



Managing Media with Final Cut Pro X Libraries

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Introduction

Media management is at the core of today's file-based post-production workflows, and Final Cut Pro X 10.1 includes some fundamental changes that will improve and accelerate all of your future work. This document provides a comprehensive description of the new methods for organizing media and projects, including the critical first steps of updating from previous versions of Final Cut Pro X.

Before you update your existing projects and events, see [What's New in Final Cut Pro X 10.1](#) for a summary of the key changes in Final Cut Pro X 10.1. The update process is described in detail in [Update Projects and Events to Final Cut Pro X 10.1](#). The rest of the document outlines detailed strategies and best practices that are important to planning future post-production workflows.

Comprehensive information about the features in Final Cut Pro X can be found in the application's Help menu or online at <http://help.apple.com/finalcutpro>.

What's New in Final Cut Pro X 10.1

The major change in Final Cut Pro X 10.1 is the move to a production-focused library format for media organization. This new library model allows editors to simply collect all of the media for a particular production in a single location and then bring productions online and offline as needed.

There are several new concepts in the library model that are important to understand before you update to Final Cut Pro X 10.1.

Libraries

In Final Cut Pro X 10.1, libraries represent a new way to organize your work. A library contains multiple events and projects in the same location. The first time you open Final Cut Pro X 10.1, it creates a library file in the Movies folder. When you create a new project or event, it's automatically included in the active library. The library tracks all your media files, your edited projects, and the associated metadata.

You can have multiple libraries open at the same time, and you can easily copy events and projects between libraries. This makes it simple and quick to move media, metadata, and creative work to another system so that you can edit on a portable computer, collaborate with other editors, or archive your projects and media.

Managed and External Media

Media that you import into a specific library is stored inside the library and is referred to as *managed* media. Media can also be imported or copied to any location on a connected volume and linked to the library as *external* media. Multiple users can access this external media instantly on shared storage, including a storage area network (SAN) such as Xsan, Apple's SAN file system.

If you want to share access to managed media, you can convert it to external media at any time using the Consolidate command. You can also use the Consolidate command to collect external media as managed media inside the library for easy transport or archiving.

Generated Media

Render files, optimized files, and proxy files are all considered *generated* media because the system creates them in the background after the original media has been imported. All generated media is managed media and is stored inside the library. To save disk space, you can remove render files before moving or archiving a library. Copying a project between libraries does not copy render files because render files can be quickly regenerated.

Update Projects and Events to Final Cut Pro X 10.1

Before You Update

To work with projects and events created in earlier versions of Final Cut Pro X, you must update them to version 10.1. You can update existing projects and events when you first open Final Cut Pro X 10.1, or you can update them later.

Important: It's a good idea to make a backup copy of your files before permanently updating them to the new format. (The update process also gives you the option to save your old project and event files in a separate folder.) After your projects and events are updated to Final Cut Pro X 10.1, they cannot be used with earlier versions of Final Cut Pro. Backing up your current copy of the Final Cut Pro application will allow you to move your files to another Mac and continue working on these projects as needed using version 10.0.9 of Final Cut Pro. For more information about backing up your files and the Final Cut Pro application, go to [Final Cut Pro X 10.1: How to back up important files before updating](#) and the [Final Cut Pro Support](#) webpage.

When your projects and events are updated, the following things happen:

- For each connected volume that contains folders named Final Cut Projects or Final Cut Events, Final Cut Pro creates a new library named with the volume name. Existing projects and events are moved into the new library.
- All projects on each connected volume are collected in a new event named Updated Projects, and this event is placed in the newly created library for that volume.
- If you had project folders in the Project Library before updating, the names of the project folders are assigned as keywords to the projects that were in those folders.
- To make the new library self-contained, Final Cut Pro copies any existing compound clips or multicam clips on other volumes into the new library.
- If you have projects and events that link to event media on another volume, Final Cut Pro creates a Final Cut External Media folder for that media. After updating, you can use the Consolidate command to copy the linked media to the same volume as the linking event.
- After the update is complete, a message appears asking whether you want to move the old project and event files to the Trash. If you choose to move the files to the Trash and need to go back to them for any reason, you can restore them to their original location using the File > Put Back command in the Finder. However, after the Trash is emptied, the deleted projects and events cannot be restored.

Note: Media files are never moved to the Trash or deleted during the update process.

Select Options for Updating Projects and Events

If you have any existing projects and events in Final Cut Pro, you are presented with options for updating them when you open Final Cut Pro X 10.1 for the first time.

To update projects and events when you first open Final Cut Pro X 10.1

In the window that appears, choose one of the following options:

- *Update All:* Click Update All to allow Final Cut Pro to organize your existing projects and events into libraries. This is the simplest option. The projects and events on each volume are combined into a single library for that volume. After the update, you may want to organize your libraries and events to suit your particular workflow.
- *Update Later:* If you're not sure what to do, you can defer the update. When you choose this option, a new library is created. You can immediately start using Final Cut Pro X 10.1 to create new events and projects. You can always update your existing events and projects later by choosing File > Update Projects and Events.
- *Locate:* If you've been using SAN locations on an Xsan volume, you can click Locate to navigate to and then update SAN location folders. You can select a volume, a SAN location, or any folder containing a Final Cut Projects or Final Cut Events folder, and update it. This creates a new library next to the folder where the original projects and events were located. This manual update can be done at any time; for example, a SAN location may not be connected when you first open Final Cut Pro X 10.1.

Note: All the projects or events within any Final Cut Projects or Final Cut Events folder must be updated at the same time so that references to assets, compound clips, and multicam clips can be properly resolved. You can't update single projects or events.

During the update process, Final Cut Pro asks whether you want to move the old versions of your updated projects and events to the Trash. If you do this and then later need the old projects for any reason (for example, if you have multiple users on your system who have not updated), you can restore the files to their original location by opening the Trash, selecting the files, and choosing File > Put Back. However, after the Trash is emptied, the deleted projects and events cannot be restored.

Note: The Put Back command cannot be used for SAN locations.

Manually Update Projects and Events

There are a few scenarios where you'll need to update events and projects after the initial update, including:

- Events and projects on volumes that weren't connected during the initial update, or events and projects in SAN locations
- Events and projects that weren't stored on the root level of the connected volumes or were stored in renamed folders
- Projects, events, or sets of events that were offline when using Intelligent Assistance's Event Manager X application
- All projects and events, if you clicked Update Later when first presented with update options

To manually update projects and events

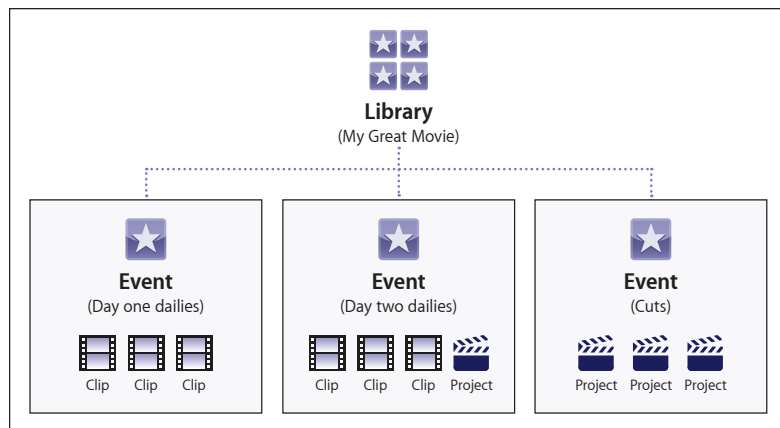
1. If necessary, connect the volumes that contain the projects and events you want to update, and then open Final Cut Pro.
2. Choose File > Update Projects and Events.
3. When the update window appears, click one of the update options described in [Select Options for Updating Projects and Events](#), above.

About Final Cut Pro Libraries

In Final Cut Pro X 10.1, your events are organized within libraries. Events contain both projects and clips.

Libraries

Final Cut Pro X 10.1 builds on the library concept used in applications such as Aperture and tailors it to professional video post-production workflows. You can think of a library as a self-contained unit of work such as a production or a job.



The following are important aspects of the new library model:

- *Self-contained:* Libraries are intended to be self-contained and don't depend on the content of other libraries. They may refer to media outside of the library, but they don't refer to clips in other libraries. This simplifies the process of archiving completed work. For more information, see [Archive Productions](#).
- *Single library file:* The library file is a single package in the file system containing all of the library databases and other supporting files. This includes generated media such as analysis files, render files, optimized media, proxy media, thumbnails, audio waveforms, and so on. You can copy and move the single library file to easily hand off all of your work on a given job or production.
- *Managed or external media:* Any source media (camera files, audio files, stills, or other movies) may reside either within the library file (as managed media) or outside the library file in a folder located anywhere on a hard disk or network. A managed library provides a convenient way to copy or move all of the media files associated with a single production.* External media, on the other hand, makes sharing media with multiple users easier. For example, you can store external media on shared storage such as a storage area network (SAN).
- *Support for multiple libraries:* In Final Cut Pro X 10.1, you can have multiple libraries open in the application at the same time. For example, you can have libraries for stock footage, or for pulling shots from old productions while editing your current production. For more details about moving or copying productions across libraries, see [Manage Media and Libraries](#).

The way you use a particular library depends on the nature of your production and workflow, but the general concept is that all of the media files required for a specific job are contained within a library. Here are some examples of possible library workflows:

- *Feature-length movie:* A movie can contain many days or weeks of dailies organized in events, as well as the many rough cuts of the final movie. Multiple editors can easily exchange events between their own copies of the library.
- *Episode of a dramatic series:* The library can contain all the footage for producing a single episode. If you use content from a previous episode, you can open that library and copy media or events into the current library.
- *Season of a reality show:* Reality shows are shot over a longer period of time, and stories are constructed based on the content that is captured. Media is often used across multiple episodes, and less commonly across multiple seasons as the characters and story lines may change too dramatically.
- *An ad campaign:* When you're working on a series of ads for a particular campaign, you might share media and assets (product stills, storyboards, and so on) across multiple spots.
- *Weddings or other occasions:* Content for an entire wedding can be used for many different types of deliverables (websites, DVDs, and so on), but rarely is content from one wedding used in a project for another wedding. Because multiple libraries can be open at the same time, standardized or reusable content can be sourced from a user-created "stock content library."

* Motion projects (such as effects, transitions, and generators) and third-party effects are not managed within the library and must be separately tracked and archived. See [Archive Productions](#).

Events

An event is similar to a folder that can hold clips and projects. You can easily copy or move clips and projects between events to organize them. An event might represent a day of shooting, an episode of a dramatic series, a location in a reality show, a portion of a wedding such as the reception or ceremony, or a series of edited projects.

Using an event as a “collection” that can be handed off to another editor or an assistant on the team is a good use of the library model. For example, an assistant editor can create an event for a day’s dailies and hand this over to the primary editor, and the editor can create an event containing his or her cuts for a scene or reel of a movie to hand back to the assistant.

Projects

A project corresponds to an edited sequence in the Timeline. The project may be a full movie or episode, or it may be a subsection that needs to be handed off.

With Final Cut Pro X 10.1, projects are now contained within events. Placing projects in a single “transfer event” (in a transfer library) makes for cleaner organization and interchange with others working on the same production.

Clips

A clip is the most fundamental element in an edited project. There are two types of clips.

Standard Clips

Standard clips consist of links to the source media files on your hard disk. They also contain metadata such as timecode, keywords, markers, and so on. Standard clips can be synchronized clips with dual-system sound, titles, or generators. Whenever you add a standard clip from an event to the Timeline, the new Timeline clip is a copy of the original event clip.

Reference Clips

Reference clips are composed of a “parent” clip in the Browser and “child” clips in the Timeline that refer back to the parent clip. Child clips have the advantage of being lightweight while still referring back to the complexity of the parent clip. When you edit the contents of any reference clip, you are in fact editing the parent clip from the Browser. Any changes you make to the clip are inherited by all of its child clips. Reference clips include compound clips and multicam clips.

- *Compound clips:* You can use compound clips to group any combination of clips in the Timeline or the Browser, and nest clips within other clips. In the Timeline, compound clips function just like other clips.
- *Multicam clips:* A multicam clip is a set of clips grouped together and synchronized by a common sync point. You can use multicam clips to edit footage from multicamera shoots or other synchronized footage in real time. View all angles playing simultaneously in the Angle Viewer and easily cut and switch between them.

Manage Media, Libraries, and Archives

For maximum efficiency and creativity, you can organize your libraries and media to suit your specific workflow. You can rename libraries and drag events between libraries. You can also create new libraries from a collection of events. For more information, see Final Cut Pro X Help at <http://help.apple.com/finalcutpro>.

During the update process, Final Cut Pro does not automatically copy your media across volumes (in order to avoid unnecessary copies). Therefore, consolidating the source media files for each library at a logical location on your hard disks or network is a great starting point after updating.

Work with Managed and External Media

Camera originals are the assets that are created by cameras and other recording devices during the production process. These assets are the most precious components of the production as they cannot be re-created after the fact. For this reason, it's very important that the original assets be carefully organized and tracked for use by all productions that require them. Final Cut Pro X provides two ways of tracking original camera media.

Managed Media

All original assets live within the library file and travel with it wherever that file goes. This has a number of advantages, including ease of archiving, distribution, and organization. However, storing the assets inside the library file makes it less efficient to share them with other editors and with applications such as Motion and Adobe Photoshop.

Managed media works best for the following types of projects:

- Single user
- Small projects
- Minimal sharing of individual media files

External Media

You can also choose to store the original media outside the library file as external media. You can store media on internal hard disks, connected external hard disks, and network volumes, including shared storage and storage area networks such as Xsan. External media is visible to any applications or libraries that need to work with it. However, along with this advantage comes the responsibility to move any media required for a library when you move the library, and to delete the source media files if they're no longer used. Final Cut Pro X never deletes media stored outside a library file because other libraries or applications may refer to it.

Libraries with external media lend themselves best to these kind of productions:

- Multiple users
- Medium to large projects
- Interchange with other applications

Final Cut Pro X 10.1 adds the ability to import all media to external locations. This means that an assistant or the first person to import original camera files can put them anywhere on shared storage. No matter where the original media is located, you can consolidate it in the library file (as managed media) or move it to another external location at any time.

Work with Generated Media

There are several types of media files that are generated within Final Cut Pro. Most of these files are stored within the library file and can be regenerated as needed.

Render Files

Render files are shared across multiple projects and events within a library. Conveniently, duplicated projects share the same render files. You can delete render files for one or more projects and events to free up storage space on media hard disks, or before transferring the library to another system. You can choose to delete all render files or just the unused render files.

Optimized Media, Proxy Media, and Thumbnails

If you work with long-GOP formats such as H.264 that cannot be easily edited with good performance, you can create optimized or proxy versions of your media.

Optimized media uses the Apple ProRes 422 codec format, which provides better performance during editing, faster render times, and better color quality for compositing.

Proxy media is a smaller-frame-size Apple ProRes version of the original media. You can create proxy files to dramatically improve real-time editing performance on slower computers. Proxy media also takes up much less storage space on media hard disks. After all the proxy media has been generated, you can switch between playing proxy media and higher-quality media using the Viewer Options pop-up menu in the upper-right corner of the Viewer.

Finally, there are application files, including video frame thumbnail files and audio waveform thumbnail files. These thumbnails provide a visual representation of the media content.

Media management commands in Final Cut Pro X allow you to copy and move optimized and proxy media. Render files and thumbnails are not copied during these operations and are regenerated as needed.

Analysis Files

Final Cut Pro X analyzes media in the background and creates files that enable optical flow retiming and automatic color balance adjustments, as well as other operations such as people detection.

All analysis files are regenerated on demand and are moved along with source assets during media management operations.

Manage Media and Libraries

There are some standard workflows involving media management that are critical to professional post-production. A few of the most important media management operations and commands are listed below.

Copy and Move

The Copy and Move commands transfer managed or external media to a different location. This results in the data being only in the final destination (Move) or in both locations (Copy). In addition to using the Copy and Move commands, you can copy and move clips and projects by dragging.

The Copy and Move commands work the same way as moving files within and across volumes in the OS X Finder. Dragging items within a library moves the items, and dragging items to a different library copies the items. If you hold down the Option key while dragging an item within a library, the item is copied.

To move clips or projects within a library

- Drag items to the new location.

Managed and external media files are not moved. Just the clip or project is moved.

To copy clips or projects within a library

- Option-drag items to the new location.

Managed and external media files are not copied. Just the clip or project is copied.

To copy clips or projects to another library

- Drag items to an event in the other library.

Managed media files are copied to the new library. External media files are not copied.

Note: You can also move items to another library by Command-dragging them.

To add clips to projects in another library

- Drag clips from the Browser to the Timeline in the other library.

Managed media files are copied to the new library. External media files are not copied.

Consolidate

The Consolidate command collects all of the media associated with a particular library, event, or project in a single location, either internal (managed) or external to the library. Consolidating is an easy way to collect all media for housekeeping or archiving.

- Consolidating to a managed library gives you a convenient package to archive or transfer.
- Consolidating to a managed library copies the media into the library file, leaving the original media undisturbed (in case other libraries or applications refer to it). After consolidating, the library is linked to the managed media.
- Consolidating a library to an external location moves or copies all media referenced by the library to a single location. Media within the library file is moved to the external location, resulting in a smaller library file. All media that was already external to the library file is copied to the new external location.
- The Consolidate command can also be used to copy media from one external location to another.

Delete Render Files

This command deletes all render files and share files (such as movies shared to a website) from the library. You can delete render files for one or more projects or events. You also have the option to delete all render files or just unused render files.

Merge Events

The Merge Events command combines multiple events into a single event. If two clips are truly duplicates, the resulting event contains only one version of the clip. If the clips differ in any way, both clips remain so that you can resolve the differences.

Back Up Libraries and Projects

In addition to using systemwide backup functions such as Time Machine, you can use tools in Final Cut Pro X to automatically back up all of your creative work.

Duplicate Projects as Snapshots

In addition to duplicating projects using the Duplicate command, you can use the Duplicate Project as Snapshot command in Final Cut Pro X 10.1 to quickly create a self-contained version of a project that may be used at a later time. The important difference between this snapshot and a regular project duplicate is that all the compound and multicam clips are independent and thereby protected from accidental changes as you continue to edit your original project.

Back Up or Restore the Library

Final Cut Pro X 10.1 adds new functionality to periodically back up all library databases so that they can be restored in the event of a problem.

At any time, you can open a “known good” copy of your library from the Final Cut Pro Backups folder. This folder can be located on another hard disk or in a specific location on a network so that if the main hard disk fails, there is still a usable copy to restore. These backups include all library, event, and project databases, but not your media. As it generates new library backups, Final Cut Pro automatically deletes backups that are more than a few days old.

When the backup library is restored, a new library is created so that you can move any changes from the working library into the new library if needed.

Note: Backup files are not copied during media management operations.

Archive Productions

Important projects need to be archived. You can archive a project as a short-term solution to free up hard disk storage space, or you can archive a project for long-term storage and retrieve it when it needs updating or repurposing.

To archive a production

1. Select the items in the library you want to archive, such as one or more events or a final project.
The media included in the archive depends on your selection:
 - Select an event to archive all media in the event, whether or not it’s used in a project.
 - Select a project to archive the project and the media needed for that project. This results in a smaller archive.
2. Choose File > Copy [*item*] to Library > New Library, type a name for the new library, navigate to a location for the new library, and click Save.
3. In the window that appears, do one of the following:
 - *If you want the smallest possible archive:* Make sure the Optimized Media and Proxy Media checkboxes aren’t selected.
 - *If you want to include optimized or proxy media (and copying time and storage space aren’t issues):* Select the Optimized Media checkbox, the Proxy Media checkbox, or both.
4. Click OK.
5. Select the new archive library and choose File > Consolidate Library Files.
 - Consolidating managed media within the library provides you with one library file that has everything you need later.
 - Consolidating to an external location results in two items to move—the library and the media folder. However, you can more easily share this media later with multiple editors (on a storage area network, for example).

Note: Render files are not copied across libraries. You can regenerate them when you reopen your library.

You may also want to archive a rendered media file of the final project together with a Final Cut Pro X XML export of the final project. This XML file is a human-readable text representation that describes the edited sequence in the Timeline with all of the edit timing, asset references, effects, metadata, and other information available. This is a much richer archiving choice than an EDL and makes for a more accurate and complete re-creation of the project at a later date. For more information about exporting an XML file, see Final Cut Pro X Help at <http://help.apple.com/finalcutpro>.

There are a few other items you should archive in addition to the library. These are elements of your project that you would need if you set up a new system to edit an archived library.

- *Motion templates:* Any custom motion templates created in ~/Movies/Motion Templates/
- *Fonts:* Any custom fonts that aren't included with the system
- *Plug-ins:* Any third-party plug-ins used within the project, such as FxPlug effects, Audio Units plug-ins, or camera manufacturer plug-ins that enable playback of specific camera formats such as RED, Sony XAVC, or Canon XF

Collaborate with Other Editors

You can use the power and flexibility built into Final Cut Pro to work easily and efficiently with all members of your team. Carefully managing the handoff or “turnover” process allows multiple individuals to work collaboratively.

Tip: To prevent any confusion over current versions of a project, keep media and projects in separate events. This way, the primary editor can control versions of edited sequences in an event dedicated to that purpose. Meanwhile, assistants can transfer media (such as dailies) using media-only events that are separate from the editor's working projects.

When handing off new events to an editor who already has a working library, you can copy the events directly to the working library or create a transfer library containing the events.

To prepare dailies

When preparing media for multiple users to share, you should always import the media directly to an external location on a media hard disk or shared network.

1. Within a new library, create an event for each day's dailies, and import each day's media into the event for that day.
2. Use keywords to organize media based on important criteria such as scene and take.

You can also create new clips as needed:

- Synced clips with dual-system sound
- Multicam clips
- Roughly assembled shots in new compound clips that can be used as a traditional “string out”

To hand off a new library

When first handing off events to another editor, you need to create a new library containing the events. For example, an assistant editor can create a new library containing events to be handed off to the primary editor, and then make the new library available on shared storage.

1. In the working library, select the event or events you want to hand off.
2. Choose File > Copy Events to Library > New Library.
Note: When you hand off a library, you have the option to include optimized or proxy media. If you don't include these files, copying goes faster and the library takes up less space on the destination media hard disk. However, if copying time and storage space aren't issues and including the files will save time when the editor begins working, you should make sure all the generated media is copied as well.
3. Type a name for the new library, navigate to a location for the new library, and click Save.
4. If you want to include the media files along with the library, do the following:
 - a. In the Libraries list, select the new library and choose File > Consolidate Library.
 - b. In the window that appears, confirm the library file and click OK.
5. When copying is complete, select the new library in the Libraries list and choose File > Close Library.
6. If the new library is not already on shared storage, move the library to a location where the other editor can access it.

To hand off new events to a working library by copying

You can copy new events from your working library to another editor's working library located on shared storage. For example, an assistant editor can use this method to update the primary editor's working library.

1. On the destination system, close the working library on shared storage or the storage area network.
2. Open this library (the destination library) in Final Cut Pro on the system you want to hand off from.
3. Drag the events you want to hand off from your library (the source library) to the destination library you opened.
 - When you copy an event to the library, all of the clips in the event are copied, whether or not they're used in a project.
 - If you copy a project to the library, only the clips needed for that project are copied.
 - If you're working with external media on shared storage, no media files are copied.
4. When copying is complete, select the updated destination library in the Libraries list and choose File > Close Library.

The second editor can then open the updated destination library on his or her system and continue working.

To hand off new events to a working library using a transfer library

Another way to hand off new events to a working library on shared storage is to create an intermediate library, or “transfer” library. For example, an assistant editor can create a transfer library containing new events to be handed off to the primary editor, and then copy the new events from the transfer library to the primary editor’s working library.

1. On the system you want to transfer from, select the events you want to hand off.
2. Choose File > Copy Events to Library > New Library.
3. In the window that appears, type a name for the new library, navigate to a location for the new library, and click Save.
4. If you want to include optimized or proxy media in the new transfer library, select the appropriate checkboxes in the window that appears, and click OK.
5. In the Libraries list, select the newly created library and choose File > Close Library.
6. On the destination system, open the new transfer library by choosing File > Open Library > [library name], and drag the updated events to the working library.

Note: Motion templates are not managed as assets within the library but are instead stored in ~/Movies/Motion Templates/. If a project is dependent on custom titles or other Motion templates, these must be handed off separately. Placing updated Motion templates in a central location on shared storage as a last step in any handoff process guarantees that all editors working on a project can access the templates at any time.