Adobe® Experience Cloud

Adobe Dynamic Media Classic Image Quality and Sharpening Best Practices

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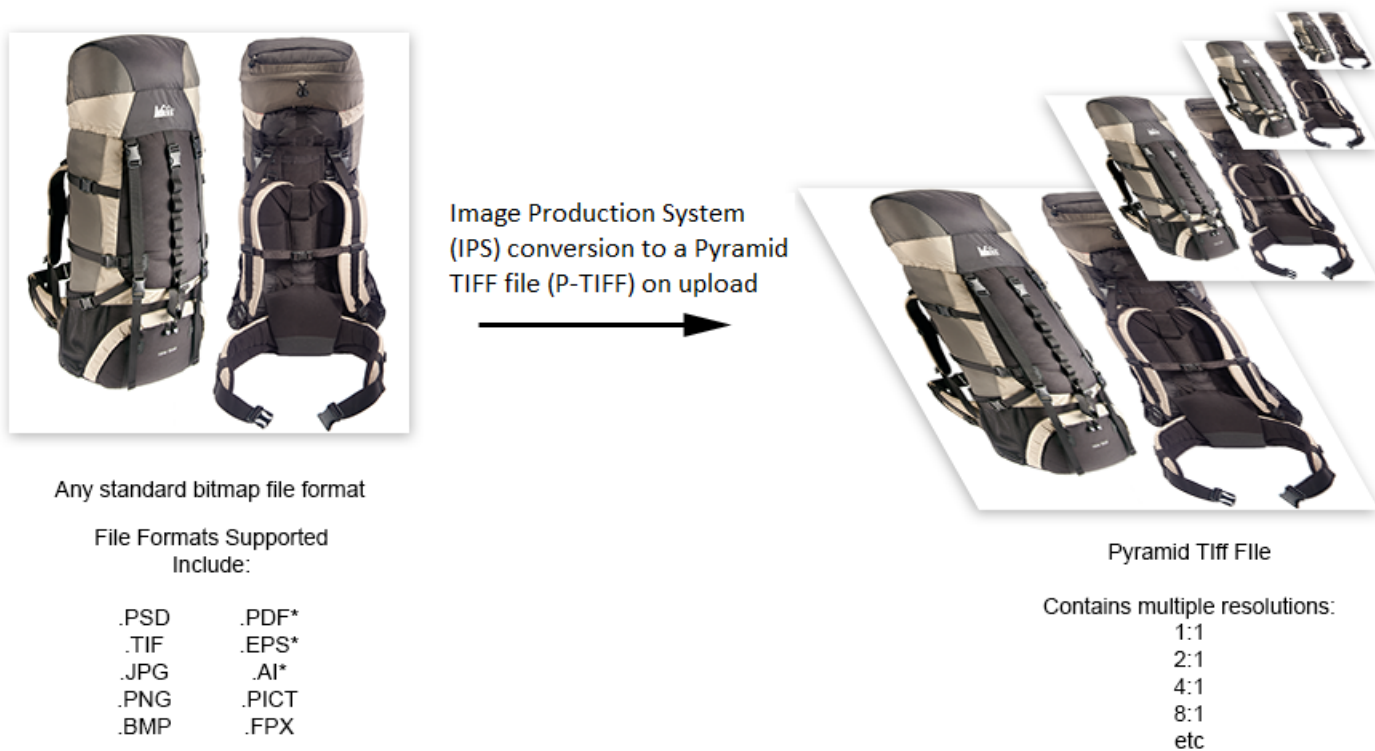
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About image sharpening

This document shows you several methods you can use in Adobe Dynamic Media Classic and on Image Serving to sharpen an image, and also control image sharpening.

How dynamic image serving works

Using Dynamic Media Classic and Image Serving you can create multiple derivative images based on one, high-resolution source file. You can upload one image with a large pixel count. For example, 2000 pixels in the long dimension is the recommended size for an image that you can leverage across multiple uses. You can also create multiple different size product images and display the image in a zoom viewer. With dynamic image serving, you get many images from one source file.

Image Production System (IPS) conversion to a Pyramid TIFF file (P-TIFF) on upload

Any standard bitmap file format

File Formats Supported Include:

.PSD   .PDF*
.TIF   .EPS*
.JPG   .AI*
.PNG   .PICT
.BMP   .FPX

* Upon upload, PostScript files (PDF, EPS, AI) can be rasterized as bitmaps.

Pyramid TIff FIle

Contains multiple resolutions:
1:1
2:1
4:1
8:1
etc

On upload, images are converted to P-TIFF (Pyramid TIFF) files. The P-TIFF contains built-in zoom states based on the power of 2x.

The Image Server uses these built-in zoom states in different ways. When serving a stand-alone image, based on the size information passed on the URL string, the Image Server finds the next largest zoom state and downsamples from there. When a P-TIFF image is served in a Dynamic Media viewer, the viewers are configured by default to serve one of the 2x layers and only show a tile of the image, insuring a fast zoom experience.

Regardless of how an image is used, when an image is downsampled, image degradation occurs. Because of this problem, Dynamic Media Classic and Image Server offer several methods to enhance an image, including three sharpening options.

Sharpening options are found throughout Dynamic Media Classic and are used in different ways with Image Server products. Options include the following:

- Using Image Presets with sharpening.
- Using sharpening modifiers in the URL string.
- Adding image modifiers to a Viewer Preset and apply it to a Dynamic Media viewer, such as a Zoom, eCatalog, or Spin).
- Creating image-specific overrides to global image sharpening values.

How image sharpening works

Image sharpening is a necessary process when working with computer graphics. Dynamic Media Classic and Image Servers let you take advantage of sharpening by offering several options, as described below. However, it is important to understand exactly what sharpening does to an image and when you have sharpened enough. While all images need some sharpening, different types of images need more sharpening and others need less sharpening. It is helpful to learn when you have applied too much sharpening, too little sharpening, and when it is optimally sharpened.

The following graphic shows how three different levels of sharpening affect the same image:

In all cases, image sharpening increases the contrast of contrasty pixels. This effect accentuates "edges" in the image. We perceive this enhanced edge contrast as sharpness. It is easy to enhance an image by running a combination of sharpening filters on an image. However, it is also easy to over-sharpen an image.

In the graphic above, the over sharpened image on the right exhibits a halo effect, or banding of edge lines.

All Dynamic Media Classic sharpening options use sharpening filters that are based on edge contrast enhancement to create the sharpening effect.

Best practices

It is recommended that you always use image presets when you call images. Doing so ensures that a uniform size and sharpening is enforced on any image called with an Image Preset. Furthermore, you can easily edit and change an Image Preset's sharpening parameters. The next time you run a publish event, all images called with that preset are affected with the new values.

See *Adding an image preset to save frequently used sharpening options*

It is also recommended that you add sharpening to Viewer Presets, and then call a viewer with that preset. This order ensures that images within your viewers are crisp and appealing.

See *Adding sharpening to a viewer preset*.

However, whether you use Image Presets and Viewer Presets, or some alternate method of sharpening, the bottom line is that you must sharpen your images. If you do not, your images and website can soft and fuzzy. This kind of presentation can lead web visitors to question or wonder about the accuracy of your images.

Link to additional documentation

Dynamic Media Image Serving and Image Rendering API

Adding an image preset to save frequently used sharpening options

Image presets let you package the various image modifiers most often used to create a dynamically resized image into a small text string.

An image preset basically contains values for the file format (usually JPEG for the web), pixel count, and image sharpening. Instead of appending the URL with each image modifier to create a specific type of image size, you create an image preset. For example, you could create an image preset called `thumbnail`. You configure the thumbnail image preset with the size, file format, and sharpening options that you want. And finally, you call to the image using the image preset name.

The following two URLs produce the same 350 x 350 JPEG image with image sharpening. Can you tell which URL is using an image preset?

```
http://sample.scene7.com/is/image/S7train/Backpack_A?$!_s7product$
```

and

```
http://sample.scene7.com/is/image/S7train/Backpack_A?wid=350&hei=350&fmt=jpeg&qlt=85,0&resMode=sharp&op_usm=0.9,1.0,8,0
```

The first—and shorter—URL, clearly demonstrates the efficiency of using an image preset. In this case, the preset is named `!_s7product`.

See *Adding an image preset to save frequently used sharpening options*.

The second—and longer— URL is an alternate method to using an image preset. In this case, you manually create a URL that contains all the sharpening commands. See

You change and update an Image Preset any time. You see the results of any change you make to a preset after you publish and after you clear the URL cache and refresh. However, the real benefit of using image presets is that if you use one preset for every image in a particular size category, any Company Administrator can update the settings of that Image Preset in Dynamic Media Classic, republish, and affect every image using that format, all without the need to change any web code.

As a best practice, it is recommended that you use Image Presets. That is, one Image Preset per unique image size on your website.

To add an image preset

1. Near the upper-right corner of Dynamic Media Classic, click **Setup** > **Application Settings** > **Image Presets**.
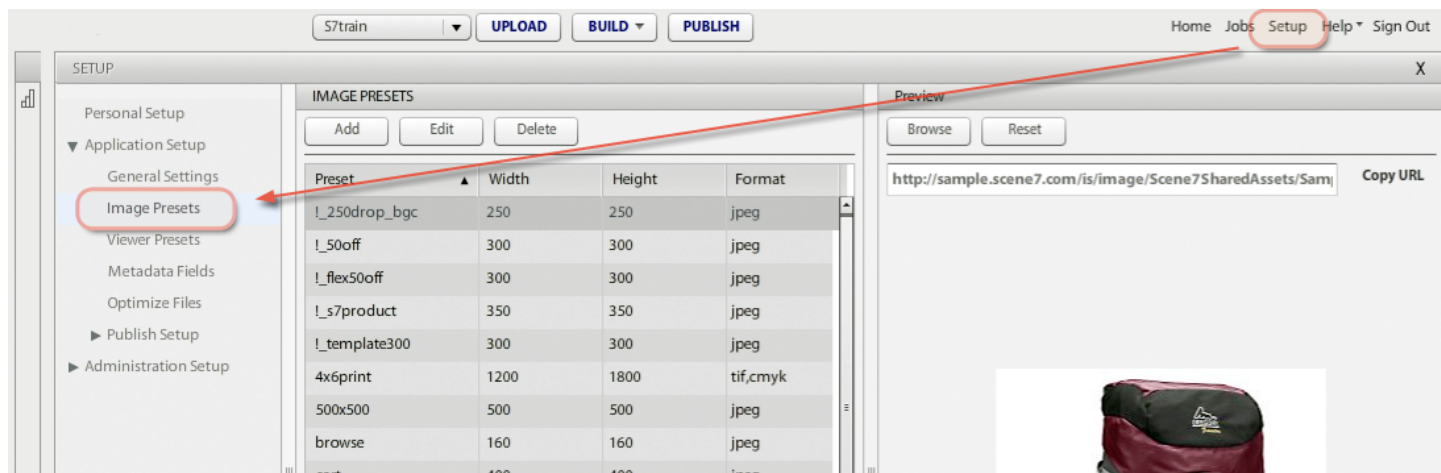
2. In the Image Presets list box, do one of the following:

• Click **Add**.

• Select an existing preset name in the list, and then click **Edit**.

The following graphic shows the settings that were used for the $!_s7product$ preset name (350 x 350 pixel) used in the URL example above.
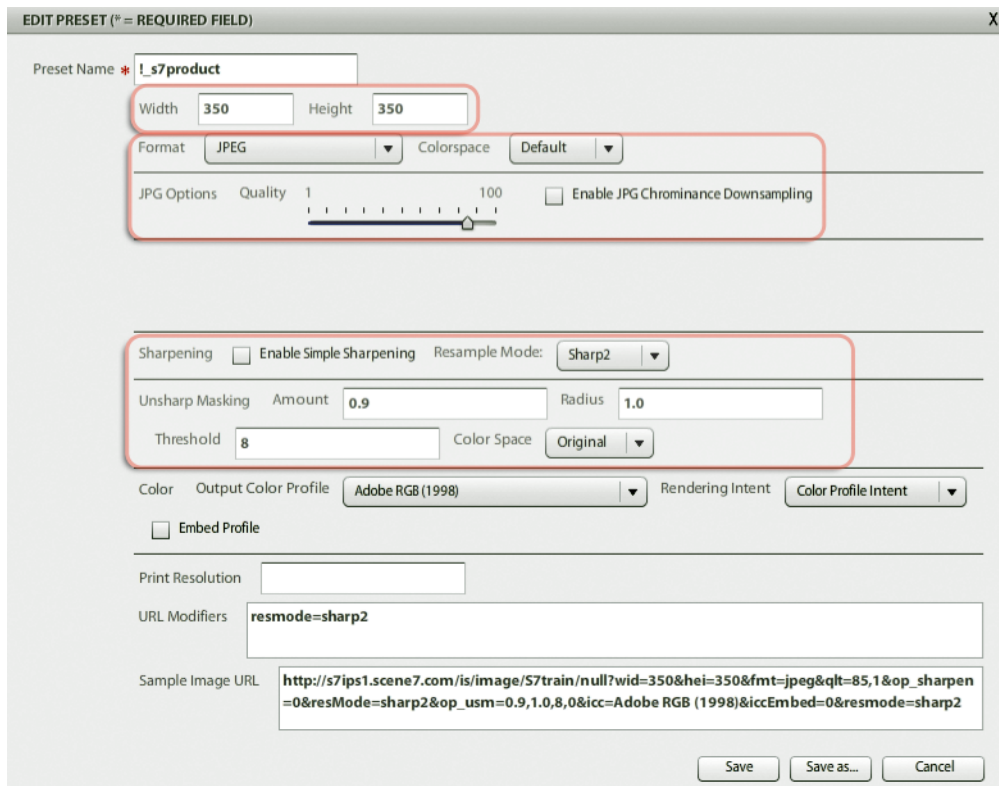
3. Set the options that you want. Preset Name is the only required field. However, it would not make sense to create a preset that does not include some level of sharpening.

See also *Manually creating a URL that contains all the image modifier commands*

Manually creating a URL that contains all the image modifier commands

An alternate to using Image Presets is to manually create a URL that contains all the sharpening commands. While this method of sharpening is possible, it is not considered a best practice because it makes the URL longer and it is challenging to update.

Images served from Dynamic Media Image Server come from a URL string. Each image is generated from a P-TIFF (Pyramid TIFF) master image. The syntax looks like the following (note the image modifiers at the end of the URL path):

Essentially, the URL contains a reference to the image and any Image Server protocols—instructions that tell the Image Server how to act on the image—to create the final image.

Individual Image Server protocols are concatenated together with an ampersand (`&`) to create a string of effects. Each protocol 'argument' contains the name of the Image Server effect and the value of the effect. For example, `wid=250` resizes the image to 250 pixels wide, and `resMode=sharp` tells the Image Server to resample the image using a Lanczos interpolation algorithm which basically sharpens the image as it is resized.

Image sharpening options

While Dynamic Media Image Server contains many modifiers, the following are just the sharpening options:

Image sharpening name	Description	Parameters
Simple Sharpening	URL modifier: `op_sharpen=1` This filter runs a sharpening pass on the source file after it is resized (downsampled, made smaller). This filter is similar to the `sharpen` filter in Adobe Photoshop and does not allow for the use of any user parameters. Normally, you use this filter or Unsharp Mask but not both. As a best practice, this sharpening type is not recommended. Example: `op_sharpen=1`	`0|1`
Resample Mode	URL modifier: `resMode=sharp2` The Resampling Mode filter is a way in which image pixels are intelligently	`bilin|bicub|sharp2|trilin` • `bilin`

Image sharpening name	Description	Parameters
	deleted to resize an image, in a visually pleasing way, to a desired pixel dimension. This method sharpens the image when it is downsampled to resize it. The other resample methods do not sharpen the image when it downsamples. The setting is called **sharp2**. 💡 *Note:* *The Resample Mode of* ***sharp2*** *replaces* ***sharp*** *because* ***sharp2*** *is least likely to cause aliasing artifacts, known as Moiré.* Example: `resMode=sharp2`	Selects standard bi-linear interpolation. Fastest resampling method; some aliasing artifacts may be noticeable. • `bicub` Selects bi-cubic interpolation. More CPU-intensive than `bilin`, but yields sharper images with less noticeable aliasing artifacts. • `sharp2` Selects a modified Lanczos Window function as an interpolation algorithm. Can produce slightly sharper results than `bicub` at a higher CPU cost. • `trilin` Selects a modified tri-linear interpolation, which uses both higher and lower resolutions, if available. This parameter is recommended only when aliasing is an issue. It reduces JPEG sizes due to reduced high frequency data.
Unsharp Mask	URL modifier:`op_usm=1,1,10,0` This filter lets you fine-tune a sharpening filter effect on the final downsampled image, controlling the intensity of the effect, the radius of the effect (as measured in pixels), and a threshold of contrast that is ignored. This effect uses the same options as Photoshop's Unsharp Mask filter. Contrary to what the name suggests, Unsharp Mask is a sharpening filter. Example: `op_usm=1,1,10,0`	amount, radius, threshold, monochrome • amount Controls the amount of contrast that is applied to edge pixels. Think of it as the intensity of the effect. The main difference between the amount values of Unsharp Mask in Dynamic Media Classic and the amount values in Adobe Photoshop, is that Photoshop has an amount range of 1% to 500%. Whereas, in Dynamic Media Classic, the range is 0.0 to 5.0. A value of 5.0 in Dynamic Media Classic is the rough equivalent of 500% in Photoshop; a value of 0.9 is the equivalent of 90%, and so on. • radius Controls the radius of the effect. The effect is run on all pixels in an image and radiates out from all pixels in all directions. The radius is measured in pixels. Setting a correct radius value depends on the size of the image. For example, to get a similar sharpening effect for a 2000 x 2000 pixel image and 500 x 500 pixel image, you would set a radius value of two pixels on the 200 x 200 pixel image and a radius value of one pixel on the 500 x 500 pixel image. A larger value is used for an image that has more pixels. • threshold

Image sharpening name	Description	Parameters
		Threshold is a range of contrast that is ignored when the Unsharp Mask filter is applied. This is important so that no "noise" is introduced to an image when this filter is used. The value range is 0-255, which is the number of brightness steps in a grayscale image. 0=black, 128=50% gray and 255=white. For example, a threshold value of 12 ignores slight variations is skin tone brightness to avoid adding noise, but still add edge contrast to contrasty areas such as where eyelashes meet skin. For example, if you have a photo of someone's face, the Unsharp Mask affects the contrasty parts of the image, such as where eyelashes and skin meet to create an obvious area of contrast, and the smooth skin itself. Even the smoothest skin exhibits subtle changes in brightness values. If you do not use a threshold value, the filter accentuates these subtle changes in skin pixels. In turn, a noisy and undesirable effect is created while contrast on the eyelashes is increased, enhancing sharpness. To avoid this issue, a threshold value is introduced that tells the filter to ignore pixels that do not change contrast dramatically, like smooth skin. In the zipper graphic shown earlier, notice the texture next to the zippers. Image noise is exhibited because the threshold values were too low to suppress the noise. See *How image sharpening works*. • monochrome Set to `0` to unsharp-mask each color component separately; set to `1` to unsharp-mask image brightness (intensity).

While it is not recommended, you *could* mix all three image sharpening types to achieve your final result. Regardless, it is recommended that you save these options in Dynamic Media Classic as part of an image preset.
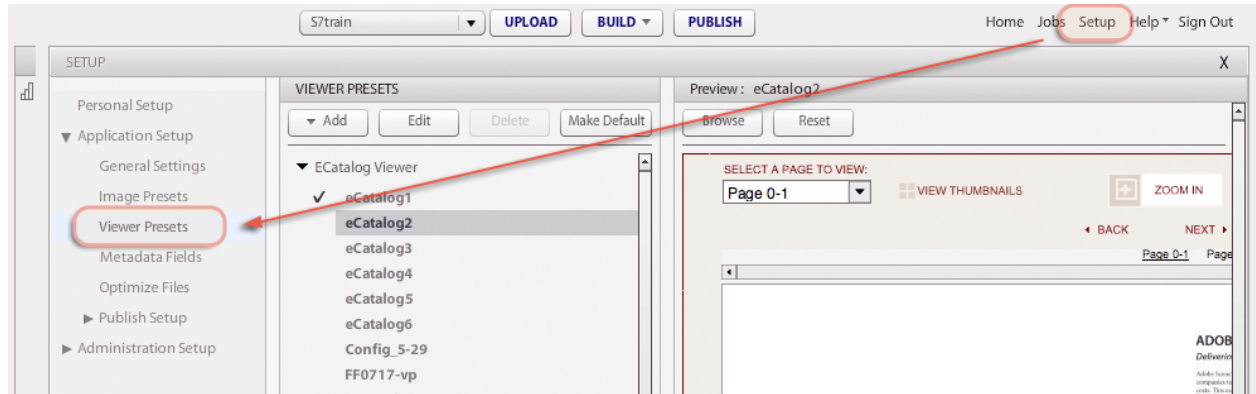
Adding sharpening to a viewer preset

While image presets have a dialog box for choosing sharpening options, viewer presets do not have the same user interface. However, unless you add sharpening image modifiers to the preset, the small 'initial load' image can look overly soft because it is being downsampled to fit into the viewer window, without being sharpened.

In Dynamic Media Classic, viewer presets, like image presets, let you centralize many options into one location, including the choice of skin and viewer options, such as including a Print button or controlling the speed of the zoom animation.

To add sharpening to a viewer preset

1. In Dynamic Media Classic, click **Setup** > **Application Setup** > **Viewer Presets**.

2. One of the options is **Modifiers**, and is found under the Core Settings section of all eCatalog, Spin, and Custom Zoom Viewer Presets. By adding the URL sharpening commands to the Modifiers text field, that adds sharpening every time that viewer is called with that viewer preset.
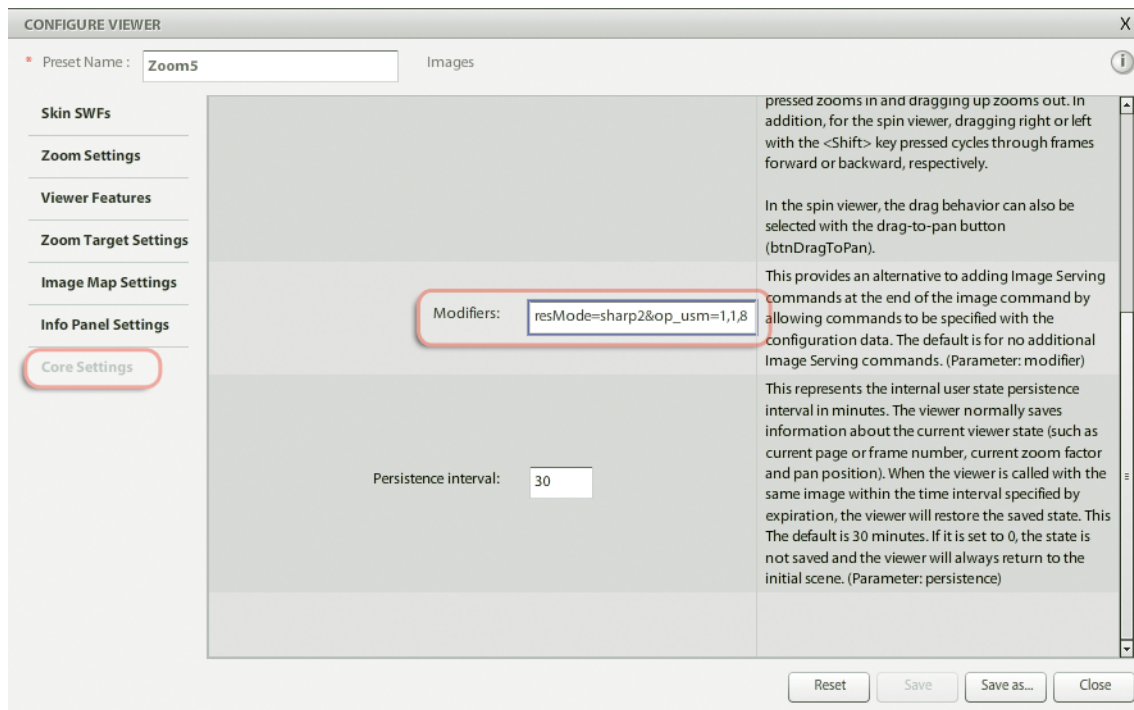

Setting company wide image sharpening options

If you do not use an Image Preset or pass specific Image Server sharpening protocols along the URL string, then your image is not sharpened when downsampled. However, you can set default sharpening values if this occurs and then any image always has some sharpening.

To set your company's default sharpening options

1. In Dynamic Media Classic, click **Setup** > **Application Setup** > **Publish Setup** > **Image Server**.

   You can set the Default Resampling Mode to `Sharp2`. This setting always sharpens the image when downsampling.
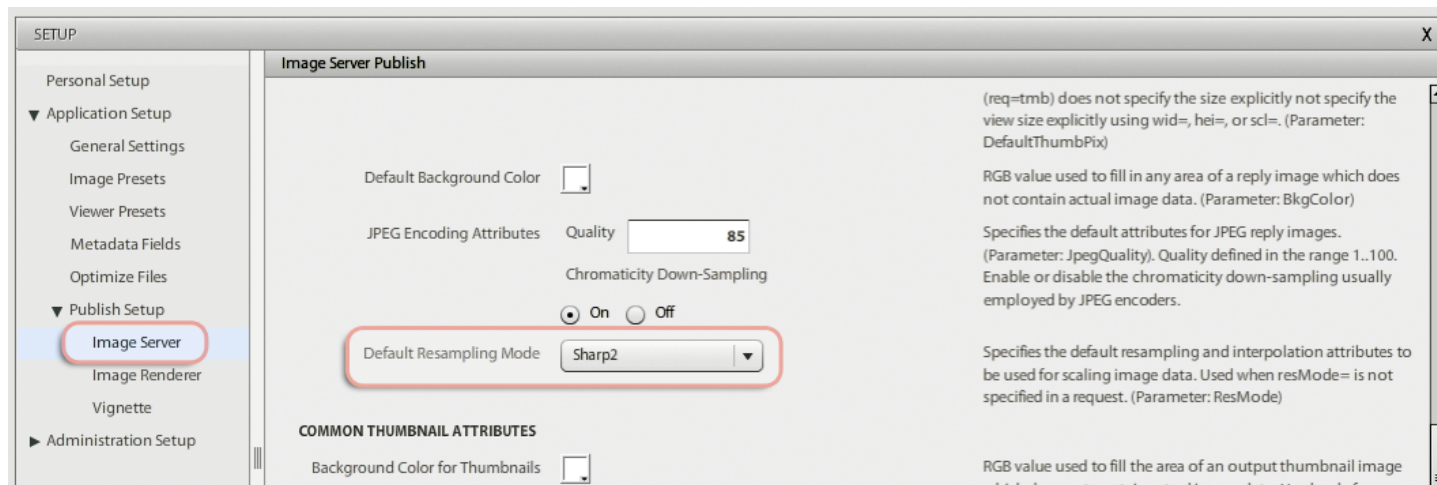
Creating image-specific sharpening overrides

The least recommended image sharpening method is to create sharpening overrides on an image-by-image basis. This method lets you override the sharpening in an Image Preset with its own specific values. However, realize this method also overrides *all* other sharpening methods at *any* image size. The best use case for this method is if some of your images are not high resolution, and the values in the Image Presets are too high for these small images. In this case, some per-image sharpening might be needed.

> 💡 **Note:** *Per-image sharpening negates the effects of sharpening in an image preset or a viewer preset. Use only if your workflow requires it.*

To create image-specific sharpening overrides

1. In Dynamic Media Classic, select any image.
2. Click **Detail View**, and then click **Sharpen**.
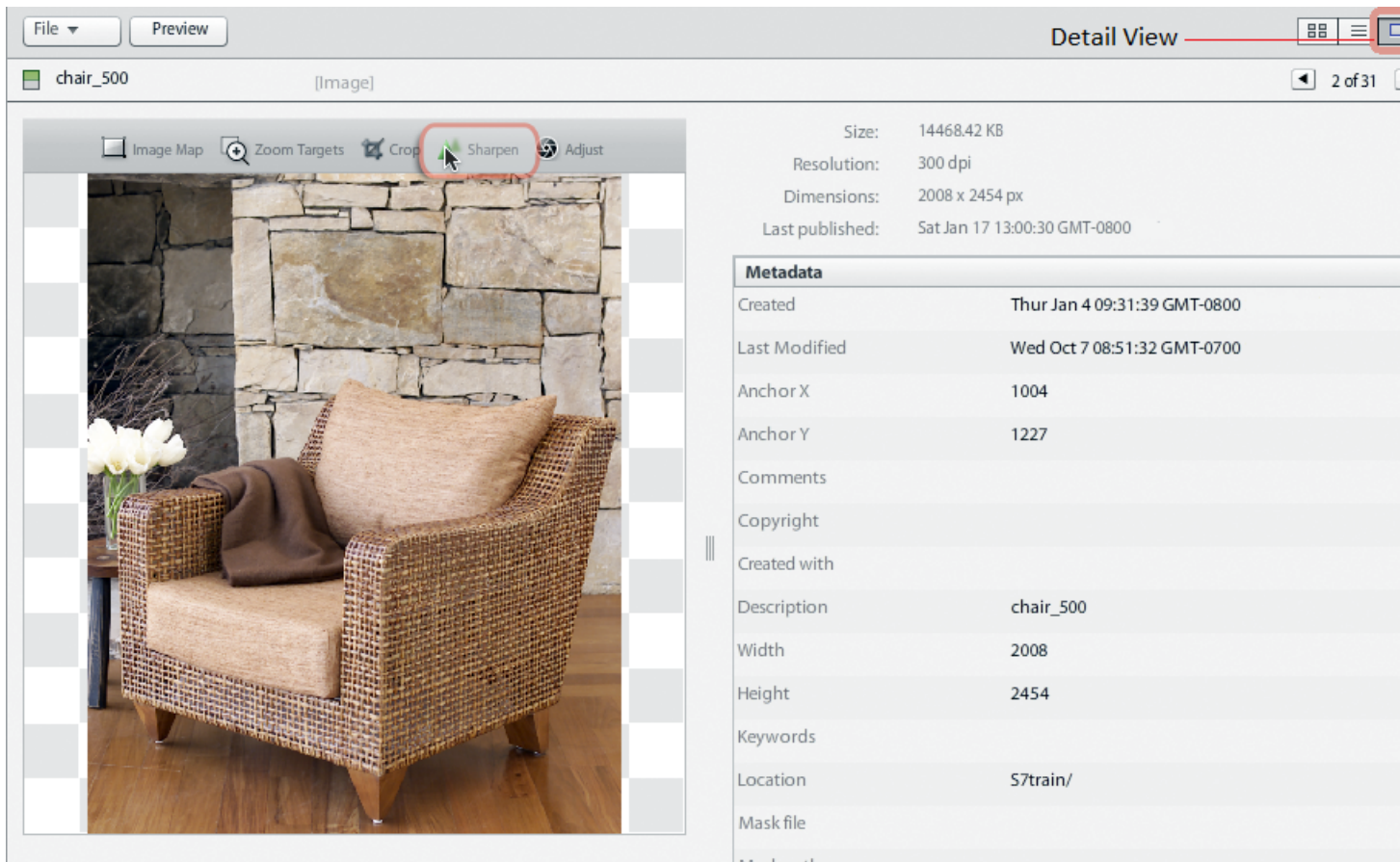
3. In the **Sharpness Editor** page, set the Sharpening parameters that you want, and then click **Save** near the lower-right corner.
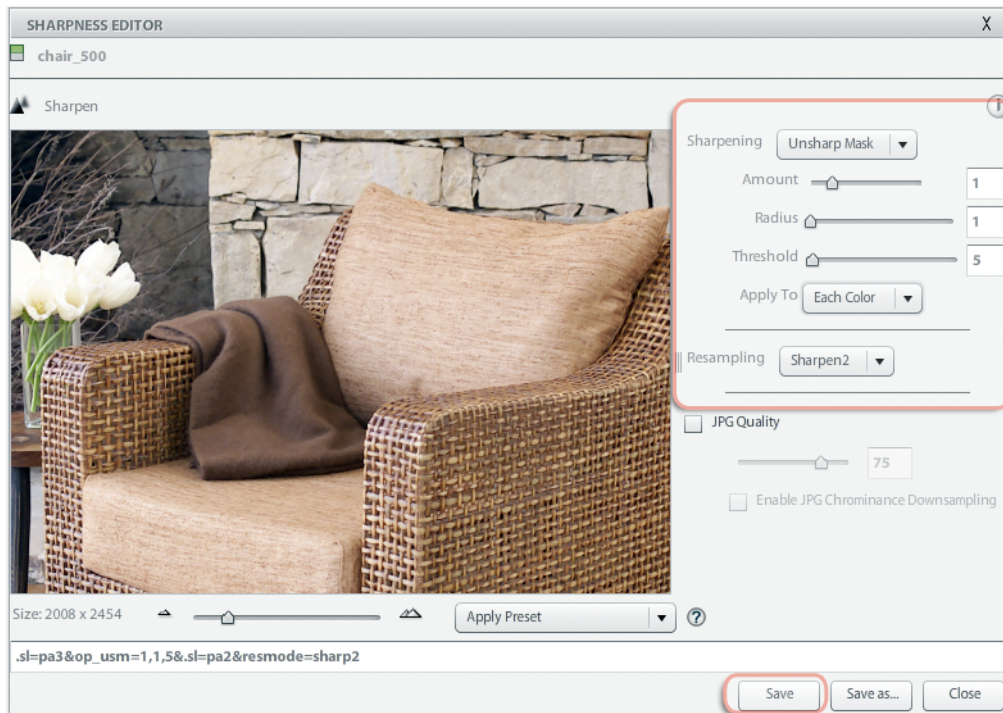
The Image Server uses these sharpening parameters rather than any command you call in the URL, such as a sharpening modifier or an image preset.

Be sure that you publish to see the sharpening changes come through in the image.