

Enabling Seamless Media Workflows via XML Interchange

Auto-conform Multi-layered Apple® Final Cut Pro® Sequences in Discreet® Smoke® Using XML Open Interchange Format

Over the years, numerous systems have been developed for moving project metadata from one system to another. When the EDL was first put into use over 30 years ago, it provided an excellent open system for taking a project off one linear editing system and essentially rebuilding it on another. The fact that the EDL is still in use today is a testament to its usefulness and versatility. However, with the proliferation of multi-layered timelines and effects-laden projects containing effects that are far more complex than simple transitions and speed changes, the EDL is definitely beginning to show its age.

Newer interchange formats such as OMF and AAF offer an alternate solution to EDLs, but these are partially-closed formats generally created on one system, for use on another system by the same vendor. They can be used to exchange projects between systems, but contain “black” binary information which is often unreadable without extensive development to reverse engineer the proprietary format. Of course, this makes closed systems unpractical. Closed systems do not address the real need to share metadata between applications and systems in an open and extensible format, a format around which facilities can build a pipeline. Could XML offer a solution?

XML, or eXtensible Markup Language, provides a general purpose means for creating special-purpose markup languages. Based on internationally recognized standards, XML can describe many different kinds of data in a completely open, human- or machine-readable format. Its primary purpose was to offer a way of sharing structured text and information across the Internet; however it has proven useful in many other applications. For instance, by implementing XML in an NLE environment, projects based on XML are described in a structured way, making it possible for applications to understand and open these projects without specific knowledge of where they originated. In other words, with XML, the potential exists for describing the elements of a given project in a way that other systems can understand.

Enter Apple® Final Cut Pro® XML, an interchange format that contains descriptive tags that explain all the contents of an Apple Final Cut Pro project, from a multi-layer sequence, to edits and transitions to effects, color correction settings and even keyframe data. Using the XML interchange format, you can share many elements of a Final Cut Pro HD project with any other application or system that supports XML, including other nonlinear editors.

Discreet Smoke, for instance, uses the information contained in the Apple Final Cut Pro XML to import a Final Cut Pro sequence, auto-conform the compressed offline SD/HDV sequence, and then recapture at full HD resolution, high-quality non-compressed RGB 4:4:4 media for online finishing. This makes Discreet Smoke and Final Cut Pro ideal partners in an integrated iterative high-quality finishing pipeline.

Final Cut Pro XML Workflow

The process of conforming an offline Final Cut Pro project on a Discreet® Smoke® system involves multiple stages. The following section provides a high-level overview of the steps you must perform in order to successfully benefit from the powerful conform environment created when partnering Apple® Final Cut Pro® and Discreet Smoke.

- Log, Capture and Edit in Apple Final Cut Pro.
- Export the sequence from Final Cut Pro as an XML file.
- Import the XML file into Discreet Smoke.
- Recapture the offline media.
- Finish the project and output as needed.

Logging, Capturing, and Editing in Final Cut Pro

Using Final Cut Pro, you are able to perform all the preparatory work needed to begin editing. This can include logging, batch capturing, and so on. And, of course, you can use Final Cut Pro to build edited, multi-layered sequences that include DVEs, color correction, animated text, and many other effects.

In a typical iterative scenario, the editing on the offline system is performed using lower-quality SD material from down-converted dubs that you can then recapture on the online system in high-quality non-compressed SD or HD material. Because of differing standards between SD and HD video, certain frame rates are better suited for this workflow. For instance, if you start from an interlaced format such as NTSC, it is very easy to switch to 1080i 59.94 HD as the playback rate is identical. All that changes is the size of each frame.

When working in 24p progressive frame mode, Final Cut Pro uses the Advanced Telecine method for removing pull-down (which is created by cameras such as the Panasonic® AG-DVX100) instead of the more common Reverse Telecine process that removes 2:3 pull-down used by Telecine transfers. As a result of this difference, there are certain project settings that you should not use for offline Final Cut Pro editing if you intend on auto-conforming the project in Smoke using an XML interchange file. These include:

- NTSC footage played at 24 fps (Advanced Telecine Pulldown)
- 720p@24fps
- 720p@30fps

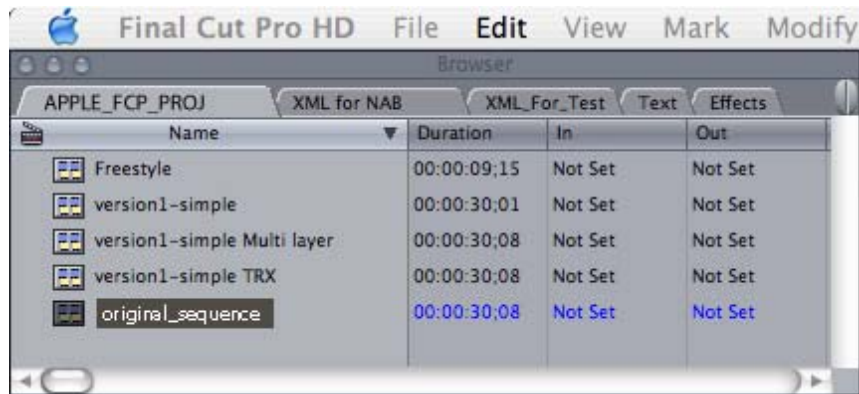
Exporting a Sequence as an XML File

To fully benefit from the interoperability between Final Cut Pro and Smoke, you must export each Final Cut Pro sequence as a separate XML file. Before exporting the sequence from Final Cut Pro, you should perform a Consolidate operation on the sequence so that Smoke does not capture unnecessary handles.

Note: To export a valid XML file from Final Cut Pro for use in the Smoke system, you must export the file from Final Cut Pro version 4.1 or higher.

To export an FCP sequence as an XML file:

1. After editing your offline sequence, select it in the Project Browser.



2. Choose File > Export > XML.

The Export XML dialog appears.



3. In the Export XML dialog:

- Select Apple XML Interchange Format, version 1, from the XML Export list.
- Disable "Include Master Clips Outside selection."

4. Click OK.

5. You are prompted to save the file to disk.

Note: The name you assign to the exported XML file is applied to the library reel that is created upon importing the XML file into the Smoke system. The name of the FCP sequence is assigned to the conformed clip itself.

Importing an FCP XML File into Smoke

Import XML sequences from FCP in the same way you import an EDL or OMF file – Using the EDL module. Each XML file contains a single FCP sequence with video and audio layers that you can recapture in Smoke. During import, Discreet Smoke parses the XML file so that it can interpret the file's contents. This allows Discreet Smoke to rebuild a timeline, while maintaining much of the original FCP sequence metadata. For instance, Discreet Smoke will recreate the sequence layer structure, clips (with the original handles), speed changes, cuts, dissolves and wipes.

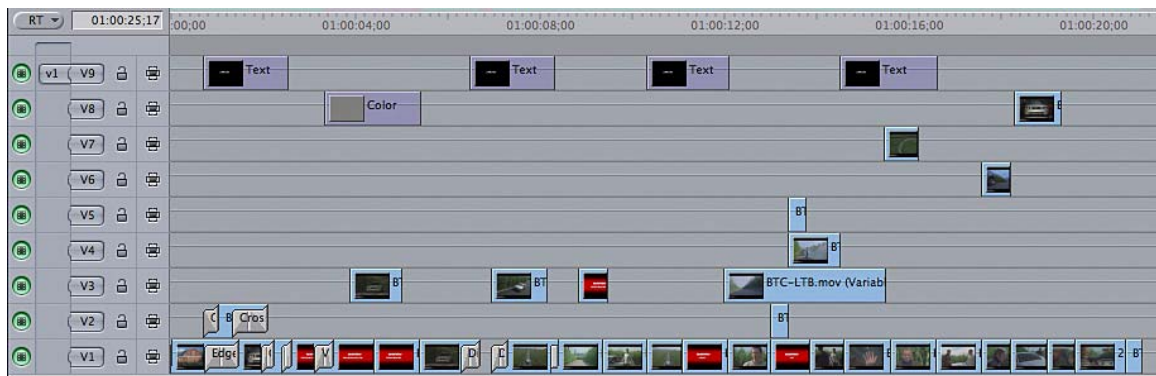


Figure 1: Original Final Cut Pro Sequence

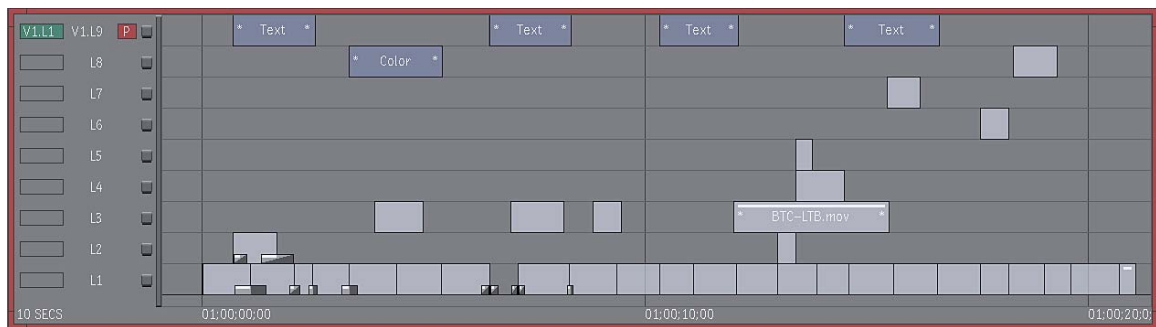


Figure 2: Conformed Smoke Timeline

Unsupported effects, such as color correction, layer transformation, text, custom wipes, and other FCP specific capabilities are marked on the Discreet Smoke timeline with soft effects and comments. By referring to the comment for a given segment, you can rebuild the effect.

For a list of elements that are translated and maintained when passed from Final Cut Pro to Discreet Smoke, refer to the chapter entitled *Importing Final Cut Pro XML* in the *Discreet Smoke User's Guide*.

Note: In order to import a Final Cut Pro XML file into Smoke, you must be using Discreet Smoke 6.7 or higher.

To import the XML file into Discreet Smoke:

1. Go into the Import EDL module.
2. Select xml from the File Format dialog.
3. Click Load, and then select the XML file in the file browser.

The file is loaded into Discreet Smoke and parsed. This may take a few moments depending on the size and complexity of the file. Once the parsing is complete, the Recapture module opens.

Note: To avoid capturing unnecessary material handles when auto-capturing from an imported XML file, use the Library tool > Consolidate function to remove extras handles that may be contained in the timeline.

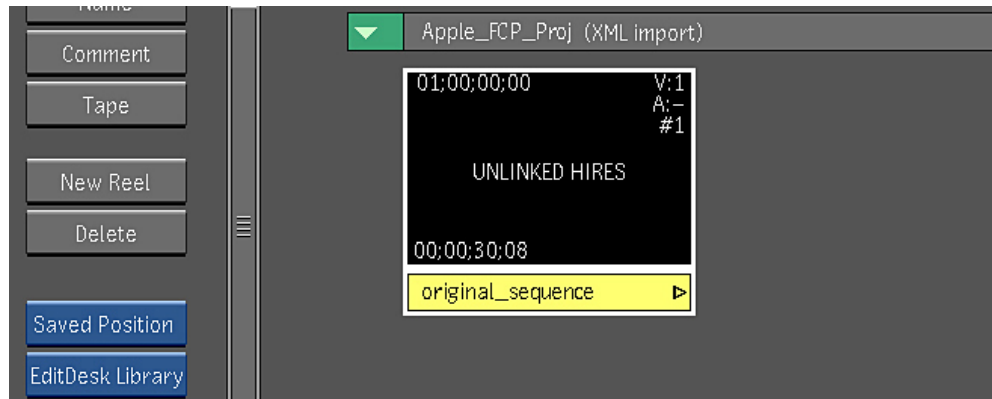
Recapturing an XML Timeline

The imported XML file simply contains metadata that provides information about the original media used to recreate the sequence. It does not contain the media itself. As such, after importing an XML file into Discreet Smoke, you have to recapture the footage from the original high-quality SD or HD tapes using the Recapture tool.

If you are rebuilding a timeline that contained audio elements that came in off a CD, you will need to manually import and re-edit these CD elements into the timeline (there are CD audio segment placeholders).

To complete the recapture process:

1. In the Clip library, select the assembled clip.



2. Click Tools.
3. Click Unlink/Relink, and then select Recapture.

The clip is loaded into the Recapture tool.

4. Click Recapture to launch Auto-capture.

Note: You can use the Convert Tape to File function to import still image formats instead of capturing material from tape.

5. In the Auto-capture module, complete the capture operation.
6. When you return to the Recapture module, click the Relink button to link the new captured material to the clip.

Once the Auto-capture operation is complete, return to the Clip Library and load the conformed, auto-captured clip to the Desktop for final finishing.

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