



Digital Music, Photo, and Video Collections



MPV Presentation Profile Specification

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ABSTRACT

The MusicPhotoVideo specification defines a manifest and metadata format and practices for processing and playback of collections of digital photo, video, and related audio and file content stored on an optical disc and other storage media such as memory cards and computer harddrives or exchanged via internet protocols.

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RELEASE HISTORY

<i>Version</i>	<i>Date</i>	<i>Comments</i>
1.00	23 October 2002	First public release.
1.01	11 March 2003	Schema and document format is unchanged. Changed name from MultiPhoto/Video to MPV and MusicPhotoVideo; updated logo, contact info, copyright. Added Music Profile mention. Updated graphics to use MPV and Music Profile. No other changes.

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Chapter 1: Introduction

1.1 Executive Summary

MPV (MusicPhotoVideo) is an open specification that makes easier the representation, exchange, processing and playback of collections of music, photo, and video content, including stills, stills with audio, still sequences, video clips, and audio clips. By analogy, MPV is added to the original data to enable slideshow and browsing tasks of photo-video content just as DPOF [DPOF] is added to the original data to enable printing of photo content.

Music applications that use MPV benefit even when they only use it for simple playlists of audio files. Use of the Music profile provides for enhanced capabilities such as album art, dynamic playlists, choice of music-only or music-video playback, and handling of other music properties.

Imaging applications and devices and users that use MPV benefit even when they only interact with still images in basic ways; when content like video clips and still sequences are added, such as can be captured by a majority of the digital cameras introduced recently, the benefits expand.

MPV uses a simple 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.

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 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 may be contributed by interested parties.

The specification is being developed in phases and results in "profiles". Each profile in MPV defines only those formats and practices that are necessary for the key tasks targeted by the profile. A number of candidate profiles for development have been identified, including:

- **Basic Profile:** key tasks: defining content collections, renditions, identifiers, and access to other metadata
- **Presentation Profile:** two key tasks: defining a presentation view of the assets, such as a slideshow with background music or playlist of the assets.
- **Music Profile:** key tasks: representing collections of published music

- **Internet Profile:** key task: interacting with and sending collections of music, photo, and video content over the web and email
- **Capture Profile:** key task: writing new content to storage media and updating the collection info
- **Disc Archive Profile:** key task: interoperability of photo archives on recordable optical discs
- **Editing Profile:** key task: modifying existing collections of photo-video content.
- **Printing Profile:** key task: printing collections of photo-video content
- **Container Profile:** key task: storing photo-video content collections in containers

Underlying all profiles is the “Core”, which defines the overall framework of all MPV profiles. The Basic and Presentation Profiles, for example, build on the Core and, when implemented in consumer electronics devices like DVD players or in application software, can provide compelling playback of photo-video slideshows and interactive browsing of photo-video content. It can also facilitate interchange of photo-video content between applications.

MPV technology has three central components: Collections, Metadata, and Identification. Each of these make reference in various ways to data files containing the photo-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.

1.2 Overview

MPV (MusicPhotoVideo) is an open specification to enhance interoperability, ease-of-use, and abilities to play and manipulate collections of photo/video content, including still images, still with audio, still sequences, video clips, music and audio clips, and related files. MPV is made available without royalty from the Optical Storage Technology Association (OSTA). OSTA is an industry association promoting the use and interoperability of recordable CD and DVD discs in computer and consumer electronics devices.

MPV enables PC software and consumer electronics devices like DVD players to playback and manipulate collections of digital music, photo and video content including still images, still with audio, still sequences, video clips, audio-only clips, and related files. The emphasis is on personal content originating from many sources including digital cameras, film, scanners and video digitizer and stored on a range of media including memory cards, recordable or stamped CDs and DVDs, and even computer harddisks or internet services.

Development of the specification will be in multiple stages. A Basic profile provides for the basic definition of collections of photo-video content. A Presentation Profile extends the specification for an enhanced presentation experience of interactive browsing and slideshow playback provided by DVD players and other devices and media player software. Additional profiles will be developed subsequently.

The MPV specification will further promote adoption of current and new categories of digital imaging products by enhancing ease-of-use and interoperability of music, photo and video content collections and applications. The format enables an end-user experience that starts fast, is highly interactive, provides for playing and editing collections of photo/video content, never requires the device or application to reveal the underlying storage file system, and can be implemented in firmware of consumer electronics devices like DVD players as well as by PC

The graphic consists of four green rounded rectangular boxes arranged in a 2x2 grid. The top-left box is a darker shade of green and contains the text 'MPV Provides ...'. The top-right box is a medium green and contains the text 'Fast and friendly user experience:' followed by three bullet points: '> Start fast, play slideshow, browse interactively', '> Interact with albums and photo-video "items", not files.', and '> Robust against renaming and reorganization of files'. The bottom-left box is a light green and contains the text 'One format that can work anywhere:' followed by three bullet points: '> Any storage media, any device, any software', '> "Adds on" to existing technology without conflict.', and '> Fully extensible'. The bottom-right box is a medium green and contains the text 'Immediate Value:' followed by one bullet point: '> Playback on Microsoft Win XP and IE 5.5+ browsers or choice of other players.', and 'Future Value:' followed by one bullet point: '> Playback on DVD players and other devices supporting MPV [target: Christmas 2003]'.

software. MPV can be produced automatically or interactively by digital cameras, scanners, imaging software, internet services and other devices.

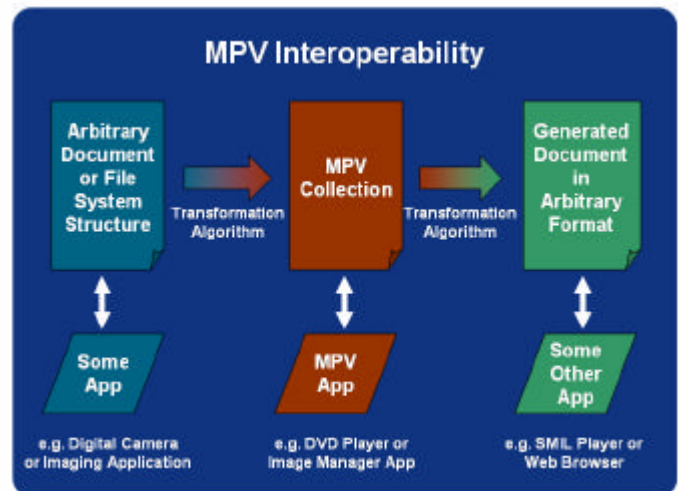
MPV provides specific manifest and metadata formats and implementation practices that support existing industry specifications such as the World Wide Web Consortium's SMIL [SMIL20] and I3A's DIG35 [DIG35-2001]. MPV is compatible with and supports the DCF [DCF-1999] and Exif [Exif2002] specifications that are widely used in digital cameras.

Support for MPV can be "added on" to existing applications and conventions because it is non-invasive and can co-exist with existing file system structures and formats. The format is designed for longevity and extensibility through the use of industry-standard XML. The manifest format will support write-only media, high-performance update, and use in low-memory, low-performance devices.

Key technical advances provided by the MPV specification specifically enable or enhance interoperability and end-user experience. Collections of photo-video content can be specified with optional presentation information. Practices for how to represent, compute, insert, and compare identifiers of digital assets enable collections to be more robust when assets are renamed or moved. Metadata for compound assets like still image sequences and primary and dependent assets (e.g. thumbnails, low-res renditions) allow manipulation of higher level constructs than the individual primary assets.

The MPV format does not contain the content itself -- MPV is an aggregation of information about the content, including references to the content. It provides essentially a Table of Contents and metadata repository; a typical implementation is a stand-alone file such as "ALBUM.PVM" and zero or more dependent files.

MPV is well suited as an intermediate format for exchange of music, photo and video content collections across applications, devices, and services. Some applications may also choose to use it as the primary format for storing their own data. MPV is structured such that it may be used with reasonable efficiency as a lightweight textual database to maintain metadata and related information for hundreds to the low thousands of music, photo and video content files.



1.3 Terms of Use

This section of the specification is descriptive and not intended to be complete nor definitive. Please refer to the definitive statement of licensing terms at the beginning of the MPV specification document for a precise and legal description.

The MPV specification is developed using an open process. The resulting specification is available from OSTA. No royalty is charged by OSTA for use of the specification. The overall desire is to develop a specification that is not subject to separate licensing requirements or royalty. During the development process, the expectation is that all participants contribute their efforts and intellectual property without any expectation or requirement for compensation. However, OSTA does not warrant that the specification is not or will not be subject to such claims by other parties.

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, some sample open-source code implementations of key steps in processing MPV content may be contributed by interested parties.

Chapter 2: Key Concepts of the MPV and Related Specifications

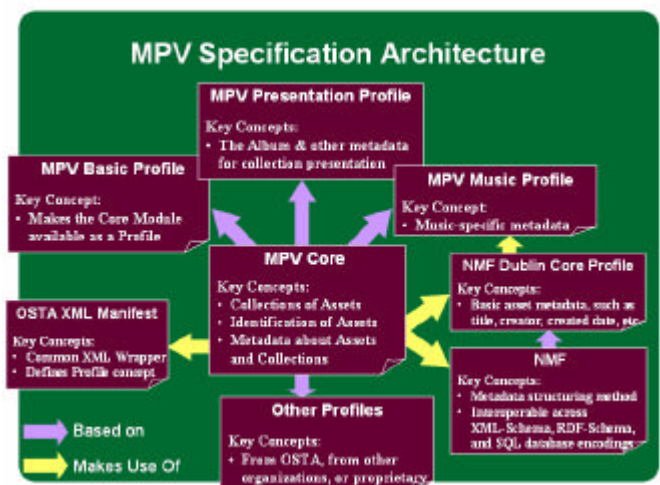
2.1 MPV Specification Architecture

MPV is not just one specification, it is a family of related specifications. This architecture results from several principle objectives:

- MPV should be highly extensible, allowing anyone to create proprietary or open extensions to MPV without modifying the MPV specification itself.
- Adding extensions should not damage interoperability of the basic collection information.
- Specifications that are fundamentally separable concepts should be separated. This allows each specification to be used and evolve independently of each other.
- MPV should not define alternate representations where mainstream representations exist.

These principles result in the following characteristics of the MPV and related specifications.

- The **MPV Core** is the essence of the MPV specification. However, it cannot be used by itself; it must always be incorporated into a Profile, which is the basic unit of extension in MPV.
- The **MPV Basic and Presentation Profiles** are extensions that utilize the MPV Core. **Other Profiles** are extensions organized in exactly the same way.
- The **MPV Music Profile** defines music-specific metadata, making use of the MPV Presentation Profile and Dublin Core.
- MPV makes use of the **OSTA XML Manifest**, which defines the Profile concept.
- MPV makes use of the **NMF Specification** for structured representation of arbitrary metadata. NMF is a wholly separate concept.
- MPV recommends use of the NMF-encoding of **Dublin Core**, a separate and widely adopted specification for representing basic metadata about assets of all kinds.



2.2 Profiles and Modules, Schema and Practices

The MusicPhotoVideo specifications contain the following kinds of content.

Schema define the structure of MPV content, providing a precise grammar and vocabulary of expression. MPV uses XML-Schema [XSCHEMA], a well-known schema definition language, to define this grammar and vocabulary in combination with prose descriptions to clarify usage and behaviour. A wide variety of commercial and open source tools support the use of XML Schema, including for schema design and schema and content validation.

In MPV, all schema are available in machine-readable form in addition to inclusion on a fragmentary basis within the specification document. The machine-readable schema in the informative definition; in the case of discrepancy, the specification document supercedes the machine-readable schema.

Practices define required and recommended behaviours in prose or pseudo code. Practices are a critical component to interoperability because they establish expectations and processes for how MPV content is handled.

Profiles are a set of Schema and Practices and additional content and are the principle unit of formal specification, of specification implementation and of specification compliance. Products can implement or not implement profiles. Each profile in MusicPhotoVideo defines only those schema and practices that are necessary for the key tasks targeted by the profile.

Referenced Specifications are other specifications used by the MPV specifications. These specifications may be from OSTA or other organizations.

2.3 MPV Core and the MPV Basic and Presentation Profiles

Profiles represent the basic unit of extension within MPV. Profiles define schema and practices that are available for addressing a given task. Typically, profiles define one or more top-level elements in a manifest plus various additional metadata.

The MPV Core specification [MPV-Core] and the MPV Basic [MPVBasic] and Presentation Profiles [MPV-Basic, MPV-Pres] were all developed at one time, and the Core documentation makes reference to the Basic and Presentation Profiles. However, nothing about the Basic and Presentation Profile specifications and implementation is treated specially in the Core. In other words, the Basic and Presentation Profiles play by the same rules that new, as yet undefined additional profiles must play by.

2.3.1 MPV Core

An overview of the MPV Core is described in detail in a following chapter. It provides the three core concepts of Collections, Metadata, and Identification. No profile is considered an MPV-related Profile unless it makes use of the MPV Core, either directly or indirectly.

MPV Core establishes the use of the OSTA XML Manifest for as the XML document file format for MPV content.

2.3.2 MPV Basic Profile

This specification defines The MPV Basic Profile which simply makes available the MPV Core as an MPV Profile. This is necessary since Profiles are the only unit of incorporation into an OSTA XML Manifest. The MPV Basic Profile provides two top-level elements in a manifest: AssetList and MarkedAssets.

Primary tasks that users of the MPV Basic Profile can accomplish include definition of collections of assets by reference and grouping of those assets into distinguished sets using MarkLists. These basic tasks are the essence of what MPV provides.

ASSETLIST

The AssetList is the basic unit of collection representation in MPV. Assets themselves may only be defined in an AssetList. Only one AssetList is allowed in a manifest.

MARKEDASSETS

The MarkedAssets element may contain MarkLists that make reference to assets. Standard marklist types like “primary” and “selected” provide for interchange of lists of distinguished assets. Multiple MarkLists may be present in the MarkedAssets element.

2.3.3 MPV Presentation Profile

Primary tasks for the MPV Presentation Profile are to provide albums that allow the user apply presentation information to a collection of assets. The primary usages are to play a slideshow, interactively browse the primary assets, or selectively print the album’s contents.

The MPV Presentation Profile provides very basic presentation information that emphasizes use by a devices and applications with a broad range of presentation capabilities and significant amounts of application-level control over presentation behaviour. Additional profiles may define much richer or more tightly scoped presentation behaviours.

ALBUM, ALBUMREF

An album is a presentation-oriented view of the asset list and the most common representation of an MPV collection exposed to users . It is an ordered set of references to assets in asset lists. Albums can link to other albums. Multiple albums can be grouped together in one file or isolated in separate files. AlbumRefs can be to albums in the same or different manifests and local or remote. Albums may have renditions, related documents and mark lists of their own.

FOREGROUND, BACKGROUND

Users interact with Album-level Foreground and Background assets; they and the Album's Related Documents are conceptually the primary assets in a collection. Typically, users interact most with foreground assets while background assets are secondary and fewer. Foreground and background assets may also contain additional content, including renditions and related documents. Additional content may enhance the performance, scope, presentation, and other characteristics of an album but do not fundamentally change it from a user's perspective.

PRESENTATION CONTROL

The overall approach for representing presentation information is compatible with SMIL, a powerful XML format for representing presentations from the World Wide Web Consortium (W3C). MPV Presentation Profile provides a very constrained set of properties compatible with SMIL that provides just a basic level of presentation control. A MPV document can be mechanically translated into any of the common SMIL profiles. This makes MPV a good intermediate representation and also suggests a MPV playback strategy on platforms that also have SMIL players. Because the Presentation Profile is not extensive however, many other implementations can be contemplated. For example, compelling playback of MPV documents in modern web browsers is readily accomplished.

Because MPV also allows arbitrary XML metadata to be embedded or referenced, it is possible to embed additional presentation information directly in SMIL or other presentation languages. These may be used by players aware of these formats and practices.

2.4 XML Usage

XML LEVERAGE

MPV content is well-formed XML. This allows the MPV document to be processed using standard XML processing tools and environments. For example, when opened in the Microsoft Internet Explorer 5.5 and above web browser, a MPV document with associated style sheet can present an attractive user interface for playback of MPV photo-video collections. Similarly, straight forward XSLT translation can convert an MPV document into a SMIL-based presentation for playback with an appropriate player. MPV can also be easily utilized within other XML specifications.

NAMESPACES

XML namespaces are a means to allow XML elements of the same name that exist in different schema to co-exist within the same document.

MPV requires the use of namespaces. By convention, all elements and attributes in MPV are used with their prefixes in all XML encodings. MPV does not support namespace-unaware processing. Most modern XML tools support namespace-aware processing.

Chapter 3: MPV Presentation Profile 1.0

The MPV Presentation Profile 1.0 is designed to accomplish the following key tasks: definition of albums and viewing a slideshow and interactively browsing the album. An album is a presentation-focused view of the collections of photo-video assets defined by the MPV Core Specification [MPV-Core].

The MPV Presentation Profile 1.0 consists of the following modules and practices, which are specified in detail separately in this document.

- MPV Core Schema 1.0
- MPV Core Practices 1.0
- MPV Presentation Schema 1.0
- MPV Presentation Practices 1.0

The MPV Presentation Profile is expected to be supported by most MPV-aware applications and devices that present collections to users and provides the basis for interoperability of collections across all range of storage media, devices, applications, and services.

Schema group	Namespace Identifier	Schema Location	Conventional Namespace Prefix
Presentation Profile	http://ns.osta.org/mpv/presentation/1.0/	<code>lax/profiles/presentation/profile.xsd</code>	<code>mpvp:</code>

Chapter 4: MPV Presentation Schemas

4.1 Introduction

The MPV Presentation schemas define a few key elements and attributes. These are focused on enhancing the presentation experience. The key components are:

- Album – presentation of a set of assets
- NMF Metadata:
 - Media Presentation Control properties – presentation-related information, such as duration
 - Transition Filter – transition effects between assets

4.2 Schema Information

The MPV presentation module uses the following schemas:

Schema group	Namespace Identifier	Conventional Namespace Prefix
Presentation	http://ns.osta.org/mpv/presentation/1.0/	mpvp:
Control	http://ns.osta.org/mpv/presentation/1.0/Control/	mpvpCtrl:
TransitionFilter	http://ns.osta.org/mpv/presentation/1.0/TransitionFilter/	mpvpTrans:

4.3 <mpvp:Album>

An album defines a collection of media assets. They are organized in foreground and background collections. During playback, foreground and background are rendered in parallel for the slideshow. For interactive browsing, only foreground assets are used.

A typical use of the Background element is to specify a backdrop still image to underly the thumbnails during interactive browsing and a sequence of audios to provide music during the slideshow.

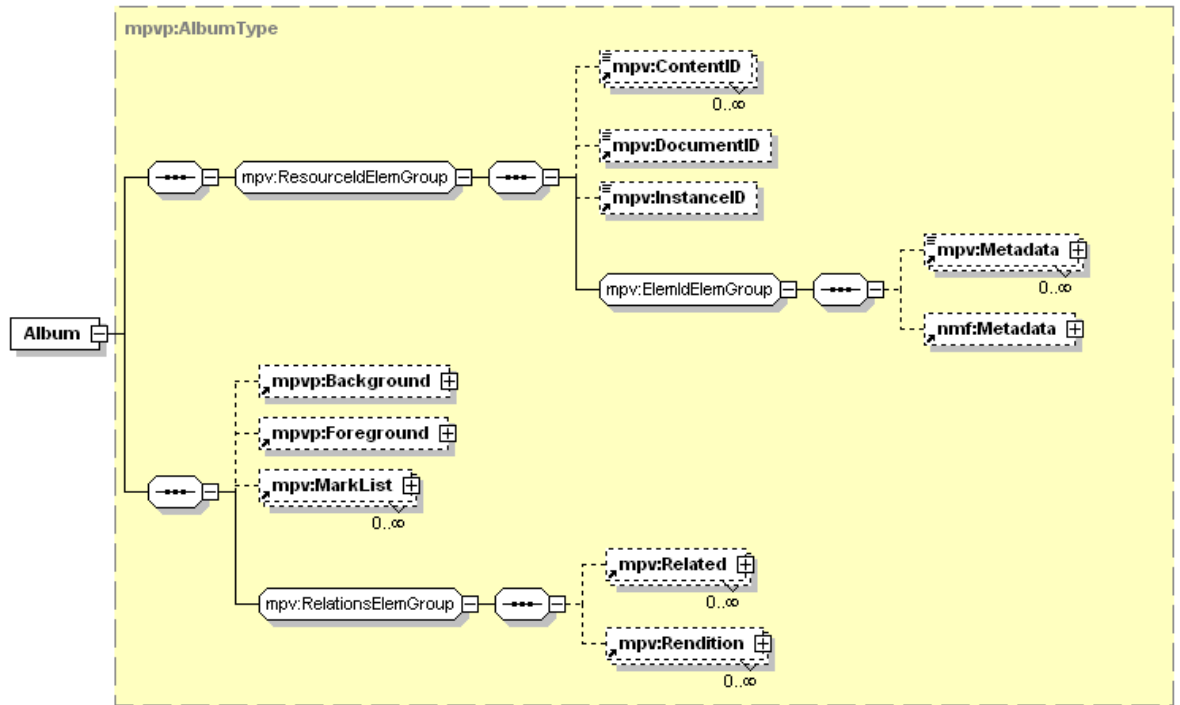
The Related element can make reference to arbitrary asset files associated with the Album but they carry no explicit semantics. For example, a file such as the DPOF AUTPRINT.MRK datafile placed in the DCF /MISC directory could be referenced using the Related element.

Renditions of an album itself represent derivatives of the collection. Typical renditions include a thumbnail representation of the album, a rendered video of the slideshow and print-formatted pages of the collection.

MarkLists of an album represent lists of album items that are distinguished in some manner. Predefined marklist types are defined by the Core specification [MPV-Core].

element Album

diagram



namespace <http://ns.osta.org/mpvp/presentation/1.0/>

type **AlbumType**

children **ContentID DocumentID InstanceID Metadata Metadata Background Foreground Related Rendition MarkList**

attributes	Name	Type	Use	Default	Fixed
	mpv:id	xs:ID			

source `<xs:element name="Album" type="mpvp:AlbumType" substitutionGroup="mpvp:ManifestChildBase"/>`

```

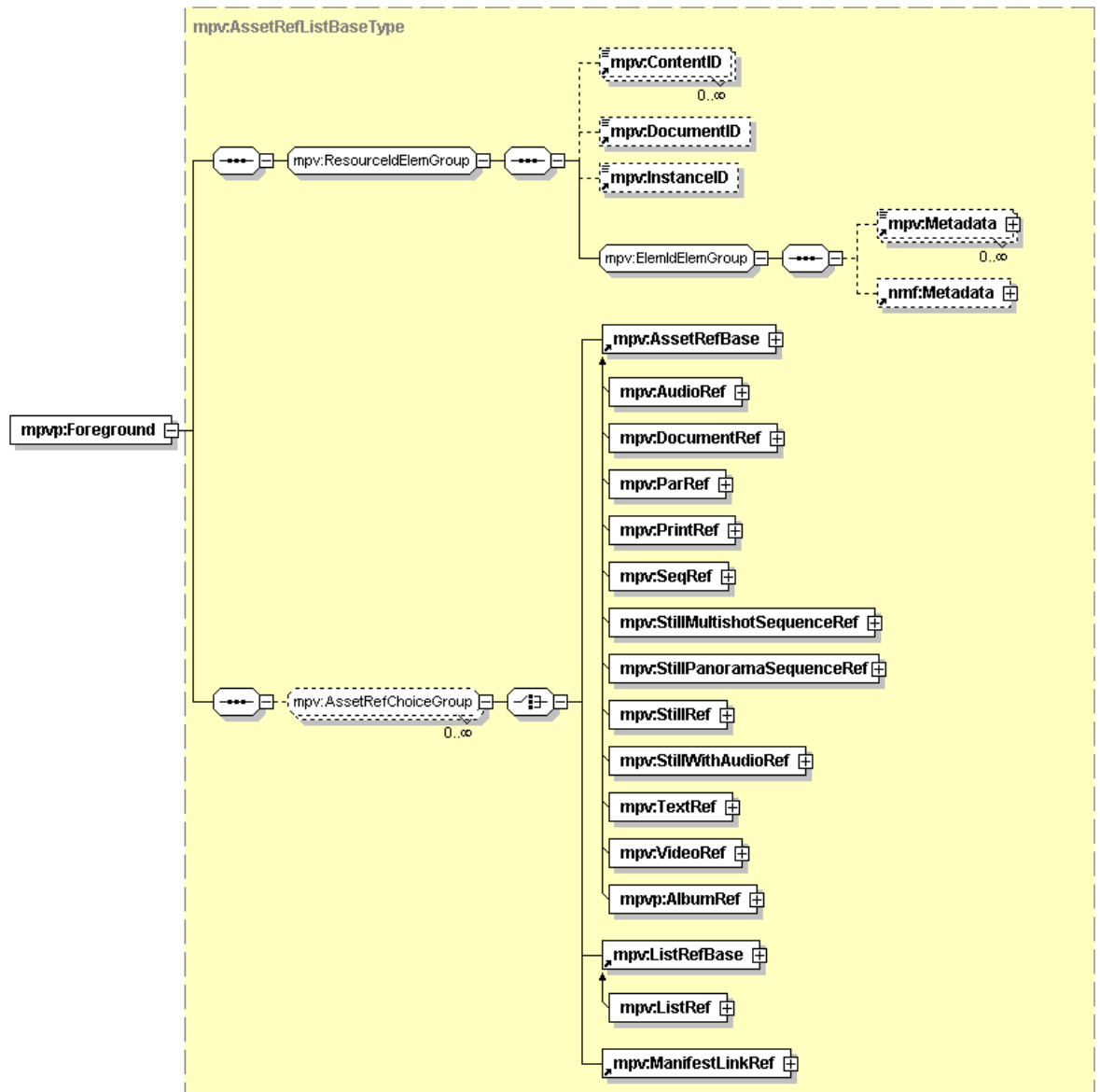
source <xs:complexType name="AlbumType">
  <xs:complexContent>
    <xs:extension base="mpvp:ManifestChildType">
      <xs:sequence>
        <xs:element ref="mpvp:Background" minOccurs="0"/>
        <xs:element ref="mpvp:Foreground" minOccurs="0"/>
        <xs:element ref="mpvp:MarkList" minOccurs="0" maxOccurs="unbounded"/>
        <xs:group ref="mpv:RelationsElemGroup"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
    
```


4.4 <mpvp:Foreground>, <mpvp:Background>

The MPV specification allows collections of assets to be organized conceptually into foreground and background content. The player decides how best to mix and present these contents. Additionally, assets may be organized into the generic Related group, which carries no specific semantics or specified as Renditions.

element **Foreground**

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/>

type [AssetRefListBaseType](#)

children	ContentID DocumentID InstanceID Metadata Metadata AssetRefBase ListRefBase ManifestLinkRef										
used by	complexType AlbumType										
attributes	<table border="1"> <thead> <tr> <th>Name</th> <th>Type</th> <th>Use</th> <th>Default</th> <th>Fixed</th> </tr> </thead> <tbody> <tr> <td>mpv:id</td> <td>xs:ID</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Name	Type	Use	Default	Fixed	mpv:id	xs:ID			
Name	Type	Use	Default	Fixed							
mpv:id	xs:ID										
source	<code><xs:element name="Foreground" type="mpv:AssetRefListBaseType"/></code>										

The Background element diagram is identical.

4.5 <mpvp:AlbumRef>

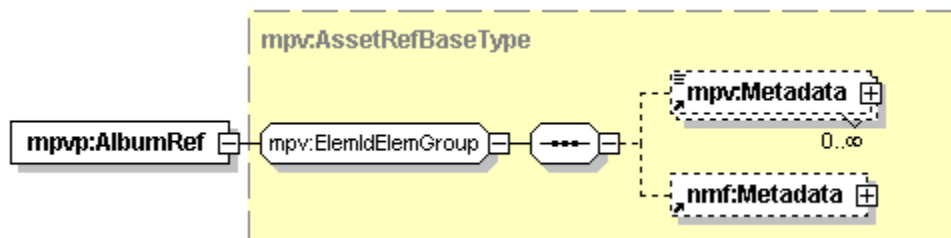
An AlbumRef element references an Album asset in either the same or a different manifest.

The use of mpvp:AlbumRef is intended to be used to refer to a specific Album. It MUST always be used with the mpv:idRef attribute, which carries the mpv:id value of the mpv:Album element in an MPV manifest that should be used. To refer to an Album in another manifest, both the mpv:idRef and mpv:manifestLinkIDRef attributes MUST be used.

If the intent is to refer to the default mpvp:Album in a manifest, then a mpv:ManifestLinkRef MUST be used instead, which will refer to the associated mpv:ManifestLink asset using the mpv:idRef attribute. In the case when no mpvp:Album is defined in the manifest, the AssetList will be used directly.

element AlbumRef

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/>

type [AssetRefBaseType](#)

children [Metadata](#) [Metadata](#)

attributes	Name	Type	Use	Default	Fixed
	manifestLinkIDRef	xs:NCName	optional		
	listIDRef	xs:NCName	optional		
	mpv:id	xs:ID			
	idRef	xs:NCName	required		

source `<xs:element name="AlbumRef" type="mpv:AssetRefBaseType" substitutionGroup="mpv:AssetRefBase"/>`

idRef

Provides the “mpv:id” value of the referenced mpvp:Album. When no listIDRef is present, the current manifest is used. When no manifestLinkIDRef is present, the current manifest is used.

listIDRef

Provides the “mpv:id” value of the AssetList or MarkList that contains the referenced asset. When no listIDRef is present, the AssetList in the current manifest is used.

manifestLinkIDRef

Provides the “mpv:id” value of the ManifestLink asset that contains the referenced asset. When no manifestLinkIDRef is present, the current manifest is used.

4.6 <mpvpCtrl:ControlProperties> Media Asset Presentation Control

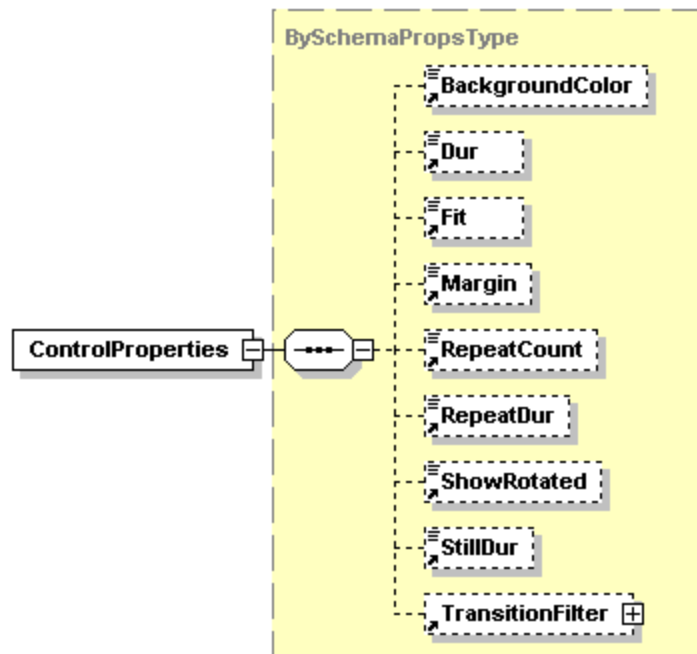
The Presentation Profile defines a schema for presentation properties. This schema can be used on media assets references in the Album by placing the properties in the nmf:Metadata element of an asset reference.

This schema is derived from the SMIL specifications [SMIL10] and [SMIL20]. The SMIL language and SMIL players are seen as an attractive tools for presenting MPV documents. A carefully constrained set of SMIL elements and attributes are chosen for this basic presentation schema. The emphasis was on selecting just those features essential to deliver a basic user experience that is easy to use and compelling and that can also be implemented across many platforms and embedded devices.

The guiding practice for applications and devices that process and present MPV content based on this schema is that presentation properties inherit to lower areas of scope. For example, a <mpvp:Fit> value specified as metadata of the <mpv:Foreground> element itself will apply to all its children.

element ControlProperties

diagram



namespace <http://ns.osta.org/mpvp/presentation/1.0/Control/>

type [BySchemaPropsType](#)

children [BackgroundColor](#) [Dur](#) [Fit](#) [Margin](#) [RepeatCount](#) [RepeatDur](#) [ShowRotated](#) [StillDur](#) [TransitionFilter](#)

source `<xs:element name="ControlProperties" type="BySchemaPropsType" substitutionGroup="nmf:BySchemaPropsBase"/>`

source `<xs:complexType name="BySchemaPropsType">
 <xs:complexContent>`

```

<xs:extension base="nmf:BySchemaPropsType">
  <xs:sequence>
    <xs:element ref="BackgroundColor" minOccurs="0"/>
    <xs:element ref="Dur" minOccurs="0"/>
    <xs:element ref="Fit" minOccurs="0"/>
    <xs:element ref="Margin" minOccurs="0"/>
    <xs:element ref="RepeatCount" minOccurs="0"/>
    <xs:element ref="RepeatDur" minOccurs="0"/>
    <xs:element ref="ShowRotated" minOccurs="0"/>
    <xs:element ref="StillDur" minOccurs="0"/>
    <xs:element ref="TransitionFilter" minOccurs="0"/>
  </xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>

```

4.6.1 Properties: **mpvpCtrl:BackgroundColor**

Specifies the background color of the element and all subelements. This is used to fill any visual region not occluded by the asset's rendition. The default background color is "transparent", which implies that, by default, the implementation dependent window background will be shown. The vocabulary for BackgroundColor is defined by CSS2 system colors [CSS2].

element **BackgroundColor**

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/Control/>

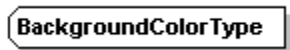
type [BackgroundColorType](#)

used by complexType [BySchemaPropsType](#)

source `<xs:element name="BackgroundColor" type="BackgroundColorType"/>`

complexType **BackgroundColorType**

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/Control/>

type extension of **xs:string**

used by element [BackgroundColor](#)

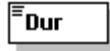
source `<xs:complexType name="BackgroundColorType">
 <xs:simpleContent>
 <xs:extension base="xs:string"/>
 </xs:simpleContent>
</xs:complexType>`

4.6.2 Properties: mpvpCtrl:Dur

Specifies the simple duration.

element Dur

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/Control/>

type [DurType](#)

used by complexType [BySchemaPropsType](#)

source `<xs:element name="Dur" type="DurType"/>`

simpleType DurationType

namespace	http://ns.osta.org/mpv/presentation/1.0/Control
type	xs:string
used by	element Properties/Dur
source	<code><xs:simpleType name="DurationType"> <xs:restriction base="xs:string"/> </xs:simpleType></code>

The attribute value can be any of the following:

Clock-value

Specifies the length of the simple duration, measured in element active time.
Value must be greater than 0.

Clock values have the following syntax:

```
Clock-value      ::= Timecount -value
Timecount-value  ::= Timecount ( "." Fraction)?
Fraction         ::= DIGIT+
Timecount        ::= DIGIT+
DIGIT            ::= [0-9]
```

"media"

Specifies the simple duration as the intrinsic media duration. This is only valid for elements that define media.

"indefinite"

Specifies the simple duration as indefinite.

4.6.3 Properties: mpvpCtrl:Fit

This attribute specifies the behavior if the intrinsic height and width of a visual media asset differ from the values specified by the height and width attributes in the "region" element. This attribute replaces the behavior defined in CSS2.

element Fit

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/Control/>

type [FitType](#)
 used by complexType [BySchemaPropsType](#)
 source `<xs:element name="Fit" type="FitType"/>`

simpleType FitType

namespace	http://ns.osta.org/mpv/presentation/1.0/Control/
type	union of (FitBaseType , xs:anyURI)
used by	element Properties/Fit
source	<code><xs:simpleType name="FitType"> <xs:union memberTypes="mpvpCtrl:FitBaseType xs:anyURI"/> </xs:simpleType></code>

simpleType FitBaseType

namespace	http://ns.osta.org/mpv/presentation/1.0/Control/
type	restriction of xs:string
used by	simpleType FitType
facets	enumeration hidden enumeration fill enumeration meet enumeration scroll enumeration slide
source	<code><xs:simpleType name="FitBaseType"> <xs:restriction base="xs:string"> <xs:enumeration value="hidden"/> <xs:enumeration value="fill"/> <xs:enumeration value="flexFill"/> <xs:enumeration value="meet"/> <xs:enumeration value="scroll"/> <xs:enumeration value="slice"/> </xs:restriction> </xs:simpleType></code>

This attribute can have the following values:

fill

Scale the asset's height and width independently so that the content just touches all edges of the box.

flexFill

Same as fill but with the allowance the processor may apply additional context information to modify the result in order to achieve a better viewing experience. An example would be a processor that wouldn't upsample a small picture if the viewing area was too much larger than the picture.

hidden (default)

- If the intrinsic height (width) of the media asset element is smaller than the height (width) defined in the "region" element, render the asset starting from the top (left) edge and fill up the remaining height (width) with the background color.
- If the intrinsic height (width) of the media asset element is greater than the height (width) defined in the "region" element, render the asset starting from the top (left) edge until the height (width) defined in the "region" element is reached, and clip the parts of the asset below (right of) the height (width).

meet

Scale the visual media asset while preserving its aspect ratio until its height or width is equal to the value specified by the height or width attributes, while none of the content is clipped. The asset's left top corner is positioned at the top-left coordinates of the box, and empty space at the left or bottom is filled up with the background color.

scroll

A scrolling mechanism should be invoked when the element's rendered contents exceed its bounds.

slice

Scale the visual media asset while preserving its aspect ratio so that its height or width are equal to the value specified by the height and width attributes while some of the content may get clipped. Depending on the exact situation, either a horizontal or a vertical slice of the visual media asset is displayed. Overflow width is clipped from the right of the media asset. Overflow height is clipped from the bottom of the media asset.

4.6.4 Properties: mpvpCtrl:Margin

Specifies the percentage of the percentage of the height and width of the region that should be allocated as a margin area around the media asset element. This value is specified as a floating point number between 0 and 1.

element Margin

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/Control/>

type [MarginType](#)

used by complexType [BySchemaPropsType](#)

source `<xs:element name="Margin" type="MarginType"/>`

complexType MarginType

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/Control/>

type extension of **xs:float**


used by element [Margin](#)

source `<xs:complexType name="MarginType">
 <xs:simpleContent>
 <xs:extension base="xs:float"/>
</xs:simpleContent>
</xs:complexType>`

4.6.5 Properties: mpvpCtrl:RepeatCount

Specifies the number of iterations of the simple duration.

element **Properties/RepeatCount**

diagram	
namespace	http://ns.osta.org/mpv/presentation/1.0/Control/
type	xs:string
source	<code><xs:element name="RepeatCount" type="xs:string" minOccurs="0"/></code>

It can have the following attribute values:

numeric value

This is a (base 10) "floating point" numeric value that specifies the number of iterations. It can include partial iterations expressed as fraction values. A fractional value describes a portion of the simple duration. Values must be greater than 0.


"indefinite"

The element is defined to repeat indefinitely (subject to the constraints of the parent time container).

4.6.6 Properties: mpvpCtrl:RepeatDur

Specifies the total duration for repeat.

element **Properties /RepeatDur**

diagram	
namespace	http://ns.osta.org/mpv/presentation/1.0/Control/
type	xs:string
source	<code><xs:element name="RepeatDur" type="xs:string" minOccurs="0"/></code>

It can have the following attribute values:

Clock-value

Specifies the duration in element active time to repeat the simple duration.


"indefinite"

The element is defined to repeat indefinitely (subject to the constraints of the parent time container).

4.6.7 Properties: mpvpCtrl:ShowRotated

Specifies the total degrees from 0 to 360 for rotation of the asset when presented.

element **Properties /ShowRotated**

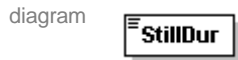
diagram	
namespace	http://ns.osta.org/mpv/presentation/1.0/Control/
type	xs:integer
source	<code><xs:element name="ShowRotated" type="xs:integer" minOccurs="0"/></code>

The default value is 0.

4.6.8 Properties: mpvpCtrl:StillDur

Specifies, in seconds, the length of time that Stills should be displayed during a sequential presentation of assets.

element **StillDur**



namespace <http://ns.osta.org/mpv/presentation/1.0/Control/>

type [StillDurType](#)

used by complexType [BySchemaPropsType](#)

source `<xs:element name="StillDur" type="StillDurType"/>`

complexType **StillDurType**



namespace <http://ns.osta.org/mpv/presentation/1.0/Control/>

type extension of **xs:float**

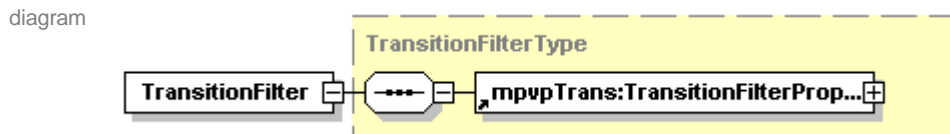
used by element [StillDur](#)

source `<xs:complexType name="StillDurType">
 <xs:simpleContent>
 <xs:extension base="xs:float"/>
</xs:simpleContent>
</xs:complexType>`

4.6.9 Property: mpvpCtrl:TransitionFilter

Specifies the transitionFilter that should be applied to the media asset.

element **TransitionFilter**



namespace <http://ns.osta.org/mpv/presentation/1.0/Control/>

type [TransitionFilterType](#)

children [TransitionFilterProperties](#)

used by complexType [BySchemaPropsType](#)

source `<xs:element name="TransitionFilter" type="TransitionFilterType"/>`

source `<xs:complexType name="TransitionFilterType">
 <xs:complexContent>
 <xs:extension base="nmf:CompositePropType">
 <xs:sequence>
 <xs:element ref="mpvpTrans:TransitionFilterProperties"/>
 </xs:sequence>
</xs:extension>`

```
</xs:complexContent>
</xs:complexType>
```

The value of the property is an mpvpTrans:TransitionFilterProperties element (see below).

4.6.10 Example of syntax

In the following example, presentation properties are specified for the Still image referenced in the Album foreground.

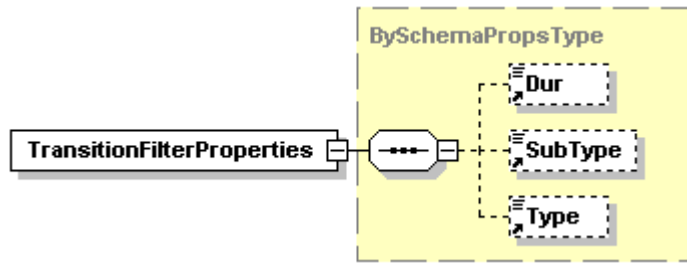
```
<file:Manifest
  xmlns:file="http://ns.osta.org/manifest/1.0/"
  xmlns:mpv="http://ns.osta.org/mpv/1.0/"
  xmlns:nmf="http://ns.osta.org/nmf/1.0/"
  xmlns:mpvp="http://ns.osta.org/mpv/presentation/1.0/"
  xmlns:mpvpCtrl="http://ns.osta.org/mpv/presentation/1.0/Control/"
  xmlns:mpvpTrans="http://ns.osta.org/mpv/presentation/1.0/TransitionFilter/"
>
  . . .
  <mpvp:Album mpv:id="ALB001">
    <mpvp:Foreground>
      . . .
      <mpvp:StillRef mpv:idRef="ID000200">
        . . .
        <nmf:Metadata>
          <ControlProperties xmlns="http://ns.osta.org/mpv/presentation/1.0/Control/">
            <BackgroundColor>Blue</BackgroundColor>
            <Fit>meet</mpvpCtrl:Fit>
            <TransitionFilter>
              <TransitionFilterProperties
                xmlns="http://ns.osta.org/mpv/presentation/1.0/mpvpTrans">
                <Type>barWipe</Type>
              </TransitionFilterProperties>
            </TransitionFilter>
          </ControlProperties>
        </nmf:Metadata>
      </mpvp:StillRef>
    </mpvp:Foreground>
  </mpvp:Album>
  . . .
</file:Manifest>
```

4.7 **<mpvpTrans:TransitionFilterProperties>**

A transition filter that implements a transition from the asset before to the asset after. It is applied at the completion of presenting the asset on which it is defined and transitioning into the next asset that is defined. This element is strictly presentation oriented. It is specified as the value of the TransitionFilter property in the mpvp schema.

element **TransitionFilterProperties**

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/TransitionFilter/>

type [BySchemaPropsType](#)

children [Dur](#) [SubType](#) [Type](#)

used by complexType [TransitionFilterType](#)

source

```
<xs:element name="TransitionFilterProperties" type="BySchemaPropsType"
substitutionGroup="nmf:BySchemaPropsBase"/>
```

source

```
<xs:complexType name="BySchemaPropsType">
<xs:complexContent>
<xs:extension base="nmf:BySchemaPropsType">
<xs:sequence>
<xs:element ref="Dur" minOccurs="0"/>
<xs:element ref="SubType" minOccurs="0"/>
<xs:element ref="Type" minOccurs="0"/>
</xs:sequence>
</xs:extension>
</xs:complexContent>
</xs:complexType>
```

4.7.1 Property: mpvpTrans:Dur

The default duration is the intrinsic duration built into the transition. All of the transitions have a default duration of 1 second.

element **Dur**

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/TransitionFilter/>

type [DurType](#)

used by complexType [BySchemaPropsType](#)

source

```
<xs:element name="Dur" type="DurType"/>
```

source

```
<xs:complexType name="DurType">
<xs:simpleContent>
<xs:extension base="xs:float"/>
</xs:simpleContent>
</xs:complexType>
```

4.7.2 Property: **mpvpTrans:Subtype**

This is the subtype of the transition. This parameter is optional and if specified, must be one of the transition subtypes appropriate for the specified type as listed. If this parameter is not specified then the transition reverts to the default subtype for the specified transition type.

element **SubType**

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/TransitionFilter/>

type [SubTypeType](#)

used by complexType [BySchemaPropsType](#)

source `<xs:element name="SubType" type="SubTypeType"/>`

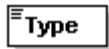
source `<xs:complexType name="SubTypeType">
<xs:simpleContent>
<xs:extension base="xs:string"/>
</xs:simpleContent>
</xs:complexType>`

4.7.3 Property: **mpvpTrans:Type**

This is the type or family of transition. This attribute is required and must be one of the transition families listed.

element **Type**

diagram



namespace <http://ns.osta.org/mpv/presentation/1.0/TransitionFilter/>

type [TypeType](#)

used by complexType [BySchemaPropsType](#)

source `<xs:element name="Type" type="TypeType"/>`

source `<xs:complexType name="TypeType">
<xs:simpleContent>
<xs:extension base="xs:string"/>
</xs:simpleContent>
</xs:complexType>`

4.7.4 Recommended Transitions

MPV Player implementations are not required to implement any transitions. If they do implement transitions, the following transition types are recommended to be implemented first.

Transition type	Default Transition subtype
barWipe	leftToRight

irisWipe	rectangle
clockWipe	clockwiseTwelve
snakeWipe	topLeftHorizontal

Please refer to the appendix for a complete set of defined transition types and subtypes.

Chapter 5: MPV Presentation Module Practices

The Presentation Module practices are largely recommended because there is an on-going growth of basic and innovative presentation techniques and attributes. Rather than strive for completeness or overspecification of behaviour, MPV strives to provide just enough presentation schema and practices to enable applications to provide the user two basic capabilities: browsing and watching. Close behind in user value for photo-video content is printing. Additional presentation capabilities may be expressed as custom metadata and processed by specialized players.

5.1 Best Practices for Linking Manifests and Albums

When specifying links to Albums and Manifests in MPV, two mechanisms are available. `mpv:ManifestLinkRef` is an explicit link to an entire manifest and uses the `mpv:idRef` attribute to identify which manifest in the `AssetList`. It is processed according to general manifest processing practices, including use of a default `mpvp:Album` when present. `mpvp:AlbumRef` allows for an explicit link to a particular album in some manifest, using the `mpv:idRef` attribute to identify the album in the manifest identified with the attribute `mpv:manifestLinkIdRef`. Note that in this case, the `mpv:idRef` is processed in the context of the target manifest document. The `mpv:id` value is the identifier of the `mpvp:Album` element.

5.2 Best Practices for Presenting a Manifest

An OSTA XML manifest [MANIFEST] may contain more than one Album. For presentation purposes, the first album is the default Album; other content may be ignored. If additional Albums in a manifest are to be presented, they must be referred to explicitly from another Album, such as the default Album; alternately, the presentation application may choose to present the user with the list of albums defined in the manifest.

A key presentation characteristic is perceived startup time from storage media insertion or presentation invocation to begin of the presentation. This performance can be accelerated in various ways:

- place the manifest in a location that is quickly found by the scanning algorithm for manifests
- provide the user positive feedback that the Manifest is being loaded or processed
- load only one album at a time
- provide Screen and Thumbnail Renditions for images and video
- present using placeholders for assets whose `lastURL` values require fixup; then slowly fixup broken `lastURLs`

5.3 Best Practices for Watching

The basic watch experience is to play back the content in the MPV album as follows. The Background and Foreground parts of an Album have the same expressive power. Background assets and metadata are played under foreground assets and metadata, both in z-order and in audio mixing.

Using this behavior, a typical watch experience of a slideshow can be provided:

- Foreground sequence of Still, Video, and Audio content
- Background music track of Audio content

For better performance, use of "Screen" Renditions is recommended when present.

More advanced watching applications will provide the user to pause, rewind, and fast forward through the content. Additional operations may be available directly on the content as watched, such as "Mark" or "Print".

UNSUPPORTED TYPES

When an asset has a media type that isn't supported for playback (e.g. a GIF image), the recommended behaviour for the watch application is to skip silently over the unsupported asset.

ALBUMREF, MANIFESTLINKREF

When an asset is an Album, the recommended behaviour for the watch application is to skip silently over the AlbumRef and ManifestLinkRef.

PROVIDED SHOWS

Watch applications should study the Renditions available on the Album or Foreground for a "Show" Rendition video. This represents a pre-computed rendition of the watch experience and should be used in preference to the watch experience the application can produce itself or at least presented as an option to the user. The "Show" rendition provides a means for sophisticated authoring and production applications to separately produce an advanced watch experience that can be accessed simply by playing a video. There is a user expectation that the Show content and Album content be approximately the same.

5.4 Best Practices for Browsing

The basic browsing experience should provide two basic capabilities:

- browsing of thumbnails of photo-video content
- browsing of full-screen views of the photo-video content

For better performance in thumbnail mode, use of "Thumbnail" Renditions for both stills and video is recommended. For better performance in full-screen mode, use of "Screen" Renditions for stills is recommended.

Advanced browsing applications will treat StillsMultishotSequence and StillsPanoramaSequence specially. For example, in thumbnail browse mode, they may show just one of the stills and iconically represent that the item is a sequence of stills.

UNSUPPORTED TYPES

When an asset has a media type that isn't supported for playback (e.g. a GIF image), the recommended behaviour for the browsing application is to show an empty thumbnail with a message that the media type is not supported by this player.

ALBUMREF, MANIFESTLINKREF

When the Album contains references to other Albums or Manifests, these are presented to the user as choices to link to another Album. A "Thumbnail" or "Screen" Rendition on the AlbumRef or ManifestLinkRef can offer a visual depiction of the target Album. The [DC-NMF] metadata can be used to provide information about the album or manifest.

When browsing, it is recommended that AlbumRefs and ManifestLinkRefs be presented just as another type of asset, albeit one that when selected opens another album.

RENDITIONS

Other renditions at the album and asset levels may be of interest. In particular, Print assets may offer useful content to print, such as thumbnail index pages or CD labels. Browsing applications are recommended to provide the user access to renditions and assets of the type "Print" and "Text".

5.5 Best Practices for Supported Formats

The following formats SHOULD be supported by all players that support a given MPV asset type.

Stills:

- JPEG, in both Exif and JFIF variations

Video:

- MPEG1

Audio:

- MPEG1 Layer 3 (MP3)

The following formats MAY be supported for playback by players that desire to play a large percentage of the photo-video content they may encounter, based on current practices for Digital Still Camera category products and related imaging software applications.

Stills:

- JPEG, in both Exif and JFIF variations
- TIFF
- GIF
- PNG

Video:

- AVI MJPEG
- MOV PJPEG
- MPEG1
- MPEG1 VideoCD
- MPEG2

Audio:

- WAV
- MPEG1 Layer 3 (MP3)
- MPEG1 Layer 2

Print:

- PDF

5.6 Examples

5.6.1 List of Albums with Background Image and Album Thumbnails

This is a complete example of a list of 2 albums in the foreground. The background has a single reference to a Still asset that is described in the assetlist of the same manifest that contains the first album. Each Album and ManifestLink also has a thumbnail rendition that may be used for presentation of the link.

```
<?xml version="1.0" encoding="UTF-8"?>
<file:Manifest
  xmlns:file="http://ns.osta.org/manifest/1.0/"
  xmlns:mpv="http://ns.osta.org/mpv/1.0/"
  xmlns:mpvp="http://ns.osta.org/mpv/presentation/1.0/"
  xmlns:nmf="http://ns.osta.org/nmf/1.0/" >
  <nmf:Metadata>
    <Properties xmlns="http://ns.osta.org/manifest/1.0/">
      <ProfileBag>
        <Profile>http://ns.osta.org/mpv/basic/1.0/</Profile>
        <Profile>http://ns.osta.org/mpv/presentation/1.0/</Profile>
      </ProfileBag>
    </Properties>
  </nmf:Metadata>

  <mpvp:Album>
    <mpvp:Background>
      <mpv:StillRef mpv:manifestLinkIDRef="ID000100" mpv:idRef="ID002" />
    </mpvp:Background>
    <mpvp:Foreground>
      <!-- Album ID001 in another manifest -->
      <mpvp:AlbumRef mpv:manifestLinkIDRef="ID000200" mpv:idRef="ID001"/>
      <!-- Default album in another manifest -->
      <mpvp:ManifestLinkRef mpv:idRef="ID000300" />
    </mpvp:Foreground>
  </mpvp:Album>

  <mpv:AssetList>

  <mpv:Still mpv:id="ID000100">
    <mpv:LastURL>background.jpg</mpv:LastURL>
  </mpv:Still>

  <!-- ManifestLink -->
  <mpv:ManifestLink mpv:id="ID000200">
    <mpv:ContentID>urn:osta-
    org:mpv:dsig:md5:all:EF886AEFA3B340da971BAF09B17DBC122</mpv:ContentID>
```

```

<mpv:LastURL mpv:filesystem="ISO8859-1">COLLECT1/ALBUM.PVM</mpv:LastURL>
<mpv:LastURL mpv:filesystem="NTFS">Collection 1/album.pvm</mpv:LastURL>
<nmf:Metadata>
  <Properties xmlns="http://purl.org/dc/elements/1.1/">
    <title>Collection 1 - stills asset list</title>
  </Properties>
</nmf:Metadata>
<mpv:Rendition mpv:renditionUsage="thumbnail">
  <mpv:StillRef mpv:idRef="ID000101"/>
</mpv:Rendition>
</mpv:ManifestLink>

<mpv:Still mpv:id="ID000201">
  <mpv:LastURL>thumbs/album-234s349j6.jpg</mpv:LastURL>
</mpv:Still>

<!-- ManifestLink -->
<mpv:ManifestLink mpv:id="ID000300">
  <mpv:ContentID>urn:osta-
org:mpv:dsig:md5:all:EF886AEFA3B340da971BAF09B17DBC122</mpv:ContentID>
  <mpv:LastURL mpv:filesystem="ISO8859-1">COLLECT4/ALBUM.PVM</mpv:LastURL>
  <mpv:LastURL mpv:filesystem="NTFS">Collection 4/album.pvm</mpv:LastURL>
  <nmf:Metadata>
    <Properties xmlns="http://purl.org/dc/elements/1.1/">
      <title>Collection 4 - full multimedia album</title>
    </Properties>
  </nmf:Metadata>
  <mpv:Rendition mpv:renditionUsage="thumbnail">
    <mpv:StillRef mpv:idRef="ID000301"/>
  </mpv:Rendition>
</mpv:ManifestLink>

<mpv:Still mpv:id="ID000301">
  <mpv:LastURL>thumbs/album-349ks923ft.jpg</mpv:LastURL>
</mpv:Still>

</mpv:AssetList>
</file:Manifest>

```

5.6.2 Album Renditions of a Video Slideshow and Printed Content

This is a complete example of an album that has two alternate renditions. One is a video that is a pre-generated rendition of the album's contents and the second is a pre-generated print rendition of the album's contents. The Stills that make up the contents of the Album's foreground and background track are all described in a separate manifest which is identified in the asset list with the mpv:id of "ID000100". The video rendition is described in the external manifest while the print rendition is described in this manifest.

```

<?xml version="1.0" encoding="UTF-8"?>
<file:Manifest
  xmlns:file="http://ns.osta.org/manifest/1.0/"
  xmlns:mpv="http://ns.osta.org/mpv/1.0/"
  xmlns:mpvp="http://ns.osta.org/mpv/presentation/1.0/"
  xmlns:nmf="http://ns.osta.org/nmf/1.0/" >

  <nmf:Metadata>

```

```

<Properties xmlns="http://ns.osta.org/manifest/1.0/">
  <ProfileBag>
    <Profile>http://ns.osta.org/mpv/basic/1.0/</Profile>
    <Profile>http://ns.osta.org/mpv/presentation/1.0/</Profile>
  </ProfileBag>
</Properties>
</nmf:Metadata>

<mpvp:Album>
  <mpvp:Background>
    <mpv:StillRef mpv:manifestLinkIDRef="ID000100" mpv:idRef="ST005" />
  </mpvp:Background>
  <mpvp:Foreground>
    <mpv:StillRef mpv:manifestLinkIDRef="ID000100" mpv:idRef="ST001" />
    <mpv:StillRef mpv:manifestLinkIDRef="ID000100" mpv:idRef="ST002" />
    <mpv:StillRef mpv:manifestLinkIDRef="ID000100" mpv:idRef="ST003" />
  </mpvp:Foreground>
  <mpv:Rendition mpv:renditionUsage="show">
    <mpv:VideoRef mpv:manifestLinkIDRe="ID000100" mpv:idRef="VD001" />
  </mpv:Rendition>
  <mpv:Rendition mpv:renditionUsage="print">
    <mpv:PrintRef mpv:idRef="PR001" />
  </mpv:Rendition>
</mpvp:Album>

<mpv:AssetList>

  <!-- Print Rendition of Album ->
  <mpv:Print mpv:id="PR001">
    <mpv:LastURL>Index.pdf</mpv:LastURL>
    <nmf:Metadata>
      <Properties xmlns="http://purl.org/dc/elements/1.1/">
        <format>application/pdf</format>
      </Properties>
    </nmf:Metadata>
  </mpv:Document>

  <!-- ManifestLink -->
  <mpv:ManifestLink mpv:id="ID000100">
    <mpv:ContentID>urn:osta-
org:mpv:dsig:md5:all:EF886AEFA3B340da971BAF09B17DBC122</mpv:ContentID>
    <mpv:LastURL mpv:filesystem="ISO8859-1">COLLECT1/ALBUM.PVM</mpv:LastURL>
    <mpv:LastURL mpv:filesystem="NTFS">Collection 1/album.pvm</mpv:LastURL>
    <nmf:Metadata>
      <Properties xmlns="http://purl.org/dc/elements/1.1/">
        <title>Collection 1 - stills asset list</title>
      </Properties>
    </nmf:Metadata>
  </mpv:ManifesteLink>

</mpv:AssetList>

</file:Manifest>

```

Appendix I: Transition Types Reference

The following table is excerpted from the SMIL 2.0 specification. It lists the vocabulary of defined transition types and subtypes. The SMPTE Wipe Codes (where appropriate) are provided in parentheses after the subtype name and are for reference only. The Wipe Codes are not part of the transition subtype name. The default transition subtype for each type is indicated by the word [default].

Transition type	Transition subtypes (SMPTE Wipe Codes in parentheses)
Edge Wipes - wipes occur along an edge	
"barWipe"	"leftToRight" (1) [default], "topToBottom" (2)
"boxWipe"	"topLeft" (3) [default], "topRight" (4), "bottomRight" (5), "bottomLeft" (6), "topCenter" (23), "rightCenter" (24), "bottomCenter" (25), "leftCenter" (26)
"fourBoxWipe"	"cornersIn" (7) [default], "cornersOut" (8)
"barnDoorWipe"	"vertical" (21) [default], "horizontal" (22), "diagonalBottomLeft" (45), "diagonalTopLeft" (46)
"diagonalWipe"	"topLeft" (41) [default], "topRight" (42)
"bowTieWipe"	"vertical" (43) [default], "horizontal" (44)
"miscDiagonalWipe"	"doubleBarnDoor" (47) [default], "doubleDiamond" (48)
"veeWipe"	"down" (61) [default], "left" (62), "up" (63), "right" (64)
"barnVeeWipe"	"down" (65) [default], "left" (66), "up" (67), "right" (68)
"zigZagWipe"	"leftToRight" (71) [default], "topToBottom" (72)
"barnZigZagWipe"	"vertical" (73) [default], "horizontal" (74)
Iris Wipes - shapes expand from the center of the media	
"irisWipe"	"rectangle" (101) [default], "diamond" (102)

"triangleWipe"	"up" (103) [default], "right" (104), "down" (105), "left" (106)
"arrowHeadWipe"	"up" (107) [default], "right" (108), "down" (109), "left" (110)
"pentagonWipe"	"up" (111) [default], "down" (112)
"hexagonWipe"	"horizontal" (113) [default], "vertical" (114)
"ellipseWipe"	"circle" (119) [default], "horizontal" (120), "vertical" (121)
"eyeWipe"	"horizontal" (122) [default], "vertical" (123)
"roundRectWipe"	"horizontal" (124) [default], "vertical" (125)
"starWipe"	"fourPoint" (127) [default], "fivePoint" (128), "sixPoint" (129)
"miscShapeWipe"	"heart" (130) [default], "keyhole" (131)
Clock Wipes - rotate around a center point	
"clockWipe"	"clockwiseTwelve" (201) [default], "clockwiseThree" (202), "clockwiseSix" (203), "clockwiseNine" (204)
"pinWheelWipe"	"twoBladeVertical" (205) [default], "twoBladeHorizontal" (206), "fourBlade" (207)
"singleSweepWipe"	"clockwiseTop" (221) [default], "clockwiseRight" (222), "clockwiseBottom" (223), "clockwiseLeft" (224), "clockwiseTopLeft" (241), "counterClockwiseBottomLeft" (242), "clockwiseBottomRight" (243), "counterClockwiseTopRight" (244)
"fanWipe"	"centerTop" (211) [default], "centerRight" (212), "top" (231), "right" (232), "bottom" (233), "left" (234)
"doubleFanWipe"	"fanOutVertical" (213) [default], "fanOutHorizontal" (214), "fanInVertical" (235), "fanInHorizontal" (236)
"doubleSweepWipe"	"parallelVertical" (225) [default], "parallelDiagonal" (226), "oppositeVertical" (227), "oppositeHorizontal" (228), "parallelDiagonalTopLeft" (245), "parallelDiagonalBottomLeft" (246)
"saloonDoorWipe"	"top" (251) [default], "left" (252), "bottom" (253), "right" (254)
"windshieldWipe"	"right" (261) [default], "up" (262), "vertical" (263), "horizontal" (264)
Matrix Wipes - media is revealed in squares following a pattern	
"snakeWipe"	"topLeftHorizontal" (301) [default], "topLeftVertical" (302), "topLeftDiagonal" (303), "topRightDiagonal" (304), "bottomRightDiagonal" (305), "bottomLeftDiagonal" (306)
"spiralWipe"	"topLeftClockwise" (310) [default], "topRightClockwise" (311), "bottomRightClockwise" (312), "bottomLeftClockwise" (313), "topLeftCounterClockwise" (314), "topRightCounterClockwise" (315), "bottomRightCounterClockwise" (316), "bottomLeftCounterClockwise" (317)
"parallelSnakesWipe"	"verticalTopSame" (320), [default] "verticalBottomSame" (321), "verticalTopLeftOpposite" (322), "verticalBottomLeftOpposite" (323), "horizontalLeftSame" (324), "horizontalRightSame" (325), "horizontalTopLeftOpposite" (326), "horizontalTopRightOpposite" (327), "diagonalBottomLeftOpposite" (328), "diagonalTopLeftOpposite" (329)

"boxSnakesWipe"	"twoBoxTop" (340) [default], "twoBoxBottom" (341), "twoBoxLeft" (342), "twoBoxRight" (343), "fourBoxVertical" (344), "fourBoxHorizontal" (345)
"waterfallWipe"	"verticalLeft" (350) [default], "verticalRight" (351), "horizontalLeft" (352), "horizontalRight" (353)
Non-SMPTE Wipes	
"pushWipe"	"fromLeft" [default], "fromTop", "fromRight", "fromBottom"
"slideWipe"	"fromLeft" [default], "fromTop", "fromRight", "fromBottom"
"fade"	"crossfade" [default], "fadeToColor", "fadeFromColor"

The "pushWipe" transitions looks as if the destination media "pushes" the background media away. In other words, both the background media and the destination media are moving.

In the "slideWipe" transitions, the destination media moves, but the background media does not. The visual effect of "slideWipe" transitions is that the destination media is "sliding" in across the background media.

The "fade" transitions are pixel-by-pixel blends between the destination media and either the background media or a specified color.

Appendix II: References

[CSS2]

"Cascading Style Sheets, level 2", Bert Bos, Håkon Wium Lie, Chris Lilley, Ian Jacobs. W3C Recommendation 12 May 1998.

Available at <http://www.w3.org/TR/REC-CSS2>

[DATETIME]

"Date and Time Formats", M. Wolf, C. Wicksteed. W3C Note 27 August 1998,

Available at: <http://www.w3.org/TR/NOTE-datetime>

[DC]

"Dublin Core Metadata Initiative", a Simple Content Description Model for Electronic Resources.

Available at <http://purl.org/DC/>

[DC-NMF]

"Dublin Core Normalized Metadata Format Profile Specification 1.0"; OSTA, 2002.

Available at <http://www.osta.org/mpv/>

[DCF-1999]

"Design rule for Camera File system, Version 1.0", JEIDA standard, English Version 1999.1.7, Japanese Electronic Industry Development Association (JEIDA).

[DIG35-2001]

"DIG35 Specification – Metadata for Digital Images, Version 1.1", June 18, 2001, International Imaging Industry Association (I3A) [recently formed by combining the Digital Imaging Group and PIMA].

<http://www.i3a.org>

[ISO8601]

"Data elements and interchange formats - Information interchange - Representation of dates and times", International Organization for Standardization, 1998.

[ISO10646]

""Information Technology -- Universal Multiple-Octet Coded Character Set (UCS) -- Part 1: Architecture and Basic Multilingual Plane", ISO/IEC 10646-1:1993. This reference refers to a set of codepoints that may evolve as new characters are assigned to them. This reference therefore includes future amendments as long as they do not change character assignments up to and including the first five amendments to ISO/IEC 10646-1:1993. Also, this reference assumes that the character sets defined by ISO 10646 and Unicode remain character-by-character equivalent. This reference also includes future publications of other parts of 10646 (i.e., other than Part 1) that define characters in planes 1-16. "

[JFIF]

"JPEG File Interchange Format, Version 1.02"; Eric Hamilton, September 1992.
Available at <http://www.w3.org/Graphics/JPEG/jfif.txt>

[MANIFEST]

"XML Manifest Specification 1.0"; OSTA, 2002.,
Available at <http://www.osta.org/mpv/>

[MD5]

"The MD5 Message-Digest Algorithm", RFC 1321, April 1992.
Available at <http://www.ietf.org/rfc/rfc1321.txt>. Further information and source code available at <http://userpages.umbc.edu/~mabzug1/cs/md5/md5.html>

[MIME-2]

"RFC 2046: Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types"; N. Freed, N. Borenstein, November 1996.
Available at <ftp://ftp.isi.edu/in-notes/rfc2046.txt>

[MIMETYPES-REG]

IANA official registry of MIME media types
Available at <http://www.isi.edu/in-notes/iana/assignments/media-types/media-types>

[MPV-Basic]

"MusicPhotoVideo – Basic Profile Specification", OSTA, 2002,
Available at <http://www.osta.org/mpv/>

[MPV-Core]

"MusicPhotoVideo Core Specification 1.0"; OSTA, 2002.,
Available at <http://www.osta.org/mpv/>

[MPV-Pres]

"MusicPhotoVideo Presentation Profile Specification 1.0"; OSTA, 2002.,
Available at <http://www.osta.org/mpv/>

[NMF]

"Normalized Metadata Format Specification 1.0"; OSTA, 2002.,
Available at <http://www.osta.org/mpv/>

[PNG-MIME]

"Registration of new Media Type image/png"; Glenn Randers-Pehrson, Thomas Boutell, 27 July 1996.
Available at <ftp://ftp.isi.edu/in-notes/iana/assignments/media-types/image/png>

[PNG-REC]

"PNG (Portable Network Graphics) Specification Version 1.0"; Thomas Boutell (Ed.).
Available at <http://www.w3.org/TR/REC-png>

[QT]

"QuickTime Movie File Format Specification", May 1996.
Available at <http://developer.apple.com/techpubs/quicktime/qtdevdocs/REF/refFileFormat96.htm>

[QT-MIME]

"Registration of new MIME content-type/subtype"; Paul Lindner, 1993.
Available at <http://www.isi.edu/in-notes/iana/assignments/media-types/video/quicktime>

[RDFsyntax]

"Resource Description Framework (RDF) Model and Syntax Specification", Ora Lassila and Ralph R. Swick. W3C Recommendation 22 February 1999, Available at <http://www.w3.org/TR/REC-rdf-syntax/>

[RDFschema]

"Resource Description Framework (RDF) Schema Specification", Dan Brickley and R.V. Guha. W3C Proposed Recommendation 03 March 1999, Available at <http://www.w3.org/TR/PR-rdf-schema/>

[RFC1766]

"Tags for the Identification of Languages", H. Alvestrand, March 1995. Available at <ftp://ftp.isi.edu/in-notes/rfc1766.txt>

[SMIL10]

"Synchronized Multimedia Integration Language (SMIL) 1.0" P. Hoschka. W3C Recommendation 15 June 1998, Available at <http://www.w3.org/TR/REC-smil>.

[SMIL20]

"Synchronized Multimedia Integration Language (SMIL 2.0) Specification". W3C Working Draft, work in progress. Available at <http://www.w3.org/TR/smil20/>

[SMIL-MOD]

"Synchronized Multimedia Modules based upon SMIL 1.0", Patrick Schmitz, Ted Wugofski and Warner ten Kate. W3C Note 23 February 1999, Available at <http://www.w3.org/TR/NOTE-SYMM-modules>

[URI]

"Uniform Resource Identifiers (URI): Generic Syntax", T. Berners-Lee, R. Fielding, L. Masinter, August 1998. Note that RFC 2396 updates [RFC1738] and [RFC1808].

[UCS-2]

16-bit encoding of ISO 10646, commonly known as the Unicode character set.

[UTF-8]

Yergeau, F., "UTF-8, a transformation format of ISO 10646", RFC 2279, January 1998.

[W3C-NSURI]

"URIs for W3C namespaces". Policy and administrative issue for W3C, Oct. 1999. Available at <http://www.w3.org/1999/10/nsuri>

[XML10]

"Extensible Markup Language (XML) 1.0" T. Bray, J. Paoli and C.M. Sperberg-McQueen. W3C Recommendation 10 February 1998, Available at <http://www.w3.org/TR/REC-xml>

[XML-NS]

"Namespaces in XML", Tim Bray, Dave Hollander, Andrew Layman. W3C Recommendation 14 January 1999, Available at <http://www.w3.org/TR/REC-xml-names>

[XMP-FW]

"XMP – Extensible Metadata Platform 14 Sept 01", Copyright 2001 Adobe Inc, Available at <http://xml.coverpages.org/XMP-MetadataFramework.pdf>. Also at <http://partners.adobe.com/asn/developer/xmp/download/docs/MetadataFramework.pdf>

[XSCHEMA]

"XML Schema, XML Schema Part 1: Structures". W3C Working Draft, work in progress.

Available at <http://www.w3.org/TR/xmlschema-1/>

[XSL]

"Extensible Stylesheet Language (XSL) Specification", Stephen Deach. W3C Working Draft, work in progress.

Available at <http://www.w3.org/TR/xsl/>