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Technical Specification

**Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
Telecommunication management;
Configuration Management (CM);
Generic network resources Integration Reference Point (IRP):
Bulk CM eXtensible Markup Language (XML)
file format definition
(3GPP TS 32.625 version 7.1.0 Release 7)**



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Foreword

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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:

- 32.621: Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Requirements
- 32.622: Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Network Resource Model (NRM)
- 32.623: Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)
- 32.625: Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Bulk CM eXtensible Markup Language (XML) file format definition**

Configuration Management (CM), in general, provides the operator with the ability to assure correct and effective operation of the 3G network as it evolves. CM actions have the objective to control and 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.

CM actions may be requested as part of an implementation programme (e.g. additions and deletions), as part of an optimisation programme (e.g. modifications), and to maintain the overall Quality of Service (QoS). The CM actions are initiated either as single actions on single NEs of the 3G network, or as part of a complex procedure involving actions on many resources/objects in one or several NEs.

1 Scope

The present document provides the NRM-specific part related to the Generic Network Resources IRP NRM [1] of the XML file format definition for the Bulk Configuration Management IRP IS [2].

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

Bulk CM XML file formats are based on XML [4], XML Schema [5] [6] [7] and XML Namespace [8] specifications.

This specification is related to 3GPP TS 32.622 V7.0.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 32.622: "Telecommunication management; Configuration Management (CM); Generic network resources Integration Reference Point (IRP): Network Resource Model (NRM)".
- [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: 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:

| | |
|-------|--|
| CM | Configuration Management |
| DTD | Document Type Definition |
| EDGE | Enhanced Data for GSM Evolution |
| GERAN | GSM/EDGE Radio Access Network |
| GSM | Global System for Mobile communication |
| IRP | Integration Reference Point |
| IS | Information Service |
| NRM | Network Resource Model |
| UMTS | Universal Mobile Telecommunications System |
| UTRAN | Universal Terrestrial Radio Access Network |
| XML | eXtensible Markup Language |

4 Structure and content of configuration data XML files

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

Annex A of the present document defines the NRM-specific XML schema `genericNrm.xsd` for the Generic Network Resources IRP NRM defined in 3GPP TS 32.622 [1].

XML schema `genericNrm.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], with the following exception: as defined in 3GPP TS 32.615 [3], the `vsData` XML element type has an empty XML content.

Additionally, XML schema `genericNrm.xsd` also provides the following global XML declarations and definitions:

- XML complex type `NrmClass`: derivation base type (see [5], [6] and [7]) for all NRM class associated XML element types (see 3GPP TS 32.615 [3]);
- XML element type `vsData`: derivation base type (see [5], [6] and [7]) for all vendor-specific XML element types (see 3GPP TS 32.615 [3]);
- XML element type `SubNetworkOptionallyContainedNrmClass`: substitution group head (see [5], [6] and [7]) for all XML element types associated to further NRM classes optionally contained under `SubNetwork` NRM class;
- XML element type `ManagedElementOptionallyContainedNrmClass`: substitution group head (see [5], [6] and [7]) for all XML element types associated to further NRM classes optionally contained under `ManagedElement` NRM class.

Annex A (normative): Configuration data file NRM-specific XML schema (file name "genericNrm.xsd")

The following XML schema `genericNrm.xsd` is the NRM-specific schema for the Generic Network Resources IRP NRM defined in 3GPP TS 32.622 [1]:

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

<!--
 3GPP TS 32.625 Generic Network Resources IRP
 Bulk CM Configuration data file NRM-specific XML schema
 genericNrm.xsd
-->

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

  <!-- Base XML type for all NRM class associated XML elements -->

  <complexType name="NrmClass">
    <attribute name="id" type="string" use="required"/>
    <attribute name="modifier" use="optional">
      <simpleType>
        <restriction base="string">
          <enumeration value="create"/>
          <enumeration value="delete"/>
          <enumeration value="update"/>
        </restriction>
      </simpleType>
    </attribute>
  </complexType>

  <!-- Generic Network Resources IRP NRM attribute related XML types -->

  <simpleType name="dn">
    <restriction base="string">
      <maxLength value="400"/>
    </restriction>
  </simpleType>

  <complexType name="dnList">
    <sequence minOccurs="0" maxOccurs="unbounded">
      <element name="dn" type="xn:dn"/>
    </sequence>
  </complexType>

  <simpleType name="linkType">
    <list>
      <simpleType>
        <restriction base="string">
          <enumeration value="Signalling"/>
          <enumeration value="Bearer"/>
          <enumeration value="OAM_AND_P"/>
          <enumeration value="Other"/>
        </restriction>
      </simpleType>
    </list>
  </simpleType>

  <complexType name="linkListType">
    <sequence minOccurs="0" maxOccurs="unbounded">
      <element name="dn" type="xn:dn"/>
    </sequence>
  </complexType>

  <!-- Generic Network Resources IRP NRM class associated XML elements -->
```

```

<element name="SubNetwork">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="userLabel" minOccurs="0"/>
                <element name="userDefinedNetworkType" minOccurs="0"/>
                <element name="setOfMcc" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:SubNetwork"/>
            <element ref="xn:ManagedElement"/>
            <element ref="xn:MeContext"/>
            <element ref="xn:ManagementNode"/>
            <element ref="xn:IRPAgent"/>
            <element ref="xn:SubNetworkOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="ManagedElement">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="managedElementType" minOccurs="0"/>
                <element name="userLabel" minOccurs="0"/>
                <element name="vendorName" minOccurs="0"/>
                <element name="userDefinedState" minOccurs="0"/>
                <element name="locationName" minOccurs="0"/>
                <element name="swVersion" minOccurs="0"/>
                <element name="managedBy" type="xn:dnList" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:IRPAgent"/>
            <element ref="xn:ManagedElementOptionallyContainedNrmClass"/>
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="MeContext">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType/>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:ManagedElement"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="ManagementNode">
  <complexType>
    <complexContent>

```

```

<extension base="xn:NrmClass">
  <sequence>
    <element name="attributes" minOccurs="0">
      <complexType>
        <all>
          <element name="userLabel" minOccurs="0"/>
          <element name="vendorName" minOccurs="0"/>
          <element name="locationName" minOccurs="0"/>
          <element name="managedElements" type="xn:dnList" minOccurs="0"/>
          <element name="swVersion" minOccurs="0"/>
          <element name="userDefinedState" minOccurs="0"/>
        </all>
      </complexType>
    </element>
    <choice minOccurs="0" maxOccurs="unbounded">
      <element ref="xn:IRPAgent"/>
      <element ref="xn:VsDataContainer"/>
    </choice>
  </sequence>
</extension>
</complexContent>
</complexType>
</element>

<element name="IRPAgent">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="systemDN" minOccurs="0"/>
              </all>
            </complexType>
          </element>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<element name="VsDataContainer">
  <complexType>
    <complexContent>
      <extension base="xn:NrmClass">
        <sequence>
          <element name="attributes" minOccurs="0">
            <complexType>
              <all>
                <element name="vsDataType" minOccurs="0"/>
                <element name="vsDataFormatVersion" minOccurs="0"/>
                <element ref="xn:vsData" minOccurs="0"/>
              </all>
            </complexType>
          </element>
          <choice minOccurs="0" maxOccurs="unbounded">
            <element ref="xn:VsDataContainer"/>
          </choice>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
</element>

<!--
  VsDataContainer NRM class vsData attribute associated empty XML element
-->

<complexType name="vsData"/>
<element name="vsData" type="xn:vsData"/>

<!--
  Abstract head XML element for all XML elements associated to further
  NRM classes optionally contained under SubNetwork NRM class
-->

<element

```

```
    name="SubNetworkOptionallyContainedNrmClass"
    type="xn:NrmClass"
    abstract="true"
  />

  <!--
    Abstract head XML element for all XML elements associated to further
    NRM classes optionally contained under ManagedElement NRM class
  -->

  <element
    name="ManagedElementOptionallyContainedNrmClass"
    type="xn:NrmClass"
    abstract="true"
  />

</schema>
```

Annex B (informative): XML schema electronic files

The electronic files corresponding to the normative XML schemas defined in the present document are available in native form in the following archive:

http://www.3gpp.org/ftp/specs/archive/32_series/32.625/schema/32625-710-XMLSchema.zip

Annex C (informative): Change history

| Change history | | | | | | | | |
|----------------|-------|-----------|------|-----|--|-----|-------|-------|
| Date | TSG # | TSG Doc. | CR | Rev | Subject/Comment | Cat | Old | New |
| Jun 2002 | SA_16 | SP-020298 | -- | -- | Submitted to TSG SA #16 for Information | -- | 1.0.0 | |
| Sep 2002 | SA_17 | SP-020460 | -- | -- | Submitted to TSG SA #17 for Approval | -- | 2.0.0 | 5.0.0 |
| Jun 2003 | SA_20 | SP-030287 | 0001 | -- | Correction of Generic NRM XML schema namespace URIs | F | 5.0.0 | 5.1.0 |
| Jun 2003 | SA_20 | SP-030288 | 0002 | -- | Generic NRM XML schema dependencies removal | F | 5.0.0 | 5.1.0 |
| Sep 2003 | -- | -- | -- | -- | Editorials & Cosmetics | -- | 5.1.0 | 5.1.1 |
| Oct 2003 | -- | -- | -- | -- | Attached to this TS the normative XML schema electronic files corresponding to Sept 2003 TS 32.625 | -- | 5.1.1 | 5.1.2 |
| Dec 2003 | SA_22 | SP-030648 | 0003 | -- | Add SetofMcc attribute in Generic NRM XML definition for NRM alignment | B | 5.1.2 | 6.0.0 |
| Mar 2004 | SA_23 | SP-040131 | 0005 | -- | Add the capability to contain instances of VsDataContainer to some MOs - Align with IS 32.622 | A | 6.0.0 | 6.1.0 |
| Jun 2004 | SA_24 | SP-040259 | 0007 | -- | Removal of XML schema URI dependencies | A | 6.1.0 | 6.2.0 |
| Jun 2004 | SA_24 | SP-040258 | 0009 | -- | Correction of the annex related to XML schema electronic files publication | A | 6.1.0 | 6.2.0 |
| Jun 2004 | SA_24 | SP-040251 | 0011 | -- | Correction of legal values for managedElementType attribute | A | 6.1.0 | 6.2.0 |
| Dec 2004 | SA_26 | SP-040808 | 0013 | -- | Correct attribute for the managementScope association - Align with IS in 32.622 | A | 6.2.0 | 6.3.0 |
| Mar 2005 | SA_27 | SP-050046 | 0014 | -- | Add genericNRM.xsd for new IMS Links | B | 6.3.0 | 6.4.0 |
| Mar 2005 | SA_27 | SP-050046 | 0016 | -- | Error corrections to genericNRM.xsd | A | 6.3.0 | 6.4.0 |
| Jun 2005 | SA_28 | SP-050296 | 0019 | -- | Remove the xxxIRPs from the Schema - Align with the IS in TS 32.622 | F | 6.4.0 | 6.5.0 |
| Jun 2005 | SA_28 | SP-050296 | 0020 | -- | Correction of inappropriate XML type for a list of Distinguished Names | F | 6.4.0 | 6.5.0 |
| Sep 2005 | SA_29 | SP-050461 | 0023 | -- | Correct genericNrm.xsd XML schema | F | 6.5.0 | 6.6.0 |
| Sep 2006 | SA_33 | SP-060535 | 0024 | -- | Correct the use of dnList instead of string type for indicating multiple DN | F | 6.6.0 | 6.7.0 |
| 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. | -- | 6.7.0 | 7.0.0 |
| Sep 2007 | SA_37 | SP-070612 | 0025 | -- | Define LinkListSet Type - Align with 3GPP2 | F | 7.0.0 | 7.1.0 |
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History

| Document history | | |
|-------------------------|--------------|-------------|
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| V7.1.0 | October 2007 | Publication |
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