PBCore Structure

PBCore 2.1 is made up of 15 containers and 82 elements, and makes use of 49 XML attributes. Attributes are used to further qualify or describe the elements and their values. Not all attributes can be used to describe every element. This Handbook contains a description of each element, what contains them, what they contain, and a list of what attributes can be used to describe them.

Within a PBCore XML Document, the order and structure of the elements is determined by the XSD. Elements must be included in the correct order, or the XML document will not validate. Below is a listing of the correct order of subelements in PBCore:

- pbcoreDescriptionDocument
    - pbcoreAssetType
    - pbcoreAssetDate
    - pbcoreIdentifier
    - pbcoreTitle
    - pbcoreSubject
    - pbcoreDescription
    - pbcoreGenre
    - pbcoreRelation
        - pbcoreRelationType
        - pbcoreRelationIdentifier
    - pbcoreCoverage
        - coverage
        - coverageType
    - pbcoreAudienceLevel
    - pbcoreAudienceRating
    - pbcoreCreator
        - creator
        - creatorRole
    - pbcoreContributor
        - contributor
        - contributorRole
    - pbcorePublisher
        - publisher
        - publisherRole
    - pbcoreRightsSummary
        - rightsSummary
        - rightsLink
        - rightsEmbedded
    - pbcoreInstantiation
        - instantiationIdentifier
        - instantiationDate
        - instantiationDimensions
        - instantiationPhysical
        - instantiationDigital

- instantiationStandard
- instantiationLocation
- instantiationMediaType
- instantiationGenerations
- instantiationFileSize
- instantiationTimeStart
- instantiationDuration
- instantiationDataRate
- instantiationColors
- instantiationTracks
- instantiationChannelConfiguration
- instantiationLanguage
- instantiationAlternativeModes
- instantiationEssenceTrack
  - essenceTrackType
  - essenceTrackIdentifier
  - essenceTrackStandard
  - essenceTrackEncoding
  - essenceTrackDataRate
  - essenceTrackFrameRate
  - essenceTrackPlaybackSpeed
  - essenceTrackSamplingRate
  - essenceTrackBitDepth
  - essenceTrackFrameSize
  - essenceTrackAspectRatio
  - essenceTrackTimeStart
  - essenceTrackDuration
  - essenceTrackLanguage
  - essenceTrackAnnotation
  - essenceTrackExtension
  - instantiationRelation
    - instantiationRelationType
    - instantiationRelationIdentifier
  - instantiationRights
    - rightsSummary
    - rightsLink
    - rightsEmbedded
  - instantiationAnnotation
  - instantiationPart
  - instantiationExtension
- pbcoreAnnotation
- pbcorePart
- pbcoreExtension
  - extensionWrap
    - extensionElement
    - extensionValue

- extensionAuthorityUsed
  - extensionEmbedded

There are three main ways of structuring a PBCore XML document. The most common way is to contain all elements within a pbcoreDescriptionDocument. This allows a user to describe the intellectual content of an asset using asset-level subelements, such as pbcoreAssetType, pbcoreTitle, and pbcoreCreator. A pbcoreDescriptionDocument is considered complete and valid if it only includes asset-level descriptive information; however, within a pbcoreDescriptionDocument, users can also use pbcoreInstantiation and its subelements to describe all instances of that asset (tapes, digital files, etc) within a single record.

Here is example of a pbcoreDescriptionDocument using only the minimum required elements for the document to be valid:

DESCRIPTION DOCUMENT

IDENTIFIER: 00001
      Source: PBCore Handbook
TITLE: Hamlet
DESCRIPTION: Filmed production of Shakespeare's Hamlet

PBCore XML

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<pbcoreDescriptionDocument xmlns="http://www.pbcore.org/PBCore/PBCoreNamespace.html"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.pbcore.org/PBCore/PBCoreNamespace.html
https://raw.githubusercontent.com/WGBH/PBCore_2.1/master/pbcore-2.1.xsd">
  <pbcoreIdentifier source="PBCore Handbook">00001</pbcoreIdentifier>
  <pbcoreTitle>Hamlet</pbcoreTitle>
  <pbcoreDescription>Filmed production of Shakespeare's Hamlet</pbcoreDescription>
</pbcoreDescriptionDocument>
```

Here is an example of a pbcoreDescriptionDocument with all descriptive asset-level elements filled out, as well as two associated instantiations:

DESCRIPTION DOCUMENT

ASSET TYPE: Episode
      Source: PBCore
ASSET DATE: 11-17-1970
      Date Type: broadcast
 IDENTIFIER: 00001
      Source: PBCore Handbook
TITLE: Hamlet
      Title type: Episode

TITLE: ITV Sunday Night Theater
 Title type: Series
TITLE: 3204
 Title type: Episode Number
SUBJECT: Princes--Denmark--Drama
 Source: Library of Congress Subject Headings
 Ref: http://id.loc.gov/authorities/subjects/sh2008109991.html
DESCRIPTION: Filmed production of Shakespeare's Hamlet
GENRE: Drama
 Source: IMDB
RELATION
 RELATION TYPE: Has Derivative
  Source: PBCore
 RELATION IDENTIFIER: 00038
  Annotation: A two-disc audio set comprising the soundtrack of the production
COVERAGE
 COVERAGE: Denmark
 COVERAGE TYPE: Spatial
AUDIENCE LEVEL: General Audience
 SOURCE: EBU Intended Audience Code
AUDIENCE RATING: N/A
 Annotation: The program predates TV parental guidelines
CREATOR:
 CREATOR: Wood, Peter, 1925-2016
  Source: Library of Congress Name Authorities
  Ref: http://id.loc.gov/authorities/names/n86143606.html
 CREATOR ROLE: Director
  Source: PBCore
CREATOR
 CREATOR: Shakespeare, William, 1564-1616
  Source: Library of Congress Name Authorities
  Ref: http://id.loc.gov/authorities/names/n78095332
 CREATOR ROLE: Author
  Source: PBCore
CONTRIBUTOR
 CONTRIBUTOR: Chamberlain, Richard, 1935
  Source: Library of Congress Name Authorities
  Ref: http://id.loc.gov/authorities/names/n85158136
 CONTRIBUTOR ROLE: Actor
  Source: PBCore
  Portrayal: Hamlet
PUBLISHER
 PUBLISHER: Hallmark Hall of Fame Productions, Inc.
RIGHTS SUMMARY
 RIGHTS SUMMARY: Copyright Chamberlain-LeMaire (U.K.) Limited and ATV Network Limited, 1970

INSTANTIATION
      INSTANTIATION IDENTIFIER: 422934074
            Source: OCLC Number
      INSTANTIATION DATE: 11-17-1970
            Date Type: created
      INSTANTIATION PHYSICAL: Film
            Source: PBCore
      INSTANTIATION LOCATION: UCLA Film and Television Archive
      INSTANTIATION MEDIA TYPE: Moving Image
            Source: PBCore
      INSTANTIATION GENERATIONS: Original
            Source: PBCore
      INSTANTIATION DURATION: 01:30:00
      INSTANTIATION COLORS: Color
      INSTANTIATION LANGUAGE: eng
INSTANTIATION
      INSTANTIATION IDENTIFIER: T:31586
            Source: Paley Center for Media Catalog
      INSTANTIATION DATE: 11-17-1970
            Date Type: created
      INSTANTIATION PHYSICAL: Open reel videotape
            Source: PBCore
      INSTANTIATION LOCATION: Paley Center for Media
      INSTANTIATION MEDIA TYPE: Moving Image
            Source: PBCore
      INSTANTIATION GENERATIONS: Copy
            Source: PBCore
      INSTANTIATION DURATION: 01:49:43
      INSTANTIATION COLORS: Black and white
      INSTANTIATION LANGUAGE: eng
ANNOTATION: Program initially broadcast in the UK as part of ITV Sunday Night Theater and in the United States as part of NBC's Hallmark Hall of Fame

PBCore XML

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<pbcoreDescriptionDocument
xmlns="http://www.pbcore.org/PBCore/PBCoreNamespace.html"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.pbcore.org/PBCore/PBCoreNamespace.html
https://raw.githubusercontent.com/WGBH/PBCore_2.1/master/pbcore-2.1.xsd">
  <pbcoreAssetType source="PBCore">Episode</pbcoreAssetType>
  <pbcoreAssetDate dateType="broadcast">11-17-1970</pbcoreAssetDate>
  <pbcoreIdentifier source="PBCore Handbook">00001</pbcoreIdentifier>
  <pbcoreTitle titleType="Episode">Hamlet</pbcoreTitle>
  <pbcoreTitle titleType="Series">ITV Sunday Night Theater</pbcoreTitle>
  <pbcoreSubject
ref="http://id.loc.gov/authorities/subjects/sh2008109991.html"
source="Library of Congress Subject Headings">Princes--Denmark--Drama
```

```xml
</pbcoreSubject>
  <pbcoreDescription>Filmed production of Shakespeare's
Hamlet</pbcoreDescription>
  <pbcoreGenre source="IMDB">Drama</pbcoreGenre>
  <pbcoreRelation>
    <pbcoreRelationType source="PBCore">Has Derivative</pbcoreRelationType>
    <pbcoreRelationIdentifier annotation="A two-disc audio set comprising the
soundtrack of the production">00038</pbcoreRelationIdentifier>
  </pbcoreRelation>
  <pbcoreCoverage>
    <coverage>Denmark</coverage>
    <coverageType>Spatial</coverageType>
  </pbcoreCoverage>
  <pbcoreAudienceLevel source="EBU Intended Audience Code">General
Audience</pbcoreAudienceLevel>
  <pbcoreAudienceRating annotation="The program predates TV parental
guidelines">N/A</pbcoreAudienceRating>
  <pbcoreCreator>
   <creator source="Library of Congress Name Authorities"
ref="http://id.loc.gov/authorities/names/n86143606.html">Wood, Peter, 1925-
2016</creator>
    <creatorRole source="PBCore">Director</creatorRole>
  </pbcoreCreator>
  <pbcoreCreator>
    <creator source="Library of Congress Name Authorities"
ref="http://id.loc.gov/authorities/names/n78095332">Shakespeare, William,
1564-1616</creator>
    <creatorRole source="PBCore">Author</creatorRole>
  </pbcoreCreator>
  <pbcoreContributor>
    <contributor source="Library of Congress Name Authorities"
ref="http://id.loc.gov/authorities/names/n85158136">Chamberlain, Richard,
1935</contributor>
    <contributorRole portrayal="Hamlet"
source="PBCore">Actor</contributorRole>
  </pbcoreContributor>
  <pbcorePublisher>
    <publisher>Hallmark Hall of Fame Productions, Inc.</publisher>
  </pbcorePublisher>
  <pbcoreRightsSummary>
    <rightsSummary>Copyright Chamberlain-LeMaire (U.K.) Limited and ATV
Network Limited, 1970</rightsSummary>
  </pbcoreRightsSummary>
  <pbcoreInstantiation>
    <instantiationIdentifier source="OCLC
Number">422934074</instantiationIdentifier>
    <instantiationDate dateType="created">11-17-1970</instantiationDate>
    <instantiationPhysical source="PBCore">Film</instantiationPhysical>
    <instantiationLocation>UCLA Film and Television
Archive</instantiationLocation>
    <instantiationMediaType source="PBCore">Moving
Image</instantiationMediaType>
    <instantiationGenerations
source="PBCore">Original</instantiationGenerations>
    <instantiationDuration>01:30:00</instantiationDuration>
    <instantiationColors source="">Color</instantiationColors>
    <instantiationLanguage>eng</instantiationLanguage>
```

```
   </pbcoreInstantiation>
   <pbcoreInstantiation>
     <instantiationIdentifier source="Paley Center for Media
Catalog">T:31586</instantiationIdentifier>
     <instantiationDate dateType="created">11/17/1970</instantiationDate>
     <instantiationPhysical source="PBCore">Open reel
videotape</instantiationPhysical>
     <instantiationLocation>Paley Center for Media</instantiationLocation>
     <instantiationMediaType source="PBCore">Moving
Image</instantiationMediaType>
     <instantiationGenerations source="PBCore">Copy</instantiationGenerations>
     <instantiationDuration>01:49:43</instantiationDuration>
     <instantiationColors source="">Black and white</instantiationColors>
     <instantiationLanguage>eng</instantiationLanguage>
   </pbcoreInstantiation>
   <pbcoreAnnotation>Program initially broadcast in the UK as part of ITV
Sunday Night Theater and in the United States as part of NBC's Hallmark Hall
of Fame </pbcoreAnnotation>
</pbcoreDescriptionDocument>
```

These two documents represent two extremes, but each institution can determine the level of description and PBCore usage that works for their individual use case.

Individual pbcoreDescriptionDocuments can also be collected using the root element pbcoreCollection. When using pbcoreCollection as the root element of a pbcoreDocument, the hierarchy remains the same, but one or many pbcoreDescriptionDocuments are contained inside the pbcoreCollection element for serialization. Here is an example of a pbcoreCollection document containing three pbcoreDescriptionDocuments:

COLLECTION DOCUMENT

     DESCRIPTION DOCUMENT
     IDENTIFIER: 19993
        Source: TGIF
     TITLE: Sabrina the Teenage Witch
        Title type: Series
     DESCRIPTION: Fragment of a recorded episode of a television series about a teen witch and her wacky aunts

     DESCRIPTION DOCUMENT

     IDENTIFIER: 19994
        Source: TGIF
     TITLE: Boy Meets World
        Title type: Series
     DESCRIPTION: Fragment of a recorded episode of a television sitcom about a boy's everyday life

     DESCRIPTION DOCUMENT

IDENTIFIER: 19996
Source: TGIF
TITLE: Sister, Sister
Title type: Series
DESCRIPTION: Fragment of a recorded episode from a television sitcom about twins separated at birth

PBCore XML

```xml
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<pbcoreCollection xmlns="http://www.pbcore.org/PBCore/PBCoreNamespace"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.pbcore.org/PBCore/PBCoreNamespace
https://raw.githubusercontent.com/WGBH/PBCore_2.1/master/pbcore-2.1.xsd">
<pbcoreDescriptionDocument>
    <pbcoreIdentifier source="TGIF">19993</pbcoreIdentifier>
    <pbcoreTitle titleType="Series">Sabrina the Teenage Witch</pbcoreTitle>
    <pbcoreDescription>Fragment of a recorded episode of a television series
about a teen witch and her wacky aunts</pbcoreDescription>
  </pbcoreDescriptionDocument>
  <pbcoreDescriptionDocument>
    <pbcoreIdentifier source="TGIF">19994</pbcoreIdentifier>
    <pbcoreTitle titleType="Series">Boy Meets World</pbcoreTitle>
    <pbcoreDescription>Fragment of a recorded episode of a television sitcom
about a boy's everyday life</pbcoreDescription>
  </pbcoreDescriptionDocument>
  <pbcoreDescriptionDocument>
    <pbcoreIdentifier source="TGIF">19996</pbcoreIdentifier>
    <pbcoreTitle titleType="Series">Sister, Sister</pbcoreTitle>
    <pbcoreDescription>Fragment of a recorded episode from a television
sitcom about twins separated at birth </pbcoreDescription>
  </pbcoreDescriptionDocument>
</pbcoreCollection>
```

The third way of structuring a PBCore document is to use pbcoreInstantiationDocument as the root element. If a pbcoreInstantiationDocument is used as the root element, only the Instantiation elements may appear inside the document. PBCoreInstantiationDocuments can be used to track physical information about archival collections for which little to no content information is available. They can also be used as a means of recording technical metadata about digital files in a collection.

A pbcoreInstantiationDocument is considered complete and valid if it includes an identifier and a location. InstantiationDocuments can also include complex multi-layered information through the use of the instantiationEssenceTrack container element, which describe the individual streams that comprise an instantiation, such as audio, video, timecode, etc. InstantiationEssenceTracks can also be used to describe instantiations within descriptionDocuments, but cannot form standalone PBCore documents.

Here is an example of a pbcoreInstantiationDocument using only the minimum required elements for the document to be valid:

INSTANTIATION DOCUMENT

INSTANTIATION IDENTIFIER: 00001
        Source: PBCore Handbook
INSTANTIATION LOCATION: Library of Congress

PBCore XML

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<pbcoreInstantiationDocument
xmlns="http://www.pbcore.org/PBCore/PBCoreNamespace.html"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.pbcore.org/PBCore/PBCoreNamespace.html
https://raw.githubusercontent.com/WGBH/PBCore_2.1/master/pbcore-2.1.xsd">
  <instantiationIdentifier source="PBCore
Handbook">00001</instantiationIdentifier>
  <instantiationLocation>Library of Congress</instantiationLocation>
</pbcoreInstantiationDocument>
```

Here is an example of a pbcoreInstantiationDocument fully describing a physical instance, with all applicable elements filled out.

INSTANTIATION DOCUMENT

INSTANTIATION IDENTIFIER: 00001
        Source: PBCore Handbook
INSTANTIATION DATE: 12-27-1964
        Date Type: created
INSTANTIATION DIMENSIONS: 4800
        Units of Measure: ft
INSTANTIATION PHYSICAL: 2 inch videotape
        Source: PBCore
INSTANTIATION STANDARD: NTSC
INSTANTIATION LOCATION: Library of Congress
INSTANTIATION MEDIA TYPE: Moving Image
        Source: PBCore
INSTANTIATION GENERATIONS: Master
        Source: PBCore
INSTANTIATION TIME START: 01:00:00
INSTANTIATION DURATION: 00:30:00
INSTANTIATION COLORS: Color
        Source: PBCore
INSTANTIATION CHANNEL CONFIGURATION: video, audio, control, and timecode tracks
INSTANTIATION LANGUAGE: eng
INSTANTIATION RIGHTS:
        RIGHTS SUMMARY: Copyright unknown; no donor restrictions

PBCore XML

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<pbcoreInstantiationDocument
xmlns="http://www.pbcore.org/PBCore/PBCoreNamespace.html"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://www.pbcore.org/PBCore/PBCoreNamespace.html
https://raw.githubusercontent.com/WGBH/PBCore_2.1/master/pbcore-2.1.xsd">
  <instantiationIdentifier source="PBCore
Handbook">00001</instantiationIdentifier>
  <instantiationDate dateType="created">12-27-1964</instantiationDate>
  <instantiationDimensions unitsOfMeasure="ft">4800</instantiationDimensions>
  <instantiationPhysical source="PBCore">2 inch
videotape</instantiationPhysical>
  <instantiationStandard>NTSC</instantiationStandard>
  <instantiationLocation>Library of Congress</instantiationLocation>
  <instantiationMediaType source="PBCore">Moving
Image</instantiationMediaType>
  <instantiationGenerations source="PBCore">Master</instantiationGenerations>
  <instantiationTimeStart>01:00:00</instantiationTimeStart>
  <instantiationDuration>00:30:00</instantiationDuration>
  <instantiationColors source="PBCore">Color</instantiationColors>
  <instantiationChannelConfiguration>video, audio, control, and timecode
tracks</instantiationChannelConfiguration>
  <instantiationLanguage>eng</instantiationLanguage>
  <instantiationRights>
    <rightsSummary>Copyright unknown; no donor restrictions</rightsSummary>
  </instantiationRights>
</pbcoreInstantiationDocument>
```

Here is an example of a pbcoreInstantiationDocument that describes a digital file with technical metadata automatically generated by a file characterization tool (in this case, MediaInfo).

INSTANTIATION DOCUMENT

INSTANTIATION IDENTIFIER: barcode_152572_clip.mov
        Source: File Name
INSTANTIATION DATE: 2018-02-26T19:14:19Z
        Date Type: file modification
INSTANTIATION DIGITAL: video/mp4
INSTANTIATION STANDARD: MPEG-4
        profile: QuickTime

INSTANTIATION LOCATION:
/Users/rebecca_fraimow/Downloads/barcode_152572_clip.mov
INSTANTIATION MEDIA TYPE: Moving Image
INSTANTIATION FILE SIZE: 291475523
        Units of Measure: byte
INSTANTIATION DURATION: 00:00:10;00
INSTANTIATION DATA RATE: 23947472
        Units of Measure: bit/second

INSTANTIATION TRACKS: 2
INSTANTITAION CHANNEL CONFIGURATION: Track 2: 8 channels (L R C LFE Ls R Rls Rb)
INSTANTIATION ESSENCE TRACK
    ESSENCE TRACK TYPE: Video
    ESSENCE TRACK IDENTIFIER: 1
        Source: ID
    ESSENCE TRACK IDENTIFIER: 0
        Source: StreamKindID (MediaInfo)
    ESSENCE TRACK IDENTIFIER: 0
        Source: StreamOrder (MediaInfo)
    ESSENCE TRACK STANDARD: NTSC
    ESSENCE TRACK ENCODING: YUV
        Source: codecid
        Ref: v210
        Annotation: compression_mode:Lossless
    ESSENCE TRACK DATA RATE: 223724851
        Units of Measure: bit/second
    ESSENCE TRACK FRAME RATE: 29.970
        Annotation: rational_frame_rate:30000/1001 interlacement:BFF
    ESSENCE TRACK BIT DEPTH: 10
    ESSENCE TRACK FRAME SIZE: 720x480
    ESSENCE TRACK ASPECT RATIO: 1.333
    ESSENCE TRACK TIME START: 01:00:01.135
        Source: Container
    ESSENCE TRACK DURATION: 00:00:10;00
    ESSENCE TRACK LANGUAGE: eng
INSTANTIATION ESSENCE TRACK
    ESSENCE TRACK TYPE: Audio
    ESSENCE TRACK IDENTIFIER: 2
        Source: ID
        Annotation: default:Yes
    ESSENCE TRACK IDENTIFIER: 0
        Source: StreamKindID (MediaInfo)
    ESSENCE TRACK IDENTIFIER: 1
        Source: StreamOrder (MediaInfo)
    ESSENCE TRACK ENCODING: PCM
        Source: codecid
        Ref: in24
        Annotation: endianness:Little signedness:Signed
    ESSENCE TRACK DATA RATE: 9216000
        Units of Measure: bit/second
        Annotation: CBR
    ESSENCE TRACK SAMPLING RATE: 48000
        Units of Measure: Hz
    ESSENCE TRACK BIT DEPTH: 24

ESSENCE TRACK TIME START: 01:00:02.135
           Source: Container
ESSENCE TRACK DURATION: 00:00:10.010
ESSENCE TRACK LANGUAGE: eng
INSTANTIATION ANNOTATION: 303
           Annotation Type: FrameCount
INSTANTIATION ANNOTATION: Lav58.20.100
           Annotation Type: Encoded_Application

PBCore XML

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!-- Generated at 2019-10-24T18:15:11Z by MediaInfoLib - v18.12 -->
<pbcoreInstantiationDocument
xsi:schemaLocation="http://www.pbcore.org/PBCore/PBCoreNamespace.html
https://raw.githubusercontent.com/WGBH/PBCore_2.1/master/pbcore-2.1.xsd"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="http://www.pbcore.org/PBCore/PBCoreNamespace.html">
     <instantiationIdentifier source="File
Name">barcode_152572_clip.mov</instantiationIdentifier>
     <instantiationDate dateType="file modification">2018-02-
26T19:14:19Z</instantiationDate>
     <instantiationDigital>video/mp4</instantiationDigital>
     <instantiationStandard profile="QuickTime">MPEG-4</instantiationStandard>
     <instantiationLocation>/Users/rebecca_fraimow/Downloads/barcode_152572_cl
ip.mov</instantiationLocation>
     <instantiationMediaType>Moving Image</instantiationMediaType>
     <instantiationFileSize
unitsOfMeasure="byte">291475523</instantiationFileSize>
     <instantiationDuration>00:00:10;00</instantiationDuration>
     <instantiationDataRate
unitsOfMeasure="bit/second">232947472</instantiationDataRate>
     <instantiationTracks>2</instantiationTracks>
     <instantiationChannelConfiguration>Track 2: 8 channels (L R C LFE Ls R
Rls Rb), Track 2: 8 channels (L R C LFE Ls R Rls
Rb)</instantiationChannelConfiguration>
     <instantiationEssenceTrack>
         <essenceTrackType>Video</essenceTrackType>
         <essenceTrackIdentifier source="ID">1</essenceTrackIdentifier>
         <essenceTrackIdentifier source="StreamKindID
(MediaInfo)">0</essenceTrackIdentifier>
         <essenceTrackIdentifier source="StreamOrder
(MediaInfo)">0</essenceTrackIdentifier>
         <essenceTrackStandard>NTSC</essenceTrackStandard>
         <essenceTrackEncoding source="codecid" ref="v210"
annotation="compression_mode:Lossless">YUV</essenceTrackEncoding>
         <essenceTrackDataRate unitsOfMeasure="bit/second"
annotation="CBR">223724851</essenceTrackDataRate>
         <essenceTrackFrameRate annotation="rational_frame_rate:30000/1001
interlacement:BFF">29.970</essenceTrackFrameRate>
         <essenceTrackBitDepth>10</essenceTrackBitDepth>
         <essenceTrackFrameSize>720x486</essenceTrackFrameSize>
         <essenceTrackAspectRatio>1.333</essenceTrackAspectRatio>
```

```
        <essenceTrackTimeStart
source="Container">01:00:02.135</essenceTrackTimeStart>
        <essenceTrackDuration>00:00:10;00</essenceTrackDuration>
        <essenceTrackLanguage>eng</essenceTrackLanguage>
    </instantiationEssenceTrack>
    <instantiationEssenceTrack>
        <essenceTrackType>Audio</essenceTrackType>
        <essenceTrackIdentifier source="ID"
annotation="default:Yes">2</essenceTrackIdentifier>
        <essenceTrackIdentifier source="StreamKindID
(MediaInfo)">0</essenceTrackIdentifier>
        <essenceTrackIdentifier source="StreamOrder
(MediaInfo)">1</essenceTrackIdentifier>
        <essenceTrackEncoding source="codecid" ref="in24"
annotation="endianness:Little signedness:Signed">PCM</essenceTrackEncoding>
        <essenceTrackDataRate unitsOfMeasure="bit/second"
annotation="CBR">9216000</essenceTrackDataRate>
        <essenceTrackSamplingRate
unitsOfMeasure="Hz">48000</essenceTrackSamplingRate>
        <essenceTrackBitDepth>24</essenceTrackBitDepth>
        <essenceTrackTimeStart
source="Container">01:00:02.135</essenceTrackTimeStart>
        <essenceTrackDuration>00:00:10.010</essenceTrackDuration>
        <essenceTrackLanguage>eng</essenceTrackLanguage>
    </instantiationEssenceTrack>
    <instantiationAnnotation annotationType="Other_Codec_List">QuickTime
TC</instantiationAnnotation>
    <instantiationAnnotation
annotationType="FrameCount">300</instantiationAnnotation>
    <instantiationAnnotation
annotationType="Encoded_Application">Lavf57.72.101</instantiationAnnotation>
</pbcoreInstantiationDocument>
```

In addition to these three main forms of PBCore documents, the structure of PBCore can be extended through the use of the pbcorePart or instantiationPart elements. The element pbcorePart can be used within a pbcoreDescriptionDocument to repeat all asset-level elements for a more detailed description of different parts of the content. This structure is sometimes used when a single asset contains several discrete units of intellectual content – for example, an album that has several songs by different singers, an anthology show that contains several segments, or a compilation that includes multiple programs.

Although an asset may be divided into segments by pbcorePart, the pbcoreDescriptionDocument must still include all required elements (title, identifier with source, and description) for the asset as a whole in order be valid. Each Part must also include these required elements, and all sub-elements must appear in the same order within a pbcorePart as within a pbcoreDescriptionDocument.

Here is an example of a pbcoreDescriptionDocument that uses pbcorePart to describe the different programs included in a single box set:

DESCRIPTION DOCUMENT

ASSET TYPE: Compilation
>Source: PBCore

IDENTIFIER: 978-1-62789-267-4
>Source: ISBN

IDENTIFIER: 123456
>Source: WGBH Barcode

TITLE: Wild West
>Title Type: Box Set

DESCRIPTION: They were "heroes" and rebels, but they were all epic personalities who took center stage in the creation of the mythic Wild West. This superb selection of documentaries and authentically reproduced memorabilia combine to present compelling portraits of the icons who risked everything in a dazzling new land of opportunity.
>Source: Back of box

GENRE: Documentary

COVERAGE
>COVERAGE: American West
>COVERAGE TYPE: Spatial

COVERAGE
>COVERAGE: 19th Century
>COVERAGE TYPE: Temporal

CREATOR
>CREATOR: WGBH
>CREATOR ROLE: Producer

CREATOR
>CREATOR: Sharon Griberg
>CREATOR ROLE: Senior Producer

CREATOR
>CREATOR: Mark Samuels
>CREATOR ROLE: Executive Producer
>>Source: PBCore

PUBLISHER
>PUBLISHER: PBS Distribution
>PUBLISHER ROLE: Distributor
>>Source: PBCore

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>Source: Back of box

INSTANTIATION
>INSTANTIATION IDENTIFIER: 123456
>>Source: WGBH Barcode
>INSTANTIATION STANDARD: NTSC
>INSTANTIATION LOCATION: WGBH

INSTANTIATION MEDIA TYPE: Moving Image
 Source: PBCore
INSTANTIATION GENERATIONS: Copy: Access
 Source: PBCore
INSTANTIATION DURATION: 6:00:00
INSTANTIATION ALTERNATIVE MODES: English SDH Subtitles
INSTANTIATION ANNOTATION: DVD Box Set
PBCORE PART
 ASSET TYPE: Program
 Source: PBCore
 IDENTIFIER: 123456-1-BK
 Source: WGBH
 TITLE: Billy the Kid
 SUBJECT: Billy the Kid
 DESCRIPTION: On April 28, 1881, just days from being hanged for murder, 21-year-old
Henry McCarty, alias Billy the Kid, outfoxed his jailors and electrified the nation with the last in
a long line of daring escapes. Just a few weeks later, he was finally gunned down by an
ambitious sheriff, and the felling of one of the most notorious criminals of the age made
headlines across the country.
 Source: American Experience website
 CREATOR
 CREATOR: John Maggio
 CREATOR ROLE: Producer
 CREATOR
 CREATOR: Michael Murphy
 CREATOR ROLE: Narrator
PBCORE PART
 ASSET TYPE: Program
 Source: PBCore
 IDENTIFIER: 123456-1-JJ
 Source: WGBH
 TITLE: Jesse James
 SUBJECT: Jesse James
 DESCRIPTION: The legend of Jesse James is one of America's most familiar myths –
and one of its most wrong-headed. James, so the legend goes, was a Western outlaw, but in
reality, he never went west. He has been called American's own Robin Hood, yet he robbed both
rich and poor, and was never seen to share his ill-gotten gains. He was known as a gunfighter –
but his victims were almost always unarmed. Less heroic than brutal, James was a member of a
vicious band of Missouri guerrillas during the Civil War, and sought vengeance for the
Confederate defeat afterwards. In a life steeped in prolific violence and bloodshed, he met what
was perhaps the most fitting end.
 Source: American Experience website
 CREATOR
 CREATOR: Mark Zwonitzer
 CREATOR ROLE: Producer
 CREATOR

CREATOR: Michael Murphy
CREATOR ROLE: Narrator
PBCORE PART
ASSET TYPE: Program
Source: PBCore
IDENTIFIER: 123456-1-BC
Source: WGBH
TITLE: Butch Cassidy and the Sundance Kid
SUBJECT: Butch Cassidy
SUBJECT: The Sundance Kid
DESCRIPTION: In an era in which cold-blooded killers such as Jesse James and the Younger Brothers terrorized the American West, Butch Cassidy, the Sundance Kid and their Wild Bunch gang took a smart and methodical approach to bank and train robbery. In the 1890s, their thrilling exploits – robbing banks and trains and then seemingly vanishing into thin air – became front-page news and the basis of rumor and myth, captivating Americans from coast to coast.
Source: American Experience website
CREATOR
CREATOR: John Maggio
CREATOR ROLE: Producer
CREATOR
CREATOR: Michael Murphy
CREATOR ROLE: Narrator

PBCore XML

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"heroes" and rebels, but they were all epic personalities who took center
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PBS by WGBH Boston. Senior Producer: Sharon Griberg. Executive Producer: Mark
Samels. Images Courtesy of: Alamy &amp; Getty Images. Additional DVD
materials and packaging copyright 2016 PBS Distribution. All rights
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Jesse James is one of America's most familiar myths – and one of its most
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reality, he never went west. He has been called American's own Robin Hood,
yet he robbed both rich and poor, and was never seen to share his ill-gotten
gains. He was known as a gunfighter – but his victims were almost always
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Bunch gang took a smart and methodical approach to bank and train robbery. In
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The element instantiationPart functions in a similar way to pbcorePart, but works to subdivide
instantiationDocuments and instantiations within pbcoreDescriptionDocuments. This structure

can be used for multi-part instantiations in which two or more discrete items may need to be described with individual technical metadata, such as a film that stretches over multiple reels, a CD set that contains several individual discs, or two video files that combine to form a multi-channel installation.

As with pbcorePart, the record must still include required subelements (identifier with source and location) for the instantiation as a whole in order be valid. Each instantiationPart must also include these required elements, and all sub-elements must appear in the same order within an instantiationPart as within an instantiation.

Here is an example of a pbcoreDescriptionDocument that uses instantiationPart to describe different DVDs within a single box set.

DESCRIPTION DOCUMENT

ASSET TYPE: Compilation
  Source: PBCore
IDENTIFIER: 978-1-62789-267-4
  Source: ISBN
IDENTIFIER: 123456
  Source: WGBH Barcode
TITLE: Wild West
  Title Type: Box Set
DESCRIPTION: They were "heroes" and rebels, but they were all epic personalities who took center stage in the creation of the mythic Wild West. This superb selection of documentaries and authentically reproduced memorabilia combine to present compelling portraits of the icons who risked everything in a dazzling new land of opportunity.
  Source: Back of box
GENRE: Documentary
COVERAGE
  COVERAGE: American West
  COVERAGE TYPE: Spatial
COVERAGE
  COVERAGE: 19th Century
  COVERAGE TYPE: Temporal
CREATOR
  CREATOR: WGBH
  CREATOR ROLE: Producer
CREATOR
  CREATOR: Sharon Grimberg
  CREATOR ROLE: Senior Producer
CREATOR
  CREATOR: Mark Samuels
  CREATOR ROLE: Executive Producer
   Source: PBCore
PUBLISHER

PUBLISHER: PBS Distribution
PUBLISHER ROLE: Distributor
Source: PBCore
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Source: Back of box
INSTANTIATION
INSTANTIATION IDENTIFIER: 123456
Source: WGBH Barcode
INSTANTIATION STANDARD: NTSC
INSTANTIATION LOCATION: WGBH
INSTANTIATION MEDIA TYPE: Moving Image
Source: PBCore
INSTANTIATION GENERATIONS: Copy: Access
Source: PBCore
INSTANTIATION DURATION: 6:00:00
INSTANTIATION ALTERNATIVE MODES: English SDH Subtitles
INSTANTIATION ANNOTATION: DVD Box Set
INSTANTIATION PART
IDENTIFIER: 123456-1
Source: WGBH Barcode
LOCATION: WGBH
INSTANTIATION PART
IDENTIFIER: 123456-2
Source: WGBH Barcode
LOCATION: WGBH
ANNOTATION: Includes a memorabilia collection of replica documents sourced from national and state collections, including the Library of Congress.

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materials and packaging copyright 2016 PBS Distribution. All rights
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As should by now be apparent, there is a lot of flexibility and variety in the structure of PBCore documents. Each institution or application using PBCore should consider implementing internal standards for the description of complex assets that suit their individual needs.