Reframing Shots

Most of the time, you'll edit high-definition (HD) or maybe ultra-high definition (UHD) projects that use a 16:9 aspect ratio. But sometimes you'll need (or want) to edit and view your program using a different aspect ratio. You can do so using the Output Blanking menu.

1 Choose Timeline > Output Blanking > 2.39.

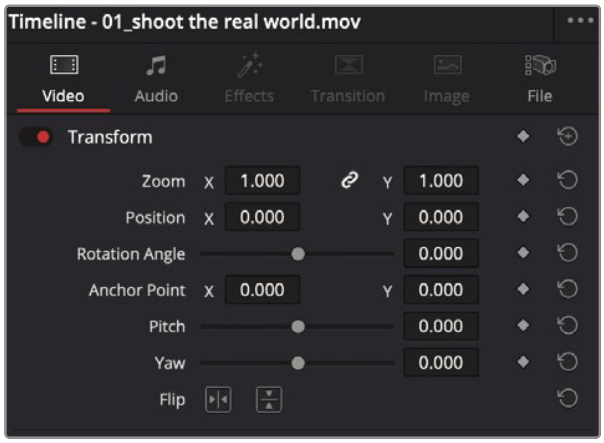
The aspect ratio of 2.39:1, which is used for 35mm theatrical widescreen, is applied in the viewer.

TIP The controls used by the Output Blanking menu to create masks are located on the color page in the sizing palette's Output Sizing mode.

When you apply output blanking, it does not remove the hidden part of the clip, it just covers it up, which allows you to reframe clips to better fit the new aspect ratio.

2 Move the playhead over the first interview clip.

3 Select the clip in the timeline, and in the Inspector, click the Video tab.



Among many other video controls, the Inspector now shows the sizing controls for the selected clip. These controls include typical parameters for Zoom, Position, Rotation Angle, and Crop.

You can move your subject down in the viewer to give him more headroom and create a more pleasing composition.

4 Hover the mouse pointer over the Y position numeric field.

Any numeric field can be used as a virtual slider just by dragging within the field.

5 In the Y position numeric field, drag to the left until the value shows - 50.00.

This is better positioning for the subject. You'll have to copy this to the remaining interview shots.

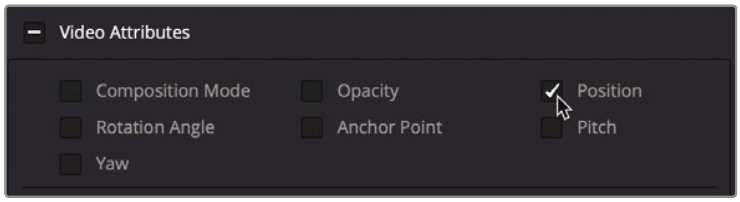
6 Choose Edit > Copy or press Command-C (macOS) or Ctrl-C (Windows).

7 From the Timeline menu, choose Select Clips with Clip Color > Navy.

This will select all the interview clips in the timeline since we previously color coded those clips navy in Lesson 4.

8 Choose Edit > Paste Attributes or press Option-V (macOS) or Alt-V (Windows) to open the Paste Attributes window.

9 In the Video Attributes category, select the Position checkbox and click Apply.



This Position value applied to the first interview clip is pasted onto the selected interview clips.

TIP Another way to copy and paste effects is to use adjustment clips from the Effects Library. Place an adjustment clip above clips on a new track on the timeline, add an effect to the adjustment clip, and then reuse it over any other clips you want. Any effect on the adjustment clip is applied to all clips below it in the timeline

Using Onscreen Controls

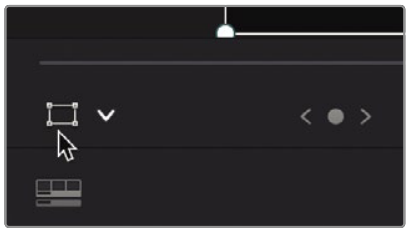
You can apply common transform operations such as position, scale, and rotation using onscreen controls in the viewer rather than dragging virtual sliders in the Inspector. Let's reframe a shot by resizing it in the viewer.

1 Move the playhead over the "03_BAY_AREA LIGHTS" clip and zoom in on it using the slider in the toolbar.

This is near the end of the promo, so to indicate that you are bringing this trailer to a close, let's simulate the camera pulling back and away from the scene. First, you'll use the onscreen control to resize the clip a bit larger.

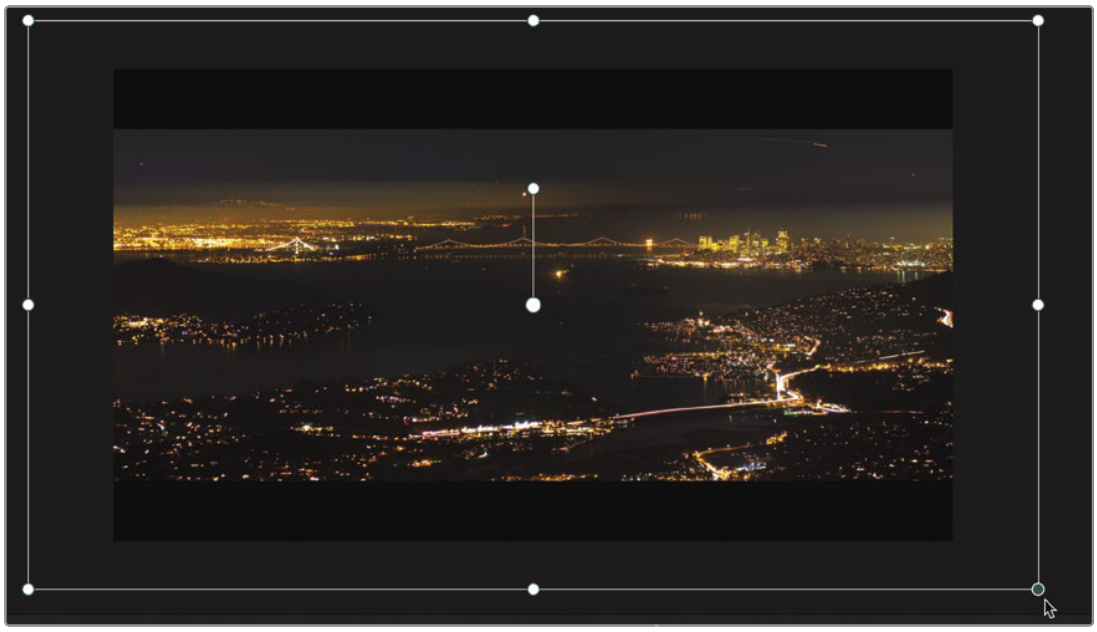
2 Select the "03 BAY AREA LIGHTS" clip in the timeline to show its controls in the Inspector

3 In the lower-left corner of the viewer, click the Transform onscreen control button.



A bounding rectangle appears in the viewer to show the size and position of the frame.

4 To scale the clip, drag a handle in any corner of the bounding box away from the center until the zoom value shows 1.200.



TIP In the Magnification menu (in the upper left of the viewer), you can change how the frame is sized in the viewer.

By default, the zoom X and Y values are linked together so the clip is resized equally in X and Y, thereby keeping its normal aspect ratio.

5 In the lower-left corner of the viewer, click the Transform button to hide the onscreen controls.

Animating a Resize

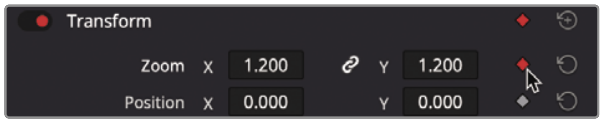
Almost every parameter displayed in the Inspector can be animated over time by setting two keyframes. You'll use the current resized frame as the starting keyframe and then set a new keyframe at the end of the clip.

1 Move the playhead to the start of the "03 BAY AREA LIGHTS" clip.

2 Select the clip to display the controls in the Inspector.

Animating the parameters of an image over time requires that you set keyframes. Keyframes allow you to assign different parameter values to specific frames. DaVinci Resolve then interpolates between the two values to create a smooth animation. You have already scaled up the clip, so can use this position as your first keyframe, and then you can position the playhead where you want to scale down the clip.

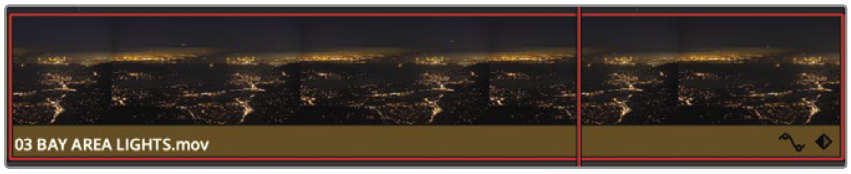
3 In the Inspector, click the Zoom keyframe button to the right of the Zoom X and Y numeric fields to set the first keyframe.



DaVinci Resolve uses an auto-keyframe model. When a parameter already has one keyframe set, changing the position of the playhead, and then modifying the parameter, automatically adds a second keyframe.

The first keyframe that signifies the start of the animation is now set. You'll set the second value where you want the image to stop scaling.

4 In the timeline, position the playhead about one-third of the way from the end of the "03 BAY AREA LIGHTS" clip.



5 Place the cursor over the Zoom X numeric field and drag to the right until the value is reset to 1.0.

TIP You can double-click the parameter name to reset the value to its default.

6 Press the / (forward slash) key to play around the currently selected clip.

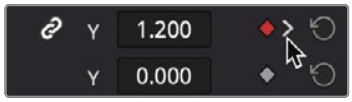
You can further control the keyframe position and smoothness of the motion using the Ease-In/Ease-Out commands and the Keyframes Editor.

7 Move to the start of the clip, and in the Inspector, right-click over the Keyframe button and choose Ease Out.

This will create a more natural motion as the scaling begins. Now you must move to the last keyframe and set an Ease In.

The Go to Next/Previous Keyframe buttons appear when keyframes have been added to a control. Clicking the button moves the playhead to the next or previous keyframe position.

8 Click the Go to Next Keyframe button to jump to the last keyframe.



9 Right-click over the red diamond keyframe icon and choose Ease In.

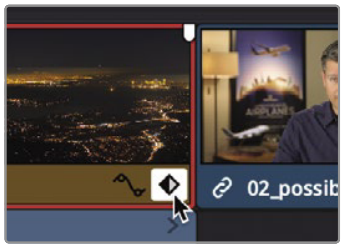
This will smooth the motion as the animation ends. Now, we can adjust timing of the animation as well.

10 Press the / (forward slash) key to play around the currently selected clip.

The motion is smoother, but it comes to a stop too soon. While the Inspector can help you set and remove keyframes, it cannot change their location on the timeline. To do that, you can use the timeline Keyframes Editor.

11 Zoom in to the timeline to see the “03 BAY AREA LIGHTS” clip clearly.

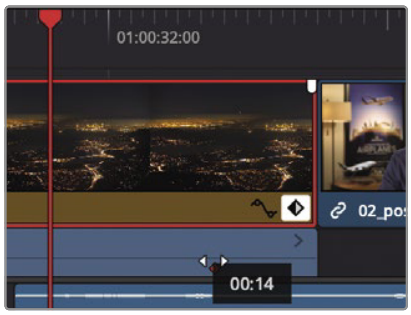
12 With the clip still selected, in the lower-right corner of the timeline segment, click the diamond-shaped Keyframe button.



The keyframe tracks include small white dots that represent each keyframe.

Dragging these white dots will change the position of those keyframes.

13 Select the last white keyframe in the Keyframes Editor and drag it slightly to the right to extend the animation.



14 Click the Keyframe button to close the keyframe display.

15 Press the / (forward slash) key to play around the currently selected clip.

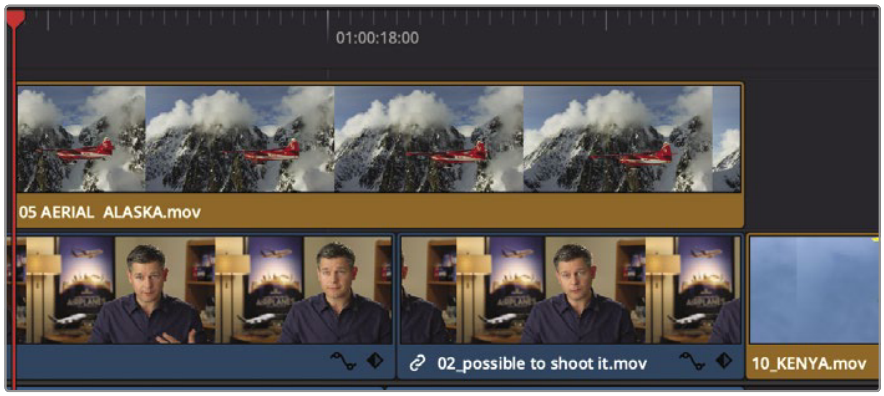
Creating a Constant Speed Change

Changing the playback speed of a clip is done for a variety of reasons. Sometimes it's used to accentuate dramatic action, and sometimes it's used so the timing of a clip fits into a scene.

In almost every production genre, you'll need to speed up clips, slow them down, and even stop and hold on a frame for a few seconds.

The most common type of speed change is a constant speed change. It uniformly alters the playback of a clip in the timeline to turn it into a slow-motion clip or a fast-motion clip of a single frame rate.

1 In the timeline, position the playhead at the start of the "05 AERIAL ALASKA" clip on video track 2.

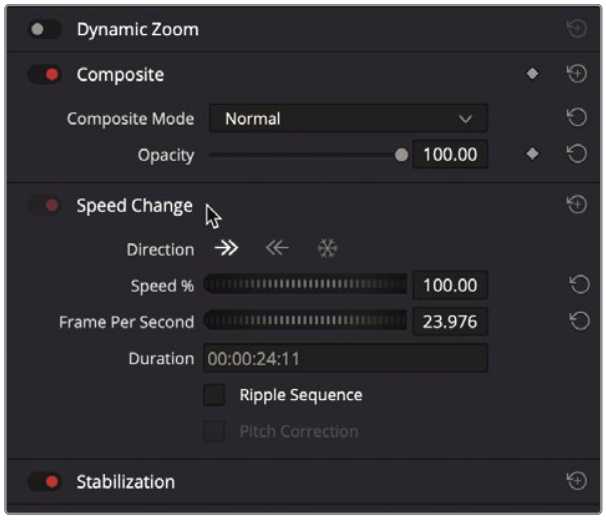


2 Play over the clip (always a good idea before you change its speed.)

This clip is a bit too slow, and it would be nice to see the camera continue to move behind it. You want to speed up the clip but not change its duration in the timeline.

3 Select “05 AERIAL ALASKA” in the timeline.

4 In the Inspector, click the Video tab and click the Speed Change label to reveal the speed change controls.



The speed controls include direction forward, direction backward, and freeze frame buttons. Changing the Speed % number field changes the playback speed of the clip.

5 In the Speed% number field, enter **200**.

Setting this value to 200% means that the clip will play twice as fast as the timeline frame rate—in this case, 48 frames per second. To indicate that the clip’s playback speed has been changed, a small speed change icon is displayed next to the clip’s name in the timeline.

6 Play the clip to see the speed change results.

When creating a slow-motion clip, the default Speed Change settings do not change the overall duration of the clip or the timeline. However, you can have it ripple the timeline or use other tools that allow you to modify the speed of a clip by changing its duration.

Slow Motion Using the Retime Controls

While the Speed Change settings in the Inspector create constant speed changes and retain the clip duration, the retime controls in the timeline slow down a clip or speed it up by modifying a clip's duration. This can be incredibly helpful when trying to end a clip at a specific point or have it match a musical beat.

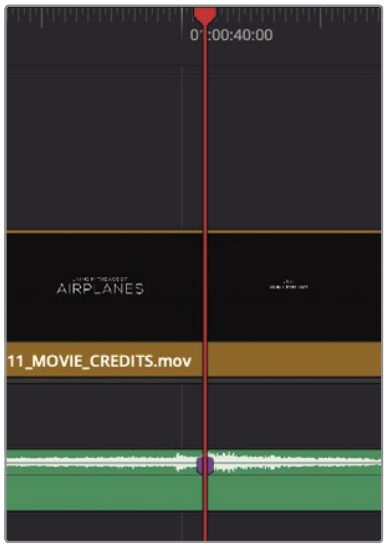
1 Press Shift-Z to see the entire timeline.

2 In the timeline, position the playhead at the start of the "07 WATER TAKEOFF" clip and play to the end of the timeline.

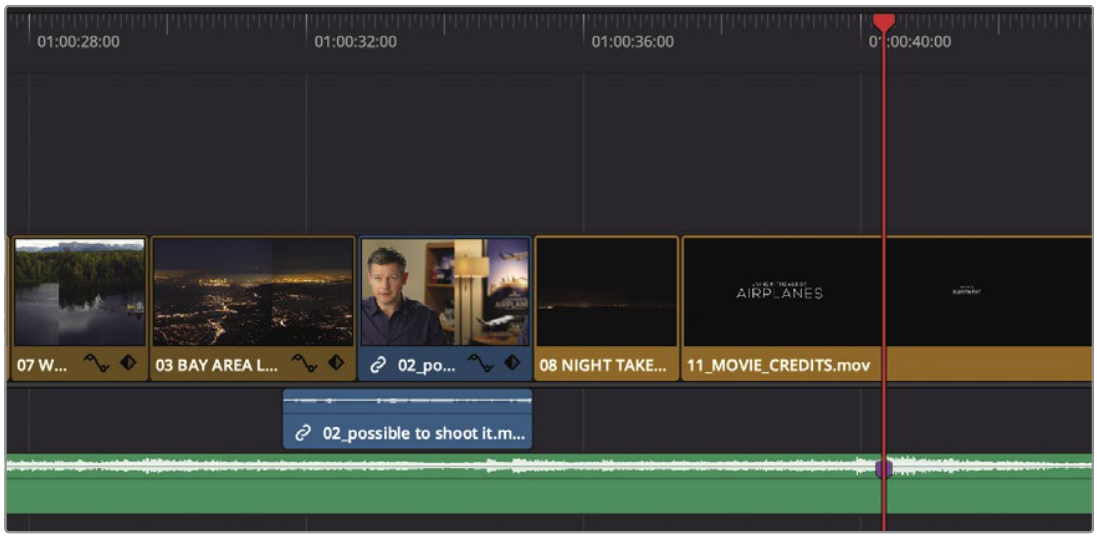
The music rises to a finish with two big drumbeats. A purple marker icon on the music track identifies the last of the two drumbeats. We'll learn more about markers in the next lesson, but for now, that marker is where we would like the cut to the credits to occur. You may have noticed that the cut happens a few seconds before the drumbeat. Instead of trimming a clip and using more of a shot than you care to, you can extend a clip using the retime controls. We'll extend the "07 WATER TAKEOFF" just far enough to have the cut to the credits occur at the purple marker location.

TIP If you cannot see the purple marker, you may have reduced the audio track size too much. Use the Timeline View Options menu to increase the size of the audio tracks until you can see the purple marker on the music track.

3 Position the playhead at the purple marker location.



4 Use the magnification slider in the toolbar to zoom in on the timeline, but ensure that you are still able to see the “07 WATER TAKEOFF” and the playhead location.



5 Right-click the “07 WATER TAKEOFF” clip, and in the pop-up menu, choose Retime Controls, or select the clip and press Command-R (macOS) or Ctrl-R (Windows).

The Speed Change bar appears at the top of the clip in the timeline. The current speed of the clip is listed along the bottom. The speed of a clip is altered by trimming the Speed Change bar in the timeline.

6 Move the pointer to the right edge of the Speed Change bar.

The pointer turns into a double-arrow cursor.

7 Drag the edge of the Speed Change bar to the right to lengthen the clip until the speed display at the bottom of the clip reads 40%.

Dragging the Speed Change bar to the left extends the duration of the clip by slowing down its playback speed. However, just as in trimming, while the Selection tool is enabled, extending the clip will overwrite the next clip in the timeline. We want the timeline to ripple.

8 Press Command-Z (macOS) or Ctrl-Z (Windows) to undo the previous speed change.

9 In the toolbar, click the Trim mode tool, or press T.

10 Move the pointer to the right edge of the Speed Change bar, and drag to the right until until the speed display at the bottom of the clip reads around 40% and the last cut to the credits clip is aligned with the purple marker and the playhead.

11 Play the retimed clip to see the results.

TIP To return a clip to its original speed, click the Clip Speed drop-down menu at the bottom of the clip, and choose Reset to 100%.

With the Trim tool selected, the timeline is rippled, thereby pushing the rest of the clips to the right. The clip's duration and the overall timeline duration are extended.

Changing Retime Processing

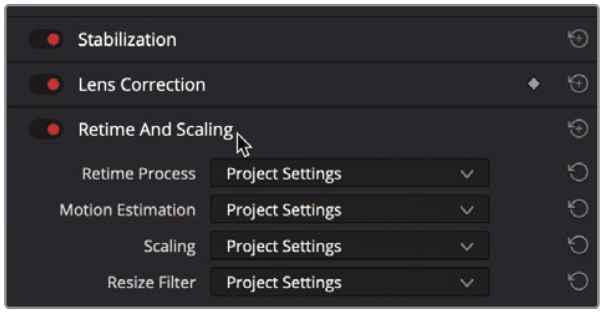
The retime did fix our timing with the audio, but there is a noticeable stutter in the playback of the “07 WATER TAKEOFF” clip. Forty percent speed is rather slow and that can often look choppy when played back.

You can change the way a retimed clip is processed and thereby change the way it looks. The various retime processing settings located in the Inspector trade speed for quality. Which you choose will depend on the type of movement in your shot and how much processing time you are willing to allow.

1 Click the Selection tool in the toolbar or press A.

2 Select the retimed “07 WATER TAKEOFF” clip.

3 Open the Inspector’s video tab and click the Retime and Scaling label to expose the controls.



4 Select the Retime Process menu to open it.

You have three options for processing clip retiming: Nearest, Frame Blend, and Optical Flow.

– **Nearest** is the fastest processing option but delivers the lowest-quality results. This simple operation duplicates frames to create slow motion, which often causes stepping artifacts even in clips that have just a moderate amount of movement. Nearest is the default option set on the Master Settings of the Project Settings.

– **Frame Blend** is a slightly more processor-intensive option that delivers better-looking results. It also duplicates frames to create slow motion but then blends them to produce smoother motion. This is the most reliable option and generally delivers acceptable results.

– **Optical Flow** is the most processor-intensive and highest-quality process. It uses motion estimation and warping techniques to generate new frames from the original source frames. The results can be exceptionally smooth when the motion in a clip is unobstructed. However, if two moving elements cross while moving in different directions (such as legs crossing when walking) or the camera movement is erratic, optical flow processing can cause stretching and tearing artifacts.

TIP The motion estimation drop-down menu includes options that can sometimes improve small tears or stretching artifacts caused by Optical Flow.

5 In the menu, choose Optical Flow.

When Optical Flow is selected, a red bar appears above the clip to indicate that the process needs to cache. If smart caching is enabled, the rendering will be performed in the background and you'll be able to see the results in a few seconds.

6 When the clip is cached, play over the optical flow results to see the smoother motion.

It's a good idea to first try optical flow processing to see if it produces acceptable results, and then revert to Frame Blend as necessary. Optical Flow, unlike the other retime processing types, requires that you cache the result.

NOTE DaVinci Resolve Studio includes even higher-quality slow motion processing called Speed Warp using the DaVinci Neural Engine. In many circumstances, this option in the Inspector's Motion Estimation menu will yield higher visual quality with fewer artifacts than even the Enhanced Better setting. If you do not have DaVinci Resolve Studio, you can play the example movie in the R17 Beginner Guide Lessons > Lesson 07 folder.

Rendering and Background Caching

Depending on the speed of your computer and disk drives, as well as the media file types you're using, all effects may not play back smoothly on your computer. The fps (frames per second) indicator above the timeline viewer shows the actual playback frame rate that your computer is achieving. If the number has a red dot next to it, your system is playing your project slower than the actual project frame rate.

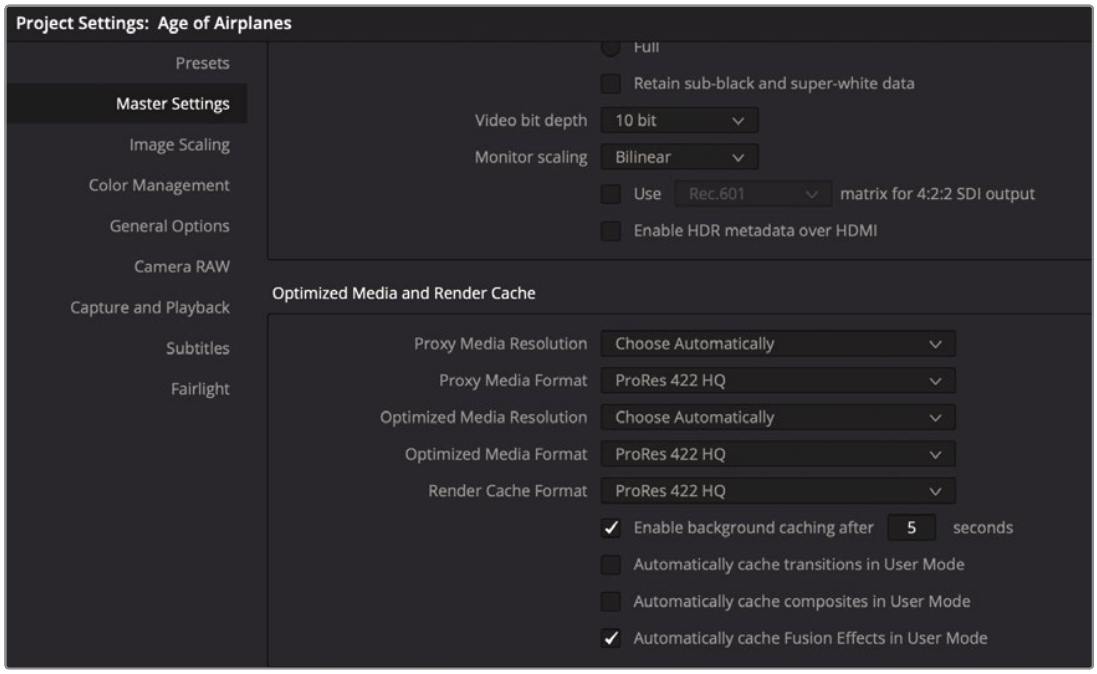
To optimize playback performance for complex effects, DaVinci Resolve can automatically render and cache such effects to your disk drive. Although DaVinci Resolve can use three distinct caching systems to render files, this exercise will focus on smart caching for the edit page.

The first task is to make sure caching is turned on and has not changed from the default setting.

1 Choose Playback > Render Cache> Smart.

The smart cache operates on timeline-specific effects such as transitions, opacity adjustments, and composite mode superimpositions. Regions of the timeline that require caching have a red bar over them, whereas regions that are already cached have a blue bar over them. All of this is easy enough, but additional settings allow you to customize the caching operation.

2 Choose File > Project Settings > Master Settings.



Master settings include a few Optimized Media settings related to caching. The “Cache frames in” menu sets the compression format that DaVinci Resolve uses to save the rendered files. The choices common to macOS and Windows include uncompressed 10-bit and 8-bit formats, Avid’s DNxHR, and GoPro Cineform formats. In macOS, DaVinci Resolve also includes Apple’s ProRes compression format.

The default setting (ProRes 422 HQ on macOS and DNxHR HQX on Windows) creates a high-quality 10-bit file that will look good in your final output. If you are temporarily working on a portable or laptop with a slow disk drive, you may want to opt for a marginally lower-quality 8-bit format such as Avid DNxHR HQ or ProRes 422 to enable faster processing. For now, you’ll leave this setting at the default value and move on to background processing.

3 Make sure “Enable background caching” is selected.

When background caching is enabled, effects rendering begins based on the length of time your computer sits idle.

4 In the “Enable background caching” numeric box, enter **3**.

Background caching will now begin to render effects after your computer sits idle for 3 seconds.

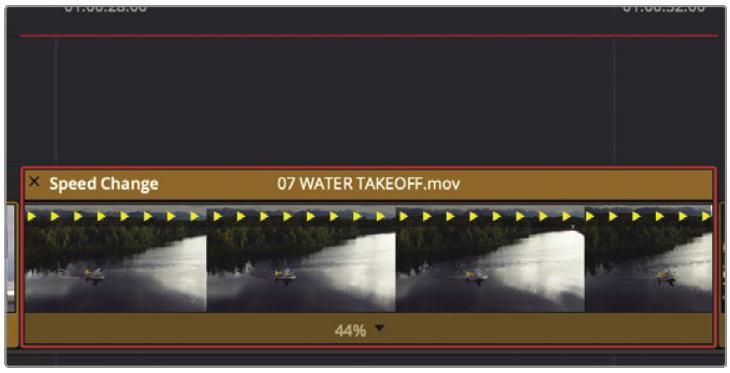
5 Click Save at the bottom of the settings window to save the setting and close the window.

Let’s make a small change to our retimed water takeoff clip to see how caching works in practice.

6 Move the playhead to the start of the “07 WATER TAKEOFF” clip and select the clip in the timeline.

7 In the Inspector, open the Speed Change controls and type in **45** for the Speed %.

As soon as you enter a new speed value, a red line appears above the clip in the timeline indicating it needs to cache before it can play back.



As you leave the mouse and keyboard idle, caching will begin and the line will then turn blue. That’s when you know caching has finished, and you can play the clip.

TIP To delete all the rendered cache files for the current project, choose Playback > Delete Render Cache > All.

Now that your smart caching is set, DaVinci Resolve will automatically render everything necessary to optimize playback for your effects. When you reopen a project, cached clips are still cached, but when you change any cached effect, it will need to be re-cached.

Lesson Review

1. Why would you be unable to drag a transition to extend its duration in the edit page timeline?
2. How do you save a custom transition preset?
3. True or false? You set up and enable background caching in the Inspector.
4. What is the minimum number of keyframes required for an animation of the position parameter?
5. If you wanted to change the speed of a clip, what's the difference between using Speed Change or Retime Controls?

Answers

1. If no media handles are available on either side of the transition, you will not be able to drag the transition to extend its duration.
2. To save a custom transition preset, right-click the transition on the timeline and choose Create Transition Preset.
3. False. Background caching is set up and enabled in the Project Settings.
4. Two keyframes of two different values are needed at two different clip locations to create an animation.
5. Adjusting the Speed Change settings allows you to type specific speed values. Once set, the clip duration remains the same in the timeline while playing back at a different speed. The Retime Controls provide a speed bar above the clip in the timeline, and dragging the speed bar speeds up or slows down the clip by changing its duration.