

# Flash® Media Manifest(F4M) Format Specification Errata: May 2014

## Flash® Media Manifest(F4M) Format Specification Errata: May 2014

Copyright 2014 Adobe Systems Incorporated. All rights reserved.

Flash® Media Manifest(F4M) Format Specification Errata: May 2014

If this guide is distributed with software that includes an end user agreement, this guide, as well as the software described in it, is furnished under license and may be used or copied only in accordance with the terms of such license. Except as permitted by any such license, no part of this guide may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, recording, or otherwise, without the prior written permission of Adobe Systems Incorporated. Please note that the content in this guide is protected under copyright law even if it is not distributed with software that includes an end user license agreement.

The content of this guide is furnished for informational use only, is subject to change without notice, and should not be construed as a commitment by Adobe Systems Incorporated. Adobe Systems assumes no responsibility or liability for any errors or inaccuracies that may appear in the informational content contained in this guide.

Adobe and Flash are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries. All other trademarks are the property of their respective owners.

This guide contains links to third-party websites that are not under the control of Adobe Systems Incorporated, and Adobe Systems Incorporated is not responsible for the content on any linked site. If you access a third-party website mentioned in this guide, then you do so at your own risk. Adobe Systems Incorporated provides these links only as a convenience, and the inclusion of the link does not imply that Adobe Systems Incorporated endorses or accepts any responsibility for the content on those third-party sites. No right, license, or interest is granted in any third party technology referenced in this guide.

Updated Information/Additional Third Party Code Information available at <http://www.adobe.com/go/thirdparty>.

Adobe Systems Incorporated, 345 Park Avenue, San Jose, California 95110, USA.

Notice to U.S. Government End Users. The Software and Documentation are "Commercial Items," as that term is defined at 48 C.F.R. §2.101, consisting of "Commercial Computer Software" and "Commercial Computer Software Documentation," as such terms are used in 48 C.F.R. §12.212 or 48 C.F.R. §227.7202, as applicable. Consistent with 48 C.F.R. §12.212 or 48 C.F.R. §§227.7202-1 through 227.7202-4, as applicable, the Commercial Computer Software and Commercial Computer Software Documentation are being licensed to U.S. Government end users (a) only as Commercial Items and (b) with only those rights as are granted to all other end users pursuant to the terms and conditions herein. Unpublished rights reserved under the copyright laws of the United States. Adobe Systems Incorporated, 345 Park Avenue, San Jose, CA 95110-2704, USA. For U.S. Government End Users, Adobe agrees to comply with all applicable equal opportunity laws including, if appropriate, the provisions of Executive Order 11246, as amended, Section 402 of the Vietnam Era Veterans Readjustment Assistance Act of 1974 (38 USC 4212), and Section 503 of the Rehabilitation Act of 1973, as amended, and the regulations at 41 CFR Parts 60-1 through 60-60, 60-250, and 60-741. The affirmative action clause and regulations contained in the preceding sentence shall be incorporated by reference.

Published May 2014.

## Abstract

This document corrects errors and omissions in the "Flash® Media Manifest(F4M) Format Specification Version 3.0" document as published in August 2013.

## 1. Revised "Annex A. Manifest Examples (Informative)"

The following section replaces Annex A of the specification:

### *Annex A. Manifest Examples (Informative)*

#### *A.1. Recorded RTMP Stream*

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myvideo</id>
  <duration>253</duration>
  <media url="rtmp://example.com/myvideo"/>
</manifest>
```

## A.2. Recorded HDS Presentation with Multiple Bitrates and DRM

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myvideo</id>
  <duration>253</duration>
  <mimeType>video/x-flv</mimeType>
  <streamType>recorded</streamType>
  <baseURL>http://example.com</baseURL>
  <drmAdditionalHeader
    url="http://mydrmserver.com/mydrmadditionalheader"/>
  <bootstrapInfo profile="named" url="/mybootstrapinfo"
    fragmentDuration="4"/>
  <media url="/myvideo/low" bitrate="408" width="640" height="480"/>
  <media url="/myvideo/med" bitrate="908" width="800" height="600"/>
  <media url="/myvideo/hi" bitrate="1708" width="1920" height="1080"/>
</manifest>
```

## A.3. Live RTMFP Stream

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myvideo</id>
  <streamType>live</streamType>
  <media url="rtmfp://example.com/myapp" groupspec="G:XYZZYXZYX"
    multicastStreamName="mystream"/>
</manifest>
```

## A.4. Live RTMP Stream with DVR

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myvideo</id>
  <streamType>live</streamType>
  <dvrInfo windowDuration="1800" offline="false" />
  <media url="rtmpe://example.com/myapp" />
</manifest>
```

## A.5. HDS Presentation with Alternative Audio Renditions

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myvideo</id>
  <streamType>recorded</streamType>
  <duration>100</duration>
  <label>English</label>
  <lang>eng</lang>
  <mimeType>video/mp4</mimeType>
  <baseURL>http://example.com/</baseURL>
  <bootstrapInfo profile="named" id="boot1" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <bootstrapInfo profile="named" id="boot2" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <bootstrapInfo profile="named" id="boot3" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <media url="myvideo" bitrate="1300" bootstrapInfoId="boot1" />
  <media url="myvideo_audio1" bitrate="192" bootstrapInfoId="boot2"
    type="audio" label="German" lang="deu" alternate="true" />
  <media url="myvideo_audio2" bitrate="192" bootstrapInfoId="boot3"
    type="audio" label="Arabic" lang="ara" alternate="true" />
</manifest>
```

## ***A.6. HDS Presentation with Multiple Bitrates and Alternative Audio***

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myvideo</id>
  <label>English</label>
  <lang>en</lang>
  <streamType>recorded</streamType>
  <duration>100</duration>
  <mimeType>video/mp4</mimeType>
  <baseUrl>http://example.com/</baseUrl>
  <bootstrapInfo profile="named" id="boot1" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <bootstrapInfo profile="named" id="boot2" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <bootstrapInfo profile="named" id="boot3" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <bootstrapInfo profile="named" id="boot4" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <bootstrapInfo profile="named" id="boot5" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <media url="myvideo_250"      bitrate="250"  bootstrapInfoId="boot1" />
  <media url="myvideo_500"      bitrate="500"  bootstrapInfoId="boot1" />
  <media url="myvideo_900"      bitrate="900"  bootstrapInfoId="boot1" />
  <media url="myvideo_1300"     bitrate="1300" bootstrapInfoId="boot2" />
  <media url="myvideo_2100"     bitrate="2100" bootstrapInfoId="boot3" />
  <media url="myvideo_audio1"   bitrate="192"  bootstrapInfoId="boot4"
    type="audio" label="Español" lang="es" alternate="true" />
  <media url="myvideo_audio2"   bitrate="192"  bootstrapInfoId="boot5"
    type="audio" label="Chinese" lang="zh" alternate="true" />
</manifest>

```

## A.7. Multi-level Manifest

### A.7.1. Set-level Manifest

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myVideo</id>
  <baseUrl>http://www.example.com/myvideo/</baseUrl>
  <streamType>live</streamType>
  <media href="stream250.f4m" bitrate="250" />
  <media href="stream500.f4m" bitrate="500" />
</manifest>

```

### A.7.2. Stream-level Manifest (stream250.f4m)

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myStream1</id>
  <baseURL>http://www.example.com/data/</baseURL>
  <bootstrapInfo profile="named" id="boot1" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <media url="stream250" bootstrapInfoId="boot1"/>
</manifest>

```

### A.7.3. Stream-level Manifest (stream500.f4m)

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myStream1</id>
  <baseURL>http://www.example.com/data/</baseURL>
  <bootstrapInfo profile="named" id="boot1" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <media url="stream500" bootstrapInfoId="boot1"/>
</manifest>

```

### A.8. Alternative Audio Codecs

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myvideo</id>
  <streamType>recorded</streamType>
  <duration>100</duration>
  <label>English</label>
  <lang>en</lang>
  <mimeType>video/mp4</mimeType>
  <baseURL>http://example.com/</baseURL>
  <bootstrapInfo profile="named" id="boot1" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <bootstrapInfo profile="named" id="boot2" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <bootstrapInfo profile="named" id="boot3" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <media url="myvideo"          bitrate="1300" bootstrapInfoId="boot1" />
  <media url="myvideo_audio1"  bitrate="192" bootstrapInfoId="boot2"
    type="audio" audioCodec="ec-3" alternate="true" />
</manifest>

```

### A.9. Backups

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myVideo</id>
  <streamType>live</streamType>
  <media href="http://server1.example.com/stream250.f4m" bitrate="250"/>
  <media href="http://server1.example.com/stream500.f4m" bitrate="500"/>
  <adaptiveSet>
    <media href="http://server2.example.com/stream300.f4m" bitrate="300"/>
    <media href="http://server2.example.com/stream600.f4m" bitrate="600"/>
  </adaptiveSet>
  <adaptiveSet>
    <media href="http://server3.example.com/stream250.f4m" bitrate="250"/>
    <media href="http://server3.example.com/stream500.f4m" bitrate="500"/>
  </adaptiveSet>
</manifest>
```

*The primary audio+video content will be sourced from <http://server1.example.com/stream250.f4m> or <http://server1.example.com/stream500.f4m>.*

*If the primary audio+video content fails, the first backup will be sourced from <http://server2.example.com/stream300.f4m> or <http://server2.example.com/stream600.f4m>.*

*If that backup fails, the next backup will be sourced from <http://server3.example.com/stream200.f4m> or <http://server3.example.com/stream500.f4m>.*

## A.10. Backups and Alternative Audio

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myVideo</id>
  <streamType>live</streamType>
  <media href="http://av1.example.com/stream250.f4m" bitrate="250"/>
  <media href="http://av1.example.com/stream500.f4m" bitrate="500"/>
  <media href="http://audio1.example.com/audio.f4m" type="audio"
    alternate="true" lang="es" label="spanish"/>
  <adaptiveSet>
    <media href="http://av2.example.com/stream300.f4m" bitrate="300"/>
    <media href="http://av2.example.com/stream600.f4m" bitrate="600"/>
  </adaptiveSet>
  <adaptiveSet type="audio" alternate="true" lang="es" label="spanish">
    <media href="http://audio2.example.com/audio.f4m"/>
  </adaptiveSet>
</manifest>
```

*The primary audio+video content will be sourced from [av1.example.com](http://av1.example.com).*

*If the primary audio+video content fails, the first backup will be sourced from [av2.example.com](http://av2.example.com).*

*The spanish audio content will be sourced from [audio1.example.com](http://audio1.example.com).*

*If the spanish audio content fails, the first backup will be sourced from [audio2.example.com](http://audio2.example.com).*

## A.11. Backups and <baseURL>

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myVideo</id>
  <streamType>live</streamType>
  <baseURL>http://server1.example.com/</baseURL>
  <media href="a.f4m"/>
  <adaptiveSet>
    <media href="b.f4m"/>
  </adaptiveSet>
</manifest>
```

*The primary audio+video content will be sourced from <http://server1.example.com/a.f4m>*

*If the primary audio+video content fails, the first backup will be sourced from <http://server1.example.com/b.f4m>*

## A.12. Presentation with No Implicit Adaptive Sets

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myVideo</id>
  <streamType>live</streamType>
  <adaptiveSet>
    <media href="http://server1.example.com/stream.f4m"/>
  </adaptiveSet>
</manifest>
```

*The primary audio+video content will be sourced from <http://server1.example.com/stream.f4m>.*

## A.13. SMPTE Timecodes

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myVideo</id>
  <contentType> </contentType>
  <streamType>live</streamType>
  <media url="livestream" streamId="livestream"
    bootstrapInfoId="boot1" />
  <bootstrapInfo profile="named" id="boot1" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <smpteTimecodes>
    <smpteTimecode timestamp="61646.816" smpte="19:38:11:8"
      date="2013-04-01" timezone="-08:00" />
    <smpteTimecode timestamp="65246.879" smpte="20:38:11:23"/>
    <smpteTimecode timestamp="68846.942" smpte="21:38:12:7"/>
  </smpteTimecodes>
</manifest>
```

## A.14. Ad signaling information

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns="http://ns.adobe.com/f4m/1.0" version="3.0">
  <id>myvideo</id>
  <bootstrapInfo profile="named" id="boot1" fragmentDuration="4">
    (BASE64 encoding of bootstrap information)
  </bootstrapInfo>
  <cueInfo id="mycueInfo">
    <cue type="spliceOut" id="1" time="266.061"
      duration="30.5" programId="2354" availNum="1"
      availsExpected="5"/>
    <cue type="spliceOut" id="2" time="300" duration="7"/>
  </cueInfo>
  <media streamId="mystream" url="mystream"
    bootstrapInfoId="boot1" cueInfoId="mycueInfo" />
</manifest>

```

## 2. Revised "Annex B. XML Schema (Informative)"

The following section replaces Annex B of the specification:

### *Annex B. XML Schema (Informative)*

```

<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns="http://ns.adobe.com/f4m/1.0" xmlns:f4m="http://ns.adobe.com/f4m/1.0"
  xmlns:xs="http://www.w3.org/2001/XMLSchema" targetNamespace="http://ns.adobe.com/f4m/1.0"
  elementFormDefault="qualified">
  <xs:element name="manifest" type="manifest">
    <xs:unique name="unique-drmAdditionalHeader-id">
      <xs:selector xpath="f4m:drmAdditionalHeader"/>
      <xs:field xpath="@id"/>
    </xs:unique>
    <xs:unique name="unique-drmAdditionalHeaderSet-id">
      <xs:selector xpath="f4m:drmAdditionalHeaderSet"/>
      <xs:field xpath="@id"/>
    </xs:unique>
    <xs:unique name="unique-bootstrapInfo-id">
      <xs:selector xpath="f4m:bootstrapInfo"/>
      <xs:field xpath="@id"/>
    </xs:unique>
  </xs:element>

  <xs:complexType name="adaptiveSet">
    <xs:sequence minOccurs="1" maxOccurs="unbounded">
      <xs:element name="media" type="media"/>
    </xs:sequence>
    <xs:attributeGroup ref="mediaAttributes"/>
  </xs:complexType>

  <xs:complexType name="bestEffortFetchInfo">
    <xs:attribute name="id" type="xs:string"/>
    <xs:attribute name="fragmentDuration" type="xs:decimal"/>
    <xs:attribute name="segmentDuration" type="xs:decimal"/>
  </xs:complexType>

  <xs:complexType name="bootstrapInfo">
    <xs:simpleContent>
      <xs:extension base="xs:base64Binary">
        <xs:attribute name="fragmentDuration" type="xs:decimal"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>

```



```

        <xs:attribute name="id" type="xs:string"/>
        <xs:attribute name="profile" type="xs:string" use="required"/>
        <xs:attribute name="url" type="xs:anyURI"/>
        <xs:attribute name="segmentDuration" type="xs:decimal"/>
    </xs:extension>
</xs:simpleContent>
</xs:complexType>

<xs:complexType name="cue">
    <xs:attribute name="availNum" type="xs:decimal"/>
    <xs:attribute name="availsExpected" type="xs:decimal"/>
    <xs:attribute name="duration" type="xs:decimal" use="required"/>
    <xs:attribute name="id" type="xs:string" use="required"/>
    <xs:attribute name="time" type="xs:decimal"/>
    <xs:attribute name="type" type="xs:string" use="required"/>
    <xs:attribute name="programId" type="xs:decimal"/>
</xs:complexType>

<xs:complexType name="cueInfo">
    <xs:sequence minOccurs="0" maxOccurs="unbounded">
        <xs:element name="cue" type="cue"/>
    </xs:sequence>
    <xs:attribute name="id" type="xs:string" use="required"/>
</xs:complexType>

<xs:simpleType name="deliveryType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="streaming"/>
        <xs:enumeration value="progressive"/>
    </xs:restriction>
</xs:simpleType>

<xs:complexType name="drmAdditionalHeader">
    <xs:simpleContent>
        <xs:extension base="xs:base64Binary">
            <xs:attribute name="id" type="xs:string"/>
            <xs:attribute name="prefetchDeadline" type="xs:decimal"/>
            <xs:attribute name="url" type="xs:anyURI"/>
            <xs:attribute name="startTimestamp" type="xs:decimal"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>

<xs:complexType name="drmAdditionalHeaderSet">
    <xs:sequence minOccurs="0" maxOccurs="unbounded">
        <xs:element name="drmAdditionalHeader" type="drmAdditionalHeader" minOccurs="0"
maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="id" type="xs:string"/>
</xs:complexType>

<xs:complexType name="dvrInfo">
    <xs:attribute name="offline" type="xs:boolean" default="false"/>
    <xs:attribute name="url" type="xs:anyURI"/>
    <xs:attribute name="windowDuration" type="xs:decimal"/>
</xs:complexType>

<xs:complexType name="manifest">
    <xs:choice minOccurs="0" maxOccurs="unbounded">
        <xs:element name="adaptiveSet" type="adaptiveSet"/>
    </xs:choice>
</xs:complexType>

```

```

<xs:element name="baseURL" type="xs:anyURI" />
<xs:element name="bestEffortFetchInfo" type="bestEffortFetchInfo" />
<xs:element name="bootstrapInfo" type="bootstrapInfo" />
<xs:element name="cueInfo" type="cueInfo" />
<xs:element name="deliveryType" type="deliveryType" />
<xs:element name="dvrInfo" type="dvrInfo" />
<xs:element name="drmAdditionalHeader" type="drmAdditionalHeader" />
<xs:element name="drmAdditionalHeaderSet" type="drmAdditionalHeader" />
<xs:element name="duration" type="xs:decimal" />
<xs:element name="id" type="xs:string" />
<xs:element name="label" type="xs:string" />
<xs:element name="lang" type="xs:string" />
<xs:element name="media" type="media" />
<xs:element name="mimeType" type="xs:string" />
<xs:element name="smpteTimecodes" type="smpteTimecodes" />
<xs:element name="startTime" type="xs:dateTime" />
<xs:element name="streamType" type="streamType" default="liveOrRecorded" />
</xs:choice>
<xs:attribute name="version" default="1.0">
  <xs:simpleType>
    <xs:restriction base="xs:string">
      <xs:enumeration value="1.0" />
      <xs:enumeration value="2.0" />
      <xs:enumeration value="3.0" />
    </xs:restriction>
  </xs:simpleType>
</xs:attribute>
<xs:attribute name="profile" type="xs:string" default="urn://porfile.adobe.com/F4F" />
</xs:complexType>

<xs:complexType name="media">
  <xs:all>
    <xs:element name="metadata" type="xs:base64Binary" minOccurs="0" />
  </xs:all>
  <xs:attribute name="bitrate" type="xs:positiveInteger" />
  <xs:attribute name="bestEffortFetchInfoId" type="xs:string" />
  <xs:attribute name="bootstrapInfoId" type="xs:string" />
  <xs:attribute name="cueInfoId" type="xs:string" />
  <xs:attribute name="drmAdditionalHeaderId" type="xs:string" />
  <xs:attribute name="drmAdditionalHeaderSetId" type="xs:string" />
  <xs:attribute name="groupspec" type="xs:string" />
  <xs:attribute name="height" type="xs:decimal" />
  <xs:attribute name="href" type="xs:anyURI" />
  <xs:attribute name="multicastStreamName" type="xs:string" />
  <xs:attribute name="url" type="xs:anyURI" />
  <xs:attribute name="streamId" type="xs:string" />
  <xs:attribute name="videoCodec" type="xs:string" />
  <xs:attribute name="width" type="xs:decimal" />
  <xs:attributeGroup ref="mediaAttributes" />
</xs:complexType>

<xs:attributeGroup name="mediaAttributes">
  <xs:attribute name="alternate" type="xs:boolean" default="false" />
  <xs:attribute name="audioCodec" type="xs:string" />
  <xs:attribute name="type" default="audio+video">
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="audio" />
        <xs:enumeration value="audio+video" />
        <xs:enumeration value="data" />
        <xs:enumeration value="text" />
      </xs:restriction>
    </xs:simpleType>
  </xs:attribute>

```

```
        <xs:enumeration value="video" />
        <xs:enumeration value="video-keyframe-only" />
    </xs:restriction>
</xs:simpleType>
</xs:attribute>
<xs:attribute name="label" type="xs:string" />
<xs:attribute name="lang" type="xs:string" />
</xs:attributeGroup>

<xs:complexType name="smpteTimecode">
    <xs:attribute name="smpte" type="xs:string" />
    <xs:attribute name="timestamp" type="xs:decimal" />
    <xs:attribute name="date" type="xs:date" />
    <xs:attribute name="timezone" type="xs:string" />
</xs:complexType>

<xs:complexType name="smpteTimecodes">
    <xs:sequence minOccurs="0" maxOccurs="unbounded">
        <xs:element name="smpteTimecode" type="smpteTimecode" />
    </xs:sequence>
</xs:complexType>

<xs:simpleType name="streamType">
    <xs:restriction base="xs:string">
        <xs:enumeration value="live" />
        <xs:enumeration value="recorded" />
        <xs:enumeration value="liveOrRecorded" />
    </xs:restriction>
</xs:simpleType>
```

```
</xs:simpleType>  
</xs:schema>
```