ACESclip VWG: User Requirements

The following represents the outcome of meetings of the ACESclip Virtual Working Group (VWG) which set out to gather the user requirements of ACESclip metadata.

Definitions:

**Clip:** a sequence of images (e.g. original camera clip, VFX shot, entire program, etc.)

**ACESclip:** ACES-related XML metadata associated with a clip

**ACES images:** an ACES image or image sequence (encoded according to SMPTE ST 2065-1) conforming to SMPTE ST 2065-4 (OpenEXR) or ST 2065-5 (MXF)

**Non-ACES camera original images:** an image or clip consisting of camera original image data, which has been viewed through an ACES viewing pipeline, but has not yet been converted to ACES 2065-1 by an IDT (e.g. Camera RAW, MOV, MXF, DPX, TIFF, etc)

**Viewing Pipeline:** the order of operations necessary to output a display-referred image, representative of the creative intent at that moment in the production process.

**What are the user requirements of ACESclip metadata?**

**Requirements:**

1. **New specification should build upon ‘**[**strawman**](https://www.dropbox.com/s/42j3hro2ilax6vd/S-201X-00X.pdf?dl=0)**’** rather than trying to pare down the [existing TB-2014](https://www.dropbox.com/s/cbcppjpubcdj8m0/TB-2014-009.pdf?dl=0) specification.
2. Support communication of **viewing pipeline for ACES images**, with support for:
	1. ACES Version (implies RRT)
	2. IDT used
	3. LMT stack (CDL, LUT)
	4. Working Space of LMT (see #7)
	5. ODT used
3. Support communication of **viewing pipeline for non-ACES camera original images**, with support for:
	1. ACES Version (implies RRT)
	2. IDT used
	3. LMT stack (CDL, LUT)
	4. Working Space of LMT (see #7)
	5. ODT used
4. Elements of viewing pipeline should each have a **state** to imply whether it has been applied to image data or not (e.g. an IDT may be included but already applied to image data)
5. Must support a **ClipID element** in order to associate it with a clip or shot name
	1. It should be **possible for ACESclip to exist *before* a clip is actually recorded** (e.g. a template for DIT to set up live on-set viewing)
	2. Support for timecode element
6. Must be **compatible with an Academy Digital Source Master (DSM) archival** which leverages ST.2065-5 (ACES in MXF) and SMPTE ST.2067-50 (IMF App #5)
7. Must support **non-core ACES color transforms**
	1. Applicable for IDT, LMT, and ODT
	2. Support **hash of transforms** for integrity checks
	3. Support for CLF and CTL
8. Must support **non-ACES working spaces for LMTs (working spaces other than ACEScc and ACEScct)**
	1. Exact mechanism for this TBD
	2. Potential solution: ACEScsc transforms based on forward/reverse IDTs
9. Optionally support **history** element with past <ACESclip> iterations.
	1. UUID for each history element
10. Optionally support **framing** element
	1. Similar to EXR *dataWindow* and *displayWindow*

**What software or hardware should create, accept, and/or process ACESclip XML metadata?**

**Software / hardware:**

* Cameras (e.g. digital cameras directly outputting ACES images, or those with published IDTs)
* On-set software (e.g. Pomfort Livegrade, Filmlight Prelight, etc)
* Dailies software (e.g. Colorfront, Daylight, Resolve, etc)
* Editorial software
* Transcoding / VFX pull systems
* VFX software (e.g. Nuke, Flame, etc)
* Color grading software (e.g. Resolve, Baselight, Nucoda, etc)
* IMF mastering software (e.g. Colorfront, Clipster, Marquise, etc)
* ACESclip XML editor

**Example use cases:**

**“DIT template” use case:**

1. Colorist or post house creates ACESclip XML using **color grading system** defining the ‘look template’ or potentially multiple looks for the project.
2. DIT is provided ACESclip XML which is then loaded into **on-set grading system.**
3. DP consults with DIT who modifies CDLs or LMTs within the on-set grading system throughout shooting.
4. DIT exports modified ACESclip XMLs to dailies alongside footage.
5. **Dailies** **system** reads ACESclip XMLs in order to bake in the look for editorial / dailies media, export new ACESclip XML alongside OCF (with ClipID elements) to associate with each clip.
6. Post house receives ACESclip XMLs alongside OCF and ingests into their database for conform and VFX pulls.

**“In-camera” use case:**

1. **Camera** is configured into ACES mode and generates an ACESclip XML for each clip on the camera card, depending on the in-camera settings used.
2. **Dailies** **system** reads ACESclip XMLs in order to bake in the look for editorial / dailies media, export new ACESclip XML alongside OCF, and writes ClipID elements into each XML to associate with each clip.
3. Post house receives ACESclip XMLs alongside OCF and ingests into their database for future conform and VFX pulls.

**“VFX pull” use case:**

1. From #3 above, post house creates EXRs containing ACES 2065-1 for VFX pulls and sends sidecar ACESclip XML to VFX vendors with each shot.
2. VFX artist loads ACES EXR plate and ACESclip XML and **VFX software** is auto-configured to give them a preview of the creative intent.

**“Final color” use case:**

1. Conform pulls and VFX shots come together with ACESclip XMLs during conform and give colorists the existing creative intent as a starting point
2. Exact implementation will vary across **color grading software** (similar to bringing in CDLs today)

**“Archival / Academy DSM” use case:**

1. Project is creatively approved and ready for archival of graded ACES master.
2. **Color grading software** exports ACES master along with ACESclip XML.
3. **IMF mastering software** imports ACES master along with ACESclip XML and creates ACES IMF (SMPTE App #5) / Academy DSM package.