



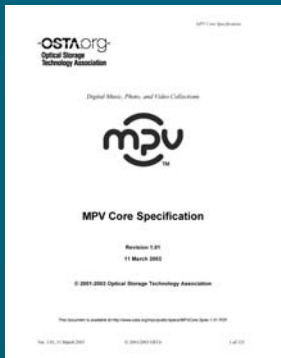
MPV Technology Introduction

**Pieter van Zee
Senior Architect
Hewlett-Packard Co.**

**OSTA MPV Interoperability Seminar
Tokyo**

**Oct. 12, 2005
www.osta.org/mpv**

MPV Initiative Components



Open Specifications



Website

Trademark Program



Other Specs & Standards

Compliance Test Plan & Test Tools (with 3rd parties)



Email Lists



SDKs (3rd parties)



Completed & Released MPV Specifications

CEA Audiobooks Dec. 2004		Interoperability Est. Dec. 2005		Interoperability July 2005	
ISA CPXe Internet Photo Services Feb. 2003	Portable Storage July 2005	Broadcast TV Dec. 2004	Music Dec. 2003	Presentation (Albums & Slideshows) Nov. 2002	
Basic Nov. 2002				Core Nov. 2002	

Marketing & Training Materials



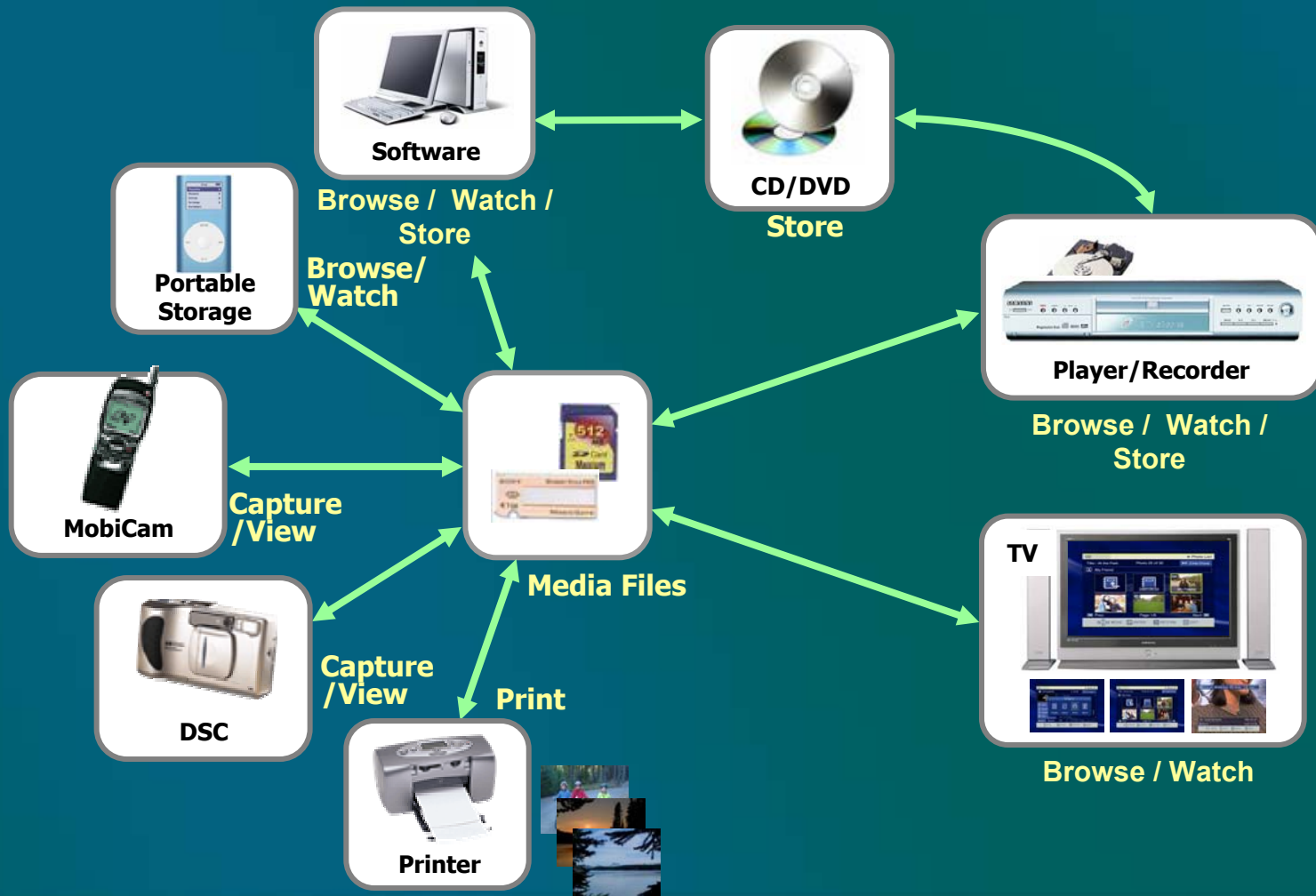
MusicPhotoVideo™

**An open, multiplatform,
free standard for
exchanging rich
collections of digital
music, photo and video
files & metadata**

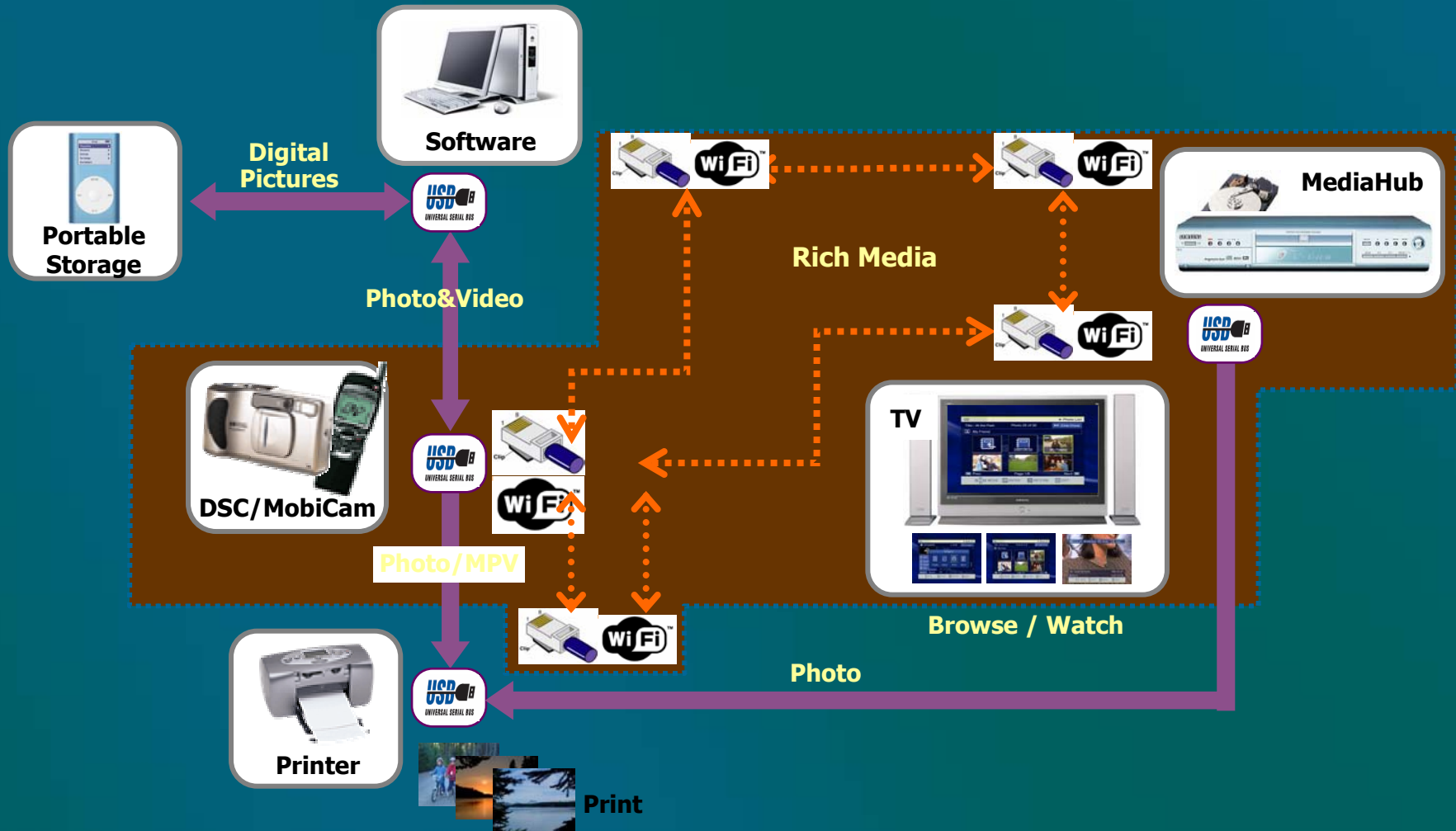
MPV Promise

**Enjoying Collections of Digital
Music, Photo, and Video Files Everywhere**

Storage-Based Collections



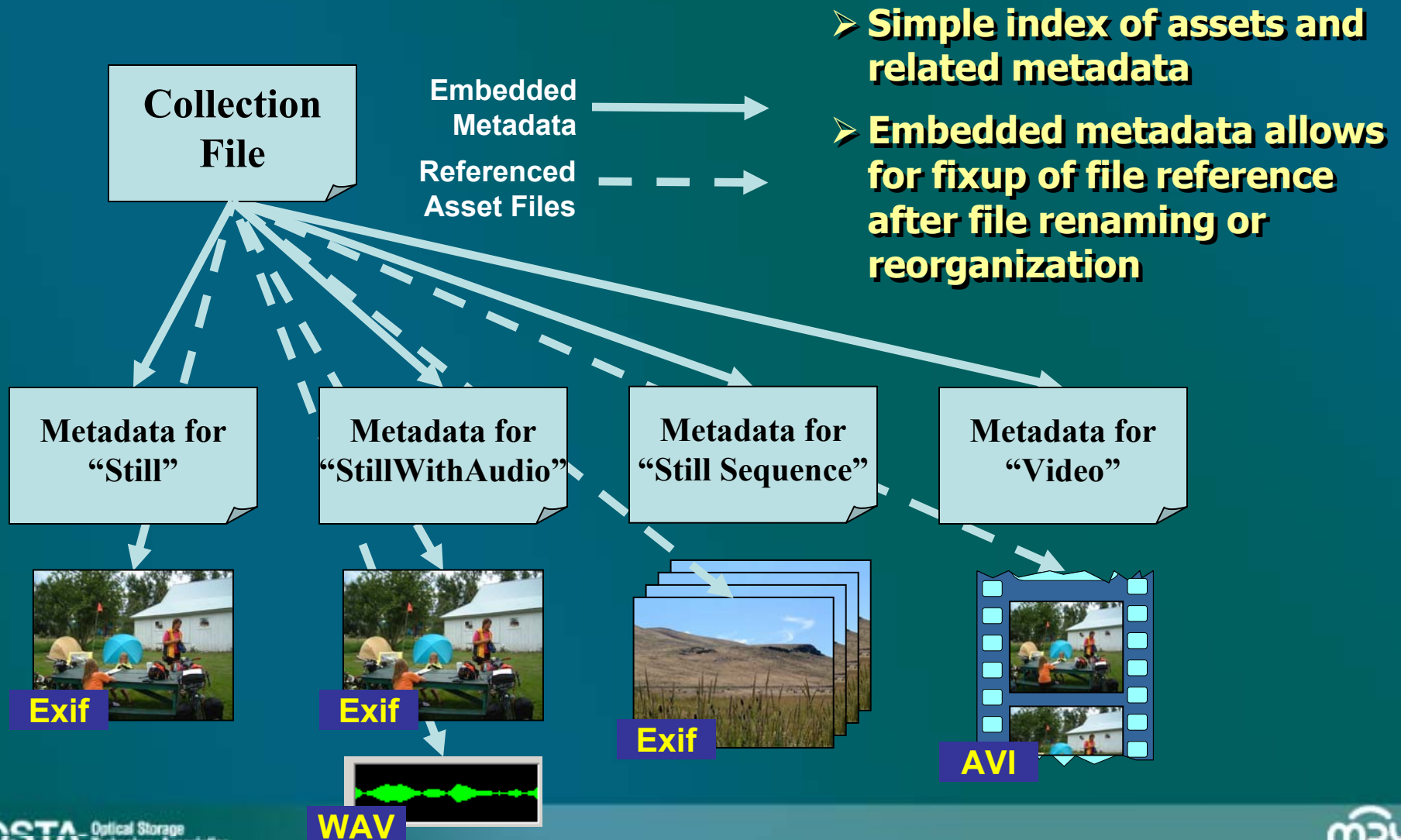
Live-Connection Collections



MPV Provides:

**A standard way to
represent & exchange
collections of music, photo
and video files & metadata**

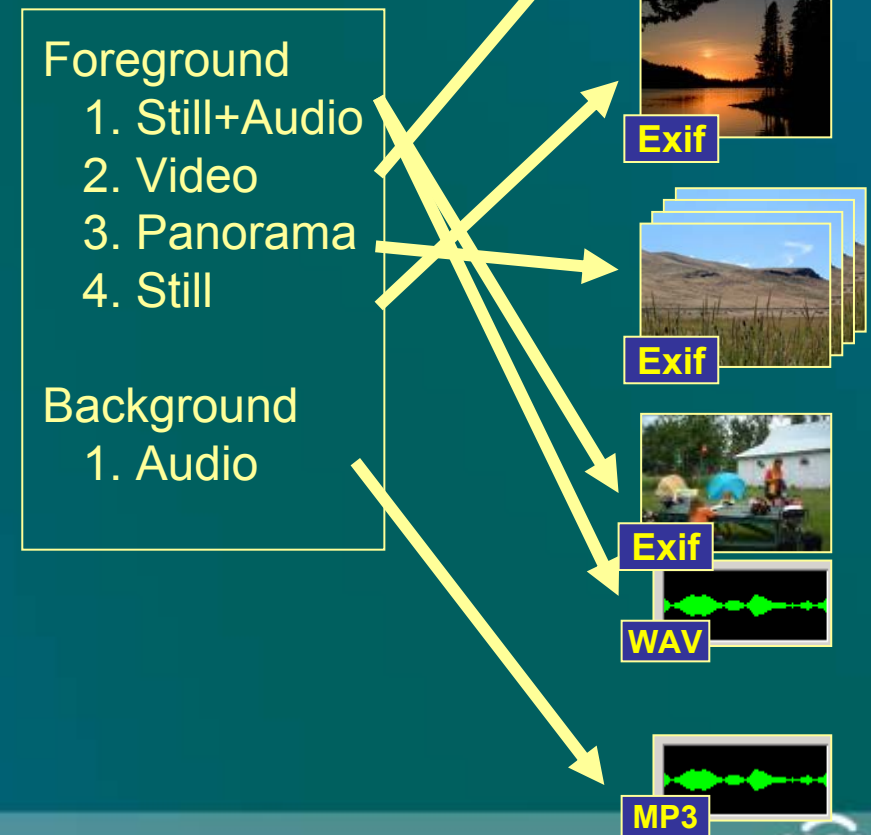
MPV Collections



MPV Collection Components

- ***A collection file:***
 - “Multimedia playlist”, “multimedia album”
 - Typical file size: 5K to 50K
- ***A list of assets***
 - Simple assets: Still, Video, Audio, ...
 - Composite assets: Still+Audio, Multishot, Panorama, ...
 - Renditions: Thumbnail, Screen, ...
- ***Metadata (optional)***
 - Title, description, keywords, dates, sizes, ...
- ***Presentation (optional)***
 - Multimedia slideshow

Slideshow Presentation



MPV Provides Interoperable Collections

Different File Layouts

```
MISC/  
  ALBUM.PVM  
DCIM/  
  132IMDCF/  
    IMG_3292.JPG  
    STA_3293.JPG  
    STA_3294.JPG  
    STA_3295.JPG  
    STA_3296.JPG  
    IMG_3297.JPG  
    IMG_3297.WAV  
    MOV_3298.MPG  
    MOV_3298.THM  
    MOV_3299.MPG  
    MOV_3299.THM  
  133IMDCF/  
    IMG_3301.JPG  
    IMG_3302.JPG  
    IMG_3303.JPG  
    IMG_3304.JPG  
    MOV_3305.MPG  
    MOV_3305.THM  
    IMG_3306.JPG  
    IMG_3306.WAV  
    IMG_3307.JPG  
    IMG_3307.RAW
```



```
INDEX.PVM  
PS_IMAGE/  
  _PR_20021014_0001_12948/  
    ALBUM.PVM  
      R021014T172315.JPG  
      R021014T174313.JPG  
      R021014T174319.JPG  
      R021014T174327.JPG  
      R021014T174338.JPG  
      R021014T174734.JPG  
      R021014T174734.WAV  
      R021014T181522.MPG  
      R021014T181522.THM  
      R021014T190554.MPG  
      R021014T190554.THM  
      R021014T190923.JPG  
      R021014T190923.JPG  
      R021014T190924.JPG  
      R021014T190925.JPG  
      R021014T190933.MPG  
      R021014T190933.THM  
      R021014T191812.JPG  
      R021014T191812.WAV  
      R021014T192645.JPG  
      R021014T192645.RAW
```



Identical MPV Collections (Enhance Interoperability)

```
AssetList  
Video  
  Rendition: thumbnail  
Still  
StillWithAudio  
  Still  
  Audio  
Still  
  Rendition: raw  
Multishot  
  Still  
  Still  
  Still  
Panorama  
  Still  
  Still  
  Still
```

MPV Products Review

(Flash Slideshow)

Samsung digital cameras

Nikon PictureProject™ SW

Olympus m:robe™ player

Hewlett-Packard ImageZone™ SW

InterVideo MediaOne SW

Brandenberg Gate Demo

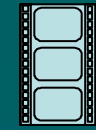
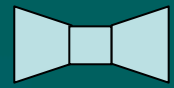
Berlin, Oct. 3, 2002

Brandenberg Gate Demo Capture



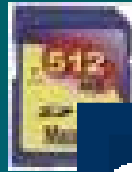
Still
Still+Audio
Video
Burst
Panorma

Album Created
By User
Stored as
MPV File



Brandenberg Gate Demo Store

```
ALBUM.PVM
DCIM/
  132IMDCF/
    IMG_3292.JPG
    STA_3293.JPG
    STA_3294.JPG
    STA_3295.JPG
    STA_3296.JPG
    IMG_3297.JPG
    IMG_3297.WAV
    MOV_3298.MPG
    MOV_3298.THM
    MOV_3299.MPG
    MOV_3299.THM
  133IMDCF/
    IMG_3301.JPG
    IMG_3302.JPG
    IMG_3303.JPG
    IMG_3304.JPG
    MOV_3305.MPG
    MOV_3305.THM
    IMG_3306.JPG
    IMG_3306.WAV
    IMG_3307.JPG
    IMG_3307.RAW
```

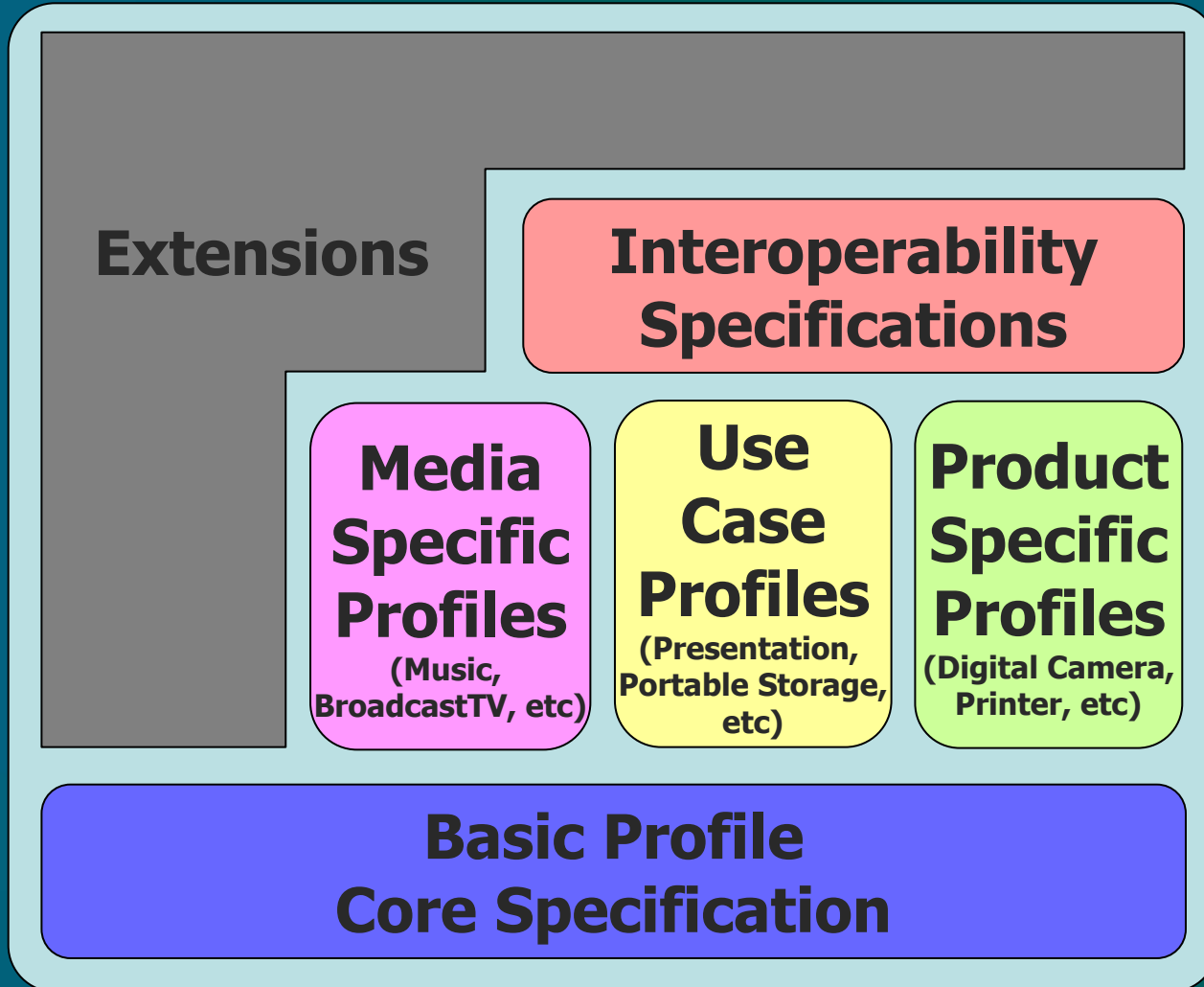


.pvm = PhotoVideoManifest

MPV Control File (album.pvm)

```
AssetList
  Still
  Panorama
    Still
    Still
    Still
    Still
  StillWithAudio
    Still
    Audio
  Video
    Rendition: thumbnail
  Video
    Rendition: thumbnail
  Multishot
    Still
    Still
    Still
  Video
    Rendition: thumbnail
  StillWithAudio
    Still
    Audio
  Still
    Rendition: raw
```

MPV Framework



Completed & Released MPV Specifications



**R6WG11
Audiobooks**
Dec. 2004



Est. Dec 2005

Interoperability

Aug. 2005



**CPXe
Internet
Photo
Services**
Feb. 2003

**Portable
Storage**
Aug. 2005

**Broadcast
TV**
Dec. 2004

Music
Dec. 2003

**Present-
ation
(Albums &
Slideshows)**
Nov. 2002

Basic
Nov. 2002

Core
Nov. 2002

New Work In Progress

Specifications Under Development

Print

Digital
Camera

Home
Network
Storage

(UPnP AV)

Internet

Picture
Disc

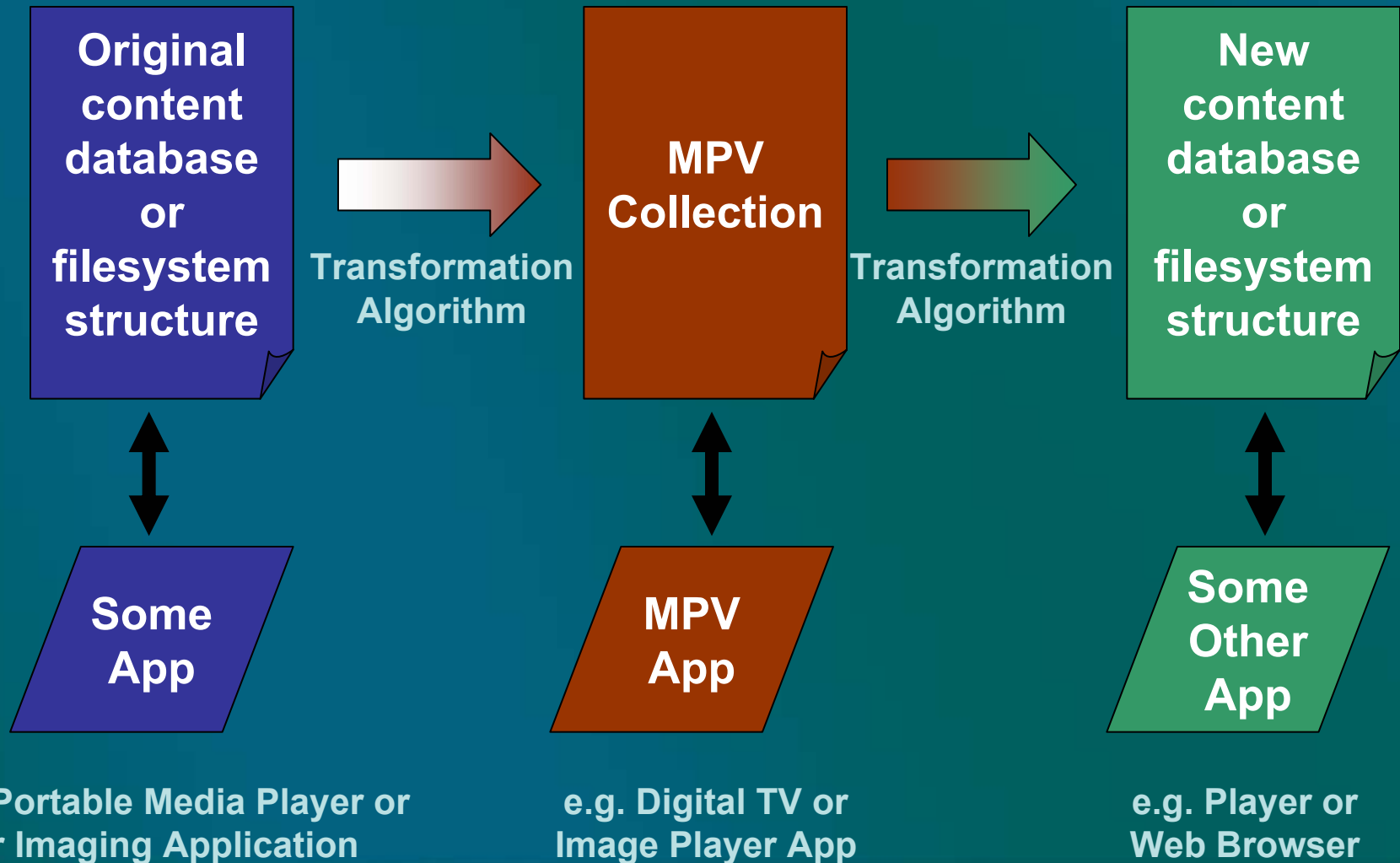
(PASS)

Media
Player

(PictSync)

- **Additional specifications are under development**
 - **Print: Consistent Experience Cameras to Printers**
 - **Digital Camera: high-performance update in cameras**
 - **Home Network Storage: Unload cameras & transfer files over Home Networked Devices Connected Using UPnP AV**
 - **Internet: Download files, reference files on internet**
 - **Picture Disc: Picture Archive & Sharing**
 - **Media Player: Portable Media Player Connectivity & Photo exchange**

MPV Supports Easy Import / Export



MPV Core Specification

Three Core Concepts

Collections of Assets

Metadata About Assets

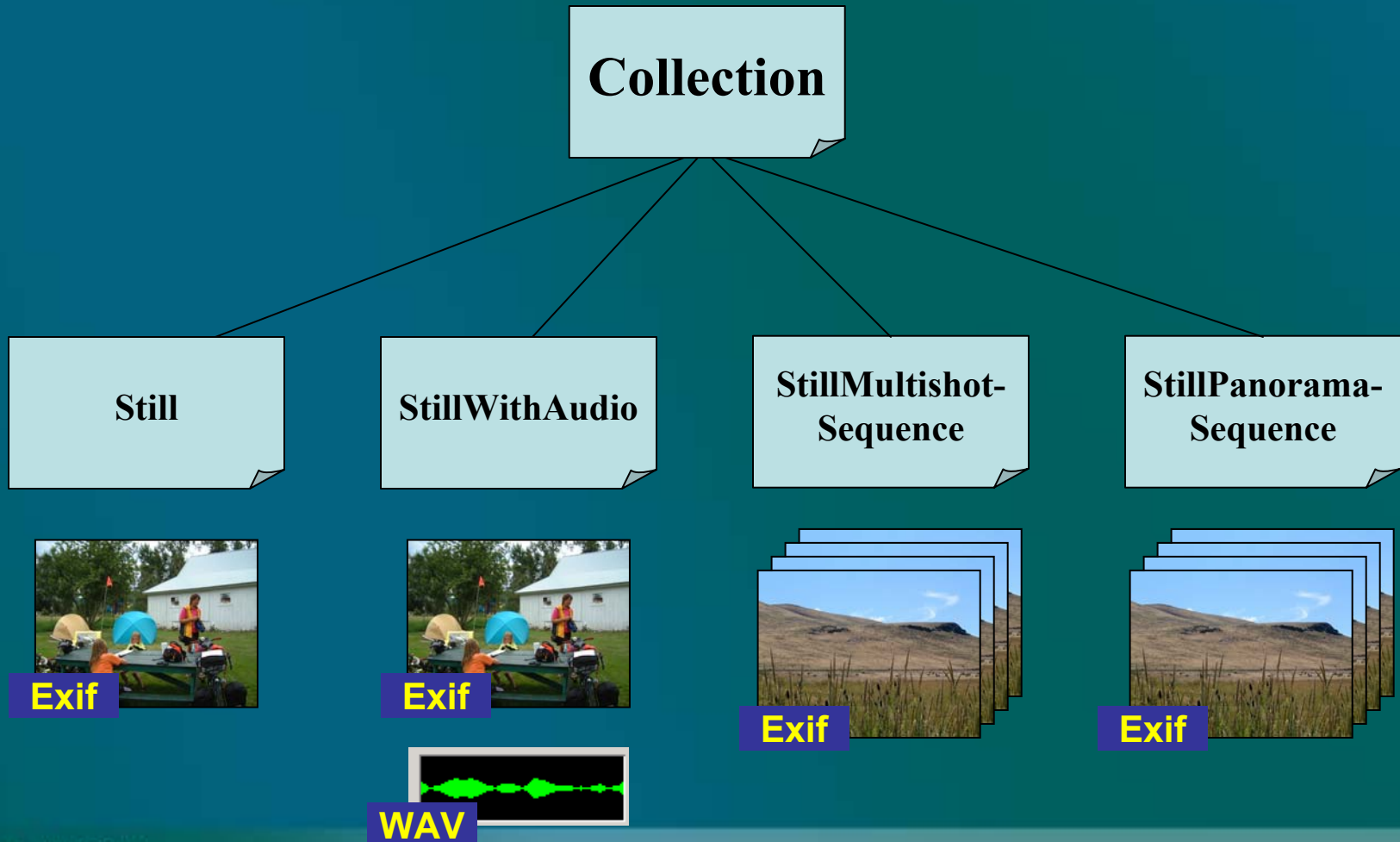
Identification of Assets

Existing Content
Formats & Practices
(DCF, Exif, WAV, AVI, MOV, ...)

Existing Metadata
Formats
(DPOF, Exif, IPTC, DIG35, ...)

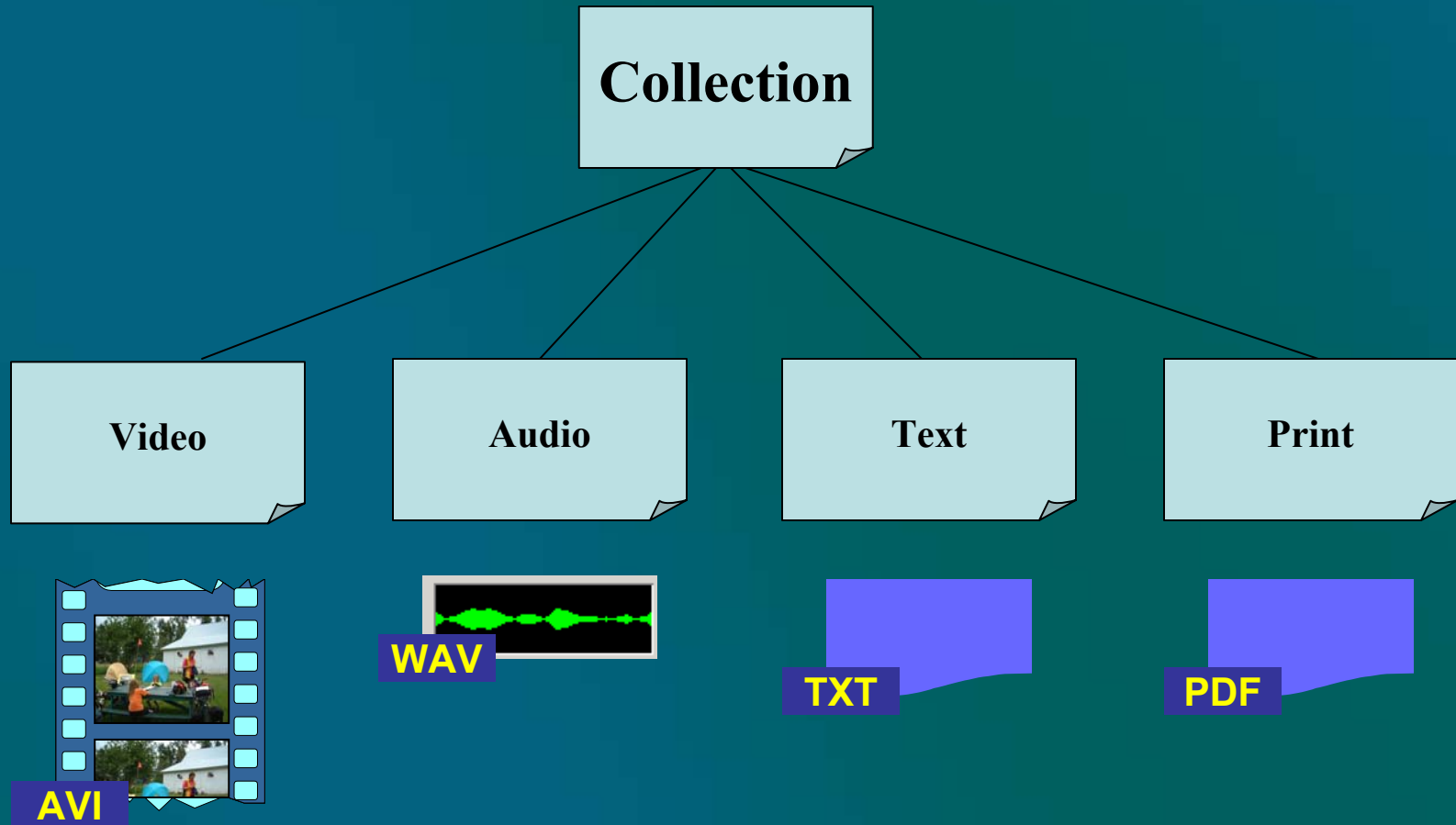
MPV – Still-based Assets

(file types shown are examples, not limitations)



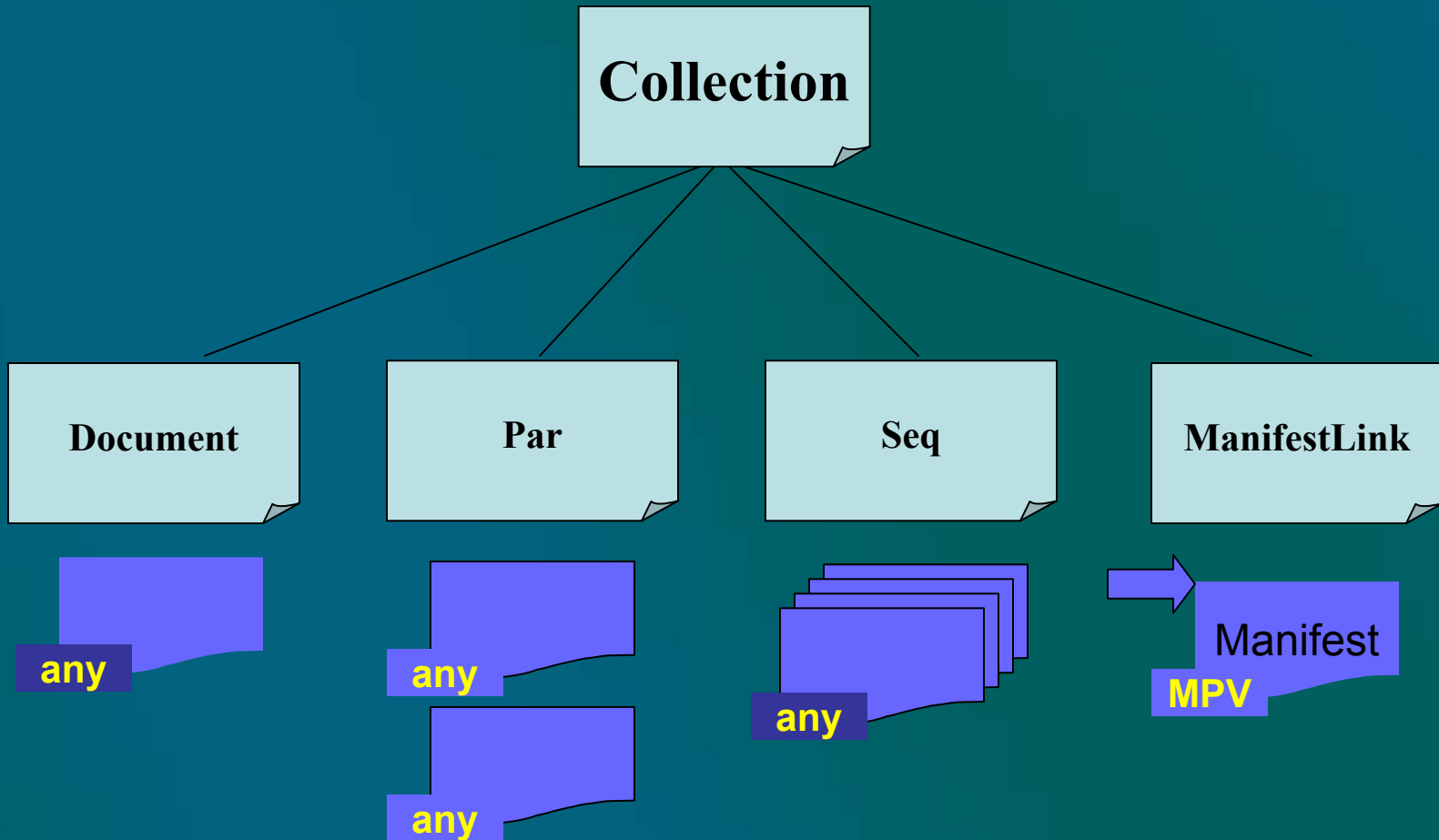
MPV - Additional Assets

(file types shown are examples, not limitations)



MPV – Supporting Asset Types

(file types shown are examples, not limitations)



Study Sample MPV Files

MPV Basic Profile

Collection

Manifest:

- Wraps all components of a MPV collection
- Practices for manifest file naming and location

Asset List:

- An unordered set of assets

Mark List:

- An ordered set of asset references
- primary, selected, hidden, <app-specific extensions>

Simple Assets:

- Still, Video, Audio, Text, Print, Document, ManifestLink

Composite Assets:

- StillWithAudio, StillMultishotSequence, StillPanoramaSequence, Par, Seq

Renditions:

- master, screen, thumbnail, subsampled, lowRes, highRes, show, print, proof, draft, alt, targetSystem

Related Documents:

- any document

Metadata

Any Metadata:

- Holds arbitrary XML-formatted metadata
- Useful for pre-existing schema

NMF Metadata:

- Recommended for new metadata schema
- Interoperable across XML Schema, RDF Schema and database environments.
- XML-Schema-based validation

NMF Dublin Core:

- Common metadata about assets: title, creator, created date, etc.

Identification

Identifiers:

- LastURL: path to the object
- InstanceID: unique per object
- DocumentID: same for all renditions
- ContentID: Content-based Identification

MPV Presentation Profile

Album

Album:

- Defines a presentation-oriented view of a collection

Foreground & Background:

- Ordered sequence of objects, grouped by purpose

Renditions and Related Documents:

- Album-level renditions and related documents, e.g. index sheet, slideshow video

Mark Lists:

- Marked objects in the album

AlbumLink:

- Links one album to another

Presentation Control

Metadata:

- Background color, duration, scaling fit, transitions, repeats, etc.

MPV Music & CEA AudioBooks

MPV Music Profile Spec

- **Applies Existing MPV Basic & Presentation Profiles to Music Content**
 - Music Playlists
- **Defines Types of Assets**
 - Dual music video and music track
 - Grouping music tracks for better navigation
- **MIMEtypes for well-known music file formats**
- **Defines Music-specific metadata**
 - Genre, Artist, etc.

CEA AudioBook Spec

- **Applies MPV Music Profile to Audiobook Content**
 - Audiobook Playlists
- **MIMEtypes for well-known audiobook file formats**
- **Defines Audiobook-specific metadata**
 - Author, Chapter, Page Number, etc.

MPVTools 2.0 SDK

Open Source: mpvtools.sourceforge.net

Multi-Platform

MPV Reader:

- **Easy-to-use Functions:**
 - Find MPV file
 - Get thumbs, screen res, slideshow, etc
- Extensible
- Slim (<50KB uncompressed)

MPV Writer:

- single-res pictures
- options: multi-res, MD5 Content IDs, directory processing
- command line utilities

Code:

- C code, OS abstraction layer
- < 80KB compr. object code for all
- MIT License – use for anything

Windows

MPV Player:

- Play slideshow with bkgnd music
- Browse using thumbnail filmstrip
- Print still images
- Can be embedded in an app using the IE Control

Code:

- 60KB HTML source code
- No install required, downloadable
- Requires IE 6.0 or above
 - e.g. WinXP (has IE 6.0)

XML Parser

Two XML Parsers Supported

- Expat Parser; free; 60-80KB obj. code
- Unicoi Microparser; not free; 8KB obj. code

Coming Up ...

- **MPV IS – Interoperability Spec**
- **MPV PS - Portable Storage Spec**
- **MPV Broadcast TV Spec**
- **MPV Trademark Licensing Program**

**Call to Action:
Implement MPV-IS in
your products today**

MPV in Summary

- **A Practical Technology**
- **To Improve Simplicity, Reliability, Ease of Use**
- **When Exchanging Collections of Music, Photo, and Video Files And Metadata**
- **Between Any Combination of CE and PC devices**
- **Connected by Physical Storage**
- **or Home Network or Internet.**
- **Each Vendor Determines Which Formats to Support and Design Of The User Interface**
- **Managed by OSTA as an Open Standard**
- **Free, Multiplatform, Royalty-Free**



MusicPhotoVideoTM

www.osta.org/mpv