



MultiPhoto/Video

Manifest, Metadata and Practices for Digital Photo-Video Collections



Basic Profile Specification

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ABSTRACT

The MultiPhoto/Video 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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Chapter 1: Introduction

1.1 Executive Summary

MultiPhoto/Video (MPV) is an open specification that makes easier the processing and playback of collections of photo-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 is added to the original data to enable printing of photo content.

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

MultiPhoto/Video uses a simple text-based format that is easily understood and also easy to produce and consume programmatically in firmware or computer software. MultiPhoto/Video 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 makes use of established specifications and standards.

The development and promotion of MultiPhoto/Video is sponsored jointly by two industry-leading trade associations, the Optical Storage Technology Association (OSTA) and the International Imaging Industry Association (I3A). The specification development and promotion process is open to all members; all organizations and individuals are welcomed as members. These associations include over 100 member companies from all over the world that produce products that collectively represent a majority marketshare in mainstream consumer digital imaging and recordable optical storage categories.

MultiPhoto/Video is not only a specification. It also includes a compliance test suite and processes, compliance testing materials, and a logo program for compliant products. In addition, some sample open-source code implementations of key steps in processing MPV content are available. These materials and procedures are made available and administered by OSTA at a modest cost. OSTA and I3A charge no royalty for use of the specification or logo.

The specification is being developed in phases and results in "profiles". Each profile in MultiPhoto/Video 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: viewing a slideshow and interactively browsing content collections
- **Internet Profile:** key task: interacting with and sending collections of photo-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 Module”, which defines the overall framework of all MPV profiles. The Basic and Presentation Profiles, for example, build on the Core Module 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.

MultiPhoto/Video 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 is augmented with Presentation information that may be used by player applications and devices to provide an attractive user experience.

1.2 Overview

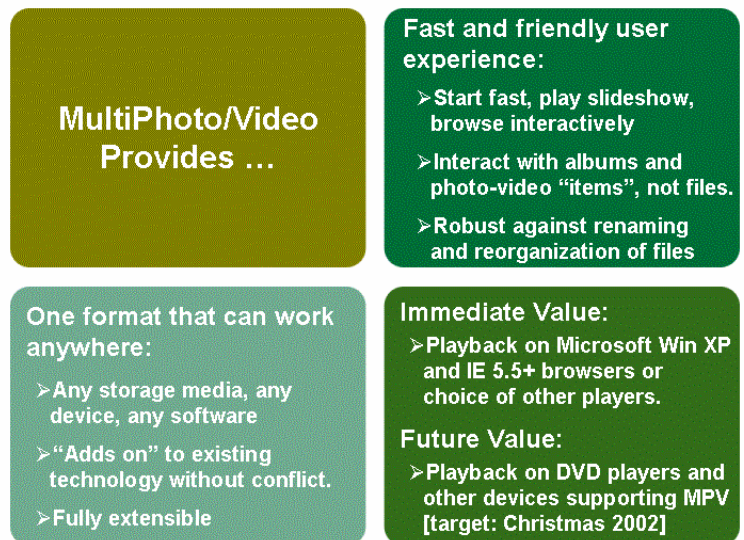
MultiPhoto/Video (MPV) is an open specification to enhance interoperability, ease-of-use, and abilities to play and manipulate collections of photo/video content, including still images, still with audio, still sequences, video clips, audio-only clips, and related files. MPV is made available at low cost and without royalty from the Optical Storage Technology Association (OSTA) and the International Imaging Industry Association (I3A). OSTA is an industry association promoting the use and interoperability of recordable CD and DVD discs in computer and consumer electronics devices. I3A is an industry association promoting digital and film imaging technologies.

MPV enables PC software and consumer electronics devices like DVD players to playback and manipulate collections of digital photo/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 for use by DVD players and media player software to provide slideshows and interactive browsing of digital photo/video content will be completed first – that is this document. Another basic profile for photo-video capture products like digital cameras, scanners, and imaging software will be developed subsequently. Both profiles will be fairly simple and easy to support.

The MPV specification will further promote adoption of current and new categories of digital imaging products by enhancing ease-of-use and interoperability of photo/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 reveals the underlying storage file system, and can be implemented in firmware of consumer electronics devices like DVD players as well as by PC 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, I3A's DIG35, and Adobe's eXtensible Metadata



Platform XMP. MPV is compatible with and supports the DCF and Exif specifications from the JEITA and JCIA that are widely used in digital cameras. New metadata elements will be developed as necessary. The work is oriented to deliver tangible and useful results in the near-term.

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.MPV" and zero or more dependent files.

MPV is well suited as an intermediate format for exchange of photo-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 photo-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 MultiPhoto/Video specification document for a precise and legal description.

The MultiPhoto/Video specification is developed using an open process. The resulting specification is available at no or modest cost from OSTA and I3A. No royalty is charged by OSTA or I3A 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 and I3A does not warrant that the specification is not or will not be subject to such claims by other parties.

MultiPhoto/Video is not only a specification. It also includes a compliance test suite and processes, compliance testing materials, and a logo program for compliant products. In addition, some sample open-source code implementations of key steps in processing MPV content are available. These materials and procedures are made available and administered by OSTA at a modest cost. OSTA and I3A charge no royalty for use of the specification or logo.

Chapter 2: Key Concepts

MultiPhoto/Video has some key concepts and approaches.

- The Basic Profile has three core concepts centered on Collections, Metadata, and Identification.
- The Presentation Profile adds in the Album view of the collection and other Presentation information.
- Profiles and Modules structure the specification, while the Schema formally defines it and Practices guide its use.

2.1 Collections

Collections are assembled using a few core concepts .

MANIFEST

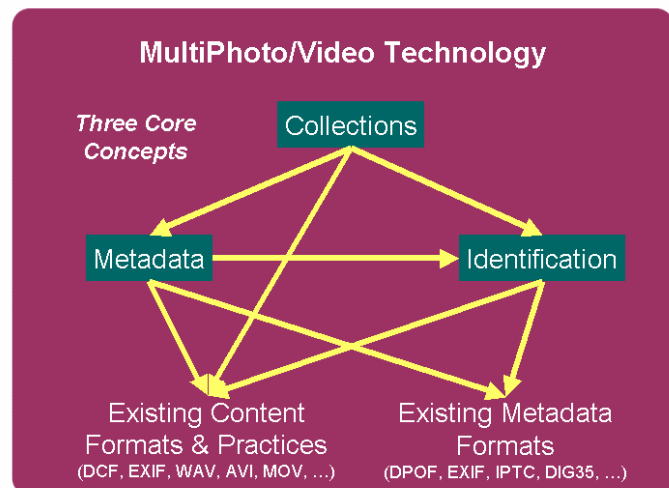
The MPV manifest groups all the MPV components into a single XML document. A MPV manifest contains a least one asset list or manifest links. It may contain zero or more albums and mark lists, which provide views onto those assets. In typical usage, a MPV manifest is stored in a stand-alone file.

ASSET LIST

An asset list is an unordered set of assets that each have a unique local identifier in the MPV collection. It is the only place photo-video assets may be defined as part of the collection – everything else in MPV is metadata and references to assets. A MPV collection contains at least one asset list or link to a manifest in another file. By analogy, an asset list may be considered a table of assets in a database and the id is the foreign key. Another analogy would be to the entries in a Unix file system inode.

MARK LIST

A mark list is an ordered set of asset references and associated metadata and mark type. A MPV collection may contain zero or more mark lists. The optional mark list with the special "primary" mark type identifies which assets in the asset list are considered to be top-level assets in a collection and gives them an order. Other predefined mark types are "selected" and "hidden"; the mark type is fully extensible.



SIMPLE MEDIA ASSETS

An asset list may contain the following types of media assets. MPV does not constrain which formats of these media assets may be in a collection. Simple media assets correspond to physical storage entities, i.e. files.

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

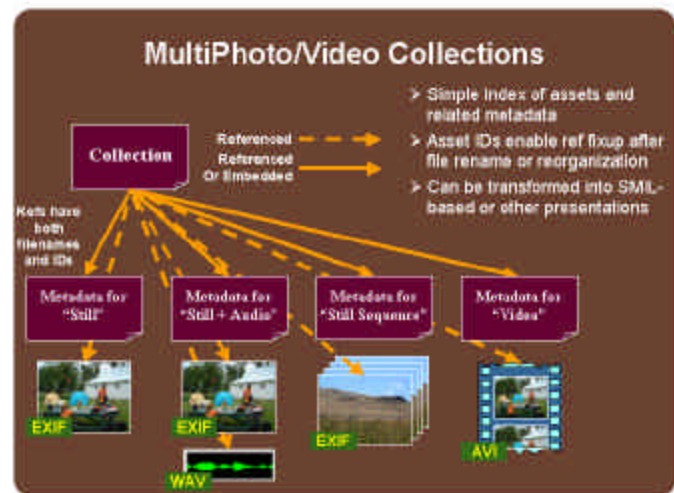
Any media asset may contain renditions and related documents.

COMPOSITE MEDIA ASSETS

In addition to the simple media assets, MPV also defines composite assets, which are semantically meaningful groups of media assets. These correspond to typical capture modes of digital cameras.

- StillWithAudio
- StillMultishotSequence
- StillPanoramaSequence
- Par
- Seq

Composite media assets may be primary assets, renditions, or related documents. The Seq and Par assets allow for arbitrary expression of other media assets but lack the direct association with the user's capture mode.



RENDITIONS

Any simple or composite media asset and even an album may have one or more renditions. Typically, original asset is the master rendition and is usually defined implicitly. Renditions other than the master rendition are derived versions of the original media asset. The relationship between the original rendition and the derived renditions is captured in metadata. The derived version may be direct, as in a screen resolution image of a hi-res image, or indirect, as in a video stream or print rendition of a collection.

RELATED DOCUMENTS

All simple and composite media assets and an album may have one or more related documents. Such documents may have any relation to the media asset, including other assets used in constructing the asset or additional metadata related to the asset.

2.2 Metadata

MPV IS METADATA, NOT DATA

MPV provides metadata to describe photo/video asset collections. It does not contain the actual asset data files themselves. The set of MPV metadata defines collections, identifiers, simple and composite assets, and a basic set

of presentation information. MPV also provides the ability to embed completely arbitrary XML-formatted metadata from any source, providing an easy and open extension mechanism.

MPV provides full interoperability with Adobe System's open metadata specification called XMP (Extensible Metadata Platform), a rich family of metadata schema and practices for individual assets of many types that is being adopted by many commercial vendors. This is the preferred mechanism to specify many kinds of common metadata in MPV, such as for Dublin Core, Graphics, Image, Dynamic Media, Video, Audio, Text, PagedText, Rights management, and Media management. Using the VXMP framework utilized by MPV, custom metadata schema can be designed that is fully interoperable with both MPV and XMP and also fully validatable using commonly available XML-Schema-based tools.

OTHER METADATA

Generally speaking, MPV recommends that metadata about basic media assets be embedded in the asset. Recommended practices are provided for using existing metadata formats in typical media file formats, such as Exif, JFIF, TIFF, WAV, MP3, MPG, AVI, and MOV. Metadata for composite media assets often cannot reside only in the basic media assets because it spans multiple asset files. This information is often stored in various established metadata formats such as I3A's DIG35 and Adobe's XMP. This type of metadata may be embedded within an MPV document, even when it is not part of the MPV schema.

XML PACKETS

MPV uses XML packets to provide for embedding and extracting MPV metadata in arbitrary files. The XML packet format is defined by Adobe's XMP specification.

NAMESPACES AND NAMING EQUIVALENCE

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

MPV requires that the MPV namespace prefixes on all elements and attributes be used in all XML encodings.

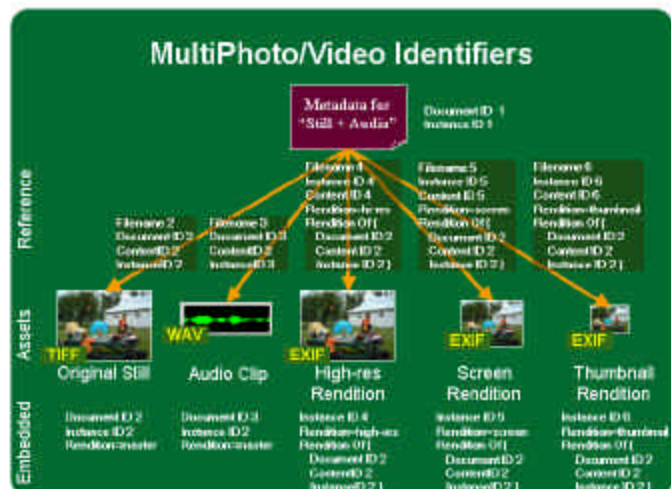
Some older existing XML-based applications and schema do not support namespaces. MPV can be encoded using a pseudo namespace by prefixing all elements and attributes with a defined namespace prefix separated with the underscore ("_"). Such an encoding is defined to enable the MPV specification to be used when namespaces are not supported; however, documents of this type are NOT well-formed MPV documents and need to be translated to use namespaces before they can be expected to interoperate with other MPV processors.

2.3 Identifiers

TYPES OF IDENTIFIERS

Identifiers are the means by which references are made between a collection and the assets it references. All basic and composite media assets in a collection are identified by two or more identifiers. There are four kinds of identifiers:

- id – a unique identifier local to the MPV collection in which it is used and used to reference elements in a MPV collection.
- lastURL – last known location
- instanceID – unique identifier for an asset



- documentID – the same for all renditions
- contentID – computed using the content as input; statistically unique for each asset.

More than one of the lastURL, documentID, and contentID identifiers may be used. For example, multiple lastURLs may be provided to allow for different filenames in different file systems, such as on a CD. Multiple contentIDs may be provided that utilize different computation algorithms with various tradeoffs of speed and robustness.

The lastURL can be a local filename or remote URL. Significantly, lastURL is not a robust reference; it is broken easily by the user renaming or rearranging the referenced assets. Equally, the lastURL can be broken easily when a collection and assets are transferred across devices, storage formats and file systems.

To be robust against broken lastURL names, MPV provides identifier mechanisms and practices that allow the lastURL values to be fixed up when broken by searching for files with identifiers that match those contained in the collection. The ability to fix up broken references is a key contribution that MPV makes to industry practices for representing collections.

COMPUTING IDENTIFIERS

Identifiers can be computed and inserted in media assets in a variety of ways.

- arbitrary identifiers – computed in some manner independent of the asset data and assigned to the asset. Arbitrary identifiers are typically quick to generate and compare but are fragile because if they are damaged or lost, they cannot be reconstructed.
- content-based identifiers – computed in some manner dependent on the asset data. Content-based identifiers are typically slower to generate and compare, but are more robust and also less invasive because they can be regenerated based on the content itself.

Arbitrary identifiers are computed using a variety of algorithms typically available in the operating system. MPV uses the UUID 128-bit identifier which is readily generated by most modern operating systems. Sample source code for computing an assigned identifier is provided and can be used for firmware implementations.

Many content-based identifier computation methods exist. MPV specifies the MD5 algorithm as the basic algorithm that should always be supported. MD5 computes a 128-bit hash of the byte values in an arbitrary set of content.

2.4 Presentation

The MPV Basic Profile defines how to represent collections. The MPV Presentation Profile defines how to present them.

ALBUM, ALBUMLINK

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. Album links use URIs, allowing reference to local or remote albums. 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.

USER TASKS

Primary user tasks for albums are to allow the user to play a slideshow of or interactively browse the primary assets in the album. The MPV Presentation Profile extends the spec with very basic presentation information to enhance the user's experience.

PRESENTATION CONTROL

The overall approach for representing presentation information derives from SMIL, a powerful XML format for representing presentations from the World Wide Web Consortium (W3C). MPV Presentation Profile is a very constrained derivative of 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 MPV also allows arbitrary metadata to be embedded or referenced, it is possible to embed additional presentation information in SMIL or other presentation languages. These may be used by players aware of these formats and practices.

XML LEVERAGE

MPV is well-formed XML. This allows the MPV album document to be used with standard XML processing environments. For example, when opened in the Microsoft Internet Explorer 5.5 and above web browser, an 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.

2.5 Profiles and Modules, Schema and Practices

The MultiPhoto/Video specification is organized in the following ways.

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 normative definition; in the case of discrepancy, it supercedes the fragmentary descriptions in the specification document.

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.

Modules are a grouping of Schema and Practices and are the unit of design that provides a coherent set of capabilities. Modules are indivisible; they cannot be subdivided. Modules may be combined if designed to be compatible.

Profiles are a set of Modules and are the unit of formal specification, of specification implementation and of specification compliance. Products can implement or not implement profiles. Each profile in MultiPhoto/Video defines only those modules that are necessary for the key tasks targeted by the profile.

Chapter 3: MPV Basic Profile 1.0

The MPV Basic Profile 1.0 is designed to accomplish the following key tasks: defining collections of photo-video assets and related types of content including other media types and renditions, identifiers of those assets, and access to metadata. The Basic Profile instantiates the MPV Core Module specification as a Profile, but also includes the additional VXMP schema that are available.

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

- MPV Core Module Schema 1.0
- MPV Core Module Practices 1.0
- MPV VXMP Module Schema 1.0
- MPV VXMP Module Practices 1.0

The MPV Basic Profile is expected to be supported by most MPV-aware applications and devices 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	Specified Prefix for Namespace-Incompatible Environments
Basic Profile	http://ns.osta.org/mpv/basic/1.0/	profile/basic/basic.xsd	mpvb:	mpvb_

Appendix I: 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/>

[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>

[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>

[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.

[VXMP]

"VXMP – Validatable Extensible Metadata Platform – 17 June 2002", Copyright 2002 Hewlett-Packard Co.,
Available at [TODO – fixup]

[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-MetadadataFramework.pdf>. Also at
<http://partners.adobe.com/asn/developer/xmp/download/docs/MetadadataFramework.pdf>

[XSHEMA]

"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/>

Appendix II: ToDo and Things to remember & discuss
