Digital Music, Photo, and Video Collections

MPV Broadcast Television Profile

Revision 1.0

October 2004

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ABSTRACT

The Broadcast Television Profile defines metadata and practices for processing of collections of recorded television shows stored on a variety of storage media such as hard drives or optical disks, or exchanged via internet protocols.

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RELEASE HISTORY

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Appendix I: References
Chapter 1: Introduction

1.1 Executive Summary

MPV is an open specification that makes the representation, exchange, processing and playback of collections of digital media content (including music, still images, stills with audio, still sequences, video clips, and audio clips) easier for a consumer.

The development and promotion of MPV is sponsored by the Optical Storage Technology Association (OSTA). The specification development and promotion process is open to all members; all organizations and individuals are welcomed as members. The association includes over 50 member companies from all over the world that produce products that collectively represent a majority marketshare in mainstream recordable optical storage categories.

MPV uses a text-based format that is easily understood and also easy to produce and consume programmatically in firmware or computer software. MPV does not tackle a large number of problems at once – instead, it focuses on a few key problems that it solves with simple but robust approaches. Where possible and practical, it supports use of established specifications and standards.

Applications, devices and consumers that use MPV benefit even when they only interact with music and audio in basic ways such as personal music collections that can be burned on CDs by many software applications.

MPV technology has three central components: Collections, Metadata, and Identification. Each of these make reference in various ways to data files containing the music, photo, or video content. This information may be augmented by information from various profiles. For example, the Presentation profile provides information that may be used by player applications and devices to provide an attractive playback user experience.

The MPV Core Specification sets out specific formalities to follow -- an MPV file must declare which specifications it implements along with their namespaces. This allows a processing application to quickly determine whether a given MPV file meets its expectations for processing.

MPV is not only a specification. It also includes a compliance test suite and processes, compliance testing materials, a logo program for compliant products, and a website. These materials and procedures are made available and administered by OSTA at a modest cost. OSTA charges no royalty for use of the specification or logo. In addition, sample open-source code implementations of key steps in processing MPV content are being contributed by interested parties.
Chapter 2: MPV Broadcast Television Profile 1.0

With the advent of Digital Video Recorders (DVRs), users can easily record many television shows to a variety of digital media types. The MPV Broadcast Television Profile allows users, via applications and devices, to create and manipulate collections of broadcast television content organized into playlists. The MPV Broadcast Television Profile extends the existing MPV Core Specification by augmenting this framework with additional metadata and practices specific to television content.

A user may start with a collection of recordings made to a hard drive, then organize and burn a subset on a DVD. When video collections are represented on the disc using MPV files that implement the MPV Broadcast Television Profile, a playback application or device can quickly start playback when the disc is inserted and allow the user to easily navigate and play video content. In addition to basic video playback, an application or device can display television show information like titles and descriptions. Additional content may also be part of the collection and is available to be shown by the playback application or device, such as production years, actors, directors, or other kinds of pertinent data.

2.1 Formalities For Use of the MPV Broadcast Television Profile

COMPATIBILITY

The MPV Broadcast Television Profile 1.0 is an extension of the MPV Core Specification 1.0 and is fully compatible with the MPV framework it establishes. Thus MPV files that implement the MPV Broadcast Television Profile should be usable in basic ways by MPV-aware applications and devices not focused on video playback. This means, for example, that an MPV playback application or device can read and playback Broadcast Television Profile collections even if it doesn’t understand the MPV Broadcast Television Profile; however, the TV-specific information will be ignored and the playback experience will be less full-featured than in a MPV Broadcast Television Profile compliant player.

SCHEMA NAMESPACE

To use the MPV Broadcast Television Profile, this information must be present in the namespace declarations of the MPV manifest:
The schema location may be specified optionally. Multiple schema variations may exist depending on the degree of validation desired by the developer. Typical variations include “lax”, “strict”, and “fixed”. These schema will all implement the grammar of the MPV Broadcast Television Profile but will vary in the degree of flexibility and conformance requirements that they embody.

**EXAMPLE**

```xml
<?xml version="1.0" encoding="UTF-8"?>
<file:Manifest
    xmlns:file="http://ns.osta.org/manifest/1.0/
    xmlns:file2="http://ns.osta.org/manifest/2.0/
    xmlns:mpv="http://ns.osta.org/mpv/1.0/
    xmlns:mpvtv="http://ns.osta.org/mpv/tv/1.0/
    xmlns:dc="http://ns.osta.org/nmf/1.0/dc/

    <nmf:Metadata>
        <file:ManifestProperties>
            <file2:AboutManifestMPVDocumentID>DOCID001</file2:AboutManifestMPVDocumentID>
            <file2:WrittenBy>http://www.mycompany.com/myapp/1.05/</file2:WrittenBy>
            <ProfileBag>
                <Profile>http://ns.osta.org/mpv/basic/1.0/</Profile>
                <Profile>http://ns.osta.org/mpv/dc/1.0/</Profile>
                <Profile>http://ns.osta.org/mpv/tv/1.0/</Profile>
            </ProfileBag>
            </file:ManifestProperties>
        </nmf:Metadata>

    <mpv:Document mpv:id="DOCID001">
        <mpv:InstanceID>urn.osta-org:mpv.uuid.2342945BAEFF98AE8848848723</mpv:InstanceID>
        <nmf:Metadata>
            <dc:Properties>
                <dc:creator>My Company, Inc.</dc:creator>
                <dc:rights>(c) My Company. All rights reserved.</dc:rights>
                <dc:language>en-US</dc:language>
            </dc:Properties>
        </nmf:Metadata>
    </mpv:Document>
...  
</file:Manifest>
```
Chapter 3: MPV Broadcast Television
Schema Introduction

3.1 Introduction

The MPV Broadcast Television Profile makes use of the existing [MPVCore] Specification for creating collections of video content and organizes them into AssetLists. For metadata, it uses the MPV Dublin Core NMF specification wherever possible.

The TV metadata that may be represented using the MPV Broadcast Television Profile includes the following:

**TVShow/Program:** Filename, Show Title, Episode Title, Description, Ratings, Cast Members, Station Information, Start Time, Duration, Genre, and others.

**Playlist:** Title, Description, Playlist Assets, and others.

Unlike other MPV Profiles, the Broadcast Television Profile does not depend on the MPV Presentation Profile. The Broadcast Television Profile concerns itself with describing the metadata associated with a show, rather than defining playback experiences. Devices that support the MPV Broadcast Television Profile are free to pick and choose the relevant metadata that generates an acceptable user experience for that device.

This is not, however, intended to preclude the use of a MPV Broadcast Television Profile defined AssetList by devices that support the MPV Presentation Profile.

3.2 Examples

MPV Broadcast Television AssetLists can range from simple to sophisticated, depending on the amount of available information and the ability of the creating application or device. Playback applications and devices determine the extent to which they use available information and the presentation of that information.

3.2.1 Namespaces and Profiles

All MPV files begin with a preamble that declares the XML namespaces and profiles used by the file. The `xmlns:xyz="namespace identifier"` sequence assigns a shortcut prefix (xyz) to represent the unique namespace identifier within the file. Use of namespaces allows the same element name to be used from different schema without ambiguity. For example, `<foo:Element>` and `<bar:Element>` are different if the namespace identifiers for each prefix are different and are the same if the namespace identifiers are the same.
A typical preamble:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<file:Manifest
xmlns:file="http://ns.osta.org/manifest/1.0/
xmlns:file2="http://ns.osta.org/manifest/2.0/
xmlns:mpv="http://ns.osta.org/mpv/1.0/
xmlns:mpvtv="http://ns.osta.org/mpv/tv/1.0/
xmlns:dc="http://ns.osta.org/nmf/1.0/dc/
xmlns:nmf="http://ns.osta.org/nmf/1.0/

<nmf:Metadata>
<file:ManifestProperties>
<file2:AboutManifestMPVDocumentID>DOCID001</file2:AboutManifestMPVDocumentID>
<file2:WrittenBy>http://www.mycompany.com/myapp/1.05/</file2:WrittenBy>
<ProfileBag>
<Profile>http://ns.osta.org/mpv/basic/1.0/</Profile>
<Profile>http://ns.osta.org/nmf/1.0/dc/</Profile>
<Profile>http://ns.osta.org/mpv/tv/1.0/</Profile>
</ProfileBag>
</file:ManifestProperties>
</nmf:Metadata>

<mpv:Document mpv:id="DOCID001">
<mpv:InstanceID>urn.osta-org.mpv.uuid.2342945B989848848723</mpv:InstanceID>
<nmf:Metadata>
<dc:Properties>
<dc:creator>My Company, Inc.</dc:creator>
<dc:rights>(c) My Company. All rights reserved.</dc:rights>
<dc:language>en-US</dc:language>
</dc:Properties>
</nmf:Metadata>
</mpv:Document>
```

As a best practice, the Basic and Dublin Core profiles SHOULD be listed in the manifest. Only if a writer is adding terms from the Presentation profile should the Presentation profile be listed in the manifest. Adding additional profile entries allow players that only understand those profiles to provide simple playback of a MPV file implementing the Broadcast Television Profile.

### 3.2.2 Simple Example

This example MPV Broadcast Television Profile file has three programs with only file location information for each program. There is no `<mpvtv:Playlist>` playlist, so the presentation sequence is the order of appearance in the `<mpvtv:AssetList>`.

Even with this very simple usage, the MPV AssetList adds value to the user’s playback experience because the order of video playback is specified explicitly and is different from the sort order of the video content by filename or file date.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<file:Manifest
xmlns:file="http://ns.osta.org/manifest/1.0/
xmlns:file2="http://ns.osta.org/manifest/2.0/
xmlns:mpv="http://ns.osta.org/mpv/1.0/
```
3.2.3 Richer Example

In contrast to the previous example, the following example has much more information. In this case, a single video is specified along with a lot of information about it including titles, descriptions, record date, source channel, recorded duration, etc.

Note there is also a Playlist (the mpvtv:Playlist element) provided that specifies playlist-level information, such as the current resume point of the underlying asset, when it can be deleted, etc.
Careful reading of the mpv:AssetList in this example illustrates a more complete description of video content as well as embedded audio, associated external audio, alternate still image thumbnails and preview video assets. Not all these assets are considered primary: the user doesn’t want to interact with all assets equally. Primary assets are the ones that match the user’s idea of what the primary content is, such as a collection of videos. The mpvtv:PlaylistAsset element is used to identify the primary assets and other presentation information.

While this example does not illustrate this, the MPV Broadcast Television Profile can be applied to a “hybrid” storage medium, such as a hard drive that contains video, MP3 music, or still photos. When played in a compliant player, the user may enjoy listening to the MP3 music performances. In this case, no MPV Broadcast Television information is used, just audio content and navigation. Conversely, a Broadcast Television Profile device can ignore the MP3 music and concentrate on relevant video content.

Filenames of assets are specified using the mpv:LastURL element. Pathnames can be relative or absolute; relative names begin relative to the location of the MPV file. Pathnames are to be specified using URL-compliant syntax. This includes translation of special characters like the space (“ ”) into equivalent representations like “%20” and use of prefixes like file:// to introduce absolute pathnames to local files. Multiple pathnames may be specified for any given asset; they are interpreted as alternate paths to the same set of bits. A processing application tries them sequentially to try and locate the asset.

The term “LastURL” is used to emphasize that its value is a URL to the last-known location of the file; because media files may be moved or renamed independently of the MPV file, it is possible that the media file has moved and must be searched for. The mpv:InstanceID and mpv:ContentID elements, if provided, are identifiers that can be used to find files that cannot be located by any of the LastURL entries.
<mpv:AssetList>
  <mpv:Video mpv:id="VID0001">
    <mpv:lastURL mpv:filesystem="UDF">/Seinfeld/Seinfeld84.mpg</mpv:lastURL>
  </mpv:Video>
</mpv:AssetList>

<nmf:Metadata>
  <dc:Properties>
    <dc:title>Seinfeld</dc:title>
    <dc:description>Elaine fails a drug test---twice---and loses her job; Jerry talks about his Uncle Leo on "The Tonight Show."</dc:description>
    <dc:creator>TV Guide</dc:creator>
    <dc:language>en-US</dc:language>
    <dc:format>video/mpeg</dc:format>
  </dc:Properties>

  <dct:Properties>
    <dct:Abstract>Four neurotic New Yorkers in a show about nothing.</dct:Abstract>
  </dct:Properties>
</nmf:Metadata>

<mpvtv:ShowProperties>
  <mpvtv:episodeTitle>The Showerhead</mpvtv:episodeTitle>
  <mpvtv:startTime>2004-03-24T19:01</mpvtv:startTime>
  <mpvtv:duration>28.0</mpvtv:duration>
  <mpvtv:channel>25-2</mpvtv:channel>
  <mpvtv:expectedStartTime>2004-03-24T19:00</mpvtv:expectedStartTime>
  <mpvtv:expectedDuration>30.0</mpvtv:expectedDuration>
  <mpvtv:productionYear>1998</mpvtv:productionYear>
  <mpvtv:firstAirDate>1998-02-15</mpvtv:firstAirDate>
</mpvtv:ShowProperties>

<!-- Here is a genreSeq that defines a primary genre of Comedy, secondary of Sitcom -->
  <mpvtv:genre>Comedy</mpvtv:genre>
  <mpvtv:genre>Sitcom</mpvtv:genre>
</mpvtv:genreSeq>

<!-- As for ratings, let’s have one US, two rat ings reasons -->
  <mpvtv:ratingValue>TV-PG</mpvtv:ratingValue>
  <mpvtv:ratingReason>Language</mpvtv:ratingReason>
  <mpvtv:ratingReason>Suggestive Dialog</mpvtv:ratingReason>
</mpvtv:rating>

<!-- Cast members are next -->
<mpvtv:castMemberBag>
  <mpvtv:castMember mpvtv:castType="urn:osta-org:mpv:tv:cast:actor">
    <mpvtv:castMemberName>
      <mpvtv:castMemberSurname>Seinfeld</mpvtv:castMemberSurname>
      <mpvtv:castMemberGivenName>Jerry</mpvtv:castMemberGivenName>
    </mpvtv:castMemberName>
  </mpvtv:castMember>
</mpvtv:castMemberBag>
<mpvtv:castMemberSurname>Louis-Dreyfus</mpvtv:castMemberSurname>
<mpvtv:castMemberGivenName>Julia</mpvtv:castMemberGivenName>
</mpvtv:castMember>

<mpvtv:castMember mpvtv:castType="urn:osta-org:mpv:tv:cast:actor">
<mpvtv:castMemberName>
<mpvtv:castMemberSurname>Richards</mpvtv:castMemberSurname>
<mpvtv:castMemberGivenName>Michael</mpvtv:castMemberGivenName>
</mpvtv:castMemberName>
<mpvtv:castMemberRole>
<mpvtv:castMemberGivenName>Kramer</mpvtv:castMemberGivenName>
</mpvtv:castMemberRole>
</mpvtv:castMember>

<mpvtv:castMember mpvtv:castType="urn:osta-org:mpv:tv:cast:actor">
<mpvtv:castMemberName>
<mpvtv:castMemberSurname>Alexander</mpvtv:castMemberSurname>
<mpvtv:castMemberGivenName>Jason</mpvtv:castMemberGivenName>
</mpvtv:castMemberName>
<mpvtv:castMemberRole>
<mpvtv:castMemberGivenName>George</mpvtv:castMemberGivenName>
</mpvtv:castMemberRole>
</mpvtv:castMember>

</mpvtv:castMemberBag>

<!-- A single showID -->
<mpvtv:showID mpvtv:idAuthority="urn:osta-org:mpv:tv:id:tvguide">
8499099090229</mpvtv:showID>

<!-- embedded audio -->
<mpvtv:Audio>
<nmf:Metadata>
<dc:properties>
<dc:description>Main Audio</dc:description>
<dc:language>en-US</dc:language>
<dc:format>audio/mpeg</dc:format>
</dc:properties>
<mpvtv:ShowProperties>
<mpvtv:audioType>normal</mpvtv:audioType>
<mpvtv:audioEncoding>stereo</mpvtv:audioEncoding>
</mpvtv:ShowProperties>
</nmf:Metadata>
</mpvtv:Audio>

<!-- Reference to external audio stream(s) -->
<mpv:AudioRef mpv:refId="AUD00000001"/>

</mpvtv:ShowProperties>

</nmf:Metadata>

<!-- Related noCommercial video version of this asset -->
  <mpv:VideoRef mpv:idref = "VID00010001"/>
</mpv:Related>
</mpv:Video>

<!-- Audio associated with video, referenced by an AudioRef -->
<mpv:Audio mpv:id="AUD00000001">
  <mpv:lastURL mpv:filesystem="UDF">ShowAudio.mpg</mpv:lastURL>
  <mpv:ContentID>urn:osta-org:dsig:md5:all:8735353445934AC</mpv:ContentID>
  <nmf:Metadata>
    <dc:properties>
      <dc:description>Spanish SAP Audio</dc:description>
      <dc:language>es-US</dc:language>
      <dc:format>audio/mpeg</dc:format>
    </dc:properties>
    <mpvtv:ShowProperties>
      <mpvtv:audioType>normal</mpvtv:audioType>
      <mpvtv:audioEncoding>stereo</mpvtv:audioEncoding>
      <mpvtv:audioSize>146</mpvtv:audioSize>
    </mpvtv:ShowProperties>
  </nmf:Metadata>
</mpv:Audio>

<!-- Related video, defines a commercial-free index point set of base video -->
<!-- Note that there is no new instance of the underlying show in this case -->
<mpv:Video mpv:id="VID00010001">
  <nmf:Metadata>
    <dc:Properties>
      <dc:title>No Commercial Version</dc:title>
    </dc:Properties>
    <mpvtv:ShowProperties>
      <!-- IndexPointSeq providing an ordered sequence of index points -->
      <mpvtv:IndexPointSeq>
        <mpvtv:IndexPoint>00:00:00:00</mpvtv:IndexPoint>
        <mpvtv:IndexPoint>00:10:00:00</mpvtv:IndexPoint>
        <mpvtv:IndexPoint>00:20:00:00</mpvtv:IndexPoint>
      </mpvtv:IndexPointSeq>
      <!-- CutPointSeq defines an ordered list of start-stop pairs -->
      <!-- This particular one cuts out minutes 13-16 of the original -->
      <mpvtv:CutPointSeq>
        <mpvtv:IndexPoint>00:00:00:00</mpvtv:IndexPoint>
        <mpvtv:IndexPoint>00:12:12:30</mpvtv:IndexPoint>
        <mpvtv:IndexPoint>00:17:00:00</mpvtv:IndexPoint>
        <mpvtv:IndexPoint>00:30:00:00</mpvtv:IndexPoint>
      </mpvtv:CutPointSeq>
    </mpvtv:ShowProperties>
  </nmf:Metadata>
</mpv:Video>

<!-- This video asset IS A commercial free version of the underlying video -->
  <mpv:VideoRef mpv:idRef="VID0001"/>
</mpv:Related>
3.3 MPV Broadcast Television Profile Metadata Introduction

The [MPVCore] specification supports the concept of Assets organized into an AssetList. To this framework, the MPV Broadcast Television Profile adds a new nmf:Metadata type (mpvtv:ShowProperties) to the base mpv:Video asset. ShowProperties add metadata that specifically describes television content; the existing framework continues to be used in a manner fully consistent with existing specifications.

<table>
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<th>Metadata</th>
<th>MPV Broadcast Television Profile</th>
<th>Discussion</th>
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</thead>
<tbody>
<tr>
<td>Mpv:Video Asset</td>
<td>Subelements of the mpv:Video asset</td>
<td></td>
</tr>
<tr>
<td>Pathname</td>
<td>mpv:LastURL</td>
<td>one or more pathnames that should resolve to the file. Each pathname is specific to a filesystem, so there can be different names</td>
</tr>
<tr>
<td>Field</td>
<td>URI</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Title</td>
<td>nmf:Metadata</td>
<td>dc:Properties</td>
</tr>
<tr>
<td>Short Title</td>
<td>nmf:Metadata</td>
<td>dct:Properties</td>
</tr>
<tr>
<td>Episode Title</td>
<td>nmf:Metadata</td>
<td>mpv:tv:ShowProperties</td>
</tr>
<tr>
<td>Description</td>
<td>nmf:Metadata</td>
<td>dc:Properties</td>
</tr>
<tr>
<td>Show Description</td>
<td>nmf:Metadata</td>
<td>dct:Properties</td>
</tr>
<tr>
<td>Start Time</td>
<td>nmf:Metadata</td>
<td>mpv:tv:ShowProperties</td>
</tr>
<tr>
<td>Duration</td>
<td>nmf:Metadata</td>
<td>mpv:tv:ShowProperties</td>
</tr>
<tr>
<td>Expected Start Time</td>
<td>nmf:Metadata</td>
<td>mpv:tv:ShowProperties</td>
</tr>
<tr>
<td>Expected Duration</td>
<td>nmf:Metadata</td>
<td>mpv:tv:ShowProperties</td>
</tr>
<tr>
<td>Genre</td>
<td>nmf:Metadata</td>
<td>mpv:tv:ShowProperties</td>
</tr>
<tr>
<td>Creator</td>
<td>nmf:Metadata</td>
<td>dc:Properties</td>
</tr>
<tr>
<td>Language</td>
<td>nmf:Metadata</td>
<td>dc:Properties</td>
</tr>
<tr>
<td>Rating(Bag)</td>
<td>nmf:Metadata</td>
<td>mpv:tv:ShowProperties</td>
</tr>
<tr>
<td>Property</td>
<td>Property Name</td>
<td>Description</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Production Year</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>First Air Date</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Alternate Description Container</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Alternate Description Language</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Alternate Description</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Cast Member</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Cast Member Type</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Cast Member Name</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Cast Member Role</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Cast Member Surname</td>
<td>(mpvtv:castMemberName</td>
<td>mpvtv:castMemberRole)</td>
</tr>
<tr>
<td>Cast Member Given Name</td>
<td>(mpvtv:castMemberName</td>
<td>mpvtv:castMemberRole)</td>
</tr>
<tr>
<td>Station Info</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Station Display Name</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Station Full Name</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Station Logo</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Channel</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Affiliation</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Show Flags</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Closed Caption</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Letterbox</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Field</td>
<td>XML Path</td>
<td>Description</td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Live</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>New</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Repeat</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>CopyInhibit</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Encrypted</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Video Format</td>
<td>nmf:Metadata</td>
<td>dc:Properties</td>
</tr>
<tr>
<td>Video Encoding</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Method</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Bitrate</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Size</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Source</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Standard</td>
<td>nmf:Metadata</td>
<td>mpvtv:ShowProperties</td>
</tr>
<tr>
<td>Audio</td>
<td>mpv:Audio</td>
<td>nmf:Metadata</td>
</tr>
<tr>
<td>Audio Type</td>
<td>mpv:Audio</td>
<td>nmf:Metadata</td>
</tr>
<tr>
<td>Audio Description</td>
<td>mpv:Audio</td>
<td>nmf:Metadata</td>
</tr>
<tr>
<td>Audio Description Language</td>
<td>mpv:Audio</td>
<td>nmf:Metadata</td>
</tr>
<tr>
<td>Audio Format</td>
<td>mpv:Audio</td>
<td>nmf:Metadata</td>
</tr>
<tr>
<td>Audio Encoding</td>
<td>mpv:Audio</td>
<td>nmf:Metadata</td>
</tr>
<tr>
<td>Audio Filesize</td>
<td>mpv:Audio</td>
<td>nmf:Metadata</td>
</tr>
<tr>
<td>Audio Language</td>
<td>mpv:Audio</td>
<td>nmf:Metadata</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Language</td>
<td>shows, RFC1766, optional territory</td>
<td></td>
</tr>
<tr>
<td>ShowID(Bag)</td>
<td>Grouping of variety of unique categorization IDs, idAuthority type holds URN of registering authority (tvguide, v-isan, etc)</td>
<td></td>
</tr>
<tr>
<td>Index Point Sequence</td>
<td>Ordered container for Index Points, defines a list of index points.</td>
<td></td>
</tr>
<tr>
<td>Index Point</td>
<td>SMPTE-style index point.</td>
<td></td>
</tr>
<tr>
<td>Cut Point Sequence</td>
<td>Ordered container for Index Points, defines a start – stop list of index points.</td>
<td></td>
</tr>
<tr>
<td>Index Point</td>
<td>SMPTE-style index point.</td>
<td></td>
</tr>
<tr>
<td>Preview</td>
<td>Thumbnails, playback video clips, stills, etc.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tunnel for well-formed XML, per [MPVCore]</td>
<td></td>
</tr>
<tr>
<td><strong>Playlist of TVShow Assets</strong></td>
<td><strong>Container for playlist assets, references to AssetList of TVShow</strong></td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Playlist title (e.g., “Dad’s Videos”).</td>
<td></td>
</tr>
<tr>
<td>Description</td>
<td>Playlist description (further descriptive text for title)</td>
<td></td>
</tr>
<tr>
<td>Language</td>
<td>Title/Description Language, RFC1766, optional territory</td>
<td></td>
</tr>
<tr>
<td>PlaylistRef</td>
<td>Reference to another playlist</td>
<td></td>
</tr>
<tr>
<td>PlaylistAsset</td>
<td>Container for a playlist entry</td>
<td></td>
</tr>
<tr>
<td>KeepUntil</td>
<td>Date on which this asset may be deleted,</td>
<td></td>
</tr>
</tbody>
</table>
| LastAccess       | mpv:Playlist|mpv:PlaylistAsset
|                 | [nmf:Metadata]mpv:ShowProperties|mpv:LastAccess |
|                 |             | NULL date if keep forever |

Date on which this asset was last accessed, NULL date if never accessed.

- mpv:Metadata
  - Tunnel for well-formed XML, per [MPVCore]
Chapter 4: MPV Broadcast Television

Video Asset Metadata

Wherever possible, the Broadcast Television Profile utilizes metadata defined by [MPVCore] and [DC]. Where the Broadcast Television Profile can enhance the definition of a TVShow asset, it does so by adding new metadata defined by an mpvtv: tag. Thus, a TVShow asset is defined as an mpv: Video asset with additional properties. What follows is a description of those properties and their utilization within the scope of this profile.

4.1 Locating a TVShow Asset: mpv:LastURL

The base [MPVCore] specification defines mpv:LastURL as the last known file system location of a named asset. A particular asset MUST define at least one LastURL tag, but MAY define more than one if the asset in question has a different file name in different file systems.

**EXAMPLE:**

```xml
<mpv:Video mpv:id="ID00000001">
  <mpv:LastURL>file:///Local/my%20Video%20Assets/ID00000001.mpg</mpv:LastURL>
  <mpv:LastURL mpv:filesystem="NTFS">
    file:///c:/Documents%20and%20Settings/user/Video/my%20Video%20Assets/ID00000001.mpg
  </mpv:LastURL>
  ...
</mpv:Video>
```

4.2 MPV / Dublin Core TVShow Metadata

One of the great benefits of MPV is its extensible structure. As new profiles are added, applications that process the older metadata are still useful, even if they weren’t specifically designed to work with the new profile metadata.

In keeping with this, the Broadcast Television Profile makes full use of core metadata as applicable.
These include:

<table>
<thead>
<tr>
<th>MPVCore Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Title</td>
<td>Full show title</td>
</tr>
<tr>
<td>Description</td>
<td>Episode specific description</td>
</tr>
<tr>
<td>Creator</td>
<td>Creator/Owner of metadata</td>
</tr>
<tr>
<td>Language</td>
<td>Language used by MPVCore title / description, in [RFC1766] format</td>
</tr>
<tr>
<td>Format</td>
<td>Applicable MIME format, typically video/mpeg</td>
</tr>
<tr>
<td>writtenBy</td>
<td>Manifest tag containing last writer of manifest</td>
</tr>
<tr>
<td>documentIDRef</td>
<td>Manifest reference to document metadata</td>
</tr>
</tbody>
</table>

**EXAMPLE:**

```xml
<?xml version="1.0" encoding="UTF-8"?>
<file:Manifest
 xmlns:file="http://ns.osta.org/manifest/1.0/"
 xmlns:file2="http://ns.osta.org/manifest/2.0/"
 xmlns:mpv="http://ns.osta.org/mpv/1.0/"
 xmlns:mpvtv="http://ns.osta.org/mpv/tv/1.0/"
 xmlns:dc="http://ns.osta.org/nmf/1.0/dc/"
 xmlns:nmf="http://ns.osta.org/nmf/1.0/"

 <nmf:Metadata>
  <file:ManifestProperties>
   <file2:AboutManifestMPVDocumentID>DOCID001</file2:AboutManifestMPVDocumentID>
   <file2:WrittenBy>http://www.mycompany.com/myapp/1.05/</file2:WrittenBy>
   <ProfileBag>
     <Profile>http://ns.osta.org/mpv/basic/1.0/</Profile>
     <Profile>http://ns.osta.org/nmf/1.0/dc/</Profile>
     <Profile>http://ns.osta.org/mpv/tv/1.0/</Profile>
   </ProfileBag>
  </file:ManifestProperties>
 </nmf:Metadata>

 ...

 <mpv:AssetList>
  <mpv:Video mpv:id="ID00000001">
   ... 
   <nmf:Metadata>
    <dc:Properties>
     <dc:Title>Seinfeld</dc:Title>
     <dc:description>Elaine fails a drug test---twice---and loses her job; Jerry talks about his Uncle Leo on "The Tonight Show."</dc:description>
     <dc:creator>TV Guide</dc:creator>
     <dc:language>en-US</dc:language>
     <dc:format>video/mpeg</dc:format>
    </dc:Properties>
   ... 
  </mpv:Video>
```
4.3 MPV / Dublin Core Qualifier TVShow Metadata

In addition to the Dublin Core metadata defined in [MPVCore], the Dublin Core Metadata Initiative group has defined qualifiers to extend or refine the base set (see [DC-QUAL]). The Broadcast Television Profile makes use of some of these qualifiers to give further information to a processing application.

These include:

<table>
<thead>
<tr>
<th>Dublin Core Qualifier</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative Title</td>
<td>Alternative Title, used for a short title if one exists</td>
</tr>
<tr>
<td>Abstract</td>
<td>Generic show description</td>
</tr>
</tbody>
</table>

**Example:**

```xml
<?xml version="1.0" encoding="UTF-8"?>
<file:Manifest
 xmlns:file="http://ns.osta.org/manifest/1.0/
 xmlns:file2="http://ns.osta.org/manifest/2.0/
 xmlns:mpv="http://ns.osta.org/mpv/1.0/
 xmlns:mpvtv="http://ns.osta.org/mpv/tv/1.0/
 xmlns:dc="http://ns.osta.org/nmf/1.0/dc/
 xmlns:nmf="http://ns.osta.org/nmf/1.0/
 <nmf:Metadata>
  <file:ManifestProperties>
   <file2:AboutManifestMPVDocumentID>DOCID001</file2:AboutManifestMPVDocumentID>
   <file2:WrittenBy>http://www.mycompany.com/myapp/1.05</file2:WrittenBy>
   <ProfileBag>
     <Profile>http://ns.osta.org/mpv/basic/1.0/</Profile>
     <Profile>http://ns.osta.org/nmf/1.0/dc/</Profile>
     <Profile>http://ns.osta.org/mpv/tv/1.0/</Profile>
   </ProfileBag>
  </file:ManifestProperties>
</nmf:Metadata>

...<mpv:AssetList>
  <mpv:Video mpv:id="ID00000001">
    ...
  </mpv:Video>
</mpv:AssetList>
```

```
<nmf:Metadata>
  <dc:Properties>
    <dc:Title>The Tonight Show With Jay Leno</dc:Title>
  </dc:Properties>
```

4.4 Broadcast Specification TVShow Metadata

The vast majority of metadata that the Broadcast Television Profile provides cannot be represented by the MPV Core or Dublin Core Qualifiers. These items are defined under a new <mpvtv:ShowProperties> tag.

4.4.1 Basic Broadcast Profile TVShow Data

The very simplest type of show and scheduling information are the ones that are described with a single element.

These include:

<table>
<thead>
<tr>
<th>Simple Show Properties</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>episodeTitle</td>
<td>Episode Title, for episodic shows</td>
</tr>
<tr>
<td>productionYear</td>
<td>Four digit production year</td>
</tr>
<tr>
<td>firstAirDate</td>
<td>Date show first aired, in [ISO8601] Date format</td>
</tr>
<tr>
<td>channel</td>
<td>One or two part (major,minor) receiver channel, with non-numeric separator</td>
</tr>
<tr>
<td>startTime</td>
<td>Actual start time, in [ISO8601] Date / Time format</td>
</tr>
<tr>
<td>duration</td>
<td>Actual duration, in minutes, fractional seconds</td>
</tr>
<tr>
<td>expectedStartTime</td>
<td>Scheduled start time, in [ISO8601] Date / Time format</td>
</tr>
<tr>
<td>expectedDuration</td>
<td>Scheduled duration, in minutes, fractional seconds</td>
</tr>
</tbody>
</table>

**EXAMPLE:**

```xml
<?xml version="1.0" encoding="UTF-8"?>
```
<file:Manifest
xmlns:file="http://ns.osta.org/manifest/1.0/"
xmlns:file2="http://ns.osta.org/manifest/2.0/"
xmlns:mpv="http://ns.osta.org/mpv/1.0/"
xmlns:mpvtv="http://ns.osta.org/mpv/tv/1.0/"
xmlns:dc="http://ns.ota.org/nmf/1.0/dc/"
xmlns:nmf="http://ns.osta.org/nmf/1.0/"

<nmf:Metadata>
<file:ManifestProperties>
<file2:ManifestMPVDocumentID>DOCID001</file2:ManifestMPVDocumentID>
<file2:WrittenBy>http://www.mycompany.com/myapp/1.05/</file2:WrittenBy>
<ProfileBag>
<Profile>http://ns.osta.org/mpv/basic/1.0/</Profile>
<Profile>http://ns.ota.org/nmf/1.0/dc/</Profile>
<Profile>http://ns.osta.org/mpv/tv/1.0/</Profile>
</ProfileBag>
</file:ManifestProperties>
</nf:Mfetadata>

<mpv:AssetList>
<mpv:Video mpv:id="ID00000001">

<nmf:Metadata>
<dc:Properties>
dc:Title>Seinfeld</dc:title>
<dc:description>Elaine fails a drug test---twice---and loses her job; Jerry talks about
his Uncle Leo on "The Tonight Show."</dc:description>
<dc:creator>TV Guide</dc:creator>
<dc:language>en-US</dc:language>
<dc:format>video/mpeg</dc:format>
</dc:Properties>
<dtc:Properties>
dct:Abstract>Four neurotic New Yorkers in a show about nothing.</dct:Abstract>
</dtc:Properties>
<mpvtv:ShowProperties>

<mpvtv:episodeTitle>The Showerhead</mpvtv:episodeTitle>
<mpvtv:startTime>2004-03-24T19:01</mpvtv:startTime>
<mpvtv:duration>28.0</mpvtv:duration>
<mpvtv:channel>5-2</mpvtv:channel>
<mpvtv:startTime>2004-03-24T19:00</mpvtv:startTime>
<mpvtv:duration>30.0</mpvtv:duration>
<mpvtv:productionYear>1998</mpvtv:productionYear>
<mpvtv:firstAirDate>1998-02-15</mpvtv:firstAirDate>

</mpvtv:ShowProperties>

</nf:Mfetadata>

<mpv:Video>

<mpv:Still mpv:id="TNT-LOGO-ID">

...
Note the differences in the two separate start time / duration fields: though the broadcast schedule represented by the expected values shows the show starting at 7:00pm local time for a duration of 30 minutes, the actual underlying asset was recorded starting one minute late (7:01pm), and ending one minute early (28 minute duration).

### 4.4.2 Compound Broadcast Profile TVShow Data

The next level of information is only slightly more complicated: the data that is described with a compound element.

#### 4.4.2.1 StationInfo

The Station Info describes the channel the show appears on. The basic encapsulating tag is `<mpvtv:StationInfo>`, which contains the following items:

<table>
<thead>
<tr>
<th>mpvtv:stationInfo tags</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>stationName</td>
<td>Station display name, up to 8 characters</td>
</tr>
<tr>
<td>stationFullName</td>
<td>If different from station name</td>
</tr>
<tr>
<td>stationLogo</td>
<td>Encapsulates an mpv:StillRef</td>
</tr>
<tr>
<td>stationAffiliation</td>
<td>Broadcast station affiliation, e.g., &quot;NBC&quot;</td>
</tr>
</tbody>
</table>

**EXAMPLE**

```xml
<mpv:Video>
  ...
  <mpvtv:stationInfo>
    <mpvtv:stationName>TNT</mpvtv:stationName>
    <mpvtv:stationFullName>Turner Network Television</mpvtv:stationFullName>
    <mpvtv:stationLogo>
      <mpv:StillRef mpv:idref="TNT-LOGO-ID"/>
    </mpvtv:stationLogo>
  </mpvtv:stationInfo>
  ...
</mpv:Video>

<mpv:Still mpv:id = "TNT-LOGO-ID">
  ...
</mpv:Still>
```

#### 4.4.2.2 ShowFlags

The `<mpvtv:showFlags>` tag encapsulates a number of items usually treated as bit flags. They are:
mpvtv:showFlags | Description
---|---
cc | Closed Caption
live | Live Broadcast
new | New Airing
repeat | Repeat Airing
letterbox | Letterbox Format
copyInhibit | Copy Protect
encrypted | Content Encrypted

**EXAMPLE:**

```xml
<mpv:Video>
  ...
  <mpvtv:stationInfo>
    <mpvtv:stationName>TNT</mpvtv:stationName>
    <mpvtv:stationFullName>Turner Network Television</mpvtv:stationFullName>
    <mpvtv:stationLogo>
      <mpv:StillRef mpv:idref="TNT-LOGO-ID"/>
    </mpvtv:stationLogo>
  </mpvtv:stationInfo>
  ...
  <mpvtv:showFlags>
    <mpvtv:cc/>
    <mpvtv:letterbox/>
    <mpvtv:new/>
  </mpvtv:showFlags>
  ...
</mpv:Video>

<mpv:Still mpv:id = "TNT-LOGO-ID">
  ...
</mpv:Still>
```

### 4.4.2.3 VideoEncoding

A Broadcast Television Profile device can sometimes make use of knowledge about the physical nature of the recording. These values are:

mpvtv:videoEncoding tag | Description
---|---
encodedSource | One of: (standardDef, enhancedDef, highDef)
encodedStandard | Video Standard, see below table for values
encodedMethod | One of: (mpeg-vbr, mpeg-cbr)
encodedBitrate | Integer, in kbps
encodedSize | File size in kB

<table>
<thead>
<tr>
<th>encodedStandard types</th>
<th>encodedStandard values</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTSC</td>
<td>One of: (NTSC, NTSC-EIA, NTSC-JEIA)</td>
</tr>
<tr>
<td>PAL</td>
<td>One of: (PAL, PAL-B, PAL-G, PAL-H, PAL-D, PAL-I)</td>
</tr>
</tbody>
</table>
### Example:

```xml
<mpv:Video>
  ...
  <mpvtv:stationInfo>
    <mpvtv:stationName>TNT</mpvtv:stationName>
    <mpvtv:stationFullName>Turner Network Television</mpvtv:stationFullName>
    <mpvtv:stationLogo>
      <mpv:StillRef mpv:idref="TNT-LOGO-ID"/>
    </mpvtv:stationLogo>
  </mpvtv:stationInfo>
  <mpvtv:showFlags>
    <mpvtv:cc/>
    <mpvtv:letterbox/>
    <mpvtv:new/>
  </mpvtv:showFlags>
  <mpvtv:videoEncoding>
    <mpvtv:encodedSource>highDef</mpvtv:encodedSource>
    <mpvtv:encodedStandard>ATSC-8VSB</mpvtv:encodedStandard>
    <mpvtv:encodedMethod>mpeg-vbr</mpvtv:encodedMethod>
    <mpvtv:encodedBitrate>9800</mpvtv:encodedBitrate>
    <mpvtv:encodedSize>10240</mpvtv:encodedSize>
  </mpvtv:videoEncoding>
  ...
</mpv:Video>
```

### 4.4.3 Container-based Broadcast Profile TVShow Data

Next are a set of basic TVShow metadata defined within a container tag. Containers are used by XML and the [MPVCore] specification to encapsulate one or more related elements. The [MPVCore] specification also defines containers with an explicit ordering type (see `<mpv:Seq>`, `<mpv:Par>`). The Broadcast Television Profile extends these concepts in two ways. The first is the addition of a Bag ordering type, denoting an unordered collection. The
The appending of an ordering type to a base type to form a container of that base type. Thus, an unordered collection of `<mpvtv:foo>` types is defined as `<mpvtv:fooBag>`. An ordered sequence of `<mpv:bar>` types is defined by an `<mpvtv:barSeq>`.

The Broadcast Television Profile defines these new container types:

<table>
<thead>
<tr>
<th>Container</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>genreSeq</td>
<td>An ordered list of <code>&lt;mpvtv:genre&gt;</code> types</td>
</tr>
<tr>
<td>ratingBag</td>
<td>An unordered list of show ratings</td>
</tr>
<tr>
<td>descriptionBag</td>
<td>An unordered list of descriptions</td>
</tr>
<tr>
<td>castMemberBag/Seq</td>
<td>An unordered/ordered list of cast members</td>
</tr>
<tr>
<td>showIDBag</td>
<td>An unordered list of unique show identifiers</td>
</tr>
</tbody>
</table>

**EXAMPLE:**

```xml
<?xml version="1.0" encoding="UTF-8"?>
<file:Manifest
 xmlns:file="http://ns.osta.org/manifest/1.0/
 xmlns:file2="http://ns.osta.org/manifest/2.0/
 xmlns:mpv="http://ns.osta.org/mpv/1.0/
 xmlns:mpvtv="http://ns.osta.org/mpv/tv/1.0/
 xmlns:dc="http://ns.osta.org/nmf/1.0/dc/
 xmlns:nmf="http://ns.osta.org/nmf/1.0/"
<nmf:Metadata>
 <file:ManifestProperties>
  <file2:AboutManifestMPVDocumentID>DOCID001</file2:AboutManifestMPVDocumentID>
  <file2:WrittenBy>http://www.mycompany.com/myapp/1.05</file2:WrittenBy>
  <ProfileBag>
   <Profile>http://ns.osta.org/mpv/basic/1.0/</Profile>
   <Profile>http://ns.osta.org/nmf/1.0/dc/</Profile>
   <Profile>http://ns.osta.org/mpv/tv/1.0/</Profile>
  </ProfileBag>
 </file:ManifestProperties>
</nmf:Metadata>
...
<mpv:AssetList>
 <mpv:Video mpv:id="ID000000001">
  ...
 <nmf:Metadata>
  <dc:Properties>
   <dc:Title>Seinfeld</dc:Title>
   <dc:description>Elaine fails a drug test---twice---and loses her job; Jerry talks about his Uncle Leo on "The Tonight Show."</dc:description>
   <dc:creator>TV Guide</dc:creator>
   <dc:language>en-US</dc:language>
   <dc:format>video/mpeg</dc:format>
  </dc:Properties>
  ...
 <mpvtv:ShowProperties>
   ...
```
<mpvtv:genre>Comedy</mpvtv:genre>
<mpvtv:genre>Sitcom</mpvtv:genre>
</mpvtv:genreSeq>

In this example, note that the show has two genres contained within an <mpvtv:genreSeq> element. The Comedy genre should be considered the primary one, followed by the Sitcom genre.

### 4.4.3.1 Genres

A genre is a classification or categorization of a show based on its content, be it comedy, news, sports or some other classification.

A genre may appear alone, or within a genreSeq element as outlined above. GenreSeqs SHOULD be specified with a vocabulary attribute (in URN form) so that a processing application knows the source of categorization.

Genre vocabularies defined by this specification follow:

<table>
<thead>
<tr>
<th>Genre Vocabulary</th>
<th>mpvtv:ratingAuthority</th>
</tr>
</thead>
</table>

### 4.4.3.2 Ratings

Ratings are assigned by a variety of authorities and are meant to help a viewer select suitable content. Because each individual authority may assign a different rating to the same show, ratings elements may appear alone or within a Bag container.

Ratings authorities are specified as attribute types and defined using a URN syntax. The ratings authorities defined by this specification follow:

<table>
<thead>
<tr>
<th>Rating Authority</th>
<th>mpvtv:ratingAuthority</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPAA (Motion Picture Association of America)</td>
<td>urn:osta-org:mpv:tv:rating:mpaa</td>
</tr>
<tr>
<td>Canadian TV English (V-Chip)</td>
<td>urn:osta-org:mpv:tv:rating:en-CA</td>
</tr>
<tr>
<td>Canadian TV French (V-Chip)</td>
<td>urn:osta-org:mpv:tv:rating:fr-CA</td>
</tr>
<tr>
<td>Star Rating</td>
<td>urn:osta-org:mpv:tv:rating:5star</td>
</tr>
</tbody>
</table>

Defined within an <mpv:rating> tag are two element types: a rating value followed by one or more ratings reasons.

<table>
<thead>
<tr>
<th>Rating Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ratingValue</td>
<td>Actual rating</td>
</tr>
<tr>
<td>ratingReason</td>
<td>Rating modifier</td>
</tr>
</tbody>
</table>
Ratings values for defined elements:

<table>
<thead>
<tr>
<th>Rating Authority</th>
<th>mpvtv:ratingValue</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPAA (Motion Picture Association of America)</td>
<td>One of: (G, PG, PG-13, R, NC-17, NR, X)</td>
</tr>
<tr>
<td>US TV (V-Chip)</td>
<td>One of: (TV-Y, TV-Y7, TV-G, TV-PG, TV-14, TV-MA)</td>
</tr>
<tr>
<td>Canadian TV English (V-Chip)</td>
<td>One of: (E, C, C8+, G, PG, 14+, 18+)</td>
</tr>
<tr>
<td>Canadian TV French (V-Chip)</td>
<td>One of: (E, G, 8 ans+, 13 ans+, 16 ans+, 18 ans+)</td>
</tr>
<tr>
<td>Star Rating</td>
<td>Fractional value, by .5, up to 5 (0, 0.5, 1.0 ... 4.5, 5.0)</td>
</tr>
</tbody>
</table>

And the matching ratingReasons:

<table>
<thead>
<tr>
<th>Rating Authority</th>
<th>mpvtv:ratingReason</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPAA (Motion Picture Association of America)</td>
<td>One of: (Adult Situations, Graphic Language, Language, Brief Nudity, Strong Sexual Content, Graphic Violence, Mild Violence, Violence, Rape)</td>
</tr>
<tr>
<td>US TV (V-Chip)</td>
<td>One of: (Fantasy Violence, Violence, Sexual Situations, Language, Suggestive Dialogue)</td>
</tr>
<tr>
<td>Canadian TV English (V-Chip)</td>
<td>None defined.</td>
</tr>
<tr>
<td>Canadian TV French (V-Chip)</td>
<td>None defined.</td>
</tr>
<tr>
<td>Star Rating</td>
<td>None defined.</td>
</tr>
</tbody>
</table>

4.4.3.3 Descriptions

The Broadcast Television Profile provides for a base show description defined by the [MPVCore] dc:description tag. While this is suitable for most applications, more advanced applications may wish to process more than one description type for a variety of reasons:

- A shorter or longer description than the base definition is available
- An alternate language encoding is available
- A description from another creator source is available

For each of these cases, an alternate description is provided via the <mpvtv:description> tag. This tag may appear alone or within an <mpvtv:descriptionBag> container.

A creator attribute defines the content origin and is specified by URN syntax.

<table>
<thead>
<tr>
<th>Description Content Creator</th>
<th>mpvtv:creator type attribute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cinebook</td>
<td>urn:osta-org:mpv:tv:desc:cinebook</td>
</tr>
<tr>
<td>TVGuide Editorial Description</td>
<td>urn:osta-org:mpv:tv:desc:tvguide_editorial</td>
</tr>
<tr>
<td>TVGuide Short Description</td>
<td>urn:osta-org:mpv:tv:desc:tvguide_short</td>
</tr>
</tbody>
</table>

An alternate description has two [MPVCore] properties:

<table>
<thead>
<tr>
<th>MPVCore Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Alternate description</td>
</tr>
<tr>
<td>Language</td>
<td>Language used by MPVCore description, in [RFC1766] format</td>
</tr>
</tbody>
</table>
4.4.3.4 Cast Members

The usual television show has many cast members, the Broadcast Television Profile has the capability to describe them all.

Cast members are defined using the `<mpvtv:castMember>` tag. As with descriptions above, a cast member may appear singly or within an `<mpvtv:castMemberBag>`.

With the `<mpvtv:castMember>` tag is an attribute that defines the cast member type:

<table>
<thead>
<tr>
<th>Cast Member Type</th>
<th><code>&lt;mpvtv:castType&gt;</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>Actor</td>
<td>Actor</td>
</tr>
<tr>
<td>Director</td>
<td>Director</td>
</tr>
<tr>
<td>Writer</td>
<td>Writer</td>
</tr>
<tr>
<td>Guest Star</td>
<td>guestStar</td>
</tr>
</tbody>
</table>

Within an `<mpvtv:castMember>` tag are two subordinate container tags:

<table>
<thead>
<tr>
<th>Cast Member Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>castMemberName</td>
<td>Cast Member Name</td>
</tr>
<tr>
<td>castMemberRole</td>
<td>For castType Actor only</td>
</tr>
</tbody>
</table>

Within a cast member element are two tags that define name. Surname includes last name and optional suffix (e.g., Jr., Sr., III). A cast member with only one name (Madonna) will have surname only. Given Name includes first name and optional middle name or middle initial.

<table>
<thead>
<tr>
<th>Cast Member Name Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>castMemberSurname</td>
<td>Surname (last name)</td>
</tr>
<tr>
<td>castMemberGivenName</td>
<td>Given name (first name)</td>
</tr>
</tbody>
</table>

4.4.3.5 ShowIDs

Independent of the various computed ID fields provided by [MPVCore], a number of different organizations have expressed interest in providing a unique showID for television content. Rather than try and overload an existing ID, this profile defines a showID tag. The tag has a defined attribute (mpvtv:idAuthority) that a processing application can use to identify the registrar of the value.

ShowIDs may appear in a showIDBag if there is more than one defined.

Defined attribute values include:

<table>
<thead>
<tr>
<th>Registering Authority</th>
<th><code>&lt;mpvtv:idAuthority&gt;</code></th>
</tr>
</thead>
<tbody>
<tr>
<td>TVGuide</td>
<td>urn:osta-org:mpv:tv:id:tvguide</td>
</tr>
<tr>
<td>V-ISAN</td>
<td>urn:osta-org:mpv:tv:id:v-isan</td>
</tr>
</tbody>
</table>

4.4.3.6 Summary Example

In order to tie the definitions of this section together, here is an annotated example of their use.
EXAMPLE:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<file:Manifest
  xmlns:file="http://ns.osta.org/manifest/1.0/"
xmns:file2="http://ns.osta.org/manifest/2.0/"
xmns:mpv="http://ns.osta.org/mpv/1.0/"
xmns:mpvtv="http://ns.osta.org/mpv/tv/1.0/"
xmns:dc="http://ns.osta.org/nmf/1.0/dc/"
xmns:nmf="http://ns.osta.org/nmf/1.0/"

<nmf:Metadata>
    <file:ManifestProperties>
        <file2:AboutManifestMPVDocumentID>DOCID001</file2:AboutManifestMPVDocumentID>
        <file2:WrittenBy>http://www.mycompany.com/myapp/1.05/</file2:WrittenBy>
        <ProfileBag>
            <Profile>http://ns.osta.org/mpv/basic/1.0/</Profile>
            <Profile>http://ns.osta.org/nmf/1.0/dc/</Profile>
            <Profile>http://ns.osta.org/mpv/tv/1.0/</Profile>
        </ProfileBag>
    </file:ManifestProperties>
</nmf:Metadata>

<mpv:AssetList>
    <mpv:Video mpv:id="ID00000001">
        ...
    </mpv:Video>
</mpv:AssetList>

<nmf:Metadata>
    <dc:Properties>
        <dc:Title>Seinfeld</dc:Title>
        <dc:description>Elaine fails a drug test---twice---and loses her job; Jerry talks about his Uncle Leo on "The Tonight Show."</dc:description>
        <dc:creator>TV Guide</dc:creator>
        <dc:language>en-US</dc:language>
        <dc:format>video/mpeg</dc:format>
    </dc:Properties>

    <dct:Properties>
        <dct:Abstract>Four neurotic New Yorkers in a show about nothing.</dct:Abstract>
    </dct:Properties>

    <mpvtv:ShowProperties>
        <!-- Here is a genreSeq that defines a primary genre of Comedy, secondary of Sitcom -->
        <mpvtv:genreSeq>
            <mpvtv:genre>Comedy</mpvtv:genre>
            <mpvtv:genre>Sitcom</mpvtv:genre>
        </mpvtv:genreSeq>

        <!-- As for ratings, let’s have one US, one Canadian -->
        <mpvtv:ratingBag>
                <mpvtv:ratingValue>PG-13</mpvtv:ratingValue>
                <mpvtv:ratingReason>Language</mpvtv:ratingReason>
            </mpvtv:rating>

            <mpvtv:rating mpvtv:ratingAuthority="urn:osta-org:mpv:tv:rating:en-CA">
                <mpvtv:ratingValue>14+</mpvtv:ratingValue>
            </mpvtv:rating>
        </mpvtv:ratingBag>
    </mpvtv:ShowProperties>

    ...
</nmf:Metadata>
```
</mpvtv:ratingBag>

<!-- An alternate short description -->
  <nmf:Metadata>
    <dc:Properties>
      <dc:description>Elaine fails drug test, Jerry insults Uncle Leo</dc:description>
      <dc:language>en-US</dc:language>
    </dc:Properties>
  </nmf:Metadata>
</mpvtv:description>

<!-- Cast members are next -->
<mpvtv:castMemberBag>
  <mpvtv:castMember mpvtv:castType="urn:osta-org:mpv:tv:cast:actor">
    <mpvtv:castMemberName>
      <mpvtv:castMemberSurname>Seinfeld</mpvtv:castMemberSurname>
      <mpvtv:castMemberGivenName>Jerry</mpvtv:castMemberGivenName>
    </mpvtv:castMemberName>
    <mpvtv:castMemberRole>
      <mpvtv:castMemberGivenName>Jerry</mpvtv:castMemberGivenName>
    </mpvtv:castMemberRole>
  </mpvtv:castMember>
  <mpvtv:castMember mpvtv:castType="urn:osta-org:mpv:tv:cast:actor">
    <mpvtv:castMemberName>
      <mpvtv:castMemberSurname>Louis-Dreyfus</mpvtv:castMemberSurname>
      <mpvtv:castMemberGivenName>Julia</mpvtv:castMemberGivenName>
    </mpvtv:castMemberName>
    <mpvtv:castMemberRole>
      <mpvtv:castMemberGivenName>Elaine</mpvtv:castMemberGivenName>
    </mpvtv:castMemberRole>
  </mpvtv:castMember>
  <mpvtv:castMember mpvtv:castType="urn:osta-org:mpv:tv:cast:actor">
    <mpvtv:castMemberName>
      <mpvtv:castMemberSurname>Richards</mpvtv:castMemberSurname>
      <mpvtv:castMemberGivenName>Michael</mpvtv:castMemberGivenName>
    </mpvtv:castMemberName>
    <mpvtv:castMemberRole>
      <mpvtv:castMemberGivenName>Kramer</mpvtv:castMemberGivenName>
    </mpvtv:castMemberRole>
  </mpvtv:castMember>
  <mpvtv:castMember mpvtv:castType="urn:osta-org:mpv:tv:cast:actor">
    <mpvtv:castMemberName>
      <mpvtv:castMemberSurname>Alexander</mpvtv:castMemberSurname>
      <mpvtv:castMemberGivenName>Jason</mpvtv:castMemberGivenName>
    </mpvtv:castMemberName>
    <mpvtv:castMemberRole>
      <mpvtv:castMemberGivenName>George</mpvtv:castMemberGivenName>
    </mpvtv:castMemberRole>
  </mpvtv:castMember>
</mpvtv:castMemberBag>
4.5 MPV Core Metadata Extended by Broadcast TV Profile

4.5.1 Audio

In the usual case for a recorded television program, the audio is embedded with the video content. However, there may be additional audio streams associated with a show: a device may choose to record the SAP (Secondary Audio Program) stream, or a DVD may have multiple language streams available.

The Broadcast Television Profile solves both problems by extending the concepts presented in [MPVCore].

4.5.1.1 Embedded Audio

Since embedded audio does not reference a separate asset, the Broadcast Television Profile extends the base <mpv:Audio> asset to provide a new <mpvtv:Audio> tag.

Within the <mpvtv:Audio> tag, some Dublin Core metadata is used to describe the audio asset:

<table>
<thead>
<tr>
<th>Dublin Core <a href="">mpvtv:Audio</a> tags</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>description</td>
<td>Descriptive presentation text for stream</td>
</tr>
<tr>
<td>language</td>
<td>Audio language used, in [RFC1766] format</td>
</tr>
<tr>
<td>format</td>
<td>Applicable MIME format, typically audio/mpeg</td>
</tr>
</tbody>
</table>

Items that cannot be described by Dublin Core are specified using Broadcast Television Profile specific tags.

<table>
<thead>
<tr>
<th>Broadcast Television Profile <a href="">mpvtv:Audio</a> tags</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>audioType</td>
<td>One of: normal, hearing impaired</td>
</tr>
<tr>
<td>audioEncoding</td>
<td>One of: mono, stereo, dolby surround, dolby digital 5.1</td>
</tr>
</tbody>
</table>

4.5.1.2 External Audio

An audio stream external to the video stream is a concept well handled by [MPVCore]. The Broadcast Television Profile allows the inclusion of all specific embedded audio types outlined above, plus the addition of the file size of the described audio stream. Note that external audio uses the core <mpv:Audio> tag for greater compatibility with existing profiles.
### Broadcast Television Profile `<mpv:Audio>` tags

<table>
<thead>
<tr>
<th>Tag</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>audioSize</td>
<td>File size, in KB, of audio file.</td>
</tr>
</tbody>
</table>

#### 4.5.1.3 Summary Example

In order to tie the definitions of this section together, here is an annotated example of their use.

**Example:**

```xml
<mpv:AssetList>

    <!-- definition of a base video asset -->
    <mpv:Video mpv:id="ID00000001">
        ...
        <nmf:Metadata>
            <dc:Properties>
                ...
            </dc:Properties>
            <mpvtv:ShowProperties>
                ...
            </mpvtv:ShowProperties>
            <!-- embedded audio -->
            <mpvtv:Audio>
                <nmf:Metadata>
                    <dc:properties>
                        <dc:description>Main Audio</dc:description>
                        <dc:language>en-US</dc:language>
                        <dc:format>audio/mpeg</dc:format>
                    </dc:properties>
                    <mpvtv:ShowProperties>
                        <mpvtv:audioType>normal</mpvtv:audioType>
                        <mpvtv:audioEncoding>stereo</mpvtv:audioEncoding>
                    </mpvtv:ShowProperties>
                </nmf:Metadata>
            </mpvtv:Audio>
        ...
        <mpv:AudioRef mpv:refId="AUD00000001 " />
    </mpvtv:ShowProperties>
    <!-- Audio associated with video, referenced by an AudioRef -->
    <mpv:Audio mpv:id="AUD00000001">
        <mpv:lastURL mpv:filesystem="UDF">ShowAudio.mpg</mpv:lastURL>
        <mpv:ContentID>urn:osta-org:dsig:md5:all:8735353445934AC</mpv:ContentID>
        <nmf:Metadata>
            <dc:properties>
                <dc:description>Spanish SAP Audio</dc:description>
                <dc:language>es-US</dc:language>
                <dc:format>audio/mpeg</dc:format>
            </dc:properties>
            <mpvtv:ShowProperties>
            </mpvtv:ShowProperties>
        </nmf:Metadata>
    </mpv:Video>
</mpv:AssetList>
```
4.5.2 Renditions of a TVShow Asset

The file(s) specified in the primary TVShow asset should generally be the complete program. There are a number of cases where an alternate rendition may be specified to enhance either the user navigation or customer viewing experience.

Such cases might include:
1) A thumbnail still image displayed during playlist navigation
2) A subsampled version viewable on a specific device

Renditions of a TVShow asset are specified using the <mpv:Rendition> tag and appropriate mpv:renditionUsage attribute values. The [MPVCore] specification provides the normative reference for acceptable values, alternatives may be specified via URN syntax.

Acceptable renditions include:

<table>
<thead>
<tr>
<th>RenditionUsage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>thumbnail</td>
<td>Thumbnail preview of video</td>
</tr>
<tr>
<td>subsampled</td>
<td>Subsampled resolution of base, new mpvtv:VideoEncoding tag expected</td>
</tr>
</tbody>
</table>

**Example**

```xml
<mpv:Video>
  <mpv:Rendition mpv:renditionUsage="thumbnail">
    <mpv:StillRef mpv:idref="THUMBNAI-L-STILL-ID"/>
  </mpv:Rendition>
  ...
</mpv:Video>

<mpv:Still mpv:id = "THUMBNAI-L-STILL-ID">
  ...
</mpv:Still>
  ...
```
4.5.3 Related References to a TVShow Asset

As noted above, the file(s) specified in the primary TVShow asset should generally be the complete program. Just as a rendition, there are cases where a related asset might provide an alternate viewing experience, such as a commercial-free view of a program.

These relations are specified using the <mpv:Related> tag and appropriate mpv:relationship attribute value. In the Broadcast Television Profile, these relationships should be specified with URN syntax.

Relationships understood by this profile include:

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>urn:osta-org:mpv:tv:relation:noCommercial</td>
<td>References a noCommercial subset of the containing base Video asset.</td>
</tr>
<tr>
<td>urn:osta-org:mpv:tv:relation:noCommercialOf</td>
<td>Refers back to the base video the containing Video asset is a noCommercial subset of.</td>
</tr>
<tr>
<td>urn:osta-org:mpv:tv:relation:preview</td>
<td>References a preview subset of the containing base Video asset.</td>
</tr>
<tr>
<td>urn:osta-org:mpv:tv:relation:previewOf</td>
<td>Refers back to the base video the containing Video asset is a preview subset of.</td>
</tr>
<tr>
<td>urn:osta-org:mpv:tv:relation:userEditOf</td>
<td>Refers back to the base video the containing Video asset is a user edited subset of.</td>
</tr>
</tbody>
</table>

4.5.3.1 IndexPoints

There are many situations in which is is useful to describe subsets of video. For years, VCRs have had the capability to mark “index points” in video so that the user can perform a seek to an index point. In the Related references above, it is easy to see that a “noCommercialOf” version of a particular video can be described as a series of cut points from the original.

The Broadcast Television Profile supports the use of an IndexPoint tag within either an IndexPointSeq or CutPointSeq container:

<table>
<thead>
<tr>
<th>Metadata</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IndexPoint</td>
<td>SMPTE-style (HH:MM:SS:FF) description of a particular video frame</td>
</tr>
<tr>
<td>CutPointSeq</td>
<td>Ordered container of start – stop timestamp pairs denoting included video</td>
</tr>
<tr>
<td>IndexPointSeq</td>
<td>Ordered container of IndexPoints.</td>
</tr>
</tbody>
</table>

A Related video containing a CutPointSeq may or may not have a physical file associated with it – it may simply be a description of what to cut from the original video file, or it can be a physical manifestation of the result of the cut process. By convention, a Video object with a LastURL tag refers to a physical file.

The following example illustrates an encoding of a noCommercialOf version of a video using CutPointSeqs and IndexPoints.

**EXAMPLE:**

```xml
<-- Here is an original video asset, which has a related noCommercial version -->
<mpv:Video mpv:id="VID0001">
  ...
</mpv:Video>
```
4.6 OSTA MD5 Digital Signature Identification

One of the three core concepts defined by MPV is content identification.

There are two ways that television shows are identified in the Broadcast Television Profile. One is the method discussed above, where unique showIDs are defined by known registered authorities. The other is the method inherited from [MPVCore], which defines IDs algorithmically computed at some point in their life (the mpv:ContentID / mpv:DocumentID / mpv:InstanceID).

Every asset can have zero or more mpv:ContentID / mpv:DocumentID / mpv:InstanceID elements which contain strongly-typed identifiers. [MPVCore] defines a basic identification scheme based on the MD5 algorithm to provide a statistically unique identifier. Other identification schemes may be defined by OSTA or any other organization.
The following informative discussion is derived from [MPVCore], which provides the normative reference. OSTA-defined digital signatures take the form

```
```


Three MD5-hash-based digital signatures that are also useful are:

```
urn:osta-org:mpv:dsig:md5:all:<value>
```

Every byte in the entire file is processed.

```
```

Only the <byte count> integer number of bytes from the start of the file is processed. This is attractive to robustly refer to very large files or to files that are frequently edited or appended and for which the head can generate an approximately unique signature. If unspecified, the default byte count is 8192. Example: "urn:osta-org:mpv:dsig:md5:head:30000:EF886AEFA3B340da971BAF09B17DBC122"

```
```

Only the <byte count> integer number of bytes from the end of the file is processed. This is attractive to quickly detect changes in files that are frequently edited or appended. If unspecified, the default byte count is 8192. Example: "urn:osta-org:mpv:dsig:md5:tail:30000:EF886AEFA3B340da971BAF09B17DBC122"

In addition, a MD5 signature for the body of specific file types may be defined.
Chapter 5: MPV Broadcast Television Playlists

5.1 MPV Broadcast Television Playlists

The MPV Broadcast Television Profile Playlist is tailored to the presentation and navigation of underlying audio/video assets in a video recording system.

Assets representing TV Shows may be spread across one or more recording media in a system in a variety of ways, but a system may want to present a specific ordering to a user, independent of where the item is stored. For example, a system may wish to present available shows, sometimes sorted by name or by date recorded.

This means that it isn’t possible to specify content location and playback order simply by requiring specific directory and filenames. Instead, MPV provides an approach that allows the content to be located anywhere and with any name.

A Playlist (<mpvtv:Playlist>) contains its own metadata such as title, description, and language and MAY contain zero or more PlaylistAssets (<mpvtv:PlaylistAsset>). A PlaylistAsset MUST contain a reference to an underlying media asset, and SHOULD contain metadata describing the playback state of that asset (such as current resume point, date last accessed, etc.).

Playlists MAY reference other Playlists, and those referenced playlists may be stored either locally (in the same filesystem) or remotely (in a different filesystem). A given MPV file MAY contain more than one Playlist, and if so, all Playlists are contained within a PlaylistBag. By convention, if multiple Playlists are encountered, then the first Playlist in the Bag is considered the default Playlist. A Playlist reference may be used by a rendering device as a form of display hierarchy akin to a container folder in a filesystem, if it so chooses. Otherwise, the device is under no obligation to display PlaylistAssets in the ordering provided, it MAY be treated as one suggested ordering.

The basic structure of a playlist uses the <mpvtv:Playlist> element, which may contain metadata, playlist assets, and references to other playlists.

```
...  
  <mpvtv:PlaylistBag>
    <mpvtv:Playlist>
      <nmf:Metadata>  ... </nmf:Metadata>
      <mpv:Metadata> ... </mpv:Metadata>
      <mpvtv:PlaylistRef> ... </mpvtv:PlaylistRef>
      <mpvtv:PlaylistRef> ... </mpvtv:PlaylistRef>
      <mpvtv:PlaylistAsset> ... </mpvtv:PlaylistAsset>
      <mpvtv:PlaylistAsset> ... </mpvtv:PlaylistAsset>
    </mpvtv:Playlist>
  </mpvtv:PlaylistBag>
```
5.1.1 MPV / Dublin Core Element Usage
Metadata placed in the mpvtv:Playlist element has the entire Playlist as a scope. These tags include:

<table>
<thead>
<tr>
<th>[MPVCore] Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>title</td>
<td>Playlist title</td>
</tr>
<tr>
<td>description</td>
<td>Optional playlist description</td>
</tr>
<tr>
<td>language</td>
<td>Language used by MPVCore title / description, in [RFC1766] format</td>
</tr>
</tbody>
</table>

5.1.2 Broadcast Specification Metadata
Within a Playlist element, the following tags are available:

<table>
<thead>
<tr>
<th>Broadcast Specification Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PlaylistAsset</td>
<td>Playlist Asset: references an underlying video asset.</td>
</tr>
<tr>
<td>PlaylistRef</td>
<td>Reference a playlist from another source</td>
</tr>
</tbody>
</table>

5.1.3 PlaylistAsset Metadata
PlaylistAssets have the following properties:

<table>
<thead>
<tr>
<th>PlaylistAsset Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>resumePoint</td>
<td>Timestamp, in SMPTE-type format, denoting where playback will resume from</td>
</tr>
<tr>
<td>lastAccess</td>
<td>Last access time, in [ISO8601] Date / Time format</td>
</tr>
<tr>
<td>keepUntil</td>
<td>Keep until time, in [ISO8601] Date / Time format, after which the underlying video asset MAY be deleted.</td>
</tr>
</tbody>
</table>

5.1.4 Summary Example
In order to tie the definitions of this section together, here is an annotated example of their use.

**EXAMPLE:**

```xml
...  <!-- Playlist Bags contain one or more distinct Playlists, which may link other playlists -->
<mpvtv:PlaylistBag>
...  ...
</mpvtv:PlaylistBag>
```
<mpvtv:Playlist mpvtv:id="PLAYLIST0001">
  <mpv:InstanceID>urn:osta-org:dsig:md5:all:043449CA9577688</mpv:InstanceID>
  <nmf:Metadata>
    <!-- General playlist specific properties -->
    <dc:Properties>
      <dc:title>Seinfeld Episodes</dc:title>
      <dc:description>Recorded September – October 1999</dc:description>
      <dc:language>en-US</dc:language>
    </dc:Properties>
  </nmf:Metadata>

  <!-- Playlist assets refer to video assets in asset list -->
  <!-- First Asset -->
  <mpvtv:PlaylistAsset>
    <nmf:Metadata>
      <mpvtv:ShowProperties>
        <mpvtv:resumePoint>00:00:00:00</mpvtv:resumePoint>
        <mpvtv:lastAccess>1999-10-07T19:00</mpvtv:lastAccess>
        <mpvtv:keepUntil>2030-12-31</mpvtv:keepUntil>
      </mpvtv:ShowProperties>
    </nmf:Metadata>
    <mpv:VideoRef mpv:idRef="SEINFELD100799"/>
  </mpvtv:PlaylistAsset>

  <!-- Second Asset -->
  <mpvtv:PlaylistAsset>
    <nmf:Metadata>
      <mpvtv:ShowProperties>
        <mpvtv:resumePoint>00:15:00:00</mpvtv:resumePoint>
        <mpvtv:lastAccess>1999-10-14T19:00</mpvtv:lastAccess>
        <mpvtv:keepUntil>2030-12-31</mpvtv:keepUntil>
      </mpvtv:ShowProperties>
    </nmf:Metadata>
    <mpv:VideoRef mpv:idRef="SEINFELD101499"/>
  </mpvtv:PlaylistAsset>

  <!-- Reference to a completely different playlist -->
  <mpvtv:PlaylistRef mpvtv:idRef="PLAYLIST0002"/>
</mpvtv:Playlist>

  <!-- And here's a second Playlist, which may reference the same or different assets -->
  <mpvtv:Playlist mpvtv:id="PLAYLIST0002">
    <mpv:InstanceID>urn:osta-org:dsig:md5:all:324204345649CA95776</mpv:InstanceID>
    <nmf:Metadata>
      <!-- General playlist specific properties -->
      <dc:Properties>
        <dc:title>Seinfeld Episodes</dc:title>
        <dc:description>Recorded November – December 1999</dc:description>
        <dc:language>en-US</dc:language>
      </dc:Properties>
    </nmf:Metadata>
  </mpvtv:Playlist>
</mpvtv:Playlist>
<!-- Playlist assets refer to video assets in asset list -->
<!-- First Asset -->
<mpvtv:PlaylistAsset>
<nmf:Metadata>
  <mpvtv:ShowProperties>
    <mpvtv:resumePoint>00:00:00:00</mpvtv:resumePoint>
    <mpvtv:lastAccess>1999-11-14T19:00</mpvtv:lastAccess>
    <mpvtv:keepUntil>2030-12-31</mpvtv:keepUntil>
  </mpvtv:ShowProperties>
</nmf:Metadata>

<!-- Reference to video asset itself (commercial free version) -->
<mpv:VideoRef mpv:idRef="SEINFELD111499"/>
</mpvtv:PlaylistAsset>

</mpvtv:Playlist>
</mpvtv:PlaylistBag>

...
Chapter 6: Broadcast Television Profile

Manifests

The [MPVCore] specification establishes the structure and nomenclature of MPV files and assets. The MPV file is an XML document called an MPV Manifest; thus, the outer-most element of a MPV file is `<file:Manifest>`.

One very useful capability that [MPVCore] provides is to link manifests to one another. The `<mpv:ManifestLink>` element creates a link to another MPV file. In this manner, just as with the World Wide Web, an endless chain of linked MPV files can be created.

Typically, when applied to a removable storage media like a CD, DVD, or memory card, all the links will be self-contained within the media. In this case, typically a file using the distinguished filename “index.tvm” will contain a top-level list of playlists.

6.1 Best Practices for Generating Manifest Data

There are any number of ways for applications and devices to produce and update AssetLists and Playlists. They may be the result of extensive manual user interaction or by an automatic process that occurs when the underlying asset is recorded, played back, or discarded.

6.1.1 Top-Level Playlist

The simplest best practice is to provide a top-level playlist in the same Manifest file that defines the underlying assets, such as an index.tvm. This gives the playback application or device the best ability to find and present contents intended by the creator application. All references should be self-contained within the media containing the Manifest, especially in the case of removable media. In the case of a hybrid removable media system, such as a combo HD/DVD PVR device, each device SHOULD have their own Manifest file(s) listing their own AssetList / Playlist data. Manifest reference links are supported, but should reference manifests on the same physical device.

An application or device MAY keep AssetLists and Playlists in separate files. This approach is efficient and scalable because it separates the metadata updated by recording from the metadata updated by playback.
Chapter 7: MPV Broadcast Television
Profile Extensions to MPV Core
Specification

7.1 Broadcast Television Manifest File Types & Extensions

For systems in which file type is carried by the file name extension, such as Microsoft Windows and Unix, the TV Show Manifest file will utilize an extension. The MPV Broadcast Television Profile defines two extensions a manifest may carry.

.tvm

This extension identifies a file to be a TVshow Manifest (TVM).

Usage is case insensitive. This extension may be registered by an application to provide default and alternate processors of TV Show Manifests.

.xml

This extension identifies a file as containing XML content. Usage is case insensitive. A TVShow Manifest should only use this extension if it expects to be processed by a general-purpose XML processor such as Microsoft Internet Explorer. It is recommended that the manifest include an XML processing instruction specifying a stylesheet to use for presentation.

This extension may be registered by an application to provide general purpose XML content processing. An application should register this extension with care, as many types of content may carry the .xml extension and an application should do its best to handle this content in a general fashion.

For example, Microsoft Internet Explorer 5.5 and above registers this extension; when it processes the file, it looks for a stylesheet processing instruction. IE renders the results of applying the stylesheet to the XML content. This separation of content and presentation allows IE to be a general purpose XML processing engine and suitable for handling the .xml extension.

Some applications examine leading characters of a file in an attempt to determine its file type. No byte sequences can be counted on to always be present, but generally all XML documents in the UTF-8 charsets begin with hexadecimal 3C 3F 78 6D 6C, ("<?xml"). While this will identify the document as an XML document, it does NOT identify it as a TVShow Manifest. This requires parsing the document to locate the outer element defined by the manifest schema.
7.2 TVShow Manifest MIME Media Type

MIME media types are widely used in internet applications to indicate the type of a file or content in a manner external of the file and independent of the name of the file or any information embedded in the file [MIME-2]. IANA maintains a registry of MIME media types and the set of MIME media types IANA thinks is registered at any time can be found at [MIMETYPES-REG].

The MIME media types are RECOMMENDED for use in a Broadcast TV Manifest are:

video/mpeg
   This MIME type identifies the content as being mpeg-based video.

application/vnd.osta-org.tvm+xml
   This MIME media type identifies the content to be a TVShow Manifest. Usage is case sensitive. This media type may be registered with internet browsers by an application to provide the default processor of a TVShow Manifest.

application/xml
   This MIME media type identifies the content as containing XML content. Usage is case sensitive. A TVShow Manifest should only use this MIME type if it expects to be processed by a general-purpose XML processor such as Microsoft Internet Explorer. It is recommended that the manifest include an XML processing instruction specifying a stylesheet to use for presentation.

   This MIME media type may be registered by an application to provide general purpose XML content processing. An application should register this media type with care, as many types of content may carry the application/xml media type and an application should do its best to handle this content in a general fashion.

Other MIME media types may be used as applicable to the content.

7.3 Choosing Which File Type and MIME Media Type to Use

For products authoring TVShow Manifests, the choice of file extension and MIME media type is important. The product should consider the contexts in which it expects the manifest to be used. The primary decision factor is whether the product expects the manifest to be used in an environment that is explicitly MPV-aware or one that is not.

A MPV-aware environment will have the .tvm file extension and application/vnd.osta-org.tvm+xml media type registered to an application. A MPV-unaware environment will not.

Generally speaking, it is preferable to use a TVShow Manifest in an MPV-aware environment because the MPV-aware application is better able to utilize fully the MPV capabilities. In particular, an MPV-aware environment will likely handle better the situation in which the default lastURL reference in invalid; it should use other available lastURL values or the identifiers available on an asset to fixup the lastURL value.

7.4 Finding a TVShow Manifest File

The TVShow Manifest is the essential document to be managed and manipulated for collections of television content. MPV collections define a structured association of assets and provide access to metadata about those assets.
When searching a file system for a TVShow Manifest, they can be located by name or by extension. When requested by name, the manifest is either found or not found. If not found, the algorithm defined elsewhere for lastURL fixup should be applied.

The MPV Broadcast Television Profile defines the following algorithm that describes how to locate an MPV manifest when the name is not known.

If dealing with a removable storage unit, e.g. an optical disc inserted, the starting current working directory is the root directory.

If dealing with a user's personal computer "login" account, there may be a set of directories to be considered in sequence that will lead to the "root" TVShow Manifest for the account. Best Practices for which directories to consider are defined elsewhere.

If browsing a filesystem, the current working directory is decided by the application conducting the search.

The scan algorithm to find a TVShow Manifest from a given current working directory is:

In the current working directory, look for a file with one of the following case-insensitive names according to the order given.

INDEX.TVM
INDEXTVM.XML
PLAY.TVM
PLAYTVM.XML
<any name>.TVM, in an undefined order when more than one is present
INDEX.PVM
INDEXPVM.XML
<any name>.PVM, in an undefined order when more than one is present

If no matching file is found, the child directories of the current directory are scanned in an alphabetical breadth-first traversal to a depth of one subdirectory.

If no matching file is found, the parent and parent sibling directories of the current directory are scanned in an alphabetical breadth-first traversal to a height of one parent directory.

Files matching the pattern are processed in the order encountered. When a TVShow Manifest is encountered, it is opened and scanned for an MPVTV PlaylistBag/Playlist or AssetList. Without external guidance, the first MPVTV Playlist encountered is used for presentation; if none is found, the AssetList is used.

The rationale behind this search algorithm is to first locate any top-level manifest containing MPV information, with a fallback of then finding named TVShow Manifests. It is allowed for the MPV document to be located up to one directory down.

N.B. By allowing the TVShow Manifest to carry the .XML extension or type, general purpose XML processors can operate on the MPV document and apply XML processing capabilities. For example, with Microsoft Internet Explorer 5.5 and above, an XML processing instruction in the INDEXTVM.XML file can invoke a style sheet that can transform the MPV document into an attractive browser-based presentation.

The search algorithm covers all of the following directories, where CWD is the current working directory. Naturally, when the path cannot be reached, it stops.

/R1/P1/CWD
/R1/P1/CWD/C1
/R1/P1/CWD/C2
/R1/P1/CWD/C3
But not these:

/R2
/R2/P2
/R1/P2/D1
/R1/P1/CWD/C1/E1

In each of the directories scanned, the application shall search for all of the possible TVShow Manifest file names.

### 7.5 Media Types and File Formats

MPV is an open asset management / playlist format that can support an expandable set of defined media file formats. Formats are identified using MIME media types, as is well-established practice for internet-era standards.
Appendix I: References

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"Using Dublin Core – Dublin Core Qualifiers". Available at http://dublincore.org/documents/usageguide/qualifiers.shtml

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‘ISO 3166-1 Codes for the representation of names of countries and their subdivisions - Part 1: Country codes.’
[ISO8601]

[ISO10646]
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IANA official registry of MIME media types
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[SMIL-MOD]
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[URI]
Note that RFC 2396 updates [RFC1738] and [RFC1808].

[UCS-2]
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[UTF-8]

[W3C-NSURI]
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