STORM

USER GUIDE

VERSION 1.0v4

Storm software design and engineering: James Wilson, Chris Steele, Paul Brickel, Juan Leni, Simon Carter, Jerry Huxtable, Zulfiqar Malik, Dylan Yudaken, Przemek Stys, Michael Jones, and David Jennings.

Product testing: Dan Allum and Nikolas Almpanis

Writing and layout design: Joel Byrne

Proof reading: Eija Närvänen

The Foundry
6th Floor, The Communications Building
48 Leicester Square, London
WC2H 7LT
UK

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1 PREFACE

Storm is designed to assist digital media production workflow by combining several traditional process steps. Storm preserves the original captured media at its native resolution and colour depth throughout the workflow simplifying the production process.

Storm's key features include:

- **Ease of operation**—designed for use on or near set by directors, cinematographers, or continuity assistants.
- **Minimal data loss**—preserve the original captured media at its native resolution and colour depth.
- **Real-time playback**—play media and productions in real-time.

Production Workflow and Storm

So where does Storm fit into the production process? Storm was initially designed to fill a niche between onset filming and post-production processes like colour correction, visual effects (VFX), and sound editing. From there, Storm evolved organically to blur the line between the set and more technical processes like advanced editing.

Figure 1.1 shows a typical Storm production workflow combining some traditional production steps.

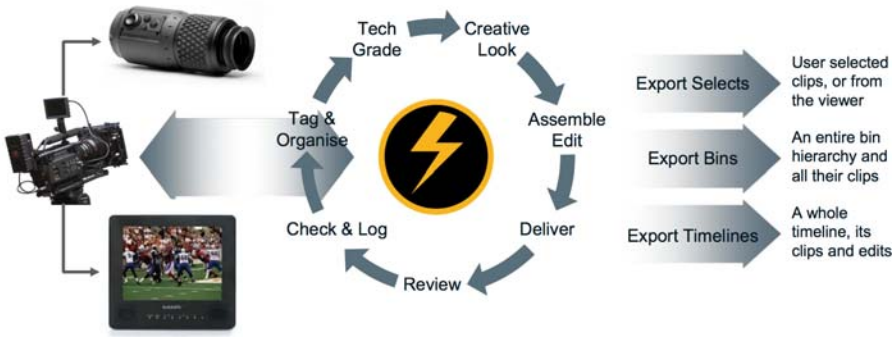


Figure 1.1: Typical Storm workflow

About this Guide

Throughout this User Guide, we assume you have a basic knowledge of video and audio theory, as well as proficiency with the operating system on which Storm is installed.

There are a few style conventions that you should be aware of throughout this Guide:

Note *This text provides important or useful information for the smooth operation of Storm.*

Tip *These are extra bits of information, not necessarily critical to the procedure you're performing, but worth knowing.*

Bold text denotes onscreen points of interest such as tabs, buttons, and menu items.

Underlined text highlights links to cross references or our website with automatic redirection to the relevant page.

For the most up-to-date information, please see the Storm product page and the latest Storm User Guide on our website at www.thefoundry.co.uk.

Getting Help

If you can't find what you need in this document, there are other sources of help available to you for all aspects of Storm and its operation.

Online Help

Most controls offer concise instructions in the form of tool tips. To display the tool tips, hover your mouse pointer over an interface control or parameter.

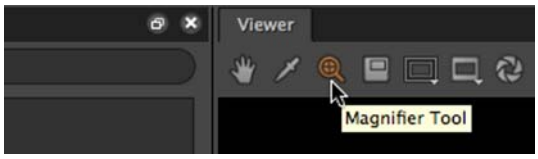


Figure 1.2: Tooltips

2 INSTALLATION AND LICENSING

Installing and licensing new applications can be a boring task that you just want to be done with as soon as possible. To help you with that, this chapter guides you to the point where you have a default Storm workspace in front of you and are ready to start viewing and editing your media with the minimum of effort.

System Requirements

Before you do anything else, ensure that your system meets the following minimum requirements to run Storm effectively:

- Mac Pro, MacBook Pro, or iMac running a minimum of Mac OS X Snow Leopard 10.6.4
- 2 GB of disk space available for caching and temporary files
- 2 GB of RAM (minimum requirement)
- Display with at least 1280 x 1024 pixel resolution and 24-bit colour

Installing Storm

Download Storm from www.thefoundry.co.uk/products/storm/get/ by clicking **Buy Storm**.

Follow the on screen instructions to download the correct installer.

Mac OS X

1. Double-click on the **.dmg** archive to extract the installation package.
2. Double-click on the **.pkg** file.
3. Follow the on-screen instructions to install Storm. By default, Storm is installed to **/Applications/Storm 1.0**.

Launching and Licensing Storm

Storm requires that you obtain a licence at first start up. You can purchase activation keys over the Internet by clicking **Purchase Licence** in the Storm licensing dialog that displays when you launch Storm without a licence, or by contacting The Foundry Sales Department at sales@thefoundry.co.uk.

Launch Storm using one of the following methods:

Mac OS X

- Click the Storm dock icon.

- Using the Finder, open the Storm application directory (by default, **/Applications/Storm 1.0/**), and double-click the **Storm 1.0.app** icon (or list item).
- Open a terminal and enter the following command:
  `open /Applications/Storm1.0v4/Storm 1.0.app`

A **Licensing** dialog box displays.

Select an activation option from the Storm **Licensing** dialog:

- **Purchase Licence**—click to open a web browser directly to The Foundry website to purchase an activation key.
- **Activate Key or Use Server**—click to enter a previously obtained activation key. When you enter the activation key, Storm automatically obtains a licence from the web and installs it on your machine.

Note *Storm does not currently support Licence Servers.*

- **Obtain Trial Licence**—click to automatically install a trial licence valid for 15 days. Whenever you then launch Storm, the **Licensing** dialog displays how many days remain before your trial licence expires. Note that you can only obtain a trial licence for a major Storm release once on each machine (for example, if you had a trial licence for Storm 1.0v1, you can't get another one for Storm 1.0v2 on the same machine).

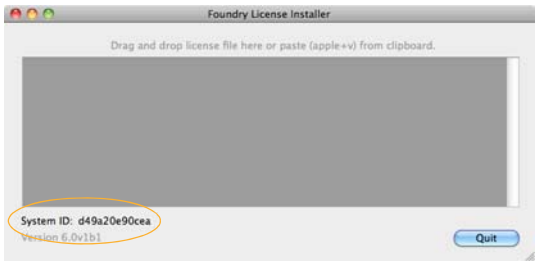
Note *You can select **Help** > **Licence** in Storm to display the **Licensing** dialog at any time.*

Manual Licensing

If the automated licensing provided with Storm fails, for example if your site has a strict Internet usage policy, you'll need to obtain a licence manually. You'll need the Foundry Licence Installer (FLI), your machine's System ID, and a licence key. If you encounter any problems with licensing, go to our website's support page at: www.thefoundry.co.uk/products/storm/support/

To licence Storm manually, do the following:

1. Download and run the FLI software package from:
   www.thefoundry.co.uk/support/licensing/foundry-licence-installer/rlm/
   Your System ID is displayed at the bottom of the window.



2. Using an Internet browser, navigate to
   www.thefoundry.co.uk/products/storm/try/manual-install/
3. Enter your System ID and details in the fields provided and click **Continue**.
   The field at the top of the screen contains your licence key, which should look something like this:

```
LICENSE foundry storm_i 1.4 permanent uncounted
hostid="d49a20e90cea" share=h start=29-nov-2010
issuer=website issued=29-nov-2010 _ck=6f589821dd
sig="60P0452V06MDS
AP8MWWNYVF8YRP56U26SDH8H0022GD4MSFP940PHQ74M4V6T7514GEH4
Y18CV"
```

4. Drag-and-drop, or copy and paste, the licence key into the FLI window to install the licence.
5. Start Storm using one of the following methods:

Mac OS X

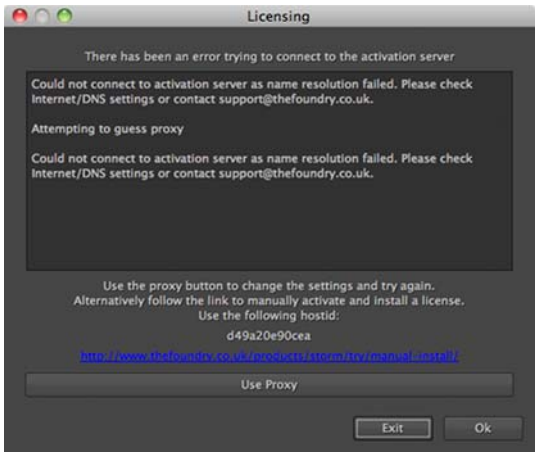
- Click the Storm dock icon.
- Using the Finder, open the Storm application directory (by default, **/Applications/Storm 1.0/**), and double-click the **Storm 1.0.app** icon (or list item).
- Open a terminal and enter the following command:

```
open /Applications/Storm1.0v4/Storm 1.0.app
```

The default **Reviewing** workspace displays.

Troubleshooting Licensing

If the following screen displays, there is a problem with the connection between Storm and our website.

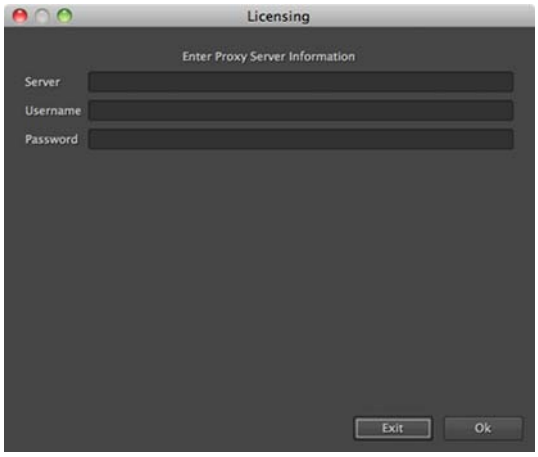


- Check your Internet connection and click **OK** to try again, or
- Install you licence manually using the steps described in Manual Licensing.

Using Proxy Servers

If you use a proxy server to connect to the Internet:

1. Click **Use Proxy** and enter your proxy server information in the **Server**, **Username**, and **Password** fields.



2. Click **OK** to try again.

For other licensing problems, go to our website's support page at: www.thefoundry.co.uk/products/storm/support/

3 Importing Media

The first step in any Storm Production is to import your media files to the **In Tray** within your Production. There are a number of ways to do this, and each method depends largely on the quantity of media you're working with.

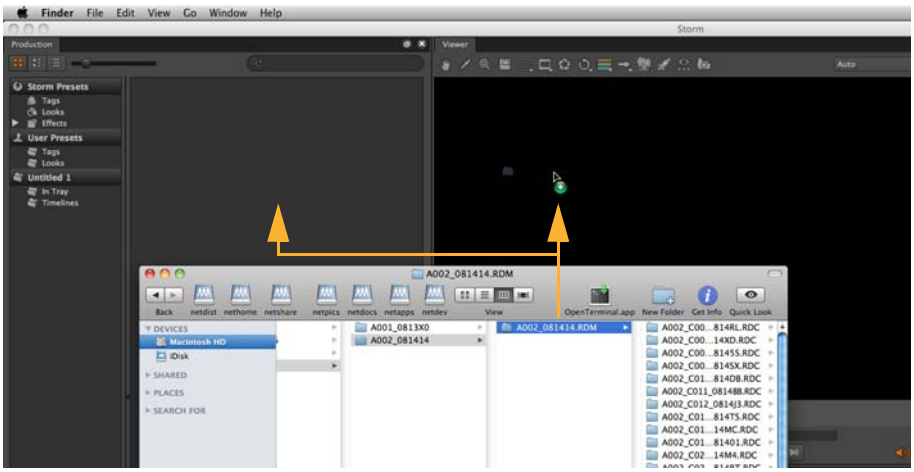
Note *Before you begin, it's always a good idea to back up your raw media to at least one other location.*

Using Drag-and-Drop

Storm allows you to quickly load media from the Finder directly using drag-and-drop. Simply locate your media in the Finder and drag the clip, folder, or folders into Storm's **Production** tab or Viewer.

Storm automatically sorts through the folders you drag-and-drop and only imports supported file types, ignoring any files that were imported previously—you cannot import duplicate files into Storm.

Note *Storm 1.0v4 supports EPIC and HDRx in addition to regular R3D files.*



All media loaded using drag-and-drop is placed in the **In Tray** in the **Production** tab.

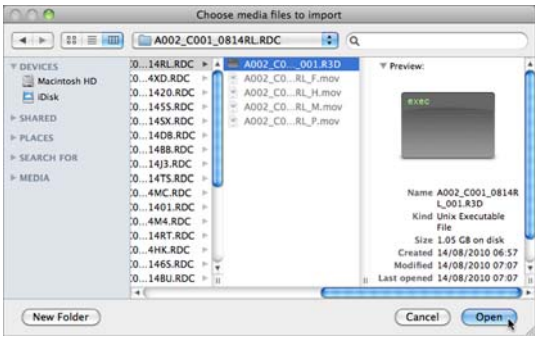
Using the File Menu

If you're used to working with menus, you can also import clips using the file browser. You can import individual clip files or entire folders, depending on the amount of media you intend to use.

1. Navigate to **File** > **Import Clips** or **Import Folders**.

Tip *You can also use the **cmd/Ctrl** + **I** and **shift** + **cmd/Ctrl** + **I** hotkeys.*

A browser dialog box displays.



2. Select the file(s) or folder(s) that you require and click **Open**.

   Storm automatically sorts through the folders you select and only imports supported file types.

Note *Storm 1.0v4 supports EPIC and HDRx in addition to regular R3D files.*

All media loaded using **Import Clips** or **Import Folder** is placed in the **In Tray** in the **Production** tab.

4 Reconnecting and Conforming Media

Storm automatically attempts to reconnect and conform imported Storm Productions or Final Cut Pro XML with the original source files during import. This process recovers all the grades you applied in Storm and applies them to the imported files.

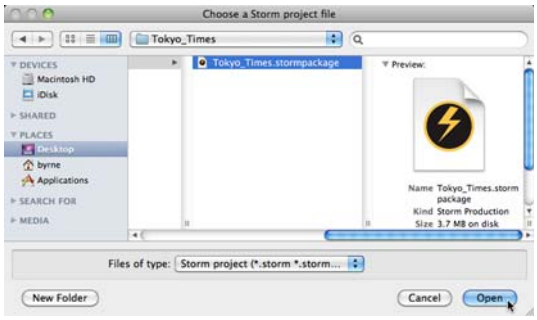
Note *You may need to reconnect your Production or XML manually if the location of your media has changed, for example if you originally read the source files from an external drive.*

Loading Storm Productions

When you load a Production, Storm checks the file paths to the media used and attempts to reconnect and conform the files automatically.

To load a previously saved Production on Mac OSX:

1. Navigate to **File** > **Open...** or use the **cmd** + **O** hotkey.
   The **Choose a Storm project file** dialog box displays.

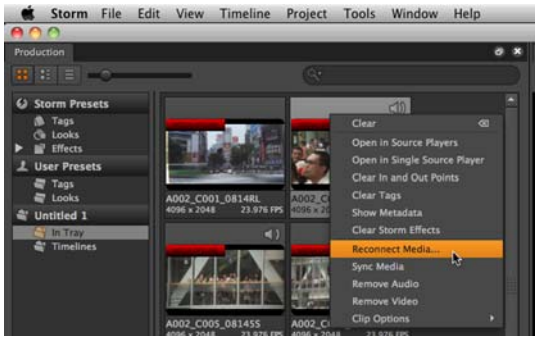


2. Locate your Production and click **Open**.
   Storm opens your Production and attempts to reconnect and conform the source files.

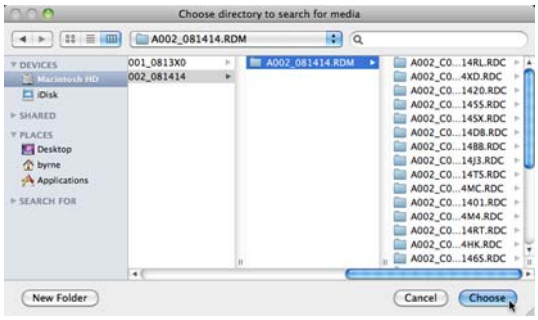
Manual Reconnection

If the file paths have changed, for example, when you load a Production created remotely, some or all of the media may appear Offline.

1. Right-click the offline media and select **Reconnect Media...**



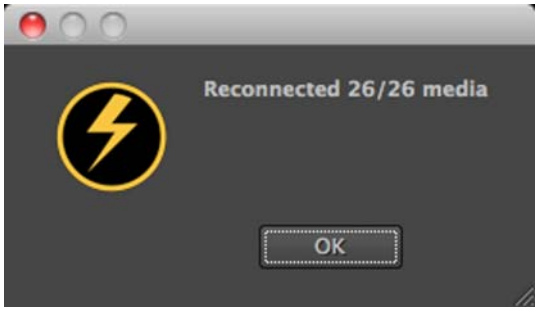
The **Choose directory to search for media** dialog box displays.



2. Browse to the location of the source files and click **Choose**.

   Storm reconnects and conforms the source files from the directory you selected.

   A progress dialog reports the number of successful re-connections.



3. Repeat the **Reconnect Media** process for all the offline media.

Importing XML

Storm can read existing clip, Bin, or Timeline XML files created by Final Cut Pro and reconnect and conform the XML with the original files. Storm can process the XML if it was originally created in Storm and round-tripped to Final Cut Pro and back again, or if the XML was created in Final Cut Pro using QuickTime reference files and then imported.

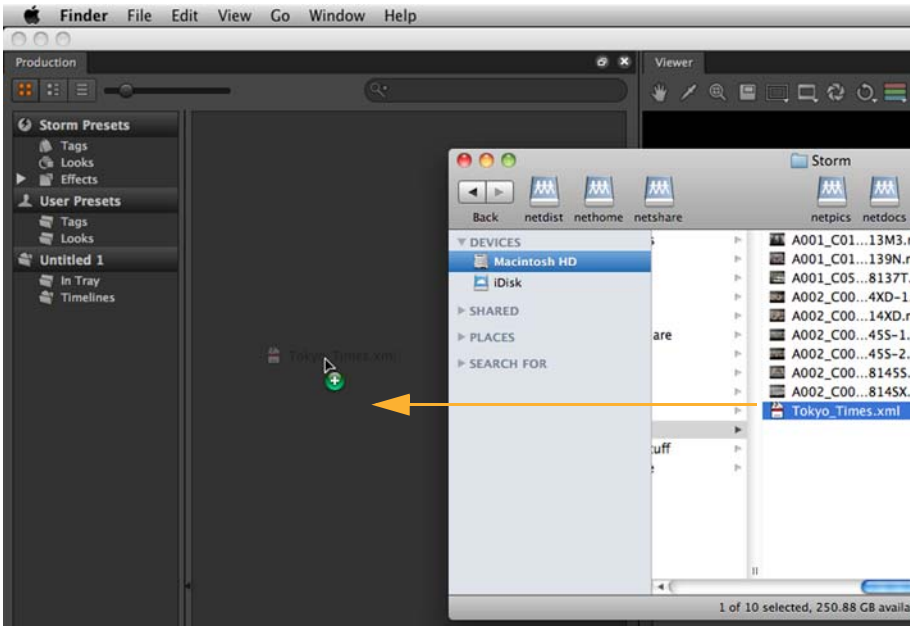
Note *QuickTime files that were not created by Storm do not carry effects over from Final Cut Pro.*

Reconnecting XML

When you load XML from Final Cut Pro, Storm checks the file paths to the media used and attempts to reconnect and conform the files automatically.

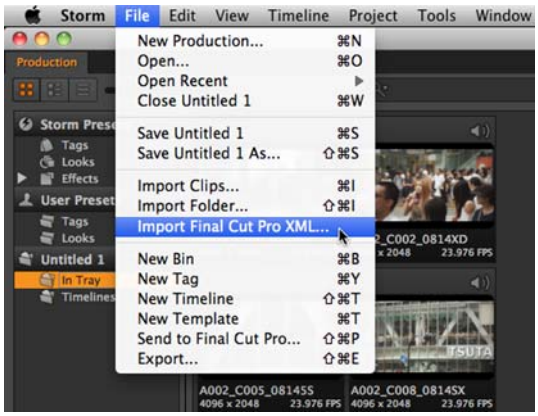
Note *If you know where all the source media used by the XML resides, you can pre-import the files manually and then import the XML to auto reconnect and conform the Production.*

1. Import your XML file:
   - Locate your XML in the Finder and drag the file to Storm's **Production** tab,



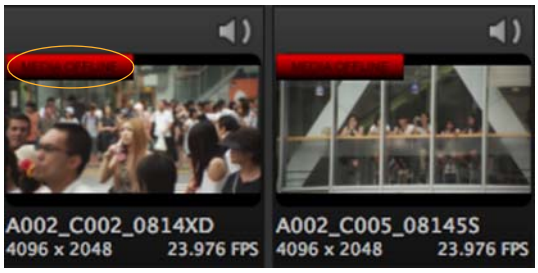
OR

- Import your XML using the **File** > **Import Final Cut Pro XML** menu option, locate your XML and click **Open**.

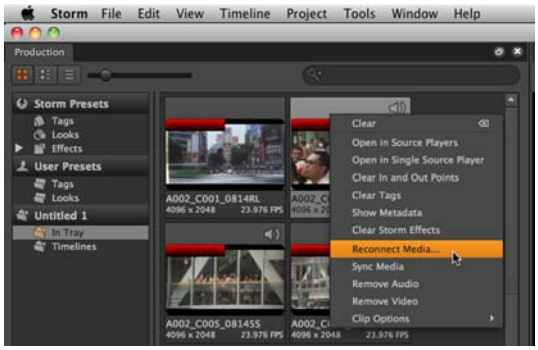


Storm opens your XML and attempts to reconnect and conform the source files.

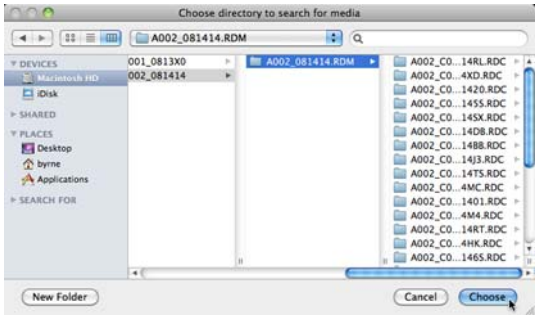
Unless you pre-imported your source files, your media appears as offline.



2. Right-click the offline clip, Bin, or Timeline and select **Reconnect Media...**



The **Choose directory to search for media** dialog box displays.



3. Browse to the location of the source files and click **Choose**.

   Storm reconnects and conforms the source files from the directory you selected.

   A progress dialog reports the number of successful re-connections.

4. Repeat the **Reconnect Media** process for all the offline media.

Tip *You can also import XML directly into Storm Timelines for concurrent editing, preserving your edits, but adding grades from third party applications. See Applying Grades to Timelines for more information.*

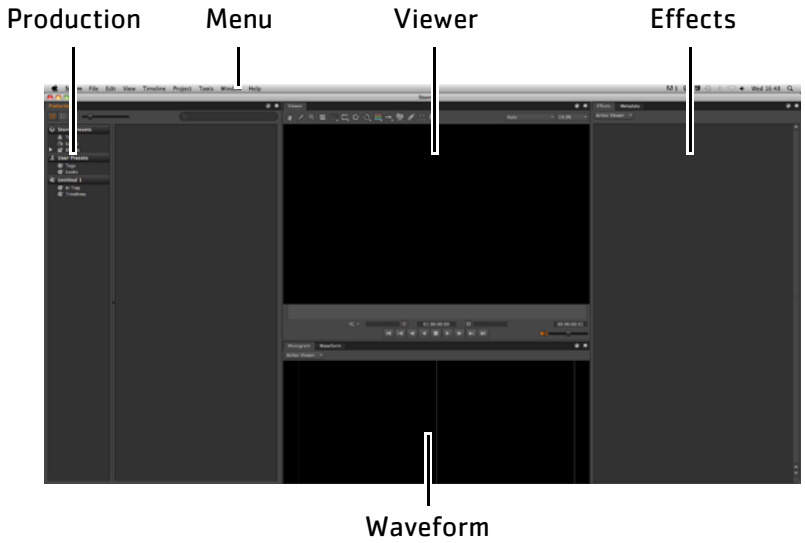
5 Customising Your Workspace

Workspace Overview

Storm's interface is customisable using floating panes and show/hide functionality, but two default workspaces are supplied for your convenience; **Reviewing** and **Editing**.

- The default **Reviewing** workspace is used primarily to confirm your media intent is fully realised before proceeding to the editing stage of post-production. You can add tags and notes, set clip In and Out markers, and organise your media into bins as required.
- The **Editing** workspace provides the tools you'll need to fine-tune your media, add visual effects, synchronise audio, and export your finished product.

Launch Storm and take a moment to familiarise yourself with the default **Reviewing** workspace.



1. **Production tab**—manage all aspects of your projects and Bins.
2. **Menu bar**—access Storm's drop down menus.
3. **Viewer tab**—display and review your media.
4. **Effects tab**—displays any effects applied to the clip in the Viewer.
5. **Waveform and Histogram tab**—displays Luma and RGB information for the currently selected Viewer.

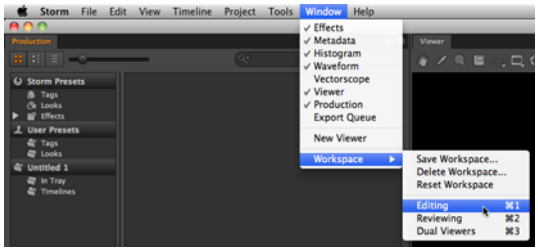
Menu Bar Components

The Menu Bar contains various Storm controls, many of which are available through context sensitive right-click menus, keyboard shortcuts, and toolbars.

For a full list of hotkeys, buttons, and menu functions refer to Appendix A: Storm Hotkeys.

You can switch between workspaces by navigating to **Window** > **Workspace** and selecting **Editing** or **Reviewing** as shown. Alternatively, you can toggle between the default workspaces using **cmd/Ctrl** + **1** and **cmd/Ctrl** + **2**.

Any custom workspaces you create are added to the end of the list. You can access the first custom workspace using **cmd/Ctrl** + **3**, and so on.



Creating Your Own Workspace

Storm's workspace consists of panes, which act like containers, and tabs which describe the individual areas you work with in Storm. During the customisation process, you can:

- Resize your entire workspace or panes independently.
- Split panes to create new work areas, for example two Viewers side-by-side.
- Add and remove panes and tabs as required.
- Float and nest tabs to group similar functions together, for example Histogram, Vectorscope, and Waveform in the same pane.
- Maximise the pane under the mouse cursor by pressing ~ (tilde). Press ~ again to return to the regular interface.

Storm allows you to create as many workspaces as you require, one for each project you undertake if necessary. In practice though, you may find that two or three custom workspaces will cover your needs.

Tip *You can return to the saved version of a workspace by navigating to **Window** > **Workspace** > **Reset Workspace**.*

Resizing your workspace

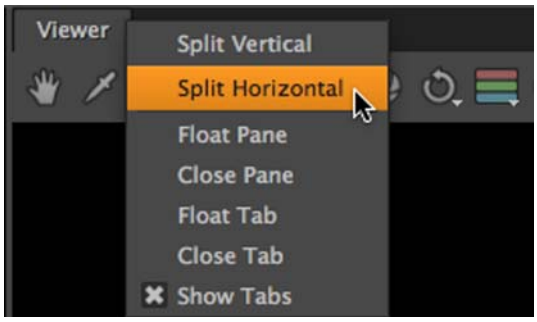
Resizing the interface, panes, and tabs works in much the same way as other software applications:

- To resize the entire interface, drag the resize handle at the bottom right of the application to the required width and height.
- To resize individual panes, hover the mouse over the edges of the required area until the cursor changes to the resize icon.
  Click and drag the cursor to resize the pane or tab.

Splitting panes

Splitting panes allows you to organise your workspace into distinct areas delineated by well defined borders.

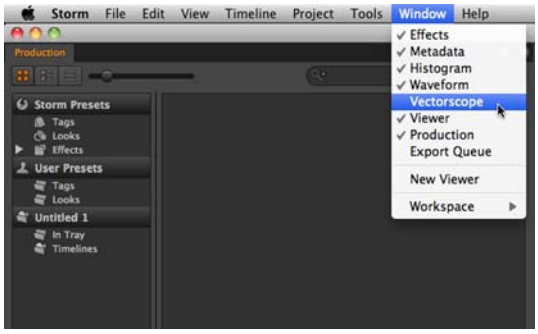
- To split panes, right-click the required pane and select **Split Vertical** or **Split Horizontal**.



Adding and removing panes and tabs

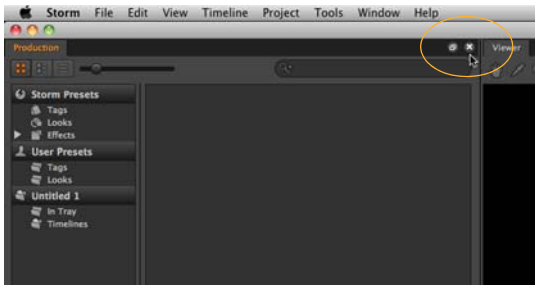
Adding and removing tabs gives you the freedom to personalise your workspace depending on your current production.

- Add new tabs by navigating to **Window** and selecting the required tab.



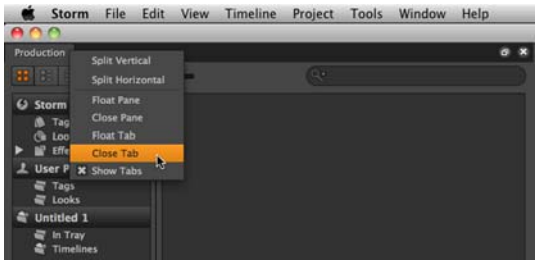
The tab is embedded in its default position or added to the interface as a floating window.

- Close any pane or tab that is not required by:
  - Clicking the **x** in its top right-hand corner,



OR

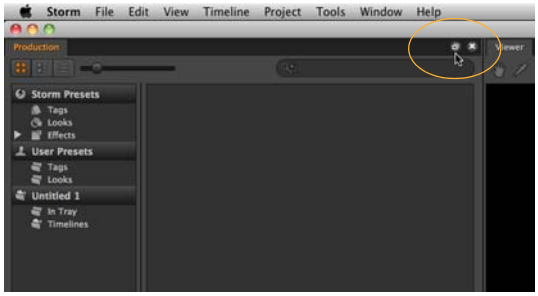
  - Right-clicking the tab name and selecting **Close Pane** or **Close Tab**.



Floating and nesting

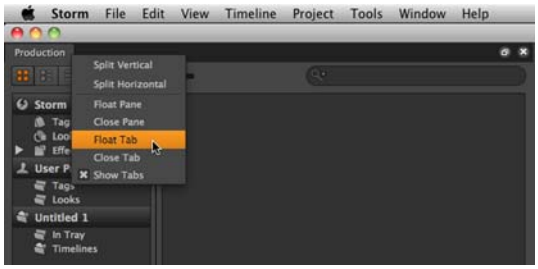
You can move existing panes and tabs to new locations in the interface (to help you organise your production).

- Float a pane or tab by:
  - Clicking the  icon in its top right-hand corner,



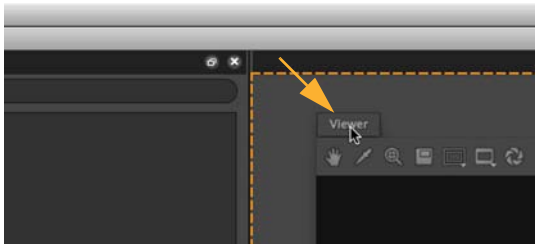
OR

- Right-clicking the tab name and selecting **Float Pane** or **Float Tab**.

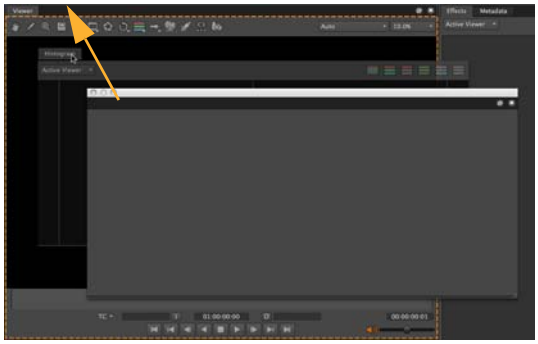


OR

- Dragging the required tab from its current location.



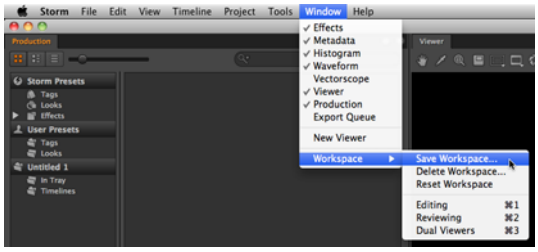
- Nest any floating pane or tab by dragging it to any existing pane.



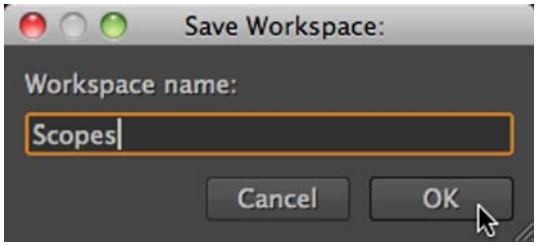
Tip *Use the orange highlight* ▬▬ *around the destination pane to help you determine where the tab will be nested.*

Saving Workspaces

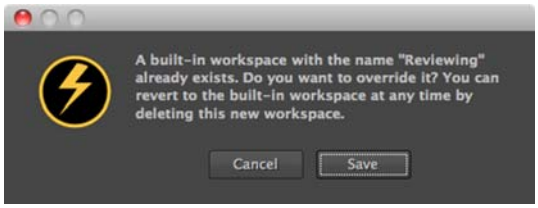
Once you're happy with the changes you've made to the workspace, navigate to **Window** > **Workspace** > **Save Workspace**.



Enter a name for the workspace, then click **OK** to preserve your workspace as a Storm workspace file (extension **.stws**).



Tip *If you save a workspace called **Editing** or **Reviewing**, you can override the default supplied with Storm by clicking **Save** in the dialog box.*

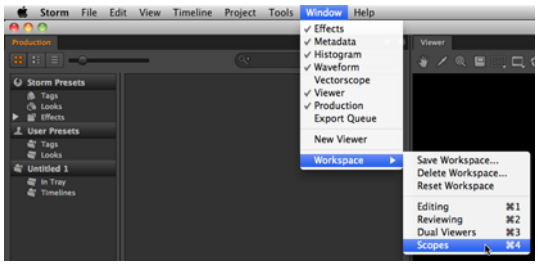


Delete the workspace you created to restore the default layout.

Loading Workspaces

To use a previously saved workspace, navigate to **Window** > **Workspace** and select the custom workspace name you require.

Tip *Alternatively, you can use the workspace hotkey **cmd/Ctrl** + **n** (where n = the number of the custom workspace).*



Your presaved workspace is loaded.

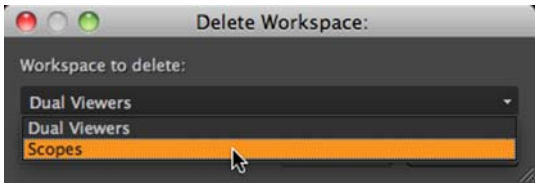
Deleting Workspaces

You may find that after using Storm on a number of productions, some of the workspaces you created earlier have been superceded by more useful entries. **Delete Workspace** allows you clear up your saved files from within Storm, although you can remove the files manually from the save location.

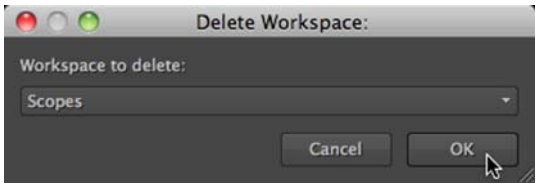
Tip *You can return to the saved version of a workspace by navigating to **Window** > **Workspace** > **Reset Workspace**.*

To delete custom workspaces:

1. Navigate to **Window** > **Workspace** > **Delete Workspace**.
2. Select the required workspace from the drop down menu.



3. Click **OK** to delete the selected entry.

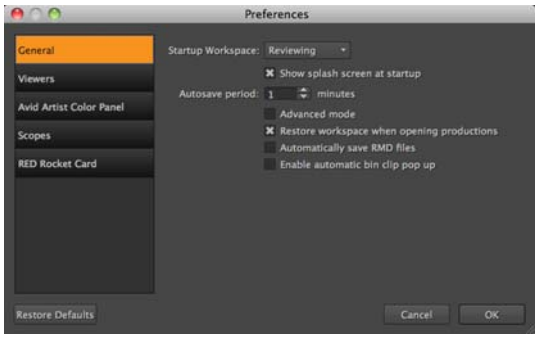


Workspace Preferences

The **Preferences** dialog allows you to make global changes to the way the interface behaves every time you start Storm. Changes you make in the **Preferences** override any local changes when you restart Storm.

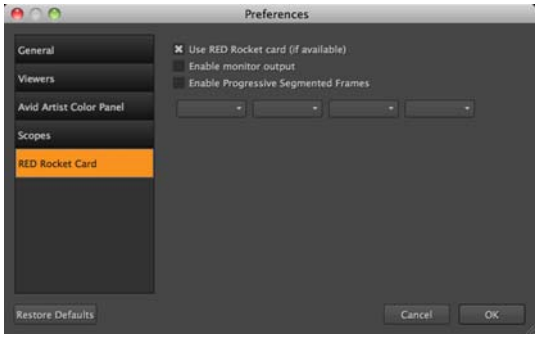
To access the **Preferences** dialog, either:

- Navigate to **Storm** > **Preferences**, or
- Use the Preferences hotkey **cmd/Ctrl** + **,** (comma).



- **General** preferences take care of how Storm starts up and how often your work is automatically saved.
  - **Startup Workspace**—select the default workspace Storm loads at startup.
  - **Show splash screen**—enable or disable Storm's product page during startup.
  - **Autosave period**—set how often you want Storm to save your work in the background. Use the up and down arrows or type a new value in the field.
  - **Advanced Mode**—enable or disable the bit depth dropdown in the Viewer and Export dialogs. **Advanced Mode** is disabled by default.
  - **Restore workspace**—whether Storm restores the saved workspace lay-out or uses the default Reviewing or Editing workspaces when you open an existing Production.
  - **Automatically save RMD files**—enable this option to automatically save changes you make to clip RED Look effects as RMD files. See About RMD Files for more information.
  - **Show popup clip overlay**—enable or disable the thumbnail mouse-over popup containing clip information and mini playback controls.
- **Viewers** preferences determine the default settings for the Viewer at startup as well as all new Viewers that you add to the workspace—you can still adjust the settings of individual Viewers.
  - **Guides**—select the default **Guides** to apply to Viewers. Choose from **No Guides** (the default), **Title Safe**, **Action Safe**, and **Both**.

- **Avid Artist Color Panel** preferences allow you to enable or disable the use of control surfaces. See About Control Surfaces for more information.
- **Scopes** preferences set the Black and White points for Histogram and Waveform Out of Range warnings individually, in the range 0-1. See Using Scopes for more information.
- **RED Rocket Card** preferences determine the default settings for RED Rocket output.



  - Select **Enable monitor output** to use the RED Rocket's monitor output function.
  - Enable **Progressive Segmented Frames** to send progressive signal as if it were interlaced.
  - Use the dropdown menus to set Storm's output to match the monitor you intend to use:
    - Resolution
    - Colour Space
    - Bit Depth
    - Frames Rate (fps)

Once you've made your selections in the **Preference** dialog, click **OK** to save your changes. Bear in mind that changing some preferences, for example **Use RED Rocket card** and **Scopes**, require you to restart Storm before they're applied.

You can also click **Restore Defaults** to return to the original **Preference** settings.

About Control Surfaces

Storm supports the use of the **Avid Artist Color Panel** in conjunction with effects applied to clips in the Viewer. Any effect in the **Effects Stack** can be mapped to the panel, for example Lift Gamma Gain, and is adjustable using the wheels on the panel.

To help you get started using the panel to complement Storm's **Effects Stack**, run through the following example setup and use instructions.

1. Plug the panel directly into the computer currently running Storm, using a standard Ethernet cable.
2. Ensure that the panel is enabled in **Workspace Preferences** (see above).
3. Drag a clip to the Viewer.
4. Go to **Storm** > **Effect** and drag the **Lift Gamma Gain** effect to the Viewer.

   By default, the panel focuses on the **RED Look** effect in the **Effects Stack**.
5. To select the Lift Gamma Gain effect, either:
   - Use the panel **shift** + **Page** ▶ buttons to move down the **Effects Stack** to Lift Gamma Gain, or
   - Select Lift Gamma Gain using the mouse.
6. Move the panel wheels to adjust the Lift Gamma Gain settings.

For more detailed setup and use instructions, see the Avid website at http://euphonix.avid.com/artist/ux/euphonix/artist-support.html

6 Reviewing and Organising Your Media

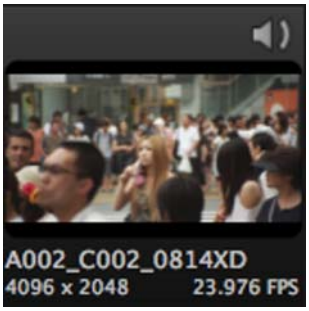
In the film industry, reviewing your media at the beginning of the day is the norm. This media is often referred to as Dailies. One of Storm's most powerful features is realtime playback—having the power to review your media onset—enabling you to view Hourlies, preventing wasted time earlier in the production workflow.

The default **Reviewing** workspace is designed for viewing Hourlies, providing a large Viewer, scopes, and Tags so you can evaluate your media onset.

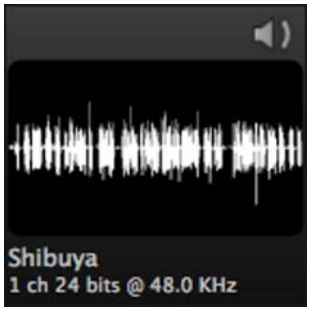
About Clips

Storm's interface sorts your clips into three broad categories: Audio and Video, Audio Only, and Video Only. Clips are displayed differently depending on their content, location, and in the case of the Viewer, the current mode (see Viewer Tools):

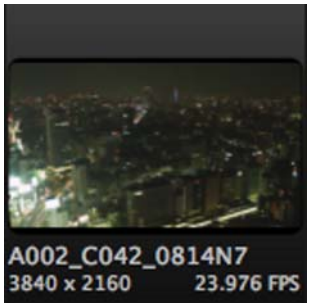
Clips in Bins



Audio and Video



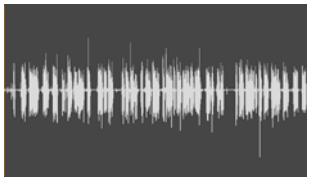
Audio Only



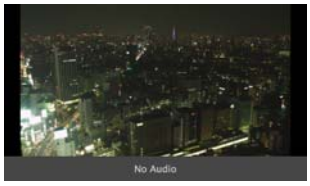
Video Only

Clips in the Viewer

Audio and Video



Audio Only



Video Only

Clips on the Timeline

Audio and Video Audio Only Video Only

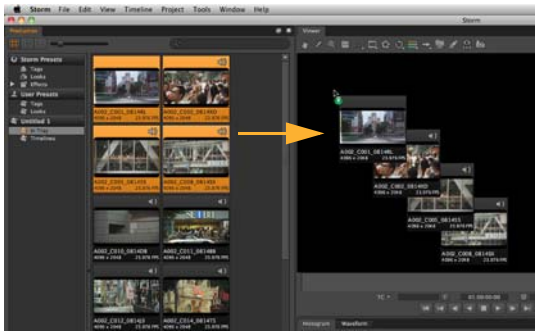
For more information on Timelines, see Using the Timeline.

Viewing Media

The Viewer is where your media is displayed and manipulated as well as where you apply tags and effects. When using the **Reviewing** workspace, the Viewer is set by default to be the main focus of the interface.

To view your media in the Viewer, simply drag-and-drop the file or files from the **Production** tab in to the Viewer. Any duplicate clips discovered by Storm are ignored during the import process.

Note *All your media resides in the **Production** tab **In Tray** by default.*



Viewer Tools

The Viewer, in both the **Reviewing** and **Editing** workspaces, has two sets of tools for manipulating your media: the view tools and the playback tools.

The view tools, located at the top of the Viewer, are used to affect the mouse pointer as you move over the Viewer, and to select Viewer preferences.

Icon	Function	Description
	Pan	Click and hold to pan around the Viewer if the image is larger than the window.
	Colour Sample	Enable or disable the RGB colour information sampler in the Viewer.
	Magnifier	Enable or disable the spot magnifier. Drag the tool over the Viewer to enlarge areas of the media temporarily.
	ROI	Click and drag to define a Region of Interest (ROI) in the Viewer. The scopes only display information within the ROI, when active.
	Show Overlays	Enable or disable overlay bounding boxes, for example **Action Safe**.
	Show Masks	Enable or disable a range of Viewer masks, for example **16:9**.
	Clipping Warning	Enable or disable Storm's clipping warning tool to alert you when the image is under or over exposed.
	Transform	Change the orientation of the clip(s) in the Viewer. Select from **Rotate**, **Flip Horizontal**, and **Flip Vertical**. **Note:** Transforms in the Viewer do not affect your final exports.
	Channels	Select the channel(s) to output to the Viewer, for example **RGB**, single channel, or **Luma**.
	Playback Mode	Select the playback behaviour for Viewer output. Select from **Continue**, **Repeat**, **Bounce**, and **Stop**.
	Viewer Mode	Select the Viewer display mode, for example **Audio and Video** or **Video Only**.
	RED Rocket Indicator	Lights when a RED Rocket card is installed on the machine running Storm. See RED Rocket Options below for more information.
	Toggle Effects	Enable or disable the Effects Stack applied to the current clip.
	Set Thumbnail Image	Click to set the current Viewer frame as the clip's thumbnail in Bins.
Bit Depth		Set the bit depth displayed in the Viewer, for example 8-bit or Half Float. **Note:** The Bit Depth dropdown menu is only displayed if you enable **Advanced Mode** in the Preferences dialog. See Workspace Preferences.
Image Quality		Set the Viewer image quality for working with low powered machines, for example Full Quality, Quarter, or Sixteenth.
Scale		Set the scale applied to the clip in the Viewer, for example 25%, 75%, or Fit.

RED Rocket Options

Using a RED Rocket card with Storm increases the rendering speed and adds the option to pipe your output to a monitor as well as the Viewer.

The RED Rocket icon has five states:


Inactive—the RED Rocket card is either not present or inactive.


Firmware error—there is a problem with the card firmware. Hover the mouse over the icon for more information.


Monitor active—the monitor is enabled and working correctly. Hover the mouse over the icon for more information.

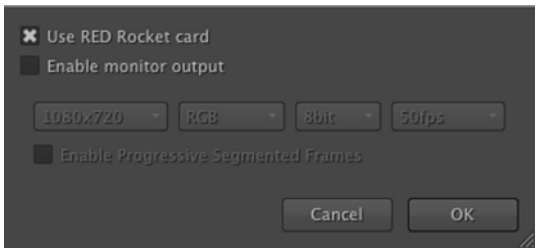

Active—the RED Rocket card is present and active.

To modify the RED Rocket options:

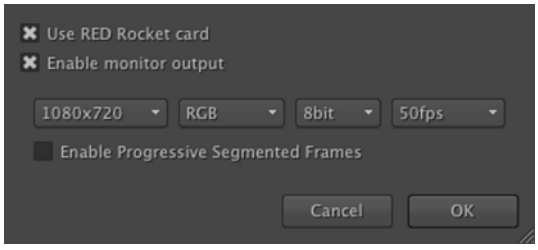
1. Click the  icon in the **Viewer**.

Note *You must have **Use RED Rocket** enabled in the **Preferences** dialog to access these options. See Workspace Preferences for more information.*

The **RED Rocket Settings** dialog displays.



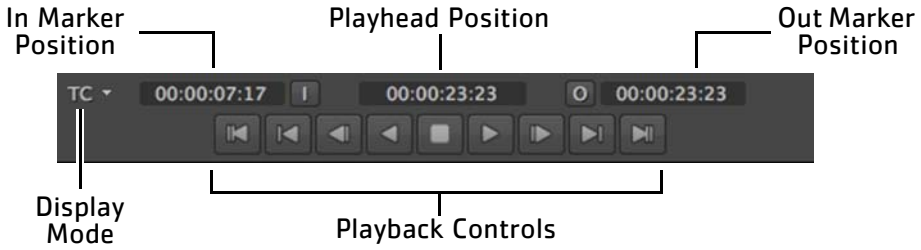
2. Temporarily disable the RED Rocket card by deselecting **Use RED Rocket card**. Unlike the option in the **Preferences** dialog, changing this setting does not affect Storm at startup.
3. Select **Enable monitor output** to use the RED Rocket's monitor output function.



4. Use the dropdown menus to set Storm's output to match the monitor you intend to use:
   - Resolution
   - Colour Space
   - Bit Depth
   - Frame Rate (fps)
5. Enable **Progressive Segmented Frames** to send progressive signal as if it were interlaced.
6. Click **OK** to save your settings.

Playback Tools

The playback tools manipulate the media itself, in much the same way as other editing or playback software.



The playback tools can be summarised as follows:

- **In and Out markers**—numerical representations of the clip In and Out markers. See Editing and Effects for more information on In and Out markers.
- **Playhead position**—numerical representation of the current position of the playhead.
- **Display Mode**—select the timing method to display during playback:
  - **Timecode (TC)**—displays the playhead position within the current clip irrespective of the number of clips in the Viewer.
  - **Absolute Timecode (AC)**—displays the Time of Day (ToD) inherited from the camera or timecode imposed on the media from an external source, for example a Jam sync source such as an Audio recorder.

    Timecodes imposed by external sources are suffixed with • **(jam)** as shown in Figure 6.1.

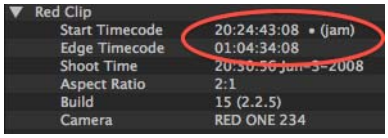


Figure 6.1: External Timecodes.

- **Edge Code (EC)**—displays the clip edge code read from the current clip's metadata.
- **Clip Frames (CF)**—displays the frame number in the current clip read from the clip's metadata.

Note *In dedicated Timeline Viewers, sometimes known as Record Viewers, the **Clip Frames** timecode is renamed **Timeline Frames**.*

- **Drop Frame**—is a timecode display option that leaves out two frames from the 30 fps timecode sequence every minute (except every 10th minute) so that long running NTSC timelines are accurate to a real-time clock (NTSC framerate is 3000/1001, or approximately 0.01% slower than 30fps).

  Drop Frames cannot be used when CF is selected as the **Display Mode**.

Note *Enabling **Drop Frame** is a Timecode display feature only—the source media remains a continuous stream of frames.*

- **Playback controls**—standard media playback controls including continuous or by frame forward and backward, skip to next or previous edit, and skip to start or end of all clips.

  The following table describes playback behaviour depending on the Playback Mode selected.

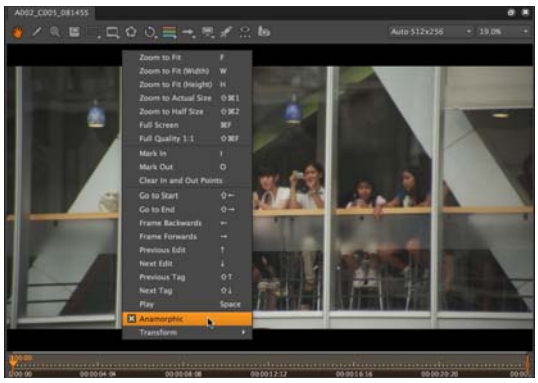
Mode	Description	In/Out Effect
Continue	Play once through all clips in the Viewer sequentially.	In-Out range has no effect.
Repeat	Play through the current clip from start to finish in an infinite loop.	Repeats within the In-Out Points.
Bounce	Play through the current clip from start to finish then reverse to the start of the clip and stop.	Bounces within the In-Out Points.
Stop	Play through the current clip from start to finish then stop.	Play through to the Out Point.

About Anamorphic Media

Storm automatically recognises anamorphic clips and displays them with a 2:1 aspect ratio. When you're ready to export an anamorphic clip, you can select whether or not to preserve the aspect ratio using a dropdown menu in the Export dialog. See Managing Storm Output.

If for any reason you want to display an anamorphic clip with a 1:1 aspect ratio, right-click in the Viewer displaying the clip and deselect the

Anamorphic checkbox.



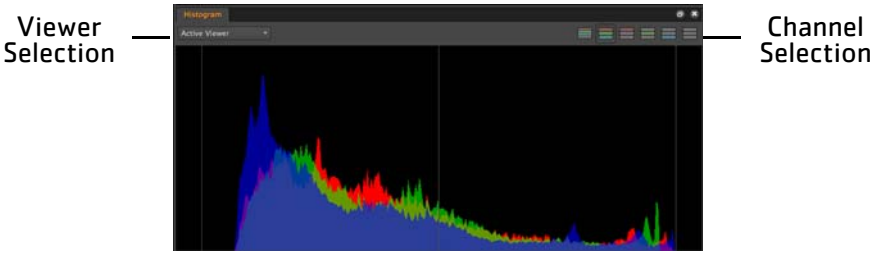
Using Scopes

Storm provides three realtime scopes to help you evaluate your media. Realtime scopes provide data as the Viewer plays your clip, but you can also view the scopes frame by frame if you prefer.

Histogram

The **Histogram** provides three colour channel and luma channel information that describes the distribution of red, green, blue, and luma pixels throughout the current frame.

The Histogram graphs the number of pixels at each brightness level, and from left to right, the areas of the Histogram represent shadow, mid tones, and highlights.



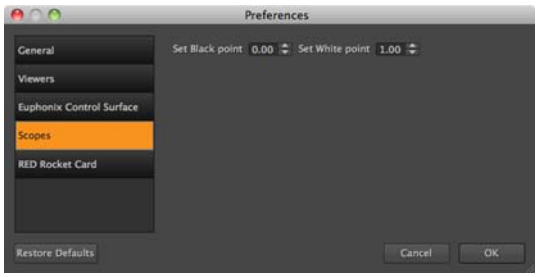
There are also **Viewer** and **Channel** selection controls on the **Histogram** tab:

- **Viewer selection**—if you have multiple Viewers open, use the drop down menu to associate Histogram output to the required clip.

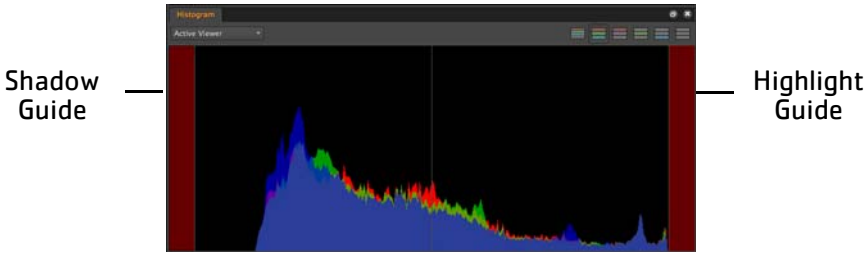
  The default value, **Active Viewer**, automatically displays details on the last Viewer you selected.

- **Channel selection**—select the channel information to output. The default setting displays RGB and Luma, but you can break the view down to just RGB or single channels.

The scopes feature global customisable guides to help you grade your clips. Navigate to **Storm** > **Preferences** > **Scopes** and enter values between **0** and **1** for the **Black** and **White** points.

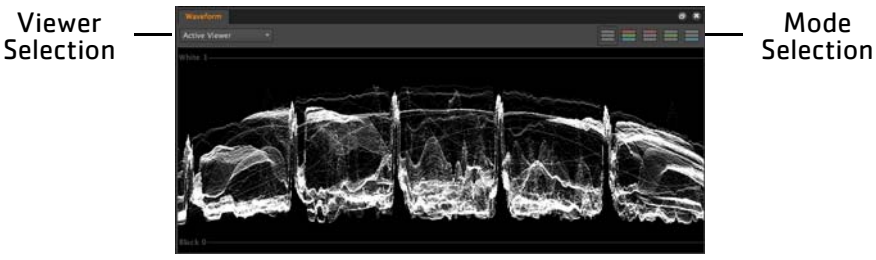


The guides at the edges of the Histogram turn red to warn you when the distribution is out of range:



Waveform

The **Waveform** scope provides information on clip luminance, or brightness, which you can use to decide whether the clip is over or under exposed. The white traces represent luminance values from 0 - 100% (black through the spectrum to white). The higher the waveform, the brighter the image in the Viewer.



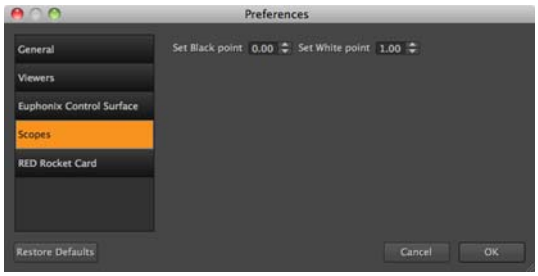
The upper white marker is used to measure when over exposure could be a problem. If your waveform has a lot of traces over the white marker, you should consider reducing the brightness of the clip. The opposite is true of the lower black marker.

There are also **Viewer** and **Mode** selection controls on the **Waveform** tab:

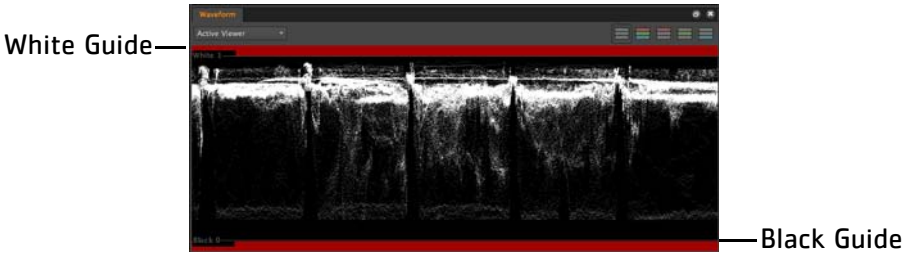
- **Viewer selection**—if you have multiple Viewers open, use the drop down menu to associate Waveform output to the required clip.

  The default value, **Active Viewer**, automatically displays details on the last Viewer you selected.
- **Mode selection**—select the mode to output. The default setting displays Luma only, but you can also view the RGB channels ganged together or separately.

The scopes feature global customisable guides to help you grade you clips. Navigate to **Storm** > **Preferences** > **Scopes** and enter values between **0** and **1** for the **Black** and **White** points.



The guides at the top and bottom of the Waveform turn red to warn you when the distribution is out of range:



Vectorscopes

Vectorscopes display colour, saturation, and hue information for the current frame. Similar to colour wheels, Vectorscopes display information radially, from the centre outward. The further from the centre the data spans, the more saturation is represented.

In Figure 6.2, you can see that the frame represented contains mostly yellows and reds, but the values are not oversaturated. Figure 6.3 represents a badly saturated frame. Notice the spill of yellow traces distributed toward the edge of the scope pass the target (the highlighted square).

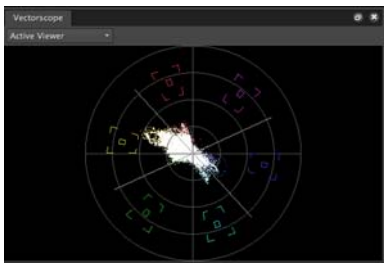


Figure 6.2 Normal saturation.

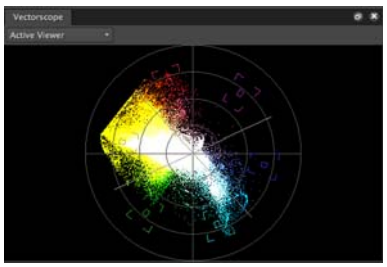


Figure 6.3: High Saturation.

There is also a **Viewer** selection control on the **Vectorscope** tab:

- **Viewer selection**—if you have multiple Viewers open, use the drop down menu to associate Vectorscope output to the required clip.

  The default value, **Active Viewer**, automatically displays details on the last Viewer you selected.

Using Tags

During the review process, you can use Tags to mark shots of a particular type or content as you organise your production into Bins ready for editing. The default Tags supplied with Storm include good and bad shots, colour codes, and 1-5 star quality Tags. You can also create custom Tags by right-clicking in the right hand side of the **Production** tab or by pressing **cmd/Ctrl** + **Y**. You can apply Tags to frames, clips, or all clips currently in the Viewer.

Note *There is no limit to the number of Tags you can apply, but the playback toolbar can become cluttered if you apply Tags to every frame.*

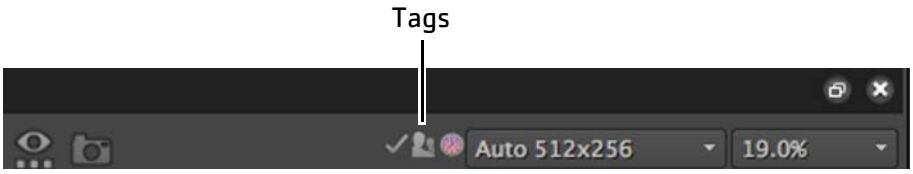
To apply a tag to your media, use the playback tools to move to the required frame and drag-and-drop the tag from **Production** > **Storm Presets** > **Tags** to the Viewer.

Drop the tag on **Tag this frame**, **Tag whole clip**, or **Tag all clips** as required.

Tags applied to frames appear above the Viewer playback tools in the clip Timeline.

Tip *Use **Shift** + ↓ or ↑ to skip to the next or previous Tag on the current clip or reposition Tags by dragging them along the Timeline.*

Tags applied to entire clips appear above the Viewer, next to the **Image Quality** dropdown menu.

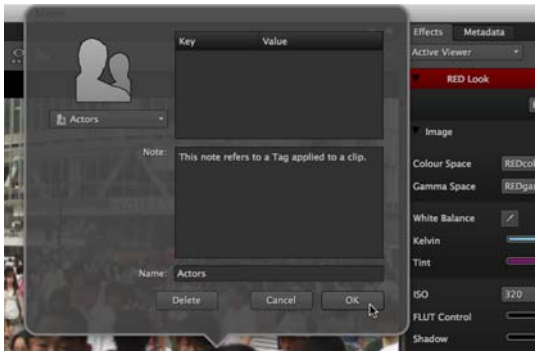


Adding Notes to Tags

In some cases, a simple Tag on a frame or clip may not contain all the information that you wish to pass on to the next stage of production. Adding a note to a Tag can provide that extra detail.

Note *To delete a note, don't click **Delete**, because this refers to the Tag. Instead, delete the notes in the window and click **OK**.*

1. Add notes to Tags by clicking on the required Tag and entering text. The example shows a note added to a clip Tag, but you can also add notes to frame Tags in the same way.



2. Click **OK** to save the note.

Filtering and Flagging Media Using Tags

Once all your media is tagged as required, you can use Storm to search for clips containing certain tags, for example, if you wanted to find all clips that you tagged as 3 Star quality.

There are two types of Tag search you can perform: **Filter** and **Flag**. Select the desired search type by clicking the magnifier icon in the **Production** tab.

- **Filter**—displays all clips that contain the specified tag. This is the default search method.
- **Flag**—displays all clips and marks the items that don't match the search tag.

Drag the required Tag from the **Production** tab into the search box and select the Bin or Bins you want to Filter or Flag.

Tip *If you have more than one search criteria, click the icons in the search box to display a brief description of the icons.*

Filters and flags persist until you change the search criteria or click the  *icon in the search box.*

*You can select multiple search items and move left and right through the criteria, as well as remove individual criteria by pressing **Backspace**. See Appendix A: Storm Hotkeys for more information.*

The examples below show Storm **Filtering** the In Tray to display only media with the 3 Star Tag applied and **Flagging** all media that doesn't have the 3 Star Tag applied to it.

Filtering...

...and Flagging

Creating Custom Tags

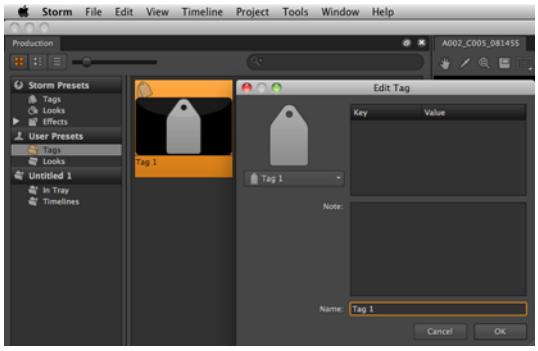
While using Storm you may find that you require a specific Tag or suite of Tags that are not provided by default. Creating Custom Tags allows you to really control the organisation of your media, and you can even create your own Tag icons.

Tip *Move your Custom Tags to the **User Presets** > **Tags** Bin so that you can access them across all your Productions.*

To create a Custom Tag, do the following:

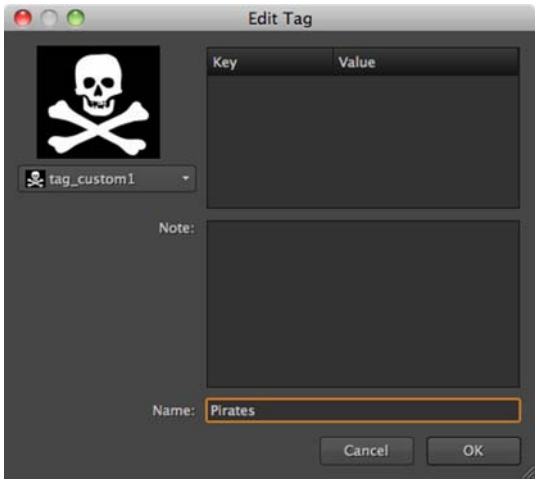
1. Select the Bin to contain the Tag in the **Production** tab.
2. Navigate to **File** > **New Tag**, or press **cmd/Ctrl** + **Y**.
   The new Tag is placed in the selected Bin.

3. Double-click the Tag to open the **Edit Tag** dialog box.



4. Enter a name for the Tag in the description field.
5. Click the **Tag** dropdown menu to select an icon for the Custom Tag.

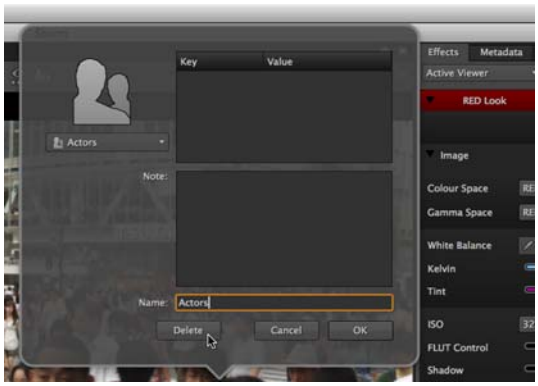
Tip *You can import your own image for the Tag by selecting **Assign** to open the Finder.*



6. Click **OK** to save your changes.

Removing Tags

To remove a Tag from a frame or clip, click the Tag and click **Delete**.



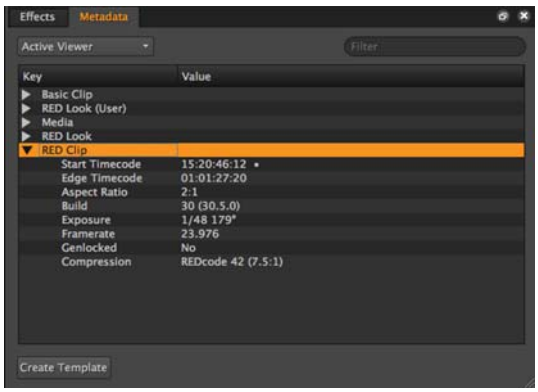
You can remove all Tags from a clip or selection of clips by right-clicking your selections in the Media Pool and choosing **Clear Tags**.

Viewing Metadata

Metadata is information that describes media content, separate from the clip itself, in the form of a table on the Metadata tab. Types of metadata include Duration, File Size, the Camera used to record the clip, and RED Look data.

Some metadata cannot be edited using Storm, for example the items under the RED Clip section shown below. Other areas such as RED Look (User) and User data update as you make edits, change settings, or add Tags.

To view Metadata for a clip, drag-and-drop the clip in to the Viewer and select the Metadata tab.



Tip *If the Metadata tab is not populated automatically, click the clip in the Viewer to update the information.*

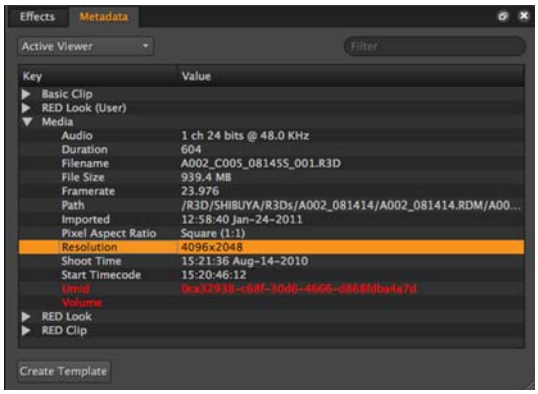
Filtering and Flagging Media Using Metadata

If searching using Tags has not filtered your media effectively, you can use Storm to search for clips containing certain Metadata, for example, if you wanted to find all clips that had a particular Resolution or Frame rate.

To filter or flag using Metadata, you must create a Metadata Template to use in the search function:

1. Select the data to filter by clicking the required entry in the Metadata tab.

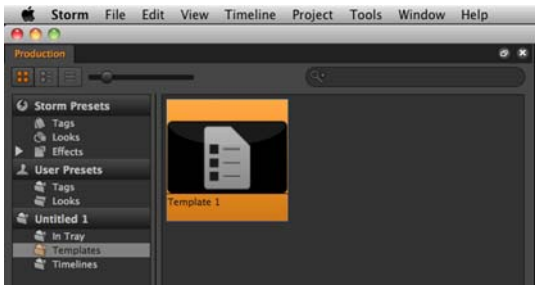
Tip *You can select more than one entry by holding **cmd/Ctrl** and clicking to add items.*



2. Click **Create Template**.

A **Templates** folder is added to the **Production** tab, and the new template is placed inside.

Note *If a **Templates** folder is already present, the new template is placed in the existing folder.*



3. Rename the Template by clicking the new entry and typing a new name.
4. Use the Template as a filter or flag by dragging the Template to the search box as described in Filtering and Flagging Media Using Tags.

About Bins

The term **Bins** originates from when film clips were actually stored in physical containers during the editing process, and Storm continues this tradition by using this naming convention for the folders in which your media is stored and organised.

The **Reviewing** workspace contains several Bins by default to help you begin organising your clips, Tags, and Looks.

- **Scale Slider**—adjust the size of your thumbnails. This slider is not available in the text only Display Mode.
- **Search Box**—filter or flag your media using Tags, Metadata, or Looks. See Filtering and Flagging Media Using Tags for more information.

- **Default Bins**—basic Bins containing Tags, Effects, and the In Tray. See Default Bins for more information.
- **Display Mode**—select the display mode from thumbnails, small thumbnails and text, or text only.

Bins can contain all file types used by Storm including other Bins, effects, Tags, and Looks.

Default Bins

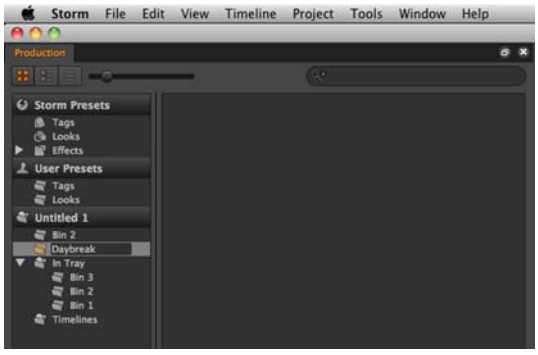
The default Bins are always present when you open a new Storm Production. These basic Bins are used to differentiate between types of content as described below:

- **Storm Presets**—this Bin contains all the default Tags, Looks, and Effects that are available for new Productions.
- **User Presets**—this Bin contains any custom Tags or Looks that you save when using Storm. Files saved in the User Presets Bin are available across all future Productions.
- **Untitled 01**—you should rename this Bin using **File** > **Save Untitled 01** as your current Production and store files that are only associated with the current Production.

Creating Bins

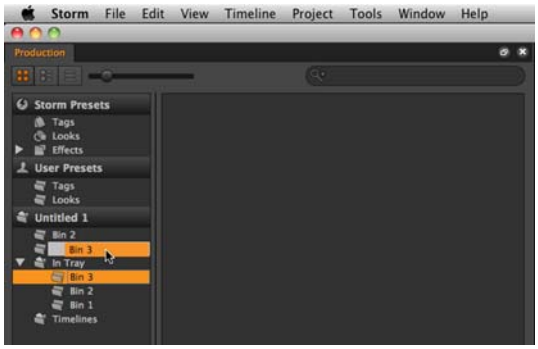
To create new Bins, navigate to **File** > **New Bin** or press **cmd/Ctrl** + **B**. New Bins are added to the currently selected location, or to the default **Production** Bin if nothing is selected.

To rename a Bin, click the new Bin and type a name in the field provided.



You can move Bins, effects, Tags, and Looks around by dragging and

dropping them to a new location.



7 Editing and Effects

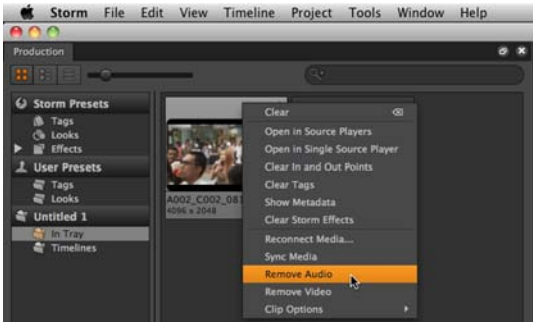
Editing Your Media

Once you've organised your media, you're ready to start the editing process. You can remove audio or video tracks, add In and Out Points to create more accurate selections, cutting out parts of the media you don't require, and add some colour, grade, and other effects before adding your clips to the Timeline.

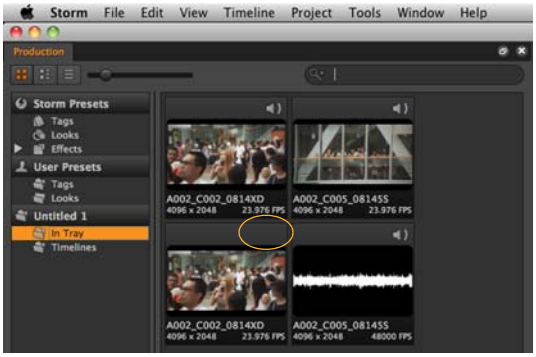
Removing Tracks from Clips

Linked audio and video tracks in the same clip are not always required and Storm allows you remove either track from a clip and create a new clip in the In Tray.

1. Select the required clip or clips in the Production tab and right-click on a selection to display the context menu.
2. Select **Remove Audio** or **Remove Video** from the list.



New clips are added to the In Tray with the same name as the source. Notice that the Audio icon at the top-right of the clip or the video thumbnail is removed from the new clip.



Note *You can relink video only clips with independent WAV files using **Sync Media**. See WAV Clip Tracks for more information.*

Using In and Out Markers

In and Out markers enable you to trim clips down to just the portions of the media that you require. These markers don't alter the length of the source clip, but instead, tell Storm which part of the clip you want to use.

The source In and Out markers define the actual start point and duration of the clip. The remainder of the source clip not required is known as the clip 'head and tail' or 'handles'. When a source clip containing In and Out points is added to a Timeline, you can slip the clip around the markers to adjust the clip's output. See Timeline Editing Tools for more information.

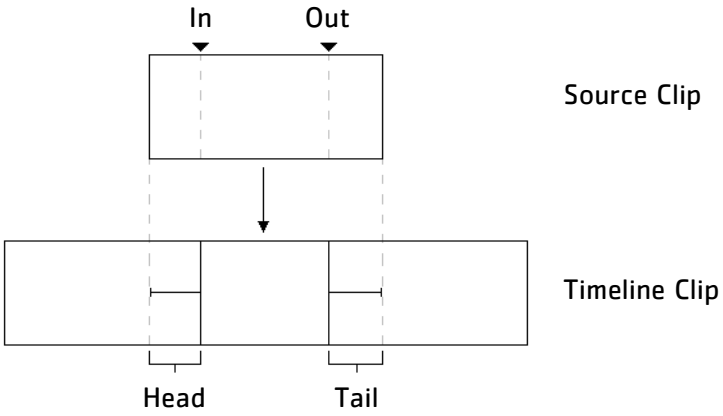


Figure 7.1: Clip Handles

To set In and Out markers:

1. Move the playhead to the location of the In Point and press **I** on your keyboard.

   The In Point is marked by the In tab and the time is recorded on the playback controls pane.

Note *See Playback Tools for a description of the various Time Codes you can use.*

2. Move the playhead to the location of the Out Point and press **O** on your keyboard.

The Out Point is marked by the Out tab and the time is recorded on the playback controls pane.

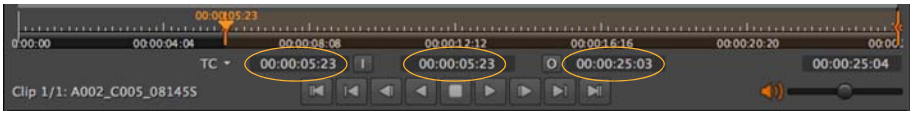
Tip *You can also set markers by navigating to **View** > **Mark In** or **Mark Out**.*

Click and drag the markers to adjust their position or clear the markers from your clip by navigating to **View** > **Clear In and Out Points**. The markers are removed completely, but you can reapply them by repositioning the playhead and pressing **I** or **O**.

See Exporting Trimmed R3Ds for details on using In and Out points to trim R3D source files.

Using Time Code Fields

Storm's Viewer Time Code fields are used to place the playhead or In and Out markers with more accuracy than placing them manually. There are three fields corresponding to **In Point**, **playhead**, and **Out Point** respectively.



You can enter **absolute**, **partial**, and **relative** Time Code values for each individual field, and if you like, you can even exclude the separators.

- **Absolute**—places the marker at the point selected in real time, providing that the value is not out of range in the selected clip. Absolute markers always contain eight digits.

Example	Result
01:05:43:21	Places the selected marker at 1 hour, 05 minutes, 43 seconds, and 21 frames
01054321	

- **Partial**—alters the current position of the marker depending on the current position. Partial markers can contain up to seven digits.

Current Position	Example	Result
01:05:43:21	01	01:05:43:01
	02:01	01:05:02:01
	0201	

- **Relative**—uses + and - values to alter the position of the marker relative to its current position. Relative markers are valid from ± 1 to 99999999.

Current Position	Example	Result
01:05:43:21	+1	01:05:43:22
	-110	01:05:42:11
	+10000	01:06:43:21
	-100000	00:05:43:21

Note *See Playback Tools for a description of the various Time Codes you can use.*

Applying Effects

Storm has a versatile Effects palette for use with your media, including transform, colour, and blur effects. Effects can be added by drag-and-drop from the **Production** tab to either the Viewer or the Effects Stack.

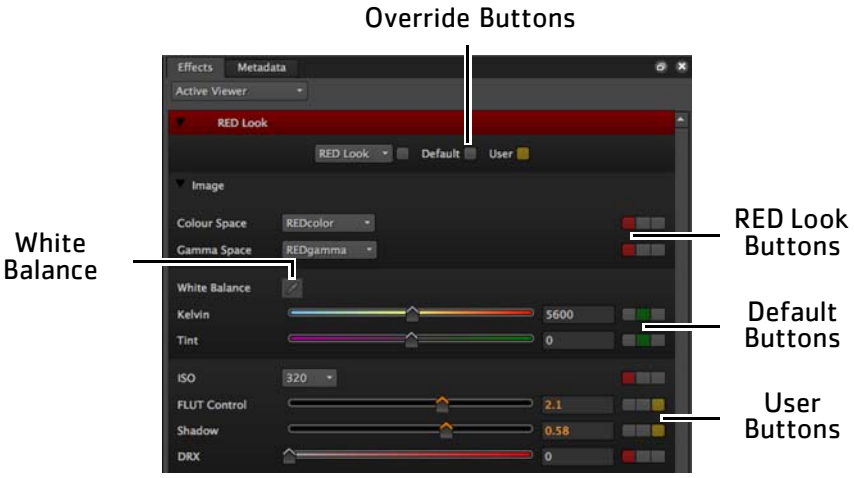
You can drop effects directly into the Effects Stack—either above or below existing effects—as long as the orange highlight is visible before you drop the effect.

Note *You cannot drop effects above the RED Look effect.*

Any number of effects can be added to clips and are stored in the order they were applied in the Effects Stack.

The RED Look Effect

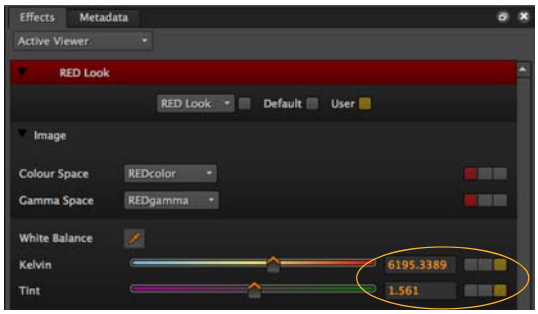
It's worth noting here that all R3D clips include a RED Look effect with three modes that can be applied to the entire clip or individual settings and handy **White Balance** and curve tools.



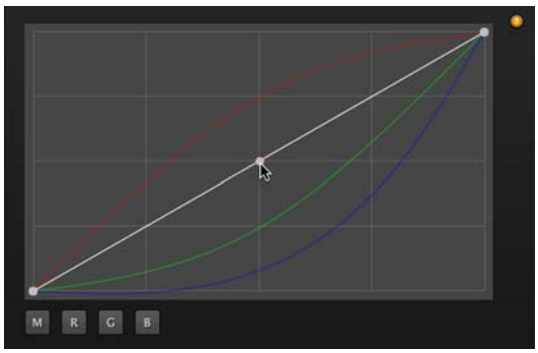
- **RED Look**—this mode contains all the input decisions made by the on set cameraman. Click the red buttons to apply the RED Look.
- **Default**—this mode applies the RED camera factory settings, that is, none of the on set decisions are included. Click the green buttons to apply the camera default settings.
- **User**—this mode records any changes that you make to the RED Look effect. Click the yellow buttons to apply your changes.
- **Clip Overrides**—use the clip overrides to apply the above modes across the entire clip. As the name suggests, selecting overrides removes any modifications you may have made, but you can retrieve them using the **User** buttons on individual settings.
- **White Balance**—quickly adjusts the **Kelvin** and **Tint** RED Look settings. To use the tool, click the dropper icon and use the dropper tool to select a colour you recognise as white in the Viewer. If you use this tool repeatedly, you'll notice that selecting the dropper tool temporarily turns off your previous White Balance effect so it's easier for you to see the true colours of your footage and select the colour you want to mark white.

Tip *You can use the colour picker window in the top left corner of the Viewer to help you select colour values closer to 1.0 for the white.*

Click on the selected white in the Viewer to White Balance the clip. Notice the **Kelvin** and **Tint** values are adjusted and the **User** mode buttons are activated.



- **Curves**—used to adjust channels in the current clip. Select the required channel from **Master** (or **RGB**), **Red**, **Green**, or **Blue**.



Use the mouse to drag-and-drop a point anywhere along the curve to a new value. The example shows a high **Red** and low **Green** and **Blue** values. The **Master** curve is at its default value.

- **Lift Gamma Gain**—used to adjust the Lift, Gamma, and Gain values using colour wheels or sliders. The Lift Gamma Gain tools in the RED Look

effect work in a similar way to those supplied in the Storm effect, but with more emphasis on the Redcine-X math.

About HDRx Clips

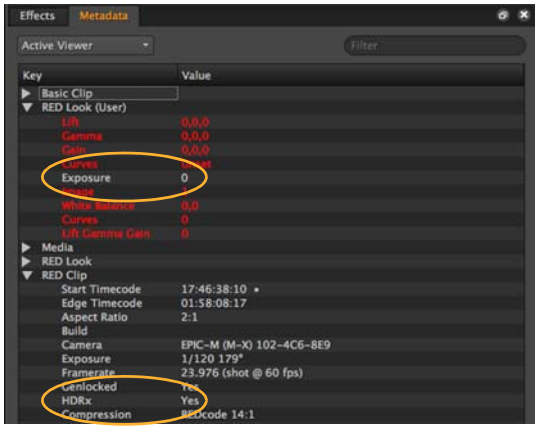
High Dynamic Range (HDR) clips shot on EPIC cameras simultaneously record two values for each frame, resulting in High and Low exposure information which Storm can read individually.

You can view HDRx clips in the same way as any other clip, but there are two unique identifiers for HDRx—the Metadata and REDLook effects.

HDRx Metadata

Drag-and-drop an HDRx clip to the Viewer and open up the Metadata tab. Expand the **RED Look (User)** and **RED Clip** fields to see the HDRx specific metadata:

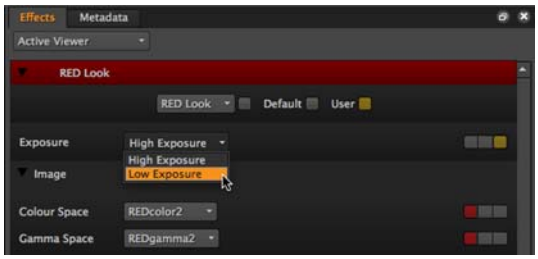
Note *The Metadata tab shown is truncated for ease of reference.*



- **Exposure**—displays which exposure setting is currently displayed in the Viewer. A value of 0 refers to High exposure, and 1 refers to Low exposure.
- **HDRx**—displays whether or not the clip currently in the Viewer is HDRx.

HDRx REDLook

All HDRx clips have an extra REDLook effect included, just above the **Image** dropdown in the **Effects** tab.



The **Exposure** type you select in the REDLook sets the exposure level carried over into the Timeline or export, so make sure you set the correct level before proceeding.

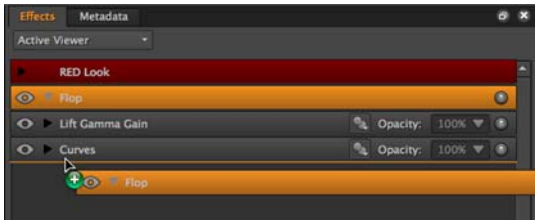
Using the Effects Stack

The Effects Stack displays all the effects applied to the current clip, including the RED Look settings. Effects are displayed in chronological order, with the most recent addition at the bottom of the stack.

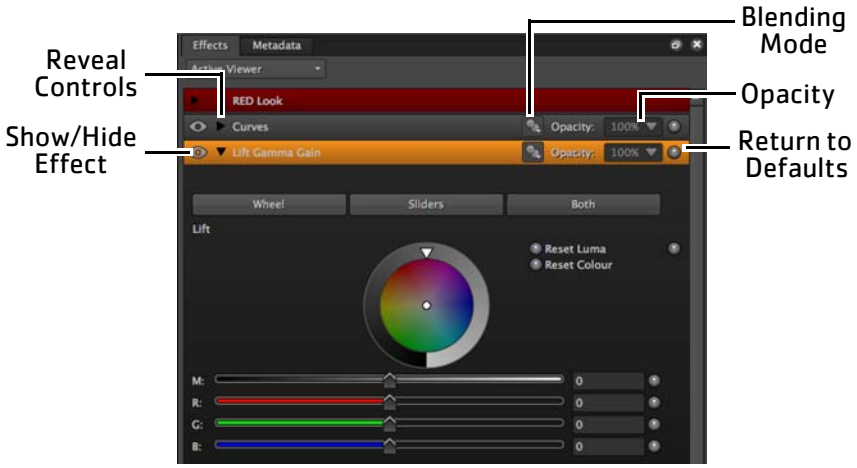
Note *Bear in mind that the order in which effects are applied alters the impact they have on the clip—Storm reads applied effects from the top of the Effects Stack down.*

For example, adding a Curves effect followed by Lift Gamma Gain does not produce the same results as Lift Gamma Gain followed by Curves.

You can change the order in which effects appear by dragging and dropping the required effect to a new position in the stack.



All Effects in the stack also have the following controls:



- **Reveal Controls**—click the reveal button to open the control drop down menu for the selected effect.
- **Show/Hide Effect**—click show/hide to quickly toggle the selected effect on and off.
- **Blending Mode**—click and hold the icon to display the effects blending modes. See Blending Modes for more information.
- **Opacity**—enter the effect opacity or click and scrub the slider to dissolve between the full effect at 100% and the original footage at 0%.
- **Return to Defaults**—click to return all controls to the default setting for the selected effect.

Specialised Effect Controls

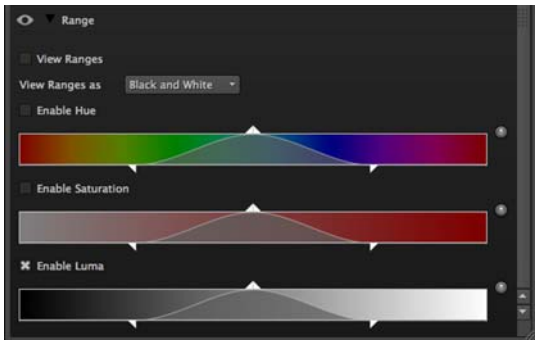
In addition to the universal stack controls, you can adjust effects using their specialised controls in the Effects Stack or by entering numerical values in the appropriate fields.

The following control types enable you to fine-tune Storm's effects:

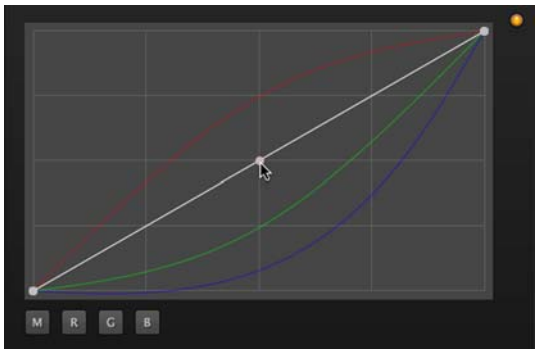
- **Sliders and Fields**—the most basic controls in the Effects Stack. Scrub the sliders or enter values in the fields to adjust effect parameters.

Values that have not been altered remain greyed out until used, similar to **Hue** in the example.

- **Range Graphs**—enable you to affect or pick out only certain areas of the clip, for example, the highlights.



  - Select **View Ranges** to dynamically update the Viewer as you alter Range values.
  - Select how you would like the Ranges to be represented in the Viewer from the drop down menu. The default is **Black and White**.
  - Enable and disable **Hue**, **Saturation**, and **Luma** controls individually using the checkboxes, for example **Enable Luma** as shown.
  - Adjust the curves to highlight the areas of the clip where the selected effect is applied.
- **Curves**—used to adjust channels in the current clip. Select the required channel from **Master** (or **RGB**), **Red**, **Green**, or **Blue**.



  Use the mouse to drag-and-drop a point anywhere along the curve to a new value. The example shows a high **Red** and low **Green** and **Blue** values. The **Master** curve is at its default value.
- **Wheels**—used to alter luma and HSV values for the current clip. The outer ring represents the luma value (from black, clockwise to white) and the inner ring the HSV value (stronger values are further away from the centre).

Figure 7.2: Default wheel values.

Figure 7.3: Low luminance green.

Note *Wheels in Storm are calibrated to need a lot of mouse movement to make significant changes to the colour values.*

- Adjust the luma value by dragging the pointer to the new luma setting, for example anti clockwise to decrease the luminance as shown in Figure 7.3.
- Adjust the colour values by dragging the pointer from the centre to the required colour and hue, for example low luminance green shown in Figure 7.3.

Storm supports the use of third party control panels with colour wheels. See About Control Surfaces for more information.

Blending Modes

Effect blending modes enable you to customise your output by blending the original footage with effects at different intensities, or **Opacity**. All Storm effects have blend and opacity controls, but the results depend on the effect and the effect hierarchy within the Effects Stack.

The blend mode button has three states:

Normal—no blending is applied. Click and hold to select a blend mode.

Active—the selected blending mode is currently enabled. Click to disable the current blend mode.

Inactive—the selected blending mode is currently disabled. Click to enable the current blend mode.

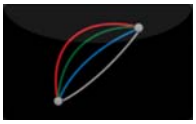
Click and hold the blending modes button to display the available modes:

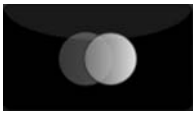
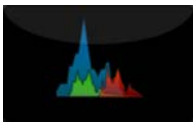
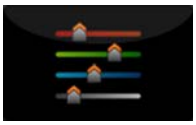
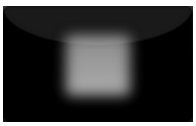
The various blend modes behave in a similar way to other applications using blending modes for editing or layering, for example Adobe® PhotoShop®. After selecting your blending mode, click the Opacity field and adjust the slider as required.

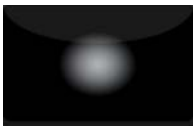
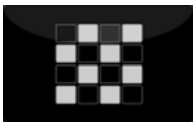
Effect Groups

Effects within Storm are stored in **Production** > **Storm Presets** > **Effects**. Simply drag-and-drop the required effect on to the Viewer to apply the effect and add it to the Effects Stack.

The Effects tab contains the following effects:

Effect	Description	Icon
Colour Effects		
Adjust HSV	Apply **HSV** changes and use the Range graphs to limit the effect to apply only to particular luma or hue/saturation ranges.	
Curves	Adds an **RGB** curve graph to the clip to adjust colour and a Range graphs to highlight particular colours or features. You can adjust all the curves at once using the Master button, or individual channels using the Red, Green, and Blue buttons.	

Effect	Description	Icon
Colour Filter	Enables or disables **RGB** and **Luma** channels. You can export which ever channels you require using this effect, for example if you wanted to check for noise in a particular channel.	
Invert	Inverts the colour values of the current clip.	
Levels	Allows you to adjust the black and white points of the current clip. The histogram in the effect doesn't update as you move the markers—it only represents the input from the Viewer. You can also use the Range graphs to limit the effect to apply only to particular ranges.	
Lift Gamma Gain	Adds individual colour wheels and sliders for **Lift**, **Gamma**, and **Gain** on the clip as well as a Range graphs to highlight particular colours or features. Select which controls are displayed using the **Wheel**, **Sliders**, and **Both** buttons.	
Tint	Use the colour wheel, sliders, and colour picker to push the clip's midtones toward a particular colour while not affecting the blacks and whites.	
WhiteBalance	Allows you to automatically balance colour temperature in the current clip by setting a 'standard white' using the colour picker. You can adjust your results using the colour wheel and sliders.	
Masking Effects		
Blanking	Apply manual or preset masks to each side of the clip, for example 4:3, 16:9, or 2.35:1.	
Soft Edges	Applies adjustable soft edges to the clip.	

Effect	Description	Icon
Vignette	Applies an adjustable brightness reduction around the borders of the clip.	
Generators		
Checkerboard	Generates an adjustable checkerboard over the entire clip. You can toggle between generators and clips using the show/hide icon and Opacity field described under Using the Effects Stack.	
Colour Wheel	Generates a colour wheel over the entire clip for comparison.	
Colour Bars	Generates colour bars over the entire clip for colour comparison.	
Constant	Generates a colour constant over the entire clip. You can use the colour picker to select a constant from the current clip.	
Ramp	Applies an adjustable colour ramp to the clip.	
Transform Effects		
Flip	Inverts the image on the Y axis.	
Flop	Inverts the image on the X axis.	

Effect	Description	Icon
Pan and Scan	Zoom, scale, pan, and rotate the image in the Viewer.	
Blur Effects		
GaussianBlur	Applies an adjustable soft-edged, circular blur to the current clip.	
RadialBlur	Applies adjustable blur to the clip from a specified centre.	

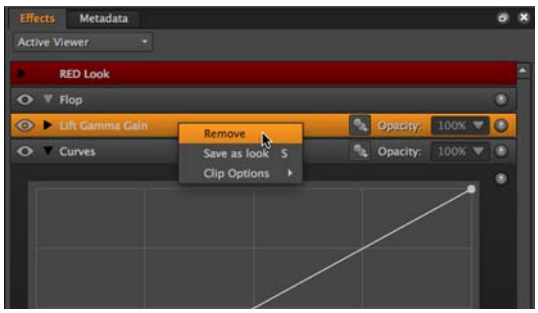
Removing Effects

The Effects Stack can contain any number of effects, but in order to keep the stack 'clean' you should consider removing effects that are not in use.

Note *The RED Look effect cannot be removed from the stack.*

To remove an effect or effects:

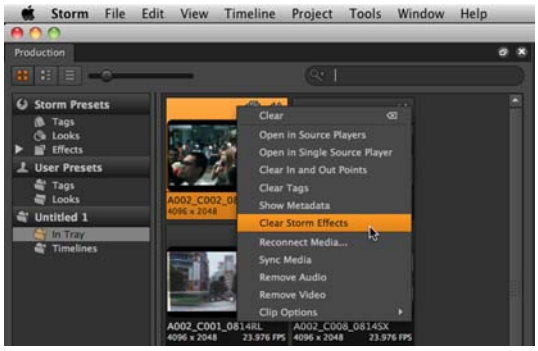
1. Hold **cmd/Ctrl** or **Shift** and click the effect or effects you want to remove.
2. Either:
   - Press **Delete** or **Backspace** on your keyboard, or
   - Right-click on an effect banner and select **Remove**.



In the example, the Lift Gamma Gain effect is removed leaving only RED Look, Flop, and Curves in the Effects Stack.

You can remove all Storm effects from a clip or selection of clips by right-

clicking your selections in the Media Pool and choosing **Clear Storm Effects**.



About RMD Files

RED metadata files, or RMDs, are designed to contain grade information for R3D clips. Storm can automatically create RMDs for all files, or you can create RMDs manually for specific clips.

RMDs created by Storm reside in the same folder as the clip, along with the QuickTime reference files, and can be applied to other clips further down the workflow pipeline.

Automatic RMDs

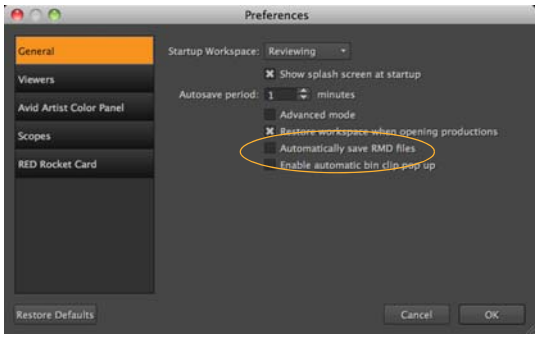
Storm's **Preferences** dialog contains an option to automatically create RMDs for files as you make changes to the RED Look to achieve an overall grade.

Note *When **Automatically save RMD files** is enabled, all changes you make to RED Look settings are added to the RMD file, overwriting any metadata that was present.*

To enable Automatic RMDs:

1. Navigate to **Storm** > **Preferences** > **General**, or press **cmd/Ctrl** + **,** (comma).

   The **Preferences** dialog box displays.



2. Select **Automatically save RMD files** and click **OK**.
3. Restart Storm to apply the change.

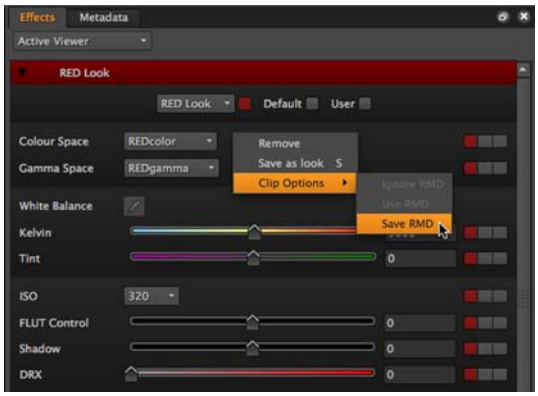
Creating Manual RMDs

Sometimes in your workflow, it's not practical to constantly save RMDs for all your clips. Storm allows you to create individual RMDs or make selections from your Production and create RMDs for just those files.

Once your RED Look changes are in place for the grade you require, you're ready to create RMDs. There are two methods of RMD creation: from the Effects Stack and directly from Bins.

RMDs from the Effects Stack

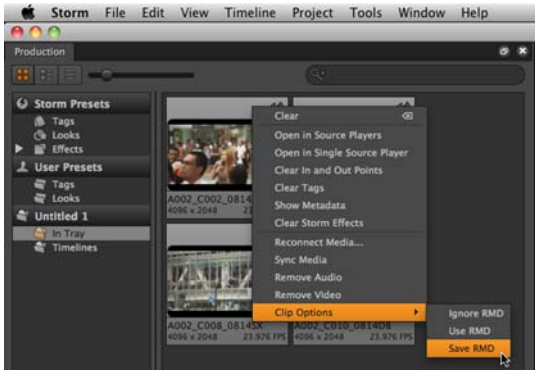
1. Modify the RED Look parameters as required to produce your grade.
2. Right-click in the RED Look effect and select **Clip Options** > **Save RMD**.



3. Storm creates an RMD file in the same folder as the source clip.

RMDs from Bins

1. Modify the RED Look parameters in all the required clips to produce your grades.
2. Select all the clips to receive RMDs from the Bin.
3. Right-click a highlighted clip and select **Clip Options** > **Save RMD**.

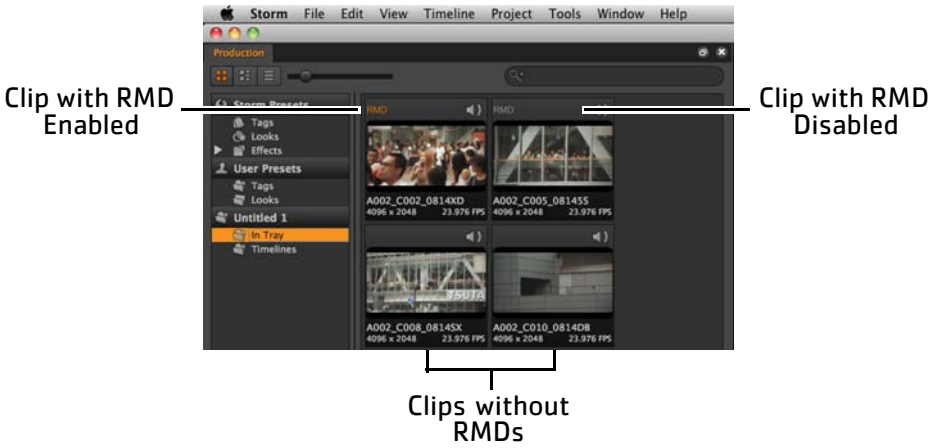


4. Storm creates an RMD file for each selection in the same folder as the source clip.

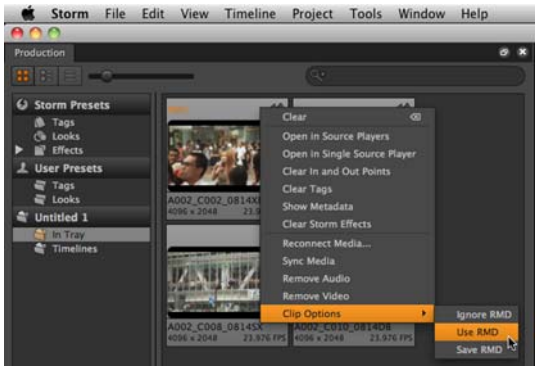
Pre-existing RMDs

Working with clips that have changed hands a number of times within a pipeline can mean that clips already have associated RMDs supplied with them—clips with existing RMD files display an RMD icon in the media pool.

Storm enables you to use or ignore existing RMDs on a single or multiple clip basis.



Select a clip or clips within a Bin, right-click and select either **Ignore RMD** or **Use RMD** as required.



8 MANAGING LOOKS

Managing Looks

Storm ships with a suite of preset Looks that you can apply to clips or use to get an idea of Storm's Effects Stack capabilities—applying a preset Look might inspire you to produce your own Custom Looks.

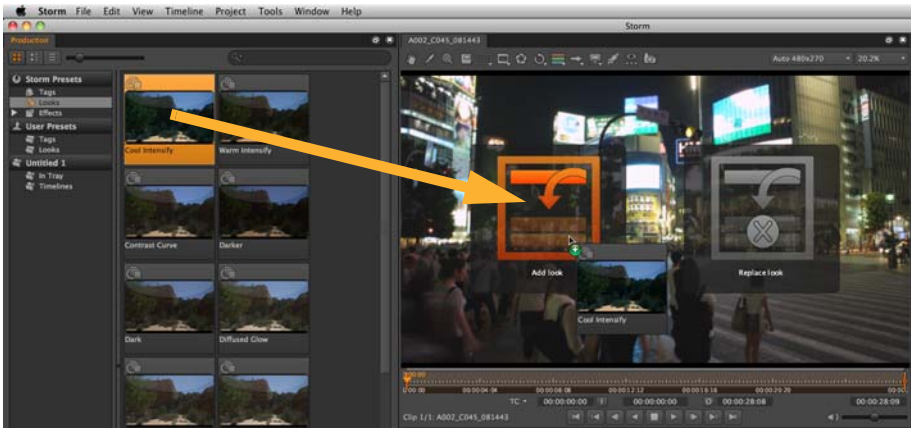
Effects in the stack can be combined to create Custom Looks that are transferrable to other clips or Productions. If you create a specific Look on one clip that you think you might be useful elsewhere, save it as a Look in Storm.

Preset Looks

You can drag-and-drop Looks from **Storm Presets** > **Looks** to the Viewer to add or replace a Look in the same way that Tags and effects are applied.

To apply a preset Look:

1. Navigate to **Storm Presets** > **Looks** and select the required look.
2. Drag the Look into the Viewer and drop it on the add or replace hotspot.



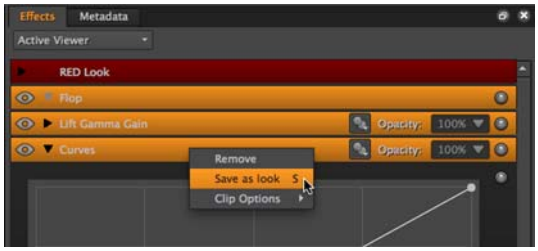
The effects contained in the Look are added to the Effects Stack.

3. Adjust the individual effects contained in the Look to create a Custom Look if required. See Creating Custom Looks.

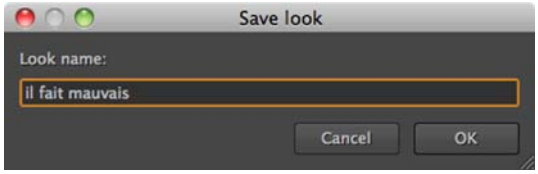
Creating Custom Looks

Once you're happy with the Effects Stack, you're ready to create your Look:

1. Hold **cmd/Ctrl** or **Shift** and click the effects in the stack that you want to include in the Look.
2. Right-click on an effect banner and select **Save as Look** or press **S**.



3. Enter a name for the Look in the **Save Look** dialog, then click **OK**.



Looks are automatically placed in the **Production** > **Untitled 01** > **Looks** folder by default.

If you want a Look to be available across all your Storm Productions, move the Look to the **User Presets** > **Look** folder—everytime you start Storm all the Looks you placed in the **User Presets** Bin are available for use.

Sharing Looks

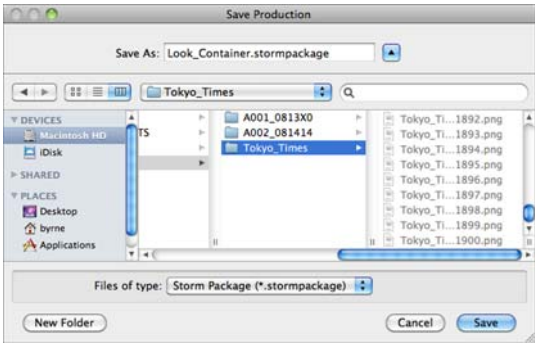
You can share your Looks by saving and distributing a Production containing only a Look, which typically creates a small, easy to manage file.

Note *Storm Productions are saved with the* ***.stormpackage*** *file extension.*

To save a Look you want to share:

1. Create your Look as described in Creating Custom Looks.
2. Navigate to **File** > **Save Untitled01**, or use the hotkey **cmd/Ctrl** + **S**.

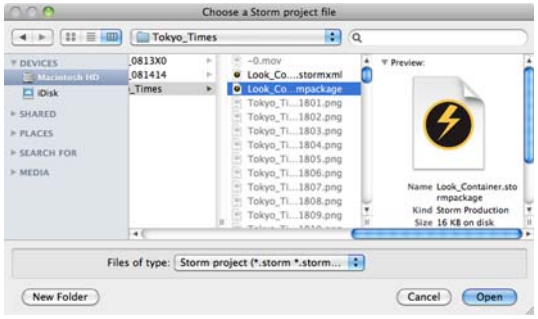
The **Save Production** screen displays.



3. Enter a file name in the **Save As** field and click **Save**.
4. Distribute the resulting **.stormpackage** file as required.

To import a shared Look:

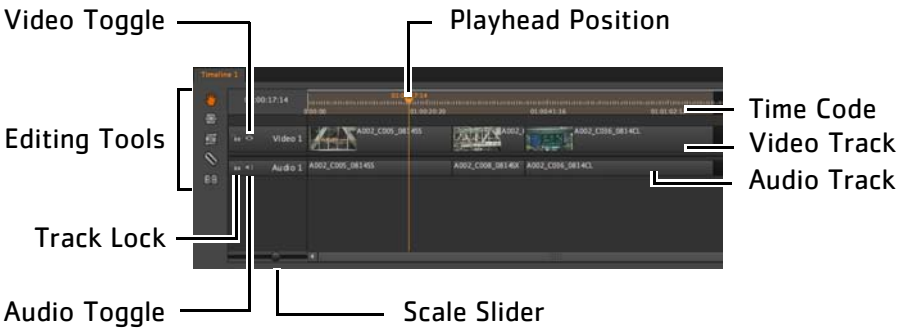
1. Navigate to **File** > **Open**, or use the hotkey **cmd/Ctrl** + **O**.
   The **Choose a Storm project file** screen displays.



2. Select your **.stormpackage** and click **Open**.
   Storm loads your Production file.
3. Move the imported Look to the local **User Presets** > **Looks** Bin to make it available across all future Productions.

9 Using the Timeline

Timelines in Storm initially have two tracks, one video and one audio, and can be described as containers for your clips. Each track contains clips that reference the source clips in your Production—making changes to clips on the Timeline does not affect the original source clip.



- **Video Toggle**—quickly turn off and on video tracks during playback.
- **Playhead Position**—displays the playhead location synchronised with the contents of the Viewer.
- **Time Code**—displays the Timeline scale. You can adjust the scale using the Scale Slider or by using the mouse wheel.
- **Video Track**—contains all video clips for the current Timeline.
- **Audio Track**—contains all the audio clips for the current Timeline.
- **Scale Slider**—adjusts the scale of the Timeline. You can fit the contents of the Timeline to the screen space available by pressing the **F** hotkey.
- **Audio Toggle**—quickly turn off and on audio tracks during playback.
- **Track Lock**—secure the selected track to disable all editing tools.
- **Editing Tools**—the tools used to manipulate clips on the Timeline. See Timeline Editing Tools for more information.

Multi-track Timelines work in the same way as standard Timelines, but they can contain more than one audio and video track:

- Video tracks in multi-track Timelines are read from the highest number track downward, for example Video 3, Video 2, Video 1. As a result, if video is present on track 3, video on track 2 in the same time slice is obscured.

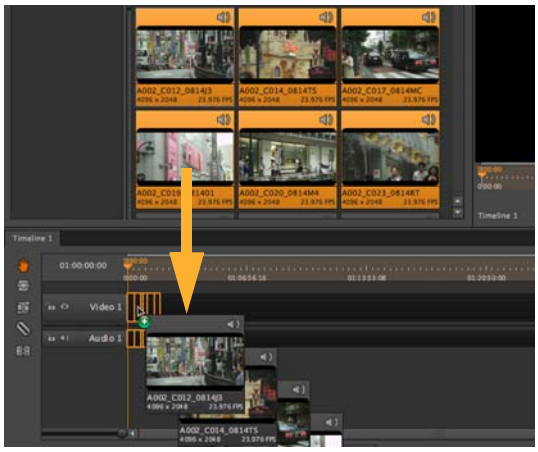
In Figure 9.1, although the playhead crosses clips on three video tracks, only the clip in Video 3 appears in the Viewer.

Figure 9.1: A typical multi-track Timeline

- Audio tracks, on the other hand, are layered and can be played back simultaneously—all three audio tracks crossed by the playhead in Figure 9.1 play back together, creating a complete audio backing for the video.

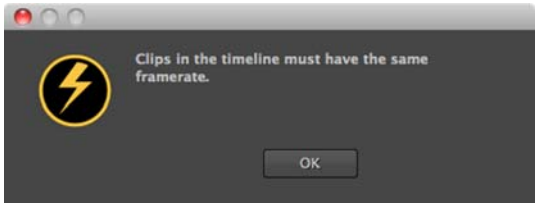
Adding Clips to the Timeline

Storm's Timeline allows you to add clips by simple drag-and-drop from either the Viewer or Bins. Using the Viewer restricts you to a single clip, the current clip, but you can drag as many clips as you like from Bins.



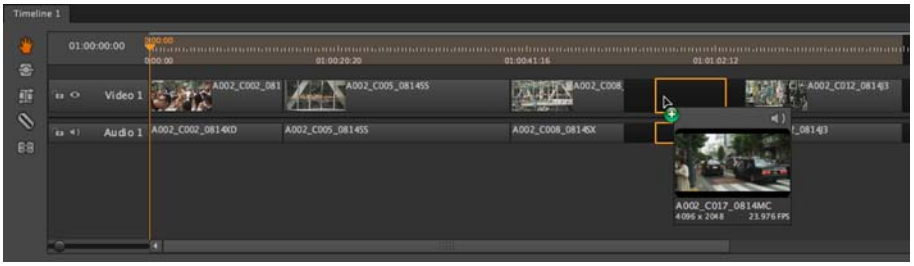
Note *If you're using HDRx clips, make sure you select the correct **Exposure** setting in the **Effects** tab before adding the clips to the TImeline. See About HDRx Clips for more information.*

Note *Storm does not support clips with different framerates on the same Timeline. If you attempt to drag clips with multiple framerates to the Timeline, a warning message displays and the action is cancelled.*



You can also drag clips to Timelines that already contain clips, but take care not to overwrite existing clips—the most recent clip overlays any existing clip. To avoid this, do one of the following:

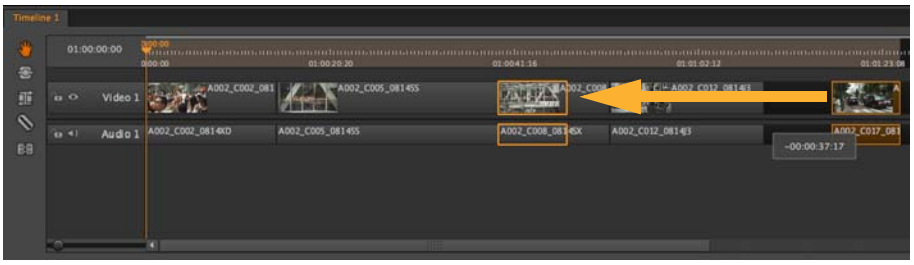
- Use the **Move Clip Tool** to make space for the new clip and then drag-and-drop it in to the space (see Move Clips Tool for more information),



OR

- Drag-and-drop the new clip at the end of the sequence. Next, drag the new clip to an existing transition, hold down the **alt** hotkey, and drop the clip to **Ripple** all other clips down the Timeline.

Tip *The cursor changes to*  *when you're using **Ripple** mode.*



To add tracks to multi-track Timelines:

- Drag-and-drop a clip above or below existing tracks as shown,

OR

- Right-click an existing audio or video track and select **New Track**.

Audio and the Timeline

Storm handles audio tracks on the Timeline in much the same way as video tracks. By default, linked audio and video tracks are edited at the same time, but you can lock either track and move them independently or hold **Alt** to select a single track if required.

Storm can handle two types of audio:

- **RED Audio**—up to four channels of audio recorded by the RED camera at the time of shooting. RED audio and video is automatically synchronised by the camera.
- **WAV Clips**—separate audio files in the WAV format that may or may not have any relation to the RED video clip. Audio in this format can be synchronised with the video track automatically or manually.

RED Audio Tracks

RED cameras can record audio at the same time as video, producing up to five tracks—four audio and one video. You can use the Timeline Editing Tools to edit tracks individually or all at once.

To edit individual tracks:

1. Lock the track(s) you do not wish to edit using the  track icon.
2. Select the required Timeline tool and perform your edits.

   For example, a simple move edit of an audio track might produce the following result:

   Notice locked video and audio tracks are greyed out and the red values on the linked tracks detail the amount of displacement.

3. You can unlock tracks using the  track icon.

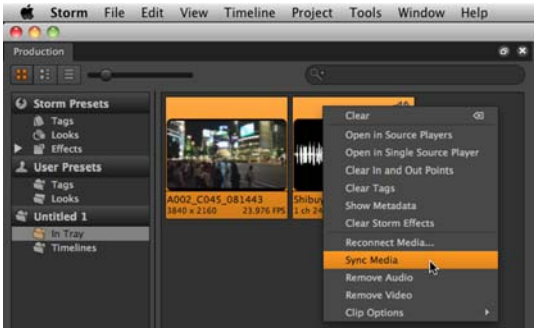
WAV Clip Tracks

Individual WAV clips can be recorded at the same time as shooting the video or they can be unrelated to the shoot, for example sound effects or music. You can add WAV clips to the Timeline in two ways:

- **Drag-and-drop**—drag your WAV clip to a Timeline audio track and drop it in to place. Use the Timeline Editing Tools to move the clip into place and set its output.
- **Synchronise audio**—the WAV clip is automatically added to the video clip, creating a new clip in the same Bin.

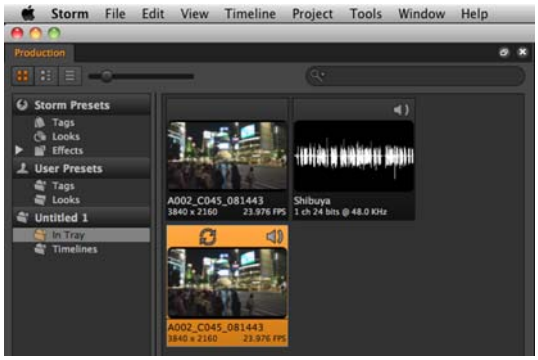
To synchronise audio and video clips:

1. Select the two clips you intend to link in the Bin.
2. Right-click either clip and select **Sync Media**.

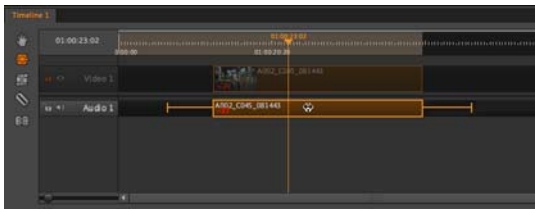


A new clip is created containing both original clips.

The new clip is marked with the synchronised media icon.



3. Drag and drop the new clip to the Timeline.
4. If the audio clip you synchronised is longer than the video clip, you can lock the video track and use the **Slip Tool** to adjust which part of the audio file plays along with video.



See using the Slip Clips Tool for more information.

Timeline Editing Tools

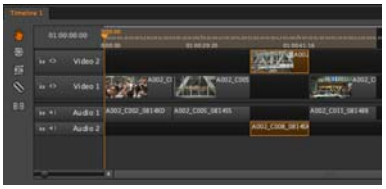
Adding your clips to the Timeline is rarely, if ever, the end of the Production process. The Timeline Editing Tools allow you to manipulate your clips directly in the Timeline instead of the Viewer. Bear in mind that edits you make in the Timeline are not carried over to the associated source clips.

Move Clips Tool

The default **Move Clips Tool** is used to make simple changes to the Timeline. Click and drag the selected clip to required position on the Timeline. A time count popup, in conjunction with the snap to clip function, helps you to reposition the clip accurately.

You can also move clips up and down the track hierarchy using drag-and-drop.

Before moving...



...and after.

Move tool modifiers

Mode	Method	Indicator	Description
Overwrite	drag and drop		The default move mode. The dragged clip overwrites any clips that are present in the move location.
Ripple	drag then hold **Alt** and drop		Drag and drop clips on top of other clips without overwriting content—clips are pushed down the Timeline to accommodate the dragged clip.
Duplicate	hold **Alt** and drag then release **Alt** and drop		Copy the clip, then drag and drop on top of other clips overwriting existing content—clips are **not** pushed down the Timeline to accommodate the dragged clip.

Mode	Method	Indicator	Description
Ripple and Duplicate	hold **Alt** then drag and drop while holding **Alt**		Copy the clip, then drag and drop clips on top of other clips without overwriting content—clips are pushed down the Timeline to accommodate the dragged clip.

Delete modifiers

Action	Hotkeys	Description
Delete	**Backspace**	Delete the selected Timeline clip(s) or gap(s)
Ripple Delete	**Shift** + **Backspace**	Remove the selected clip(s) and ripple clips down stream to close gaps in the Timeline **Note:** The ripple effect may not close gaps entirely, because Storm does not allow linked tracks to become desynchronised during rippling.

Slip Clips Tool

The **Slip Clip Tool** allows you to shift a clip's In and Out Points by the same amount and in the same direction, retaining the original clip length but altering the Timeline output.

Note *The target clip must have In and Out markers on its source reference clip to use the **Slip Clip Tool**.*

1. Click and hold the required clip to display the slip handles.
2. Drag the clip to the new position and release the mouse to complete the slip.

Using the **Slip Clip Tool** does not move the clip on the Timeline, only the clip output is changed.

Roll Tool

The **Roll Tool** enables you to move the cut in a clip backward or forward in time. Rolling the edit point between two clips shortens one clip while lengthening the other to keep the overall duration the same.

You can use the Roll Tool in one of two ways:

- **Single clip**—you can only use the **Roll Tool** after you have made a cut using the **Razor Tool**.
- **Dual clips**—one of the target clips must have In and Out markers on its source reference clip to use the **Roll Tool**.

For example, if you roll five frames at the end of one clip, the next clip would start five frames later. Figure 9.2 shows a Timeline containing a razored clip, and Figure 9.3 shows the same clips with the cut point 'rolled' to the right.

Figure 9.2: Original clips.

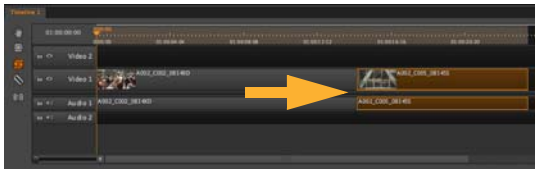


Figure 9.3: Rolled clips.

Razor Tool

The **Razor Tool** allows you to cut a clip in to separate parts so you can remove sections of the clip or rearrange clips in the Timeline.

Tip *The cursor changes state between*  *and*  *when you're using the* ***Razor Tool*** *to let you know where you can and can't make cuts.*

Figure 9.4 shows three clips on a Timeline before the **Razor Tool** is applied, and Figure 9.5 shows the same Timeline after two Razor edits and a move.

Figure 9.4: Original clips.

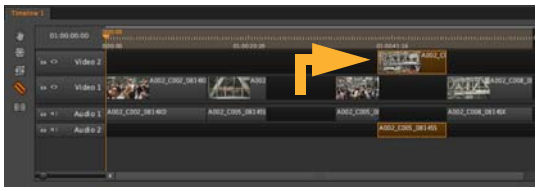


Figure 9.5: The same Timeline after two Razor cuts and move.

Join Tool

The **Join Tool** enables you to remove Razor cuts in a clip to restore it to its original state.

Joins can only occur when:

- The clips on either side of the join are from a single source clip, and
- The frame numbers are continuous.

  For example, if clip 1 ends at frame 15, clip 2 must start at frame 16.

Tip *If a join operation is possible, the cursor changes when you hover over the transition.*

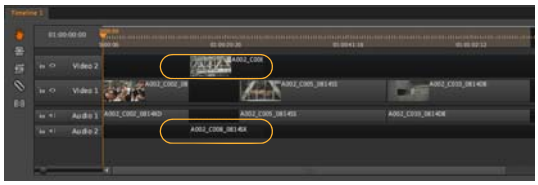
Enabling and Disabling Clips

You can temporarily enable or disable a clip or clips on the Timeline to selectively view your footage without removing the clip(s), for example if you wanted to listen to certain audio layers within a Timeline.

To enable or disable a clip or clips:

1. Select the clip or clips you want to enable or disable using the mouse and selection hotkeys.
2. Right-click on the highlighted clip and deselect **Enable Clip** to disable the clip.

Disabled clips appear black and are effectively removed from the Timeline.

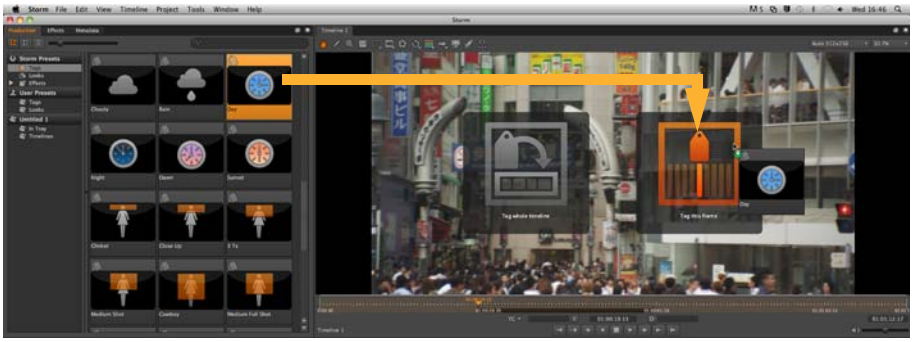


3. Right-click the clip and select **Enable Clip** to re-enable the clip.

Tagging Timelines

Timelines accept Tags in a similar way to Viewers, and they are applied in the same way—by drag-and-drop. You can add Tags to frames, clips, or the entire Timeline as necessary.

- **To tag frames**—move the playhead to the required frame and drag-and-drop the Tag into the Timeline Viewer hotspot.



Frame Tags are displayed under the Viewer, in the mini Timeline.

Tip *Use **Shift** + ↓ or ↑ to skip to the next or previous Tag on the current clip or reposition Tags by dragging them along the Timeline.*

- **To tag clips**—select the clip or clips to tag and drag-and-drop the Tag onto the Timeline.

Clip Tags are displayed on the clip in the Timeline.

- **To tag the entire Timeline**—drag-and-drop the Tag into the Timeline Viewer hotspot (Figure 9.6), or select the entire Timeline and drag-and-drop the Tag into the Timeline tracks (Figure 9.7).

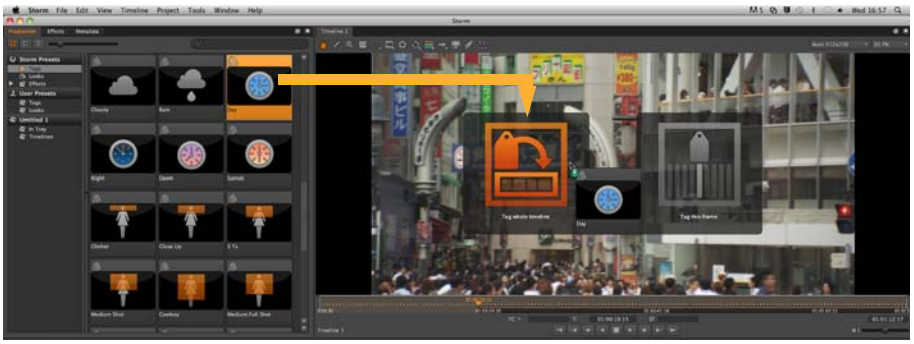
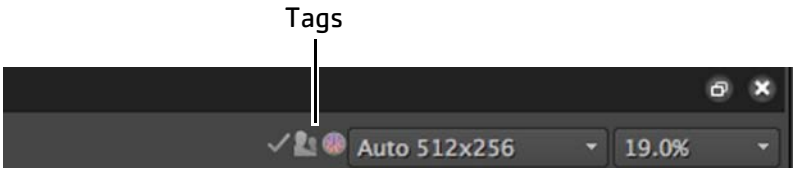


Figure 9.6: The Tag Timeline hotspot

Figure 9.7: Tagging a selected Timeline

Timeline Tags are displayed on top of the Timeline Viewer, next to the **Image Quality** dropdown menu.



Adding Effects to Timelines

Looks and Effects are also added using the familiar Storm drag-and-drop, but they can only be added to clips or the entire Timeline, not individual frames.

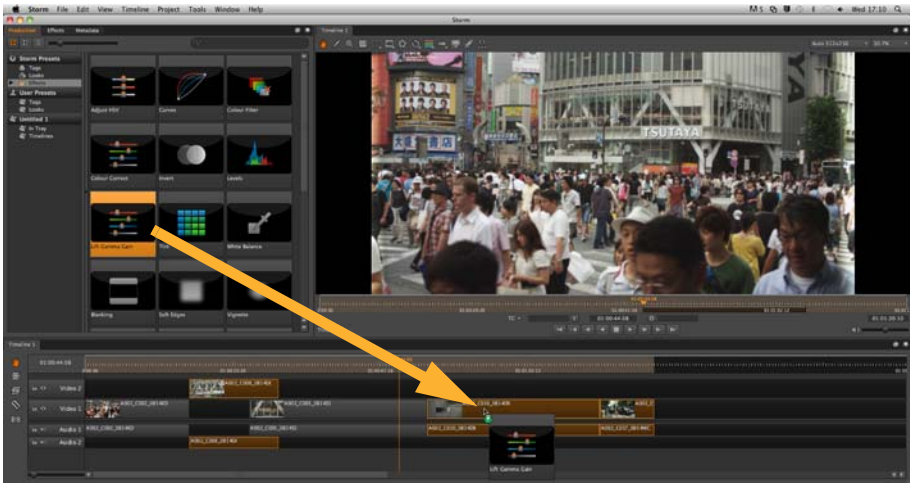
- **To add Effects to a clip**—either drag-and-drop the Effect into the required clip on the Timeline,

OR

Move the playhead to the required clip then drag-and-drop the Effect into the Viewer.

- **To add Effects to multiple clips**—select multiple clips in the Timeline and drop the Effect within the orange highlight to add the Effect to all

selected clips. The following example adds the Effect to the 2nd, 4th, and 5th clips in the Timeline.



Tip *You can add an Effect to the entire Timeline by using the **cmd/Ctrl + A** hotkey in the Timeline pane.*

Effects are displayed in the top-right corner of the clip on the Timeline.

Adding Looks to Timelines

Looks are essentially groups of Effects and they are applied in the same way, with an added option to **Add** to or **Replace** existing effects. You can use the Looks supplied with Storm or create and apply your own. See Managing Looks for more information.

- **To apply a Look to a clip**—either drag-and-drop the Effect into the required clip on the Timeline,

  OR

  Move the playhead to the required clip then drag-and-drop the Effect into the Timeline Viewer.
- **To apply a Look to multiple clips**—select clips in the Timeline and drop the Effect within the orange highlight to add the Effect to all selected clips.

Tip *You can add an Effect to the entire Timeline by using the **cmd/Ctrl + A** hotkey in the Timeline pane.*

Applying Grades to Timelines

Productions rarely occur in a linear fashion, for example shooting, followed by editing, followed by grading, and so on. Storm allows for this by round-tripping edits created in third party applications, such as Final Cut Pro, back into Storm and applying them to your Timeline—even if the Timeline was graded after it was exported to Final Cut Pro.

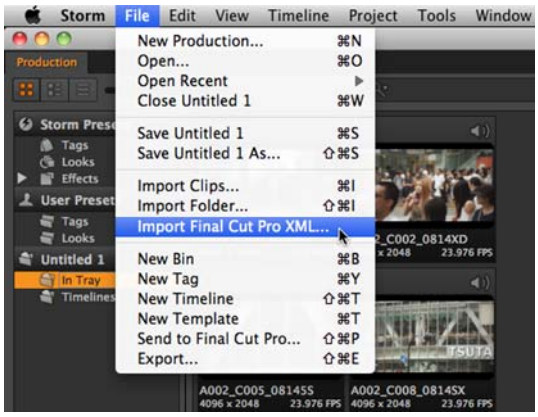
Providing that the **same source files** are present in the current Production, Storm can conform the edits from Final Cut Pro with the graded Timeline, or grade a Timeline from Bins or other Timelines within Storm.

As an example, let's assume that you've exported three clips on a Timeline to Final Cut Pro:

- You send the XML and QuickTime movies on to the next stage in your pipeline for fine editing, while you create three test grades in Storm.
- Your editor provides a Final Cut Pro XML file containing the final edit.

To conform the edit with your grades:

1. Import your XML using the **File** > **Import Final Cut Pro XML** menu option, locate your XML and click **Open**.

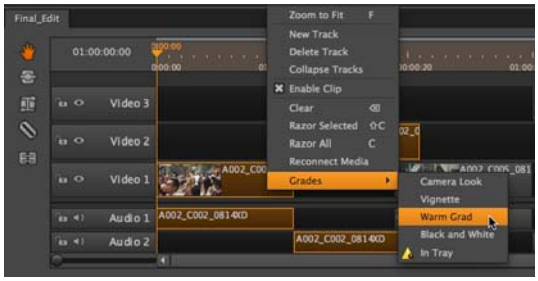


2. Double-click the imported XML to open up the Timeline.

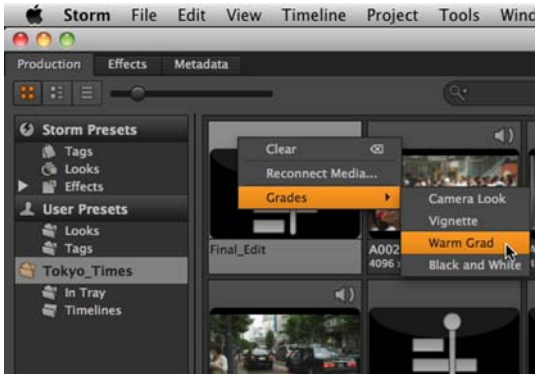
Note *If the source files are not present in the current Production, you may need to relink the XML and source files manually. See Reconnecting XML for more information.*

3. You can apply your grades to individual clips on the imported Timeline, or to the entire Timeline as required:

- **Individual clips**—select the required clip(s) on the Timeline and then right-click and navigate to **Grades** to apply the required look to the selection.



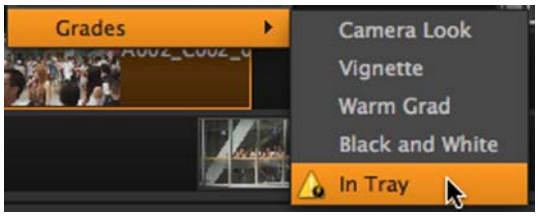
- **Timeline**—select the XML Timeline in the **In Tray** and then right-click and navigate to **Grades** to apply the required look to the entire Timeline.



Storm retains the edits you made in Final Cut Pro, but applies the grade from Storm, integrating the separate workflows.

You can swap easily between all available grades—Storm automatically removes the existing grade and replaces it with your new selection.

Note *Warning icons let you know when your selection could produce unexpected results—for example if more than one grade could be applied from the selected location.*

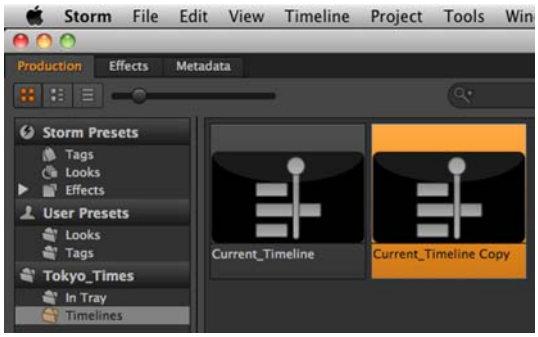


You can also use grades as a 'soft backup' for versions of your work, keeping track of your Timeline decisions. By saving your current Timeline often as your grade develops, you can quickly review previous edits if you think you're heading in the wrong direction.

To create a Timeline version:

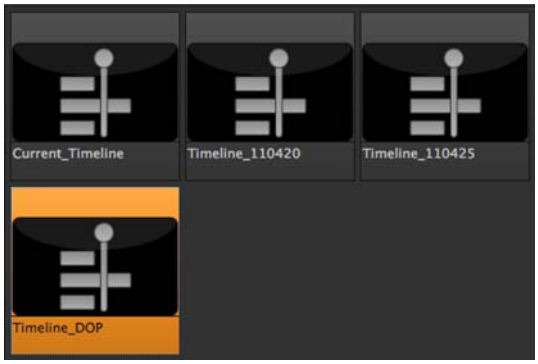
1. Select the current Timeline in the Bin view.
2. Copy and paste the Timeline by navigating to the **Edit** menu or by using the **cmd/Ctrl** + **C** and **cmd/Ctrl** + **V** hotkeys.

   A copy of the selected Timeline is created.



3. Rename the new Timeline as required.

   Using this method, you can quickly build up a version history within a Bin:



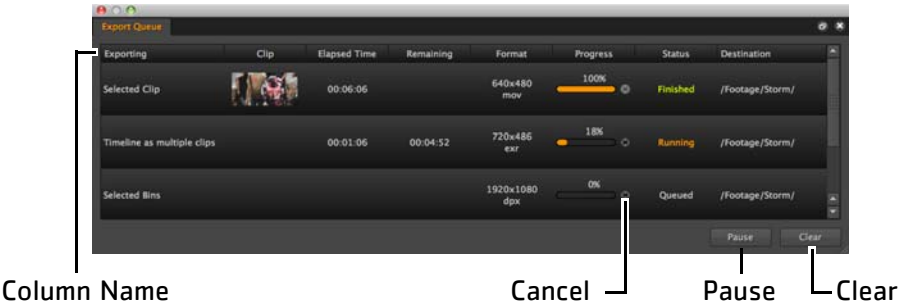
4. Right-click the Current_Timeline and select the required version to quickly review your grade's development.

10 MANAGING STORM OUTPUT

Whether you're exporting to another post-production application like Final Cut Pro or Nuke, creating QuickTime files or still frames, or trimming existing R3D files, this chapter explains how to achieve the best results from production to production.

About the Export Queue

Storm renders output in the background using the Export Queue, allowing you to continue working while your output is created. New export operations are added to the foot of the queue and processed in order from the top-down.



The Export Queue components are described below:

- **Column Name**—export information broken down into columns:
  - **Exporting**—the export operation queued.
  - **Clip**—the clip currently rendering.
  - **Elapsed Time**—the time spent rendering the current clip or the total time taken in the case of completed exports.
  - **Remaining**—the estimated time remaining to complete the current export.
  - **Format**—the format selected for the exports in the queue.
  - **Progress**—a visual representation of the **Remaining** column shown as a percentage.
  - **Status**—the status of all operations in the queue.
  - **Destination**—the specified output destination.
- **Cancel**—click to cancel individual exports.
- **Pause**—click to pause the entire Export Queue. Click once more to resume.
- **Clear**—click to remove cancelled, failed, and finished exports.

About Export Presets

As you use Storm from production to production, you'll probably find that certain combinations of export settings are used regularly. Storm's export dialog allows you to save commonly used combinations as Export Presets, so you can apply complex export decisions efficiently.

The Export dialog is shown in Figure 10.1, with the Export Presets highlighted on the left-hand side.

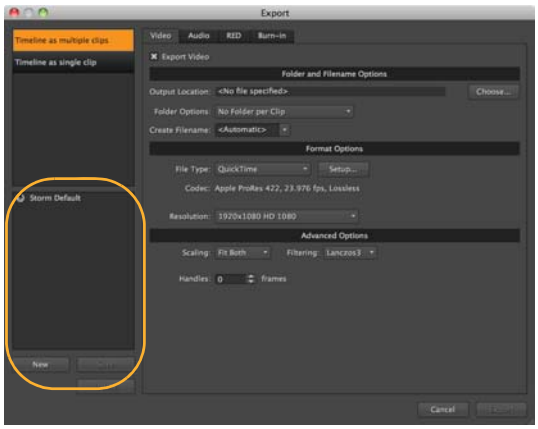


Figure 10.1: The Export Dialog

To create an Export Preset:

1. Click **New** to create an untitled preset.
2. Enter a meaningful name in the preset field, for example QT HDV 1080i.
3. Work through the export settings described in Exporting To Final Cut Pro, Exporting, and Exporting Trimmed R3Ds depending on your requirements.
4. Click **Save** to add the Export Preset to the preset list.
5. You can create as many presets as you need and overwrite or delete existing presets.

Exporting To Final Cut Pro

Unlike Storm, Final Cut Pro does not read R3D files directly. If your workflow uses Final Cut Pro for offline editing, Storm can generate QuickTime Movies for your media combined with an associated XML file that contains the Timeline and metadata.

Using Storm's export function, you can create XML and QuickTime Movies concurrently for Timelines, Bins, or single clips.

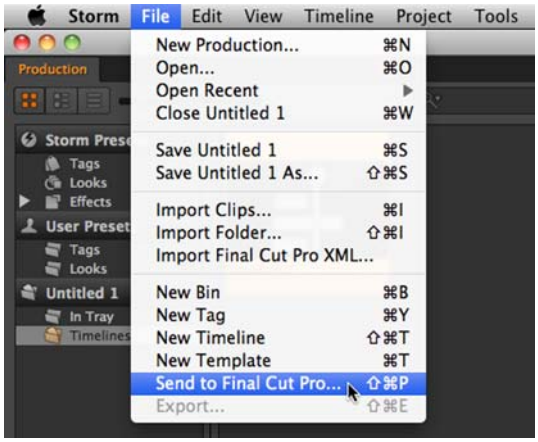
- **XML**—generated during the export process, these files contain the information necessary for Final Cut Pro to display your media organised

into Bins or edited into Timelines from Storm. XML is also used to convert Storm Tags to Final Cut Pro markers.

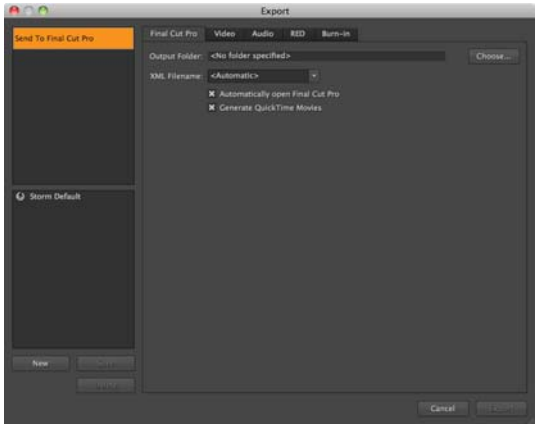
- **QuickTime Movies**—you can decide whether or not to generate reference files. Reference files are essentially copies of the selected media from your Storm project at a lower resolution, making them more manageable for offline editing. Any effects you applied in Storm are 'baked' in and contain enough information to enable Storm to conform with the original R3D media if you bring the edit back to Storm later.

The following example delivers a Timeline, but the process is the same for Bins.

1. In the **Production** tab, select the Timeline and navigate to **File** > **Send to Final Cut Pro**.



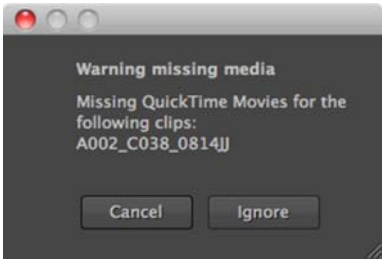
The **Export** dialog box displays.



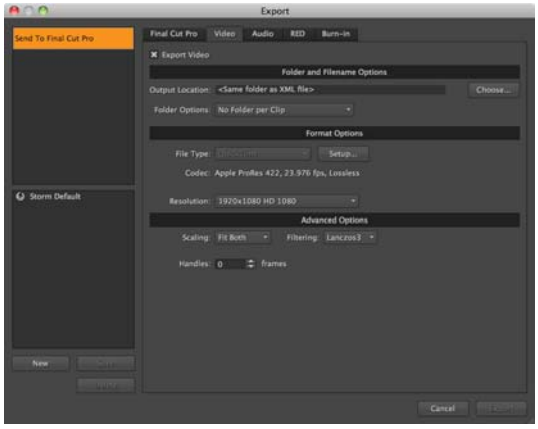
2. Enter the file path of the folder to save your output, or click **Choose...** to browse to the location.
3. Enter an XML file name in the field provided.
4. If you want to export your XML straight to Final Cut Pro, select the **Automatically open Final Cut Pro** checkbox.
5. If you have previously created QuickTime Movie files for the XML, you can deselect **Generate QuickTime Movies** to save time.

Note *If you elect to skip this step and you have not previously created QuickTime Movies from the **same source R3D files**, Final Cut Pro has no reference media, resulting in an empty Timeline.*

A warning displays if Storm cannot locate existing ***.mov*** *files for any of the clips you intend to export.*



6. Click the **Video** tab to display the video export options shown below.



7. Under **Folder and Filename Options**:
   - Enter an **Output Location** in the field provided, or click **Choose...** to browse to the location.

Note *The default value saves your output to the same folder as the XML file.*

   - Select your folder structure from the **Folder Options** dropdown:

     No Folder per Clip—All clips are placed in a single location.

     Folder per Clip—A separate folder is created for each clip in a single location.

     Bin Structure no Folder per Clip—The Storm Bin structure is preserved, but individual clips within a Bin are placed together.

     Bin Structure and Folder per Clip—The Storm Bin structure is preserved and additional folders are created for individual clips within Bins.

8. Under **Format Options**:
   - Click **Setup** to select the export **Codec**.

There are too many types of codec to list here, but examples include **Apple ProRes 422** (the default), **H.264**, and **HDV 720p24**.

- Select the required **Resolution** from the dropdown menu.

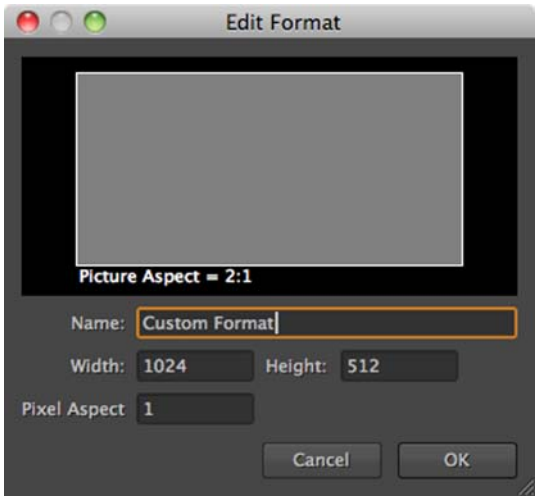
  Again, there are too many display types to list here, but some examples are **1920x1080 HD** (the default), **720x480 NTSC 4:3**, and **4096x1716 CinemaScope**.

  Alternatively, you can create a non-standard resolution by selecting **Custom** from the dropdown menu.

Note *If the aspect ratio of the selected format doesn't match the R3D material, the media is resized to fit the frame, potentially leaving black bands at top and bottom or sides.*

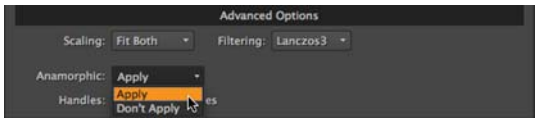
Enter a **Name**, **Width**, **Height**, and **Pixel Aspect** for the new format, and then click **OK** to save your settings.

Tip *The ratio representation updates dynamically as you make changes to the **Pixel Aspect** field.*



9. Under **Advanced Options**, select the required **Scaling** and **Filtering** options from the dropdown menus:
   - **Scaling**—designed to give you some control over output width and height. For example, if your clips were shot in 16:9, you could limit the scale by **Height** so that the frame edges are clipped to the equivalent width.
   - **Filtering**—the type of filter you select affects the quality of your output. For example, selecting a high quality **Lanczos3** filter improves quality over the standard **Box** filter.

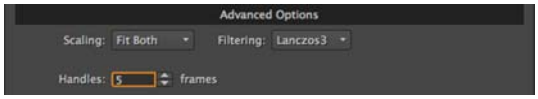
- **Anamorphic**—if the export contains anamorphic clips, this dropdown gives you the option to discard the 2:1 aspect ratio and export the clip as 1:1. The default value, **Apply**, retains the aspect ratio.



- **Bit Depth**—the bit depth to use during export, select from **8-bit**, **16-bit**, and **Half Float**. The Bit Depth dropdown menu is only displayed if you enable **Advanced Mode** in the **Preferences** dialog. See Workspace Preferences.

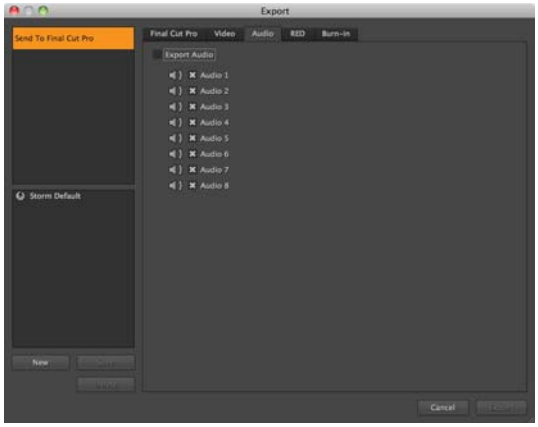
Note *Bear in mind that high quality filters and bit depth, for example **Lanczos3** and **Half Float**, require more rendering time.*

10. If you're exporting as a series of clips, you can add extra frames as 'handles' allowing you manipulate the output more easily, for example to slip the clip within the handles.



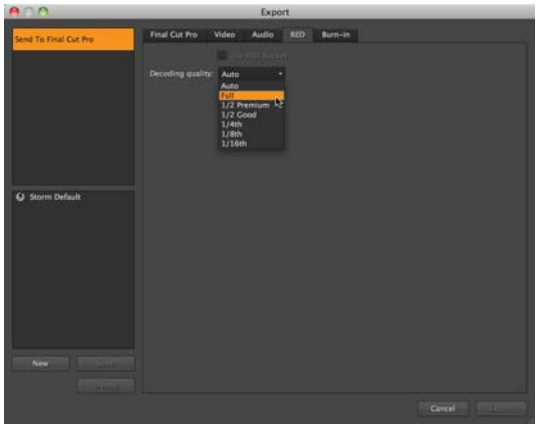
11. Click the **Audio** tab and check **Export Audio** to include any audio tracks present in the export.

Note *Storm does not export audio tracks by default. You can toggle up to eight audio tracks on and off on the **Audio** tab.*



12. Click the **RED** tab and check **Use RED Rocket** to export using the RED Rocket decoder.

13. Select the **Decoding quality** using the dropdown menu.



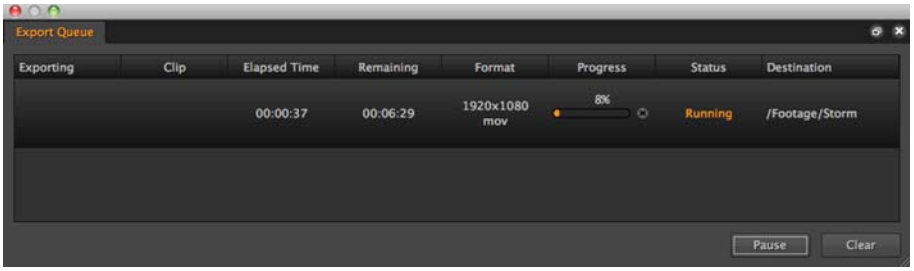
Note *Using the RED Rocket card is a high speed/low quality export option, passing your output though the hardware rather than the software.*

*If time is not one of your main considerations, you should leave **Use RED Rocket** disabled.*

14. Click **Export** to begin the conversion.

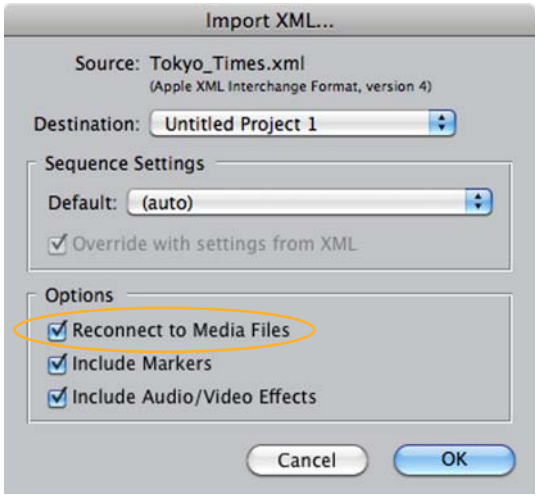
    The **Export Queue** window displays an estimate of how long the export is expected to take.

Note *The amount of time required to export your work to Final Cut Pro depends on the options you choose. Generating reference files, for example, can be a lengthy process.*



If you checked **Open Final Cut Pro**, the application launches and your work is automatically imported.

Tip *When Final Cut Pro's **Import XML...** dialog displays, ensure **Reconnect to Media Files** is checked or your media may appear offline.*



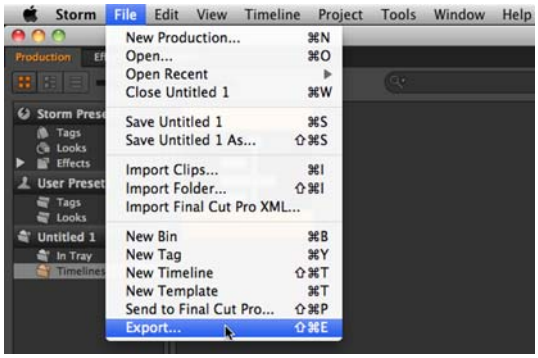
*If you're using uncommon or custom codecs and resolutions, you may also need to adjust the **Sequence Settings Default** to reflect your settings within Storm.*

Exporting

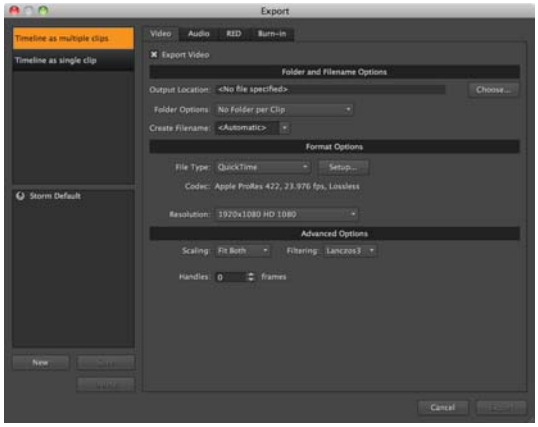
Storm can also export a clip, Bin, or Timeline as a single or multiple QuickTime file(s), or a series of still images (EXR or DPX).

Exporting to QuickTime

1. Select the clip, Bin, or Timeline you want to export from the **Production** tab and navigate to **File** > **Export** or use the **shift** + **cmd/Ctrl** + **E** hotkey.



The **Export** dialog box displays.



Note *Storm displays a different **Export** dialog depending on what you intend to deliver. For example, the **Handles** field is not displayed if you select **Timeline as single clip**.*

2. Enter the file path of the folder to save your output, or click **Choose...** to browse to the location.
3. Select your folder structure from the **Folder Options** dropdown:
   - **No Folder per Clip**—All clips are placed in a single location.
   - **Folder per Clip**—A separate folder is created for each clip in a single location.
   - **Bin Structure no Folder per Clip**—The Storm Bin structure is preserved, but individual clips within a Bin are placed together.

- **Bin Structure and Folder per Clip**—The Storm Bin structure is preserved and additional folders are created for individual clips within Bins.

4. By default, Storm automatically names your output files. You can manually select the naming structure by entering text in the following format:
   - **name**—Use when creating **.mov** files. For example, entering Tokyo_Times names your files Tokyo_Times-***cn***.mov (where *cn* = clip number in the sequence).
5. Select **File Type** > **QuickTime** using the dropdown menu.
6. Click **Setup** to select the codec used during the export.

   There are too many types of codec to list here, but some examples include **Apple ProRes 422** (the default), **H.264**, and **HDV 720p24**.
7. Select the required **Resolution** from the dropdown menu.

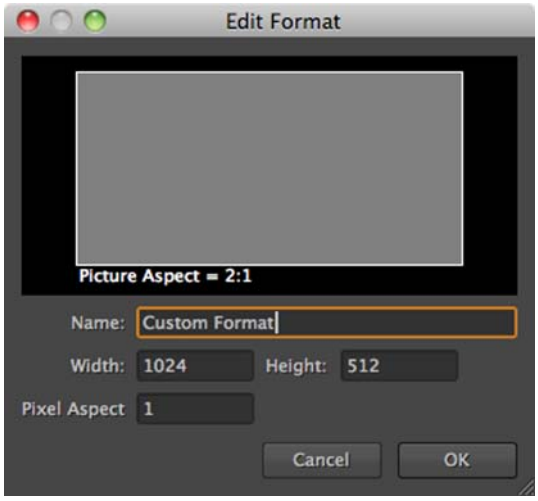
   Again, there are too many display types to list here, but some examples include **1920x1080 HD** (the default), **720x480 NTSC 4:3**, and **4096x1716 CinemaScope**.

   Alternatively, you can create a non-standard resolution by selecting **Custom** from the dropdown menu.

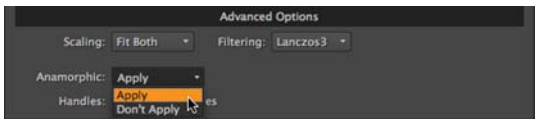
Note *If the aspect ratio of the selected format doesn't match the R3D material, the media is resized to fit the frame, potentially leaving black bands at top and bottom or sides.*

Enter a **Name**, **Width**, **Height**, and **Pixel Aspect** for the new format, and then click **OK** to save your settings.

Tip *The ratio representation updates dynamically as you make changes to the **Pixel Aspect** field.*



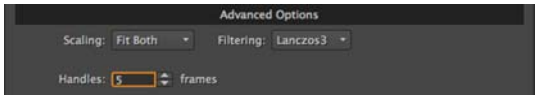
8. Under **Advanced Options**, select the required **Scaling** and **Filtering** options from the dropdown menus:
   - **Scaling**—designed to give you some control over output width and height. For example, if your clips were shot in 16:9, you could limit the scale by **Height** so that the frame edges are clipped to the equivalent width.
   - **Filtering**—the type of filter you select affects the quality of your output. For example, selecting a high quality **Lanczos3** filter improves quality over the standard **Box** filter.
   - **Anamorphic**—if the export contains anamorphic clips, this dropdown gives you the option to discard the 2:1 aspect ratio and export the clip as 1:1. The default value, **Apply**, retains the aspect ratio.



   - **Bit Depth**—the bit depth to use during export, select from 8-bit, 16-bit, and Half Float. The Bit Depth dropdown menu is only displayed if you enable **Advanced Mode** in the **Preferences** dialog. See Workspace Preferences.

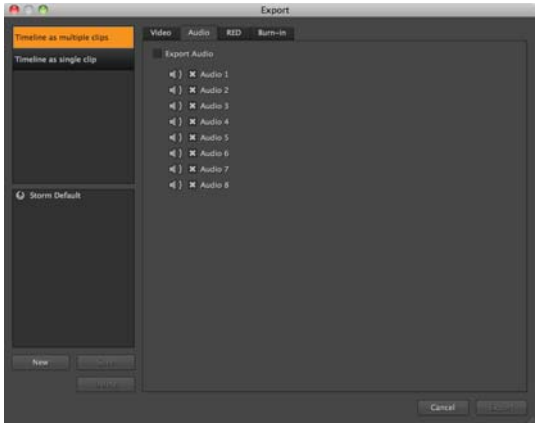
Note *Bear in mind that high quality filters and bit depth, for example **Lanczos3** and **Half Float**, require more rendering time.*

9. If you're exporting as a series of clips, you can add extra frames as 'handles' allowing you manipulate the output more easily, for example to slip the clip within the handles.

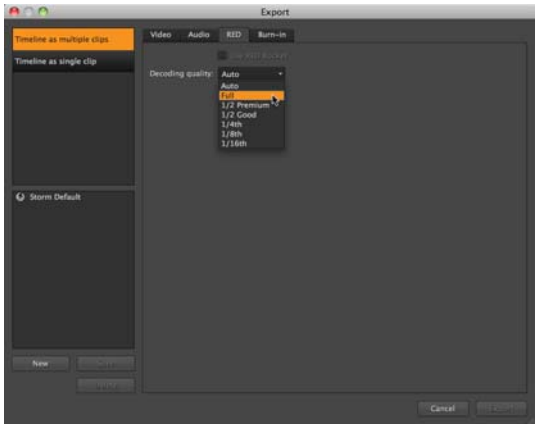


10. Click the **Audio** tab and check **Export Audio** to include any audio tracks present in the export.

Note *Storm does not export audio tracks by default. You can toggle up to eight audio tracks on and off on the **Audio** tab.*



11. Click the **RED** tab and check **Use RED Rocket** to export using the RED Rocket decoder.



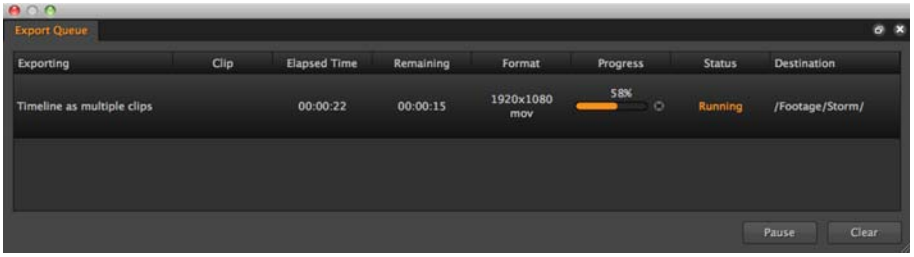
Select the **Decoding quality** using the dropdown menu.

Note *Using the RED Rocket card is a high speed/low quality export option, passing your output though the hardware rather than the software.*

*If time is not one of your main considerations, you should leave **Use RED Rocket** disabled.*

12. Take a moment to review your choices, then click **Export**.

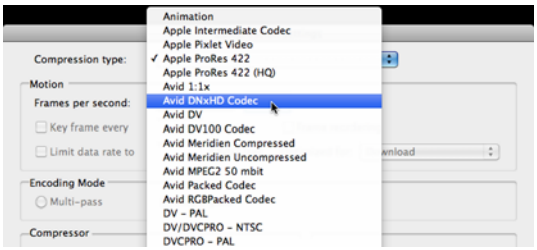
Storm sends the output to the **Export Queue** using the preferences you selected. A progress window displays an estimate of how long the export will take.



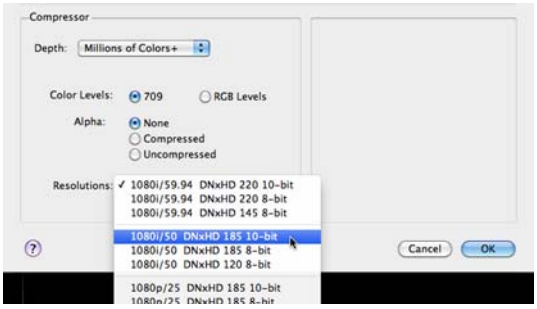
About Avid DNxHD

If you intend to export from Storm to the Avid DNxHD ® format, you'll need the correct codec supplied with Avid Media Composer™ to do the conversion. A **codec** converts one file format to another during the export process, and you can specify the DNxHD codec from the **Export** dialog box.

1. The process is identical to other QuickTime exports, so follow the initial steps described in Exporting to QuickTime.
2. Under **Format Options**, click **Setup** to select the **Compression type**, or codec, to use during the export.
3. Select **Avid DNxHD Codec** from the dropdown menu.

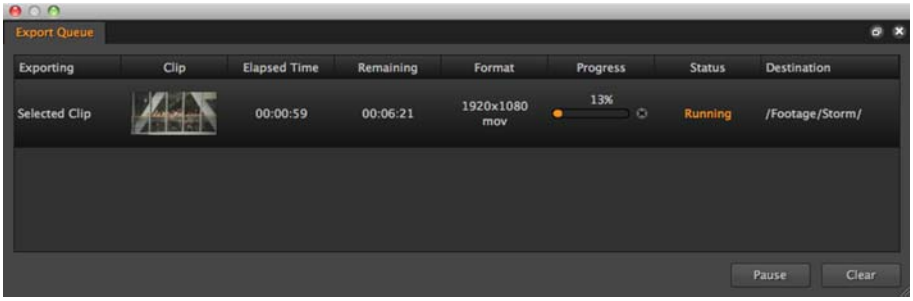


4. Under **Compressor** settings, select the required **Resolution** from the dropdown menu.



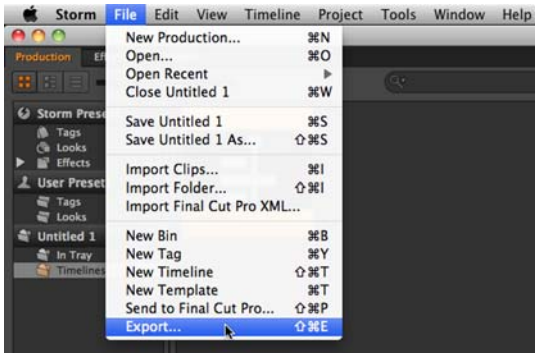
5. Follow the remaining steps under Exporting to QuickTime and click **Export**.

   Storm sends the output to the **Export Queue** using the DNxHD codec you selected. A progress window displays an estimate of how long the export will take.

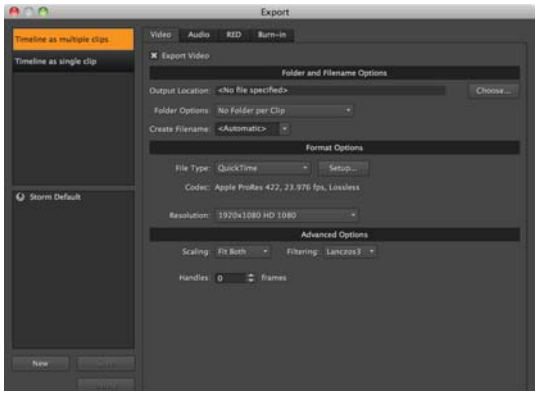


Exporting to Individual Frames

1. Select the clip, Bin, or Timeline you want to export from the **Production** tab and navigate to **File** > **Export**.

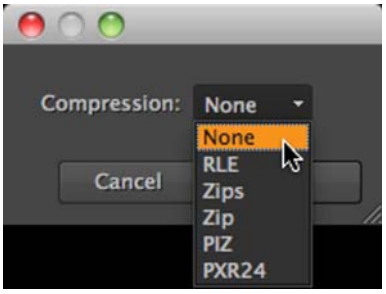


   The **Export** dialog box displays.



Note *Storm displays a different **Export** dialog depending on what you intend to deliver. For example, the **Handles** field is not displayed if you select **Timeline as single clip**.*

2. Enter the file path of the folder to save your output, or click **Choose...** to browse to the location.
3. Select your folder structure from the **Folder Options** dropdown:
   - **No Folder per Clip**—All clips are placed in a single location.
   - **Folder per Clip**—A separate folder is created for each clip in a single location.
   - **Bin Structure no Folder per Clip**—The Storm Bin structure is preserved, but individual clips within a Bin are placed together.
   - **Bin Structure and Folder per Clip**—The Storm Bin structure is preserved and additional folders are created for individual clips within Bins.
4. By default, Storm automatically names your output files. You can manually select the naming structure by entering text in the following format:
   - **name-frame**—Use when creating EXRs or DPXs. For example, entering Tokyo_Times-{frames} names your files Tokyo_Times-***fn-cn***.exr (where *cn* = clip number, and *fn* = frame number in the sequence).
5. Select **File Format** > **EXR** or **DPX** using the dropdown menu.
6. Click **Setup** to select the required compression type:



7. Select the required **Resolution** from the dropdown menu.

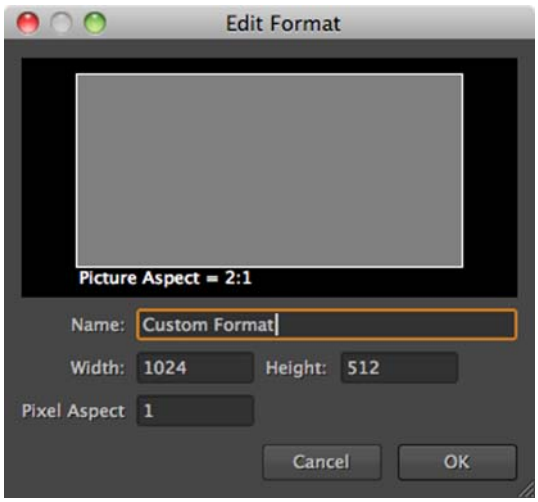
   Again, there are too many display types to list here, but some examples include **1920x1080 HD** (the default), **640x480 PC_Video**, and **720x486 (1.21) NTSC_16:9**.

   Alternatively, you can create a non-standard resolution by selecting **Custom** from the dropdown menu.

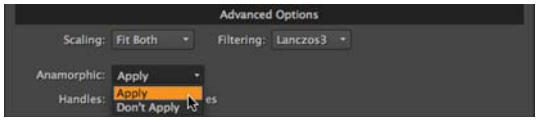
Note *If the aspect ratio of the selected format doesn't match the R3D material, the media is resized to fit the frame, potentially leaving black bands at top and bottom or sides.*

Enter a **Name**, **Width**, **Height**, and **Pixel Aspect** for the new format, and then click **OK** to save your settings.

Tip *The ratio representation updates dynamically as you make changes to the **Pixel Aspect** field.*



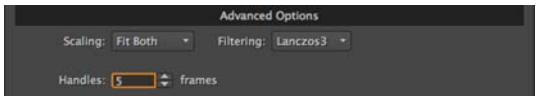
8. Under **Advanced Options**, select the required **Scaling** and **Filtering** options from the dropdown menus:
   - **Scaling**—designed to give you some control over output width and height. For example, if your clips were shot in 16:9, you could limit the scale by **Height** so that the frame edges are clipped to the equivalent width.
   - **Filtering**—the type of filter you select affects the quality of your output. For example, selecting a high quality **Lanczos3** filter improves quality over the standard **Box** filter.
   - **Anamorphic**—if the export contains anamorphic clips, this dropdown gives you the option to discard the 2:1 aspect ratio and export the clip as 1:1. The default value, **Apply**, retains the aspect ratio.



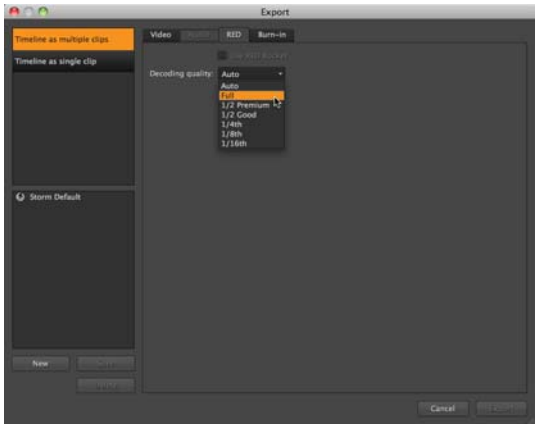
   - **Bit Depth**—the bit depth to use during export, select from 8-bit, 16-bit, and Half Float. The Bit Depth dropdown menu is only displayed if you enable **Advanced Mode** in the **Preferences** dialog. See Workspace Preferences.

Note *Bear in mind that high quality filters and bit depth, for example **Lanczos3** and **Half Float**, require more rendering time.*

9. If you're exporting as a series of clips, you can add extra frames as 'handles' allowing you manipulate the output more easily, for example to slip the clip within the handles.



10. Click the **RED** tab and check **Use RED Rocket** to export using the RED Rocket decoder.



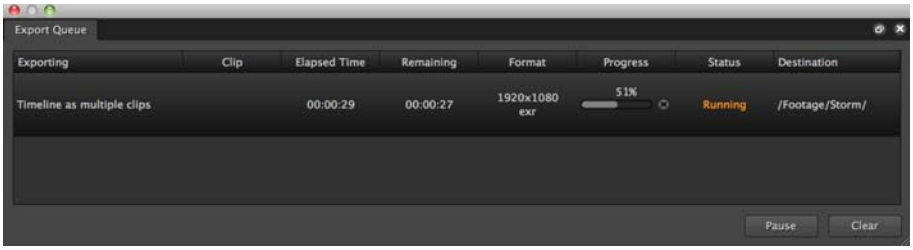
Select the **Decoding quality** using the dropdown menu.

Note *Using the RED Rocket card is a high speed/low quality export option, passing your output though the hardware rather than the software.*

*If time is not one of your main considerations, you should leave **Use RED Rocket** disabled.*

11. Take a moment to review your choices, then click **Export**.

Storm sends your output to the **Export Queue** using the preferences you selected. A progress window displays an estimate of how long the export will take.

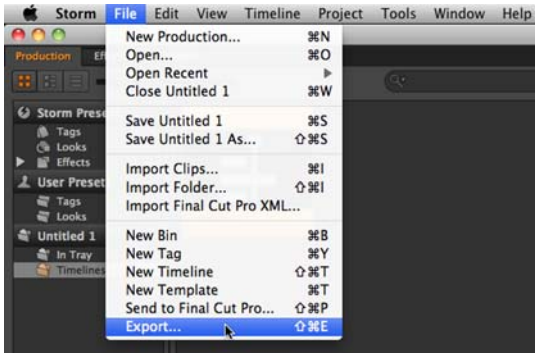


Exporting Trimmed R3Ds

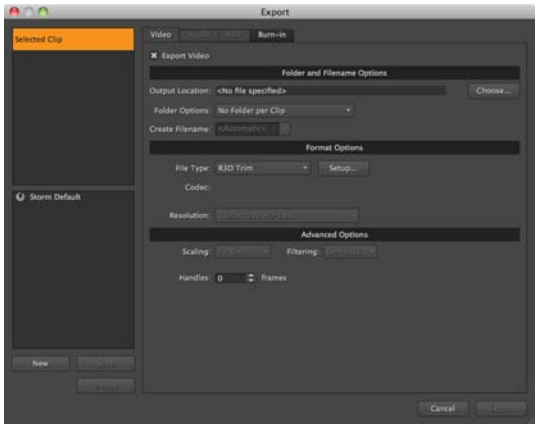
Storm can trim R3D files, allowing you to cut out wasteful footage and create new R3D source files. The new R3Ds retain the same filename to enable you to conform existing XML using the trimmed files.

Before you begin, ensure you make selections by placing In and Out points on the source clips as required.

1. Select the clip, Bin, or Timeline you want to export from the **Production** tab and navigate to **File** > **Export**.



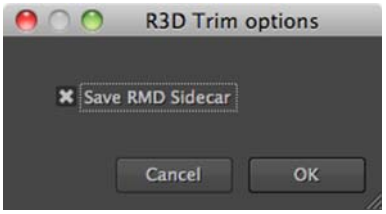
The **Export** dialog box displays.



2. Enter the file path of the folder to save your output, or click **Choose...** to browse to the location.
3. Select your folder structure from the **Folder Options** dropdown:
   - **No Folder per Clip**—All clips are placed in a single location.
   - **Folder per Clip**—A separate folder is created for each clip in a single location.
   - **Bin Structure no Folder per Clip**—The Storm Bin structure is preserved, but individual clips within a Bin are placed together.

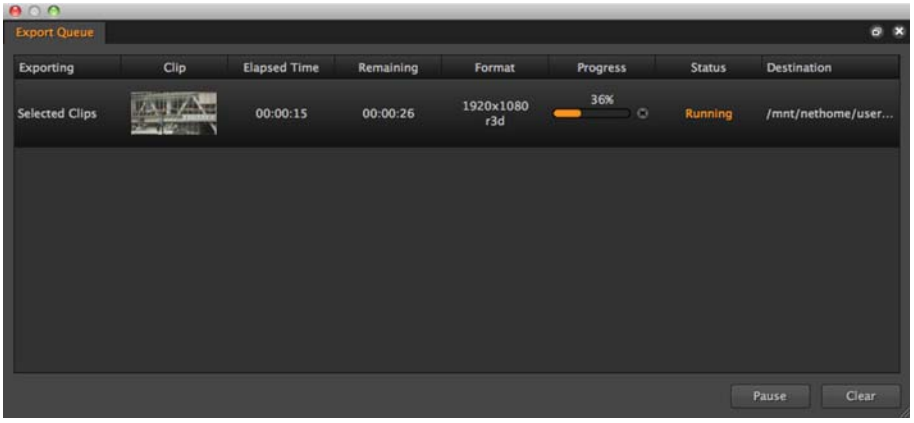
- **Bin Structure and Folder per Clip**—The Storm Bin structure is preserved and additional folders are created for individual clips within Bins.

4. Select **File Type** > **R3D Trim** using the dropdown menu.
5. Click **Setup** to select whether or not to produce RMD files along side the trimmed R3D.



6. The other export options are not available when you're trimming R3D files, so click **Export** to begin.

   Storm sends your output to the **Export Queue** using the preferences you selected. A progress window displays an estimate of how long the export will take.



APPENDIX A: STORM HOTKEYS

Storm Hotkeys

This appendix lists the hotkeys used by Storm, along with their function.

Note: *LMB, RMB, and MMB refer to the left, right, and middle mouse buttons respectively.*

Hotkey	Button	Menubar	Function
Viewer			
Shift + **cmd** + **1**	-	View > Zoom to Actual Size	Zoom the contents of the Viewer to actual size
Shift + **cmd** + **2**	-	View > Zoom to Half Size	Zoom the contents of the Viewer to half size
F	-	Scale dropdown > Fit	Zoom to fit the clip to the Viewer
H	-	Zoom to Fit (Height)	Fit the current clip to the height of the Viewer
W	-	Zoom to Fit (Width)	Fit the current clip to the width of the Viewer
cmd + **F**	-	View > Full Screen	Toggle Full Screen mode
cmd + **Shift** + **F**	-	View > Full Quality 1:1	Toggle Full Screen mode at Full Quality 1:1 zoom
E		View > Clipping Warning	Toggle the Level Warning tool on and off
cmd + ←		View > Transform > Rotate Left	Rotate the current clip 90° counter-clockwise
cmd + →		View > Transform > Rotate Right	Rotate the current clip 90° clockwise
I		View > Mark In	Set the In Point at the current frame
O		View > Mark Out	Set the Out Point as the current frame
Shift + ←		View > Go to Start	Go to the start of all clips
Shift + →		View > Go to End	Go to the end of all clips
Shift + **I**	-	View > Go to In Point	Go to the In Point in the current clip
Shift + **O**	-	View > Go to Out Point	Go to the Out Point in the current clip

Hotkey	Button	Menubar	Function
←		View > Frame Backward	Skip one frame backward
→		View > Frame Forward	Skip one frame forward
↑		View > Previous Edit	Go to the previous clip in the Viewer
↓		View > Next Edit	Go to the next clip in the Viewer
Shift + ↑	-	View > Previous Tag	Go to previous frame tag
Shift + ↓	-	View > Next Tag	Go to next frame tag
Space		View > Play	Play clip
J		View > Play Backward	Play clip backward (click multiple times to increase playback speed)
L		View > Play Forward	Play clip forward (click multiple times to increase playback speed)
K		View > Pause	Pause playback
cmd + **drag**	-	-	Zoom the contents of the Viewer
Scroll MMB (over Viewer)	-	-	Zoom the contents of the Viewer
Scroll MMB (over mini Timeline)	-	-	Zoom the mini Timeline and Viewer waveform
Click MMB (over mini Timeline)	-	-	Zoom to fit the mini Timeline and Viewer waveform. **Note:** If your mouse preferences are not set to **Button 3** for the middle mouse button, you may have to use **ctrl** + **MMB**.
Bin			
cmd + **B**	-	File > New Bin	Create a new Bin in the current Bin
cmd + **Y**	-	File > New Tag	Create a new Tag in the current Bin
Shift + **cmd** + **T**	-	File > New Timeline	Create a new Timeline in the current Bin
cmd + **T**	-	File > New Template	Create a new Template in the current Bin
cmd + **A**	-	Edit > Select All	Select all files in the current Bin
cmd + **C**	-	Edit > Copy	Copy the selected item(s) to the buffer

Hotkey	Button	Menubar	Function
cmd + **X**	-	Edit > Cut	Cut the selected item(s) to the buffer
cmd + **V**	-	Edit > Paste	Paste item(s) from the buffer
Backspace	-	-	Delete selected item(s)
Timeline			
LMB	-	-	Select a clip including any linked tracks
Alt + **LMB**	-		Select a clip, ignoring linked tracks (for example, audio only)
F	-	View > Zoom to Fit	Zoom to fit the clips on the Timeline to the available space
Backspace	-	-	Remove the selected clip(s) or gap(s) from the Timeline
Ripple Delete	-	Timeline > Ripple Delete	Remove the selected clip(s) and ripple clips down stream to close gaps in the Timeline
cmd + **A**	-	-	Select all clips in the Timeline
LMB then **Shift** + **LMB**	-	-	Select all clips between the LMB clicks (use **Shift** + **Alt** + **LMB** to ignore linked tracks)
Shift + **C**	-	Timeline > Razor Selected	Apply the Razor tool to the currently selected track(s) within the selected clip(s)
C	-	Timeline > Razor All	Apply the Razor tool to all tracks within the selected clip(s)
drag then **alt**	-	-	Activate Ripple mode while dragging clips
alt then **drag**	-	-	Duplicate the dragged clips
alt and **drag**	-	-	Ripple and duplicate the dragged clips
Spacebar		View > Play	Play through the Timeline
alt + **MMB**	-	-	Fit the Viewer to marked In and Out Points
Effects Stack			
S	-	-	Save selected effect(s) as a Look
Backspace	-	-	Delete effect(s)
cmd + **A**	-	-	Select all effects in the Effects Stack
Shift + **LMB**	-	-	Select a continuous range of effects from the currently selected effect to the next effect selected.
User Interface			
cmd + **1**	-	Window > Workspace > Editing	Switch to the default Editing workspace
cmd + **2**	-	Window > Workspace > Reviewing	Switch to the default Reviewing workspace

Hotkey	Button	Menubar	Function
cmd + **n**	-	Windows > Workspace > Custom Workspace Name	Switch to the custom workspace associated with the number selected.
~ (tilde)	-	-	Toggle between full screen and preset pane size for the pane currently under the mouse pointer.
Media Pool Searchbox			
LMB	-	-	Select search criteria
cmd + **LMB**	-	-	Toggle select individual search criteria
Shift + **LMB**	-	-	Select a range of search criteria
←→	-	-	Cycle left or right through the search criteria
Backspace	-	-	Remove the selected search criteria
Escape	-	-	Return focus to the previously selected panel

Note: *LMB, RMB, and MMB refer to the left, right, and middle mouse buttons respectively.*

APPENDIX B: THIRD PARTY LICENCES

Third Party Licences

This appendix lists third party libraries used in Storm, along with their licences.

Library	Description	Licence
Boost/1.37.0	Source code function / template library	Boost Software License - Version 1.0 - August 17th, 2003 Permission is hereby granted, free of charge, to any person or organisation obtaining a copy of the software and accompanying documentation covered by this license (the "Software") to use, reproduce, display, distribute, execute, and transmit the Software, and to prepare derivative works of the Software, and to permit third-parties to whom the Software is furnished to do so, all subject to the following: The copyright notices in the Software and this entire statement, including the above license grant, this restriction and the following disclaimer, must be included in all copies of the Software, in whole or in part, and all derivative works of the Software, unless such copies or derivative works are solely in the form of machine-executable object code generated by a source language processor. THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE AND NON-INFRINGEMENT. IN NO EVENT SHALL THE COPYRIGHT HOLDERS OR ANYONE DISTRIBUTING THE SOFTWARE BE LIABLE FOR ANY DAMAGES OR OTHER LIABILITY, WHETHER IN CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Library	Description	Licence
Breakpad 1.0	Multi-platform crash reporting system	Copyright © 2010, Google Inc. All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: • Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. • Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. • Neither the name of the organization nor the names of its contributors may be used to endorse or promote products derived from this software without specific prior written permission. THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
EuCon SDK - EuCon/2.5.5	Software development kit	The EUCON specification and trademark are property of Avid Technology, Inc. Used under license.
Expat/2.0.1	XML parser	Copyright © 1998, 1999, 2000 Thai Open Source Software Center Ltd and Clark Cooper Copyright © 2001, 2002, 2003, 2004, 2005, 2006 Expat maintainers. Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions: The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software. THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

Library	Description	Licence
GLEW/1.5.0	OpenGL support	The OpenGL Extension Wrangler Library Copyright © 2002-2008, Milan Ikits <milan ikits@ieee.org> Copyright © 2002-2008, Marcelo E. Magallon <mmagallo@debian.org> Copyright © 2002, Lev Povalahev All rights reserved. Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met: • Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer. • Redistributions in binary form must reproduce the above copyright notice, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution. • The name of the author may be used to endorse or promote products derived from this software without specific prior written permission. THIS SOFTWARE IS PROVIDED BY THE COPYRIGHT HOLDERS AND CONTRIBUTORS "AS IS" AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE COPYRIGHT OWNER OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.
JPEG/6b	File format support	This software is based in part on the work of the Independent JPEG Group.
Libexif/0.6.16	Metadata parser	Author Lutz Mueller lutz@users.sourceforge.net date 2001-2005 This library is free software; you can redistribute it and/or modify it under the terms of the GNU Lesser General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version. This library is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public License for more details.

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