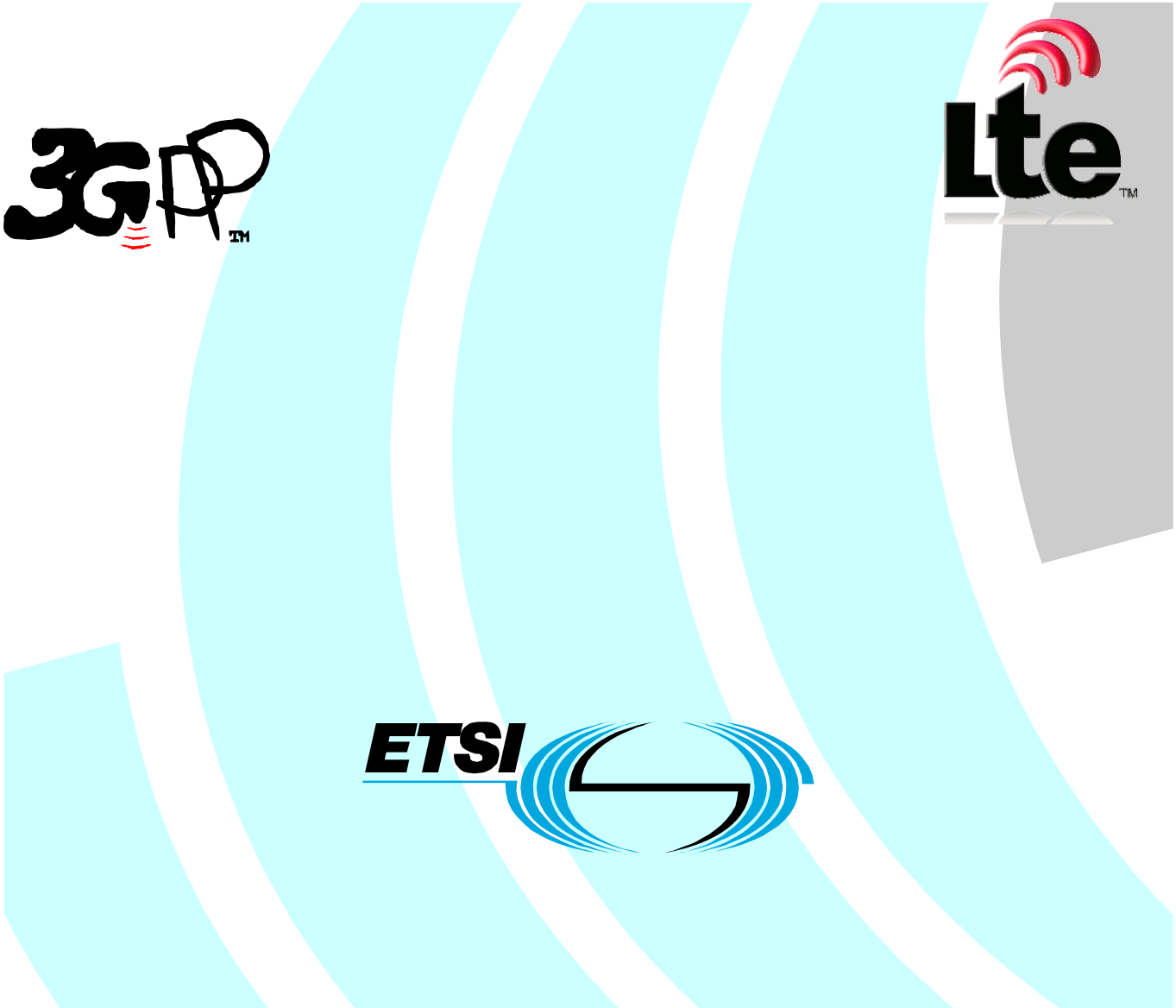
# ETSI TS 132 445 V9.1.0 (2010-01)

*Technical Specification*

**Universal Mobile Telecommunications System (UMTS);**
**LTE;**
**Telecommunication management;**
**Trace Management Integration Reference Point (IRP):**
**eXtensible Markup Language (XML) file format definition**
**(3GPP TS 32.445 version 9.1.0 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).

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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;
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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:

32.441 "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].

**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 |
| TS | Technical Specification |
| XML | eXtensible Mark-up Language |

# 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>

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

    <complexType name=" TriggeringEvent">
        <sequence>
            <element name="Events" type="xti: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="xti:UnsupportedItem" minOccurs="0"
maxOccurs="unbounded" />
        </sequence>
    </complexType>
    <!-- Attributes of the TraceJob IOC -->
    <element name="traceReference" type="unsignedLong"/>
    <element name="listOfInterfaces" type="xti:ListOfInterfaces"/>
    <element name="listOfNeTypes" type="xti:ListOfNeTypes"/>
    <element name="traceDepth" type="xti:TraceDepth"/>
    <element name="traceTarget" type="xti:TraceTarget"/>
    <element name="triggeringEvent" type="xti: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 |

# History

| Document history | | |
|---|---|---|
| V9.1.0 | January 2010 | Publication |
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