:TX metadata standard 0.9

transmission.cc/xmlns

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*Overview

In 2006, as part of the **Transmission** process, we were asked to produce **recommendations towards a standard for markup of video metadata**. Huge increases in the speed of consumer-grade bandwidth and disk storage space, as well as innovations in distribution software, mean that distributing video online is now a viable option, and better sharing and distribution of materials has become a concern for filmmakers wanting both to reach wider audiences and to facilitate improved cooperation.

One important barrier to reaching a world audience hungry for audiovisual information is the treatment of media files in a way that makes it easy for other online entities to find and use them. :tx metadata standard **0.8** represents our attempt, acting within the Transmission process and according to the feedback of its participants, to encode such a treatment in a working standard. We began work on this during **the second half of 2007** with the support of the **Open Society Institute**, and this **0.8 release** represents a 'stable first release' following open consultation with Transmission members.

In producing this standard, we have tried to created a framework which is:

• as easy as possible to understand and implement for video producers and distributors,

• applicable to as many different kinds of content as possible without being unwieldy, and

• workable in the real world.

*Rationale

Because of the interoperability, scalability, and extensibility of the Atom format, we think it represents the best future path for video producers and have broadly adopted it wherever possible.

Why Not RSS?

'RSS' has become a catch-all term for a variety of modes of marking-up content in a semi-standardized format that can be viewed and organised through client software. Programs called **feed readers** or **aggregators** can check a list of feeds and display updated items that they find. Such readers are available for various operating systems, typically as stand-alone programs or extensions to existing programs such as web browsers. Many browsers have integrated support for RSS feeds.

However, RSS is not as unified a standard as its single name would suggest. There are many incompatible versions from different groups and companies. The potential for confusion caused by different versions — none of which has a standardised schema — is obvious. There are a profusion of attributes and elements available across RSS versions. What is more, RSS 2.0 is copyrighted by its creators and may not, according to this license, be modified. We know that the sort of communities developing and working with this standard will see this as a key detractor, since many of us hold with Free/Libre and Open processes.

The Atom syndication format was specifically designed to address the general incoherence of RSS. As Robert Sayre writes:

> early syndication and publishing protocols faced various problems related to interoperability, scalability, and extensibility. The Atom format and protocol builds on earlier efforts to establish an open, extensible, interoperable, and clearly specified framework for Web-logging applications. Atom has already been deployed on a wide variety of platforms. By closely examining previous syndication formats and protocols, the Atompub working group has been able to 'pave the footpaths', and design a standard built around well-known and proven usage patterns.

In considering this format, we had to weigh on the one hand the fact that RSS is confusing and unstandardized. If RSS had been chosen, it would have begged the question which RSS should be used, and which RSS extensions and non-RSS namespaces should be used, if any?

 On the other hand, we were concerned that, in selecting Atom, sufficient tools were available that supported it. Despite the emergence of Atom as an IETF Proposed Standard, and the decision by major companies such as Google to embrace it, use of the older and more widely known RSS 0.8 and RSS 2.0 formats has continued. Many sites choose to publish their feeds in only a single format. For example CNN, the New York Times, and the BBC offer their web feeds only in RSS 2.0 format.

Because the Atom standard looks toward a future in which it will be adopted by a community of video producers, we consider it appropriate for adoption in the tx: standard. This may seem controversial, especially bearing in mind our 'real world' principle. However, on balance, the case for adopting Atom over RSS is fairly strong. We recognise the shortcomings of Atom: while each of the various web syndication feed formats has attracted enthusiastic advocates convinced of the capabilities of their respective formats, no one would dispute that RSS

predominates. But given most video producers do not currently mark up their content in any coherent fashion, the fact that Atom is the best way to create a rigorous, clear and consistent framework for marking up video metadata, means we think it should be used.

*The Standard

The tables below form 'core' of the specification drafts reviewed by the Transmission lists in the past year and a half. The fields are expressed in plain language ('**TX Name**'), followed by a description, and whether the field is 'required' or not. ('Required' here means merely required by the Transmission standard. Please note that in general the principle for a field to be 'required' is that without it, a feed would break. Thus almost everything is not considered required at the level of the standard itself: *this does not mean that implementing parties cannot require these fields in their own markup process.*)

We have described a new namespace, **Genres**, and a new Document Type Description, **Format**, to make the standard work. We also have had to extend another scheme, the US Library of Congress 'Roles and Relations' scheme, which provides some but not all of the roles we need for Credits under the Transmission standard. The reason for extending the Library of Congress scheme is that it already exists and, as will be seen in the related documents listed below, is already recommended for use in some draft Atom extensions.

Testing and Compatibility

It will be noted that the standard we have produced doesn't validate at Feedvalidator.org. This is because in our schema, more than one Content element is used (viz. Summary Text and Format), and Feed Validator doesn't like this. However, the Atom specification does not state there has to be only one Content element; indeed <http://www.imc.org/atom-syntax/mail-archive/msg17168.html indicates specifically that an Atom entry may contain more than one Content element if each Content element has a unique type / mode pair, as it does in our case. feedvalidator.org is incorrect in its assertion that 'atom:entry elements MUST NOT contain more than one atom:content element.' We point to

http://www.atomenabled.org/developers/syndication/atom-format-spec.php to show that it is allowed.

Feed Metadata

TX NAME	Required	Expression In Atom	
		MARKUP	**DESCRIPTION**
Title	YES	<title>Video Title</title>	The title of Feed.
ID	YES	<id>http://example.com/example.xml</id>	A unique id of the feed.
Link to Feed	YES	<link rel="self" type="application/atom+xml" href="http://example.org/example.xml"/>	Information about the feed's location, allowing clients to subscribe to it.
Rights	NO	<rights>Copyright 2005</rights>	Default rights for elements in the feed
Updated	YES	<updated>2007-09-11T18:30:02Z</updated>	Last update of the feed

Entry Metadata

TX NAME	REQUIRED	EXPRESSION IN ATOM*	
		MARKUP	**DESCRIPTION**
TITLE	YES	<title>Video Title</title>	The title of the video.
DESCRIPTION	YES	<content type="text">Description</content>	Short text conveying a summary or abstract of the video.
KEYWORDS / TAGS	NO	<category term="tag1"label="Tag1" />	For the rationale behind this way of marking up tags, see: http://www.tbray.org/tmp/tag-urn.html, and http://edward.oconnor.cx/2007/02/representing-tags-in-atom
GENRES	NO	<category scheme="http:/transmission.cc/Genres" term="bar" label="bar" />	The **:tx metadata standard** uses Atom's 'category' to provide for genre, creating the new scheme 'Genres', specified at transmision.cc/Genres – that is, we specify at a certain (updateable) URL what the names of the genres are. **The list can evolve over time.** See APPENDIX ONE for a current list of genres allowed within the standard; however the scheme is extensible.
THUMBNAIL	NO	<media:thumbnail url="http://example.org/video.thumbnail.jpg" />	In order to embed thumbnails, it is currently necessary to use **Yahoo! MediaRSS**. This is added to the feed element as in this example: (xmlns:media="http://search.yahoo.com/mrss")

TX NAME	REQUIRED	EXPRESSION IN ATOM*	
LINK TO VIDEO *direct link* *torrent link*	YES*	e.g., <link rel="enclosure" length="1234" type="application/ogg" href="http://example.org/video.ogg" /> e.g., <link rel="enclosure" type="application/x-bittorrent" length="123" href="http://example.org/video.ogg.torrent" />	There are several ways to link to the video. Here two examples are given: a direct link via HTTP or FTP and a link via Bittorrent. *only one Link to Video is mandatory

CREDITS	NO	<author>
		<name>Max Mustermann</name>
		</author>
		<contributor>
		  <name>James M Snell</name>
		</contributor>
		
		<contributor>
		 <name>John Doe</name>
		 <pe:role scheme="http://www.loc.gov/marc"
		       term="cmt"
		       label="Cinematographer" />
		</contributor>
			At the simplest level Atom allows for Author and Contributor. There can be more than one contributor element listing possible contributors.
			
			As this may be insufficient for Credits, it is also possible to extend Contributor via the draft Atom Person Extension. This uses the MARC 'Relators and Roles' list, which can be perused here: http://www.loc.gov/marc/sourcecode/relator/relatorlist.html. See Appendix II for further information.

TX NAME	REQUIRED	EXPRESSION IN ATOM*	
LICENSE	NO	<rights> No Copyright © 2001. No Rights Reserved. </rights> <link rel="license" type="text/html" href="http://creativecommons.org/licenses/by/2.5/" />	The <rights> field describes any rights held over the video. In addition, as described at <http://ietfreport.isoc.org/idref/draft-snell-atompub-feed-license>, a link to a machine-readable license may be provided. (See below, middle column). License link relations differ from the <rights> element in that <rights> is intended strictly as a human- readable assertion of rights held over a work, while the license link relation is intended to provide a potentially machine-readable description of what rights have been granted to others. The two may overlap one another and conflicts could arise if they are contradictory. It is important that publishers feeds ensure that the "atom:rights" and license link relations are consistent with one another if they are both used.
SUBTITLE	NO	<link rel="subtitle" href="http://example.org/video.en.srt" type="text/x-srt" hreflang="en" />	Links to external subtitles. **Can contain more than one entry.**
PUBLISHED	YES	<published>2001-09-11T18:30:02Z</published>	The publication date of the entry. All date-times in Atom conform to the Date and Time Specification of RFC 822.
UPDATED	NO	<updated>2007-09-11T18:30:02Z</updated>	This describes date the entry was last changed / updated.
RELATED PAGE	NO	<link rel="alternate" href="http://example.org/video.html" />	A link to a web page about the video.

TX NAME	REQUIRED	EXPRESSION IN ATOM*
FORMAT	NO	<format xmlns="http://transmission.cc/FileFormat"> <size>175255078</size> <duration>2996</duration> <video_codec>Theora</video_codec> <framerate>25</framerate> <video_bitrate>394.570050</video_bitrate> <width>480</width> <height>272</height> <pixel_aspect_ratio>1/1</pixel_aspect_ratio> <audio_codec>Vorbis</audio_codec> <samplerate>48000</samplerate> <channels>2</channels> <audio_bitrate>73.261261</audio_bitrate> </format>	We have established a new Document Type Definition (DTD) for Format, in addition to the namespace for Genres. The XML DTD for Format is described at http://transmission.cc/FileFormat. Note that <format> is now a sub-element of <entry>. This change was needed because some existing atom feed implementations displayed the <content><format> element as description. Having it as a sub element of <entry> disambiguates this possible interpretation.

*We use Atom in all but one case, i.e., for thumbnails.

EXAMPLE FEED

this is also available as separate reference file at http://shiftspace.cc/metadata/example.xml

```xml
<?xml version="0.8" encoding="utf-8"?>
        <feed xmlns="http://www.w3.org/2005/Atom"
        xmlns:media="http://search.yahoo.com/mrss"
        xml:lang="en">
        <title type="text">Metadata Sample Feed</title>
        <link rel="self"
        type="application/atom+xml"
        href="http://example.org/example.xml"/>
        <rights type="text">No Copyright 2005</rights>
        <id>http://example.org/example.xml</id>
        <updated>2007-09-11T18:30:02Z</updated>

        <entry>
                <title>Title</title>
                <link rel="alternate" href="http://example.org/video.html"/>
                <updated>2007-09-11T18:30:02Z</updated>
                <published>2001-09-11T18:30:02Z</published>
                <id>http://example.org/video.html</id>
                <media:thumbnail
                url="http://example.org/video.thumbnail.jpg" />
                <rights>No Copyright © 2001. No Rights Reserved.</rights>
                <author>
                        <name>Max Mustermann</name>
                        <uri>http://example.org/</uri>
                <email>max@example.com</email>
                </author>
                <contributor>
                        <name>James M Snell</name>
                </contributor>
                <category term="foo" />
                <category term="bar" />
                <category scheme="http://transmission.cc/Genres"
                term="action" label="Action" />

<category scheme="http://transmission.cc/Genres"
                term="western" label="Western" />

        <content type="text">Summary Text.</content>
        <format xmlns="http://transmission.cc/FileFormat">
                <size>175255078</size>
                <duration>2996</duration>
                <video_codec>Theora</video_codec>
                <framerate>25</framerate>
                <video_bitrate>394.570050</video_bitrate>
                <width>480</width>
                <height>272</height>
                <pixel_aspect_ratio>1/1</pixel_aspect_ratio>
                <audio_codec>Vorbis</audio_codec>
                <samplerate>48000</samplerate>
                <channels>2</channels>
                <audio_bitrate>73.261261</audio_bitrate>
        </format>
        <!-- link to the video (via http) -->
        <link rel="enclosure"
        type="application/ogg"
    href="http://example.org/video.ogg"
        length="1234" />
        <!-- link to the video (via bittorrent) -->
        <link rel="enclosure"
        type="application/x-bittorrent"
        href="http://example.org/video.ogg.torrent"
        length="12" />
        <!-- link to the german subtitle -->
        <link rel="subtitle" type="text/x-srt" hreflang="de"
        href="http://example.org/video.de.srt" length="32" />

        <!-- link to the english subtitle -->
        <link rel="subtitle" type="text/x-srt" hreflang="en"
        href="http://example.org/video.en.srt" length="32" />

        </entry>
</feed>
```

APPENDIX ONE: THE GENRES NAMESPACE

further defined and maintained at transmission.cc/Genres

The Genres namespace we describe here is based on the IMDB 'Genre' list, and is thus not specific to documentary or political filmmaking. However, it can be freely extended according to the needs of its users. Our feeling is that systematic genre taxonomy is the wrong way to go and it is better to simply suggest a list and prune this in an ad-hoc fashion as time goes along.

Action
Adventure
Animation
Biography
Comedy
Crime
Documentary
Drama
Family
Fantasy
Film-Noir
Game-Show
History
Horror
Music
Musical
Mystery
NewsReality
TV-Romance
Sci-Fi
Short
Sport
Talk-Show

Thriller
War
Western

APPENDIX TWO: ROLES AND RELATIONS

This Roles Scheme is designed to provide for markup of Credits within the Transmission metadata system. We conform to the draft suggestions set out here: **http://ietfreport.isoc.org/all-ids/draft-snell-atompub-author-extensions-00.txt**

Thus we obtain markup that looks like this:

<pe:role scheme="http://transmission.cc/Roles" term="Editor"/>

We obtained as initial list of Roles from a list held by the US Library of Congress, here: http://www.loc.gov/marc/sourcecode/relator/relatorlist.html; and one held the European Broadcasting Union here:

http://www.ebu.ch/en/technical/metadata/specifications/role_codes.php. This list is non-prescriptive. Those marking up metadata in the tx:standard can now use any term they want to describe a role in credits; but additions to the list of recognized roles will only be made from time to time.

Note the list is, in terms of the roles required by Credits, incomplete.

Example atom:contributors using Library of Congress and European Broadcasting Union roles:

Actor   A person who principally exhibits acting skills in a musical or dramatic presentation or entertainment.

Anchor   A person who acts as the central moderator of the programme, responsible for following the programme script towards the audience.

Animator   A person responsible for the creation of an animated work. This encompasses all kinds of animation including cartoons, computer generated animations and still frame animations using models.   V814

Announcer   A person, appearing in sound or in vision, responsible for reading newscast and news bulletins, for voices continuity for programs, or for describing actualities such as parades, sporting, musical and other special events.

Art Director   The person who oversees the artists and craftspeople who build the sets.

Assistant Director   A person who assists the director during a production with such things as keeping track of time, seeing that camera shots and tape and film inserts are ready when needed, etc.

Assistant Producer Assistant Producers assist Producers in the production of programmes or series and also have considerable personal responsibilities within the framework of the programme's objective, and to the Producer's brief. Some APs produce short film inserts and single episodes of programmes and / or direct live or recorded programmes in the studio, on location or as Outside Broadcast relays. In so doing, they are responsible for producing effective and exciting visual images, and sounds and words which capture and convey the intention, style and mood of the programme in a logical, coherent, objective and entertaining way. Coming up with original programme ideas and formats, which are viable in television terms and of interest to a target audience is part of their brief, as is identifying and developing potential stories, items and new angles and approaches to issues. They often write scripts, commentary and links and construct reporter-led stories. Assistant Producers set up filming, find interviewees, archive material and locations, and on some productions they suggest and book studio guests. In many cases, they supervise the post-production process, being involved in editing, dubbing and compilation. Note: not to be confused with Production Assistant   V497

Author   Script writer of a non fiction production. Person in charge of working out details of the story-line, including talents roles and scenes descriptions.

Camera Operator   Person in charge of the operation of a camera and responsible for the device's output during a production.

Commentator   A person who provides interpretation, analysis, or a discussion of the subject matter on a recording, motion picture, or other audiovisual medium

Commissioning Broadcaster   Original broadcaster commissioning the material.   V19

Composer   Person/cooperation responsible for composing the music used in the programme

Director   Person who is responsible for the general management of a work or who supervises the production of a performance for stage, screen, or sound recording.

Distributor   Agent or agency that has exclusive or shared marketing rights for an item.

Executive Producer "The person primarily in charge of the financial aspects of a production and who may also make major creative decisions. A producer who is not involved in any technical aspects of the filmmaking process, but who is still responsible for the overall production. Typically an executive producer handles business and legal issues. "

Film Editor Editor of a motion picture film. This term is used regardless of the medium upon which the motion picture is produced or manufactured (e.g., acetate film, video tape).

Funder Person or agency that furnished financial support for the production of the work.

Musician Person who performs music or contributes to the musical content of a work when it is not possible or desirable to identify the function more precisely.compiling and maintaining the original description of a metadata set (e.g., geospatial metadata set).

Narrator Speaker who relates the particulars of an act, occurrence, or course of events.

Producer Person who is responsible for the making of a motion picture, including business aspects, management of the productions, and the commercial

success of the work.

Post-Production Editor The role of the Post Production Editor is to help determine the look, sound and feel of the finished programme. The editor uses creative skills to set the pace of the piece and to further tighten the relationship between the picture and sound.

Producer A person who is responsible for the making of an audio-visual work, including business aspects, management of the productions, and the commercial success of the work. They project manage the production process to ensure that scheduled deadlines / transmission dates are met. They lead and motivate the production team towards that goal, maximising its effectiveness and developing the capabilities and potential of individual members. They are also responsible for ensuring that a programme comes in on budget, managing and controlling programme expenditure and ensuring that the production team adheres to financial constraints. And finally, they plan, prioritise and co-ordinate the effective use of resources, recording and filming schedules.

Production Assistant Production Assistants provide high level secretarial and admin support to the Producer and Director (and sometimes the whole team) at every stage of production, co-ordinating activities. Their duties include: assisting the Producer or Director in the studio gallery, film studio or on location by shot calling, shot-listing, making recording notes, cueing, liaison with Presentation / VT, timing and continuity noting; preparing operational and post-production documentation including programme scripts, camera scripts / cards; recording orders, script breakdowns, schedules edit notes and post production scripts; undertaking some preliminary research into programme materials, resources, contributors or locations; maintaining efficient production office administrative and information systems; co-ordinating the production team, contributors and artists, supplying them with up-to-date information and documentation; making detailed production and travel arrangements." Note: not to be confused with Assistant Producer V91

Production Company Organisation responsible for producing the material

Production Manager The individual under the producer and director who supervises and coordinates all of the business and technical aspects of production. P

Witness An interviewed person speaking about something (generally newsworthy) of which they have first hand experience.

Researcher   Person or corporate body responsible for performing research.

Transcriber   A person who prepares a handwritten or typewritten copy from original material, including from dictated or orally recorded material. For makers of pen-facsimiles, use Facsimilist.

Translator   Person translating within a work.

APPENDIX THREE: FORMAT DOCUMENT TYPE DEFINITION

Including Commonly Used Audio And Video Codecs.

ELEMENT	DESCRIPTION	UNIT
<size>	Size of the video file	Bytes
<duration>	Duration of the video file	Seconds
<video_codec>	Codec in which the video is encoded	n/a
<framerate>	Number of frames in a given second, either as a positive float or a fraction (e.g., NTSC is 29.97 FPS or 30000/1001.)	Frames
<video_bitrate>	Defines how much physical space one second of audio or video takes in bits (note: not in bytes). For example: 3 minutes of MP3 audio in 128kbit/sec CBR bitrate takes 2.81 megabytes of physical space (1,024 x 128 / 1,024 / 1,024 x 180 / 8).	Bits
<width>	Positive integer describing the width of the video	Pixels
<height>	Positive integer describing the height of the video	Pixels

ELEMENT	DESCRIPTION	UNIT
<pixel_aspect_ratio>	Most digital imaging systems use a square grid of pixels—that is, they sample an image at the same resolution horizontally and vertically. But there are some devices that do not (most notably some common standard-definition formats in digital television and DVD-Video). A digital image scanned at a vertical resolution twice that of its horizontal resolution (i.e. the pixels are twice as close together vertically as horizontally) might be described as being sampled at a 2:1 pixel aspect ratio, regardless of the size or shape of the image as a whole. E.g., the pixel aspect ration of D1/DV NTSC is 0.8117:1; D1/DV NTSC 16:9 is 1.2121:1; 1440x1080 (HDV) is 1.333:1.	Pixels
<audio codec>	Codec in which the audio is encoded	n/a
<samplerate>	defines the number of samples per second (or per other unit) taken from a continuous signal to make a discrete signal. Some common sample rates are: 32,000 Hz (MiniDV camcorders); 44,100 Hz (audio CD); 48,000 Hz (digital sound used for miniDV, digital TV, DVD, and films)	Hertz (Hz)
<channels>	Number of audio channels.	channel

COMMON VIDEO CODECS

H.261: Used primarily in older videoconferencing and videotelephony products.

MPEG-1 Part 2: Used for Video CDs, and also sometimes for online video. If the source video quality is good and the bitrate is high enough, VCD can look slightly better than VHS.

MPEG-2 Part 2 (a common-text standard with H.262): Used on DVD, SVCD, and in most digital video broadcasting and cable distribution systems. When used on a standard DVD, it offers good picture quality and supports widescreen. When used on SVCD, it is not as good as DVD but is certainly better than VCD due to higher resolution and allowed bitrate.

H.263: Used primarily for videoconferencing, videotelephony, and internet video. H.263 represented a significant step forward in standardized compression capability for progressive scan video. Especially at low bit rates, it could provide a substantial improvement in the bitrate needed to reach a given level of fidelity.

MPEG-4 Part 2: An MPEG standard that can be used for internet, broadcast, and on storage media. It offers improved quality relative to MPEG-2 and the first version of H.263.

DivX, **Xvid**, **FFmpeg MPEG-4** and **3ivx**: Different implementations of **MPEG-4 Part 2**.

MPEG-4 Part 10 (a technically aligned standard with the ITU-T's H.264 and often also referred to as AVC). This emerging new standard is the current state of the art of ITU-T and MPEG standardized compression technology, and is rapidly gaining adoption into a wide variety of applications.

VP6: A proprietary video codec developed by On2 Technologies and used in Adobe Flash Player 8 and above.

Sorenson 3: A codec that is popularly used by Apple's QuickTime, basically the ancestor of H.264. Many of the QuickTime movie trailers found on the web use this codec.

Sorenson Spark: A codec that was licensed to Macromedia for use in its Flash Player 6. In the same family as H.263.

Theora: Developed by the Xiph.org Foundation as part of their Ogg project, based upon On2 Technologies' VP3 codec, and christened by On2 as the successor in VP3's lineage, Theora is targeted at competing with MPEG-4 video and similar lower-bitrate video compression schemes.

WMV (Windows Media Video): Microsoft's family of video codec designs including WMV 7, WMV 8, and WMV 9.

VC-1: SMPTE standardized video compression standard (SMPTE 421M). Based on Microsoft's WMV9 video codec. One of the 3 mandatory video codecs in both HD-DVD and Blu-Ray high-definition optical disc standards. Commonly found in portable devices and on streaming video websites in its Windows Media Video implementation.

RealVideo: Developed by RealNetworks. A popular codec technology a few years ago, now fading in importance for a variety of reasons.

Cinepak: A very early codec used by Apple's QuickTime.

Huffyuv: Huffyuv (or **HuffYUV**) is a very fast, lossless Win32 video codec written by Ben Rudiak-Gould and published under the terms of the GPL as free software.

Lagarith: A more up-to-date fork of Huffyyuv.

SheerVideo: A family of ultrafast lossless QuickTime and AVI codecs