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Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Self-Organizing Networks (SON)
Policy Network Resource Model (NRM)
Integration Reference Point (IRP);
eXtensible Markup Language (XML) file format definition
(3GPP TS 32.525 version 9.2.0 Release 9)**

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Foreword

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Contents

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:

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  - 1 presented to TSG for information;
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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

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:

32.521: Self-Organizing Networks (SON) Policy Network Resource Model (NRM) Integration Reference Point (IRP): Requirements

32.522: Self-Organizing Networks (SON) Policy Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)

32.523: Self-Organizing Networks (SON) Policy Network Resource Model (NRM) Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)

32.525: Self-Organizing Networks (SON) Policy Network Resource Model (NRM) Integration Reference Point (IRP): Bulk CM eXtensible Markup Language (XML) file format definition

1 Scope

The present document provides the XML file format definition for the SON Policy Network Resource Model IRP IS [2].

An application of these XML definitions is to build a configuration file for transfer with the Bulk CM IRP using either CORBA Solution Set of 3GPP TS 32.613 [3] or the SOAP Solution Set of 3GPP TS 32.617 [5]. For this application, the basic part of the XML file format definition is provided by 3GPP TS 32.615 [4].

Other applications of these XML definitions are the SOAP solution sets of other IRPs that perform operations on managed objects, for example the Basic CM IRP SOAP SS of 3GPP TS 32.607 [6].

This specification is related to 3GPP TS 32.522 V9. 3.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 21.905: “Vocabulary for 3GPP Specifications”.

[2] 3GPP TS 32.522: "Telecommunication management; Self-Optimization (SON) Policy Network Resource Model (NRM) Integration Reference Point (IRP): Information Service (IS)”.

[3] 3GPP TS 32.613: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP); Common Object Request Broker Architecture (CORBA) Solution Set (SS)".

[4] 3GPP TS 32.615: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP); eXtensible Markup Language (XML) file format definition".

[5] 3GPP TS 32.617: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP); SOAP Solution Set (SS)".

[6] 3GPP TS 32.607: "Telecommunication management; Configuration Management (CM); Basic CM Integration Reference Point (IRP); SOAP Solution Set (SS)".

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

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

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

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

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

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

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 [7]; in the scope of the present document.

XML declaration: it specifies the version of XML being used

NOTE: See [7].

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 [7].

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 [7].

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 [7].

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 [7].

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 [7].

XML attribute specification: has a name and a value

NOTE: See [7].

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

NOTE: See [7].

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 [8], [9] and [10].

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

NOTE: See [11], 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 [8], [9] and [10].

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 [8], [9] and [10].

3.2 Symbols

void

3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

CM	Configuration Management
DTD	Document Type Definition
eNodeB	evolved NodeB
IRP	Integration Reference Point
IS	Information Service
NRM	Network Resource Model
XML	eXtensible Markup Language

4 Architectural Features

The overall architectural feature of SON Policy Network Resource Model IRP is specified in 3GPP TS 32.522 [2]. This clause specifies features that are specific to the XML definitions.

The XML definitions of this document specify the schema for a configuration content.

When using the XML definitions for a configuration file transfer with the Bulk CM IRP, using either CORBA Solution Set of 3GPP TS 32.613 [3] or SOAP Solution Set of 3GPP TS 32.617 [5], the basic part of the XML file format definition is provided by 3GPP TS 32.615 [4]. The XML definitions of this document provide the schema for the configuration content to be included in such a configuration file.

When using the XML definitions with a SOAP solution set of any interface IRP that perform operations on managed objects, for example the Basic CM IRP SOAP SS of 3GPP TS 32.607 [6], the XML definitions of this document provides the schema for the configuration content operated on by the interface IRP. Such configuration content can be name of managed object and, if applicable, IOC attributes.

5 Mapping

5.1 General mapping

An IOC maps to an XML element of the same name as the IOC's name in the IS. An IOC attribute maps to a sub-element of the corresponding IOC's XML element, and the name of this sub-element is the same as the attribute's name in the IS.

5.2 Information Object Class (IOC) mapping

The overall description of the file format of configuration data XML files is provided by 3GPP TS 32.615 [4].

Annex A of the present document defines the NRM-specific XML schema `sonPolicyNrm.xsd` for the SON Policy NRM IRP IS defined in 3GPP TS 32.522 [2].

XML schema `sonPolicyNrm.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 [4].

Annex A (normative): XML schema (file name "sonPolicyNrm.xsd")

The following XML schema sonNrm.xsd is the NRM-specific schema for the SON Policy Network Resource Model IRP NRM defined in 3GPP TS 32.522 [2]:

```
<?xml version="1.0" encoding="UTF-8"?>
<!--
  3GPP TS 32.525 SON Policy Network Resource Model IRP
  XML schema definition
  sonPolicyNrm.xsd
-->

<schema
  targetNamespace="http://www.3gpp.org/ftp/specs/archive/32_series/32.525#sonPolicyNrm"
  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"
  xmlns:sp="http://www.3gpp.org/ftp/specs/archive/32_series/32.525#sonPolicyNrm"
>
  <import namespace="http://www.3gpp.org/ftp/specs/archive/32_series/32.625#genericNrm"/>

  <!--SON Policy NRM IRP IS class associated XML elements -->

  <!-- CAC Range: 0~10000 -->
  <simpleType name="cacRange">
    <restriction base="unsignedShort">
        <maxInclusive value="10000"/>
    </restriction>
  </simpleType>

  <!-- Rate: representing a percentage -->
  <simpleType name="rateRange">
    <restriction base="unsignedShort">
      <maxInclusive value="100"/>
    </restriction>
  </simpleType>

  <!-- Priority: 0~N. Lower the number, higher the priority -->
  <complexType name="LBOTarget">
    <sequence>
      <element name="lowerEndOfCacRange" type="sp:cacRange" minOccurs="0"/>
      <element name="upperEndOfCacRange" type="sp:cacRange" minOccurs="0"/>
      <element name="Rate" type="sp:rateRange" minOccurs="0"/>
      <element name="Priority" type="unsignedShort" minOccurs="0"/>
    </sequence>
  </complexType>

   <complexType name="LBOLinkTarget">
   <sequence>
    <element name="UplinkTarget" type="sp:LBOTarget" minOccurs="0"/>
    <element name="DownlinkTarget" type="sp:LBOTarget" minOccurs="0"/>
   </sequence>
   </complexType>


  <complexType name="HooTarget">
    <sequence>
      <element name="Rate" type="sp:rateRange" minOccurs="0"/>
      <element name="Priority" type="unsignedShort" minOccurs="0"/>
    </sequence>
  </complexType>


  <!-- At most one instance under SubNetwork instance -->
  <element name="SONTargets" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
            <element name="attributes" minOccurs="0">
              <complexType>
```

```
                <all>
                  <element name="hoFailureRate" type="sp:HooTarget" minOccurs="0"/>
                  <element name="rrcConnectionEstablishmentFailureRate" type="sp:LBOLinkTarget"
minOccurs="0"/>
                  <element name="rrcConnectionAbnormalReleaseRate" type="sp:LBOLinkTarget"
minOccurs="0"/>
                  <element name="eRabSetupFailureRate" type="sp:LBOLinkTarget" minOccurs="0"/>
                  <element name="eRabAbnormalReleaseRate" type="sp:LBOLinkTarget" minOccurs="0"/>
                </all>
              </complexType>
            </element>
          </sequence>
        </extension>
      </complexContent>
    </complexType>
  </element>

  <!-- At most one instance under SubNetwork instance -->
  <element name="SONControl" substitutionGroup="xn:SubNetworkOptionallyContainedNrmClass">
    <complexType>
      <complexContent>
        <extension base="xn:NrmClass">
          <sequence>
            <element name="attributes" minOccurs="0">
              <complexType>
                <all>
                  <!--Switch:ON/OFF-->
                  <element name="hooSwitch" type="boolean" minOccurs="0"/>
                  <element name="lboSwitch" type="boolean" minOccurs="0"/>
                </all>
              </complexType>
            </element>
          </sequence>
        </extension>
      </complexContent>
    </complexType>
  </element>
</schema>
```

Annex B (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
05-2010	SA-48	SP-100286	--	--	Presentation to SA for information and approval	---	1.0.0
06-2010	SA-48	--	--	-	Publication	1.0.0	9.0.0
09-2010	SA-49	SP-100491	001	--	Remove targets based on not supported by measurements	9.0.0	9.1.0
12-2013	SA-62	SP-130612	002	1	Add missing XML elements for SONControl and SONTargets	9.1.0	9.2.0

History

Document history		
V9.0.0	July 2010	Publication
V9.1.0	October 2010	Publication
V9.2.0	January 2014	Publication