber>BSR</in:vendorUnitTypeNumber>
            <in:vendorName>Company NN</in:vendorName>
            <in:serialNumber>345678</in:serialNumber>
            <in:dateOfManufacture>2002-01-15</in:dateOfManufacture>
          </in:attributes>
        </in:InventoryUnit>
      </in:ManagedElement>
    </inventoryData>
  </fileHeader>
</inventoryDataFile>
```

```
<fileFooter fileDateTime="2002-11-18T12:00:00-06:00"/>  
</inventoryDataFile>
```

Annex D (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
Sep 2003	S_21	SP-030427	--	--	Submitted to TSG SA#21 for Information	1.0.0	