

## Elements

PBCore is made up of elements, which can be organized into three main groups: Root Elements, Asset Elements, Instantiation Elements. Elements are a way to structure information based on what type of information it is. Each element has a specific definition within the XML schema. Some elements also include best practice recommendations that, while not mandatory to follow, may guide a user's methodology in applying the elements within their cataloging workflow. Where best practice recommendations exist, they are included below the element's definition.

In XML, some elements are required to create a valid record, while others are optional and may be included only where relevant. Additionally, some elements may be repeated many times, while others may only appear once. Information about whether the element is required or optional, and whether it's repeatable or not repeatable, is included in this handbook.

If an element includes subelements, some of those subelements may also be required, and some may be optional. Required subelements and optional subelements are listed for each element that contains subelements.

Almost all elements in PBCore have the option to include more information by adding attributes to the element. As with elements, some attributes are required to make the usage of the element valid, but most are optional. Required and optional elements are listed for each element below. Definitions of each attribute can be found in the next section, Attributes Defined.

Some elements, such as instantiationGeneration, have associated controlled vocabularies that are provided and managed by PBCore. In most cases, PBCore recommends that users consult the controlled vocabularies when determining terminology for their records, but does not require their use. Other elements, such as pbcoreAudienceRating, have recommended controlled vocabularies that are provided and managed by other organizations. Again, in most cases these controlled vocabularies are not required. Where a controlled vocabulary recommendation exists for an element, it is listed below. Supported PBCore vocabularies, with definitions, are included in a later section of this handbook.

## Root Elements

### pbcoreCollection

Definition: PBCoreCollection groups multiple pbcoreDescriptionDocument XML into one container element to allow for a serialized output. Uses might include API returns or other web service output.

Best Practice: This element is not intended to be equivalent to the archive/library concept of a 'collection.' Please see pbcoreAssetType for information on how PBCore can be used to express information about collections. The element is only applicable to XML expressions of PBCore. This container enables a similar function to RSS; pbcoreCollection would be similar to rss:channel and pbcoreDescription document to rss:item.

Usage: not repeatable

Required attributes: xmlns, xsi, schemaLocation

Optional attributes: collectionTitle, collectionDescription, collectionSource, collectionRef, collectionDate

Subelements: pbcoreDescriptionDocument

Example Code:

```
<pbcoreCollection xmlns="http://pbcore.org/PBCore/PBCoreNamespace"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://pbcore.org/PBCore/PBCoreNamespace
http://pbcore.org/xsd/pbcore-2.0.xsd">
  <pbcoreDescriptionDocument>
    <pbcoreIdentifier source="NOLA
Code">AMEX000102</pbcoreIdentifier>
    <pbcoreTitle titleType="Full">American Experience: Radio
Bikini</pbcoreTitle>
    <pbcoreDescription>In July 1946, the U.S. Navy staged "Operation
Crossroads"--two highly publicized atomic bomb tests at a Pacific Island
called Bikini. This film is the story of those tests and their effect not
only on the thousands of Naval personnel and spectators who watched, but also
on the Bikinians whose homes was rendered uninhabitable by contamination,
even now, 40 years later.</pbcoreDescription>
  </pbcoreDescriptionDocument>
  <pbcoreDescriptionDocument>
    <pbcoreIdentifier source="NOLA
Code">AMEX000103</pbcoreIdentifier>
    <pbcoreTitle titleType="Full">American Experience: Hoover
Dam</pbcoreTitle>
    <pbcoreDescription>Rising more than 700 feet above the raging
waters of the Colorado River, it was called one of the greatest engineering
works in history. Hoover Dam, built during the Great Depression, drew men
desperate for work to a remote and rugged canyon near Las Vegas. There they
struggled against brutal heat, choking dust and perilous heights to build a
colossus of concrete that brought electricity and water to millions,
transforming the American Southwest. Peter Coyote
narrates.</pbcoreDescription>
  </pbcoreDescriptionDocument>
  <pbcoreDescriptionDocument>
    <pbcoreIdentifier source="NOLA
Code">AMEX000104</pbcoreIdentifier>
    <pbcoreTitle titleType="Full">American Experience: Alone on the
Ice</pbcoreTitle>
    <pbcoreDescription>In June 1934, Richard Byrd lay alone in a
small hut below the polar ice, hovering near death. No one before Byrd had
ever experienced winter in the interior of the Antarctic. In an age of
heroes, he was one of America's greatest. An explorer, aviation pioneer and
scientist, Byrd was also an egotist, risk-taker, heavy drinker -- and, his
critics claim, a fraud who took credit for the accomplishments of
others.</pbcoreDescription>
```

```
</pbcoreDescriptionDocument>
</pbcoreCollection>
```

### **pbcoreDescriptionDocument**

Definition: pbcoreDescriptionDocument is a root XML element for the expression of an individual PBCore record. pbcoreDescriptionDocument can be used to express intellectual content only (e.g. a series or collection level record with no associated instantiations), or intellectual content with one or more instantiations (e.g. an episode of a program with copies/instantiations on videotape and digital file). This element is only applicable to XML expressions of PBCore. pbcoreDescriptionDocument can only be contained by pbcoreCollection.

Usage: only repeatable within pbcoreCollection

Required attributes: xmlns, xsi, schemaLocation

Required subelements: pbcoreIdentifier, pbcoreTitle, pbcoreDescription

Optional subelements: pbcoreAssetType, pbcoreAssetDate, pbcoreIdentifier, pbcoreTitle, pbcoreSubject, pbcoreGenre, pbcoreRelation, pbcoreCoverage, pbcoreAudienceLevel, pbcoreAudienceRating, pbcoreCreator, pbcoreContributor, pbcorePublisher, pbcoreRightsSummary, pbcoreInstantiation, pbcoreAnnotation, pbcorePart, pbcoreExtension

Example Code:

```
<pbcoreDescriptionDocument xmlns="http://pbcore.org/PBCore/PBCoreNamespace"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://pbcore.org/PBCore/PBCoreNamespace
https://raw.githubusercontent.com/WGBH/PBCore_2.1/master/pbcore-2.1.xsd">
  <pbcoreIdentifier source="NOLA Code">AMEX000102</pbcoreIdentifier>
  <pbcoreTitle titleType="Full">American Experience: Radio
Bikini</pbcoreTitle>
  <pbcoreDescription>In July 1946, the U.S. Navy staged "Operation
Crossroads"--two highly publicized atomic bomb tests at a Pacific Island
called Bikini. This film is the story of those tests and their effect not
only on the thousands of Naval personnel and spectators who watched, but also
on the Bikinians whose homes was rendered uninhabitable by contamination,
even now, 40 years later.</pbcoreDescription>
</pbcoreDescriptionDocument>
```

### **pbcoreInstantiationDocument**

Definition: pbcoreInstantiationDocument is the equivalent of the instantiation element, but used for the expression of an instantiation record at the root of an XML document. This is most commonly used when referenced from other schemas, or if you want to create and express a single, stand-alone instantiation. pbcoreInstantiationDocument is a root element and cannot be contained by any other elements.

Best Practice: This is most commonly used when Intellectual Content (in other words, descriptive metadata) is not expressed using PBCore, but rather another standard such as MODS or Dublin Core.

Usage: not repeatable

Optional attributes: startTime, endTime, timeAnnotation

Required subelements: instantiationIdentifier, instantiationLocation

Optional subelements: instantiationDate, instantiationPhysical, instantiationDigital, instantiationStandard, instantiationMediaType, instantiationGenerations, instantiationFileSize, instantiationTimeStart, instantiationDuration, instantiationDataRate, instantiationColors, instantiationTracks, instantiationChannelConfiguration, instantiationLanguage, instantiationAlternativeModes, instantiationEssenceTrack, instantiationRelation, instantiationRights, instantiationAnnotation, instantiationPart, instantiationExtension

Example code:

```
<!--?xml version="1.0" encoding="UTF-8"?-->
<pbcoreInstantiationDocument
xmlns="http://www.pbcore.org/PBCore/PBCoreNamespace"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://pbcore.org/xsd/pbcore-2.1.xsd">
  <instantiationIdentifier source="McHale
University">MCU_v0123_01</instantiationIdentifier>
  <instantiationLocation>McHale University</instantiationLocation>
</pbcoreInstantiationDocument>
```

## Asset Elements

### pbcoreAssetType

Definition: pbcoreAssetType is a broad definition of the type of intellectual content being described. Asset types might include those without associated instantiations (a collection or series), or those with instantiations (programs, episodes, clips, etc.)

Best Practice: The asset type should broadly describe all related instantiations — for example, if an asset includes many instantiations representing different generations of a program, the asset type ‘program’ remains accurate for all of them.

Usage: optional, repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<pbcoreAssetType>Program</pbcoreAssetType>
```

```
<pbcoreAssetType source="pbcoreAssetType Controlled Vocabulary"
ref="http://pbcore.org/pbcore-controlled-vocabularies/pbcoreassettype-
vocabulary/#RawFootage" version="2.1">Raw Footage</pbcoreAssetType>
```

### **pbcoreAssetDate**

Definition: pbcoreAssetDate is intended to reflect dates associated with the Intellectual Content.

Best Practice: By contrast, instantiationDate is intended to reflect date information for the specific instance. For instance, if you have a VHS copy of Gone With The Wind, the pbcoreAssetDate would be 1939, while the instantiationDate of the VHS copy could be 1985. pbcoreAssetDate may also be used to reflect availability dates, etc. Date types should be specified using the @dateType attribute. Dates or time-based events related to the content of the asset, on the other hand, would be described in the ‘coverage’ element — so, while the storyline of Gone with the Wind takes place in the nineteenth century, this information should be noted in the Coverage field, not the assetDate field. Best practice is to use ISO 8601 or some other date/time standard if possible.

Usage: optional, repeatable

Optional attributes: dateType, source, ref, version, annotation

Recommended controlled vocabularies: PBCore dateType Vocabulary

Example code:

```
<pbcoreAssetDate>1987-05-13</pbcoreAssetDate>
```

```
<pbcoreAssetDate dateType="broadcast">2001-02-03</pbcoreAssetDate>
```

### **pbcoreIdentifier**

Definition: pbcoreIdentifier is an identifier that can apply to the asset. This identifier should not be limited to a specific instantiation, but rather all instantiations of an asset. It can also hold a URL or URI that points to the asset.

Best Practice: Best practice is to identify the media item (whether analog or digital) by means of an unambiguous string or number corresponding to an established or formal identification system if one exists. Otherwise, use an identification method that is in use within your agency, station, production company, office, or institution.

Usage: required, repeatable

Required attributes: source

Optional attributes: ref, version, annotation

Example code:

```
<pbcoreIdentifier source="American Archive of Public Broadcasting">cpb-
aacip_15-b853f4kv16</pbcoreIdentifier>
```

```
<pbcoreIdentifier source="NOLA Code">NOVA003406</pbcoreIdentifier>
```

## **pbcoreTitle**

Definition: pbcoreTitle is a name or label relevant to the asset.

Best Practice: There may be many types of titles an asset may have, such as a series title, episode title, segment title, or project title; therefore, the element is repeatable.

Usage: required, repeatable

Optional attributes: titleType, titleTypeSource, titleTypeRef, titleTypeVersion, titleTypeAnnotation, source, ref, version, annotation, startTime, endTime, timeAnnotation

Recommended controlled vocabularies: PBCore @titleType Vocabulary for the titleType attribute

Example code:

```
<pbcoreTitle titleType="Full" source="Box">American Experience: The Boys of
'36</pbcoreTitle>
```

```
<pbcoreTitle titleType="Program">The Boys of '36</pbcoreTitle>
```

```
<pbcoreTitle titleType="Series" titleTypeSource="PBCore titleType Controlled
Vocabulary" titleTypeRef="http://pbcore.org/pbcore-controlled-
vocabularies/titletype-vocabulary/#Series">American Experience</pbcoreTitle>
```

## **pbcoreSubject**

Definition: pbcoreSubject is used to assign topic headings or keywords that portray the intellectual content of the asset. A subject is expressed by keywords, key phrases, or even specific classification codes. Controlled vocabularies, authorities, formal classification codes, as well as folksonomies and user-generated tags, may be employed when assigning descriptive subject terms.

Usage: optional, repeatable

Optional attributes: subjectType, subjectTypeSource, subjectTypeRef, subjectTypeVersion, subjectTypeAnnotation, source, ref, version, annotation, startTime, endTime, timeAnnotation

Recommended controlled vocabularies: Library of Congress Subject Headings, IPTC NewsCodes Subject Codes, Thesaurus for Graphic Materials, Wikipedia

Example code:

```
<pbcoreSubject>Olympics</pbcoreSubject>

<pbcoreSubject subjectType="entity" source="LC Subject Headings"
ref="http://id.loc.gov/authorities/subjects/sh85147037">Winter
Olympics</pbcoreSubject>>
```

## **pbcoreDescription**

Definition: pbcoreDescription is an element that uses free-form text or a narrative to report general notes, abstracts, or summaries about the intellectual content of an asset. The information may be in the form of an individual program description, anecdotal interpretations, or brief content reviews. The description may also consist of outlines, lists, bullet points, rundowns, edit decision lists, indexes, or tables of content.

Best Practice: pbcoreDescription can be repeated, so that multiple descriptions can be provided. The attribute @descriptionType can be used to identify the type of description. The @source attribute can be used to identify the source of a description, e.g. @source='NOVA website'.

Usage: required, repeatable

Optional attributes: descriptionType, descriptionTypeSource, descriptionTypeRef, descriptionTypeVersion, descriptionTypeAnnotation, segmentType, segmentTypeSource, segmentTypeRef, segmentTypeVersion, segmentTypeAnnotation, source, ref, version, annotation, startTime, endTime, timeAnnotation

Recommended controlled vocabularies: PBCore @descriptionType Vocabulary for the descriptionType attribute

Example code:

```
<pbcoreDescription descriptionType="Version">HV (home video) Master
Letterbox</pbcoreDescription>

<pbcoreDescription descriptionType="Program" descriptionTypeSource="PBCore
descriptionType Controlled Vocabulary"
descriptionTypeRef="http://pbcore.org/pbcore-controlled-
vocabularies/descriptiontype-vocabulary/#Program" source="American Experience
website">In the summer of 1936, nine working class young men from the
University of Washington took the rowing world and the nation by a storm when
they captured the gold medal at the Olympic Games in Berlin. These sons of
loggers, shipyard workers and farmers overcame tremendous hardships—
psychological, physical and economic—to beat not only the Ivy League teams of
the East Coast but also Adolf Hitler's elite German rowers. Featuring
interviews with Brown, historians and surviving children of the 1936
Washington team, The Boys of '36 recounts their unexpected victory and the
```

obstacles they overcame to achieve it, giving hope to a nation struggling to emerge from the depths of the Great Depression.</pbcoreDescription>

```
<pbcoreDescription descriptionType="Shot List" startTime="00:00:34"
endTime="00:06:22">
  00:00:34  ship at dock/EWS
  00:01:01  Crew on deck/WS
  00:01:43  Ship bow tied to pier/WS
  00:02:02  Ship ext./observation deck/MS
  00:02:24  ship ext. Maurice Ewing sign/MS
  00:02:39  Ship ext./anchor/MS
  00:03:05  Ship ext./ stern/WS
  00:04:02  Maurice Ewing New York sign on stern/CU
  00:04:22  Truck L past length of ship/WS
  00:05:17  Ian on deck/talking to man/MS/CU
  00:05:35  Crew setting up on bow/WS
  00:06:00  Men on captain's deck/MS/Ian on deck/MS</pbcoreDescription>>
```

## pbcoreGenre

**Definition:** pbcoreGenre is an element that describes the Genre of the asset, which can be defined as a categorical description informed by the topical nature or a particular style or form of the content.

**Best Practice:** Genre refers to the intellectual content of the asset, whereas the element Asset Type defines a broader structural category; i.e. an asset might have the Asset Type of Segment, with a Genre of News, together defining a news segment.

**Usage:** optional, repeatable

**Optional attributes:** source, ref, version, annotation, startTime, endTime, timeAnnotation

**Recommended controlled vocabularies:** Library of Congress Moving Image Genre-Form Guide, IPTC NewsCodes Genres, Library of Congress Thesaurus for Graphic Materials

**Example code:**

```
<pbcoreGenre>Documentary</pbcoreGenre>

<pbcoreGenre source="Library of Congress Thesaurus for Graphic Materials"
ref="http://id.loc.gov/vocabulary/graphicMaterials/tgm003474">Educational/cul
tural films & video</pbcoreGenre>
```

## pbcoreRelation

**Definition:** pbcoreRelation contains the pbcoreRelationType and pbcoreRelationIdentifier elements. In order to properly use these two elements they must be nested with the pbcoreRelation element, and pbcoreRelation must contain both pbcoreRelationType and pbcoreRelationIdentifier if it is included.



Usage: optional, repeatable

Required subelements: pbcoreRelationType, pbcoreRelationIdentifier

Example code:

```
<pbcoreRelation>
  <!-- No data here directly; it's within sub-elements instead -->
  <pbcoreRelationType>Is Part Of</pbcoreRelationType>
  <pbcoreRelationIdentifier>NOVA</pbcoreRelationIdentifier>
</pbcoreRelation>
```

### **pbcoreRelationType**

Definition: pbcoreRelationType describes the relationship between the asset being describe by the PBCore document and any other asset. Ideally it would contain text from a controlled vocabulary for describing relationships. There is some depth to what a relationship could be. The assets can be related as different episodes in a series, different tapes in a box set, or different versions of an original, among others.

Best Practice: The assets may be related in that they are different discrete parts of a single intellectual unit, one may be a derivative of another, or they may be different versions that are distinct enough to be described as separate assets.

Usage: required within pbcoreRelation, not repeatable

Optional attributes: source, ref, version, annotation

Recommended controlled vocabularies: PBCore's Relation Type vocabulary, Dublin Core RDF Schema Declaration of Relation Types

Example code:

```
<pbcoreRelation>
  <pbcoreRelationType source="pbcoreRelationType Vocabulary"
  ref="http://pbcore.org/pbcore-controlled-vocabularies/pbcorerelationtype-
  vocabulary/#IsPartOf">Is Part Of</pbcoreRelationType>
  <pbcoreRelationIdentifier>NOVA</pbcoreRelationIdentifier>
</pbcoreRelation>
```

### **pbcoreRelationIdentifier**

Definition: pbcoreRelationIdentifier contains the identifier of the related asset. In the case that the related asset has a PBCore record, this identifier should correspond with the pbcoreIdentifier of the related asset. However, it is possible to use this element with a record that isn't in PBCore, in which case the source attribute should identify the source of the identifier.

Usage: required within pbcoreRelation, not repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<pbcoreRelation>
  <pbcoreRelationType source="pbcoreRelationType Vocabulary"
  ref="http://pbcore.org/pbcore-controlled-vocabularies/pbcorerelationtype-
  vocabulary/#IsPartOf">Is Part Of</pbcoreRelationType>
  <pbcoreRelationIdentifier>NOVA</pbcoreRelationIdentifier>
</pbcoreRelation>
```

## **pbcoreCoverage**

Definition: pbcoreCoverage is a container for subelements coverage and coverageType.

Usage: optional, repeatable

Required subelements: coverage

Optional subelements: coverageType

Example code:

```
<pbcoreCoverage>
  <!-- No data here directly; it's within sub-elements instead -->
  <coverage>1607-1631</coverage>
  <coverageType annotation="historical">Temporal</coverageType>
</pbcoreCoverage>
```

## **coverage**

Definition: coverage refers to either the geographic location or the time period covered by the asset's intellectual content. For geographic locations ('spatial' descriptors), it is expressed by keywords such as place names (e.g. 'Alaska' or 'Washington, DC'), numeric coordinates or geo-spatial data. For time-based events ('temporal' descriptors), it is expressed by using a date, period, era, or time-based event that is portrayed or covered in the intellectual content (e.g. '2007' or 'Victorian Era'). The PBCore metadata element coverage houses the actual spatial or temporal keywords. The companion element coverageType is used to identify the type of keywords that are being used.

Usage: required with pbcoreCoverage, not repeatable

Optional attributes: source, ref, version, annotation, startTime, endTime, timeAnnotation

Recommended controlled vocabularies: W3C Profile of ISO 8601 Representation of Dates and Time (Temporal), Library of Congress Extended Date/Time Format (Temporal), Getty Thesaurus of Geographic Names (Spatial), IPTC NewsCodes World Region (Spatial), GeoNames (Spatial), MARC List for Countries (Spatial), MARC List for Geographic Areas (Spatial)

Example code:

```
<pbcoreCoverage>
  <coverage>2007</coverage>
  <coverageType annotation="current">Temporal</coverageType>
</pbcoreCoverage>
<pbcoreCoverage>
  <coverage source="GeoNames" ref="
http://www.geonames.org/4766510/jamestown.html">Jamestown, VA</coverage>
  <coverageType>Spatial</coverageType>
</pbcoreCoverage>
```

### coverageType

Definition: coverageType is used to identify the actual type of keywords that are being used by its companion metadata element coverage. coverageType provides a picklist of two possible types – spatial or temporal – because coverage in intellectual content may be expressed spatially by geographic location or it may also be expressed temporally by a date, period, era, or time-based event.

Usage: optional, not repeatable

Controlled vocabularies: picklist (Spatial, Temporal)

Example code:

```
<pbcoreCoverage>
  <coverage source="Wikipedia"
ref="http://en.wikipedia.org/wiki/Werowocomoco">Werowocomoco</coverage>
  <coverageType source="PBCore coverageType
Vocabulary">Spatial</coverageType>
</pbcoreCoverage>
```

### pbcoreAudienceLevel

Definition: pbcoreAudienceLevel identifies a type of audience, viewer, or listener for whom the media item is primarily designed or educationally useful.

Usage: optional, repeatable

Attributes: source, ref, version, annotation

### Example code

```
<pbcoreAudienceLevel>Teen</pbcoreAudienceLevel>

<pbcoreAudienceLevel source="EBU Intended Audience Code"
ref="http://www.ebu.ch/metadata/cs/web/ebu_IntendedAudienceCodeCS_p.xml.htm">
Empty Nester</pbcoreAudienceLevel>
```

### **pbcoreAudienceRating**

Definition: pbcoreAudienceRating designates the type of users for whom the intellectual content of a media item is intended or judged appropriate. This element differs from the element pbcoreAudienceLevel in that it utilizes standard ratings that have been crafted by the broadcast television and film industries and that are used as flags for audience or age-appropriate materials.

Usage: optional, repeatable

Attributes: source, ref, version, annotation

Recommended controlled vocabularies: Motion Picture Association of America Classification and Rating Administration, TV Parental Guidelines

### Example code:

```
<pbcoreAudienceRating source="MPAA Movie Ratings">G</pbcoreAudienceRating>

<pbcoreAudienceRating source="TV Parental Guidelines"
ref="http://www.tvguidelines.org/ratings.htm">TV-Y7-FV</pbcoreAudienceRating>
```

### **pbcoreCreator**

Definition: pbcoreCreator is a container for sub-elements creator and creatorRole.

Usage: optional, repeatable

Required subelements: creator

Optional subelements: creatorRole

### Example code:

```
<pbcoreCreator>
  <!-- No data here directly; it's within sub-elements instead -->
  <creator>WGBH Educational Foundation</creator>
  <creatorRole source="PBCore creatorRole and contributorRole Vocabulary"
ref="http://pbcore.org/pbcore-controlled-vocabularies/creatorrole-and-
contributorrole-vocabulary/Producer">Producer</creatorRole>
```

```
</pbcoreCreator>
```

### **creator**

Definition: creator identifies the primary person, people, or organization(s) responsible for creating the asset. Note that non-primary names and roles should be included within the pbcoreContributor container.

Usage: required within pbcoreCreator, not repeatable

Attributes: affiliation, affiliationSource, affiliationRef, affiliationVersion, affiliationAnnotation, source, ref, version, annotation, startTime, endTime, timeAnnotation

Example code:

```
<pbcoreCreator>
  <creator>Paula Apsell</creator>
  <creatorRole>Senior Executive Producer</creatorRole>
</pbcoreCreator>

<pbcoreCreator>
  <creator source="LC Name Authority"
ref="http://id.loc.gov/authorities/names/n79077369">Sondheim,
Stephen</creator>
  <creatorRole>Composer and Lyricist</creatorRole>
</pbcoreCreator>
```

### **creatorRole**

Definition: creatorRole is used to identify the role played by the person, people or organization(s) identified in the companion descriptor creator. The PBCore schema allows for creatorRole to be repeated in the pbcoreCreator container element. This can be useful when a single person or organization is associated with multiple roles in an asset.

Usage: optional, repeatable

Attributes: source, ref, version, annotation

Recommended controlled vocabularies: PBCore creatorRole and contributorRole Vocabulary

Example code:

```
<pbcoreCreator>
  <creator>Paula Apsell</creator>
  <creatorRole>Senior Executive Producer</creatorRole>
</pbcoreCreator>
```

```
<pbcoreCreator>
  <creator affiliation="WGBH">Jed Rauscher</creator>
  <creatorRole source="PBCore creatorRole and contributorRole"
ref="http://pbcore.org/pbcore-controlled-vocabularies/creatorrole-and-
contributorrole-vocabulary/Editor">Editor</creatorRole>
</pbcoreCreator>
```

## **pbcoreContributor**

Definition: pbcoreContributor is a container for sub-elements contributor and contributorRole.

Usage: optional, repeatable

Required subelements: contributor

Optional subelements: contributorRole

Example code:

```
<pbcoreContributor>
  <!-- No data here directly; it's within sub-elements instead -->
  <contributor>Lisa Quijano Wolfinger</contributor>
  <contributorRole>Narrator</contributorRole>
</pbcoreContributor>
```

## **contributor**

Definition: contributor identifies a person, people, or organization that has made substantial creative contributions to the asset. This contribution is considered to be secondary to the primary author(s) (person or organization) identified in the descriptor creator.

Usage: required within pbcoreContributor, not repeatable

Optional attributes: affiliation, affiliationSource, affiliationRef, affiliationVersion, affiliationAnnotation, source, ref, version, annotation, startTime, endTime, timeAnnotation

Example code:

```
<pbcoreContributor>
  <contributor>Kenneth Branagh</contributor>
  <contributorRole>Director</contributorRole>
</pbcoreContributor>

<pbcoreContributor>
  <contributor source="LC Name Authority"
ref="http://id.loc.gov/authorities/names/nr88009360" portrayal="Gilderoy
```

```
Lockhart">Branagh, Kenneth</contributor>
  <contributorRole>Actor</contributorRole>
</pbcoreContributor>
```

### **contributorRole**

Definition: contributorRole is used to identify the role played by the person, people or organizations identified in the companion element contributor. The PBCore schema allows for contributorRole to be repeated in the pbcoreContributor container element. This can be useful when a single person or organization is associated with multiple roles in an asset.

Usage: optional, repeatable

Optional attributes: portrayal, source, ref, version, annotation

Recommended controlled vocabularies: PBCore creatorRole and contributorRole Vocabulary

Example code:

```
<pbcoreContributor>
  <contributor source="IMDB"
ref="https://www.imdb.com/name/nm0189337/">Callie Crossley</contributor>
  <contributorRole source="credits">Interviewer</contributorRole>
</pbcoreContributor>

<pbcoreContributor>
  <contributor source="LC Name Authority">Yo-Yo Ma</contributor>
  <contributorRole source="PBCore creatorRole and contributorRole"
ref="http://pbcore.org/pbcore-controlled-vocabularies/creatorrole-and-
contributorrole-vocabulary/Musician">Musician</contributorRole>
</pbcoreContributor>
```

### **pbcorePublisher**

Definition: pbcorePublisher is a container for sub-elements publisher and publisherRole.

Usage: optional, repeatable

Required subelements: publisher

Optional subelements: publisherRole

Example code:

```
<pbcorePublisher>
  <!-- No data here directly; it's within sub-elements instead -->
  <publisher>WGBH Educational Foundation</publisher>
```

```
<publisherRole>Copyright Holder</publisherRole>
</pbcorePublisher>
```

## **publisher**

Definition: publisher identifies a person, people, or organization primarily responsible for distributing or making the asset available to others. The publisher may be a person, a business, organization, group, project or service.

Usage: required within pbcorePublisher, not repeatable

Attributes: affiliation, affiliationSource, affiliationRef, affiliationVersion, affiliationAnnotation, source, ref, version, annotation, startTime, endTime, timeAnnotation

Example code:

```
<pbcorePublisher>
  <publisher source="LC Name Authority"
  ref="http://id.loc.gov/authorities/names/no94021892" annotation="back of
  box">PBS Home Video</publisher>
</pbcorePublisher>
```

## **publisherRole**

Definition: publisherRole is used to identify the role played by the specific publisher or publishing entity identified in the companion descriptor publisher. The PBCore schema allows for publisherRole to be repeated in the pbcorePublisher container element. This can be useful when a single person or organization is associated with multiple roles in an asset.

Usage: optional, repeatable

Attributes: source, ref, version, annotation

Recommended controlled vocabularies: PBCore publisherRole Vocabulary

Example code:

```
<pbcorePublisher>
  <publisher>PBS</publisher>
  <publisherRole source="PBCore publisherRole"
  ref="http://pbcore.org/pbcore-controlled-vocabularies/publisherrole-
  vocabulary/Distributor">Distributor</publisherRole>
</pbcorePublisher>

<pbcorePublisher>
  <publisher>WGBH Educational Foundation</publisher>
  <publisherRole source="PBCore publisherRole"
```



```
ref="http://pbcore.org/pbcore-controlled-vocabularies/publisherrole-
vocabulary/Presenter">Presenter</publisherRole>
</pbcorePublisher>
```

## **pbcoreRightsSummary**

Definition: pbcoreRightsSummary is a container for sub-elements ‘rightsSummary’, ‘rightsLink’ and ‘rightsEmbedded’ used to describe Rights for the asset.

Best Practice: The pbcoreRightsSummary container can be repeated to express multiple rights statements. However, all rights information contained within a pbcoreRightsSummary container should apply to the entire asset. Rights that relate to a specific instantiation of an asset, such as those conferred along with an item in a donation agreement, can be documented in the instantiationRights element.

Usage: optional, repeatable

Optional attributes: startTime, endTime, timeAnnotation

Optional subelements: rightsSummary, rightsLink, rightsEmbedded

Example code:

```
<pbcoreRightsSummary>
  <!-- No data here directly; it's within sub-elements instead -->
  <rightsSummary source="Creative Commons"
ref="http://creativecommons.org/licenses/by/3.0" version="3.0">CC BY
3.0</rightsSummary>
</pbcoreRightsSummary>
```

## **rightsSummary**

Definition: rightsSummary is used as a general free-text element to identify information about copyrights and property rights held in and over an asset or instantiation, whether they are open access or restricted in some way. If dates, times and availability periods are associated with a right, include them. End user permissions, constraints and obligations may also be identified as needed.

Best Practice: For rights information that applies to the asset as a whole, use this element within the container pbcoreRightsSummary. For rights information that is specific to an instantiation of an asset, use it within the container instantiationRights.

Usage: optional, not repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<pbcoreRightsSummary>
  <rightsSummary>Copyright belongs to WGBH; distribution rights granted in
  perpetuity</rightsSummary>
</pbcoreRightsSummary>
```

```
<pbcoreRightsSummary>
  <rightsSummary source="CD case">Copyright 2016 the Board of Regents of
  the University of Wisconsin System and the Donald Voegeli Copyright Trust.
  All rights reserved. For non-commercial use only. Not for sale. Produced by
  Jim Voegeli. Funded by Dawn and Jim Voegeli.</rightsSummary>
</pbcoreRightsSummary>
```

## rightsLink

Definition: rightsLink is a URI pointing to a declaration of rights.

Usage: optional, not repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<pbcoreRightsSummary>
  <rightsLink>http://creativecommons.org/licenses/by/3.0</rightsLink>
</pbcoreRightsSummary>
```

```
<pbcoreRightsSummary>
  <rightsLink>https://rightsstatements.org/page/InC/1.0/?language=en</rig
  htsLink>
</pbcoreRightsSummary>
```

## rightsEmbedded

Definition: rightsEmbedded allows the inclusion of xml from another rights standard, e.g. ODRL, METS, etc. The included XML then defines the rights for the PBCore asset and/or PBCore instantiation.

Usage: optional, not repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<pbcoreRightsSummary>
  <rightsEmbedded><?xml version="1.0" encoding="UTF-8"?>
  <modsCollection xmlns:xlink=http://www.w3.org/1999/xlink
```

```

xmlns:xsi=http://www.w3.org/2001/XMLSchema-instance
xmlns=http://www.loc.gov/mods/v3
xsi:schemaLocation=http://www.loc.gov/mods/v3
http://www.loc.gov/standards/mods/v3/mods-3-3.xsd>
  <mods version="3.3">
    <accessCondition type="use and reproduction"
displayLabel="restricted">Unrestricted access</accessCondition>
  </mods>
</modsCollection>
<rightsEmbedded>
</pbcoreRightsSummary>

```

## pbcorePart

**Definition:** pbcorePart is an element that may be used to split up a single asset so as to enable the use of all available elements at the pbcoreDescriptionDocument level to describe the intellectual content of individual segments of an asset.

**Best Practice:** Splitting up an asset in this way allows for defining and describing segments, stories, episodes or other divisions within the asset, such as individual films in a compilation reel, or distinct segments of a news show when each may have their own titles, creators, publishers, or other specific intellectual content information that does not apply across the whole asset.

**Usage:** optional, repeatable

**Optional attributes:** partType, partTypeSource, partTypeRef, partTypeVersion, partTypeAnnotation, startTime, endTime, timeAnnotation

**Required subelements:** pbcoreIdentifier, pbcoreTitle, pbcoreDescription

**Optional subelements:** pbcoreAssetType, pbcoreAssetDate, pbcoreSubject, pbcoreGenre, pbcoreRelation, pbcoreCoverage, pbcoreAudienceLevel, pbcoreCreator, pbcoreContributor, pbcorePublisher, pbcoreRightsSummary, pbcoreInstantiation, pbcoreAnnotation, pbcorePart, pbcoreExtension

**Example code:**

```

<pbcoreDescriptionDocument>
  <pbcoreIdentifier source="WGBH">4220-4222</pbcoreIdentifier>
  <pbcoreTitle titleType="Series" source="PBCore Controlled Vocabulary"
version="2.0">Nova</pbcoreTitle>
  <pbcoreTitle titleType="Miniseries" source="PBCore Controlled Vocabulary"
version="2.0">Making North America</pbcoreTitle>
  <pbcoreDescription>Discover how forces of almost unimaginable power gave
birth to North America.</pbcoreDescription>
  <pbcorePart>
    <!-- No data here directly; it's within sub-elements instead -->
    <pbcoreIdentifier source="WGBH">4220</pbcoreIdentifier>

```

```

    <pbcoreTitle titleType="Program" source="WGBH">Origins</pbcoreTitle>
    <pbcoreDescription>The shaping of North America, including palm trees
that once thrived in Alaska and an eruption that nearly tore the Midwest in
two.</pbcoreDescription>
  </pbcorePart>
  <pbcorePart>
    <!-- No data here directly; it's within sub-elements instead -->
    <pbcoreIdentifier source="WGBH">4221</pbcoreIdentifier>
    <pbcoreTitle titleType="Program" source="WGBH">Life</pbcoreTitle>
    <pbcoreDescription>The intertwined story of life and the landscape
in North America -- from origins to dinosaurs and an ancient primate
invasion.</pbcoreDescription>
  </pbcorePart>
  <pbcorePart>
    <!-- No data here directly; it's within sub-elements instead -->
    <pbcoreIdentifier source="WGBH">4222</pbcoreIdentifier>
    <pbcoreTitle titleType="Program" source="WGBH">Life</pbcoreTitle>
    <pbcoreDescription>From Ice Age to the oil boom, humans face
challenges and uncover wealth hidden in North America's
landscape.</pbcoreDescription>
  </pbcorePart>
</pbcoreDescriptionDocument>

```

### **pbcoreAnnotation**

Definition: pbcoreAnnotation allows the addition of any supplementary information about the metadata used to describe the PBCore record. pbcoreAnnotation clarifies element values, terms, descriptors, and vocabularies that may not be otherwise sufficiently understood.

Usage: optional, repeatable

Optional attributes: annotationType, source, ref, version, annotation

Example code:

```
<pbcoreAnnotation>This is the edited version produced for the Digital
Learning Library</pbcoreAnnotation>
```

```
<pbcoreAnnotation>No surviving instantiations of this
content</pbcoreAnnotation>
```

### **pbcoreExtension**

Definition: pbcoreExtension is an extension element. Extensions are either a wrapper containing a specific element from another standard OR embedded xml containing the extension.

Best Practice: Use it to supplement other metadata sub-elements of the PBCore description document in which it appears.

Usage: optional, repeatable

Optional subelements: extensionWrap (required ONLY if extensionEmbedded is not used), extensionEmbedded (required ONLY if extensionWrap is not used)

Example code:

```
<pbcoreExtension>
<!-- No data here directly; it's within sub-elements instead -->
  <extensionWrap>
    <extensionElement>RightsHolderName</extensionElement>
    <extensionValue>WNET.org</extensionValue>
    <extensionAuthorityUsed>
http://www.loc.gov/standards/rights/METSRights.xsd</extensionAuthorityUsed>
  </extensionWrap>
</pbcoreExtension>
```

### **extensionWrap**

Definition: extensionWrap serves as a container for the elements extensionElement, extensionValue, and extensionAuthorityUsed.

Usage: required within pbcoreExtension, instantiationExtension, or essenceTrackExtension, if extensionEmbedded is not used; cannot be used with extensionEmbedded; repeatable

Required subelements: extensionElement, extensionValue

Optional subelement: extensionAuthorityUsed

Optional attributes: source, ref, version, annotation

Example code:

```
<pbcoreExtension>
  <extensionWrap>
    <extensionElement>RightsHolderName</extensionElement>
    <extensionValue>WNET.org</extensionValue>
    <extensionAuthorityUsed>
http://www.loc.gov/standards/rights/METSRights.xsd</extensionAuthorityUsed>
  </extensionWrap>
</pbcoreExtension>
```

### **extensionEmbedded**

Definition: extensionEmbedded is an element allows the inclusion of xml from another schema, e.g. TEI, METS, etc.

Usage: required within pbcoreExtension, instantiationExtension, or essenceTrackExtension, if extensionWrap is not used; cannot be used with extensionWrap; repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<extensionEmbedded>
  <TEI xmlns="http://www.tei-c.org/ns/1.0"
  xmlns:xhtml="http://www.w3.org/1999/xhtml"
  xmlns:smil="http://www.w3.org/2001/SMIL20/Language">
    <teiHeader>
      <fileDesc>
        <sourceDesc>
          <recordingStmt>
            <recording type="video">
              <p>INTERVIEW WITH JOHN DOE</p>
            </recording>
          </recordingStmt>
        </sourceDesc>
      </fileDesc>
    </teiHeader>
    <text>
      <body>
        <listPerson>
          <person xml:id="q">
            <persName xml:lang="en">Interviewer</persName>
          </person>
        </listPerson>
        <listPerson>
          <person xml:id="a">
            <persName xml:lang="en">Doe, John</persName>
          </person>
        </listPerson>
        <div type="tape" xml:id="barcode254870">
          <incident><desc>Part 1</desc></incident>
          <div type="qa" xml:id="q0">
            <u who="#q">
              <seg xml:id="para2" smil:begin="00:00:23.685"
              smil:end="00:00:42.25">What were the conditions like when you travelled to El
              Salvador in 1991?</seg>
            </u>
            <u who="#a">
              <seg xml:id="para3" smil:begin="00:00:42.25"
              smil:end="00:02:46.138">I travelled to El Salvador in 1991 by way of
              Nicaragua. I saw many different conditions depending on the locale...</seg>
            </u>
          </div>
        </div>
      </body>
    </text>
  </TEI>
</extensionEmbedded>>
```

## Instantiation Elements

### **pbcoreInstantiation**

Definition: pbcoreInstantiation contains subelements that describe a single instantiation of an asset. The definition is malleable, but it should be thought of as any discreet and tangible unit that typically (though not always) comprises a whole representation of the asset. For example, an original master videotape, a preservation master video file, and a low-bitrate access copy would all be considered Instantiations of a single video program. All of the sub-elements held by this element are used to describe the instantiation specifically, not necessarily the asset as a whole.

Usage: optional, repeatable

Required subelements: instantiationIdentifier, instantiationLocation

Optional subelements: instantiationDate, instantiationDimensions, instantiationPhysical, instantiationDigital, instantiationStandard, instantiationMediaType, instantiationGenerations, instantiationFileSize, instantiationTimeStart, instantiationDuration, instantiationDataRate, instantiationColors, instantiationTracks, instantiationChannelConfiguration, instantiationLanguage, instantiationAlternativeModes, instantiationEssenceTrack, instantiationRelation, instantiationRights, instantiationAnnotation, instantiationPart, instantiationExtension

Optional attributes: startTime, endTime, timeAnnotation

Example code:

```
<pbcoreInstantiation>
  <!-- No data here directly; it's within sub-elements instead -->
  <instantiationIdentifier>123456</instantiationIdentifier>
  <instantiationLocation>Shelf 46, Row 3</instantiationLocation>
</pbcoreInstantiation>
```

### **instantiationIdentifier**

Definition: instantiationIdentifier contains an unambiguous reference or identifier for a particular instantiation of an asset.

Usage: required, repeatable

Required attributes: source

Optional attributes: ref, version, annotation

Example code:

```
<instantiationIdentifier source="WGBH
BARCODE">0000313536</instantiationIdentifier>
```

```
<instantiationIdentifier source="YouTube ID"
ref="http://www.youtube.com/watch?v=eYi6v20fNmc">eYi6v20fNmc</instantiationId
entifier>
```

## **instantiationDate**

Definition: instantiationDate is a date associated with an instantiation.

Best practice: It's recommended to use ISO 8601 or some other date/time standard if possible.

Usage: optional, repeatable

Optional attributes: dateType, source, ref, version, annotation

Recommended controlled vocabularies: PBCore dateType Vocabulary

Example code:

```
<instantiationDate dateType="Created">2007-05-09</instantiationDate>
```

```
<instantiationDate dateType="Issued" >2007-06-02</instantiationDate>
```

## **instantiationDimensions**

Definition: instantiationDimensions is an element that specifies either the dimensions of a physical instantiation, or the high-level visual dimensions of a digital instantiation

Best Practice: For physical dimensions, usage examples might be 7" for an audio reel. When describing visual dimensions, use this for high-level descriptors such as 1080p. Use the element frameSize to describe the pixel dimensions of a visual resource.

Usage: optional, repeatable

Optional attributes: unitsOfMeasure, source, ref, version, annotation

Example code:

```
<instantiationDimensions
annotation="letterbox">720x480</instantiationDimensions>
```

```
<instantiationDimensions
unitsOfMeasure="inches">5x7</instantiationDimensions>
```



## instantiationPhysical

Definition: instantiationPhysical is used to identify the format of a particular instantiation as it exists in a physical form that occupies physical space (e.g., a tape on a shelf). This includes physical digital media, such as a DV tape, audio CD or authored DVD, as well as analog media.

Best Practice: PBCore provides a controlled vocabulary for media objects, though any controlled vocabulary can be used as long as it is referenced. For digital storage carriers that contain portable file-based media, such as data CDs, LTO tapes or hard drives, use instantiationDigital to convey the mime type of the file instead of describing the carrier.

Usage: optional, not repeatable

Optional attributes: source, ref, version, annotation

Recommended controlled vocabularies: PBCore's instantiationPhysical (Video), instantiationPhysical (Film), instantiationPhysical (Audio)

Example code:

```
<instantiationPhysical>Piano roll</instantiationPhysical>
```

```
<instantiationPhysical source="PBCore instantiationPhysical Controlled
Vocabulary" ref="http://pbcore.org/pbcore-controlled-
vocabularies/instantiationphysical-video-vocabulary/#DigitalBetacam">Digital
Betacam</instantiationPhysical>
```

## instantiationDigital

Definition: instantiationDigital is used to identify the format of a particular instantiation of an asset as it exists as a digital file on a server, hard drive, or other digital storage medium. Digital instantiations should be expressed as a formal Internet MIME types.

Best Practice: InstantiationDigital should only be used to describe the MIME type of the digital file itself. There are multiple options to convey more information about the storage medium or location of the digital file, which are discussed in more detail on the PBCore site.

Usage: optional, not repeatable

Optional attributes: source, ref, version, annotation

Recommended controlled vocabularies: Internet Assigned Numbers Authority MIME Types, PRONOM Technical Registry

Example code:

```
<instantiationDigital>Wav file</instantiationDigital>
```

```
<instantiationDigital source="IANA MIME Media types" ref="
https://www.iana.org/assignments/media-
types/video/H264">video/H264</instantiationDigital>
```

### **instantiationStandard**

**Definition:** If the instantiation is a physical item, `instantiationStandard` can be used to refer to the broadcast standard of the video signal (e.g. NTSC, PAL), or the audio encoding (e.g. Dolby A, vertical cut). If the instantiation is a digital item, `instantiationStandard` should be used to express the container format of the digital file (e.g. MXF).

**Best Practice:** While the usage described in the definition is best practice for 2.1, this usage is likely to change if new elements are added for PBCore 3.0.

**Usage:** optional, not repeatable

**Optional attributes:** profile, source, ref, version, annotation

**Example code:**

```
<instantiationStandard>NTSC</instantiationStandard>
```

```
<instantiationStandard source="Sustainability of Digital Formats Planning for
Library of Congress Collections" ref="
https://www.loc.gov/preservation/digital/formats/fdd/fdd000266.shtml">MXF
OPl</instantiationStandard>
```

### **instantiationLocation**

**Definition:** `instantiationLocation` may contain information about a specific location for an instantiation, such as an organization's name, departmental name, shelf ID and contact information. The `instantiationLocation` for a digital file should include domain, path or URI to the file.

**Best Practice:** For digital files, `instantiationLocation` should always include a path or URI to the file. There are multiple ways to convey additional information about the location of a carrier or storage medium of the digital file, which are expressed on the PBCore site.

**Usage:** required, not repeatable

**Optional attributes:** source, ref, version, annotation

**Example code:**

```
<instantiationLocation>Vault: ML007859.121.1.</instantiationLocation>
```

```
<instantiationLocation>drive2/sourcefiles/20070910/458.wmv</instantiationLocation>
```

### **instantiationMediaType**

Definition: instantiationMediaType identifies the general, high level nature of the content of an instantiation. It uses categories that show how content is presented to an observer, e.g., as a sound, text or moving image.

Usage: optional, repeatable

Optional attributes: source, ref, version, annotation

Recommended controlled vocabularies: PBCore’s instantiationMediaType Vocabulary, IPTC NewsCodes Media Type

Example code:

```
<instantiationMediaType>Audio</instantiationMediaType>
```

```
<instantiationMediaType source="PBCore instantiationMediaType Vocabulary"
ref="http://pbcore.org/pbcore-controlled-vocabularies/instantiationmediatype-
vocabulary/#MovingImage">Moving Image</instantiationMediaType>
```

### **instantiationGenerations**

Definition: instantiationGenerations identifies the use type and provenance of the instantiation. For example, the generation of a video tape may be an “Original Master” or “Dub,” the generation of a film reel may be an “Original Negative” or “Composite Positive,” an audiotape may be a “Master” or “Mix Element,” and an image may be a “Photograph” or a “Photocopy.”

Usage: optional, repeatable

Optional attributes: source, ref, version, annotation

Recommended controlled vocabularies: PBCore’s instantiationGenerations Vocabulary, Thesaurus for Graphic Materials

Example code:

```
<instantiationGenerations>Preservation Master</instantiationGenerations>
```

```
<instantiationGenerations source="PBCore instantiationGenerations"
ref="http://pbcore.org/pbcore-controlled-
vocabularies/instantiationgenerations-vocabulary/#WorkTrack">Work
```

```
track</instantiationGenerations>
```

### **instantiationTimeStart**

Definition: instantiationTimeStart describes the point at which playback begins for a time-based instantiation. It is likely that the content on a tape may begin an arbitrary amount of time after the beginning of the instantiation.

Best Practice: Best practice is to use a timestamp format such as HH:MM:SS[:;]FF or HH:MM:SS.mmm or S.mmm.

Usage: optional, repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<instantiationTimeStart>00:23:30:15</instantiationTimeStart>
```

### **instantiationFileSize**

Definition: instantiationFileSize indicates the file size of a digital instantiation. It should contain only numerical values. As a standard, express the file size in bytes. Units of Measure should be declared in the unitsOfMeasure attribute.

Usage: optional, not repeatable

Optional attributes: unitsOfMeasure, source, ref, version, annotation

Example code:

```
<instantiationFileSize unitsOfMeasure="MB">322</instantiationFileSize>
```

### **instantiationDuration**

Definition: instantiationDuration provides a timestamp for the overall length or duration of a time-based media item. It represents the playback time.

Best Practice: Best practice is to use a timestamp format such as HH:MM:SS[:;]FF or HH:MM:SS.mmm or S.mmm.

Usage: optional, not repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<instantiationDuration>00:56:46</instantiationDuration>
```

### **instantiationDataRate**

Definition: `instantiationDataRate` expresses the amount of data in a digital media file that is encoded, delivered or distributed, for every second of time.

Best Practice: This should be expressed as numerical data, with the units of measure declared in the `unitsOfMeasure` attribute. For example, if the audio file is 56 kilobits/second, then 56 should be the value of `instantiationDataRate` and the attribute `unitsOfMeasure` should be `kilobits/second`.

Usage: optional, not repeatable

Optional attributes: `unitsOfMeasure`, `source`, `ref`, `version`, `annotation`

Example code:

```
<instantiationDataRate unitsOfMeasure="kbps">56</instantiationDataRate>
```

### **instantiationColors**

Definition: `instantiationColors` indicates the overall color, grayscale, or black and white nature of the presentation of an instantiation, as a single occurrence or combination of occurrences in or throughout the instantiation.

Usage: optional, not repeatable

Optional attributes: `unitsOfMeasure`, `source`, `ref`, `version`, `annotation`

Example code:

```
<instantiationColors>Color</instantiationColors>
```

### **instantiationTracks**

Definition: `instantiationTracks` is simply intended to indicate the number and type of tracks that are found in a media item, whether it is analog or digital. (e.g. 1 video track, 2 audio tracks, 1 text track, 1 sprite track, etc.) Other configuration information specific to these identified tracks should be described using `instantiationChannelConfiguration`.

Usage: optional, repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<instantiationTracks">1 video track, 1 audio track</instantiationTracks>
```

### **instantiationChannelConfiguration**

Definition: instantiationChannelConfiguration is designed to indicate, at a general narrative level, the arrangement or configuration of specific channels or layers of information within an instantiation's tracks. Examples are 2-track mono, 8-track stereo, or video track with alpha channel.

Usage: optional, not repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<instantiationChannelConfiguration>Ch. 1: Stereo L, Ch. 2: Stereo R, Ch. 3: DVS</instantiationChannelConfiguration>
```

### **instantiationLanguage**

Definition: instantiationLanguage identifies the primary language of the tracks' audio or text. Languages must be indicated using 3-letter codes standardized in ISO 639-2 or 639-3. If an instantiation includes more than one language, the element can be repeated. Alternately, both languages can be expressed in one element by separating two three-letter codes with a semicolon, i.e. eng;fre.

Best Practice: Alternative audio or text tracks and their associated languages should be identified using the element instantiationAlternativeModes.

Usage: optional, repeatable

Optional attributes: source, ref, version, annotation

Controlled vocabularies: PBCore requires the use of the ISO 639.2 or ISO 639.3 3-letter language codes.

Example code:

```
<instantiationLanguage source="ISO 639.3" ref="https://iso639-3.sil.org/code/jpn">jpn</instantiationLanguage>
```

```
<instantiationLanguage source="ISO 639.2"
ref="http://www.loc.gov/standards/iso639-
2/php/code_list.php">eng;fra</instantiationLanguage>
```

### **instantiationAlternativeModes**

Definition: `instantiationAlternativeModes` is a catch-all metadata element that identifies equivalent alternatives to the primary visual, sound or textual information that exists in an instantiation. These are modes that offer alternative ways to see, hear, and read the content of an instantiation. Examples include DVI (Descriptive Video Information), SAP (Supplementary Audio Program), ClosedCaptions, OpenCaptions, Subtitles, Language Dubs, and Transcripts. For each instance of available `alternativeModes`, the mode and its associated language should be identified together, if applicable. Examples include ‘SAP in English,’ ‘SAP in Spanish,’ ‘Subtitle in French,’ ‘OpenCaption in Arabic.’

Best Practice: Best practice is to use a semi-colon as a delimiter when defining more than one alternative mode.

Usage: optional, not repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<instantiationAlternativeModes>Subtitle in French; DVI in
French</instantiationAlternativeModes>
```

### **instantiationEssenceTrack**

Definition: `instantiationEssenceTrack` is an XML container element that allows for grouping of related `essenceTrack` elements and their repeated use. Use `instantiationEssenceTrack` element to describe the individual streams that comprise an instantiation, such as audio, video, timecode, etc.

Best Practice: Essence tracks can exist in either the digital or physical realm. In the digital realm, they may refer to the separate audio and video tracks within a digital file. In the physical realm, they may refer to the video and audio tracks contained on a single video tape.

Usage: optional, repeatable

Optional subelements: `essenceTrackType`, `essenceTrackIdentifier`, `essenceTrackStandard`, `essenceTrackEncoding`, `essenceTrackDataRate`, `essenceTrackFrameRate`, `essenceTrackPlaybackSpeed`, `essenceTrackSamplingRate`, `essenceTrackBitDepth`, `essenceTrackFrameSize`, `essenceTrackAspectRatio`, `essenceTrackTimeStart`, `essenceTrackDuration`, `essenceTrackLanguage`, `essenceTrackAnnotation`, `essenceTrackExtension`

Example code:

```
<instantiationEssenceTrack>
<!-- No data here directly; it's within sub-elements instead -->
  <essenceTrackType>Video</essenceTrackType>
</instantiationEssenceTrack>
```

### **essenceTrackType**

Definition: `essenceTrackType` refers to the media type of the decoded data. Tracks may possibly be of these types: video, audio, caption, metadata, image, etc.

Usage: optional, repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<essenceTrackType>Video</essenceTrackType>
```

### **essenceTrackIdentifier**

Definition: `essenceTrackIdentifier` is an identifier of the track. Several audiovisual containers include such identifier schema to identify each track, such as MPEG2 PIDs or QuickTime Track ids.

Usage: optional, repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<essenceTrackIdentifier source="Digital Asset Management System">
898_Laura.wav</essenceTrackIdentifier>

<essenceTrackIdentifier source="StreamOrder
(MediaInfo)">1</essenceTrackIdentifier>
```

### **essenceTrackStandard**

Definition: `essenceTrackStandard` should be used with file-based instantiations to describe the broadcast standard of the video signal (e.g. NTSC, PAL) or to further clarify the standard of the `essenceTrackEncoding` format.

Usage: optional, not repeatable



Optional attributes: source, ref, version, annotation

Example code:

Example code:

```
<essenceTrackStandard>NTSC</essenceTrackStandard>
```

### **essenceTrackEncoding**

Definition: `essenceTrackEncoding` identifies how the actual information in an instantiation is compressed, interpreted, or formulated using a particular scheme. Identifying the encoding used is beneficial for a number of reasons, including as a way to achieve reversible compression; for the construction of document indices to facilitate searching and access; or for efficient distribution of the information across data networks with differing bandwidths or pipeline capacities. Human-readable encoding value should be placed here. Use `@ref` to identify the codec ID.

Best Practice: Use `@source` to describe the type of encoding reference used, such as `fourcc`. In `@ref`, use a URI/URL from the source to identify the codec utilized by its container format.

Usage: optional, not repeatable

Optional attributes: source, ref, version, annotation

Recommended controlled vocabularies: EBU Video Compression Code, EBU Audio Compression Code, Wikipedia List of Codecs, IPTC NewsCodes video codec, IPTC NewsCodes audio codec

Example code:

```
<essenceTrackEncoding source="EBU Audio Compression Code"
ref="https://www.ebu.ch/metadata/cs/web/ebu_AudioCompressionCodeCS_p.xml.htm"
>WAV</essenceTrackEncoding>
```

```
<essenceTrackEncoding source="codecid" ref="avc1"
annotation="profile:High@L4">AVC</essenceTrackEncoding>
```

### **essenceTrackDataRate**

Definition: `essenceTrackDataRate` measures the amount of data used per time interval for encoded data. The data rate can be calculated by dividing the total data size of the track's encoded data by a time unit.

Best Practice: By default use bytes per second. Otherwise, this should be expressed as numerical data, with the units of measure declared in the `unitsOfMeasure` attribute.

Usage: optional, not repeatable

Optional attributes: unitsOfMeasure, source, ref, version, annotation

Example code:

```
<essenceTrackDataRate unitsOfMeasure="kbps"
annotation="compressed">1700</essenceTrackDataRate>
```

```
<essenceTrackDataRate unitsOfMeasure="bit/second"
annotation="VBR">10482976</essenceTrackDataRate>
```

### **essenceTrackFrameRate**

Definition: essenceTrackFrameRate is relevant to tracks of video track type only. The frame rate is calculated by dividing the total number of frames by the duration of the video track. By default measure frame rate in frames per second expressed as fps as a unit of measure. e.g., 24 fps.

Usage: optional, not repeatable

Optional attributes: unitsOfMeasure, source, ref, version, annotation

Example code:

```
<essenceTrackFrameRate unitsOfMeasure="fps"
annotation="interlaced">29.97</essenceTrackFrameRate>
```

```
<essenceTrackFrameRate annotation="rational_frame_rate:30000/1001
interlacement:Progressive">29.970</essenceTrackFrameRate>
```

### **essenceTrackPlaybackSpeed**

Definition: essenceTrackPlaybackSpeed specifies the rate of units against time at which the media track should be rendered for human consumption. e.g., 15ips (inches per second).

Usage: optional, not repeatable

Optional attributes: unitsOfMeasure, source, ref, version, annotation

Example code:

```
<essenceTrackPlaybackSpeed unitsOfMeasure="rpm">33
1/3</essenceTrackPlaybackSpeed>
```

**essenceTrackSamplingRate**

Definition: `essenceTrackSamplingRate` measures how often data is sampled when information from the audio portion from an instantiation is digitized. For a digital audio signal, the sampling rate is measured in kilohertz and is an indicator of the perceived playback quality of the media item (the higher the sampling rate, the greater the fidelity).

Usage: optional, not repeatable

Optional attributes: `unitsOfMeasure`, `source`, `ref`, `version`, `annotation`

Example code:

```
<essenceTrackSamplingRate
unitsOfMeasure="kHz">44.1</essenceTrackSamplingRate>
```

```
<essenceTrackSamplingRate
unitsOfMeasure="Hz">48000</essenceTrackSamplingRate>
```

**essenceTrackBitDepth**

Definition: `essenceTrackBitDepth` specifies how much data is sampled when information is digitized, encoded, or converted for an instantiation (specifically, audio, video, or image). Bit depth is measured in bits and generally implies an arbitrary perception of quality during playback of an instantiation (the higher the bit depth, the greater the fidelity).

Usage: optional, not repeatable

Optional attributes: `unitsOfMeasure`, `source`, `ref`, `version`, `annotation`

Example code:

```
<essenceTrackBitDepth>8</essenceTrackBitDepth>
```

```
<essenceTrackBitDepth annotation="color">10</essenceTrackBitDepth>
```

**essenceTrackFrameSize**

Definition: `essenceTrackFrameSize` measures the width and height of the encoded video or image track. The frame size refers to the size of the encoded pixels and not the size of the displayed image. It may be expressed as combination of pixels measured horizontally vs. the number of pixels of image/resolution data stacked vertically (interlaced and progressive scan).

Usage: optional, not repeatable

Optional attributes: `unitsOfMeasure`, `source`, `ref`, `version`, `annotation`

Example code:

```
<essenceTrackFrameSize>320x240</essenceTrackFrameSize>
```

### **essenceTrackAspectRatio**

Definition: `essenceTrackAspectRatio` indicates the ratio of horizontal to vertical proportions in the display of a static image or moving image.

Usage: optional, not repeatable

Optional attributes: `unitsOfMeasure`, `source`, `ref`, `version`, `annotation`

Example code:

```
<essenceTrackAspectRatio>4:3</essenceTrackAspectRatio>
```

```
<essenceTrackAspectRatio>1.778</essenceTrackAspectRatio>
```

### **essenceTrackTimeStart**

Definition: `essenceTrackTimeStart` provides a time stamp for the beginning point of playback for a time-based essence track. It is likely that the content on a tape may begin an arbitrary amount of time after the beginning of the instantiation.

Best Practice: Use in combination with `essenceTrackDuration` to identify a sequence or segment of an essence track that has a fixed start time and end time. Best practice is to use a timestamp format such as `HH:MM:SS[:;]FF` or `HH:MM:SS.mmm` or `S.mmm`.

Usage: optional, not repeatable

Optional attributes: `source`, `ref`, `version`, `annotation`

Example code:

```
<essenceTrackTimeStart>00:00:32:05</essenceTrackTimeStart>
```

### **essenceTrackDuration**

Definition: `essenceTrackDuration` provides a timestamp for the overall length or duration of a track. It represents the track playback time.

Best Practice: Best practice is to use a timestamp format such as `HH:MM:SS[:;]FF` or `HH:MM:SS.mmm` or `S.mmm`.

Usage: optional, not repeatable

Optional attributes: source, ref, version, annotation

Example code:

```
<essenceTrackDuration>00:56:22:13</essenceTrackDuration>
```

### **essenceTrackLanguage**

Definition: essenceTrackLanguage identifies the primary language of the tracks' audio or text. Languages must be indicated using 3-letter codes standardized in ISO 639-2 or 639-3. If an instantiation includes more than one language, the element can be repeated. Alternately, both languages can be expressed in one element by separating two three-letter codes with a semicolon, i.e. eng;fre.

Usage: optional, not repeatable

Optional attributes: source, ref, version, annotation

Controlled vocabularies: PBCore requires the use of the ISO 639.2 or ISO 639.3 3-letter language codes.

Example code:

```
<essenceTrackLanguage source="ISO 639.2"
ref="http://id.loc.gov/vocabulary/iso639-2/eng">eng</essenceTrackLanguage>
```

### **essenceTrackAnnotation**

Definition: essenceTrackAnnotation can store any supplementary information about a track or the metadata used to describe it. It clarifies element values, terms, descriptors, and vocabularies that may not be otherwise sufficiently understood.

Usage: optional, repeatable

Optional attributes: annotationType, source, ref, version, annotation

Example code:

```
<essenceTrackAnnotation annotationType="Condition note">Audio reel shows
faint signs of mold</essenceTrackAnnotation>
```

```
<essenceTrackAnnotation
annotationType="ChromaSubsampling">4:2:0</essenceTrackAnnotation>
```

## essenceTrackExtension

Definition: essenceTrackExtension is an extension element. Extensions are either a wrapper containing a specific element from another standard OR embedded xml containing the extension. The essenceTrackExtension element is a container to accomodate track-level metadata from external systems. Use it to supplement other metadata sub-elements of instantiationEssenceTrack in which it appears.

Usage: optional, repeatable

Optional subelements: extensionWrap (required ONLY if extensionEmbedded is not used), extensionEmbedded (required ONLY if extensionWrap is not used)

Example code:

```
<essenceTrackExtension>
<!-- No data here directly; it's within sub-elements instead -->
  <extensionWrap>
    <extensionElement>RightsHolderName</extensionElement>
    <extensionValue>WNET.org</extensionValue>
    <extensionAuthorityUsed>
http://www.loc.gov/standards/rights/METSRights.xsd</extensionAuthorityUsed>
  </extensionWrap>
</essenceTrackExtension>
```

## instantiationRelation

Definition: instantiationRelation is a container for sub-elements instantiationRelationType and instantiationRelationIdentifier to describe relationships to other instantiations.

Usage: optional, repeatable

Required subelements: instantiationRelationType, instantiationRelationIdentifier

Example code:

```
<instantiationRelation>
<!-- No data here directly; it's within sub-elements instead -->
  <instantiationRelationType source="PBCore relationType Vocabulary"
"http://pbcore.org/pbcore-controlled-vocabularies/pbcorerelationtype-
vocabulary/#DerivedFrom">Derived from</instantiationRelationType>
  <instantiationRelationIdentifier source="WGBH
Barcode">233745</instantiationRelationType>
</instantiationRelation>
```

## **instantiationRelationType**

Definition: instantiationRelationType describes the relation between the instantiation being described and another instantiation.

Best Practice: The instantiations may be related in that they are different discrete parts of a single intellectual unit, they may be generationally related, one may be a derivative of another, they may be different versions.

Usage: required within instantiationRelation, not repeatable

Attributes: source, ref, version, annotation

Recommended controlled vocabularies: PBCore's instantiationRelationType Vocabulary, Dublin Core RDF Schema Declaration of Relation Types

Example code:

```
<instantiationRelationType source="PBCore relationType"
"http://pbcore.org/pbcore-controlled-vocabularies/pbcorerelationtype-
vocabulary/#DerivedFrom">Derived from</instantiationRelationType>
```

## **instantiationRelationIdentifier**

Definition: instantiationRelationIdentifier is used to provide a name, locator, accession, identification number or ID where the related item can be obtained or found.

Best Practice: We recommend using a unique identifier or global unique ID in this element.

Usage: required within instantiationRelation, not repeatable

Attributes: source, ref, version, annotation

Example code:

```
<instantiationRelationIdentifier>FRON001108</instantiationRelationIdentifier>
```

## **instantiationRights**

Definition: instantiationRights is a container for sub-elements rightsSummary, rightsLink and rightsEmbedded to describe rights particular to this instantiation.

Best Practice: This element contains rights information that is specific to an instantiation of an asset, such as rights conferred in a donation agreement that apply only to a single donated item.

Usage: optional, repeatable

Optional subelements: rightsSummary, rightsLink, rightsEmbedded

Attributes: startTime, endTime, timeAnnotation

Example code:

```
<instantiationRights startTime="00:00:10" endTime="00:10:00">
<!-- No data here directly; it's within sub-elements instead -->
  <rightsSummary>Donation agreement provides rights to give access to users
on premises</rightsSummary>
</instantiationRights>
```

### **instantiationAnnotation**

Definition: instantiationAnnotation is used to add any supplementary information about an instantiation of the instantiation or the metadata used to describe it. It clarifies element values, terms, descriptors, and vocabularies that may not be otherwise sufficiently understood.

Usage: optional, repeatable

Attributes: annotationType, source, ref, version, annotation

Example code:

```
<instantiationAnnotation>Original recording lost, this serves as
master</instantiationAnnotation>
```

```
<instantiationAnnotation>Label on cassette reads "Do Not
Use"</instantiationAnnotation>
```

### **instantiationPart**

Definition: instantiationPart is a container that allows the instantiation to be split into multiple parts, which can describe the parts of a multi-section instantiation, e.g., a multi-disk DVD or vitagraph record and 35mm reel that are intended for synchronous playback. It contains all of the elements that a pbcoreInstantiation element would typically contain.

Usage: optional, repeatable

Required subelements: instantiationIdentifier, instantiationLocation

Optional subelements: instantiationDate, instantiationDimensions, instantiationPhysical, instantiationDigital, instantiationStandard, instantiationMediaType, instantiationGenerations, instantiationFileSize, instantiationTimeStart, instantiationDuration, instantiationDataRate,



instantiationColors, instantiationTracks, instantiationChannelConfiguration, instantiationLanguage, instantiationAlternativeModes, instantiationEssenceTrack, instantiationRelation, instantiationRights, instantiationAnnotation, instantiationPart, instantiationExtension

Attributes: startTime, endTime, timeAnnotation

Example code:

```
<pbcoreInstantiation>
  <instantiationPart>
    <!-- No data here directly; it's within sub-elements instead -->
    <instantiationIdentifier>654321-1</instantiationIdentifier>
    <instantiationLocation>Shelf 12, Row 7</instantiationLocation>
  </instantiationPart>
  <instantiationPart>
    <!-- No data here directly; it's within sub-elements instead -->
    <instantiationIdentifier>654321-2</instantiationIdentifier>
    <instantiationLocation>Shelf 12, Row 7</instantiationLocation>
  </instantiationPart>
</pbcoreInstantiation>
```

### **instantiationExtension**

Definition: instantiationExtension is an extension element. Extensions are either a wrapper containing a specific element from another standard OR embedded xml containing the extension.

Best Practice: Use it to supplement other metadata sub-elements of ‘instantiationPart’ or ‘pbcoreInstantiationDocument’ in which it appears.

Usage: optional, repeatable

Optional subelements: extensionWrap (required ONLY if extensionEmbedded is not used), extensionEmbedded (required ONLY if extensionWrap is not used)

Example code:

```
<instantiationExtension>
<!-- No data here directly; it's within sub-elements instead -->
  <extensionWrap>
    <extensionElement>RightsHolderName</extensionElement>
    <extensionValue>WNET.org</extensionValue>
    <extensionAuthorityUsed>
https://www.loc.gov/standards/rights/METSRights.xsd</extensionAuthorityUsed>
  </extensionWrap>
</instantiationExtension>
```