ETSI TS 132 111-5 V8.0.0 (2009-01)

Technical Specification

**Digital cellular telecommunications system (Phase 2+);
Universal Mobile Telecommunications System (UMTS);
LTE;
Telecommunication management;
Fault Management;
Part 5: Alarm Integration Reference Point (IRP):
eXtensible Markup Language (XML) definitions
(3GPP TS 32.111-5 version 8.0.0 Release 8)**

Reference
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Keywords
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Foreword

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Contents

Foreword

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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:

32.111-1   Fault Management; Part 1: 3G fault management requirements

32.111-2   Fault Management; Part 2: Alarm Integration Reference Point (IRP): Information Service (IS)

32.111-3   Fault Management; Part 3: Alarm Integration Reference Point (IRP): Common Object Request Broker Architecture (CORBA) Solution Set (SS)

32.111-5   Fault Management; Part 5: Alarm Integration Reference Point (IRP): eXtensible Markup Language (XML) definitions.

The present document is part of a TS-family, which describes the requirements and information model necessary for Telecommunications Management (TM). The TM principles and TM architecture are specified in 3GPP TS 32.101 [1] and 3GPP TS 32.102 [2].

A communications system is composed of a multitude of Network Elements (NE) of various types and, typically, different vendors, which inter-operate in a coordinated manner in order to satisfy the network users' communication requirements.

The occurrence of faults in an NE may cause deterioration or loss of this NE's function. Fault Management is the functional area, which allows the operator to detect the occurrence of faults in the network in real-time. Configuration Management and Performance Management are two more functional areas, which require the operator to be alerted to certain conditions in the network.

A standard general-purpose mechanism for the management of logs containing selected notifications from the network is required to provide an ability to perform historical analysis on faults and conditions, which occurred in the network. The TS 32.33x-series, constituting the Notification Log IRP, sets forth such a mechanism - and the present document contains the XML definition related to Alarm IRP notifications.

1 Scope

The present document specifies the XML Definitions for the Alarm Integration Reference Point (Alarm IRP) as it applies to Itf-N, in accordance with Alarm IRP IS definitions [3] as well as Notification Log IRP XML Definitions [4].

The present document defines the XML syntax of Alarm IRP notifications that is to be used for the Alarm IRP SOAP Solution Set and in conjunction with Notification Log IRP XML Definitions for Notification Log IRP XML Data File and the NL IRP XML Notification Format [4]. The document defines also the XML syntax for the IOC definitions of the Alarm IRP IS [3], which are used by the XML definitions for the Alarm IRP notifications and the Alarm IRP IS operations.

This specification is related to 3GPP TS 32.111-2 V7.1.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 32.101: "Telecommunication management; Principles and high level requirements".

[2]   3GPP TS 32.102: "Telecommunication management; Architecture".

[3]   3GPP TS 32.111-2: "Telecommunication management; Fault Management; Alarm Integration Reference Point (IRP): Information Service (IS)".

[4]   3GPP TS 32.335: "Telecommunication management; Notification Log (NL) Integration Reference Point (IRP): eXtensible Markup Language (XML) solution definitions".

[5]   3GPP TS 32.331: "Telecommunication management; Notification Log (NL) Integration Reference Point (IRP): Requirements".

[6]   3GPP TS 32.111-7: "Telecommunication management; Alarm Integration Reference Point (IRP): SOAP Solution Set (SS)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TS 32.101 [1], 3GPP TS 32.102 [2], and 3GPP TS 32.331 [5] apply.

3.2 Abbreviations

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

IRP   Integration Reference Point
IS   Information Service

NL   Notification Log
UML   Unified Modelling Language
IRP   Integration Reference Point
NRM   Network Resource Model
XML   eXtensible Markup Language

4   Alarm IRP XML Definitions

4.1   Alarm IRP notifications XML definition structure

This section provides XML definitions of Alarm IRP notifications as defined in [3]. These definitions are to be used for the Alarm IRP SOAP Solution Set and in conjunction with Notification Log IRP XML Definitions for Notification Log IRP XML Data File and the NL IRP XML Notification Format [4], as well as considerations for NL IRP XML File Name Conventions defined therein.
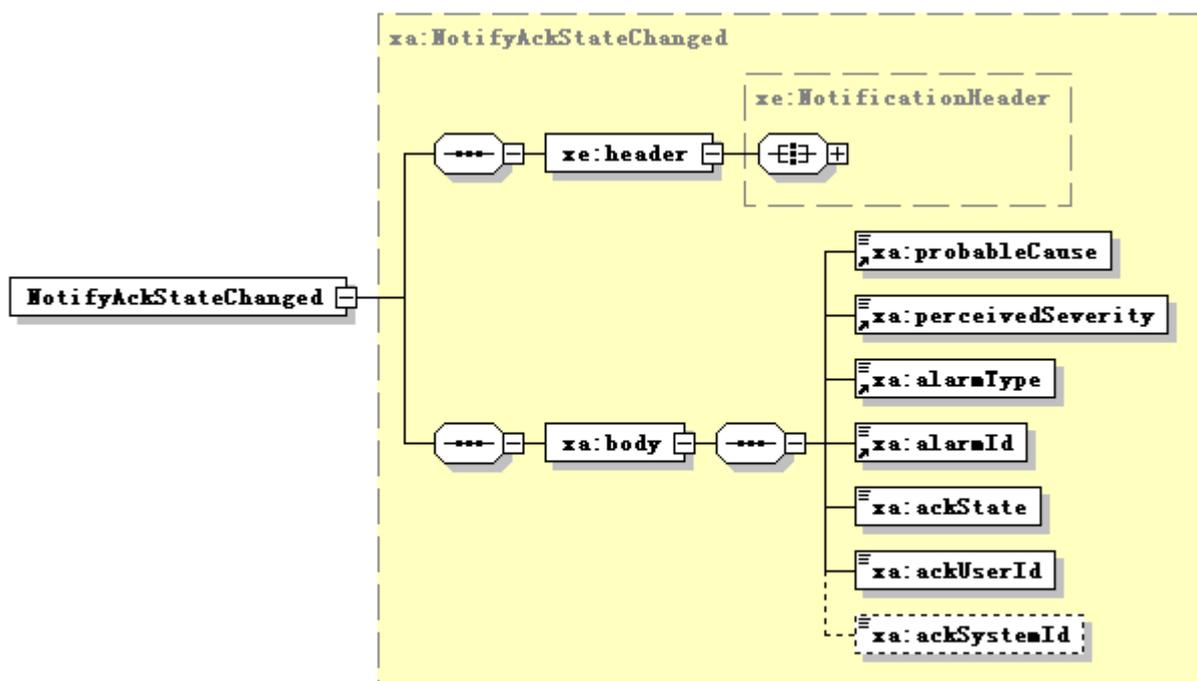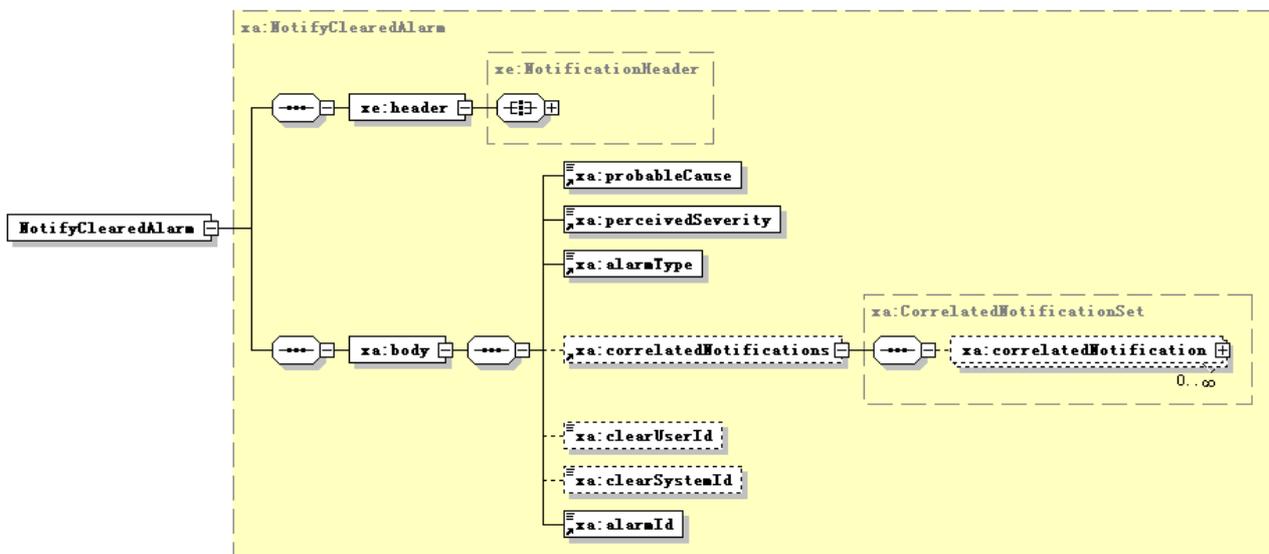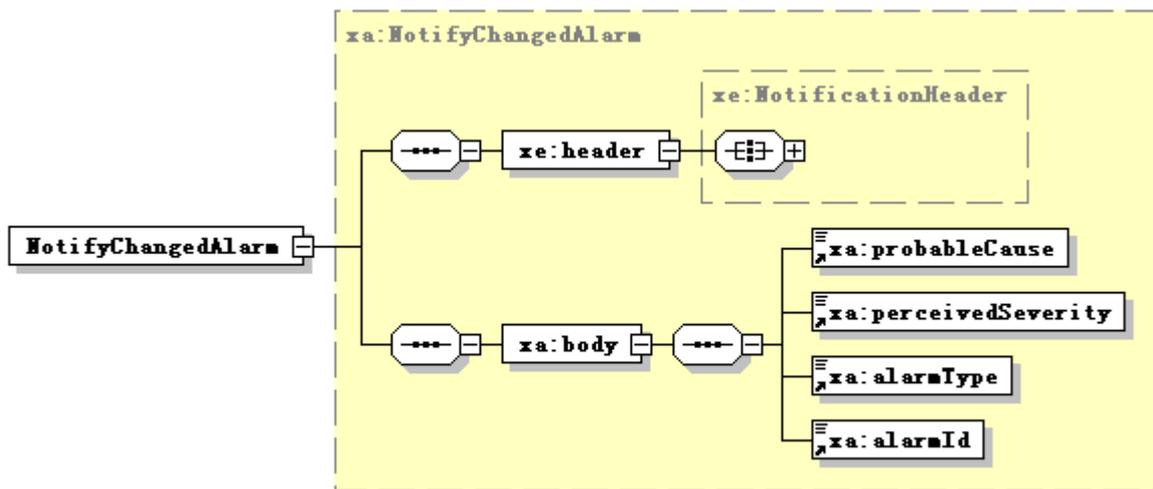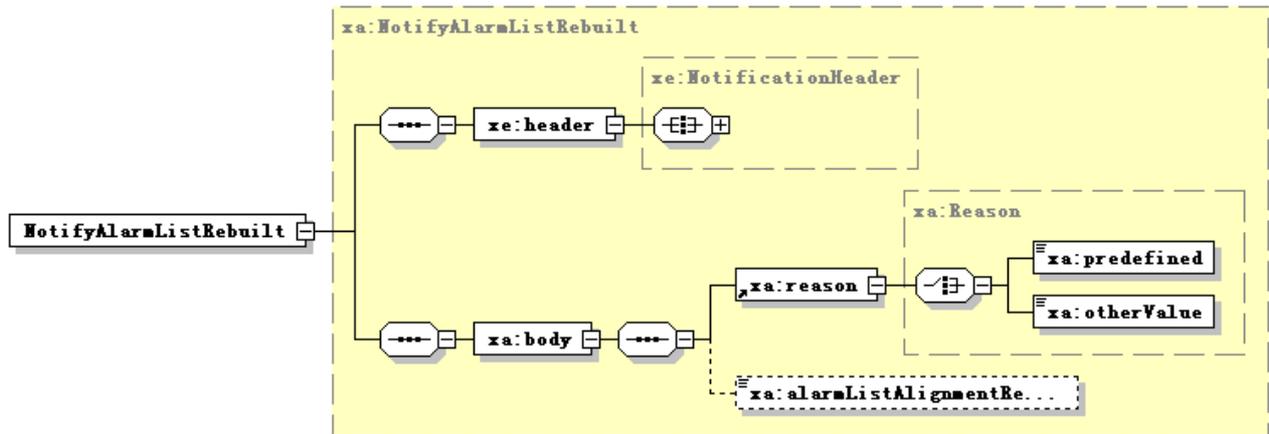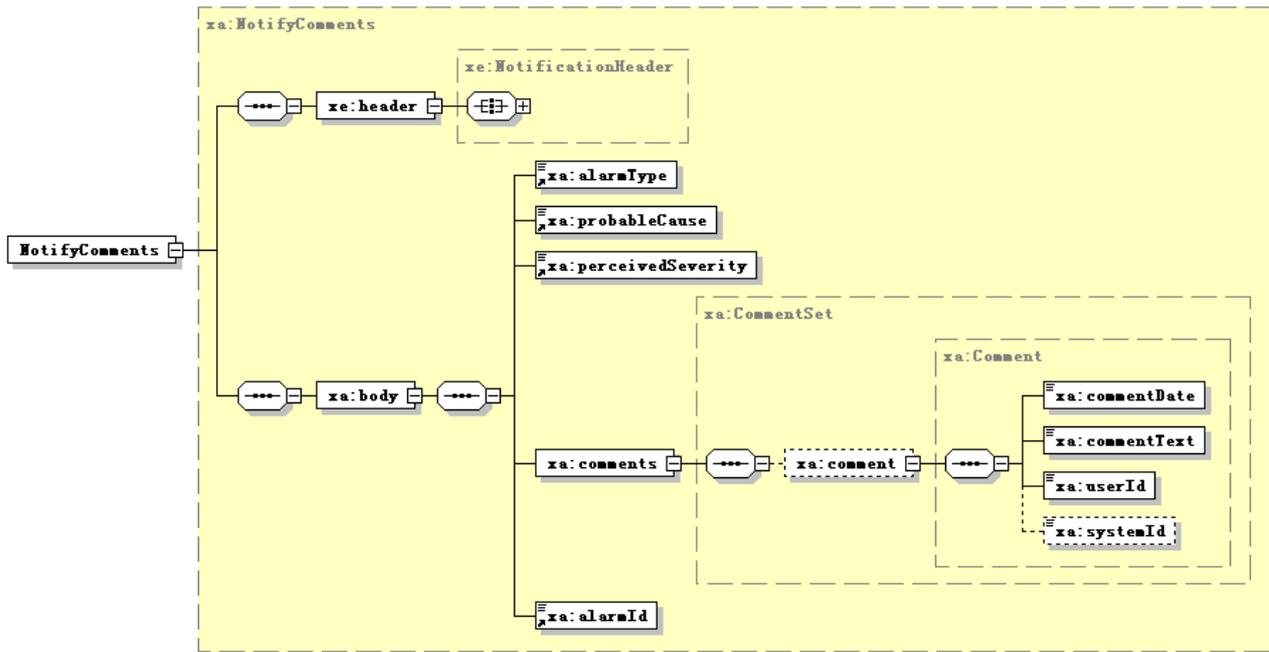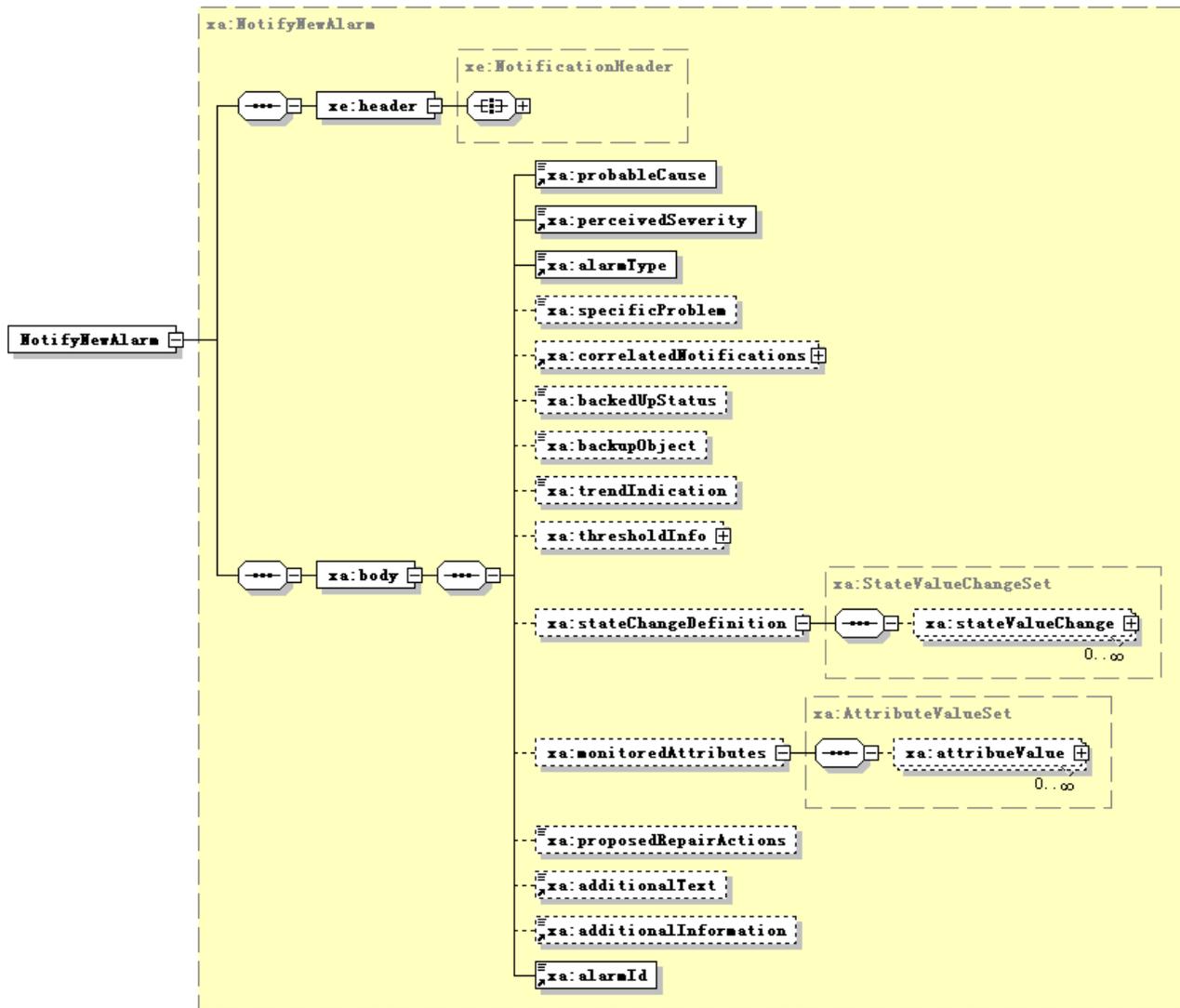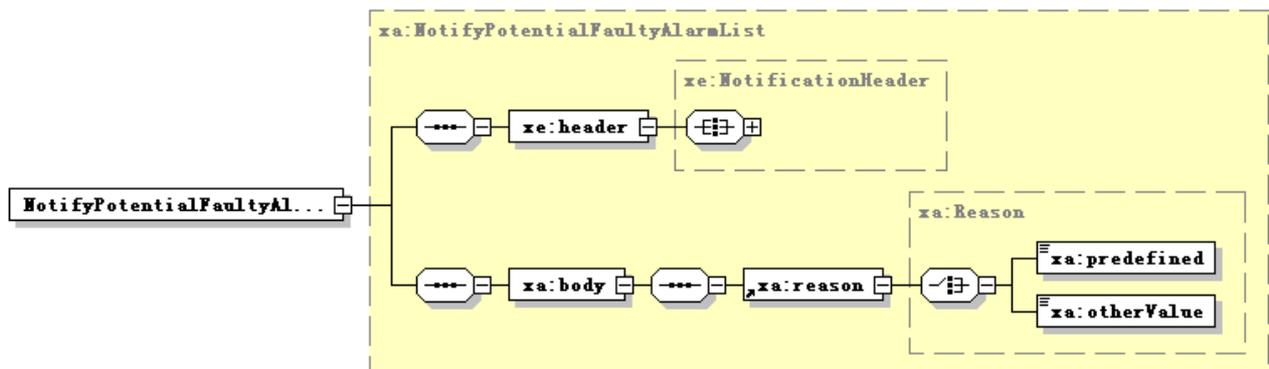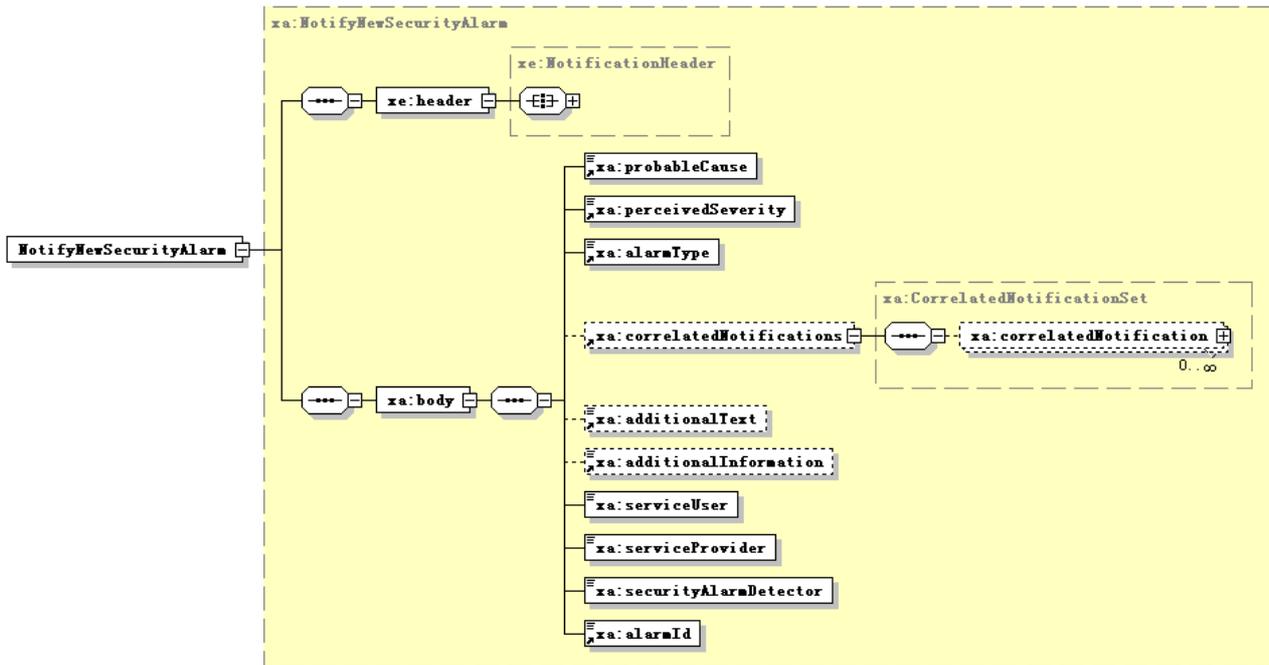
4.2 Alarm IRP XML Schema for notifications and IOCs

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!--
    3GPP TS 32.111-5 Alarm IRP XML definitions for notifications and IOCs
    alarmIRPNotifAndIOCs.xsd-->
<schema
 targetNamespace="http://www.3gpp.org/ftp/specs/archive/32_series/32.111-5#alarmIRPNotifAndIOCs"
 elementFormDefault="qualified" attributeFormDefault="unqualified"
 xmlns:xa="http://www.3gpp.org/ftp/specs/archive/32_series/32.111-5#alarmIRPNotifAndIOCs"
xmlns:xe="http://www.3gpp.org/ftp/specs/archive/32_series/32.305#notification"
 xmlns:xn="http://www.3gpp.org/ftp/specs/archive/32_series/32.625#genericNrm"
 xmlns:sm="http://www.3gpp.org/ftp/specs/archive/32_series/32.675#stateManagementIRP"
 xmlns="http://www.w3.org/2001/XMLSchema">
  <import
   namespace="http://www.3gpp.org/ftp/specs/archive/32_series/32.305#notification"/>
<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/32.675#stateManagementIRP"/>
  <!-- Type definitions -->
  <simpleType name="AckState">
    <restriction base="string">
      <enumeration value="Acknowledged"/>
      <enumeration value="Unacknowledged"/>
    </restriction>
  </simpleType>
```

```
<simpleType name="AlarmListAlignmentRequirement">
  <restriction base="string">
    <enumeration value="Alignment Required"/>
    <enumeration value="Alignment Not Required"/>
  </restriction>
</simpleType>
<simpleType name="AlarmListRebuiltReason">
  <restriction base="string">
    <enumeration value="Agent NE Communications Error"/>
    <enumeration value="Agent Restarts"/>
    <enumeration value="Indeterminate"/>
  </restriction>
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<complexType name="Reason">
    <choice>
        <element name="predefined" type="xa:AlarmListRebuiltReason"/>
        <element name="otherValue" type="string"/>
    </choice>
</complexType>
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  <restriction base="string">
    <enumeration value="Communications Alarm"/>
    <enumeration value="Processing Error Alarm"/>
    <enumeration value="Environmental Alarm"/>
    <enumeration value="Quality Of Service Alarm"/>
    <enumeration value="Equipment Alarm"/>
    <enumeration value="Integrity Violation"/>
    <enumeration value="Operational Violation"/>
    <enumeration value="Physical Violation"/>
    <enumeration value="Security Service Or Mechanism Violation"/>
    <enumeration value="Time Domain Violation"/>
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  <restriction base="string">
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    <enumeration value="Major"/>
    <enumeration value="Minor"/>
    <enumeration value="Warning"/>
    <enumeration value="Indeterminate"/>
    <enumeration value="Cleared"/>
  </restriction>
</simpleType>
<simpleType name="ProbableCause">
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    <enumeration value="Call Setup Failure"/>
    <enumeration value="Degraded Signal"/>
    <enumeration value="Far End Receiver Failure"/>
    <enumeration value="Framing Error"/>
    <enumeration value="Loss Of Frame"/>
    <enumeration value="Loss Of Pointer"/>
    <enumeration value="Loss Of Signal"/>
    <enumeration value="Payload Type Mismatch"/>
    <enumeration value="Transmission Error"/>
    <enumeration value="Remote Alarm Interface"/>
    <enumeration value="Excessive Bit Error Rate"/>
    <enumeration value="Path Trace Mismatch"/>
    <enumeration value="Unavailable"/>
    <enumeration value="Signal Label Mismatch"/>
    <enumeration value="Loss Of Multi Frame"/>
    <enumeration value="Communications Receive Failure"/>
    <enumeration value="Communications Transmit Failure"/>
    <enumeration value="Modulation Failure"/>
    <enumeration value="Demodulation Failure"/>
    <enumeration value="Back Plane Failure"/>
    <enumeration value="Data Set Problem"/>
    <enumeration value="Equipment Identifier Duplication"/>
    <enumeration value="External Device Problem"/>
    <enumeration value="Line Card Problem"/>
    <enumeration value="Multiplexer Problem"/>
    <enumeration value="NE Identifier Duplication"/>
    <enumeration value="Power Problem"/>
    <enumeration value="Processor Problem"/>
    <enumeration value="Protection Path Failure"/>
    <enumeration value="Receiver Failure"/>
    <enumeration value="Replaceable Unit Missing"/>
```

```
        <enumeration value="Replaceable Unit Type Mismatch"/>
        <enumeration value="Synchronization Source Mismatch"/>
        <enumeration value="Terminal Problem"/>
        <enumeration value="Timing Problem"/>
        <enumeration value="Transmitter Failure"/>
        <enumeration value="Trunk Card Problem"/>
        <enumeration value="Replaceable Unit Problem"/>
        <enumeration value="Real Time Clock Failure"/>
        <enumeration value="Protection Mechanism Failure"/>
        <enumeration value="Protecting Resource Failure"/>
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        <enumeration value="Air Conditioning Failure"/>
        <enumeration value="Air Dryer Failure"/>
        <enumeration value="Battery Discharging"/>
        <enumeration value="Battery Failure"/>
        <enumeration value="Commercial Power Failure"/>
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        <enumeration value="Engine Failure"/>
        <enumeration value="Fire Detector Failure"/>
        <enumeration value="Fuse Failure"/>
        <enumeration value="Generator Failure"/>
        <enumeration value="Low Battery Threshold"/>
        <enumeration value="Pump Failure"/>
        <enumeration value="Rectifier Failure"/>
        <enumeration value="Rectifier High Voltage"/>
        <enumeration value="Rectifier Low F Voltage"/>
        <enumeration value="Ventilation System Failure"/>
        <enumeration value="Enclosure Door Open"/>
        <enumeration value="Explosive Gas"/>
        <enumeration value="Fire"/>
        <enumeration value="Flood"/>
        <enumeration value="High Humidity"/>
        <enumeration value="High Temperature"/>
        <enumeration value="High Wind"/>
        <enumeration value="Ice Build Up"/>
        <enumeration value="Intrusion Detection"/>
        <enumeration value="Low Fuel"/>
        <enumeration value="Low Humidity"/>
        <enumeration value="Low Cable Pressure"/>
        <enumeration value="Low Temperature"/>
        <enumeration value="Low Water"/>
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        <enumeration value="Toxic Gas"/>
        <enumeration value="External Point Failure"/>
        <enumeration value="Storage Capacity Problem"/>
        <enumeration value="Memory Mismatch"/>
        <enumeration value="Corrupt Data"/>
        <enumeration value="Out Of CPU Cycles"/>
        <enumeration value="Software Environment Problem"/>
        <enumeration value="Software Download Failure"/>
        <enumeration value="Loss Of Real Time"/>
        <enumeration value="Reinitialized"/>
        <enumeration value="Excessive Error Rate"/>
        <enumeration value="Adapter Error"/>
        <enumeration value="Application Subsystem Failure"/>
        <enumeration value="Bandwidth Reduced"/>
        <enumeration value="Communications Protocol Error"/>
        <enumeration value="Communications Subsystem Failure"/>
        <enumeration value="Configuration Or Customizing Error"/>
        <enumeration value="Congestion"/>
        <enumeration value="CPU Cycles Limit Exceeded"/>
        <enumeration value="Data Set Or Modem Error"/>
        <enumeration value="DTE DCE Interface Error"/>
        <enumeration value="Equipment Malfunction"/>
        <enumeration value="Excessive Vibration"/>
        <enumeration value="File Error"/>
        <enumeration value="Heating Or Ventilation Or Cooling System Problem"/>
        <enumeration value="Humidity Unacceptable"/>
        <enumeration value="Input Output Device Error"/>
        <enumeration value="Input Device Error"/>
        <enumeration value="LAN Error"/>
        <enumeration value="Leak Detected"/>
        <enumeration value="Local Node Transmission Error"/>
        <enumeration value="Material Supply Exhausted"/>
        <enumeration value="Out Of Memory"/>
        <enumeration value="Output Device Error"/>
        <enumeration value="Performance Degraded"/>
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```

```
<enumeration value="Queue Size Exceeded"/>
<enumeration value="Receive Failure"/>
<enumeration value="Remote Node Transmission Error"/>
<enumeration value="Resource At Or Nearing Capacity"/>
<enumeration value="Response Time Excessive"/>
<enumeration value="Retransmission Rate Excessive"/>
<enumeration value="Software Error"/>
<enumeration value="Software Program Abnormally Terminated"/>
<enumeration value="Software Program Error"/>
<enumeration value="Temperature Unacceptable"/>
<enumeration value="Threshold Crossed"/>
<enumeration value="Toxic Leak Detected"/>
<enumeration value="Transmit Failure"/>
<enumeration value="Underlying Resource Unavailable"/>
<enumeration value="Version Mismatch"/>
<enumeration value="A BIS To BTS Interface Failure"/>
<enumeration value="A BIS To TRX Interface Failure"/>
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<enumeration value="Battery Charging Fault"/>
<enumeration value="Clock Synchronization Problem"/>
<enumeration value="Combiner Problem"/>
<enumeration value="Disk Problem"/>
<enumeration value="Excessive Receiver Temperature"/>
<enumeration value="Excessive Transmitter Output Power"/>
<enumeration value="Excessive Transmitter Temperature"/>
<enumeration value="Frequency Hopping Degraded"/>
<enumeration value="Frequency Hopping Failure"/>
<enumeration value="Frequency Redefinition Failed"/>
<enumeration value="Line Interface Failure"/>
<enumeration value="Link Failure"/>
<enumeration value="Loss Of Synchronization"/>
<enumeration value="Lost Redundancy"/>
<enumeration value="Mains Breakdown With Battery Backup"/>
<enumeration value="Mains Breakdown Without Battery Backup"/>
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<enumeration value="Receiver Antenna Fault"/>
<enumeration value="Receiver Multicoupler Failure"/>
<enumeration value="Reduced Transmitter Output Power"/>
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<enumeration value="Transcoder Problem"/>
<enumeration value="Transcoder Or Rate Adapter Problem"/>
<enumeration value="Transmitter Antenna Failure"/>
<enumeration value="Transmitter Antenna Not Adjusted"/>
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<enumeration value="File System Call Unsuccessful"/>
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<enumeration value="Invalid Pointer"/>
<enumeration value="Message Not Expected"/>
<enumeration value="Message Not Initialised"/>
<enumeration value="Message Out Of Sequence"/>
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<enumeration value="Variable Out Of Range"/>
<enumeration value="Watch Dog Timer Expired"/>
<enumeration value="Cooling System Failure"/>
<enumeration value="External Equipment Failure"/>
<enumeration value="External Power Supply Failure"/>
<enumeration value="External Transmission Device Failure"/>
<enumeration value="Reduced Alarm Reporting"/>
<enumeration value="Reduced Event Reporting"/>
<enumeration value="Recuced Logging Capability"/>
<enumeration value="System Resources Overload"/>
<enumeration value="Broadcast Channel Failure"/>
<enumeration value="Call Establishment Error"/>
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<enumeration value="Invalid MSU Received"/>
<enumeration value="LAPD Link Protocol Failure"/>
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<enumeration value="Routing Failure"/>
<enumeration value="SS7 Protocol Failure"/>
<enumeration value="Authentication Failure"/>
```

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        <enumeration value="Breach Of Confidentiality"/>
        <enumeration value="Cable Tamper"/>
        <enumeration value="Delayed Information"/>
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        <enumeration value="Duplicate Information"/>
        <enumeration value="Information Missing"/>
        <enumeration value="Information Modification Detected"/>
        <enumeration value="Information Out Of Sequence"/>
        <enumeration value="Key Expired"/>
        <enumeration value="Non Repudiation Failure"/>
        <enumeration value="Out Of Hours Activity"/>
        <enumeration value="Out Of Service"/>
        <enumeration value="Procedural Error"/>
        <enumeration value="Unauthorised Access Attempt"/>
        <enumeration value="Unexpected Information"/>
        <enumeration value="Unspecified Reason"/>
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      <restriction base="string">
        <enumeration value="Up"/>
        <enumeration value="Down"/>
      </restriction>
    </simpleType>
    <simpleType name="TrendIndicator">
      <restriction base="string">
        <enumeration value="Less Severe"/>
        <enumeration value="No Change"/>
        <enumeration value="More Severe"/>
      </restriction>
    </simpleType>
    <element name="reason" type="xa:Reason"/>
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    </complexType>
    <complexType name="AttributeValueSet">
      <sequence>
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    <complexType name="AttributeValueChange">
      <sequence>
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maxOccurs="unbounded"/>
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        <enumeration value="Administrative State"/>
        <enumeration value="Alarm Status"/>
        <enumeration value="Procedural Status"/>
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        <enumeration value="Control Status"/>
        <enumeration value="Standby Status"/>
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      </restriction>
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      <element name="operationalState" type="sm:operationalStateType"/>
      <element name="usageState" type="sm:usageStateType"/>
      <element name="administrativeState" type="sm:administrativeStateType"/>
      <element name="alarmStatus" type="sm:alarmStatusType"/>
      <element name="proceduralStatus" type="sm:proceduralStatusType"/>
      <element name="availabilityStatus" type="sm:availabilityStatusType"/>
      <element name="controlStatus" type="sm:controlStatusType"/>
      <element name="standbyStatus" type="sm:standbyStatusType"/>
      <element name="unknownStatus" type="sm:unknownStatusType"/>
    </choice>
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     <element ref="xa:commentSystemId" minOccurs="0"/>
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  </complexType>
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    <sequence>
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  </complexType>
  <complexType name="CorrelatedNotification">
    <sequence>
     <element name="source" type="xn:dn"/>
     <element name="notificationIdSet">
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maxOccurs="unbounded"/>
         </sequence>
       </complexType>
     </element>
    </sequence>
  </complexType>
  <complexType name="CorrelatedNotificationSet">
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     <element ref="xa:correlatedNotification" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
  </complexType>
  <simpleType name="NotificationType">
    <restriction base="string">
       <enumeration value="notifyNewAlarm"/>
       <enumeration value="notifyChangedAlarm"/>
       <enumeration value="notifyClearedAlarm"/>
    </restriction>
  </simpleType>
  <complexType name="NotificationIdSet">
    <sequence>
       <element name="notificationId" type="xe:NotificationId" minOccurs="0"
maxOccurs="unbounded"/>
    </sequence>
  </complexType>
  <complexType name="ThresholdInfo">
    <sequence>
     <element name="attributeId" type="string"/>
     <element name="observedValue" type="float"/>
     <element name="thresholdLevel" type="xa:ThresholdLevel" minOccurs="0"/>
     <element name="armTime" type="dateTime"/>
    </sequence>
  </complexType>
  <complexType name="ThresholdLevel">
    <sequence>
     <element name="indication" type="xa:ThresholdIndicator"/>
     <element name="low" type="float" minOccurs="0"/>
     <element name="high" type="float"/>
    </sequence>
  </complexType>
  <complexType name="NotifyAckStateChanged">
    <complexContent>
```

```
          <extension base="xe:Notification">
            <sequence>
              <element name="body">
                <complexType>
                  <sequence>
                    <element ref="xa:probableCause"/>
                    <element ref="xa:perceivedSeverity"/>
                    <element ref="xa:alarmType"/>
                    <element ref="xa:alarmId"/>
                    <element ref="xa:ackState"/>
                    <element ref="xa:ackUserId"/>
                    <element ref="xa:ackSystemId" minOccurs="0"/>
                  </sequence>
                </complexType>
              </element>
            </sequence>
          </extension>
        </complexContent>
      </complexType>
      <complexType name="NotifyAlarmListRebuilt">
        <complexContent>
          <extension base="xe:Notification">
            <sequence>
              <element name="body">
                <complexType>
                  <sequence>
                    <element ref="xa:reason"/>
                    <element name="alarmListAlignmentRequirement"
                                  type="xa:AlarmListAlignmentRequirement" minOccurs="0"/>
                  </sequence>
                </complexType>
              </element>
            </sequence>
          </extension>
        </complexContent>
      </complexType>
      <complexType name="NotifyChangedAlarm">
        <complexContent>
          <extension base="xe:Notification">
            <sequence>
              <element name="body">
                <complexType>
                  <sequence>
                    <element ref="xa:probableCause"/>
                    <element ref="xa:perceivedSeverity"/>
                    <element ref="xa:alarmType"/>
                    <element ref="xa:alarmId"/>
                  </sequence>
                </complexType>
              </element>
            </sequence>
          </extension>
        </complexContent>
      </complexType>
      <complexType name="NotifyClearedAlarm">
        <complexContent>
          <extension base="xe:Notification">
            <sequence>
              <element name="body">
                <complexType>
                  <sequence>
                    <element ref="xa:probableCause"/>
                    <element ref="xa:perceivedSeverity"/>
                    <element ref="xa:alarmType"/>
                    <element ref="xa:alarmId"/>
                    <element ref="xa:correlatedNotifications" minOccurs="0"/>
                    <element ref="xa:clearUserId" minOccurs="0"/>
                    <element ref="xa:clearSystemId" minOccurs="0"/>
                  </sequence>
                </complexType>
              </element>
            </sequence>
          </extension>
        </complexContent>
      </complexType>
      <complexType name="NotifyComments">
        <complexContent>
          <extension base="xe:Notification">
```

```
          <sequence>
            <element name="body">
              <complexType>
                <sequence>
                  <element ref="xa:alarmType"/>
                  <element ref="xa:probableCause"/>
                  <element ref="xa:perceivedSeverity"/>
                  <element ref="xa:comments"/>
                  <element ref="xa:alarmId"/>
                </sequence>
              </complexType>
            </element>
          </sequence>
        </extension>
      </complexContent>
    </complexType>
    <complexType name="NotifyNewAlarm">
      <complexContent>
        <extension base="xe:Notification">
          <sequence>
            <element name="body">
              <complexType>
                <sequence>
                  <element ref="xa:probableCause"/>
                  <element ref="xa:perceivedSeverity"/>
                  <element ref="xa:alarmType"/>
                  <element ref="xa:alarmId"/>
                  <element ref="xa:specificProblem" minOccurs="0"/>
                  <element ref="xa:correlatedNotifications" minOccurs="0"/>
                  <element ref="xa:backedUpStatus" minOccurs="0"/>
                  <element name="backupObject" type="xn:dn" minOccurs="0"/>
                  <element ref="xa:trendIndication" minOccurs="0"/>
                  <element ref="xa:thresholdInfo" minOccurs="0"/>
                  <element ref="xa:stateChangeDefinition" minOccurs="0"/>
                  <element ref="xa:monitoredAttributes" minOccurs="0"/>
                  <element ref="xa:proposedRepairActions" minOccurs="0"/>
                  <element ref="xa:additionalText" minOccurs="0"/>
                  <element ref="xa:additionalInformation" minOccurs="0"/>
                </sequence>
              </complexType>
            </element>
          </sequence>
        </extension>
      </complexContent>
    </complexType>
    <complexType name="NotifyNewSecurityAlarm">
      <complexContent>
        <extension base="xe:Notification">
          <sequence>
            <element name="body">
              <complexType>
                <sequence>
                  <element ref="xa:probableCause"/>
                  <element ref="xa:perceivedSeverity"/>
                  <element ref="xa:alarmType"/>
                  <element ref="xa:serviceUser" minOccurs="0"/>
                  <element ref="xa:serviceProvider" minOccurs="0"/>
                  <element ref="xa:securityAlarmDetector"/>
                  <element ref="xa:alarmId"/>
                  <element ref="xa:correlatedNotifications" minOccurs="0"/>
                  <element ref="xa:additionalText" minOccurs="0"/>
                  <element ref="xa:additionalInformation" minOccurs="0"/>
                </sequence>
              </complexType>
            </element>
          </sequence>
        </extension>
      </complexContent>
    </complexType>
    <complexType name="NotifyPotentialFaultyAlarmList">
      <complexContent>
        <extension base="xe:Notification">
          <sequence>
            <element name="body">
              <complexType>
                <sequence>
                  <element ref="xa:reason"/>
                </sequence>
```

```
                </complexType>
              </element>
            </sequence>
          </extension>
        </complexContent>
      </complexType>
      <!-- Notification definitions -->
      <element name="NotifyAckStateChanged" type="xa:NotifyAckStateChanged"/>
      <element name="NotifyAlarmListRebuilt" type="xa:NotifyAlarmListRebuilt"/>
      <element name="NotifyChangedAlarm" type="xa:NotifyChangedAlarm"/>
      <element name="NotifyClearedAlarm" type="xa:NotifyClearedAlarm"/>
      <element name="NotifyComments" type="xa:NotifyComments"/>
      <element name="NotifyNewAlarm" type="xa:NotifyNewAlarm"/>
      <element name="NotifyNewSecurityAlarm" type="xa:NotifyNewSecurityAlarm"/>
      <element name="NotifyPotentialFaultyAlarmList" type="xa:NotifyPotentialFaultyAlarmList"/>
        <!-- Attributes of the AlarmInformation IOC -->
        <element name="alarmId" type="string"/>
        <element name="alarmRaisedTime" type="dateTime"/>
        <element name="alarmClearedTime" type="dateTime"/>
        <element name="alarmChangedTime" type="dateTime"/>
        <element name="eventType" type="xa:EventType"/>
        <element name="alarmType" substitutionGroup="xa:eventType"/>
        <element name="probableCause" type="xa:ProbableCause"/>
        <element name="perceivedSeverity" type="xa:PerceivedSeverity"/>
        <element name="specificProblem" type="string"/>
        <element name="backedUpStatus" type="boolean"/>
        <element name="trendIndication" type="xa:TrendIndicator"/>
        <element name="thresholdInfo" type="xa:ThresholdInfo"/>
        <element name="stateChangeDefinition" type="xa:StateValueChangeSet"/>
        <element name="monitoredAttributes" type="xa:AttributeValueSet"/>
        <element name="proposedRepairActions" type="string"/>
        <element name="additionalText" type="string"/>
        <element name="additionalInformation" type="string"/>
        <element name="ackTime" type="dateTime"/>
        <element name="ackUserId" type="string"/>
        <element name="ackSystemId" type="string"/>
        <element name="ackState" type="xa:AckState"/>
        <element name="clearUserId" type="string"/>
        <element name="clearSystemId" type="string"/>
        <element name="serviceUser" type="string"/>
        <element name="serviceProvider" type="string"/>
        <element name="securityAlarmDetector" type="string"/>
        <!-- AlarmList IOC entity for alarms not related to security -->
        <element name="AlarmListNonSecurityAlarms">
            <complexType>
                <sequence minOccurs="0" maxOccurs="unbounded">
                    <element name="notificationType" type="xa:NotificationType"/>
                    <element ref="xa:alarmType"/>
                    <element ref="xa:objectClass"/>
                    <element ref="xa:objectInstance"/>
                    <element name="notificationId" type="xe:NotificationId" minOccurs="0"/>
                    <element name="eventTime" type="dateTime"/>
                    <element ref="xn:systemDN" minOccurs="0"/>
                    <element ref="xa:alarmId"/>
                    <element ref="xa:alarmRaisedTime"/>
                    <element ref="xa:alarmClearedTime"/>
                    <element ref="xa:probableCause"/>
                    <element ref="xa:perceivedSeverity"/>
                    <element ref="xa:specificProblem" minOccurs="0"/>
                    <element ref="xa:backedUpStatus" minOccurs="0"/>
                    <element ref="xa:trendIndication" minOccurs="0"/>
                    <element ref="xa:thresholdInfo" minOccurs="0"/>
                    <element ref="xa:stateChangeDefinition" minOccurs="0"/>
                    <element ref="xa:monitoredAttributes" minOccurs="0"/>
                    <element ref="xa:proposedRepairActions" minOccurs="0"/>
                    <element ref="xa:additionalText" minOccurs="0"/>
                    <element ref="xa:additionalInformation" minOccurs="0"/>
                    <element ref="xa:ackTime"/>
                    <element ref="xa:ackUserId"/>
                    <element ref="xa:ackSystemId" minOccurs="0"/>
                    <element ref="xa:ackState"/>
                    <element ref="xa:clearUserId" minOccurs="0"/>
                    <element ref="xa:clearSystemId" minOccurs="0"/>
                    <element name="backUpObject" type="xn:dn" minOccurs="0"/>
                    <element ref="xa:correlatedNotifications" minOccurs="0"/>
                    <element ref="xa:comments"/>
                </sequence>
            </complexType>
```

```
            </element>
        <!-- AlarmList IOC entity for alarms related to security -->
        <element name="AlarmListSecurityAlarms">
            <complexType>
                <sequence minOccurs="0" maxOccurs="unbounded">
                    <element name="notificationType" type="xa:NotificationType"/>
                    <element ref="xa:alarmType"/>
                    <element ref="xa:objectClass"/>
                    <element ref="xa:objectInstance"/>
                    <element name="notificationId" type="xe:NotificationId" minOccurs="0"/>
                    <element name="eventTime" type="dateTime"/>
                    <element ref="xn:systemDN" minOccurs="0"/>
                    <element ref="xa:alarmId"/>
                    <element ref="xa:alarmRaisedTime"/>
                    <element ref="xa:alarmClearedTime"/>
                    <element ref="xa:probableCause"/>
                    <element ref="xa:perceivedSeverity"/>
                    <element ref="xa:specificProblem" minOccurs="0"/>
                    <element ref="xa:additionalText" minOccurs="0"/>
                    <element ref="xa:additionalInformation" minOccurs="0"/>
                    <element ref="xa:ackTime"/>
                    <element ref="xa:ackUserId"/>
                    <element ref="xa:ackSystemId" minOccurs="0"/>
                    <element ref="xa:ackState"/>
                    <element ref="xa:clearUserId" minOccurs="0"/>
                    <element ref="xa:clearSystemId" minOccurs="0"/>
                    <element ref="xa:correlatedNotifications" minOccurs="0"/>
                    <element ref="xa:comments"/>
                    <element ref="xa:serviceUser"/>
                    <element ref="xa:serviceProvider"/>
                    <element ref="xa:securityAlarmDetector"/>
                </sequence>
            </complexType>
        </element>
        <!-- Attributes of the Comment IOC -->
        <element name="commentTime" type="dateTime"/>
        <element name="commentText" type="string"/>
        <element name="commentUserId" type="string"/>
        <element name="commentSystemId" type="string"/>
        <!-- A list of comment IOC instances -->
        <element name="comments" type="xa:CommentSet"/>
        <!-- Attributes of the CorrelatedNotification IOC -->
        <element name="source" type="xn:dn"/>
        <element name="notificationIdSet" type="xa:NotificationIdSet"/>
        <!-- A correlatedNotification IOC instance -->
        <element name="correlatedNotification" type="xa:CorrelatedNotification"/>
        <!-- A set of correlatedNotification IOC instance -->
        <element name="correlatedNotifications" type="xa:CorrelatedNotificationSet"/>
        <!-- MonitoredEntity IOC attributes; inherits from Top in order to obtain NRM IOC properties -->
        <element name="objectClass" type="string"/>
        <element name="objectInstance" type="xn:dn"/>
</schema>
```

Annex A (informative):
XML schema electronic files

The electronic files corresponding to the 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/32.111-5/schema/32111-5-800-XMLSchema.zip

Annex B (informative):
Change history

Change history								
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Cat	Old	New
Dec 2004	SA_26	SP-040792	--	--	Submitted to TSG SA#26 for Information	--	1.0.0	
Mar 2005	SA_27	SP-050022	--	--	Submitted to TSG SA#27 for Approval	--	2.0.0	6.0.0
Jun 2005	SA_28	SP-050283	0001	--	Align with 32.335	F	6.0.0	6.1.0
Jun 2006	SA_32	SP-060250	0002	--	Align XML schema with content of notifications - Align with 32.111-2 Information Service (IS)	F	6.1.0	6.2.0
Mar 2007	SA_35	SP-070035	0003	--	Correct XML schema	F	6.2.0	6.3.0
Jun 2007	SA_36	--	--	--	Automatic upgrade to Rel-7 (no CR) at freeze of Rel-7. Added to "Scope" the IS-SS relationship text. Cleaned-up references.	--	6.3.0	7.0.0
Sep 2007	--	--	--	--	Corrected URL in Annex A (informative): XML schema electronic files	--	7.0.0	7.0.1
Dec 2008	SA_42	SP-080846	0004	--	XML definition updates due to creation of SOAP SS	B	7.0.1	8.0.0

History

Document history		
V8.0.0	January 2009	Publication