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ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.741.2
Amendment 1
(11/2013)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS
IPTV multimedia services and applications for IPTV –
IPTV application event handling

IPTV application event handling: Data structures of
audience measurement for IPTV services

**Amendment 1: New Appendix I with XML
schema on the data structures of audience
measurement for IPTV services**

Recommendation ITU-T H.741.2 (2012) –
Amendment 1



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Recommendation ITU-T H.741.2

IPTV application event handling: Data structures of audience measurement for IPTV services

Amendment 1

New Appendix I with XML schema on the data structures of audience measurement for IPTV services

Summary

The ITU-T H.741.x series of Recommendations defines a foundational platform for audience measurement (AM) of IPTV services. They focus on the interface between terminal devices and an audience measurement aggregation function.

The AM platform integrates a method for end users to report personal information, and is designed to easily add time-shifted and interactive services, and non-terminal device measurement points. While the ITU-T H.741.x series allows the implementation of audience measurement for IPTV services, its mechanism may be equally applicable to non-IPTV services.

The design philosophy in the ITU-T H.741.x series is focused on scalability, minimizing the use of resources, security, flexibility to support a variety of service provider deployments, and rich privacy support to meet emerging regulations and legislation.

Recommendation ITU-T H.741.2 specifies the data elements and structures of the payloads used in audience measurement messages.

Amendment 1 adds an XML schema on the data structures of audience measurement for IPTV services.

History

| Edition | Recommendation | Approval | Study Group | Unique ID ¹ |
|---------|-----------------------------|------------|-------------|---|
| 1.0 | ITU-T H.741.2 | 2012-06-29 | 16 | 11.1002/1000/11661-en |
| 1.1 | ITU-T H.741.2 (2012) Amd. 1 | 2013-11-08 | 16 | 11.1002/1000/12066-en |

Keywords

Audience measurement, audience rating service, audience viewership, contents rating, data structures, distributed content service, end-user permission, engagement metrics, interactive services, IPTV application event handling, IPTV service, linear TV, metadata, monitoring, personalized service, privacy protection, XML schema.

¹ To access the Recommendation, type into the address line on the web browser the URL <http://handle.itu.int/> followed by the unique ID, for example <http://handle.itu.int/11.1002/1000/11830-en>.

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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Recommendation ITU-T H.741.2

IPTV application event handling: Data structures of audience measurement for IPTV services

Amendment 1

New Appendix I with XML schema on the data structures of audience measurement for IPTV services

Modifications introduced by this amendment are shown in revision marks. Unchanged text is replaced by ellipsis (...). Some parts of unchanged texts (clause numbers, etc.) may be kept to indicate the correct insertion points.

...

6 Data elements and structures for audience measurement

This clause specifies the data elements used in audience measurement in terms of identifying name, format, values, and in some cases defaults and/or privacy classification. Data elements may be newly defined or are re-used from other sources. This clause also defines data structures in terms of relationships among the data elements. The data structures are defined for use in messages between a terminal device audience measurement function (TD-AMF) and aggregation functions, and for information to be provided to a TD-AMF independently of those messages. Data structures are defined for messages for unicast and multicast delivery.

The notation is used in the following tables to facilitate the specification of the corresponding schema:

- *Support*: 1 = mandatory (one instance), 0-1 = optional (maximum one instance), 0-* = (optional and multiple instances possible), 1-* = mandatory and multiple instances possible).
- *Type*: string, integer, float, etc.
- *Container* elements are defined to group associated elements.

In the following tables containing data structures, an alternative representation may be shown which illustrates the data structure. In the event of discrepancy between an alternative representation and the previous table, the correct information is to be found in the table.

Data types used in clause 6.1 are shown in Table 1.

An XML schema that can be exchanged for IPTV services is found in Appendix I.

...

```
AMReportPackage (1)
| SubscriberID (0-1)
| TerminalDeviceID (1)
|     StorageCongestionImpactedService (0-*) [
ServiceStopDropped (0-1) ]
| MeasurementReport (1-*)
```

Figure 22 – Alternative representation of AMReportPackage data structure

Appendix I

XML schema on the data structures of audience measurement for IPTV services

(This appendix does not form an integral part of this Recommendation.)

This is the XML schema that can be exchanged for IPTV services.

```
<?xml version="1.0" encoding="UTF-8"?>
<schema xmlns:am2="urn:itut:iptv:am:part2:2012"
xmlns:mpeg7="urn:mpeg:mpeg7:schema:2004"
xmlns:ca="urn:ietf:params:xml:ns:pidf:geopriv10:civicAddr"
xmlns:gml="http://www.opengis.net/gml"
xmlns="http://www.w3.org/2001/XMLSchema"
targetNamespace="urn:itut:iptv:am:part2:2012" elementFormDefault="qualified"
attributeFormDefault="unqualified">
  <annotation>
    <documentation xml:lang="en"><![CDATA[
      This schema (H.741.2-v1.xsd) is the ITU-T H.741 Part.2 Metadata,
      Version 1 (for H.741.2-201206.doc).
      The namespace of the schema is "urn:itut:iptv:am:part2:2012", and
      its preferred namespace prefix is "am2".]]></documentation>
    </annotation>
    <import namespace="http://www.w3.org/XML/1998/namespace"
      schemaLocation="http://www.w3.org/2001/03/xml.xsd"/>
    <import namespace="urn:mpeg:mpeg7:schema:2004" schemaLocation="mpeg7-
      mds.xsd"/>
    <import namespace="urn:ietf:params:xml:ns:pidf:geopriv10:civicAddr"
      schemaLocation="rfc5139.xsd"/>
    <import namespace="http://www.opengis.net/gml"
      schemaLocation="./gml/2.1.2/gml.xsd"/>

    <!-- ===== -->
    <!-- ===== -->
    <!-- Primitive Data Types for H.741 Part.2 -->
    <!-- ===== -->
    <!-- ===== -->
    <simpleType name="NonEmptyString">
      <restriction base="string">
        <minLength value="1"/>
      </restriction>
    </simpleType>
    <complexType name="PointType">
      <complexContent>
        <extension base="gml:PointType"/>
      </complexContent>
    </complexType>
    <simpleType name="XPath">
      <restriction base="mpeg7:xPathRefType"/>
      <!-- Defined in MPEG-7 MDS. -->
    </simpleType>
    <complexType name="CivicAddr">
      <complexContent>
        <extension base="ca:civicAddress"/>
      </complexContent>
      <!-- Defined in IETF RFC 5139. -->
    </complexType>
    <simpleType name="URL">
      <restriction base="anyURI"/>
    </simpleType>
```

```

<simpleType name="IpAddressType">
  <restriction base="string">
    <pattern value="((1?[0-9]?[0-9]|2[0-4][0-9]|25[0-5])\.){3}(1?[0-9]?[0-9]|2[0-4][0-9]|25[0-5])"/>
  </restriction>
  <!-- Defined in "ATIS-0800026.xsd". -->
</simpleType>
<simpleType name="IIFIDType">
  <restriction base="string">
    <whiteSpace value="collapse"/>
  </restriction>
  <!-- Defined in "ATIS-0800026.xsd". -->
</simpleType>
<simpleType name="H770IDType">
  <union memberTypes="am2:IIFIDType am2:IpAddressType"/>
  <!-- Defined in ITU-T MDS. -->
</simpleType>
<!-- ===== -->
<simpleType name="HexBinary6">
  <restriction base="hexBinary">
    <maxLength value="6"/>
  </restriction>
</simpleType>
<simpleType name="HexBinary8">
  <restriction base="hexBinary">
    <maxLength value="8"/>
  </restriction>
</simpleType>
<simpleType name="HexBinary16">
  <restriction base="hexBinary">
    <maxLength value="16"/>
  </restriction>
</simpleType>
<simpleType name="PercentageType">
  <restriction base="float">
    <minInclusive value="0.0"/>
    <maxInclusive value="100.0"/>
  </restriction>
</simpleType>
<simpleType name="NumOfDaysType">
  <restriction base="positiveInteger"/>
</simpleType>
<simpleType name="NumOfSecondsType">
  <restriction base="positiveInteger"/>
</simpleType>
<simpleType name="NumOfSecondsWithZeroType">
  <restriction base="nonNegativeInteger"/>
</simpleType>
<complexType name="LanguageType">
  <attribute ref="xml:lang" use="optional"/>
</complexType>
<complexType name="ResolutionType">
  <attribute name="width" type="positiveInteger" use="required"/>
  <attribute name="height" type="positiveInteger" use="required"/>
</complexType>
<complexType name="TimeWindowOfTheDayType">
  <attribute name="startTime" type="time" use="optional"/>
  <attribute name="endTime" type="time" use="optional"/>
</complexType>
<complexType name="TimeWindowOfTheDayWithDefaultValueType">
  <attributeGroup ref="am2:TimeWindowOfTheDayWithDefaultValue"/>
</complexType>
<attributeGroup name="TimeWindowOfTheDayWithDefaultValue">

```

```

        <attribute name="startTime" type="time" use="optional"
default="00:00:00.00"/>
        <attribute name="endTime" type="time" use="optional"
default="23:59:59.99"/>
    </attributeGroup>
    <!-- ===== -->
    <simpleType name="AnonUserIDType">
        <list itemType="am2:AnonUserIDType"/>
    </simpleType>
    <simpleType name="AnonUserIDType">
        <restriction base="positiveInteger"/>
    </simpleType>
    <simpleType name="UserIDType">
        <list itemType="am2:UserIDType"/>
    </simpleType>
    <simpleType name="UserIDType">
        <restriction base="am2:NonEmptyString"/>
    </simpleType>
    <simpleType name="MeasurementRequestIDType">
        <list itemType="am2:MeasurementRequestIDType"/>
    </simpleType>
    <simpleType name="MeasurementRequestIDType">
        <restriction base="positiveInteger"/>
    </simpleType>
    <simpleType name="ServiceInstanceIDType">
        <restriction base="integer"/>
    </simpleType>
    <simpleType name="TerminalDeviceIDType">
        <restriction base="am2:HexBinary16"/>
    </simpleType>
    <simpleType name="SubscriberIDType">
        <restriction base="am2:NonEmptyString"/>
    </simpleType>
    <simpleType name="PackageIDType">
        <restriction base="positiveInteger"/>
    </simpleType>
    <!-- ===== -->
    <!-- ===== -->
    <!-- Data Elements for H.741 Part.2 -->
    <!-- ===== -->
    <!-- ===== -->
    <!-- User Device Information (Tables 2,5,6) -->
    <!-- ===== -->
    <complexType name="UserDeviceInformationType">
        <sequence>
            <element name="AMFCapabilityProfile"
type="am2:AMFCapabilityProfileType" minOccurs="0"/>
            <element name="CaptionLanguage" type="am2:LanguageType"/>
            <element name="AudioLanguage" type="am2:LanguageType"/>
            <element name="TVInformation"
type="am2:TVandAudioAmplifierInformationType" minOccurs="0"/>
            <element name="IPTV-TVInformation"
type="am2:DeviceInformationBaseType" minOccurs="0"/>
            <element name="AudioAmplifierInformation"
type="am2:TVandAudioAmplifierInformationType" minOccurs="0"/>
            <element name="STBInformation"
type="am2:DeviceInformationBaseType" minOccurs="0"/>
            <element name="MobileDeviceInformation"
type="am2:DeviceInformationBaseType" minOccurs="0"/>
            <element name="PCInformation" type="am2:DeviceInformationBaseType"
minOccurs="0"/>
            <element name="ImageSize" type="am2:ResolutionType"
minOccurs="0"/>
            <element name="ZoomFactor" type="float" minOccurs="0"/>

```

```

        <element name="Obscuration" type="am2:PercentageType"
minOccurs="0"/>
        <element name="VolumeDirection" type="am2:VolumeDirectionType"
minOccurs="0"/>
        <element name="ControlDevice" type="am2:ControlDeviceType"
minOccurs="0"/>
    </sequence>
    <attribute name="serviceInstanceId" type="am2:ServiceInstanceIDType"
use="required"/>
</complexType>
<!-- ===== -->
<complexType name="AMFCapabilityProfileType">
    <sequence>
        <element name="TransportCapabilitiesList"
type="am2:TransportCapabilitiesListType"/>
        <element name="SecurityCapabilities"
type="am2:SecurityCapabilitiesType"/>
        <element name="PermissionOperationModes"
type="am2:PermissionOperationModesType"/>
        <element name="ConfigurationPackageDelivery"
type="am2:ConfigurationPackageDeliveryType"/>
        <element name="MeasurementTriggerMethod"
type="am2:MeasurementTriggerMethodType"/>
        <element name="ReportDeliveryModes"
type="am2:ReportDeliveryModesType"/>
        <element name="OperationalManagementCapabilities"
type="am2:OperationalManagementCapabilitiesType"/>
        <element name="Compression" type="am2:CompressionType"
minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
</complexType>
<complexType name="TransportCapabilitiesListType">
    <sequence>
        <element name="TransportProtocolMode"
type="am2:TransportProtocolModeType" maxOccurs="unbounded"/>
    </sequence>
</complexType>
<simpleType name="TransportProtocolModeType">
    <restriction base="NMTOKEN"/>
    <!-- Values are out of scope of AM. -->
</simpleType>
<complexType name="SecurityCapabilitiesType">
    <sequence>
        <element name="CryptographicProtocol"
type="am2:CryptographicProtocolType" maxOccurs="unbounded"/>
    </sequence>
</complexType>
<simpleType name="CryptographicProtocolType">
    <restriction base="NMTOKEN">
        <enumeration value="TLS"/>
        <enumeration value="TLS-SRP"/>
        <enumeration value="OTP"/>
        <enumeration value="HMAC"/>
    </restriction>
</simpleType>
<complexType name="PermissionOperationModesType">
    <sequence>
        <element name="PermissionMode" type="am2:PermissionModeType"
maxOccurs="unbounded"/>
    </sequence>
</complexType>
<simpleType name="PermissionModeType">
    <restriction base="NMTOKEN">
        <enumeration value="External"/>

```

```

        <enumeration value="Internal"/>
        <enumeration value="Hybrid"/>
    </restriction>
</simpleType>
<complexType name="ConfigurationPackageDeliveryType">
    <sequence>
        <element name="ConfigurationMode" type="am2:ConfigurationModeType"
maxOccurs="unbounded"/>
    </sequence>
</complexType>
<simpleType name="ConfigurationModeType">
    <restriction base="NMTOKEN">
        <enumeration value="Push"/>
        <enumeration value="Pull"/>
        <enumeration value="Hybrid"/>
    </restriction>
</simpleType>
<complexType name="MeasurementTriggerMethodType">
    <sequence>
        <element name="EventTrigger"
type="am2:CommonEventForTriggerMethodType" minOccurs="0" maxOccurs="unbounded"/>
        <element name="TimeTrigger"
type="am2:CommonSampleSetForTriggerMethodType" minOccurs="0"
maxOccurs="unbounded"/>
        <element name="ServiceStartTrigger"
type="am2:LimitedSampleSetForTriggerMethodType" minOccurs="0"
maxOccurs="unbounded"/>
        <!-- The element name "TimeSampleTrigger" is changed into
"TimeTrigger" in order to maintain consistency. (see the element "TimeTrigger"
of the type "MeasurementScheduleType") -->
    </sequence>
</complexType>
<complexType name="CommonEventForTriggerMethodType">
    <attribute name="eventName" type="am2:CommonEventNameType"
use="optional"/>
    <!-- The attribute "eventName" is newly added in order to maintain
consistency. (see the element "EventTrigger" of the type
"MeasurementScheduleType") -->
    <!-- The "use" definition of the attribute "eventName" should be
"required" according to the spec, but the value is set as "optional" for type
extension (based on restriction) in the part 3 schema. -->
</complexType>
<complexType name="CommonSampleSetForTriggerMethodType">
    <attribute name="sampleSetName" type="am2:CommonSampleSetNameType"
use="optional"/>
    <!-- The attribute "sampleSetName" is newly added in order to maintain
consistency. (see the element "TimeTrigger" of the type
"MeasurementScheduleType") -->
    <!-- The "use" definition of the attribute "sampleSetName" should be
"required" according to the spec, but the value is set as "optional" for type
extension (based on restriction) in the part 3 schema. -->
</complexType>
<complexType name="LimitedSampleSetForTriggerMethodType">
    <attribute name="sampleSetName" type="am2:LimitedSampleSetNameType"
use="optional"/>
    <!-- The attribute "sampleSetName" is newly added in order to maintain
consistency. (see the element "ServiceStartTrigger" of the type
"MeasurementScheduleType") -->
    <!-- The "use" definition of the attribute "sampleSetName" should be
"required" according to the spec, but the value is set as "optional" for type
extension (based on restriction) in the part 3 schema. -->
</complexType>
<simpleType name="CommonEventNameType">
    <restriction base="NMTOKEN">

```

```

        <enumeration value="VideoResize"/>
        <enumeration value="VideoZoom"/>
        <enumeration value="VideoObscure"/>
        <enumeration value="AudioVolume"/>
        <enumeration value="ConfigurationChange"/>
        <enumeration value="UserChange"/>
        <enumeration value="UserInfoChange"/>
        <enumeration value="AudioLanguageChange"/>
        <enumeration value="CaptionLanguageChange"/>
        <enumeration value="DisplayStatus"/>
    </restriction>
</simpleType>
<simpleType name="CommonSampleSetNameType">
    <restriction base="NMTOKEN">
        <enumeration value="UserPresent"/>
        <enumeration value="TDLocation"/>
        <enumeration value="DeviceInfo"/>
        <enumeration value="UserBioInfo"/>
        <enumeration value="GenericUserInfo"/>
        <enumeration value="EventCount"/>
        <enumeration value="UserList"/>
        <enumeration value="PermitBlockedInfo"/>
    </restriction>
</simpleType>
<simpleType name="LimitedSampleSetNameType">
    <restriction base="am2:CommonSampleSetNameType">
        <enumeration value="TDLocation"/>
        <enumeration value="DeviceInfo"/>
        <enumeration value="UserBioInfo"/>
        <enumeration value="GenericUserInfo"/>
        <enumeration value="UserList"/>
        <enumeration value="PermitBlockedInfo"/>
    </restriction>
</simpleType>
<complexType name="ReportDeliveryModesType">
    <sequence>
        <element name="DeliveryMode" type="am2:DeliveryModeType"
maxOccurs="unbounded"/>
    </sequence>
</complexType>
<simpleType name="DeliveryModeType">
    <restriction base="NMTOKEN">
        <enumeration value="ImmediatePush"/>
        <enumeration value="DelayedPush"/>
        <enumeration value="Pull"/>
        <enumeration value="DelayedPushAndPull"/>
    </restriction>
</simpleType>
<complexType name="OperationalManagementCapabilitiesType">
    <sequence>
        <element name="OperationalManagement"
type="am2:OperationalManagementType" maxOccurs="unbounded"/>
    </sequence>
</complexType>
<simpleType name="OperationalManagementType">
    <restriction base="NMTOKEN">
        <enumeration value="Acknowledgements"/>
        <enumeration value="MulticastThresholdRanges"/>
        <enumeration value="MulticastErrorReporting"/>
        <enumeration value="MulticastUserInfo"/>
        <enumeration value="MulticastDeviceType"/>
        <enumeration value="MulticastMAC"/>
        <enumeration value="ContentFiltering"/>
        <enumeration value="ChannelsMeasured"/>

```

```

        <enumeration value="ChannelChangeFilter"/>
        <enumeration value="NavMethodReporting"/>
        <enumeration value="ControlDeviceReporting"/>
    </restriction>
</simpleType>
<simpleType name="CompressionType">
    <restriction base="NMTOKEN">
        <enumeration value="BiM"/>
        <enumeration value="ZLIB"/>
        <enumeration value="InfoSet"/>
        <enumeration value="EXI"/>
        <enumeration value="None"/>
        <!-- "None" is included for the "CompressionType" of Part 1. -->
    </restriction>
</simpleType>
<!-- ===== -->
<complexType name="TVandAudioAmplifierInformationType">
    <sequence>
        <element name="Manufacturer" type="am2:EISA-PNPID" minOccurs="0"/>
        <element name="Model " type="am2:VESA-EDID-ModelCode"
minOccurs="0"/>
        <element name="SerialNum " type="am2:VESA-EDID-SerialNumCode"
minOccurs="0"/>
    </sequence>
</complexType>
<simpleType name="EISA-PNPID">
    <restriction base="unsignedShort"/>
</simpleType>
<simpleType name="VESA-EDID-ModelCode">
    <restriction base="unsignedShort"/>
</simpleType>
<simpleType name="VESA-EDID-SerialNumCode">
    <restriction base="unsignedInt"/>
</simpleType>
<!-- ===== -->
<complexType name="DeviceInformationBaseType">
    <sequence>
        <element name="Manufacturer" type="am2:IEEE-OUI" minOccurs="0"/>
        <element name="Model " type="am2:NonEmptyString" minOccurs="0"/>
        <element name="SerialNum " type="am2:NonEmptyString"
minOccurs="0"/>
    </sequence>
</complexType>
<simpleType name="IEEE-OUI">
    <restriction base="am2:HexBinary6"/>
</simpleType>
<!-- ===== -->
<simpleType name="VolumeDirectionType">
    <restriction base="NMTOKEN">
        <enumeration value="Up"/>
        <enumeration value="Down"/>
        <enumeration value="Mute"/>
        <enumeration value="Unmute"/>
    </restriction>
</simpleType>
<!-- ===== -->
<simpleType name="ControlDeviceType">
    <restriction base="integer">
        <enumeration value="0"/>
        <enumeration value="1"/>
        <enumeration value="2"/>
        <enumeration value="10"/>
        <enumeration value="20"/>
        <enumeration value="30"/>

```

```

        <enumeration value="40"/>
    </restriction>
</simpleType>
<!-- ===== -->
<!-- User information (Tables 3,4) -->
<!-- ===== -->
<complexType name="UserInfoType">
    <sequence>
        <element name="PermissionLevel" type="am2:PermissionLevelType"
default="0" minOccurs="0"/>
        <element name="ControlledUserInfoTypeString"
type="am2:ControlledUserInfoTypeStringType" minOccurs="0"
maxOccurs="unbounded"/>
        <element name="ControlledUserInfoTypeDate"
type="am2:ControlledUserInfoTypeDateType" minOccurs="0" maxOccurs="unbounded"/>
        <element name="ControlledUserInfoTypeAddress"
type="am2:ControlledUserInfoAddressType" minOccurs="0" maxOccurs="unbounded"/>
        <element name="GenericUserInfoType"
type="am2:GenericUserInfoTypeType" minOccurs="0" maxOccurs="unbounded"/>
        <element name="TDLocation" type="am2:PointType"/>
        <element name="UserPresent" type="am2:UserPresentType"/>
        <element name="UserList" type="am2:UserListType" minOccurs="0"/>
        <element name="PermitBlockedInfo"
type="am2:PermitBlockedInfoType"/>
    </sequence>
    <attribute name="serviceProviderId" type="am2:H770IDType"
use="required"/>
    <attribute name="subscriberId" type="am2:SubscriberIDType"
use="required"/>
</complexType>
<!-- ===== -->
<simpleType name="PermissionLevelType">
    <restriction base="nonNegativeInteger">
        <enumeration value="0"/>
        <enumeration value="1"/>
        <enumeration value="2"/>
        <enumeration value="3"/>
    </restriction>
</simpleType>
<simpleType name="LimitedPermissionLevelType">
    <restriction base="am2:PermissionLevelType">
        <enumeration value="0"/>
        <enumeration value="1"/>
        <enumeration value="2"/>
    </restriction>
</simpleType>
<complexType name="ControlledUserInfoTypeStringType">
    <simpleContent>
        <extension base="am2:NonEmptyString">
            <attribute name="controlledUserInfoValueString"
type="am2:NonEmptyString" use="required"/>
        </extension>
    </simpleContent>
</complexType>
<complexType name="ControlledUserInfoTypeDateType">
    <simpleContent>
        <extension base="am2:NonEmptyString">
            <attribute name="controlledUserInfoValueDate" type="date"
use="required"/>
        </extension>
    </simpleContent>
</complexType>
<complexType name="ControlledUserInfoAddressType">
    <sequence>

```



```

        <element name="controlledUserInfoTypeAddress"
type="am2:NonEmptyString"/>
        <element name="controlledUserInfoValueAddress"
type="am2:CivicAddr"/>
    </sequence>
</complexType>
    <complexType name="GenericUserInfoTypeType">
        <simpleContent>
            <extension base="am2:NonEmptyString">
                <attribute name="genericUserInfoValue"
type="am2:NonEmptyString" use="required"/>
            </extension>
        </simpleContent>
    </complexType>
<!-- ===== -->
    <complexType name="UserPresentType">
        <sequence>
            <element name="PresenceMethod" type="am2:PresenceMethodType"
default="RemoteKeyPush" minOccurs="0"/>
            <element name="PresenceTime" type="time" minOccurs="0"/>
            <element name="PresenceConfidence" type="am2:PercentageType"
minOccurs="0"/>
        </sequence>
    </complexType>
    <simpleType name="PresenceMethodType">
        <restriction base="NMTOKEN">
            <enumeration value="RemoteKeyPush"/>
        </restriction>
    </simpleType>
<!-- ===== -->
    <complexType name="UserListType">
        <sequence>
            <element name="UserIdInfo" type="am2:UserIdInfoType" minOccurs="0"
maxOccurs="unbounded"/>
        </sequence>
    </complexType>
    <complexType name="UserIdInfoType">
        <sequence>
            <element name="UserIdMethod" type="am2:NonEmptyString"
minOccurs="0"/>
            <element name="UserIdConfidence" type="am2:PercentageType"
minOccurs="0"/>
        </sequence>
        <attribute name="anonUserId" type="am2:AnonUserIDType"
use="optional"/>
        <attribute name="userId" type="am2:UserIDType" use="optional"/>
    </complexType>
<!-- ===== -->
    <complexType name="PermitBlockedInfoType">
        <sequence>
            <element name="PermissionLevelFlag"
type="am2:LimitedPermissionLevelType" default="0" minOccurs="0"/>
            <element name="TerminalDeviceTypeFlag"
type="am2:TerminalDeviceTypeType" minOccurs="0"/>
            <element name="ChannelFlag" type="boolean" default="false"
minOccurs="0"/>
            <element name="ContentClassFlag" type="am2:ContentClassNameType"
minOccurs="0"/>
        </sequence>
    </complexType>
<!-- ===== -->
<!-- ===== -->
<!-- Data Structures for H.741 Part.2 -->
<!-- ===== -->

```

```

<!-- ===== -->
<!-- -->
<!-- ===== -->
<!-- 1. Configuration Package Request (Table 18) -->
<!-- ===== -->
<complexType name="ConfigPackageRequestType">
  <sequence>
    <element name="TerminalDeviceType"
type="am2:TerminalDeviceTypeType"/>
    <element name="UserPermitInfo" type="am2:UserPermitInfoType"
minOccurs="0" maxOccurs="unbounded"/>
    <element name="AMFCapabilityProfile"
type="am2:AMFCapabilityProfileType" minOccurs="0"/>
    <element name="CurrentMeasurement" type="am2:PackageReferenceType"
minOccurs="0"/>
    <element name="FutureMeasurement" type="am2:PackageReferenceType"
minOccurs="0"/>
  </sequence>
  <attribute name="terminalDeviceIdref" type="am2:TerminalDeviceIDType"
use="required"/>
  <attributeGroup ref="am2:SPAndSubscriberReference"/>
</complexType>
<complexType name="PackageReferenceType">
  <attributeGroup ref="am2:packageReference"/>
</complexType>
<attributeGroup name="packageReference">
  <attribute name="packageId" type="am2:PackageIDType" use="required"/>
  <attribute name="packageVersion" type="positiveInteger"
use="optional"/>
</attributeGroup>
<attributeGroup name="SPAndSubscriberReference">
  <attribute name="serviceProviderIdref" type="am2:H770IDType"
use="optional"/>
  <attribute name="subscriberIdref" type="am2:SubscriberIDType"
use="required"/>
</attributeGroup>
<!-- ===== -->
<!-- 2. Configuration Package Request Response (Tables
9,10,11,12,13,15,19,20) -->
<!-- ===== -->
<!-- -->
<!-- Configuration package request response (Table 19) -->
<!-- ===== -->
<complexType name="ConfigPackageRequestResponseType">
  <sequence>
    <element name="ConfigurationPackageCheckDelay"
type="am2:NumOfDaysType" minOccurs="0"/>
    <element name="ImmediateMeasurementDirective"
type="am2:ImmediateMeasurementDirectiveType" minOccurs="0"/>
    <element name="FutureMeasurementDirective"
type="am2:FutureMeasurementDirectiveType" minOccurs="0"/>
  </sequence>
</complexType>
<!-- ===== -->
<complexType name="ImmediateMeasurementDirectiveType">
  <sequence>
    <element name="Code"
type="am2:ImmediateMeasurementDirectiveCodeType" minOccurs="0"/>
    <element name="AMFConfigurationPackage"
type="am2:AMFConfigurationPackageType" minOccurs="0"/>
  </sequence>
</complexType>
<simpleType name="ImmediateMeasurementDirectiveCodeType">
  <restriction base="NMTOKEN">

```

```

        <enumeration value="NoAMRequired"/>
        <enumeration value="NoConfPackageChange"/>
        <enumeration value="ConfPackagePresent"/>
    </restriction>
</simpleType>
<!-- ===== -->
<complexType name="FutureMeasurementDirectiveType">
    <sequence>
        <element name="Code" type="am2:FutureMeasurementDirectiveCodeType"
minOccurs="0"/>
        <element name="AMFConfigurationPackage"
type="am2:AMFConfigurationPackageType" minOccurs="0"/>
    </sequence>
</complexType>
<simpleType name="FutureMeasurementDirectiveCodeType">
    <restriction base="NMTOKEN">
        <enumeration value="NoFutureConfPackage"/>
        <enumeration value="NoConfPackageChange"/>
        <enumeration value="ConfPackagePresent"/>
    </restriction>
</simpleType>
<!-- ===== -->
<!-- AMF Configuration Package (Tables 16) -->
<!-- ===== -->
<complexType name="AMFConfigurationPackageType">
    <sequence>
        <element name="UserPermitInfo" type="am2:UserPermitInfoType"
minOccurs="0" maxOccurs="unbounded"/>
        <element name="MeasurementRequestSet"
type="am2:MeasurementRequestSetType" maxOccurs="unbounded"/>
        <element name="MeasurementRequestSetFilter"
type="am2:MeasurementRequestSetFilterType" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
    <attributeGroup ref="am2:packageReference"/>
    <attribute name="effectivityDateAndTime" type="dateTime"
use="optional"/>
</complexType>
<!-- ===== -->
<!-- User Permit Info (Tables 16,20) -->
<!-- ===== -->
<!-- ===== (Table 16) -->
<complexType name="UserPermitInfoType">
    <sequence>
        <element name="UserPermit" type="am2:UserPermitType"/>
    </sequence>
    <attribute name="lastUpdateDateAndTime" type="dateTime"
use="optional"/>
</complexType>
<!-- ===== (Table 20) -->
<complexType name="UserPermitType">
    <sequence>
        <element name="DefaultPermissionLevel"
type="am2:PermissionLevelType" minOccurs="0"/>
        <element name="DefaultAllContentClassExceptList"
type="am2:ContentClassListType" minOccurs="0"/>
        <element name="UserPermissionSet" type="am2:UserPermissionSetType"
minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
    <attribute name="expirationDate" type="date" use="optional"/>
    <attributeGroup ref="am2:userListReference"/>
</complexType>
<attributeGroup name="userListReference">
    <attribute name="anonUserIdref" type="am2:AnonUserIDType"
use="optional"/>

```

```

        <attribute name="userIdref" type="am2:UserIDSType" use="optional"/>
    </attributeGroup>
    <complexType name="UserPermissionSetType">
        <sequence>
            <element name="PermissionLevel" type="am2:PermissionLevelType"
minOccurs="0"/>
            <element name="UserPermission" type="am2:UserPermissionType"
maxOccurs="unbounded"/>
        </sequence>
    </complexType>
    <complexType name="UserPermissionType">
        <sequence>
            <!-- The element "ChannelQualifier" will be extended in the Part
3. -->
            <element name="TerminalDeviceSet" type="am2:TerminalDeviceSetType"
minOccurs="0"/>
            <element name="AllContentClassExceptList"
type="am2:ContentClassListType" minOccurs="0"/>
        </sequence>
    </complexType>
    <complexType name="TerminalDeviceSetType">
        <sequence>
            <element name="TerminalDeviceType"
type="am2:TerminalDeviceTypeType" maxOccurs="unbounded"/>
        </sequence>
    </complexType>
    <simpleType name="TerminalDeviceTypeType">
        <restriction base="hexBinary">
            <enumeration value="0000"/>
            <enumeration value="0001"/>
            <enumeration value="0002"/>
            <enumeration value="0003"/>
            <enumeration value="0004"/>
            <enumeration value="0005"/>
        </restriction>
    </simpleType>
    <!-- ===== -->
    <!-- Measurement Request Set (Tables 9,10,11,12,13) -->
    <!-- ===== -->
    <!-- ===== (Table 13) -->
    <complexType name="MeasurementRequestSetType">
        <sequence>
            <sequence>
                <element name="DefaultAllContentClassExceptList"
type="am2:ContentClassListType" minOccurs="0"/>
                <element name="DefaultMeasurementPeriod"
type="am2:MeasurementPeriodType" minOccurs="0" maxOccurs="unbounded"/>
                <element name="DefaultTimeDrivenMeasurementPeriodicity"
type="am2:NumOfSecondsType" minOccurs="0"/>
                <element name="DefaultNothingNewReportMode"
type="am2:NothingNewReportModeType" minOccurs="0"/>
                <element name="DefaultInterval" type="am2:NumOfDaysType"
minOccurs="0"/>
                <element name="DefaultDeliveryAddress" type="am2:URL"
minOccurs="0" maxOccurs="unbounded"/>
                <element name="DefaultRetransmitNumber"
type="positiveInteger" minOccurs="0"/>
                <element name="DefaultStorageCongestionPolicy"
type="am2:StorageCongestionPolicyType" default="DropSufficient" minOccurs="0"/>
                <element name="DefaultMeasurementReportNumberByPush"
type="am2:MeasurementReportNumberByPushType" default="1" minOccurs="0"/>
                <element name="DefaultMaxTimeBetweenDelivery"
type="am2:NumOfSecondsWithZeroType" default="0" minOccurs="0"/>
            </sequence>
        </sequence>
    </complexType>

```

```

        <element name="DefaultDeliveryWindow"
type="am2:TimeWindowOfTheDayWithDefaultValueType" minOccurs="0"
maxOccurs="unbounded"/>
        <element name="DefaultServiceStartPermitBlockedInfo"
type="am2:PermitBlockedInfoType" minOccurs="0"/>
        <element name="DefaultTimeTriggerPermitBlockedInfo"
type="am2:PermitBlockedInfoType" minOccurs="0"/>
    </sequence>
    <element name="MeasurementRequest"
type="am2:MeasurementRequestType" maxOccurs="unbounded"/>
</sequence>
</complexType>
<!-- ===== (Table 9) -->
<complexType name="MeasurementRequestType">
    <sequence>
        <!-- The element "LinearTVQualifier" will be extended in the Part
3. -->
        <element name="AllContentClassExceptList"
type="am2:ContentClassListType" minOccurs="0"/>
        <element name="MeasurementSchedule"
type="am2:MeasurementScheduleType" maxOccurs="unbounded"/>
        <element name="MeasurementDeliverySchedule"
type="am2:MeasurementDeliveryScheduleType" minOccurs="0"/>
    </sequence>
    <attribute name="measurementRequestId"
type="am2:MeasurementRequestIDType" use="required"/>
</complexType>
<!-- ===== (Table 10) -->
<complexType name="ContentClassListType">
    <sequence>
        <element name="ContentClass" type="am2:ContentClassType"
maxOccurs="unbounded"/>
        <!-- Original definitions of the element "ContentClassDomain". -->
        <!-- element name="ContentClassDomain"
type="am2:ContentClassDomainType" maxOccurs="unbounded"/ -->
    </sequence>
</complexType>
<complexType name="ContentClassType">
    <simpleContent>
        <extension base="am2:ContentClassNameType">
            <attribute name="domain" type="am2:NonEmptyString"
use="required"/>
        </extension>
    </simpleContent>
</complexType>
<simpleType name="ContentClassNameType">
    <restriction base="am2:NonEmptyString"/>
</simpleType>
<!-- ===== (Table 11) -->
<complexType name="MeasurementScheduleType">
    <sequence>
        <element name="MeasurementPeriod" type="am2:MeasurementPeriodType"
minOccurs="0" maxOccurs="unbounded"/>
        <element name="EventTrigger"
type="am2:EventTriggerForScheduleType" minOccurs="0" maxOccurs="unbounded"/>
        <element name="TimeTrigger" type="am2:TimeTriggerForScheduleType"
minOccurs="0"/>
        <element name="ServiceStartTrigger"
type="am2:ServiceStartTriggerForScheduleType" minOccurs="0"/>
    </sequence>
</complexType>
<!-- ===== -->
<complexType name="MeasurementPeriodType">
    <sequence>

```

```

        <element name="DayOfTheWeek" type="am2:DayWithTimeWindowType"
default="0" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
</complexType>
<complexType name="DayWithTimeWindowType">
    <simpleContent>
        <extension base="am2:DayOfTheWeekType">
            <attributeGroup
ref="am2:TimeWindowOfTheDayWithDefaultValue"/>
        </extension>
    </simpleContent>
</complexType>
<simpleType name="DayOfTheWeekType">
    <restriction base="nonNegativeInteger">
        <enumeration value="0"/>
        <enumeration value="1"/>
        <enumeration value="2"/>
        <enumeration value="3"/>
        <enumeration value="4"/>
        <enumeration value="5"/>
        <enumeration value="6"/>
        <enumeration value="7"/>
        <enumeration value="8"/>
        <enumeration value="9"/>
    </restriction>
</simpleType>
<!-- ===== -->
<complexType name="TriggerBaseType">
    <sequence>
        <element name="Priority" type="am2:PriorityType" default="0"
minOccurs="0"/>
    </sequence>
</complexType>
<simpleType name="PriorityType">
    <restriction base="nonNegativeInteger">
        <minInclusive value="0"/>
        <maxInclusive value="10"/>
    </restriction>
</simpleType>
<!-- ===== -->
<complexType name="EventTriggerForScheduleType">
    <complexContent>
        <extension base="am2:TriggerBaseType">
            <sequence>
                <element name="Event"
type="am2:CommonEventForScheduleType" minOccurs="0" maxOccurs="unbounded"/>
            </sequence>
        </extension>
    </complexContent>
</complexType>
<complexType name="CommonEventForScheduleType">
    <attribute name="eventName" type="am2:CommonEventNameType"
use="optional"/>
    <attribute name="eventParameter1" type="normalizedString"
use="optional"/>
    <!-- The attribute "eventName" is newly added in order to maintain
consistency. (see the attribute "sampleSetIdentifier" of the type
"CommonSampleSetType") -->
    <!-- The "use" definition of the attribute "eventName" should be
"required", but the value is set as "optional" for type extension (based on
restriction) in the part 3 schema. -->
</complexType>
<!-- ===== -->
<complexType name="TimeTriggerForScheduleType">

```

```

    <complexContent>
      <extension base="am2:TriggerBaseType">
        <sequence>
          <element name="Periodicity" type="positiveInteger"/>
          <element name="NothingNewReportMode"
type="am2:NothingNewReportModeType" default="0" minOccurs="0"/>
          <element name="SampleSet"
type="am2:CommonSampleSetForScheduleType" minOccurs="0" maxOccurs="unbounded"/>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
  <simpleType name="NothingNewReportModeType">
    <restriction base="nonNegativeInteger">
      <enumeration value="0"/>
      <enumeration value="1"/>
      <enumeration value="2"/>
    </restriction>
  </simpleType>
  <complexType name="CommonSampleSetForScheduleType">
    <sequence>
      <element name="SampleSetQualifier"
type="am2:SampleSetQualifierType" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
    <attribute name="sampleSetName" type="am2:CommonSampleSetNameType"
use="optional"/>
    <!-- The original name of the attribute "sampleSetName" is
"sampleSetIdentifier". -->
    <!-- The values of the CommonSampleSetNameType are not "identifiers".
They are just "names" of the sample set. -->
    <!-- Original "use" definition of the attribute "sampleSetName" should
be "required", but the value is set as "optional" for type extension (based on
restriction) in the part 3 schema. -->
  </complexType>
  <!-- ===== -->
  <complexType name="ServiceStartTriggerForScheduleType">
    <complexContent>
      <extension base="am2:TriggerBaseType">
        <sequence>
          <element name="Interval" type="am2:NumOfDaysType"
minOccurs="0"/>
          <element name="SampleSet"
type="am2:LimitedSampleSetForScheduleType" minOccurs="0" maxOccurs="unbounded"/>
        </sequence>
      </extension>
    </complexContent>
  </complexType>
  <complexType name="LimitedSampleSetForScheduleType">
    <sequence>
      <element name="SampleSetQualifier"
type="am2:SampleSetQualifierType" minOccurs="0" maxOccurs="unbounded"/>
    </sequence>
    <attribute name="sampleSetName" type="am2:LimitedSampleSetNameType"
use="optional"/>
    <!-- The original name of the attribute "sampleSetName" is
"sampleSetIdentifier". -->
    <!-- The values of the CommonSampleSetNameType are not "identifiers".
They are just "names" of the sample set. -->
    <!-- Original "use" definition of the attribute "sampleSetName" should
be "required", but the value is set as "optional" for type extension (based on
restriction) in the part 3 schema. -->
  </complexType>
  <simpleType name="SampleSetQualifierType">
    <restriction base="NMTOKEN"/>

```

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        <!-- Parameters relating to the sample set identifier attribute. -->
    </simpleType>
    <!-- ===== (Table 12) -->
    <complexType name="MeasurementDeliveryScheduleType">
        <sequence>
            <element name="DeliveryAddress" type="am2:URL" minOccurs="0"
maxOccurs="unbounded"/>
            <element name="RetransmitNumber" type="positiveInteger"
minOccurs="0"/>
            <element name="StorageCongestionPolicy"
type="am2:StorageCongestionPolicyType" minOccurs="0"/>
            <choice>
                <element name="ImmediatePush" type="am2:ImmediatePushType"
minOccurs="0"/>
                <element name="DelayedDelivery"
type="am2:DelayedDeliveryType" minOccurs="0"/>
                <element name="Pull" type="am2:PullType" minOccurs="0"/>
                <element name="DelayedPushAndPull"
type="am2:DelayedDeliveryType" minOccurs="0"/>
            </choice>
        </sequence>
    </complexType>
    <simpleType name="StorageCongestionPolicyType">
        <restriction base="NMTOKEN">
            <enumeration value="ImmediatePush"/>
            <enumeration value="DropSufficient"/>
        </restriction>
    </simpleType>
    <!-- ===== -->
    <complexType name="ImmediatePushType">
        <sequence>
            <element name="MeasurementReportNumberByPush"
type="am2:MeasurementReportNumberByPushType" default="1" minOccurs="0"/>
            <element name="MaxTimeBetweenDelivery"
type="am2:NumOfSecondsWithZeroType" minOccurs="0"/>
        </sequence>
    </complexType>
    <simpleType name="MeasurementReportNumberByPushType">
        <restriction base="positiveInteger">
            <enumeration value="1"/>
        </restriction>
    </simpleType>
    <complexType name="DelayedDeliveryType">
        <sequence>
            <element name="DeliveryWindow" type="am2:TimeWindowOfTheDayType"
minOccurs="0" maxOccurs="unbounded"/>
        </sequence>
    </complexType>
    <complexType name="PullType">
        <!-- TBD -->
    </complexType>
    <!-- ===== -->
    <!-- Measurement Request Set Filter (Table 14) -->
    <!-- ===== -->
    <complexType name="MeasurementRequestSetFilterType">
        <sequence>
            <element name="UserInfoTargetString"
type="am2:UserInfoTargetStringType" maxOccurs="unbounded"/>
            <!-- Original definitions of the element "UserInfoTarget". -->
            <!-- element name="UserInfoTarget" type="am2:UserInfoTargetType"
maxOccurs="unbounded"/ -->
        </sequence>
        <attribute name="measurementRequestIDref"
type="am2:MeasurementRequestIDSType" use="required"/>

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    </complexType>
    <complexType name="UserInfoTargetStringType">
      <simpleContent>
        <extension base="am2:NonEmptyString">
          <attribute name="type" type="am2:NonEmptyString"
use="required"/>
          <attribute name="ignoreIfUnavailable" type="boolean"
use="optional" default="false"/>
        </extension>
      </simpleContent>
      <!-- Originally defined in H.741.4, but moved to H.741.2 in order to
avoid recursive imports between the two schemas. -->
    </complexType>
    <!-- Original definitions of the type "UserInfoTargetType". -->
    <!-- complexType name="UserInfoTargetType">
      <sequence>
        <element name="UserInfoTypeString" type="am2:NonEmptyString"/>
        <element name="IgnoreIfUnavailable" type="boolean" default="false"
minOccurs="0"/>
        <element name="UserInfoValueString" type="am2:NonEmptyString"/>
      </sequence>
    </complexType -->
    <!-- ===== -->
    <!-- 3. Report Package Request (Table 15) -->
    <!-- ===== -->
    <complexType name="MeasurementReportRequestType">
      <attribute name="measurementRequestIdref"
type="am2:MeasurementRequestIDSType" use="optional"/>
    </complexType>
    <!-- ===== -->
    <!-- 4. Report Package Request Response (Tables 21,22) -->
    <!-- ===== -->
    <!-- ===== -->
    <!-- AM Report Package (Table 22) -->
    <!-- ===== -->
    <complexType name="AMReportPackageType">
      <sequence>
        <element name="StorageCongestionImpactedService"
type="am2:StorageCongestionImpactedServiceType" minOccurs="0"
maxOccurs="unbounded"/>
        <element name="MeasurementReport" type="am2:MeasurementReportType"
maxOccurs="unbounded"/>
      </sequence>
      <attribute name="subscriberIdref" type="am2:SubscriberIDType"
use="optional"/>
      <attribute name="terminalDeviceIdref" type="am2:TerminalDeviceIDType"
use="required"/>
    </complexType>
    <!-- ===== -->
    <complexType name="StorageCongestionImpactedServiceType">
      <attribute name="serviceStopDropped" type="boolean" use="optional"
default="false"/>
    </complexType>
    <!-- ===== -->
    <!-- Measurement Report (Table 21) -->
    <!-- ===== -->
    <complexType name="MeasurementReportType">
      <sequence>
        <element name="DisplayStatus" type="am2:DisplayStatusType"
minOccurs="0"/>
        <element name="AudioFocus" type="am2:AudioFocusType"
minOccurs="0"/>
        <element name="CaptionLanguageChange"
type="am2:CaptionLanguageChangeType" minOccurs="0"/>

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        <element name="AudioLanguageChange"
type="am2:AudioLanguageChangeType" minOccurs="0"/>
        <element name="AudioVolume" type="am2:AudioVolumeType"
minOccurs="0"/>
        <element name="ConfigurationChange"
type="am2:ConfigurationChangeType" minOccurs="0"/>
        <element name="VideoObscure" type="am2:VideoObscureType"
minOccurs="0"/>
        <element name="VideoZoom" type="am2:VideoZoomType" minOccurs="0"/>
        <element name="VideoResize" type="am2:VideoResizeType"
minOccurs="0"/>
        <element name="EventCount" type="am2:EventCountType" minOccurs="0"
maxOccurs="unbounded"/>
        <element name="DeviceInformation" type="am2:DeviceInformationType"
minOccurs="0"/>
        <element name="UserBiographicInformation"
type="am2:UserBiographicInformationType" minOccurs="0"/>
        <element name="TDLocation" type="am2:PointType" minOccurs="0"/>
        <element name="UserList" type="am2:UserListType" minOccurs="0"/>
        <element name="UserPresent" type="am2:UserPresentType"
minOccurs="0" maxOccurs="unbounded"/>
        <element name="GenericUserInfo" type="am2:GenericUserInfoType"
minOccurs="0"/>
        <element name="UserInfoChange" type="am2:UserInfoChangeType"
minOccurs="0"/>
        <element name="PermitBlockedInfo" type="am2:PermitBlockedInfoType"
minOccurs="0"/>
    </sequence>
    <attribute name="measurementRequestIdref"
type="am2:MeasurementRequestIDType" use="required"/>
    <attribute name="measurementReportTriggerTime" type="dateTime"
use="required"/>
</complexType>
<simpleType name="DisplayStatusType">
    <restriction base="NMTOKEN">
        <enumeration value="TurnedOff"/>
        <enumeration value="TurnedOn"/>
    </restriction>
</simpleType>
<!-- ===== -->
<complexType name="AudioFocusType">
    <sequence>
        <element name="IPTVFocus" type="boolean" default="true"
minOccurs="0"/>
    </sequence>
    <attribute name="serviceInstanceIdref"
type="am2:ServiceInstanceIDType" use="required"/>
</complexType>
<!-- ===== -->
<complexType name="CaptionLanguageChangeType">
    <sequence>
        <element name="CaptionLanguage" type="am2:LanguageType"/>
    </sequence>
    <attribute name="serviceInstanceIdref"
type="am2:ServiceInstanceIDType" use="required"/>
</complexType>
<!-- ===== -->
<complexType name="AudioLanguageChangeType">
    <sequence>
        <element name="AudioLanguage" type="am2:LanguageType"/>
    </sequence>
    <attribute name="serviceInstanceIdref"
type="am2:ServiceInstanceIDType" use="required"/>
</complexType>

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<!-- ===== -->
<complexType name="AudioVolumeType">
  <sequence>
    <element name="VolumeDirection" type="am2:VolumeDirectionType"/>
  </sequence>
  <attribute name="serviceInstanceIdref"
type="am2:ServiceInstanceIDType" use="required"/>
</complexType>
<!-- ===== -->
<complexType name="ConfigurationChangeType">
  <sequence>
    <element name="AMFCapabilityProfile"
type="am2:AMFCapabilityProfileType" minOccurs="0"/>
    <element name="TVInformation"
type="am2:TVandAudioAmplifierInformationType" minOccurs="0"/>
    <element name="AudioAmplifierInformation"
type="am2:TVandAudioAmplifierInformationType" minOccurs="0"/>
  </sequence>
</complexType>
<!-- ===== -->
<complexType name="VideoObscureType">
  <sequence>
    <element name="Obscuration" type="am2:PercentageType"/>
  </sequence>
  <attribute name="serviceInstanceIdref"
type="am2:ServiceInstanceIDType" use="required"/>
</complexType>
<!-- ===== -->
<complexType name="VideoZoomType">
  <sequence>
    <element name="ZoomFactor" type="float"/>
  </sequence>
  <attribute name="serviceInstanceIdref"
type="am2:ServiceInstanceIDType" use="required"/>
</complexType>
<!-- ===== -->
<complexType name="VideoResizeType">
  <sequence>
    <element name="ResizedImage" type="am2:ResolutionType"/>
  </sequence>
  <attribute name="serviceInstanceIdref"
type="am2:ServiceInstanceIDType" use="required"/>
</complexType>
<!-- ===== -->
<complexType name="EventCountType">
  <sequence>
    <element name="EventsCounted" type="nonNegativeInteger"
default="0" minOccurs="0"/>
  </sequence>
  <attribute name="serviceInstanceIdref"
type="am2:ServiceInstanceIDType" use="required"/>
  <attribute name="startTime" type="time" use="required"/>
</complexType>
<!-- ===== -->
<complexType name="DeviceInformationType">
  <sequence>
    <element name="STBInformation"
type="am2:DeviceInformationBaseType" minOccurs="0"/>
    <element name="AudioAmplifierInformation"
type="am2:TVandAudioAmplifierInformationType" minOccurs="0"/>
    <element name="TVInformation"
type="am2:TVandAudioAmplifierInformationType" minOccurs="0"/>
    <element name="IPTV-TVInformation"
type="am2:DeviceInformationBaseType" minOccurs="0"/>

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        <element name="MobileDeviceInformation"
type="am2:DeviceInformationBaseType" minOccurs="0"/>
        <element name="PCInformation" type="am2:DeviceInformationBaseType"
minOccurs="0"/>
    </sequence>
</complexType>
<!-- ===== -->
    <complexType name="UserBiographicInformationType">
        <sequence>
            <element name="UserIdBioInfo" type="am2:UserIdBioInfoType"
maxOccurs="unbounded"/>
        </sequence>
    </complexType>
    <complexType name="UserIdBioInfoType">
        <sequence>
            <element name="ControlledUserInfoTypeString"
type="am2:ControlledUserInfoTypeStringType" minOccurs="0"
maxOccurs="unbounded"/>
            <element name="ControlledUserInfoTypeDate"
type="am2:ControlledUserInfoTypeDateType" minOccurs="0" maxOccurs="unbounded"/>
            <element name="ControlledUserInfoTypeAddress"
type="am2:ControlledUserInfoAddressType" minOccurs="0" maxOccurs="unbounded"/>
        </sequence>
        <attribute name="userIdref" type="am2:UserIDType" use="optional"/>
    </complexType>
<!-- ===== -->
    <complexType name="GenericUserInfoType">
        <sequence>
            <element name="UserIdGenericInfo" type="am2:UserIdGenericInfoType"
maxOccurs="unbounded"/>
        </sequence>
    </complexType>
    <complexType name="UserIdGenericInfoType">
        <sequence>
            <element name="GenericUserInfoType"
type="am2:GenericUserInfoTypeType" minOccurs="0" maxOccurs="unbounded"/>
        </sequence>
        <attributeGroup ref="am2:userReference"/>
    </complexType>
    <attributeGroup name="userReference">
        <attribute name="anonUserIdref" type="am2:AnonUserIDType"
use="optional"/>
        <attribute name="userIdref" type="am2:UserIDType" use="optional"/>
    </attributeGroup>
<!-- ===== -->
    <complexType name="UserInfoChangeType">
        <sequence>
            <element name="ControlledUserInfoTypeString"
type="am2:ControlledUserInfoTypeStringType" minOccurs="0"
maxOccurs="unbounded"/>
            <element name="ControlledUserInfoTypeDate"
type="am2:ControlledUserInfoTypeDateType" minOccurs="0" maxOccurs="unbounded"/>
            <element name="ControlledUserInfoTypeAddress"
type="am2:ControlledUserInfoAddressType" minOccurs="0" maxOccurs="unbounded"/>
            <element name="GenericUserInfoType"
type="am2:GenericUserInfoTypeType" minOccurs="0" maxOccurs="unbounded"/>
        </sequence>
        <attributeGroup ref="am2:userReference"/>
    </complexType>
<!-- ===== -->
<!-- 5. Ack (Table 17) -->
<!-- ===== -->
    <complexType name="AckType"/>
<!-- ===== -->

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<!-- 6. Error (Table 8) -->
<!-- ===== -->
<complexType name="ErrorType">
  <sequence>
    <element name="Accepted" type="boolean" default="true"
minOccurs="0"/>
    <element name="HighLevelError" type="am2:HighLevelErrorType"
minOccurs="0"/>
    <element name="ConfigPackageError"
type="am2:ConfigPackageErrorType" minOccurs="0"/>
    <element name="ReportRequestError"
type="am2:ReportRequestErrorType" minOccurs="0"/>
    <element name="ReportError" type="am2:ReportErrorType"
minOccurs="0"/>
    <element name="ConfigRequestError"
type="am2:ConfigRequestErrorType" minOccurs="0"/>
  </sequence>
</complexType>
<!-- ===== -->
<complexType name="HighLevelErrorType">
  <sequence>
    <element name="ErrorCode" type="am2:HighLevelErrorCodeType"/>
    <!-- The element "HighLevelErrorCode" is changed into "ErrorCode"
in order to maintain consistency. (see "ConfigPackageErrorType",
"ReportRequestErrorType", "ReportErrorType" and "ConfigRequestErrorType") -->
    <element name="RootElement" type="NMTOKEN"/>
  </sequence>
</complexType>
<simpleType name="HighLevelErrorCodeType">
  <restriction base="NMTOKEN">
    <enumeration value="NotWellFormedXMLMessage"/>
    <enumeration value="InvalidXMLMessage"/>
    <enumeration value="VersionMismatch"/>
  </restriction>
</simpleType>
<!-- ===== -->
<complexType name="ConfigPackageErrorType">
  <sequence>
    <element name="ConfigPackageErrorInfo"
type="am2:ConfigPackageErrorInfoType" maxOccurs="unbounded"/>
  </sequence>
  <attributeGroup ref="am2:packageReference"/>
</complexType>
<complexType name="ConfigPackageErrorInfoType">
  <sequence>
    <element name="ErrorCode"
type="am2:ConfigPackageErrorInfoCodeType"/>
    <element name="ErrorElement" type="am2:XPath" minOccurs="0"
maxOccurs="unbounded"/>
    <element name="ErrorEvent" type="am2:CommonEventNameType"
minOccurs="0" maxOccurs="unbounded"/>
  </sequence>
  <!-- The element "ConfigPackageErrorInfoType" is slightly modified in
order to maintain consistency. (see "HighLevelErrorType" and
"ReportRequestErrorInfoType") -->
</complexType>
<simpleType name="ConfigPackageErrorInfoCodeType">
  <restriction base="NMTOKEN">
    <enumeration value="ElementNotSupported"/>
    <enumeration value="ElementInfoNotAvailable"/>
    <enumeration value="ElementNotPermitted"/>
    <enumeration value="EventNotSupported"/>
  </restriction>
</simpleType>

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<!-- ===== -->
<complexType name="ReportRequestErrorType">
  <sequence>
    <element name="ReportRequestErrorInfo"
type="am2:ReportRequestErrorInfoType" maxOccurs="unbounded"/>
  </sequence>
</complexType>
<complexType name="ReportRequestErrorInfoType">
  <sequence>
    <element name="ErrorCode"
type="am2:ReportRequestErrorInfoCodeType"/>
    <element name="ErrorElement" type="am2:XPath" minOccurs="0"
maxOccurs="unbounded"/>
  </sequence>
  <attribute name="measurementRequestIdref"
type="am2:MeasurementRequestIDSType" use="optional"/>
</complexType>
<simpleType name="ReportRequestErrorInfoCodeType">
  <restriction base="NMTOKEN">
    <enumeration
value="RequestedMeasurementRequestIdWhichWasNotPreviouslyConfigured"/>
  </restriction>
</simpleType>
<!-- ===== -->
<complexType name="ReportErrorType">
  <sequence>
    <element name="ReportErrorInfo" type="am2:ReportErrorInfoType"
maxOccurs="unbounded"/>
  </sequence>
</complexType>
<complexType name="ReportErrorInfoType">
  <sequence>
    <element name="ErrorCode" type="am2:ReportErrorInfoCodeType"/>
    <element name="ErrorElement" type="am2:XPath" minOccurs="0"
maxOccurs="unbounded"/>
  </sequence>
  <attribute name="measurementRequestIdref"
type="am2:MeasurementRequestIDSType" use="optional"/>
</complexType>
<simpleType name="ReportErrorInfoCodeType">
  <restriction base="NMTOKEN">
    <enumeration value="ElementOrAttributeValueUnknown"/>
    <enumeration value="KnownButUnexpectedElementOrAttributeValue"/>
  </restriction>
</simpleType>
<!-- ===== -->
<complexType name="ConfigRequestErrorType">
  <sequence>
    <element name="ConfigRequestErrorInfo"
type="am2:ConfigRequestErrorInfoType" maxOccurs="unbounded"/>
  </sequence>
</complexType>
<complexType name="ConfigRequestErrorInfoType">
  <sequence>
    <element name="ErrorCode"
type="am2:ConfigRequestErrorInfoCodeType"/>
    <element name="ErrorElement" type="am2:XPath" minOccurs="0"
maxOccurs="unbounded"/>
  </sequence>

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```
</complexType>  
<simpleType name="ConfigRequestErrorInfoCodeType">  
<restriction base="NMOKEN">  
<enumeration value="ElementOrAttributeValueUnknown"/>  
</restriction>  
</simpleType>  
</schema>
```

Bibliography

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