



Specification
S-2019-001
ACES Metadata File (AMF)

The Academy of Motion Picture Arts and Sciences
Science and Technology Council
Academy Color Encoding System (ACES) Project Committee

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Summary: The ACES Metadata File (“AMF”) is a ‘sidecar’ XML file intended to exchange the metadata required to recreate ACES viewing pipelines. This document specifies example use cases for AMF along with the data model and XML tags needed for implementation.

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Revision History

Version	Date	Description
1.0	03/11/2020	Initial Version

Related Academy Documents

Document Name	Description
S-2014-002	Academy Color Encoding System — Versioning System

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1 References

The following standards, specifications, articles, presentations, and texts are referenced in this text:

Academy S-2014-002, Academy Color Encoding System - Versioning System

SMPTE ST 2065-1:2012, Academy Color Encoding Specification (ACES)

SMPTE ST 2065-4:2013, ACES Image Container File Layout

Academy TB-2014-010, Design, Integration and Use of ACES Look Modification Transforms (LMTs)

ISO 8601:2004, Data elements and interchange formats – Information interchange – Representation of dates and times

ISO/IEC 11578:1996, Information technology – Open Systems Interconnection – Remote Procedure Call (RPC)

SMPTE ST.2067-50 – Interoperable Master Format — Application #5 ACES

SMPTE RDD 47 – Interoperable Master Format — Isochronous Stream of XML Documents (ISXD) Plugin

SMPTE ST.2067-9 – Interoperable Master Format — Sidecar Composition Map

2 Terms and Definitions

The following terms and definitions are used in this document.

2.1 DateTime

(reference: ISO8601:2004) timestamp format

The DateTime is specified in the following form “YYYY-MM-DDThh:mm:ss{offset}” where:

- YYYY indicates the year
- MM indicates the month
- DD indicates the day
- T indicates the start of the required time section
- hh indicates the hour
- mm indicates the minute
- ss indicates the second
- {offset} time zone offset from UTC

NOTE: All components are required.

Example: 2014-11-20T12:24:13-8:00

2.2 TransformID

String identifying the ACES transform. Please see the ACES System Versioning Specification for more information on the format to use for TransformIDs.

3 Scope

This document specifies the ACES Metadata File (“AMF”), a ‘sidecar’ XML file intended to exchange the metadata required to recreate ACES viewing pipelines.

This specification supersedes TB-2014-009 – Academy Color Encoding System (ACES) Clip-level Metadata File Format Definition and Usage (“ACESclip”). TB-2014-009 is now considered obsolete.

4 Introduction

4.1 Why is metadata needed for ACES?

ACES defines a standard color encoding (SMPTE ST 2065-1) for exchange of images, along with Input Transforms to convert from different image sources to ACES, and Output Transforms in order to view ACES images on different types of displays.

However, when exchanging ACES images during production, there is often missing information required to fully describe the viewing pipeline or “creative intent” of that particular image.

Examples of such information:

- ACES Version – *which version of ACES was used?*
- Look Transform – *is there a creative look?*
- Output Transform – *how was this viewed on a display?*

To maintain consistent color appearance, transporting this information is crucial. Additionally, this information serves as an unambiguous archive of the creative intent.

4.2 What is AMF?

The ACES Metadata File (“AMF”) is a sidecar XML file intended to exchange the metadata required to recreate ACES viewing pipelines. It describes the transforms necessary to configure an ACES viewing pipeline for a collection of related image files.

An AMF may have a specified association with a single frame or clip. Alternatively, it may exist without any association to an image, and one may apply it to an image. An application of an AMF to an image would translate its viewing pipeline to the target image.

Images are formed at several stages of production and post-production, including:

- Digital cameras
- Film scanners
- Animation and VFX production
- Virtual production
- Editorial and color correction systems

AMF can be compatible with any digital image, and is not restricted to those encoded in the ACES (SMPTE ST 2065-1). They may be camera native file formats or other encodings if they have associated Input Device Transforms (IDTs) (using the `<inputTransform>` element) so they may be displayed using an ACES viewing pipeline.

AMFs may also embed creative look adjustments as one or more LMTs (using the `<lookTransform>` elements). These looks may be in the form of ASC CDL values, or a reference to an external look file, such as a CLF (Common LUT Format). Multiple `<lookTransform>` elements are allowed, and the order of operations in which they are applied shall be the order in which they appear in the AMF.

AMFs can also serve as effective archival elements. When paired with finished ACES image files, they form a complete archival record of how image content is intended to be viewed (for example, using the **<outputTransform>** and **<systemVersion>** elements).

AMFs do not contain “timeline” metadata such as edit points. Timeline management files such as Edit Decision Lists (EDLs) or Avid Log Exchange files (ALEs) may reference AMFs, attaching them to editing events and thus enable standardized color management throughout all stages of production.

Figure 1 shows the overall structure of an AMF in simplified form.

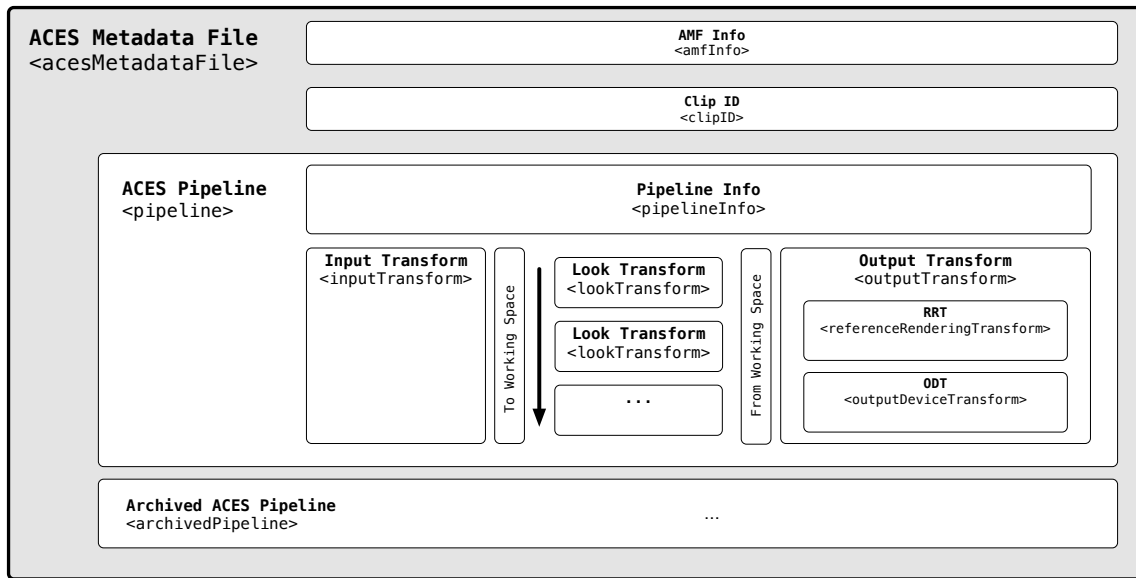


Figure 1 – A simplified diagram showing the overall structure of an ACES Metadata File.

5 Use Cases

ACES Metadata Files (AMFs) are intended to contain the minimum required metadata for transferring information about ACES viewing pipelines during production, post-production, and archival.

Typical use cases for AMF files are the application of “show LUT” LMTs in cameras and on-set systems, the capture of shot-to-shot looks generated on-set using ASC-CDL, and communication of both to dailies, editorial, VFX, and post-production mastering facilities.

AMF supports the transfer of looks by embedding ASC-CDL values within the AMF file or by referencing sidecar look files containing LMTs, such as CLF (Common LUT Format) files.

5.1 Look Development

The development of a creative look before the commencement of production is common. Production uses this look to produce a pre-adjusted reference for on-set monitoring. The creative look may be a package of files containing a viewing transform (also known as a Show LUT), CDL grades, or more. There are no consistent standards specifying how to produce them, and exchanging them is complex due to a lack of metadata.

AMF contains the ability to completely specify the application of a creative look. This automates the exchange of these files and the recreation of the look when applying the AMF. In an ACES workflow, one specifies the creative look as one or more Look Modification Transforms (LMT). AMF can include references to any number of these transforms, and maintains their order of operations.

The input and output of an LMT is always a triplet of ACES RGB relative exposure values, as defined in SMPTE ST 2065-1. This will likely need a robust transform, such as CLF, that can handle linear input data and output data.

AMF offers an unambiguous description of the full ACES viewing pipeline for on-set look management software to load and display images as intended.

5.2 On Set

Before production begins, an AMF may be created and shared with production as a “look template” for use during on-set monitoring or look management.

Cameras with AMF support can load or generate AMFs to configure or communicate the viewing pipeline of images viewed out of the camera’s live video signal.

On-set color grading software can load or generate AMFs, allowing the communication of the color adjustments created on set.

5.3 Dailies

Dailies can apply AMFs from production to the camera files to reproduce the same images seen on set. There is no single method of exchange between production and dailies. AMFs should be agnostic to the given exchange method.

It is possible, or even likely, that one will update AMFs in the dailies stage. For example, a dailies colorist may choose to balance shots at this stage and update the look. Another example could be that dailies uses a different ODT than the one used in on-set monitoring.

This specification does not define how one should transport AMFs between stages. Existing exchange formats may reference them, or image files themselves may embed them. One may also transport AMFs independently of any other files.

5.4 VFX

The exchange of shots for VFX work requires perfect translation of each shot's viewing pipeline, or color recipe. If the images cannot be accurately reproduced from VFX plates, effects will be created with an incorrect reference.

AMF provides a complete and unambiguous translation of ACES viewing pipelines. If they travel with VFX plates, they can describe how to view each plate along with any associated looks.

VFX software should have the ability to read AMF to configure its internal viewing pipeline. Or, AMF will inform the configuration of third party color management software, such as OpenColorIO.

5.5 Finishing

In finishing, the on-set or dailies viewing reference can be automatically recreated upon reading an AMF. This stage typically uses a higher quality display, which may warrant the use of a different ODT than one specified in an ingested AMF.

AMF can seamlessly provide the colorist a starting point that is consistent with the creative intent of the filmmakers on-set. This removes any necessity to recreate a starting look from scratch.

5.6 Archival

AMF enables the ability to establish a complete ACES archive, and effectively serves as a snapshot of creative intent for preservation and remastering purposes. All components required to recreate the look of an ACES archive are meaningfully described and preserved within the AMF.

One possible method for this could be the utilization of SMPTE standards such as ST.2067-50 (IMF App #5) – commonly referred to as “ACES IMF” – and SMPTE RDD 47 (ISXD) – a virtual track file containing XML data – in order to form a complete and flexible ACES archival package.

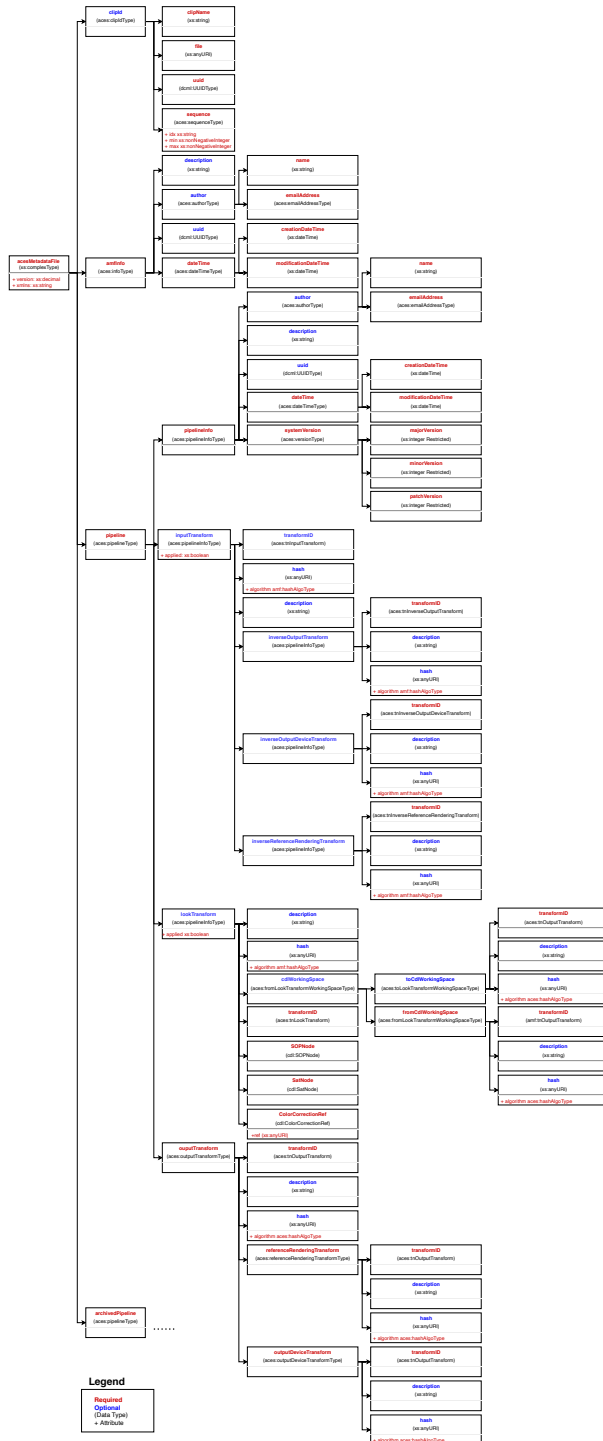
Another method could be to use SMPTE ST.2067-9 (Sidecar Composition Map) which would allow linking of a single AMF to a CPL (Composition Playlist) in the case where there is a single AMF for an entire playlist.

6 Data Model

This section describes the data intended for use within the ACES Metadata file.

All top level structures shall be tagged as being within the aces namespace with urn:acesMetadata:acesMetadataFile:v1.0

6.1 UML Diagram



6.2 Types

The following types are defined for use within the AMF XML file and are validated with the XSD schema included in Appendix A. The types are used as the basis to form the elements listed in section X in the schema.

6.2.1 Simple Types

6.2.1.1 `aces:emailAddressType`

Description:

Type defining a restricted string conforming to an email address

Base Type:

Restriction of `xs:string`

Restrictions:

```
xs:pattern value="^[^@]+@[^\.]+\..+"
```

6.2.1.2 `aces:hashAlgoType`

Description:

Type defining valid hash algorithms that can be used to validate specified transforms. The allowed algorithms are specified by the enumerated URIs in this type.

Base Type:

restriction of `xs:anyURI`

Restrictions:

```
xs:enumeration value="http://www.w3.org/2001/04/xmlenc\#sha256"
xs:enumeration value="http://www.w3.org/2000/09/xmlsig\#sha1"
xs:enumeration value="http://www.w3.org/2001/04/xmlsig-more\#md5"
```

6.2.1.3 `aces:singleDigitType`

Description:

Type defining a single digit integer

Base Type:

restriction of `xs:integer`

Restrictions:

```
xs:totalDigits value="1"
xs:totalDigits value="0"
xs:totalDigits value="9"
```

6.2.1.4 `aces:tnColorSpaceConversionTransform`

Description:

Type defining valid transformID strings for Color Space Conversion transforms

Base Type:

Restriction of `xs:string`

Restrictions:

```
xs:pattern value="urn:ampas:aces:transformId:v1.5:(ACEScsc\.\S+\.\S+\.a\d+\.v\d+|ACEScsc\.\Academy\.\S+\.a\d+\.\d+\.\d+)"
```

6.2.1.5 aces:tnInputTransform**Description:**

Type defining valid transformID strings for InputTransform transforms

Base Type:

Restriction of `xs:string`

Restrictions:

```
xs:pattern value=urn:ampas:aces:transformId:v1.5:IDT\.\S+\.\S+\.a\d+\.v\d+
```

6.2.1.6 aces:tnInverseOutputDeviceTransform**Description:**

Type defining valid transformID strings for InverseOutputDeviceTransform transforms

Base Type:

Restriction of `xs:string`

Restrictions:

```
xs:pattern value=urn:ampas:aces:transformId:v1.5:(InvODT\.\S+\.\S+\.a\d+\.v\d+|
InvODT\.\Academy\.\S+\.a\d+\.d+\.d+)
```

6.2.1.7 aces:tnInverseOutputTransform**Description:**

Type defining valid transformID strings for InverseOutputTransform transforms

Base Type:

Restriction of `xs:string`

Restrictions:

```
xs:pattern value=urn:ampas:aces:transformId:v1.5:(InvRRTOdT\.\S+\.\S+\.a\d+\.v\d+|
InvRRTOdT\.\Academy\.\S+\.a\d+\.d+\.d+)
```

6.2.1.8 aces:tnInverseReferenceRenderingTransform**Description:**

Type defining valid transformID strings for tnInverseReferenceRenderingTransform transforms

Base Type:

Restriction of `xs:string`

Restrictions:

```
xs:pattern value=urn:ampas:aces:transformId:v1.5:InvRRT\.\a\d+\.d+\.d+
```

6.2.1.9 aces:tnLookTransform**Description:**

Type defining valid transformID strings for lookTransform transforms

Base Type:

Restriction of `xs:string`

Restrictions:

```
xs:pattern value="urn:ampas:aces:transformId:v1.5:(LMT\.\S+\.\S+\.a\d+\.v\d+|LMT
\.\Academy\.\S+\.a\d+\.d+\.d+)"
```

6.2.1.10 aces:tnOutputDeviceTransform**Description:**

Type defining valid transformID strings for OutputDeviceTransform transforms

Base Type:

Restriction of `xs:string`

Restrictions:

```
xs:pattern value="urn:ampas:aces:transformId:v1.5:(ODT\.\S+\.\S+\.a\d+\.\v\d+|ODT
\.\Academy\.\S+\.a\d+\.\d+\.\d+) "
```

6.2.1.11 aces:tnOutputTransform**Description:**

Type defining valid transformID strings for OutputTransform transforms

Base Type:

Restriction of `xs:string`

Restrictions:

```
xs:pattern value="urn:ampas:aces:transformId:v1.5:(RRTODT\.\S+\.\S+\.a\d+\.\v\d
+|RRTODT\.\Academy\.\S+\.a\d+\.\d+\.\d+) "
```

6.2.1.12 aces:tnReferenceRenderingTransform**Description:**

Type defining valid transformID strings for OutputTransform transforms

Base Type:

Restriction of `xs:string`

Restrictions:

```
xs:pattern value="urn:ampas:aces:transformId:v1.5:RRT\.\a\d+\.\d+\.\d+" "
```

6.2.2 Complex Types**6.2.2.1 aces:authorType****Description:**

Type defining a sequence of elements used to communicate information about the author of the AMF file

Base Type:

`xs:sequence`

Children:

`aces:emailAddress`, `aces:name`

6.2.2.2 aces:cdlWorkingSpaceType**Description:**

Type defining the elements to communicate information about the transforms to and from the ASC-CDL Working Space

Base Type:

`xs:sequence`

Children:

`aces:fromCdlWorkingSpace`, `aces:toCdlWorkingSpace`

6.2.2.3 `aces:clipIdType`

Description:

Type defining elements used to communicate information about the essence associated with the AMF

Base Type:

`xs:sequence`

Children:

`aces:clipName`, `aces:file`, `aces:sequence`, `aces:uuid`

6.2.2.4 `aces:dateTimeType`

Description:

Type defining the elements to communicate information about the creation and modification date and time associated with various AMF elements.

Base Type:

`xs:sequence`

Children:

`aces:creationDateTime`, `aces:modificationDateTime`

6.2.2.5 `aces:hashType`

Description:

Type defining the element to communicate information about a cryptographic file hash associated with file referenced by the AMF.

Base Type:

extension of `xs:base64Binary`

Attributes:

`algorithm`

6.2.2.6 `aces:infoType`

Description:

Type defining the elements to communicate description, date and time, and UUID information.

Base Type:

`xs:sequence`

Children:

`aces:dateTime`, `aces:description`, `aces:uuid`

6.2.2.7 `aces:inputTransformType`

Description:

Type defining the elements to communicate information about an ACES Input Transform associated with an ACES viewing pipeline.

Base Type:

extension of `aces:transformType`

Children:

`aces:description`, `aces:hash`, `aces:transformId`

Attributes:

`applied`

6.2.2.8 aces:inverseOutputDeviceTransformType**Description:**

Type defining the elements to communicate information about an ACES Inverse Output Device Transform. This type is used to define an inverse ACES pipeline to specify how output referred image data should be converted to ACES.

Base Type:

extension of `aces:transformType`

Children:

`aces:description`, `aces:hash`, `aces:transformId`

6.2.2.9 aces:inverseOutputTransformType**Description:**

Type defining the elements to communicate information about an ACES Inverse Output Transform. This type is used to define an inverse ACES pipeline to specify how output referred image data should be converted to ACES.

Base Type:

extension of `textttaces:transformType`

Children:

`aces:description`, `aces:hash`, `aces:transformId`

6.2.2.10 aces:inverseReferenceRenderingTransformType**Description:**

Type defining the elements to communicate information about an ACES Inverse Reference Rendering Transform. This type is used to define an inverse ACES pipeline to specify how output referred image data should be converted to ACES.

Base Type:

extension of `aces:transformType`

Children:

`aces:description`, `aces:hash`, `aces:transformId`

6.2.2.11 aces:lookTransformType**Description:**

Type defining the elements to communicate information about an ACES Look Transform associated with an ACES viewing pipeline.

Base Type:

extension of `aces:transformType`

Children:

`aces:description`, `aces:hash`, `aces:lookTransformWorkingSpace`,
`aces:transformId`, `cdl:ColorCorrectionRef`, `cdl:SOPNode`, `cdl:SatNode`

Attributes:

`applied`

6.2.2.12 aces:outputDeviceTransformType**Description:**

Type defining the elements to communicate information about an ACES Output Device Transform asso-

ciated with an ACES viewing pipeline.

Base Type:

extension of `aces:transformType`

Children:

`aces:description`, `aces:hash`, `aces:transformId`

Attributes:

`applied`

6.2.2.13 `aces:outputTransformType`**Description:**

Type defining the elements to communicate information about an ACES Output Transform associated with an ACES viewing pipeline.

Base Type:

extension of `texttaces:transformType`

Children:

`aces:description`, `aces:hash`, `aces:outputDeviceTransform`,
`aces:referenceRenderingTransform`, `aces:transformId`

Attributes:

`applied`

6.2.2.14 `aces:pipelineInfoType`**Description:**

Type defining the elements to communicate description, author, date and time, UUID information, and ACES version information.

Base Type:

extension of `aces:infoType`

Children:

`aces:author`, `aces:dateTime`, `aces:description`, `aces:systemVersion`, `aces:uuid`

6.2.2.15 `aces:pipelineType`**Description:**

Type defining a sequence of elements used to communicate an ACES viewing pipeline

Base Type:

`xs:sequence`

Children:

`aces:pipelineInfo`, `aces:inputTransform`, `aces:lookTransforms`,
`aces:outputTransform`

6.2.2.16 `aces:referenceRenderingTransformType`**Description:**

Type defining elements used to communicate the ACES Reference Rendering Transform associated with an ACES viewing pipeline.

Base Type:

extension of `aces:transformType`

Children:

aces:description, aces:hash, aces:transformId

6.2.2.17 `aces:sequenceType`**Description:**

Type defining elements used to communicate information about a file sequence associated with an AMF.

Base Type:

extension of `xs:string`

Attributes:

`idx`, `min`, `max`

6.2.2.18 `aces:transformType`**Description:**

Type defining elements used to communicate information about ACES transforms. This type is used as the basis for other complex types.

Base Type:

`xs:sequence`

Children:

`aces:description`, `aces:hash`

6.2.2.19 `aces:versionType`**Description:**

Type defining elements used to communicate ACES system version information.

Base Type:

`xs:sequence`

Children:

`aces:majorVersion`, `aces:minorVersion`, `aces:patchVersion`

6.2.2.20 `aces:workingSpaceTransformType`**Description:**

Type defining elements used to communicate the Color Space conversion transform used to convert between the working color space associated with a particular look transform and ACES 2065-1.

Base Type:

extension of `aces:transformType`

Children:

`aces:description`, `aces:hash`, `aces:transformId`

6.3 Elements

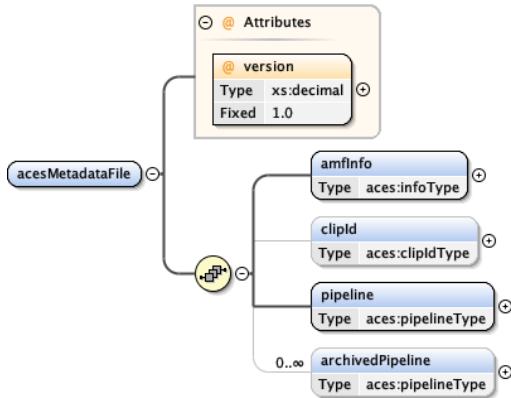
The following elements are defined for use with the AMF XML file and are validated with the XSD schema included in Appendix A.

6.3.1 `aces:MetadataFile`

Description:

The top level element of an ACES Metadata File. This element defines first level child elements.

Diagram:



Type:

`xs:element`

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: `version="1.0"`, `xmlns:aces="urn:ampas:aces:amf:v1.0"`

Optional: `xmlns`, `xsi:schemaLocation`

Parent:

None

Children:

`aces:pipeline`, `aces:archivedPipeline`, `aces:clipId`, `aces:amfInfo`

Example:

```

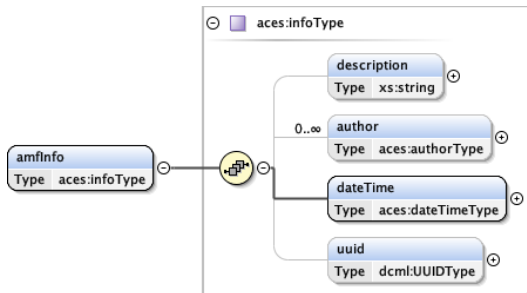
<aces:MetadataFile
  xmlns:aces="urn:ampas:aces:amf:v1.0"
  xsi:schemaLocation="urn:ampas:aces:amf:v1.0_file:acesMetadataFile.xsd"
  xmlns:cdl="urn:ASC:CDL:v1.01"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  version="1.0">
  ...
</aces:MetadataFile>
  
```

6.3.2 `aces:amfInfo`

Description:

This element contains all the elements containing information about the AMF itself including date and time information, a description element, and a UUID element.

Diagram:



Type:

aces:infoType

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: none

Optional: none

Parent:

aces:MetadataFile

Children:

aces:author, aces:dateTime, aces:description, aces:uuid

Example:

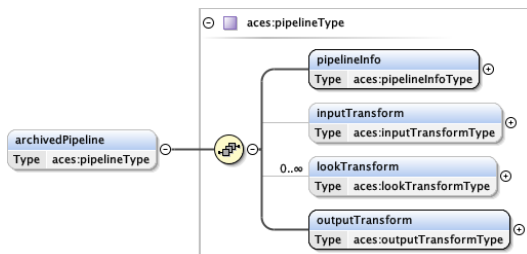
```
<aces:amfInfo>
...
</aces:amfInfo>
```

6.3.3 aces:archivedPipeline

Description:

This element contains all the elements describing an ACES viewing pipeline archived for historical purposes.

Diagram:



Type:

aces:pipelineType

Required or Optional:

Optional

Occurrences:

Min: 0 Max: unbounded

Attributes:

Required: none

Optional: none

Parent:

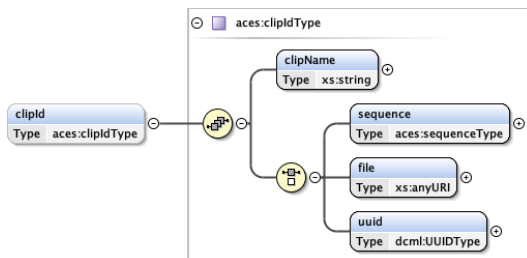
aces:MetadataFile

Children:aces:inputTransform, aces:lookTransform, aces:outputTransform,
aces:pipelineInfo**Example:**

```
<aces:archivedPipeline>
...
</aces:archivedPipeline>
```

6.3.4 aces:clipId**Description:**

This optional element contains all the elements describing the location of the media files associated with the AMF.

Diagram:**Type:**

aces:clipIdType

Required or Optional:

Optional

Occurrences:

Min: 0 Max: 1

Attributes:

Required: none

Optional: none

Parent:

aces:MetadataFile

Children:

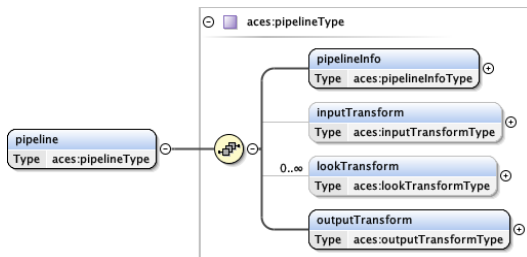
aces:clipName, aces:file, aces:sequence, aces:uuid

Example:

```
<aces:clipId>
...
</aces:clipId>
```

6.3.5 aces:pipeline**Description:**

This element contains all the elements describing the ACES viewing pipeline.

Diagram:**Type:**

aces:pipelineType

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: none

Optional: none

Parent:

aces:MetadataFile

Children:

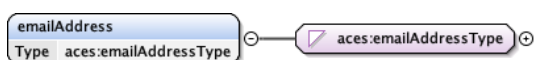
aces:inputTransform, aces:lookTransform, aces:outputTransform,
aces:pipelineInfo

Example:

```
<aces:pipeline>
...
</aces:pipeline>
```

6.3.6 aces:emailAddress**Description:**

This element used to communicate the AMF author's email address.

Diagram:

Type:

aces:emailAddressType

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: none

Optional: none

Parent:

aces:author

Children:

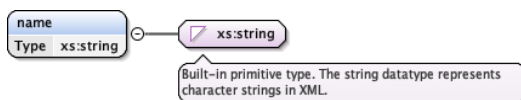
None

Example:

```
<aces:emailAddress>joe@onset.com</aces:emailAddress>
```

6.3.7 aces:name**Description:**

This element is used to communicate the name of the AMF author.

Diagram:**Type:**

xs:string

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:author

Children:

None

Example:

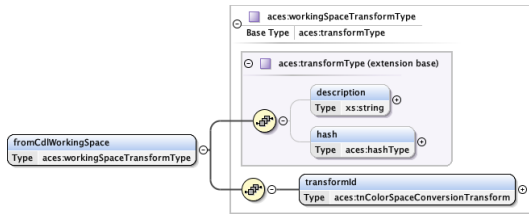
```
<aces:name>Joe Onset</aces:name>
```

6.3.8 aces:fromCdlWorkingSpace**Description:**

This element contains all the elements describing the transform used to convert from the working color

space in which an ASC-CDL is applied to ACES 2065-1.

Diagram:



Type:

`aces:workingSpaceTransformType`

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

`aces:cdlWorkingSpace`

Children:

`aces:description`, `aces:hash`, `aces:transformId`

Example:

```

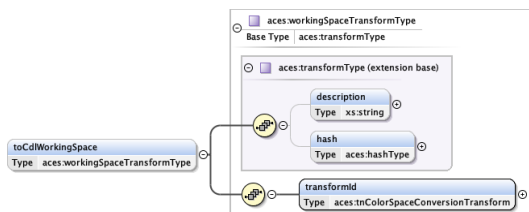
<aces:fromCdlWorkingSpace>
...
</aces:fromCdlWorkingSpace>
  
```

6.3.9 `aces:toCdlWorkingSpace`

Description:

This element contains all the elements describing the transform used to convert from ACES 2065-1 to the working color space in which a ASC-CDL transform is applied. This transform shall be included when the working color space for the ASC-CDL Transform is not a working color space described in one of the Color Space Conversion transform included in the ACES core transforms. When the working color space for the ASC-CDL Transform is a working color space described in one of the Color Space Conversion transform included in the ACES core transforms, the `aces:toCdlWorkingSpace` is optional.

Diagram:



Type:

aces:workingSpaceTransformType

Required or Optional:

Optional

Occurrences:

Min: 0 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:cdlWorkingSpace

Children:

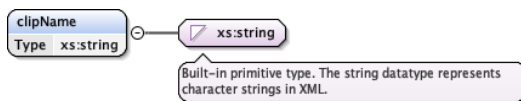
aces:description, aces:hash, aces:transformId

Example:

```
<aces:toCdlWorkingSpace>
...
</aces:toCdlWorkingSpace>
```

6.3.10 aces:clipName**Description:**

This element is used to communicate the clip name associated with the media files.

Diagram:**Type:**

xs:string

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:clipId

Children:

None

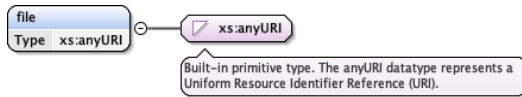
Example:

```
<aces:clipName>A001C012</aces:clipId>
```

6.3.11 aces:file**Description:**

This element is used to communicate the name of the media file. Care should be taken when using the file name as an identifier as file locations and names typically change during production and post-production.

Diagram:



Type:

`xs:anyURI`

Required or Optional:

Choice of `aces:file`, `aces:sequence` or `aces:uuid` is required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

`aces:clipId`

Children:

None

Example:

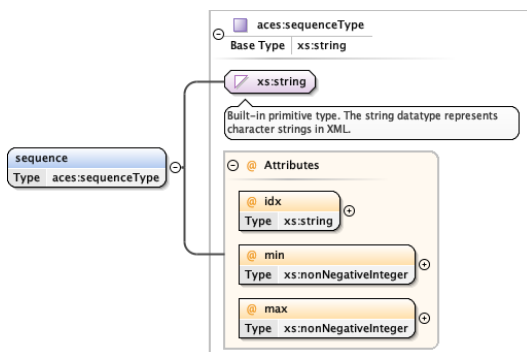
```
<aces:file>file:///foo.mxf</aces:file>
```

6.3.12 `aces:sequence`

Description:

This element is used to communicate the file sequence information associated with the media files. The file sequence includes an index indicated by the `idx` attribute (e.g. #) that is used to denote the location of frame numbers within the sequence string. The `min` and `max` attributes are used to indicate the minimum frame number and maximum frame number of the sequence. For example, if the sequence string is `movieFrame####.exr` and attributes of `aces:sequence` are `idx='#'`, `min='0'` and `max='1000'` the the media files associated with the AMF would be the frames numbered `movieFrame0000.exr` through `movieFrame1000.exr`

Diagram:



Type:

aces:sequenceType

Required or Optional:

Choice of aces:file, aces:sequence or aces:uuid is required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: idx, min, max

Optional: None

Parent:

aces:clipId

Children:

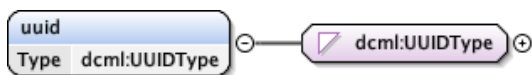
None

Example:

```
<aces:sequence idx="#"min="1"max="240">A01_C012_AE0306_###.exr</aces:sequence>
```

6.3.13 aces:clipIdType / aces:uuid**Description:**

This element is used to communicate a UUID associated with the media files referred to in the ClipID.

Diagram:**Type:**

dcml:UUIDType

Required or Optional:

Choice of aces:file, aces:sequence or aces:uuid is required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:clipId

Children:

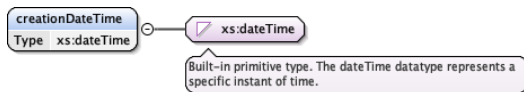
None

Example:

```
<aces:uuid>urn:uuid:797c7cd8-4eb1-4f67-afce-af2b0a1d0285</aces:uuid>
```

6.3.14 aces:creationDateTime**Description:**

This element is used to communicate the creation date and time of an AMF file or an ACES pipeline.

Diagram:**Type:**

xs:dateTime

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:dateTime

Children:

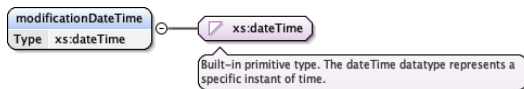
None

Example:

```
<aces:creationDateTime>2020-11-10T13:20:00Z</aces:creationDateTime>
```

6.3.15 aces:modificationDateTime**Description:**

This element is used to communicate the most recent modification date and time of an AMF file or an ACES pipeline.

Diagram:**Type:**

xs:dateTime

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:dateTime

Children:

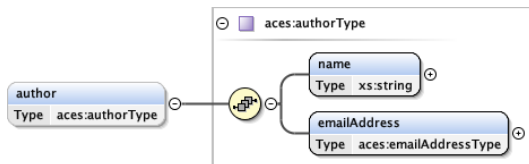
None

Example:

```
<aces:modificationDateTime>2020-11-10T13:20:00Z</aces:modificationDateTime>
```

6.3.16 aces:author**Description:**

This element contains all the elements describing the AMF author information.

Diagram:**Type:**

xs:sequence

Required or Optional:

Optional

Occurrences:

Min: 1 Max: unbounded

Attributes:

Required: None

Optional: None

Parent:

aces:amfInfo

Children:

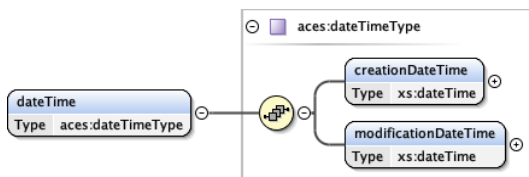
aces:name, aces:emailAddress

Example:

```
<aces:author>
...
</aces:author>
```

6.3.17 aces:dateTime**Description:**

This element contains all the elements describing the date and time of the creation and modification of the AMF.

Diagram:**Type:**

xs:sequence

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:amfInfo

Children:

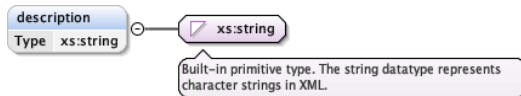
aces:creationDateTime, modificationDateTime

Example:

```
<aces:dateTime>
...
</aces:dateTime>
```

6.3.18 aces:description**Description:**

This element is used to communicate description information for an AMF file, an ACES pipeline, or various ACES viewing transforms.

Diagram:**Type:**

xs:string

Required or Optional:

Optional

Occurrences:

Min: 0 Max: 1

Attributes:

Required: None

Optional: None

Parent:

```
aces:amfInfo, aces:pipelineInfo, aces:toCdlWorkingSpace,
aces:fromCdlWorkingSpace, aces:inputTransform,
aces:lookTransform, aces:outputTransform, aces:outputDeviceTransform,
aces:referenceRenderingTransform
```

Children:

None

Example:

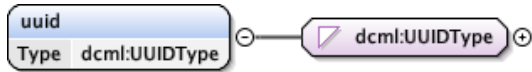
```
<aces:description>Example Movie</aces:description>
<aces:description>Technical Grade</aces:description>
```


6.3.19 `aces:infoType` / `aces:uuid`

Description:

This element is used to communicate a UUID associated with the AMF or an ACES pipeline.

Diagram:



Type:

`dcml:UUIDType`

Required or Optional:

Optional

Occurrences:

Min: 0 Max: 1

Attributes:

Required: None

Optional: None

Parent:

`aces:amfInfo`, `aces:pipelineInfo`

Children:

None

Example:

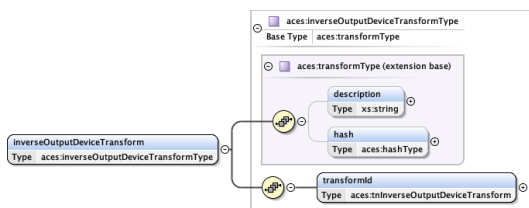
```
<aces:uuid>urn:uuid:797c7cd8-4eb1-4f67-afce-af2b0a1d0285</aces:uuid>
```

6.3.20 `aces:inverseOutputDeviceTransform`

Description:

This element contains all the elements describing the transforms associated with an inverse output device transform used to convert output referred images to ACES.

Diagram:



Type:

`aces:inverseOutputDeviceTransformType`

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:description, aces:hash, aces:transformId

Children:

```
<aces:inverseOutputDeviceTransform>
...
</aces:inverseOutputDeviceTransform>
```

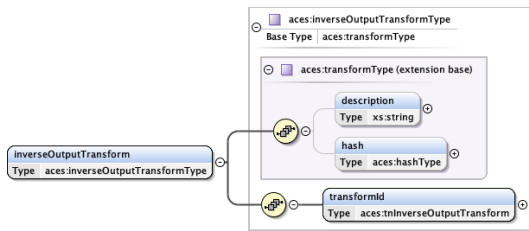
Example:

6.3.21 aces:inverseOutputTransform

Description:

This element contains all the elements describing the transforms associated with an inverse output transform used to convert output referred images to ACES.

Diagram:



Type:

aces:inverseOutputTransformType

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:description, aces:hash, aces:transformId

Children:

```
<aces:inverseOutputTransform>
...
</aces:inverseOutputTransform>
```

Example:

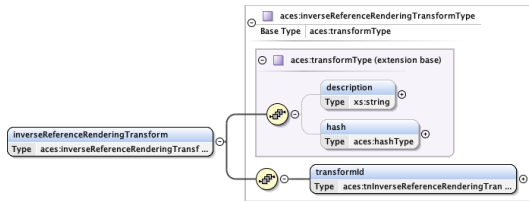
6.3.22 aces:inverseReferenceRenderingTransform

Description:

This element contains all the elements describing the transforms associated with an inverse reference

rendering transform used to convert output referred images to ACES.

Diagram:



Type:

`aces:inverseReferenceRenderingTransformType`

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:description, aces:hash, aces:transformId

Children:

```

<aces:inverseReferenceRenderingTransform>
...
</aces:inverseReferenceRenderingTransform>
  
```

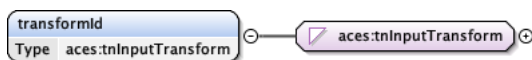
Example:

6.3.23 `aces:inputTransformType` / `aces:transformId`

Description:

This element is used to communicate the transformID of an ACES Input Transform that transforms images encoded in a color space of a camera native file to ACES 2065-1. For more information on transformIDs see S-2014-002 Academy Color Encoding System – Versioning system. Valid transforms for this element are Input Transforms. The element is restricted to enforce the use of transformIDs that follow the IDT naming conventions established in the versioning system specification. As noted in the versioning system specification, manufacturer and user created transforms shall be assigned a transformID according to patterns established in the document.

Diagram:



Type:

`aces:tnInputTransform`

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:`aces:inputTransform`**Children:**

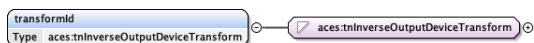
None

Example:

```
<aces:transformId>
urn:ampas:aces:transformId:v1.5:IDT.Sony.F65.a1.v1
</aces:transformId>
```

6.3.24 aces:inverseOutputDeviceTransformType / aces:transformId**Description:**

This element is used to communicate the transformID of an ACES Inverse Output Device Transform that transforms images encoded in an output referred color space to OCES. For more information on transformIDs see S-2014-002 Academy Color Encoding System – Versioning system. Valid transforms for this element are Input Transforms. The element is restricted to enforce the use of transformIDs that follow the InvODT naming conventions established in the versioning system specification. As noted in the versioning system specification, manufacturer and user created transforms shall be assigned a transformID according to patterns established in the document.

Diagram:**Type:**`aces:tnInverseDeviceOutputTransform`**Required or Optional:**

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:`aces:inputTransform`**Children:**

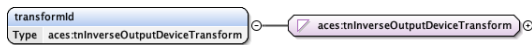
None

Example:

```
<aces:transformId>
urn:ampas:aces:transformId:v1.5:InvODT.Academy.Rec709_100nits_dim.a1.0.3
</aces:transformId>
```

6.3.25 `aces:inverseOutputTransformType` / `aces:transformId`**Description:**

This element is used to communicate the transformID of an ACES Inverse Output Transform that transforms images encoded in an output referred color space to ACES 2065-1. For more information on transformIDs see S-2014-002 Academy Color Encoding System – Versioning system. Valid transforms for this element are Input Transforms. The element is restricted to enforce the use of transformIDs that follow the InvRRTODT naming conventions established in the versioning system specification. As noted in the versioning system specification, manufacturer and user created transforms shall be assigned a transformID according to patterns established in the document.

Diagram:**Type:**

`aces:tnInverseReferenceRenderingTransform`

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

`aces:inputTransform`

Children:

None

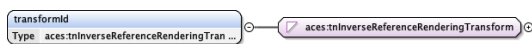
Example:

```

<aces:transformId>
urn:ampas:aces:transformId:v1.5:InvRRT.a1.0.3
</aces:transformId>
  
```

6.3.26 `aces:inverseReferenceRenderingTransformType` / `aces:transformId`**Description:**

This element is used to communicate the transformID of an ACES Inverse Reference Rendering Transform that transforms images encoded in OCES color space to ACES 2065-1. For more information on transformIDs see S-2014-002 Academy Color Encoding System – Versioning system. Valid transforms for this element are Input Transforms. The element is restricted to enforce the use of transformIDs that follow the InvRRT naming conventions established in the versioning system specification. As noted in the versioning system specification, manufacturer and user created transforms shall be assigned a transformID according to patterns established in the document.

Diagram:**Type:**

`aces:tnInverseReferenceRenderingTransform`

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:`aces:inputTransform`**Children:**

None

Example:

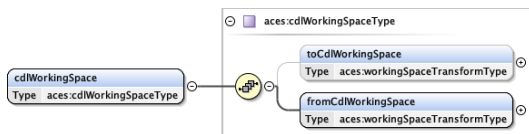
```

<aces:transformId>
urn:ampas:aces:transformId:v1.5:InvRRTOTD.Academy.Rec2020_1000nits_15nits_ST2084
.a1.1.0
</aces:transformId>

```

6.3.27 aces:cdlWorkingSpace**Description:**

This element contains all the elements describing the transforms used to convert to and from the working color space in which a ASC-CDL transform is applied. This element allows for CDLs to be applied in color spaces other than ACES RGB, since CDLs cannot contain ACES transforms themselves. The input and output of the parent `<lookTransform>` element is still ACES RGB per SMPTE ST.2065-1.

Diagram:**Type:**`aces:cdlWorkingSpaceType`**Required or Optional:**

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:`aces:lookTransform`**Children:**`aces:fromCdlWorkingSpace, aces:toCdlWorkingSpace`**Example:**

```

<aces:cdlWorkingSpace>

```

```
...
</aces:cdlWorkingSpace>
```

6.3.28 `aces:lookTransformType` / `aces:transformId`

Description:

This element is used to communicate the transformID of an ACES Look Transform. For more information on transformIDs see S-2014-002 Academy Color Encoding System – Versioning system. Valid transforms for this element are Look Transforms (LMT). The element is restricted to enforce the use of transformIDs that follow the LMT naming conventions established in the versioning system specification. As noted in the versioning system specification, manufacturer and user created transforms shall be assigned a transformID according to patterns established in the document.

Diagram:



Type:

`aces:tnLookTransform`

Required or Optional:

Choice of `aces:transformId`, `cdl:ColorCorrectionRef`, or `cdl:SOPNode` and `cdl:SatNode` required

Occurrences:

Min: 0 Max: 1

Attributes:

Required: None

Optional: None

Parent:

`aces:lookTransform`

Children:

None

Example:

```
<aces:transformId>
urn:ampas:aces:transformId:v1.5:LMT.ACME.BleachBypass.a1.v1</aces:transformId>

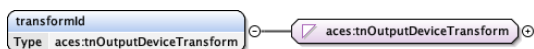
</aces:transformId>
```

6.3.29 `aces:outputDeviceTransformType` / `aces:transformId`

Description:

This element is used to communicate the transformID of the ACES Output Device Transform. For more information on transformIDs see S-2014-002 Academy Color Encoding System – Versioning system. Valid transforms for this element are Output Transforms (ODT). The element is restricted to enforce the use of transformIDs that follow the ODT naming conventions established in the versioning system specification. As noted in the versioning system specification, manufacturer and user created transforms shall be assigned a transformID according to patterns established in the document.

Diagram:



Type:

aces:tnOutputDeviceTransform

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:outputDeviceTransform

Children:

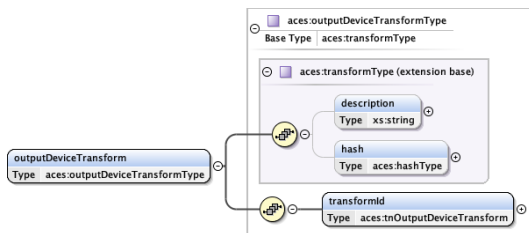
None

Example:

```
<aces:transformId>urn:ampas:aces:transformId:v1.5:ODT.Academy.P3D60_48nits.a1.0.0
</aces:transformId>
```

6.3.30 aces:outputDeviceTransform**Description:**

This element contains all the elements containing information about the ACES Output Device Transform for a given ACES viewing pipeline.

Diagram:**Type:**

aces:outputDeviceTransformType

Required or Optional:

Choice of `aces:transformId` or `aces:outputDeviceTransform` and `aces:referenceRenderingTransform` required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:OutputTransform

Children:

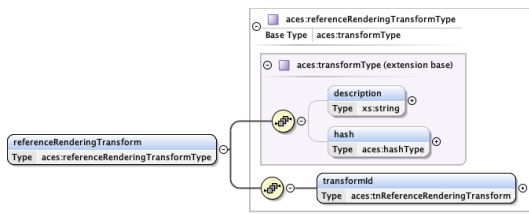
aces:description, aces:hash, aces:transformId

Example:

```
<aces:outputDeviceTransform>
...
</aces:outputDeviceTransform>
```

6.3.31 aces:referenceRenderingTransform**Description:**

This element contains all the elements containing information about the ACES Reference Rendering Transform for a given ACES viewing pipeline.

Diagram:**Type:**

aces:referenceRenderingTransformType

Required or Optional:

Choice of aces:transformId or aces:outputDeviceTransform and aces:referenceRenderingTransform required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None
Optional: None

Parent:

aces:OutputTransform

Children:

aces:description, aces:hash, aces:transformId

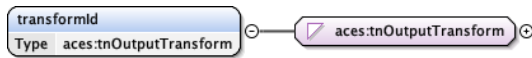
Example:

```
<aces:referenceRenderingTransform>
...
</aces:referenceRenderingTransform>
```

6.3.32 aces:outputTransformType / aces:transformId**Description:**

This element is used to communicate the transformID of the ACES Output Transform. For more information on transformIDs see S-2014-002 Academy Color Encoding System – Versioning system. Valid transforms for this element are Output Transforms (RRTODT). The element is restricted to enforce the use of transformIDs that follow the RRTODT naming conventions established in the versioning system specification. As noted in the versioning system specification, manufacturer and user created transforms shall be assigned a transformID according to patterns established in the document.

Diagram:

**Type:**

aces:tnOutputTransform

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:outputTransform

Children:

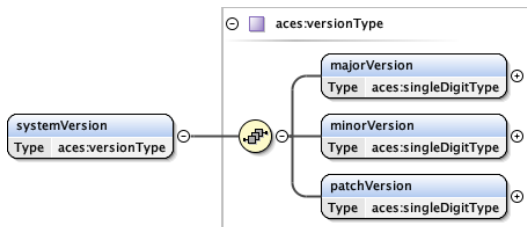
None

Example:

```
<aces:transformId>
urn:ampas:aces:transformId:v1.5:RRTODT.Academy.Rec2020_1000nits_15nits_HLG.a1.1.0
</aces:transformId>
```

6.3.33 aces:systemVersion**Description:**

This element contains all the elements containing information about the ACES version number associated with the ACES viewing pipeline.

Diagram:**Type:**

aces:versionType

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:pipelineInfo

Children:

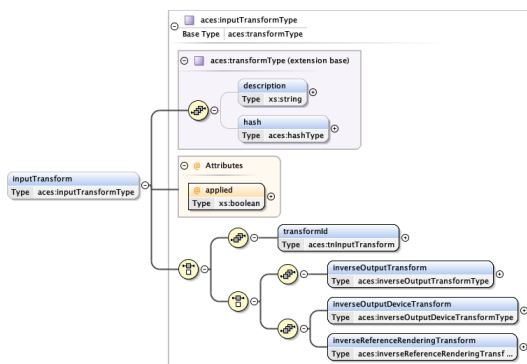
aces:majorVersion, aces:minorVersion, aces:patchVersion

Example:

```
<aces:systemVersion>
...
</aces:systemVersion>
```

6.3.34 aces:inputTransform**Description:**

This element contains all the elements containing information about the ACES input transform for a given ACES viewing pipeline. The required `applied` attribute is used to indicate if the ACES input transform indicated has been applied to the media files or not. If `applied="true"` the media files shall be encoded as according to SMPTE ST 2065-1. If `applied="false"` the media files may be transcoded to ACES using the transform indicated in the child element `transformId`.

Diagram:**Type:**

aces:inputTransformType

Required or Optional:

Optional

Occurrences:

Min: 0 Max: 1

Attributes:

Required: `applied` (xs:boolean)

Optional: None

Parent:

aces:pipeline, aces:archivedPipeline

Children:

aces:description, aces:hash, aces:transformId

Example:

```
<aces:inputTransform>
...
</aces:inputTransform>
```

6.3.35 `aces:lookTransform`

Description:

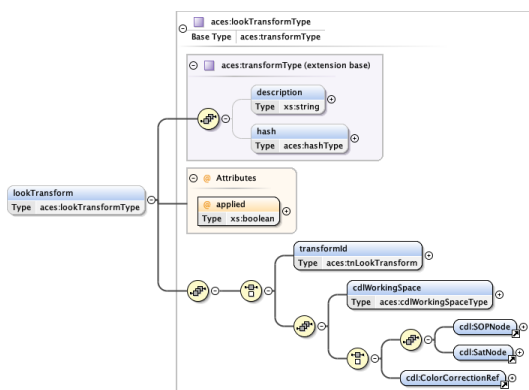
This element contains a look transform (LMT) for a given ACES viewing pipeline. If the AMF includes multiple `<lookTransform>` elements, they shall be applied in the order in which they are written in the AMF (top to bottom).

The required `applied` attribute is used to indicate if the ACES look transform has been applied to the media files or not. If `applied="true"`, the media files shall have the look transform "baked" into the image data (but is still included for diagnostic purposes). If `applied="false"`, the media files shall not have the look transform "baked" into the image data.

The input values and output values of ACES Look Transforms are ACES 2065-1. This is to avoid linking the Look Transforms to project specific working spaces. Look Transforms may convert ACES 2065-1 to a more appropriate working space for internal look application. Care should be taken when building Look Transforms as 3D LUTs, given Look Transforms input and output values are linear. In practice, smart implementations may modify the Look Transform to avoid unnecessary conversions within the context of an ACES pipeline as long as the results match those specified by the transforms in the AMF.

ASC-CDL does not have a mechanism to convert to a non-linear working space appropriate for the application of ASC-CDL values. For this reason, the `<aces:cdlTransformWorkingSpace>` element can be used to indicate the working space via transformIDs in which ASC-CDL values are to be applied.

Diagram:



Type:

`aces:lookTransformType`

Required or Optional:

Optional

Occurrences:

Min: 0 Max: unbounded

Attributes:

Required: `applied` (`xs:boolean`)

Optional: None

Parent:

`aces:pipeline`, `aces:archivedPipeline`

Children:

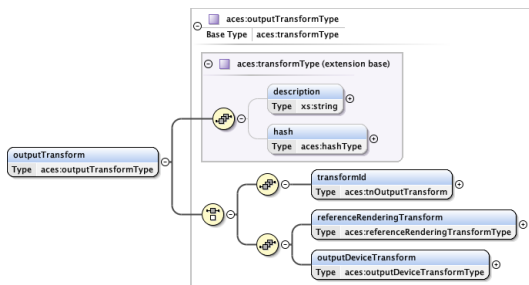
`aces:description`, `aces:hash`, `aces:CdlWorkingSpace`,
`aces:transformId`, `cdl:ColorCorrectionRef`, `cdl:SOPNode`, `cdl:SatNode`

Example:

```
<aces:lookTransform>
...
</aces:lookTransform>
```

6.3.36 aces:outputTransform**Description:**

This element contains all the elements containing information about the ACES output transform for a given ACES viewing pipeline.

Diagram:**Type:**

aces:outputTransformType

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:pipeline, aces:archivedPipeline

Children:

aces:description, aces:hash, aces:outputDeviceTransform,
aces:referenceRenderingTransform, aces:transformId

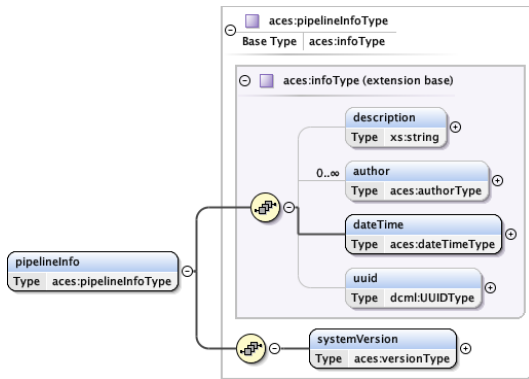
Example:

```
<aces:outputTransform>
...
</aces:outputTransform>
```

6.3.37 aces:pipelineInfo**Description:**

This element contains all the elements containing metadata information such as description, author, date and time, etc. for a given ACES viewing pipeline.

Diagram:

**Type:**

aces:pipelineInfoType

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:pipeline, aces:archivedPipeline

Children:

aces:author, aces:dateTime, aces:description, aces:systemVersion,
aces:uuid

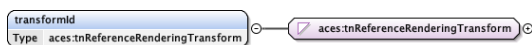
Example:

```

<aces:pipelineInfo>
...
</aces:pipelineInfo>
  
```

6.3.38 aces:referenceRenderingTransform / aces:transformId**Description:**

This element is used to communicate the transformID of the ACES Reference Rendering Transform. For more information on transformIDs see S-2014-002 Academy Color Encoding System – Versioning system. Valid transforms for this element are Reference Rendering Transform (RRT). The element is restricted to enforce the use of transformIDs that follow the RRT naming conventions established in the versioning system specification.

Diagram:**Type:**

aces:tnReferenceRenderingTransform

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:outputTransform

Children:

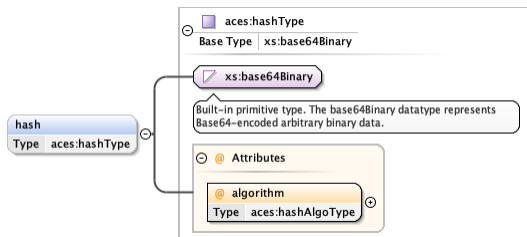
None

Example:

```
<aces:transformId>
urn:ampas:aces:transformId:v1.5:urn:ampas:aces:transformId:v1.5:RRT.a1.0.0
</aces:transformId>
```

6.3.39 aces:hash**Description:**

This element is used to communicate the cryptographic hash for a transform referenced by the AMF.

Diagram:**Type:**

aces:hashType

Required or Optional:

Optional

Occurrences:

Min: 0 Max: 1

Attributes:

Required: algorithm (restricted xs:anyURI)

Optional: None

Parent:

aces:inputTransform, aces:lookTransform, aces:outputDeviceTransform,
aces:outputTransform, aces:referenceRenderingTransform

Children:

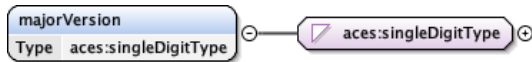
None

Example:

```
<aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">c81af4fb4a22ee
0353308e4582708951df4682bf73f838c24bf44e585fc3bb61</aces:hash>
```

6.3.40 `aces:majorVersion`**Description:**

This element contains information on the ACES system major version number associated with an ACES viewing pipeline. If the system reading the AFM has not implemented the major version specified the system shall indicate that the major version of the system and AMF do not match and produce an error.

Diagram:**Type:**

`aces:singleDigitType`

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

`/textttaces:systemVersion`

Children:

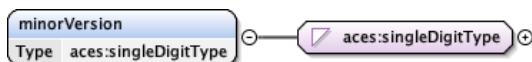
None

Example:

```
<aces:majorVersion>1</aces:majorVersion>
```

6.3.41 `aces:minorVersion`**Description:**

This element contains information on the ACES system minor version number associated with an ACES viewing pipeline. If the system reading the AFM has not implemented the minor version specified the system shall indicate that the minor version of the system and AMF do not match and produce an error.

Diagram:**Type:**

`aces:singleDigitType`

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

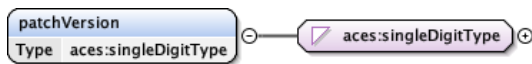
/textttaces:systemVersion

Children:

None

Example:`<aces:minorVersion>2</aces:minorVersion>`**6.3.42 aces:patchVersion****Description:**

This element contains information on the ACES system patch version number associated with an ACES viewing pipeline. If the system reading the AFM has not implemented the patch version specified the system shall indicate that the patch version of the system and AMF do not match with a warning and fall back to the most recent patch version available.

Diagram:**Type:**

aces:singleDigitType

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

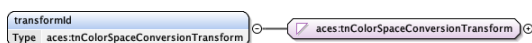
/textttaces:systemVersion

Children:

None

Example:`<aces:patchVersion>2</aces:patchVersion>`**6.3.43 aces:workingSpaceTransformType / aces:transformId****Description:**

This element is used to communicate the transformID of the ACES Color Space Conversion Transform used to convert to or from the Look Transform working space. For more information on transformIDs see S-2014-002 Academy Color Encoding System – Versioning system. Valid transforms for this element are Reference Rendering Transform (ACEScsc). The element is restricted to enforce the use of transformIDs that follow the ACEScsc naming conventions established in the versioning system specification.

Diagram:

Type:

aces:tnColorSpaceConversionTransform

Required or Optional:

Required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:toCdlWorkingSpace, aces:fromCdlWorkingSpace

Children:

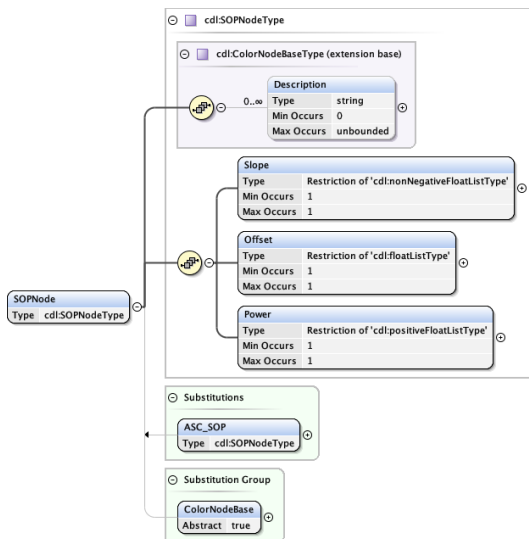
None

Example:

```
<aces:transformId>
urn:ampas:aces:transformId:v1.5:ACEScsc.Academy.ACEScct_to_ACES.a1.0.3
</aces:transformId>
```

6.3.44 cdl:SOPNode**Description:**

This element is imported from the ASC-CDL schema (ASC-CDL_schema_v1.01.xsd). It defines a Slope, Offset, Power node. <cdl:SOPNode> may be substituted with <cdl:ASC_SOP>. See the ASC-CDL documentation for more information on its usage.

Diagram:**Type:**

cdl:SOPNodeType

Required or Optional:

Choice of aces:transformId, cdl:ColorCorrectionRef, or cdl:SOPNode and cdl:SatNode required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:lookTransform

Children:

cdl:Description, cdl:Offset, cdl:Power, cdl:Slope

Example:

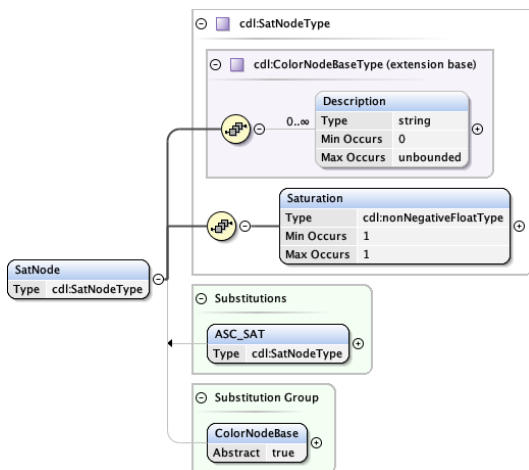
```

<cdl:ASC_SOP>
<cdl:Slope>2.0 2.0 2.0</cdl:Slope>
<cdl:Offset>0.1 0.1 0.1</cdl:Offset>
<cdl:Power>1 1 1</cdl:Power>
</cdl:ASC_SOP>

```

6.3.45 cdl:SATNode**Description:**

This element is imported from the ASC-CDL schema (ASC-CDL_schema_v1.01.xsd). It defines a saturation node. <cdl:SATNode> may be substituted with <cdl:ASC_SAT>. See the ASC-CDL documentation for more information on its usage.

Diagram:**Type:**

cdl:SATNodeType

Required or Optional:

Choice of aces:transformId, cdl:ColorCorrectionRef, or cdl:SOPNode and cdl:SatNode required

Occurrences:

Min: 1 Max: 1

Attributes:

Required: None

Optional: None

Parent:

aces:lookTransform

Children:

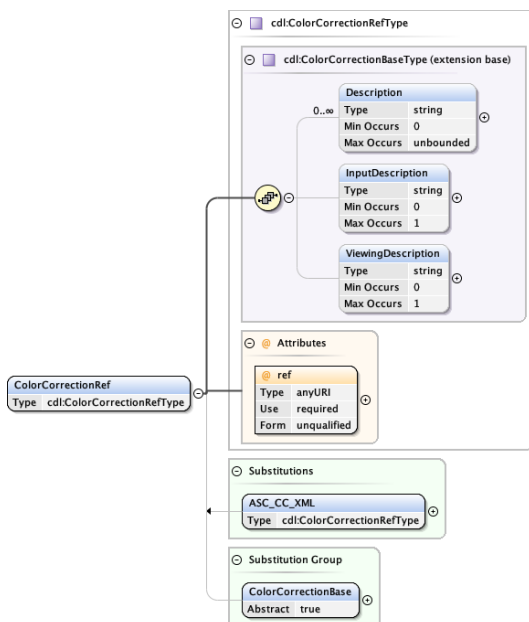
cdl:Description, cdl:Saturation

Example:

```
<cdl:ASC_SAT>
<cdl:Saturation>1.0</cdl:Saturation>
</cdl:ASC_SAT>
```

6.3.46 cdl:ColorCorrectionRef**Description:**

This element is imported from the ASC-CDL schema (ASC-CDL_schema_v1.01.xsd). It defines a Color Correction Reference node for referencing ASC-CDL values that exist in transport containers other than the AMF. `<cdl:ColorCorrectionRef>` may be substituted with `<cdl:ASC_CC_XML>`. It is recommended the `cdl:InputDescription` and `cdl:ViewingDescription` nodes not be used as this information is included in other locations within the AMF. See the ASC-CDL documentation for more information on the usage of this node.

Diagram:**Type:**

Choice of aces:transformId, cdl:ColorCorrectionRef, or cdl:SOPNode and cdl:SatNode required

Required or Optional:

cdl:ColorCorrectionRefType

Occurrences:

Min: 1 Max: 1

Attributes:

Required: ref (xs:anyURI)
Optional: None

Parent:

aces:lookTransform

Children:

cdl:Description, cdl:InputDescription, cdl:ViewingDescription

Example:

```
<cdl:ColorCorrectionRef ref="file:///foo.edl">  
<cdl:Description>Technical Grade</cdl:Description>  
</cdl:ColorCorrectionRef>
```

Appendix A

(normative)

ACES Metadata File XSD Schema

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema targetNamespace="urn:ampas:aces:amf:v1.0"
  xmlns:aces="urn:ampas:aces:amf:v1.0"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:cdl="urn:ASC:CDL:v1.01"
  xmlns:dcml="http://www.smpte-ra.org/schemas/433/2008/dcmlTypes/"
  xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
  elementFormDefault="qualified"
  attributeFormDefault="unqualified">

  <!-- Import CDL Schema -->
  <xs:import schemaLocation="ASC-CDL_schema_v1.01.xsd"
    namespace="urn:ASC:CDL:v1.01"/>

  <!-- Import SMPTE DCML Types Schema -->
  <xs:import schemaLocation="https://smpte-ra.org/sites/default/files/st433b-2008-am1-2011.xsd"
    namespace="http://www.smpte-ra.org/schemas/433/2008/dcmlTypes/" />

  <!-- Import XML Sig Schema -->
  <xs:import schemaLocation="https://www.w3.org/TR/2002/REC-xmldsig-core-20020212/xmldsig-core-schema.xsd"
    namespace="http://www.w3.org/2000/09/xmldsig#" />

  <!-- Define general types -->
  <xs:simpleType name="singleDigitType">
    <xs:restriction base="xs:integer">
      <xs:totalDigits value="1"/>
      <xs:minInclusive value="0"/>
      <xs:maxInclusive value="9"/>
    </xs:restriction>
  </xs:simpleType>

  <xs:complexType name="dateTimeType">
    <xs:sequence>
      <xs:element name="creationDateTime" type="xs:dateTime" minOccurs="1"
        maxOccurs="1"/>
      <xs:element name="modificationDateTime" type="xs:dateTime" minOccurs="1"
        maxOccurs="1"/>
    </xs:sequence>
  </xs:complexType>

  <xs:simpleType name="emailAddressType">
    <xs:restriction base="xs:string">
      <xs:pattern value="^[@]+@[^\.]+\.\.+" />
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="hashAlgoType">
    <xs:restriction base="xs:anyURI">
      <xs:enumeration value="http://www.w3.org/2001/04/xmlenc#sha256"/>
    </xs:restriction>
  </xs:simpleType>

```

```

    <xs:enumeration value="http://www.w3.org/2000/09/xmlsig#sha1"/>
    <xs:enumeration value="http://www.w3.org/2001/04/xmlsig-more#md5"/>
  </xs:restriction>
</xs:simpleType>

<xs:complexType name="hashType">
  <xs:simpleContent>
    <xs:extension base="xs:base64Binary">
      <xs:attribute name="algorithm" type="aces:hashAlgoType" use="required"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

<!-- Define transform name types -->
<xs:simpleType name="tnLookTransform">
  <xs:restriction base="xs:string">
    <xs:pattern value="urn:ampas:aces:transformId:v1.5:(LMT\.\S+\.\S+\.a\d+\.v\
d+|LMT\.Academy\.\S+\.a\d+\.\d+\.\d+)"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="tnInputTransform">
  <xs:restriction base="xs:string">
    <xs:pattern value="urn:ampas:aces:transformId:v1.5:IDT\.\S+\.\S+\.a\d+\.v\d
+"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="tnOutputDeviceTransform">
  <xs:restriction base="xs:string">
    <xs:pattern value="urn:ampas:aces:transformId:v1.5:(ODT\.\S+\.\S+\.a\d+\.v\
d+|ODT\.Academy\.\S+\.a\d+\.\d+\.\d+)"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="tnInverseOutputDeviceTransform">
  <xs:restriction base="xs:string">
    <xs:pattern value="urn:ampas:aces:transformId:v1.5:(InvODT\.\S+\.\S+\.a\d
+\.v\d+|InvODT\.Academy\.\S+\.a\d+\.\d+\.\d+)"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="tnOutputTransform">
  <xs:restriction base="xs:string">
    <xs:pattern value="urn:ampas:aces:transformId:v1.5:(RRTODT\.\S+\.\S+\.a\d
+\.v\d+|RRTODT\.Academy\.\S+\.a\d+\.\d+\.\d+)"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="tnInverseOutputTransform">
  <xs:restriction base="xs:string">
    <xs:pattern value="urn:ampas:aces:transformId:v1.5:(InvRRTODT\.\S+\.\S+\.a\
d+\.v\d+|InvRRTODT\.Academy\.\S+\.a\d+\.\d+\.\d+)"/>
  </xs:restriction>
</xs:simpleType>

<xs:simpleType name="tnReferenceRenderingTransform">
  <xs:restriction base="xs:string">
    <xs:pattern value="urn:ampas:aces:transformId:v1.5:RRT\.a\d+\.\d+\.\d+"/>
  </xs:restriction>
</xs:simpleType>

```

```

    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="tnInverseReferenceRenderingTransform">
    <xs:restriction base="xs:string">
      <xs:pattern value="urn:ampas:aces:transformId:v1.5:InvRRT\.a\d+\.\d+\.\d+"
        />
    </xs:restriction>
  </xs:simpleType>

  <xs:simpleType name="tnColorSpaceConversionTransform">
    <xs:restriction base="xs:string">
      <xs:pattern value="urn:ampas:aces:transformId:v1.5:(ACEScsc\.|S+\.\S+\.a\d
        +\.\v\d+|ACEScsc\.Academy\.|S+\.a\d+\.\d+\.\d+)"/>
    </xs:restriction>
  </xs:simpleType>

  <!-- Define clip identification types -->
  <xs:complexType name="sequenceType">
    <xs:simpleContent>
      <xs:extension base="xs:string">
        <xs:attribute name="idx" type="xs:string" use="required"/>
        <xs:attribute name="min" type="xs:nonNegativeInteger" use="required"/>
        <xs:attribute name="max" type="xs:nonNegativeInteger" use="required"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>

  <xs:complexType name="clipIdType">
    <xs:sequence>
      <xs:element name="clipName" type="xs:string" minOccurs="1" maxOccurs="1"/>
      <xs:choice minOccurs="1" maxOccurs="1">
        <xs:element name="sequence" type="aces:sequenceType"/>
        <xs:element name="file" type="xs:anyURI"/>
        <xs:element name="uuid" type="dcml:UUIDType"/>
      </xs:choice>
    </xs:sequence>
  </xs:complexType>

  <!-- Define transform types -->
  <xs:complexType name="ttransformType">
    <xs:sequence>
      <xs:element name="description" type="xs:string" minOccurs="0" maxOccurs="1"
        />
      <xs:element name="hash" type="aces:hashType" minOccurs="0" maxOccurs="1"/>
    </xs:sequence>
  </xs:complexType>

  <xs:complexType name="inputTransformType">
    <xs:complexContent>
      <xs:extension base="aces:transformType">
        <xs:choice minOccurs="1" maxOccurs="1">
          <xs:sequence>
            <xs:element name="transformId" type="aces:tnInputTransform" minOccurs="1"
              maxOccurs="1"/>
          </xs:sequence>
          <xs:choice>
            <xs:sequence>
              <xs:element name="inverseOutputTransform" type="aces:

```



```

        inverseOutputTransformType" minOccurs="1" maxOccurs="1"/>
    </xs:sequence>
    <xs:sequence>
        <xs:element name="inverseOutputDeviceTransform" type="aces:
            inverseOutputDeviceTransformType" minOccurs="1" maxOccurs="1"/>
        <xs:element name="inverseReferenceRenderingTransform" type="aces:
            inverseReferenceRenderingTransformType" minOccurs="1" maxOccurs="1"/>
    </xs:sequence>
    </xs:choice>
</xs:choice>
    <xs:attribute name="applied" type="xs:boolean" use="required"/>
</xs:extension>
</xs:complexContent>
</xs:complexType>

<xs:complexType name="referenceRenderingTransformType">
    <xs:complexContent>
        <xs:extension base="aces:transformType">
            <xs:sequence>
                <xs:element name="transformId" type="aces:tnReferenceRenderingTransform"
                    minOccurs="1" maxOccurs="1"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>

<xs:complexType name="outputDeviceTransformType">
    <xs:complexContent>
        <xs:extension base="aces:transformType">
            <xs:sequence>
                <xs:element name="transformId" type="aces:tnOutputDeviceTransform"
                    minOccurs="1" maxOccurs="1"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>

<xs:complexType name="inverseReferenceRenderingTransformType">
    <xs:complexContent>
        <xs:extension base="aces:transformType">
            <xs:sequence>
                <xs:element name="transformId" type="aces:
                    tnInverseReferenceRenderingTransform" minOccurs="1" maxOccurs="1"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>

<xs:complexType name="inverseOutputDeviceTransformType">
    <xs:complexContent>
        <xs:extension base="aces:transformType">
            <xs:sequence>
                <xs:element name="transformId" type="aces:tnInverseOutputDeviceTransform
                    " minOccurs="1" maxOccurs="1"/>
            </xs:sequence>
        </xs:extension>
    </xs:complexContent>
</xs:complexType>

```

```
<xs:complexType name="outputTransformType">
  <xs:complexContent>
    <xs:extension base="aces:transformType">
      <xs:choice minOccurs="1" maxOccurs="1">
        <xs:sequence>
          <xs:element name="transformId" type="aces:tnOutputTransform" minOccurs="1" maxOccurs="1"/>
        </xs:sequence>
        <xs:sequence>
          <xs:element name="referenceRenderingTransform" type="aces:referenceRenderingTransformType" minOccurs="1" maxOccurs="1"/>
          <xs:element name="outputDeviceTransform" type="aces:outputDeviceTransformType" minOccurs="1" maxOccurs="1"/>
        </xs:sequence>
      </xs:choice>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="inverseOutputTransformType">
  <xs:complexContent>
    <xs:extension base="aces:transformType">
      <xs:sequence>
        <xs:element name="transformId" type="aces:tnInverseOutputTransform" minOccurs="1" maxOccurs="1"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="workingSpaceTransformType">
  <xs:complexContent>
    <xs:extension base="aces:transformType">
      <xs:sequence>
        <xs:element name="transformId" type="aces:tnColorSpaceConversionTransform" minOccurs="1" maxOccurs="1"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="cdlWorkingSpaceType">
  <xs:sequence>
    <xs:element name="toCdlWorkingSpace" type="aces:workingSpaceTransformType" minOccurs="0" maxOccurs="1"/>
    <xs:element name="fromCdlWorkingSpace" type="aces:workingSpaceTransformType" minOccurs="1" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="lookTransformType">
  <xs:complexContent>
    <xs:extension base="aces:transformType">
      <xs:sequence>
        <xs:choice minOccurs="1" maxOccurs="1">
          <xs:element name="transformId" type="aces:tnLookTransform" minOccurs="1" maxOccurs="1"/>
        </xs:choice>
        <xs:sequence>
          <xs:element name="cdlWorkingSpace" type="aces:cdlWorkingSpaceType" minOccurs="1" maxOccurs="1"/>
        </xs:sequence>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
```

```

        minOccurs="1" maxOccurs="1"/>
      <xs:choice minOccurs="1" maxOccurs="1">
        <xs:sequence>
          <xs:element ref="cdl:SOPNode" minOccurs="1" maxOccurs="1"/>
          <xs:element ref="cdl:SatNode" minOccurs="1" maxOccurs="1"/>
        </xs:sequence>
        <xs:element ref="cdl:ColorCorrectionRef"/>
      </xs:choice>
    </xs:sequence>
  </xs:choice>
</xs:sequence>
<xs:attribute name="applied" type="xs:boolean" use="required"/>
</xs:extension>
</xs:complexType>
</xs:complexType>

<xs:complexType name="versionType">
  <xs:sequence>
    <xs:element name="majorVersion" type="aces:singleDigitType" minOccurs="1"
      maxOccurs="1"/>
    <xs:element name="minorVersion" type="aces:singleDigitType" minOccurs="1"
      maxOccurs="1"/>
    <xs:element name="patchVersion" type="aces:singleDigitType" minOccurs="1"
      maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="authorType">
  <xs:sequence>
    <xs:element name="name" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="emailAddress" type="aces:emailAddressType" minOccurs="1"
      maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="infoType">
  <xs:sequence>
    <xs:element name="description" type="xs:string" minOccurs="0" maxOccurs="1"
      />
    <xs:element name="author" type="aces:authorType" minOccurs="0" maxOccurs="
      unbounded"/>
    <xs:element name="dateTime" type="aces:dateTimeType" minOccurs="1"
      maxOccurs="1"/>
    <xs:element name="uuid" type="dcml:UUIDType" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<xs:complexType name="pipelineInfoType">
  <xs:complexContent>
    <xs:extension base="aces:infoType">
      <xs:sequence>
        <xs:element name="systemVersion" type="aces:versionType" minOccurs="1"
          maxOccurs="1"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

<xs:complexType name="pipelineType">

```

```
<xs:sequence>
  <xs:element name="pipelineInfo" type="aces:pipelineInfoType" minOccurs="1"
    maxOccurs="1"/>
  <xs:element name="inputTransform" type="aces:inputTransformType" minOccurs=
    "0" maxOccurs="1"/>
  <xs:element name="lookTransform" type="aces:lookTransformType" minOccurs="0"
    maxOccurs="unbounded" />
  <xs:element name="outputTransform" type="aces:outputTransformType"
    minOccurs="1" maxOccurs="1"/>
</xs:sequence>
</xs:complexType>

<!-- Define ACES Metadata File element -->
<xs:element name="acesMetadataFile">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="amfInfo" type="aces:infoType" minOccurs="1" maxOccurs="1"
        />
      <xs:element name="clipId" type="aces:clipIdType" minOccurs="0" maxOccurs="1"
        />
      <xs:element name="pipeline" type="aces:pipelineType" minOccurs="1"
        maxOccurs="1"/>
      <xs:element name="archivedPipeline" type="aces:pipelineType" minOccurs="0"
        maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="version" type="xs:decimal" use="required" fixed="1.0"/>
  </xs:complexType>
</xs:element>

</xs:schema>
```

Appendix B

(informative)

Sample ACES Metadata File XML

Example 1

```
<?xml version="1.0" encoding="UTF-8"?>
<aces:acesMetadataFile
  xmlns:aces="urn:ampas:aces:amf:v1.0"
  xsi:schemaLocation="urn:ampas:aces:amf:v1.0_file:acesMetadataFile.xsd"
  xmlns:cdl="urn:ASC:CDL:v1.01"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  version="1.0">
  <aces:amfInfo>
    <aces:dateTime>
      <aces:creationDateTime>2020-11-10T13:20:00Z</aces:creationDateTime>
      <aces:modificationDateTime>2020-11-10T13:20:00Z</aces:
        modificationDateTime>
    </aces:dateTime>
  </aces:amfInfo>
  <aces:pipeline>
    <aces:pipelineInfo>
      <aces:dateTime>
        <aces:creationDateTime>2020-11-10T13:20:00Z</aces:creationDateTime>
        <aces:modificationDateTime>2020-11-10T13:20:00Z</aces:
          modificationDateTime>
      </aces:dateTime>
      <aces:systemVersion>
        <aces:majorVersion>1</aces:majorVersion>
        <aces:minorVersion>1</aces:minorVersion>
        <aces:patchVersion>0</aces:patchVersion>
      </aces:systemVersion>
    </aces:pipelineInfo>
    <aces:outputTransform>
      <aces:transformId>urn:ampas:aces:transformId:v1.5:RR TODT.Academy.
        Rec2020_1000nits_15nits_ST2084.a1.1.0</aces:transformId>
    </aces:outputTransform>
  </aces:pipeline>
</aces:acesMetadataFile>
```

Example 2

```
<?xml version="1.0" encoding="UTF-8"?>
<aces:acesMetadataFile
  xmlns:aces="urn:ampas:aces:amf:v1.0"
  xsi:schemaLocation="urn:ampas:aces:amf:v1.0_file:acesMetadataFile.xsd"
  xmlns:cdl="urn:ASC:CDL:v1.01"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  version="1.0">
  <aces:amfInfo>
    <aces:description>Example Movie</aces:description>
    <aces:author>
      <aces:name>Foo Bar</aces:name>
      <aces:emailAddress>Foobar@onset.com</aces:emailAddress>
    </aces:author>
    <aces:dateTime>
      <aces:creationDateTime>2019-09-19T13:20:00</aces:creationDateTime>
      <aces:modificationDateTime>2019-11-27T13:20:00Z</aces:
        modificationDateTime>
    </aces:dateTime>
    <aces:uuid>urn:uuid:afe122be-59d3-4360-ad69-33c10108fa7a</aces:uuid>
  </aces:amfInfo>
  <aces:clipId>
    <aces:clipName>A001C012</aces:clipName>
    <aces:sequence idx="#" min="1" max="240">A001_C012_AE0306_###.exr</aces:
      sequence>
  </aces:clipId>
  <aces:pipeline>
    <aces:pipelineInfo>
      <aces:description>Example Movie Final DI</aces:description>
      <aces:dateTime>
        <aces:creationDateTime>2019-09-19T13:20:00</aces:creationDateTime>
        <aces:modificationDateTime>2019-11-27T13:20:00Z</aces:
          modificationDateTime>
      </aces:dateTime>
      <aces:uuid>urn:uuid:be6Ec2ea-a6DC-6cBC-ff0D-AfCED5FF3Dd8</aces:uuid>
      <aces:systemVersion>
        <aces:majorVersion>1</aces:majorVersion>
        <aces:minorVersion>0</aces:minorVersion>
        <aces:patchVersion>3</aces:patchVersion>
      </aces:systemVersion>
    </aces:pipelineInfo>
    <aces:inputTransform applied="true">
      <aces:description>IDT from Acme Camera Company</aces:description>
      <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">1531
        ea6ef06c5b0a5bea80c94f60c7b68e3989e3c90b8ebd25c28aa4670c30f8</aces:hash
      >
      <aces:transformId>urn:ampas:aces:transformId:v1.5:IDT.Acme.Camera.a1.v1
      </aces:transformId>
    </aces:inputTransform>
    <aces:lookTransform applied="true">
      <aces:description>Technical Grade</aces:description>
      <aces:lookTransformWorkingSpace>
        <aces:fromLookTransformWorkingSpace>
          <aces:transformId>urn:ampas:aces:transformId:v1.5:ACEScsc.
            Academy.ACEScct_to_ACES.a1.0.3</aces:transformId>
        </aces:fromLookTransformWorkingSpace>
      </aces:lookTransformWorkingSpace>
      <cdl:ASC_SOP>
```

```
        <cdl:Slope>2.0 2.0 2.0</cdl:Slope>
        <cdl:Offset>0.1 0.1 0.1</cdl:Offset>
        <cdl:Power>1 1 1</cdl:Power>
    </cdl:ASC_SOP>
    <cdl:ASC_SAT>
        <cdl:Saturation>1</cdl:Saturation>
    </cdl:ASC_SAT>
</aces:lookTransform>
<aces:outputTransform>
    <aces:referenceRenderingTransform>
        <aces:description>ACES v1.0.3 RRT</aces:description>
        <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">
c81af4fb4a22ee0353308e4582708951df4682bf73f838c24bf44e585fc3bb61</
aces:hash>
        <aces:transformId>urn:ampas:aces:transformId:v1.5:RRT.a1.0.3</aces:
transformId>
    </aces:referenceRenderingTransform>
    <aces:outputDeviceTransform>
        <aces:description>P3D60 ODT</aces:description>
        <aces:hash algorithm="http://www.w3.org/2000/09/xmldsig#sha1">
efd279a82c2d52ee8c49dc0793499dc86bb1a4a3fa0dfb420d59c2814c55aea6</
aces:hash>
        <aces:transformId>urn:ampas:aces:transformId:v1.5:ODT.Academy.
P3D60_48nits.a1.0.3</aces:transformId>
    </aces:outputDeviceTransform>
</aces:outputTransform>
</aces:pipeline>
</aces:acesMetadataFile>
```

Example 3

```

<?xml version="1.0" encoding="UTF-8"?>
<aces:acesMetadataFile
  xmlns:aces="urn:ampas:aces:amf:v1.0"
  xsi:schemaLocation="urn:ampas:aces:amf:v1.0_file:acesMetadataFile.xsd"
  xmlns:cdl="urn:ASC:CDL:v1.01"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  version="1.0">
  <aces:amfInfo>
    <aces:description>Exmaple Movie</aces:description>
    <aces:author>
      <aces:name>Foo Bar</aces:name>
      <aces:emailAddress>foobar@onset.com</aces:emailAddress>
    </aces:author>
    <aces:author>
      <aces:name>John Doe</aces:name>
      <aces:emailAddress>johndoe@onset.com</aces:emailAddress>
    </aces:author>
    <aces:dateTime>
      <aces:creationDateTime>2019-09-19T13:20:00</aces:creationDateTime>
      <aces:modificationDateTime>2019-11-27T13:20:00Z</aces:
      modificationDateTime>
    </aces:dateTime>
    <aces:uuid>urn:uuid:afe122be-59d3-4360-ad69-33c10108fa7a</aces:uuid>
  </aces:amfInfo>
  <aces:clipId>
    <aces:clipName>A001C030</aces:clipName>
    <aces:uuid>urn:uuid:797c7cd8-4eb1-4f67-afce-af2b0a1d0285</aces:uuid>
  </aces:clipId>
  <aces:pipeline>
    <aces:pipelineInfo>
      <aces:description>Example Movie DI Regrade</aces:description>
      <aces:dateTime>
        <aces:creationDateTime>2020-11-10T13:20:00Z</aces:creationDateTime>
        <aces:modificationDateTime>2020-11-10T13:20:00Z</aces:
        modificationDateTime>
      </aces:dateTime>
      <aces:uuid>urn:uuid:be6Ec2ea-a6DC-6cBC-ff0D-AfCED5FF3Dd8</aces:uuid>
      <aces:systemVersion>
        <aces:majorVersion>1</aces:majorVersion>
        <aces:minorVersion>0</aces:minorVersion>
        <aces:patchVersion>3</aces:patchVersion>
      </aces:systemVersion>
    </aces:pipelineInfo>
    <aces:inputTransform applied="true">
      <aces:description>IDT from Acme Camera Company</aces:description>
      <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">1531
      ea6ef06c5b0a5bea80c94f60c7b68e3989e3c90b8ebd25c28aa4670c30f8</aces:hash
      >
      <aces:transformId>urn:ampas:aces:transformId:v1.5:IDT.Acme.Camera.a1.v1
      </aces:transformId>
    </aces:inputTransform>
    <aces:lookTransform applied="true">
      <aces:description>Technical Grade</aces:description>
      <aces:lookTransformWorkingSpace>
        <aces:fromLookTransformWorkingSpace>
          <aces:transformId>urn:ampas:aces:transformId:v1.5:ACEScsc.Academy
          .ACEScct_to_ACES.a1.0.3</aces:transformId>
        </aces:fromLookTransformWorkingSpace>
      </aces:lookTransformWorkingSpace>
    </aces:lookTransform>
  </aces:pipeline>
</aces:pipeline>

```



```

    </aces:fromLookTransformWorkingSpace>
  </aces:lookTransformWorkingSpace>
  <cdl:SOPNode>
    <cdl:Slope>2.0 2.0 2.0</cdl:Slope>
    <cdl:Offset>0.1 0.1 0.1</cdl:Offset>
    <cdl:Power>1 1 1</cdl:Power>
  </cdl:SOPNode>
  <cdl:SatNode>
    <cdl:Saturation>1</cdl:Saturation>
  </cdl:SatNode>
</aces:lookTransform>
<aces:lookTransform applied="false">
  <aces:description>Acme DI Show Look</aces:description>
  <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">
e3b0c44298fc1c149afb4c8996fb92427ae41e4649b934ca495991b7852b855</aces:
hash>
  <aces:lookTransformWorkingSpace>
    <aces:toLookTransformWorkingSpace>
      <aces:description>Use ACEScc as the working space for this LMT</
aces:description>
      <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">07
eb8b020fe8fc10c8c4b983cc37798324c7eee1319f07dd0028fca96f904a7f</
aces:hash>
      <aces:transformId>urn:ampas:aces:transformId:v1.5:ACEScsc.ACME.
ACES_to_MyCustomLogSpace.a1.v1</aces:transformId>
    </aces:toLookTransformWorkingSpace>
    <aces:fromLookTransformWorkingSpace>
      <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">
ef461a45beded2c5204371f755ca2558e61743f288f3ccd719ce1de23ebcf9cb
</aces:hash>
      <aces:transformId>urn:ampas:aces:transformId:v1.5:ACEScsc.ACME.
MyCustomLogSpace_to_ACES.a1.v1</aces:transformId>
    </aces:fromLookTransformWorkingSpace>
  </aces:lookTransformWorkingSpace>
  <aces:transformId>urn:ampas:aces:transformId:v1.5:LMT.ACME.AcmeDILook.
a1.v5</aces:transformId>
</aces:lookTransform>
<aces:outputTransform>
  <aces:referenceRenderingTransform>
    <aces:description>ACES v1.0.3 RRT</aces:description>
    <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">
c81af4fb4a22ee0353308e4582708951df4682bf73f838c24bf44e585fc3bb61</
aces:hash>
    <aces:transformId>urn:ampas:aces:transformId:v1.5:RRT.a1.0.3</aces:
transformId>
  </aces:referenceRenderingTransform>
  <aces:outputDeviceTransform>
    <aces:description>P3D60 ODT</aces:description>
    <aces:hash algorithm="http://www.w3.org/2000/09/xmldsig#sha1">
efd279a82c2d52ee8c49dc0793499dc86bb1a4a3fa0dfb420d59c2814c55aea6</
aces:hash>
    <aces:transformId>urn:ampas:aces:transformId:v1.5:ODT.Academy.
P3D60_48nits.a1.0.3</aces:transformId>
  </aces:outputDeviceTransform>
</aces:outputTransform>
</aces:pipeline>
<aces:archivedPipeline>
  <aces:pipelineInfo>
    <aces:description>Example Movie Final DI</aces:description>

```

```

<aces:dateTime>
  <aces:creationDateTime>2019-09-19T13:20:00</aces:creationDateTime>
  <aces:modificationDateTime>2019-11-27T13:20:00Z</aces:
modificationDateTime>
</aces:dateTime>
<aces:uuid>urn:uuid:d89931e8-bd46-4b70-b8e9-3068cf8b91a3</aces:uuid>
<aces:systemVersion>
  <aces:majorVersion>1</aces:majorVersion>
  <aces:minorVersion>0</aces:minorVersion>
  <aces:patchVersion>3</aces:patchVersion>
</aces:systemVersion>
</aces:pipelineInfo>
<aces:inputTransform applied="true">
  <aces:description>IDT from Acme Camera Company</aces:description>
  <aces:hash algorithm="http://www.w3.org/2001/04/xmldsig-more#md5">1531
ea6ef06c5b0a5bea80c94f60c7b68e3989e3c90b8ebd25c28aa4670c30f8</aces:hash
>
  <aces:transformId>urn:ampas:aces:transformId:v1.5:IDT.Acme.Camera.a1.v1
</aces:transformId>
</aces:inputTransform>
<aces:lookTransform applied="false">
  <aces:description>Technical Grade</aces:description>
  <aces:lookTransformWorkingSpace>
    <aces:fromLookTransformWorkingSpace>
      <aces:transformId>urn:ampas:aces:transformId:v1.5:ACEScsc.Academy
.ACEScct_to_ACES.a1.0.3</aces:transformId>
    </aces:fromLookTransformWorkingSpace>
  </aces:lookTransformWorkingSpace>
  <cdl:SOPNode>
    <cdl:Slope>1.5 1.5 1.5</cdl:Slope>
    <cdl:Offset>0.1 0.1 0.1</cdl:Offset>
    <cdl:Power>1 1 1</cdl:Power>
  </cdl:SOPNode>
  <cdl:SatNode>
    <cdl:Saturation>1</cdl:Saturation>
  </cdl:SatNode>
</aces:lookTransform>
<aces:lookTransform applied="false">
  <aces:description>Acme DI Show Look</aces:description>
  <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">
e3b0c44298fc1c149afbf4c8996fb92427ae41e4649b934ca495991b7852b855</aces:
hash>
  <aces:lookTransformWorkingSpace>
    <aces:toLookTransformWorkingSpace>
      <aces:description>Use ACEScsc as the working space for this LMT</
aces:description>
      <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">07
eb8b020fe8fc10c8c4b983cc37798324c7eee1319f07dd0028fca96f904a7f</
aces:hash>
      <aces:transformId>urn:ampas:aces:transformId:v1.5:ACEScsc.ACME.
ACES_to_MyCustomLogSpace.a1.v1</aces:transformId>
    </aces:toLookTransformWorkingSpace>
    <aces:fromLookTransformWorkingSpace>
      <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">
ef461a45beded2c5204371f755ca2558e61743f288f3ccd719ce1de23ebcf9cb
</aces:hash>
      <aces:transformId>urn:ampas:aces:transformId:v1.5:ACEScsc.ACME.
MyCustomLogSpace_to_ACES.a1.v1</aces:transformId>
    </aces:fromLookTransformWorkingSpace>
  </aces:lookTransformWorkingSpace>
</aces:lookTransform>

```

```
</aces:lookTransformWorkingSpace>
  <aces:transformId>urn:ampas:aces:transformId:v1.5:LMT.ACME.AcmeDILook.
    a1.v5</aces:transformId>
</aces:lookTransform>
<aces:outputTransform>
  <aces:description>Some HDR Output Transform</aces:description>
  <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">9
    ffc28772e244f9a3c6e9893f499f2b4f2f3313d292db51aeea4fd3f65f00d9</aces:
    hash>
  <aces:transformId>urn:ampas:aces:transformId:v1.5:RRTOdT.Acme.HDRODT.a1
    .v3</aces:transformId>
</aces:outputTransform>
</aces:archivedPipeline>
</aces:acesMetadataFile>
```

Example 4

```
<?xml version="1.0" encoding="UTF-8"?>
<aces:acesMetadataFile
  xmlns:aces="urn:ampas:aces:amf:v1.0"
  xsi:schemaLocation="urn:ampas:aces:amf:v1.0_file:acesMetadataFile.xsd"
  xmlns:cdl="urn:ASC:CDL:v1.01"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  version="1.0">
  <aces:amfInfo>
    <aces:description>Example Movie</aces:description>
    <aces:author>
      <aces:name>Foo Bar</aces:name>
      <aces:emailAddress>Foobar@onset.com</aces:emailAddress>
    </aces:author>
    <aces:dateTime>
      <aces:creationDateTime>2019-09-19T13:20:00</aces:creationDateTime>
      <aces:modificationDateTime>2019-11-27T13:20:00Z</aces:
        modificationDateTime>
    </aces:dateTime>
    <aces:uuid>urn:uuid:afe122be-59d3-4360-ad69-33c10108fa7a</aces:uuid>
  </aces:amfInfo>
  <aces:clipId>
    <aces:clipName>A001C012</aces:clipName>
    <aces:sequence idx="#" min="1" max="240">A001_C012_AE0306_###.exr</aces:
      sequence>
  </aces:clipId>
  <aces:pipeline>
    <aces:pipelineInfo>
      <aces:description>Example Movie Final DI</aces:description>
      <aces:dateTime>
        <aces:creationDateTime>2019-09-19T13:20:00</aces:creationDateTime>
        <aces:modificationDateTime>2019-11-27T13:20:00Z</aces:
          modificationDateTime>
      </aces:dateTime>
      <aces:uuid>urn:uuid:be6Ec2ea-a6DC-6cBC-ff0D-AfCED5FF3Dd8</aces:uuid>
      <aces:systemVersion>
        <aces:majorVersion>1</aces:majorVersion>
        <aces:minorVersion>0</aces:minorVersion>
        <aces:patchVersion>3</aces:patchVersion>
      </aces:systemVersion>
    </aces:pipelineInfo>
    <aces:inputTransform applied="false">
      <aces:description>Inverse ODT and RRT used to import output referred
        data</aces:description>
      <aces:inverseOutputDeviceTransform>
        <aces:transformId>urn:ampas:aces:transformId:v1.5:InvODT.Academy.
          Rec709_100nits_dim.a1.0.3</aces:transformId>
      </aces:inverseOutputDeviceTransform>
      <aces:inverseReferenceRenderingTransform>
        <aces:transformId>urn:ampas:aces:transformId:v1.5:InvRRT.a1.0.3</
          aces:transformId>
      </aces:inverseReferenceRenderingTransform>
    </aces:inputTransform>
    <aces:lookTransform applied="false">
      <aces:description>Technical Grade</aces:description>
      <aces:cdlWorkingSpace>
        <aces:fromCdlWorkingSpace>
          <aces:transformId>urn:ampas:aces:transformId:v1.5:ACEScsc.
```

```
        Academy.ACEScct_to_ACES.a1.0.3</aces:transformId>
      </aces:fromCdlWorkingSpace>
    </aces:cdlWorkingSpace>
    <cdl:ASC_SOP>
      <cdl:Slope>2.0 2.0 2.0</cdl:Slope>
      <cdl:Offset>0.1 0.1 0.1</cdl:Offset>
      <cdl:Power>1 1 1</cdl:Power>
    </cdl:ASC_SOP>
    <cdl:ASC_SAT>
      <cdl:Saturation>1</cdl:Saturation>
    </cdl:ASC_SAT>
  </aces:lookTransform>
<aces:outputTransform>
  <aces:referenceRenderingTransform>
    <aces:description>ACES v1.0.3 RRT</aces:description>
    <aces:hash algorithm="http://www.w3.org/2001/04/xmlenc#sha256">
      c81af4fb4a22ee0353308e4582708951df4682bf73f838c24bf44e585fc3bb61</
    <aces:hash>
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  <aces:outputDeviceTransform>
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  </aces:outputDeviceTransform>
</aces:outputTransform>
</aces:pipeline>
</aces:acesMetadataFile>
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