ETSI TS 132 395 V7.0.0 (2007-06)

Technical Specification

**Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
Telecommunication management;
Delta synchronization Integration Reference Point (IRP):
eXtensible Markup Language (XML) file format definition
(3GPP TS 32.395 version 7.0.0 Release 7)**

Reference
DTS/TSGS-0532395v700

Keywords
GSM, UMTS

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Intellectual Property Rights

Foreword

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

The present document may refer to technical specifications or reports using their 3GPP identities, UMTS identities or GSM identities. These should be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between GSM, UMTS, 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

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:

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:

32.391: Delta Synchronisation Integration Reference Point (IRP): Requirements

32.392: Delta Synchronisation Integration Reference Point (IRP): Information Service (IS)

32.393: Delta Synchronisation Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set

32.395: Delta Synchronization Integration Reference Point (IRP): eXtensible Markup Language (XML) file format definition

The Itf-N interface is built up by a number of IRPs and a related Name Convention, which realise the functional capabilities over this interface. The basic structure of the IRPs is defined in TS 32.101 [1] and TS 32.102 [2].

IRPManagers (typically Network Management Systems) and IRPAgents (typically EMs or NEs) synchronize their data concerning alarms or configuration data. In certain scenarios this synchronization is lost or not done. This IRP provides functionality to significantly reduce the amount of data which needs to be transferred in order to re-establish synchronisation.

1 Scope

The purpose of Delta Synchronisation IRP is to define an interface through which an IRPManager can request only those data which changed (i.e. changed, were created or deleted) from a synchronisation point onwards.

The present document is the eXtensible Markup Language (XML) file format definition of Delta Synchronisation IRP for the IRP whose semantics is specified in Delta Synchronisation IRP: Information Service (3GPP TS 32.392 [11]).

This XML Definitions specification defines the XML syntax of the Delta Synchronisation IRP XML Data File.

This XML Definitions specification is related to 3GPP TS 32.392 V7.1.X.

2 References

The following documents contain provisions that, 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 32.342: "Telecommunication management; File Transfer (FT) Integration Reference Point (IRP): Information Service (IS)".

[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".

[10] 3GPP TS 32.391: "Configuration Management (CM); Delta Synchronisation Integration Reference Point (IRP): Requirements".

[11] 3GPP TS 32.392: "Configuration Management (CM); Delta Synchronisation Integration Reference Point (IRP): Information Service (IS)".

[12] 3GPP TS 32.305: "Telecommunication management; Configuration Management (CM); Notification Integration Reference Point (IRP): eXtensible Markup Language (XML) definitions".

[13] 3GPP TS 32.111-5: "Telecommunication management; Fault Management; Part 5: Alarm Integration Reference Point (IRP): eXtensible Markup Language (XML) definitions".

[14] 3GPP TS 32.615: "Telecommunication management; Configuration Management (CM); Bulk CM Integration Reference Point (IRP): eXtensible Markup Language (XML) definitions".

[15] 3GPP TS 32.300: "Telecommunication management; Configuration Management (CM); Name convention for Managed Objects".

3 Definitions and abbreviations

3.1 Definitions

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

Changed: See 3GPP TS 32.391 [10].

Changed instance: See 3GPP TS 32.391 [10].

Delta Synchronisation: See 3GPP TS 32.391 [10].

Delta Synchronisation Point: See 3GPP TS 32.391 [10].

Full Synchronisation: See 3GPP TS 32.391 [10].

IRP: See 3GPP TS 32.101 [1].

IRPAgent: See 3GPP TS 32.102 [2].

IRPManager: See 3GPP TS 32.102 [2].

XML file: file containing an XML document

XML document: composed of the succession of an optional XML declaration followed by a root XML element, see [4].

XML declaration: it specifies the version of XML being used, 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, 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, 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, see [4].

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, 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, 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, see [4].

XML attribute specification: has a name and a value, see [4].

DTD: defines structure and content constraints to be respected by an XML document to be valid with regard to this DTD, 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, 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, see [5], [6] and [7].

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, 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, see [5], [6] and [7].

3.2 Abbreviations

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

EM	Element Manager
IRP	Integration Reference Point
IS	Information Service (see 3GPP TS 32.101 [1])
Itf-N	Interface N
NE	Network Element
XML	eXtensible Mark-up Language

4 Structure and content of configuration data XML files

Annex A of the present document defines the delta synchronization-specific XML schema and element types in `deltaSynchForCMData.xsd` / `deltaSynchForAlarms.xsd` which shall be used for the files of which the locations can be supplied as an option in output of operation `triggerDeltaSynchOfCMData` or `triggerDeltaSynchOfAlarms` defined in 3GPP TS 32.392 [11].

The present schema re-uses the structure and content of 3GPP TS 32.615 [14] for delta synchronization for CM data and those of 3GPP TS 32.111-5 [13] for delta synchronization for alarm data. The differences or additions are listed here:

For delta synchronization for CM data:
The `modifier` XML attribute specification shall be used as follows:

- `Create` for all created NRM instances
- `Update` for all modified NRM instances
- `Delete` for all deleted NRM instances

For delta synchronization for alarm data:

- Created alarms shall be indicated by content XML elements of `type="xa:NotifyNewAlarm"`
- Changed alarms shall be indicated by content XML elements of `type="xa:NotifyChangedAlarm"` or of `type="xa:NotifyClearedAlarm"` or of `type="xa:NotifyComments"`
- Deleted alarms shall be indicated by content XML elements of `type="xa:NotifyAckStateChanged"`

4.1 Global structure

See 3GPP TS 32.615 [14]

The following XML namespaces are potentially used in delta synchronisation XML files:

- delta synchronisation for CM data files are associated with XML schema `deltaSynchForCMData.xsd` (see Annex A.1);
- delta synchronisation for alarm data files are associated with XML schema `deltaSynchForAlarmData.xsd` (see Annex A.2);

4.2 XML elements fileHeader and fileFooter

4.2.1 XML elements fileHeaderForDeltaSynchForCM/AlarmData

See 3GPP TS 32.615 [14]

The file header defined there is extended as follows (new parts marked by underlining):

For delta synchronization of CM data:

```
<element name="fileHeaderDeltaSynchForCMData">
  <complexType>
    <attribute name="fileFormatVersion" type="string" use="required"/>
    <attribute name="senderName" type="string" use="optional"/>
    <attribute name="vendorName" type="string" use="optional"/>
    <!-- The content of the following element is a copy of the original
         request/response parameters -->
    <element name="inAndOutputParameter" minOccurs="0" maxOccurs="1">
      <complexType>
        <sequence>
        <attribute name="managerReference" type="string" use="optional"/>
        <attribute name="dataRequested" type="dsa:AlarmDataRequested" use="required"/>
        <attribute name="startSynchronizationPoint" type="dateTime" use="required"/>
        <attribute name="newSynchronizationPoint" type="dateTime" use="required"/>
        </sequence>
      </complexType>
    </element>
  </complexType>
</element>
```

For delta synchronization of alarm data:

```
<element name="fileHeaderDeltaSynchForCMData">
  <complexType>
    <attribute name="fileFormatVersion" type="string" use="required"/>
    <attribute name="senderName" type="string" use="optional"/>
    <attribute name="vendorName" type="string" use="optional"/>
    <!-- The content of the following element is a copy of the original
        request/response parameters -->
    <element name="inAndOutputParameter" minOccurs="0" maxOccurs="1">
      <complexType>
        <sequence>
        <attribute name="managerReference" type="string" use="optional"/>
        <attribute name="dataRequested" type="dsa:AlarmDataRequested" use="required"/>
        <attribute name="startSynchronizationPoint" type="dateTime" use="required"/>
        <attribute name="newSynchronizationPoint" type="dateTime" use="required"/>
        </sequence>
      </complexType>
    </element>
  </complexType>
</element>
```

4.2.2 XML element `fileFooter`

See 3GPP TS 32.615 [14]

4.3 Delta synchronisation IRP specific XML elements

For delta synchronization of CM data: Currently none, except those in clause 4.2 .

For delta synchronization of alarm data:

```
<element name="deltaAlarm" type=”dsa:DeltaAlarm maxOccurs="unbounded"/>
```

of type

```
<complexType name=”DeltaAlarm”>
  <choice>
    <element ref="xa:NotifyNewAlarm"/>
    <element ref="xa:NotifyChangedAlarm"/>
    <element ref="xa:NotifyClearedAlarm"/>
    <element ref="xa:NotifyComments"/>
    <element ref="xa:NotifyAckStateChanged"/>
  </choice>
</complexType>
```

4.4 Delta synchronisation IRP XML File Name Conventions

For NL IRP XML File Name Conventions the generic file name definitions as specified by the FT IRP apply (see [3]).

Annex A (normative): Delta synchronization specific data file XML schemas

A.1 Delta synchronization specific data file XML schemas Generic Part (file name "deltaSynchGeneric.xsd")

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

<!–
  3GPP TS 32.695 Delta Synchronisation IRP
  Delta synchronization specific data file XML schemas
  deltaSynchGeneric.xsd
-->

<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.395#deltaSynchGeneric"

  elementFormDefault="qualified"

  xmlns="http://www.w3.org/2001/XMLSchema"

  xmlns:dsg=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.395#deltaSynchGeneric"

xmlns:xe=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.305#notification"
>


  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.305#notification"
  />

  <!-- XML types specific for delta synchronization generic part -->


<simpleType name="DeltaSynchStatus">
  <restriction base="string">
    <enumeration value="Activated"/>
    <enumeration value="Deactivated"/>
  </restriction>
</simpleType>

<complexType name="NotifyStatusOfDeltaSynchChanged">
  <complexContent>
    <extension base="xe:Notification">
      <sequence>
        <element name="body">
          <complexType>
            <sequence>
              <element name="ManagerReference" type="string"/>
              <element name="DeltaSynchStatusForCMData" type="dsg:DeltaSynchStatus"/>
              <element name="DeltaSynchStatusForAlarmData" type="dsg:DeltaSynchStatus"/>
            </sequence>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
/complexType>

<element name="NotifyStatusOfDeltaSynchChanged" type="dsg:NotifyStatusOfDeltaSynchChanged"/>

<simpleType name="DeltaSynchPointType">
  <restriction base="string">
    <enumeration value="DeltaSynchPointForAlarm"/>
    <enumeration value="DeltaSynchPointForCMData"/>
  </restriction>
</simpleType>
```

```
<simpleType name="TriggeredByAgentOrManager">
  <restriction base="string">
    <enumeration value="IRPAgent"/>
    <enumeration value="IRPManager"/>
  </restriction>
</simpleType>


<complexType name="NotifyNewDeltaSynchPoint">
  <complexContent>
    <extension base="xe:Notification">
    <sequence>
      <element name="body">
        <complexType>
          <sequence>
            <element name="NewSynchPoint" type="dateTime"/>
            <element name="RequestedSynchPoint" type="dateTime"/>
            <element name="DeltaSynchPointType" type="dsg:DeltaSynchPointType"/>
            <element name="TriggeredByAgentOrManager" type="dsg:TriggeredByAgentOrManager"/>
            <element name="AgentOrManagerReference" type="string"/>
          </sequence>
        </complexType>
      </element>
    </sequence>
    </extension>
  </complexContent>
</complexType>

<element name="NotifyNewDeltaSynchPoint" type="dsg:NotifyNewDeltaSynchPoint"/>

</schema>
```

A.2 Delta synchronization specific data file XML schemas for CM data (file name "deltaSynchForCMData.xsd")

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

<!–
  3GPP TS 32.395 Delta Synchronisation IRP
  Delta synchronization specific data file XML schemas for CM data XML schema
  deltaSynchForCMData.xsd
-->

<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.395#deltaSynchForCMData"

  elementFormDefault="qualified"

  xmlns="http://www.w3.org/2001/XMLSchema"

  xmlns:dsc=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.395#deltaSynchForCMData"


  xmlns:xn=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.625#genericNrm"


  xmlns:nk=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.665#kernelNtf"
>

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

  />

  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.665#kernelNtf"
  />

  <!-- XML types specific for delta synchronization of CM data -->

<simpleType name="CMDataRequested">
   <restriction base="string">
      <enumeration value="DNsOnly"/>
      <enumeration value="CompleteDataSet"/>
   </restriction>
</simpleType>


  <!--Delta synchronization for CM data file root XML element -->


  <element name="deltaSynchForCMDataFile">
    <complexType>
      <sequence>
        <element name="fileHeader">
          <complexType>
            <sequence>
              <element name="fileHeaderDeltaSynchForCMData">
                <complexType>
                  <attribute name="fileFormatVersion" type="string" use="required"/>
                  <attribute name="senderName" type="string" use="optional"/>
                  <attribute name="vendorName" type="string" use="optional"/>
                  <!-- The content of the following element is a copy of the original
                       request/response parameters -->
                  <element name="inAndOutputParameter" minOccurs="0" maxOccurs="1">
                    <complexType>
                      <sequence>
                      <attribute name="managerReference" type="string" use="optional"/>
                      <attribute name="dataRequested" type="dsa:AlarmDataRequested" use="required"/>
                      <attribute name="startSynchronizationPoint" type="dateTime" use="required"/>
                      <attribute name="newSynchronizationPoint" type="dateTime" use="required"/>
                      </sequence>
```

```
                    </complexType>
                  </element>
                </complexType>
              </element>
              <element name="scope" type="nk:ScopeType" minOccurs="0"/>
            </sequence>
          </complexType>
        </element>
        <element name="configData" maxOccurs="unbounded">
          <complexType>
            <choice>
              <element ref="xn:SubNetwork"/>
              <element ref="xn:MeContext"/>
              <element ref="xn:ManagedElement"/>
            </choice>
            <attribute name="dnPrefix" type="string" use="optional"/>
          </complexType>
        </element>
        <element name="fileFooter">
          <complexType>
            <attribute name="dateTime" type="dateTime" use="required"/>
          </complexType>
        </element>
      </sequence>
    </complexType>
  </element>
</schema>
```

A.3 Delta synchronization specific data file XML schemas for alarm data (file name "deltaSynchForAlarms.xsd")

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

<!–
  3GPP TS 32.395 Delta Synchronisation IRP
  Delta synchronization specific data file XML schemas for alarm data XML schema
  deltaSynchForAlarmData.xsd
-->

<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.395#deltaSynchForAlarms"


  elementFormDefault="qualified"

  xmlns="http://www.w3.org/2001/XMLSchema"


 xmlns:dsa=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.395#deltaSynchForAlarms"

  xmlns:nk=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.665#kernelNtf"

  xmlns:xa=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.111-5#alarmIRPNotif"

>

  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.111-5#alarmIRPNotif"
  />

  <import
    namespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.665#kernelNtf"
  />


  <!-- XML types specific for delta synchronization of alarm data -->

<simpleType name="AlarmDataRequested">
  <restriction base="string">
    <enumeration value="AlarmIdsOnly"/>
    <enumeration value="CompleteAlarmInformation"/>
  </restriction>
</simpleType>

<complexType name="DeltaAlarm">
  <choice>
    <element ref="xa:NotifyNewAlarm"/>
    <element ref="xa:NotifyChangedAlarm"/>
    <element ref="xa:NotifyClearedAlarm"/>
    <element ref="xa:NotifyComments"/>
    <element ref="xa:NotifyAckStateChanged"/>
  </choice>
</complexType>


  <!--Delta synchronization for alarm data file root XML element -->

  <element name="deltaSynchForAlarmDataFile">
    <complexType>
      <sequence>
        <element name="fileHeader">
          <complexType>
            <sequence>
              <element name="fileHeaderDeltaSynchForAlarms">
                <complexType>
                  <attribute name="fileFormatVersion" type="string" use="required"/>
                  <attribute name="senderName" type="string" use="optional"/>
                  <attribute name="vendorName" type="string" use="optional"/>
```

```
                <!-- The content of the following element is a copy of the original
                     request/response parameters -->
                <element name="inAndOutputParameter" minOccurs="0" maxOccurs="1">
                  <complexType>
                    <sequence>
                    <attribute name="managerReference" type="string" use="optional"/>
                    <attribute name="dataRequested" type="dsa:AlarmDataRequested" use="required"/>
                    <attribute name="startSynchronizationPoint" type="dateTime" use="required"/>
                    <attribute name="newSynchronizationPoint" type="dateTime" use="required"/>
                    </sequence>
                  </complexType>
                </element>
              </complexType>
            </element>
            <element name="scope" type="nk:ScopeType" minOccurs="0"/>
          </sequence>
        </complexType>
      </element>
      <element name="deltaAlarm" type="dsa:DeltaAlarm" maxOccurs="unbounded"/>
      <element name="fileFooter">
        <complexType>
          <attribute name="dateTime" type="dateTime" use="required"/>
        </complexType>
      </element>
    </sequence>
  </complexType>
 </element>
</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/32.395/schema/32395-700-XMLSchema.zip

Annex C (informative): Change history

Change history								
Date	TSG #	TSG Doc.	CR	R	Subject/Comment	Cat	Old	New
Jun 2007	SA_36	SP-070286	--	--	Submitted to SA#36 for Approval	--	1.0.0	7.0.0

History

Document history		
V7.0.0	June 2007	Publication