

3GPP TS 32.445 V9.2.0 (2012-03)

Technical Specification

**3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects;
Telecommunication management;
Trace Management (Trace)
Integration Reference Point (IRP):
eXtensible Markup Language (XML) file format definition
(Release 9)**



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Keywords

Management, XML

3GPP

Postal address

3GPP support office address

650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Internet

<http://www.3gpp.org>

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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:

- 32.441 "Trace Management Integration Reference Point (IRP): Requirements"
- 32.442 "Trace Management Integration Reference Point (IRP): Information Service (IS)"
- 32.443 "Trace Management Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)"
- 32.445: "Trace Management Integration Reference Point (IRP): eXtensible Markup Language (XML) file format definition"**

The present document is part of a TS-family which describes the requirements and information model necessary for the Telecommunication Management (TM) of 3G systems. The TM principles and TM architecture are specified in 3GPP TS 32.101 [2] and 3GPP TS 32.102 [3].

Trace provides very detailed information on call level for a specific subscriber or MS. This data is an additional information source to Performance Measurements and allows deeper investigations in problems solving or in case of optimization.

1 Scope

The present document is the eXtensible Markup Language (XML) file format definition of Trace IRP for the IRP whose semantics is specified in Trace IRP: Information Service (3GPP TS 32.442 [3]).

This XML Definitions specification defines the XML syntax of the Trace IRP XML Data File for the notifications related to Trace IRP. The XML file definitions for a trace data file can be found in Annex A of 3GPP TS 32.423 [4].

This XML File Format Definition specification is related to 3GPP TS 32.442 V9.0.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 32.441: "Telecommunication management; Trace Management Integration Reference Point (IRP): Requirements".
- [11] 3GPP TS 32.442: "Telecommunication management; Trace Management Integration Reference Point (IRP): Information Service (IS)".
- [12] 3GPP TS 32.422: "Telecommunication management; Subscriber and equipment trace; Trace control and configuration management"

3 Definitions and abbreviations

3.1 Definitions

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

IRP: See 3GPP TS 32.101 [1].

IRP Agent: See 3GPP TS 32.102 [2].

IRP Manager: 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
TS	Technical Specification

4 Trace Management IRP XML Definitions

4.1 Trace Management IRP notifications XML definition structure

This section provides XML definitions of Trace Management IRP notifications as defined in 3GPP TS 32.442 [3].

Editors Note; Diagram to be provided.

4.2 Trace Management IRP XML Schema for notifications

```
<?xml version="1.0" encoding="UTF-8"?>
<!--
  3GPP TS 32.445 Trace IRP
  Trace IRP specific data file XML schema
  traceIRP.xsd
-->

<schema
  targetNamespace=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.445#traceIRP"

  elementFormDefault="qualified"

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

  xmlns:tr=
"http://www.3gpp.org/ftp/specs/archive/32_series/32.445#traceIRP"

  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 trace IRP notifications -->

  <complexType name="TraceReference">
    <sequence>
      <element name="MCC" type="short" />
      <element name="MNC" type="short" />
      <element name="TRACE_ID" type="integer" />
    </sequence>
  </complexType>

  <complexType name="NotifyTraceRecordingSessionFailure">
    <complexContent>
      <extension base="xe:Notification">
        <sequence>
          <element name="body">
            <complexType>
              <sequence>
                <element name="TraceRecordingSessionReference" type="integer" minOccurs="0"/>
                <element name="TraceReference" type="tr:TraceReference"/>
                <element name="Reason" type="string" minOccurs="0"/>
              </sequence>
            </complexType>
          </element>
        </sequence>
      </extension>
    </complexContent>
  </complexType>

```

```

        </complexType>
      </element>
    </sequence>
  </extension>
</complexContent>
</complexType>

<element name="NotifyTraceRecordingSessionFailure" type="tr:NotifyTraceRecordingSessionFailure"/>

<complexType name="TraceTarget">
  <choice>
    <element name="IMSI" type="string" />
    <element name="IMEI" type="string" />
    <element name="IMEISV" type="string" />
    <element name="PUBLIC_ID" type="string" />
    <element name="PRIVATE_ID" type="string" />
    <element name="UTRAN_CELL" type="string" />
    <element name="E-UTRAN_CELL" type="string" />
  </choice>
</complexType>

<complexType name="NotifyTraceSessionLocalActivation">
  <complexContent>
    <extension base="xe:Notification">
      <sequence>
        <element name="body">
          <complexType>
            <sequence>
              <element name="TraceReference" type="tr:TraceReference"/>
              <element name="TraceTarget" type="tr:TraceTarget"/>
              <element name="IOCInstance" type="string"/>
            </sequence>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<element name="NotifyTraceSessionLocalActivation" type="tr:NotifyTraceSessionLocalActivation"/>

<complexType name="NotifyTraceSessionIdentities">
  <complexContent>
    <extension base="xe:Notification">
      <sequence>
        <element name="body">
          <complexType>
            <sequence>
              <element name="TraceRecordingSessionReference" type="integer" minOccurs="0"/>
              <element name="TraceReference" type="tr:TraceReference"/>
              <element name="TraceTarget" type="tr:TraceTarget"/>
            </sequence>
          </complexType>
        </element>
      </sequence>
    </extension>
  </complexContent>
</complexType>

<element name="NotifyTraceSessionIdentities" type="tr:NotifyTraceSessionIdentities"/>

</schema>

```

4.3 Trace Management IRP XML Schema for IOCs

```

<?xml version="1.0" encoding="UTF-8"?>
<!--
  3GPP TS 32.445 Trace Management IRP IOC XML Schema
  tMIRPIOCs.xsd

```



```

-->
<schema xmlns:xsi="http://www.3gpp.org/ftp/specs/archive/32_series/32.445#tMIRPIOCs"
xmlns:xe="http://www.3gpp.org/ftp/specs/archive/32_series/32.305#notification"
xmlns="http://www.w3.org/2001/XMLSchema"
targetNamespace="http://www.3gpp.org/ftp/specs/archive/32_series/32.445#tMIRPIOCs"
elementFormDefault="qualified" attributeFormDefault="unqualified">

  <complexType name="ListOfInterfaces">
    <sequence>
      <element name="Interface" type="integer" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
  </complexType>

  <simpleType name="NeType">
    <restriction base="string">
      <enumeration value="MSC_SERVER"/>
      <enumeration value="MGW"/>
      <enumeration value="RNC"/>
      <enumeration value="SGSN"/>
      <enumeration value="GGSN"/>
      <enumeration value="BM_SC"/>
      <enumeration value="eNB"/>
      <enumeration value="MME"/>
      <enumeration value="SGW"/>
      <enumeration value="PGW"/>
    </restriction>
  </simpleType>

  <complexType name="ListOfNeTypes">
    <sequence>
      <element name="NE" type="xsi:NeType" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
  </complexType>

  <simpleType name="TraceDepth">
    <restriction base="string">
      <enumeration value="MINIMUM"/>
      <enumeration value="MEDIUM"/>
      <enumeration value="MAXIMUM"/>
      <enumeration value="VENDORMINIMUM"/>
      <enumeration value="VENDORMEDIUM"/>
      <enumeration value="VENDORMAXIMUM"/>
    </restriction>
  </simpleType>

  <simpleType name="TraceTarget">
    <restriction base="string">
      <enumeration value="IMSI"/>
      <enumeration value="IMEI"/>
      <enumeration value="IMEISV"/>
      <enumeration value="PUBLIC_ID"/>
      <enumeration value="PRIVATE_ID"/>
      <enumeration value="UTRAN_CELL_ID"/>
      <enumeration value="EUTRAN_CELL_ID"/>
    </restriction>
  </simpleType>

  <!-- the values of the EventBitmap is coming from the TriggeringEvent trace parameter definition in
3GPP TS 32.422 -->

  <complexType name="Events">
    <sequence>
      <element name="NetworkElement" type="xsi:NeType" minOccurs="0" maxOccurs="unbounded" />
      <element name="EventBitmap" type="integer" minOccurs="0" maxOccurs="unbounded" />
    </sequence>
  </complexType>

  <complexType name="TriggeringEvent">
    <sequence>
      <element name="Events" type="xsi:Events" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
  </complexType>

```

```

<simpleType name="UnsupportedItem">
  <restriction base="string">
    <enumeration value="MANAGED_ENTITY"/>
    <enumeration value="TRACE_DEPTH"/>
    <enumeration value="LIST_OF_INTERFACES"/>
    <enumeration value="TRACE_TARGET"/>
    <enumeration value="REASON"/>
  </restriction>
</simpleType>
<complexType name="UnsupportedList">
  <sequence>
    <element name="UnsupportedItem" type="xsi:UnsupportedItem" minOccurs="0"
maxOccurs="unbounded" />
  </sequence>
</complexType>
<!-- Attributes of the TraceJob IOC -->
<element name="traceReference" type="unsignedLong"/>
<element name="listOfInterfaces" type="xsi:ListOfInterfaces"/>
<element name="listOfNeTypes" type="xsi:ListOfNeTypes"/>
<element name="traceDepth" type="xsi:TraceDepth"/>
<element name="traceTarget" type="xsi:TraceTarget"/>
<element name="triggeringEvent" type="xsi:TraceTarget"/>
<element name="traceCollectionEntityAddress" type="string"/>
<!-- Attributes of the TraceRecord IOC -->
<element name="fileName" type="string" />
</schema>

```

4.4 Trace IRP XML File Name Conventions

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

Annex A (normative):
Void

Annex B (informative):
Void

Annex C (informative): Change history

Change history								
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Cat	Old	New
Jun 2007	SA_36	SP-070290	--	--	Submitted to SA#36 for Approval	--	1.0.0	7.0.0
Dec 2008	SA_42	SP-080846	0001	--	Adding EPS related modifications to Trace IRP XML schema	B	7.0.0	8.0.0
Sep 2009	SA_45	SP-090534	0002	--	Alignment of Trace IRP XML definitions with TS 32.422	F	8.0.0	8.1.0
Sep 2009	SA-45	SP-090627	0003	--	Updates to 32.445 for SOAP SS and to align with 32.422 and 32.442	C	8.1.0	9.0.0
Dec 2009	SA-46	SP-090719	0004	--	Discontinue from Rel-9 onwards the XML schema extraction and storage, remove its reference in the informative Annex containing the link to the XML schema folder	F	9.0.0	9.1.0
March 2012	SA-55	SP-120044	0006	--	Correct syntax error in XML schema tMIRPIOCs.xsd	F	9.1.0	9.2.0