

Easy Image Processing With OSS - Friday Blog, Week 53

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Learn how to process images in OSS directly, just by adding URL parameters!

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Advanced OSS: Image Processing

Alibaba Cloud users with some experience on [AWS](#) often compare Alibaba Cloud's [Object Storage Service \(OSS\)](#) to Amazon's [S3](#).

This is a fair comparison, as both are designed to fulfill similar roles, and they offer similar features, such as:

- Object versioning
- Multi-part upload for large objects
- Read-after-write consistency
- Multi-zone redundancy
- Automatic scaling
- The ability to make each object accessible from the Internet via a unique object URL

...and a lot more.

However **they are not identical**. There are a few unique OSS features which aren't present in S3, including:

- The ability to add content to the end of an existing object via the ["append upload"](#) feature
- The ability to directly inject [RTMP video streams](#) into OSS
- The ability to automatically unzip uploaded [.ZIP](#) files
- **The ability to perform [image processing tasks](#) such as resizing, watermarking, or rotation** (the topic of today's blog)

Of course, some of these things can be implemented on AWS by pairing S3 with other services (like Lambda). The advantage of OSS is that these are built-ins that work without any external

dependencies!

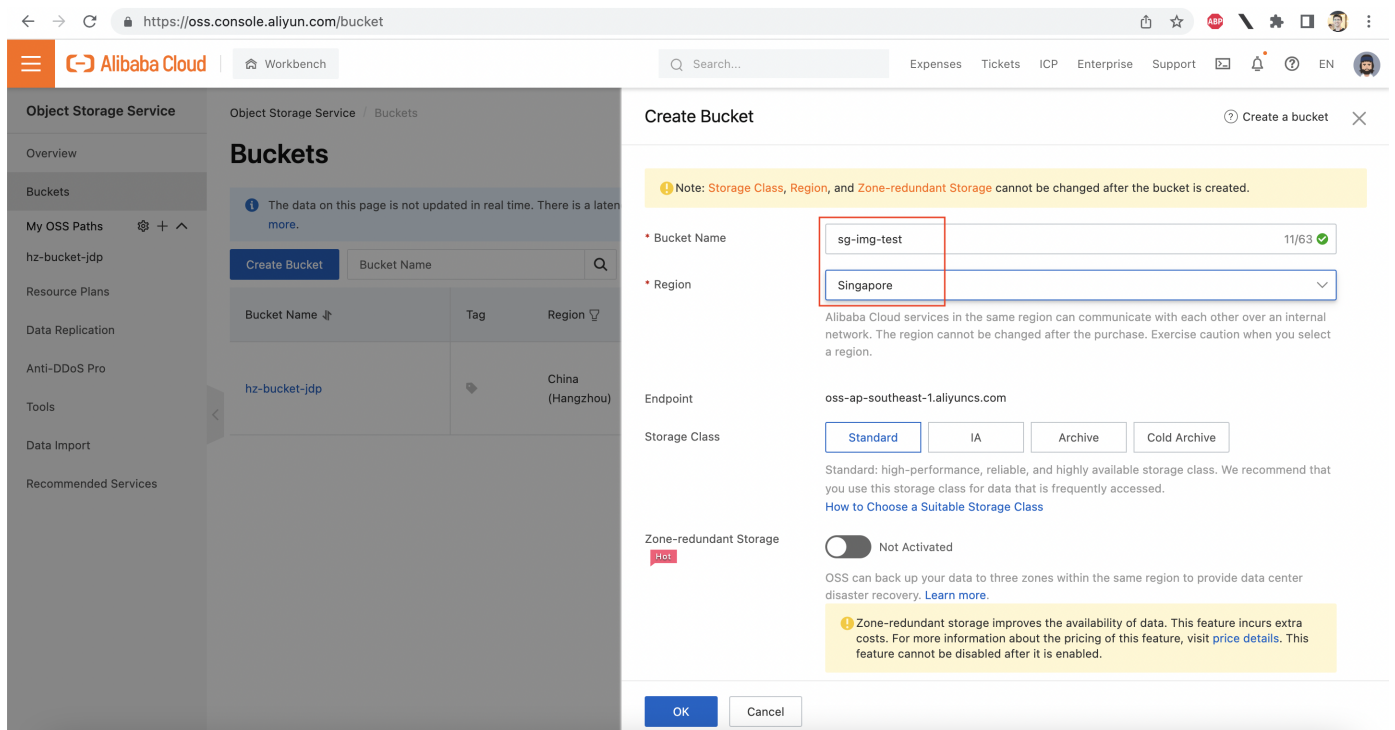
In particular, the image processing built-ins are a powerful way to work with image content.

In today's blog post we'll dive into this feature and learn how it can be used to perform a variety of common image processing tasks. Let's go!

Step 1: Setting Up A Bucket And Uploading Some Images

To test out the image processing features built into OSS, we first need to set up an OSS bucket (of course!) and add some images.

Here, I create a bucket in Singapore:

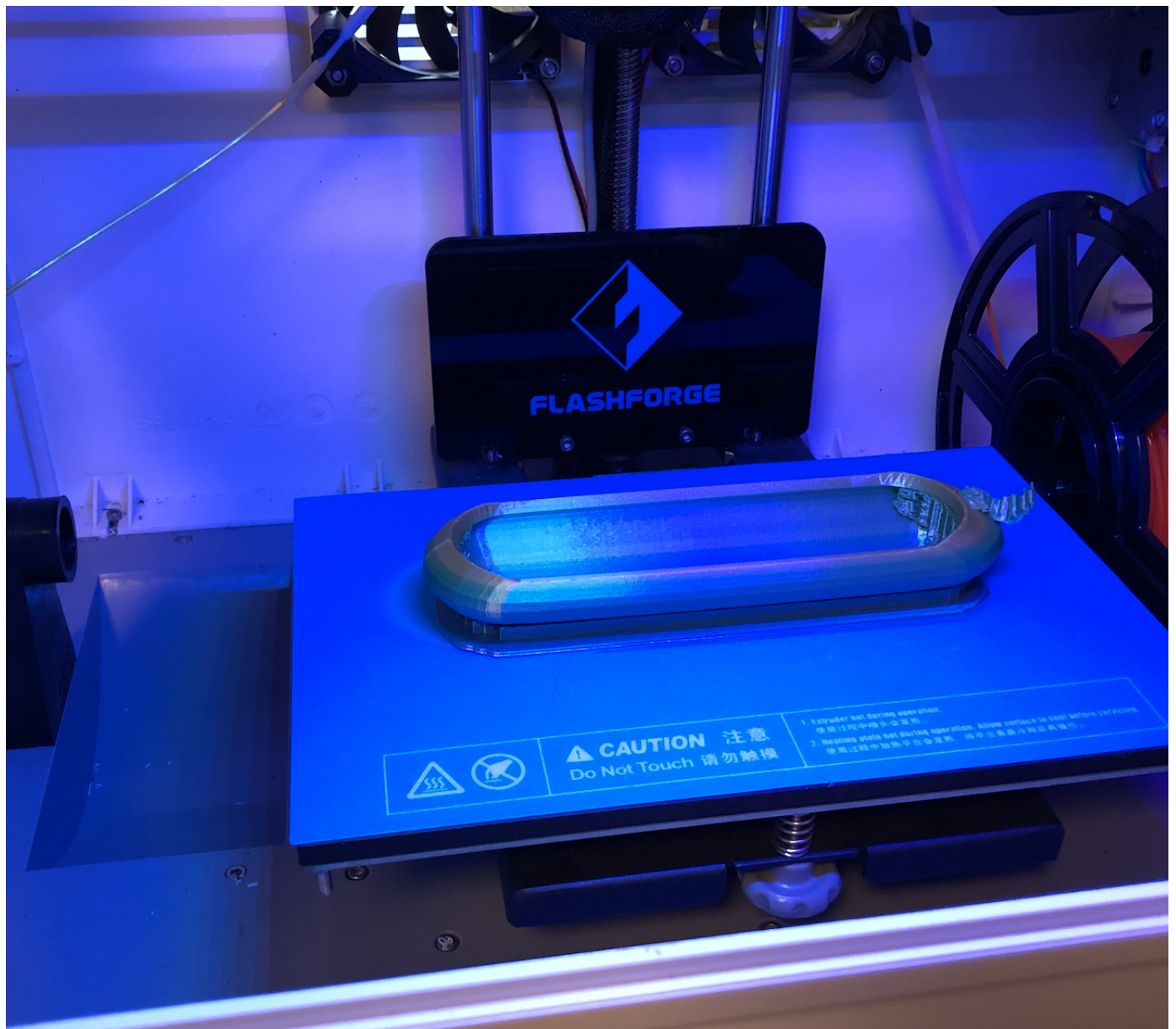


The screenshot shows the Alibaba Cloud OSS console interface. On the left is a sidebar with navigation links: Overview, Buckets, My OSS Paths, Resource Plans, Data Replication, Anti-DDoS Pro, Tools, Data Import, and Recommended Services. The main area is titled 'Buckets' and contains a table with columns 'Bucket Name', 'Tag', and 'Region'. A 'Create Bucket' button is visible. On the right, the 'Create Bucket' form is displayed. It includes a note: 'Note: Storage Class, Region, and Zone-redundant Storage cannot be changed after the bucket is created.' The form fields are: 'Bucket Name' (sg-img-test), 'Region' (Singapore), 'Endpoint' (oss-ap-southeast-1.aliyuncs.com), 'Storage Class' (Standard, IA, Archive, Cold Archive), and 'Zone-redundant Storage' (Not Activated). A yellow warning box at the bottom states: 'Zone-redundant storage improves the availability of data. This feature incurs extra costs. For more information about the pricing of this feature, visit price details. This feature cannot be disabled after it is enabled.'

Note that the image processing feature won't be affected by your logging, versioning, or storage redundancy (LRS/ZRS) settings. In my case, I set up my bucket to use LRS (local redundant storage), and I have turned *off* real-time log search and object versioning. Feel free to turn those on if you like. Again, it won't affect the image processing functionality.

Next we need to find some images to work with. To avoid copyright issues, I'll use a few of my own images (feel free to reuse them for your own OSS tests!):





Next, I upload these images to my OSS bucket:

← → ↻

https://oss.console.aliyun.com/bucket/oss-ap-southeast-1/sg-img-test/object

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🔔

?

EN

👤

Object Storage Service / Buckets / sg-img-test / Files

Task List

sg-img-test / Singapore

Click here

Frequently Used Features

Overview

Data Usage

Files

Access Control

Basic Settings

Redundancy for Fault Tolerance

Transmission

Logging

Data Processing

Upload

Create Folder

Parts

Authorize

Enter a file name prefix

Q

More Criteria

File Name

Size

Storage Class

Updated At

Actions

No Data

Set HTTP Header

Export URL List

Download

Restore

Completely Delete

Items per page: 50

< Previous

Next >

🗨

🔧

← → ↻

https://oss.console.aliyun.com/bucket/oss-ap-southeast-1/sg-img-test/object/upload

🔖 ☆

🔴

🔧

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Tickets

ICP

Enterprise

Support

📧

🔔

?

EN

👤

Overview

Data Usage

Files

Access Control

Basic Settings

Redundancy for Fault T...

Transmission

Logging

Data Processing

Upload To

Current

Specified

oss://sg-img-test/

File ACL

Inherited from Bucket

Private

Public Read

Public Read/Write

Inherited from Bucket: The ACLs of each file are the same as those of the bucket.

Files to Upload

Drag and drop one or more files or folders here to select them.

File naming conventions: 1. The file name must be UTF-8-encoded. 2. The file name is case-sensitive. 3. The file name must range from 1 to 1,023 bytes in length. 4. The file name cannot start with a forward slash (/) or two consecutive backslashes (\).

Note: If the name of the file to upload is the same as that of an existing file, the existing file is overwritten.

#1 - Click here to choose files

Select Files

Select Folders

Name

Folder

Storage Class

Size

Status

Actions

printer.png

image/png

2.27 MB

Ready for Upload

Remove

outdoors.png

image/png

3.94 MB

Ready for Upload

Remove

#2 - Then click here to upload

Upload

Cancel

← → ↻ <https://oss.console.aliyun.com/bucket/oss-ap-southeast-1/sg-img-test/object/upload>

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Overview

Data Usage >

Files >

Access Control >

Basic Settings >

Redundancy for Fault T... >

Transmission >

Logging >

Data Processing >

Upload To

File ACL

Files to Upload

Advanced Settings

Cur

Inherit

Inherited

Select

Name

Upload

Task List

Upload Tasks

If you refresh or close the browser, the ongoing upload task is canceled and all upload records are cleared.

All(2) Uploading(0) Stopped(0) Uploaded(2) Upload Failed(0)

File	Upload To	Status	Actions
printer.png 2.27 MB	oss://sg-img-test/	Uploaded	Share Clear Record
outdoors.png 3.94 MB	oss://sg-img-test/	Uploaded	Share Clear Record

If everything worked, your files will show as "Uploaded"

← → ↻ <https://oss.console.aliyun.com/bucket/oss-ap-southeast-1/sg-img-test/object>

Alibaba Cloud Workbench Expenses Tickets ICP Enterprise Support EN

Object Storage Service / Buckets / sg-img-test / Files Task List

sg-img-test / Singapore Frequently Used Features

Overview

Data Usage >

Files >

Access Control >

Basic Settings >

Redundancy for Fault Tolerance >

Transmission >

Logging >

Data Processing >

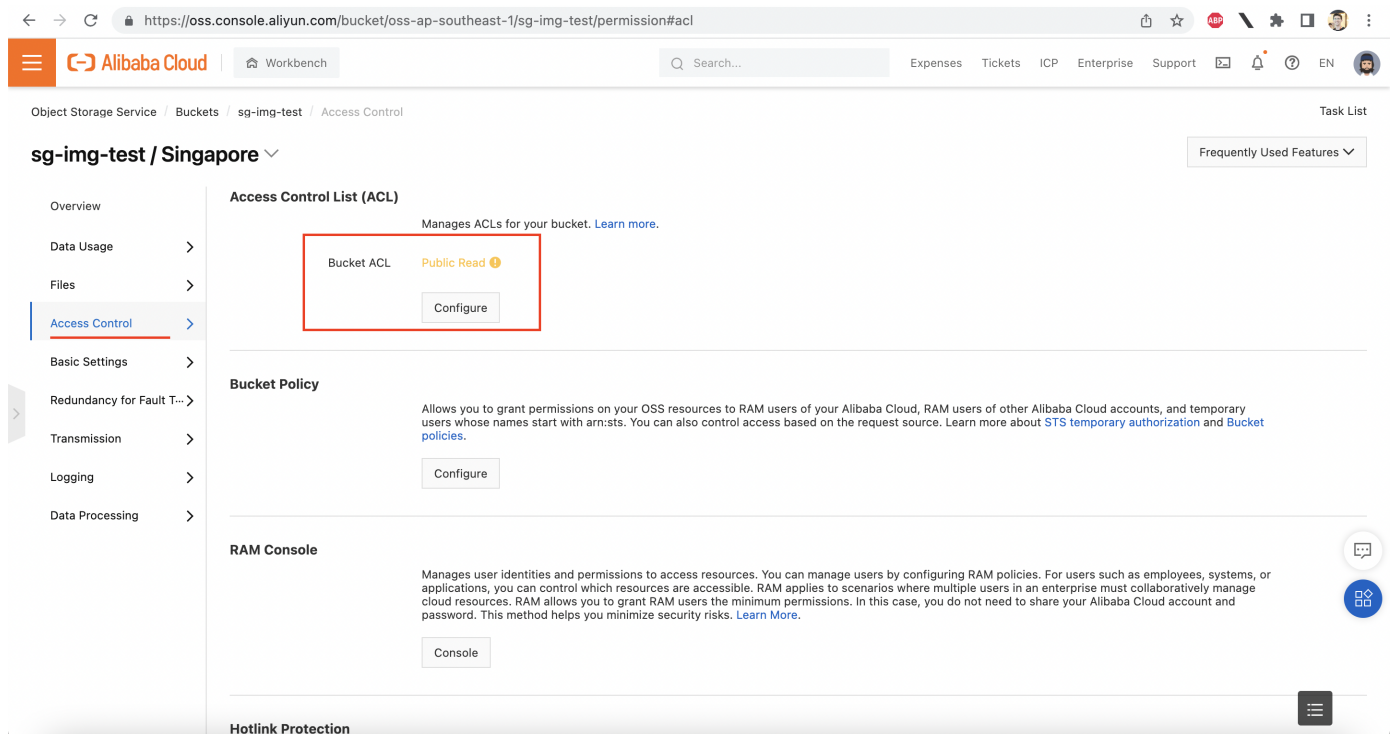
☐	File Name	Size	Storage Class	Updated At	Actions
☐	outdoors.png	3.943MB	Standard	Mar 25, 2022, 13:24:25	View Details
☐	printer.png	2.267MB	Standard	Mar 25, 2022, 13:24:27	View Details

☐

Items per page: 50 < Previous Next >

If everything worked, your files should show up here. ^_^

Note: You should make sure your bucket's ACL policy is set to "Public Read" so we can access the images from the Internet without a signing key. You can do this from "Access Control":



Step 2: Understanding URL parameters

OSS image processing is done by adding URL parameters to the end of the OSS URL which points to your image.

For example, let's assume you start with this image (a photo of a dog, as used in the [OSS documentation](#)):

```
https://image-demo.oss-cn-hangzhou.aliyuncs.com/example.jpg
```

To use OSS's built-in image processing features, we would need to add the URL parameter `?x-oss-process=` to the end of the URL. We then specify one or more operations to perform, such as `resize`. Here, we resize the image's width to **500 pixels**:

```
https://image-demo.oss-cn-hangzhou.aliyuncs.com/example.jpg?x-oss-process=image/re
```

Let's break down the URL parameters at the end of the URL (`?x-oss-process=image/resize,w_500,limit_0`):

- `?x-oss-process=` tells OSS that we want to perform image processing
- `image/` indicates that we will be using one of OSS's built-in image processing primitives (in this case, `resize`). It is also possible to **combine** multiple image processing steps into a "style". We'll talk about that later.

- `resize` is the name of the operation we want to perform (there are many others, such as blur, watermark, and crop)
- The other values following `resize`, are parameters for the resize function. All these parameters follow the format `<parameter name>_<value>`. So `w_500` means "resize the image to a width of 500 pixels". The parameter `limit_0` tells OSS that we should scale the image **up**, if its new width or height is larger than the original image file.

There is also an `m` parameter that sets the "mode". This tells OSS's image processing engine what to do in cases where the new image has a different width-to-height ratio than the original. Should the image be cropped? Padded? Scaled and then cropped? Let's play with this a little bit, using one of our sample images.

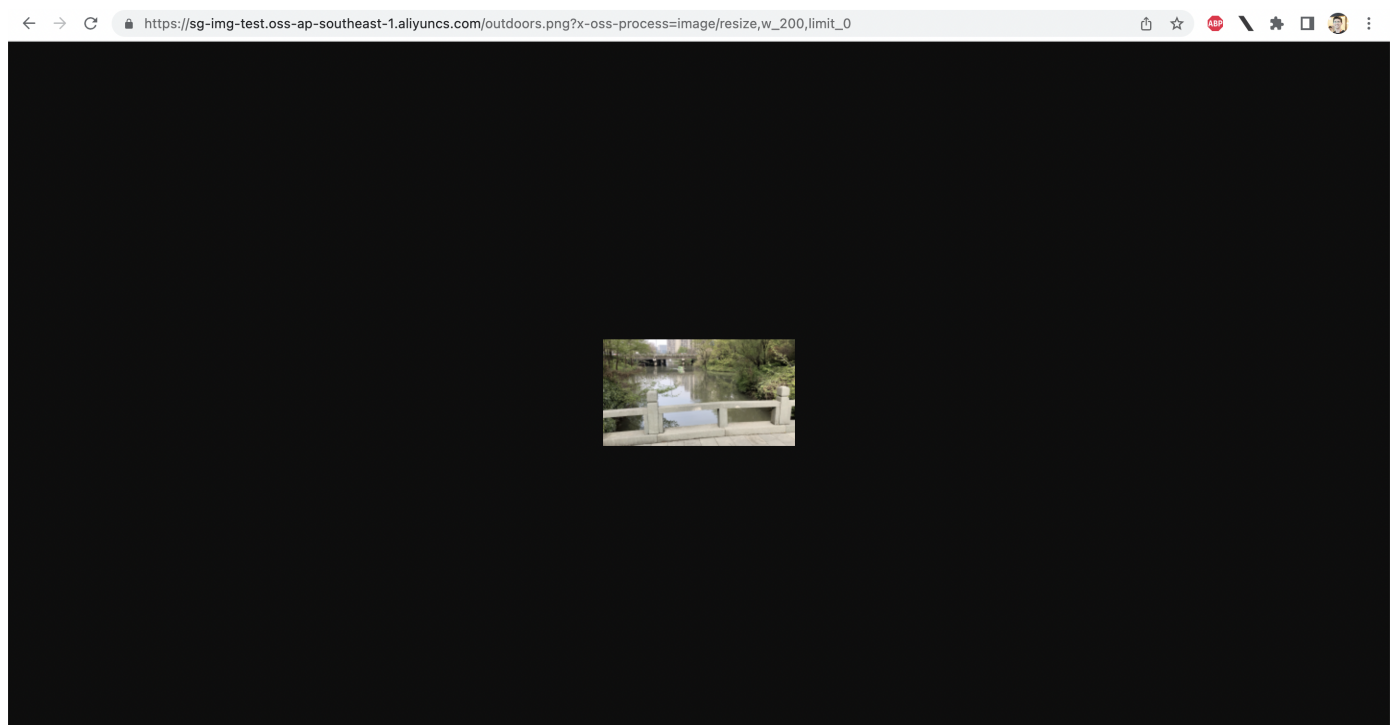
Resizing

The image of the bridge (see above) which I uploaded to OSS has an original size of 2014x1120. It's a PNG file.

Let's try forcing the width down to 200 pixels. To do this, I append `?x-oss-process=image/resize,w_200,limit_0` to the object URL, which gives me:

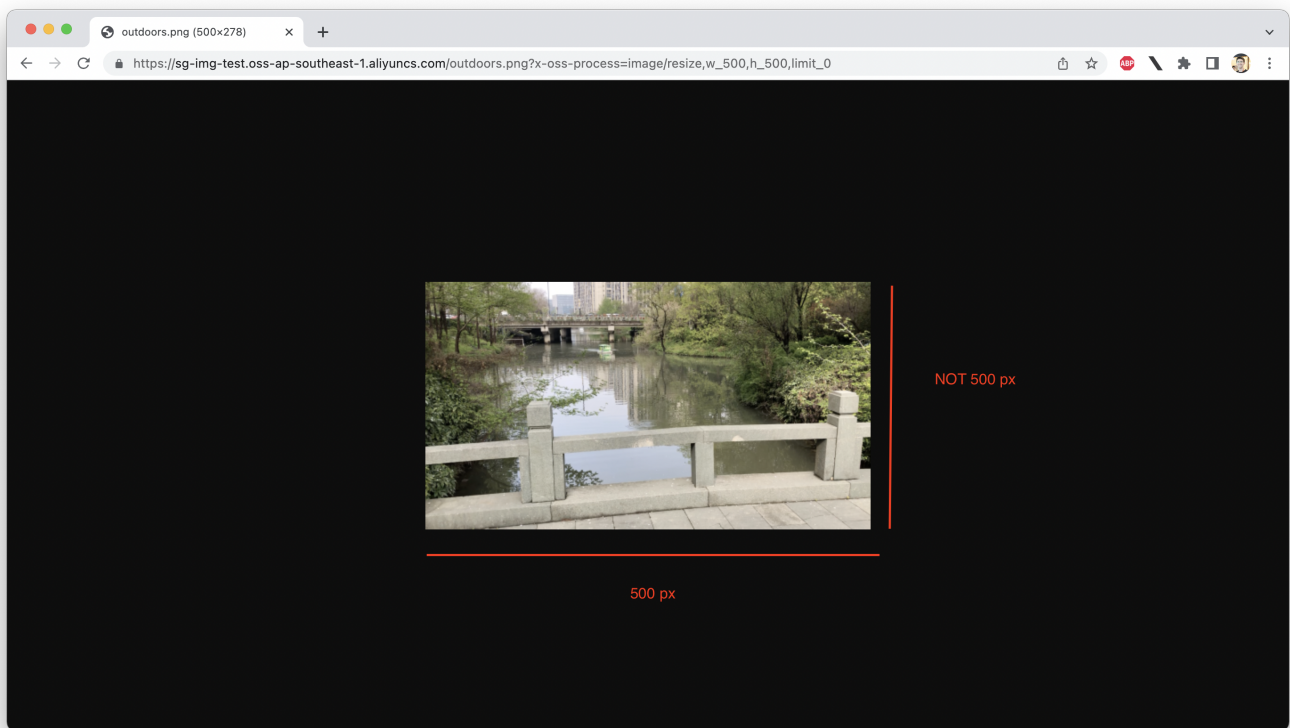
```
https://sg-img-test.oss-ap-southeast-1.aliyuncs.com/outdoors.png?x-oss-process=ima
```

And a corresponding "tiny" image:



I can add an `h_` parameter to scale the height of my image as well. Let's see what happens when I set both width *and* height to "500":

<https://sg-img-test.oss-ap-southeast-1.aliyuncs.com/outdoors.png?x-oss-process=ima>



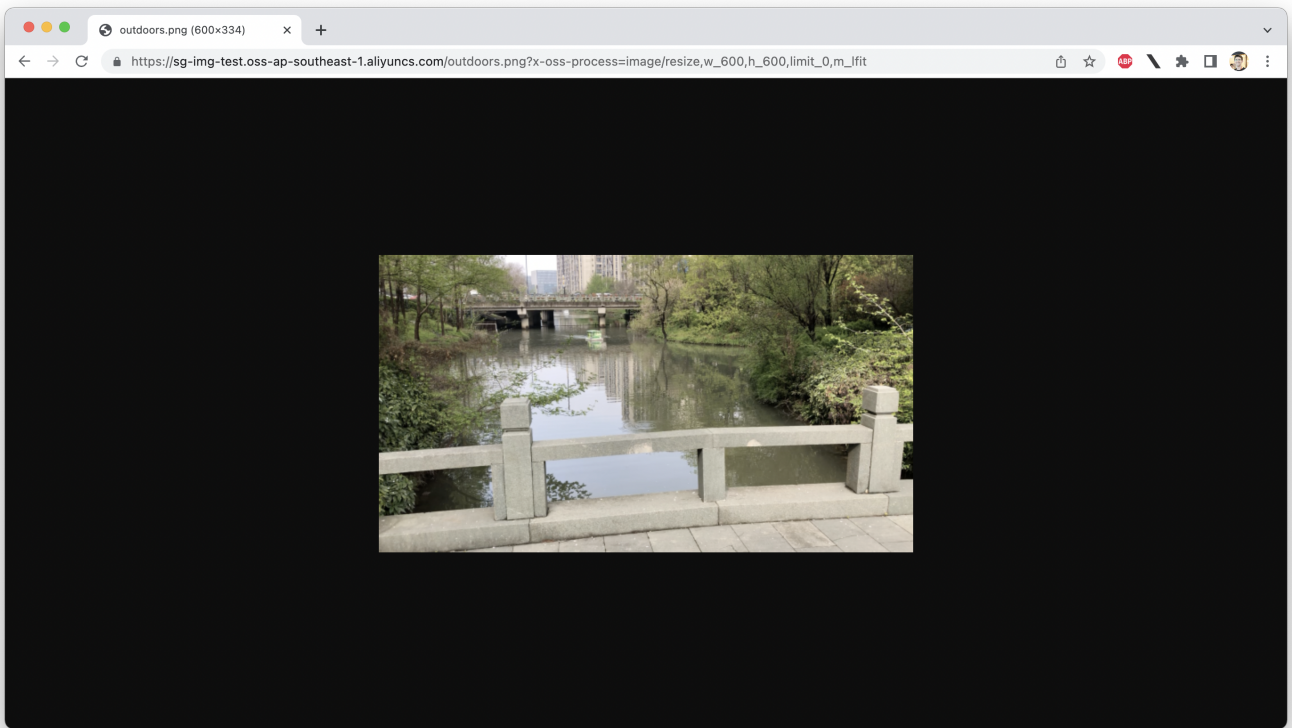
If you look closely, you'll realize that OSS seems to be ignoring the `h_500` parameter.

Why is this? OSS has several different "modes" which can be used to resize images. The default mode is "lfit" (all the modes are [documented here](#)). They are a bit tricky to explain, but I'll do my best. The default mode is "lfit".

Very roughly explained, the modes are:

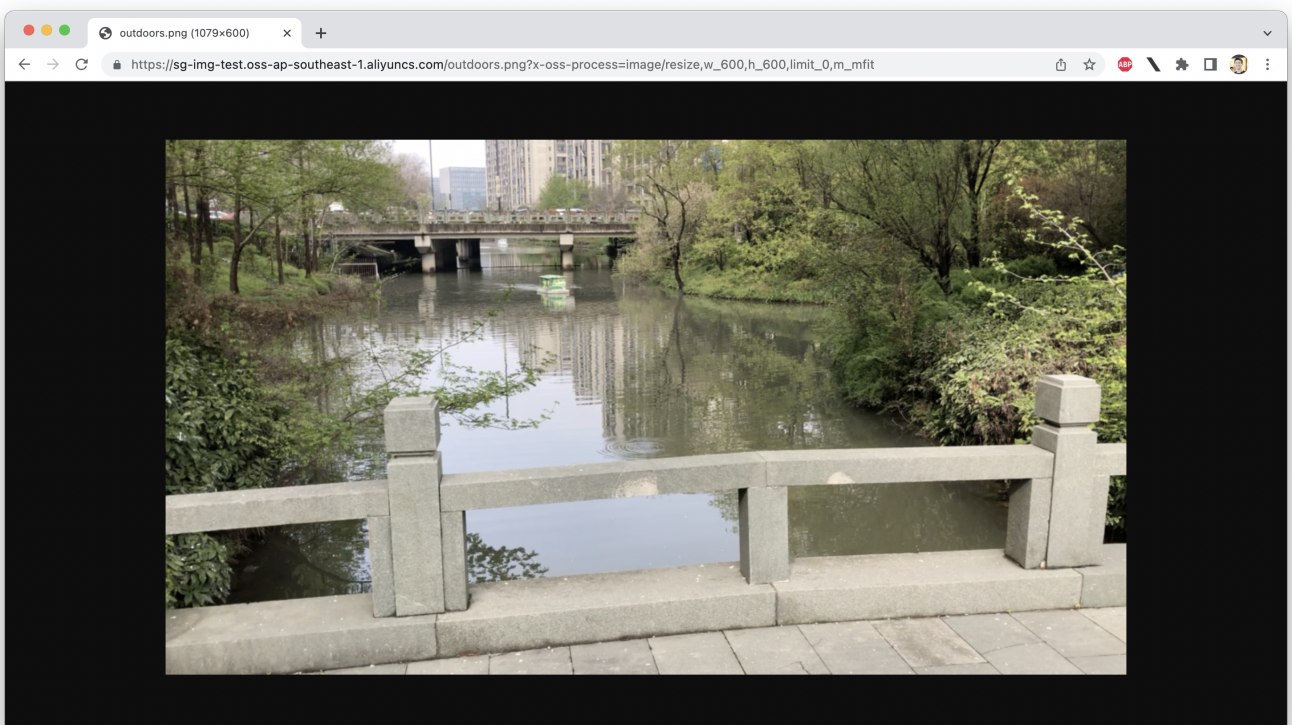
- "lfit": Preserve the image's width-to-height ratio, giving priority to whichever scaling parameter (`w_` or `h_`) produces the *smallest* final image

<https://sg-img-test.oss-ap-southeast-1.aliyuncs.com/outdoors.png?x-oss-process=ima>



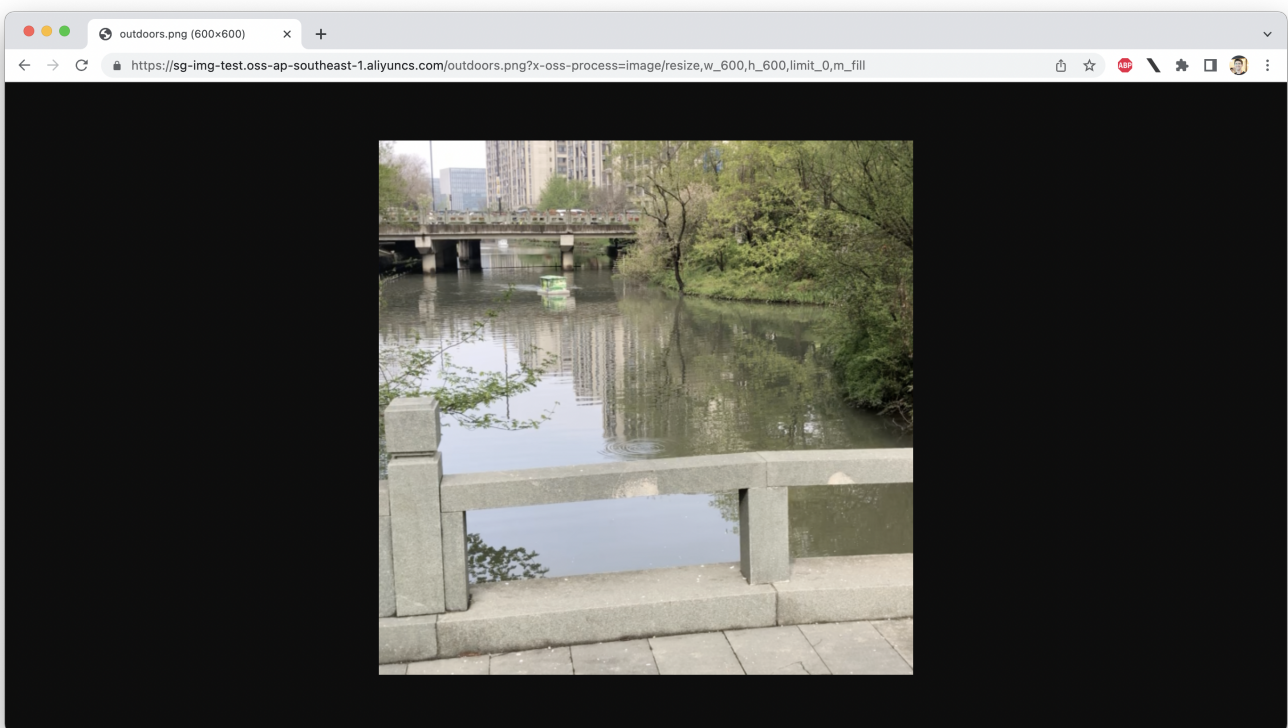
- "mfit": Preserve the image's width-to-height ratio, and scale based on whichever scaling parameter (`w_` or `h_`) results in the *biggest* final image

<https://sg-img-test.oss-ap-southeast-1.aliyuncs.com/outdoors.png?x-oss-process=ima>



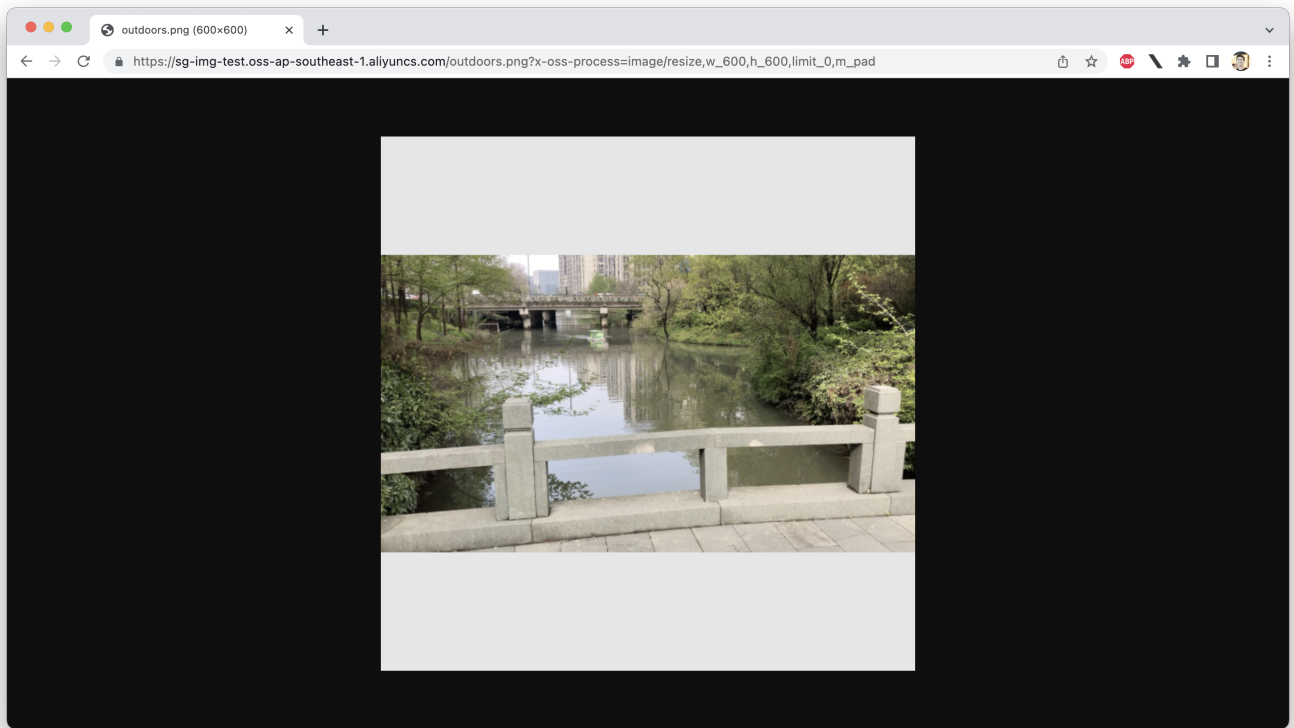
- "fill": Do not preserve the width-to-height ratio. Instead, scale the image as-needed, and crop to fit the `w_` and `h_` parameters:
 - Resizing takes place before cropping
 - During resizing, width-to-height ratio is preserved, and the image is scaled along whichever side (width or height) produces the smallest final image
 - The final cropped image is centered at the middle of the resized image

<https://sg-img-test.oss-ap-southeast-1.aliyuncs.com/outdoors.png?x-oss-process=ima>



- "pad": Resize the image to the maximum size that will fit within the `w_` and `h_` given while preserving its width-to-height ratio, then fill the extra space with padding:

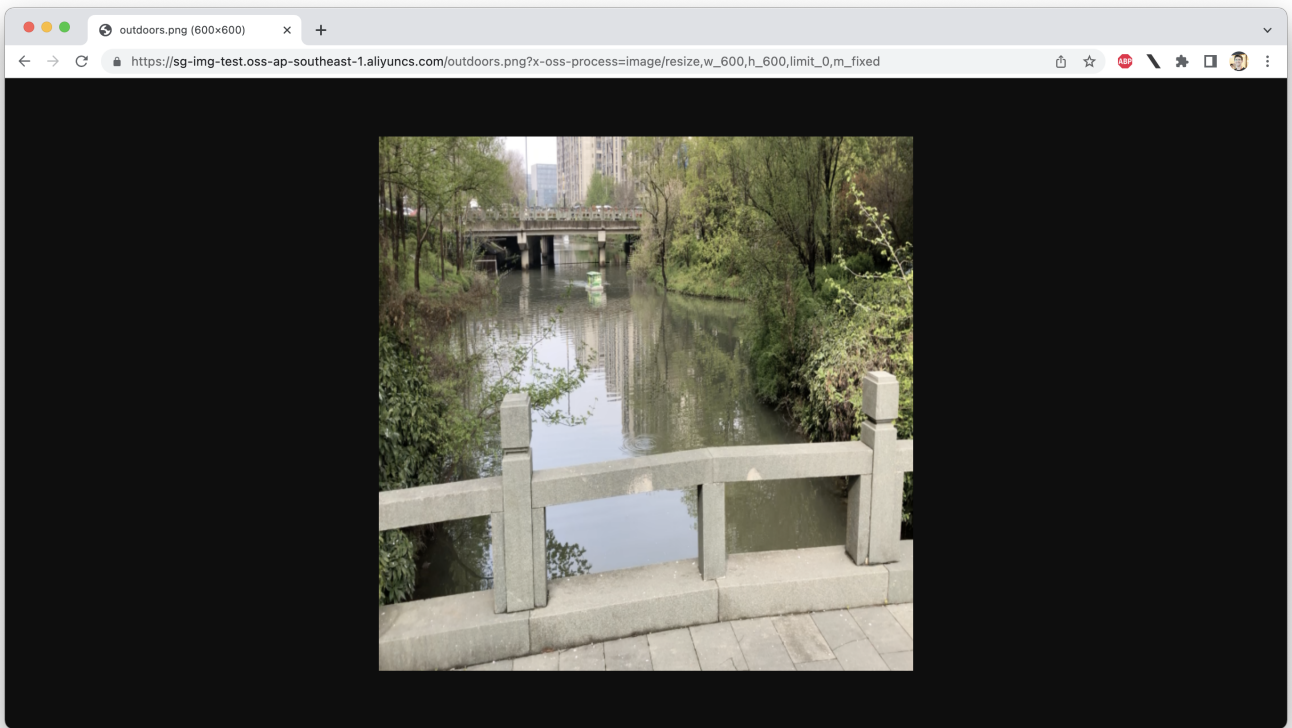
<https://sg-img-test.oss-ap-southeast-1.aliyuncs.com/outdoors.png?x-oss-process=ima>



Optionally, the padding color can be controlled with a `color` parameter that accepts hexadecimal color values, so adding `color_FF0000` would pad the image with red.

- "fixed": Do not preserve the width-to-height ratio. Deform the image to match whatever `w_` and `h_` parameters are supplied.

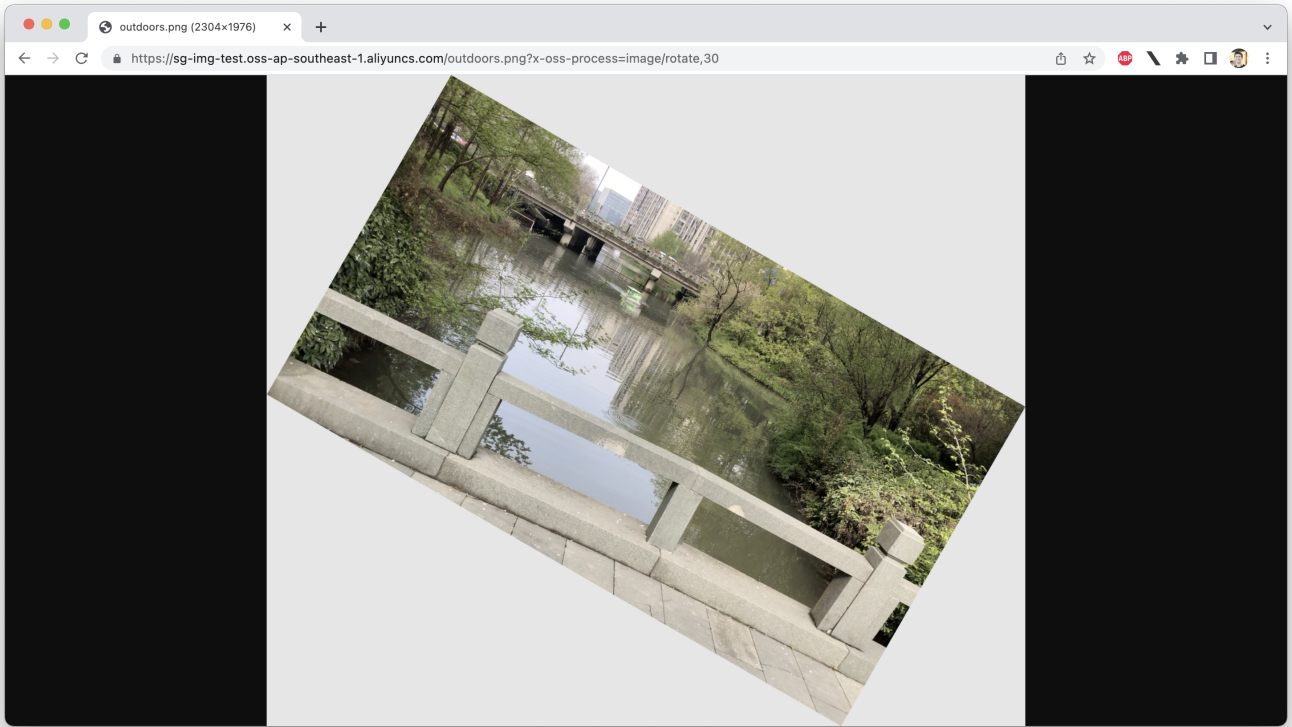
```
https://sg-img-test.oss-ap-southeast-1.aliyuncs.com/outdoors.png?x-oss-process=ima
```



Rotation

OSS also lets us rotate images, by specifying a number of degrees (0,360) by which to rotate the image in the clockwise direction. Let's rotate our bridge by 30 degrees:

```
https://sg-img-test.oss-ap-southeast-1.aliyuncs.com/outdoors.png?x-oss-process=ima
```

Note that the space around the image will be padded (as above).

Other Operations

There's a long list of other operations OSS can handle for us, including:

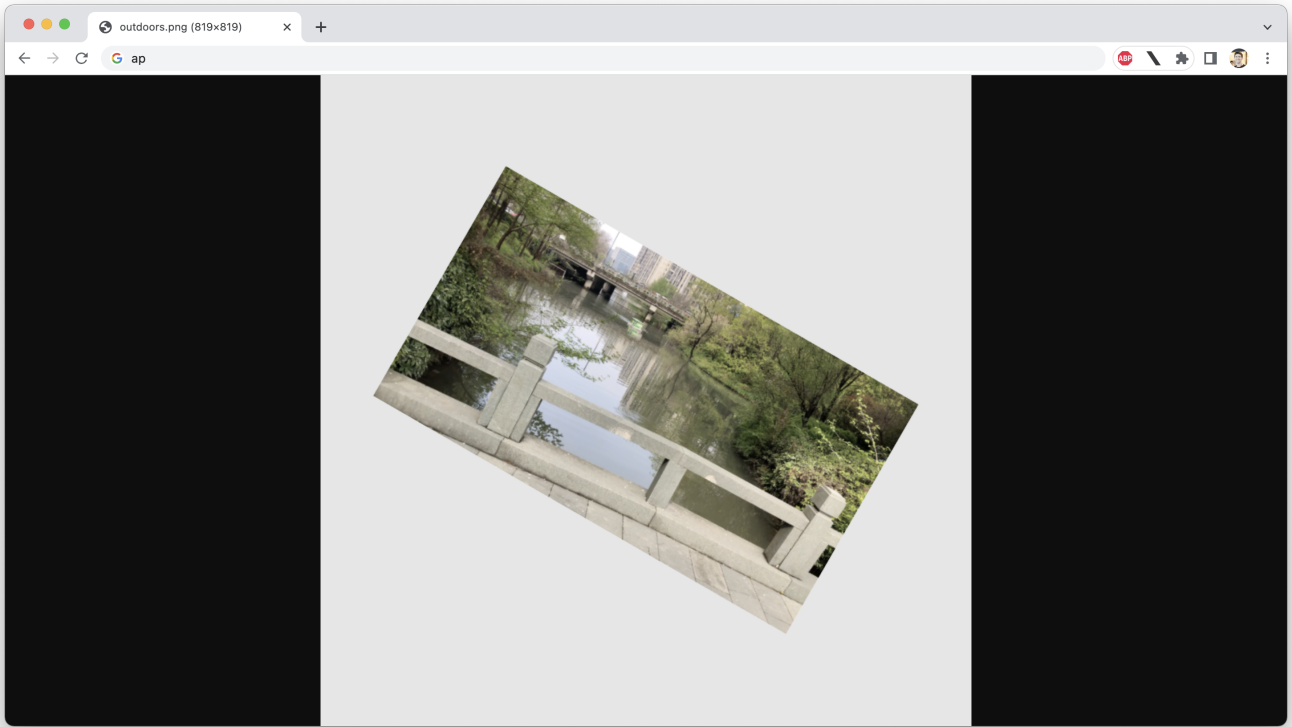
- Cropping
- Adding watermarks
- File format conversion
- Adjusting image quality
- Making indexed cuts
- Custom cropping (including circular or "incircle" crops)
- Blur / sharpen / adjust contrast

See the [OSS documentation](#) for a complete list! It's far too much to cover in a single blog post.

Step 3: Creating Templates

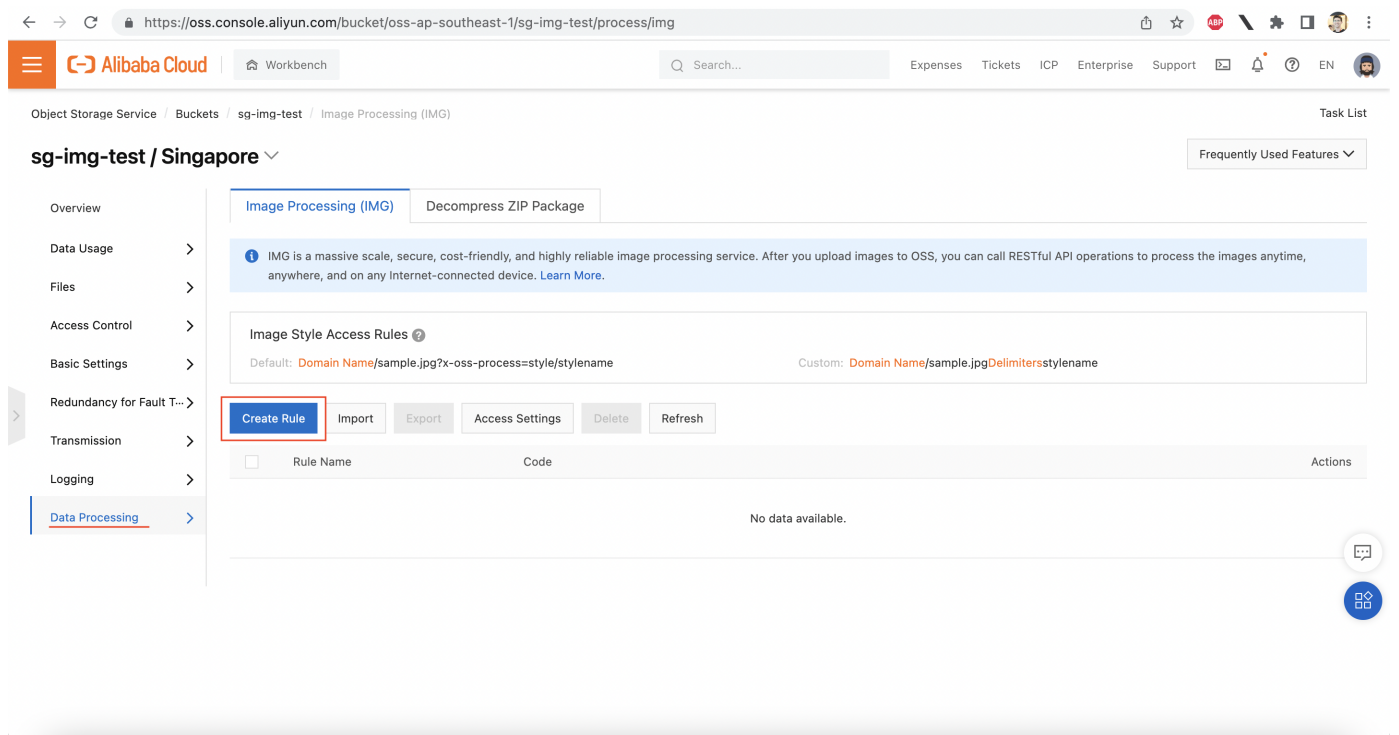
What happens if you need to apply multiple operations to an image? One way to handle this would be to append more operations to the end of our URL parameters, like this:

```
https://sg-img-test.oss-ap-southeast-1.aliyuncs.com/outdoors.png?x-oss-process=ima
```



This works, but "stacking" operations in this way quickly becomes complex (and results in some very messy looking URLs).

A better way to apply multiple operations at once is to group them into a "style". You can create styles from your bucket's "Data Processing" settings:



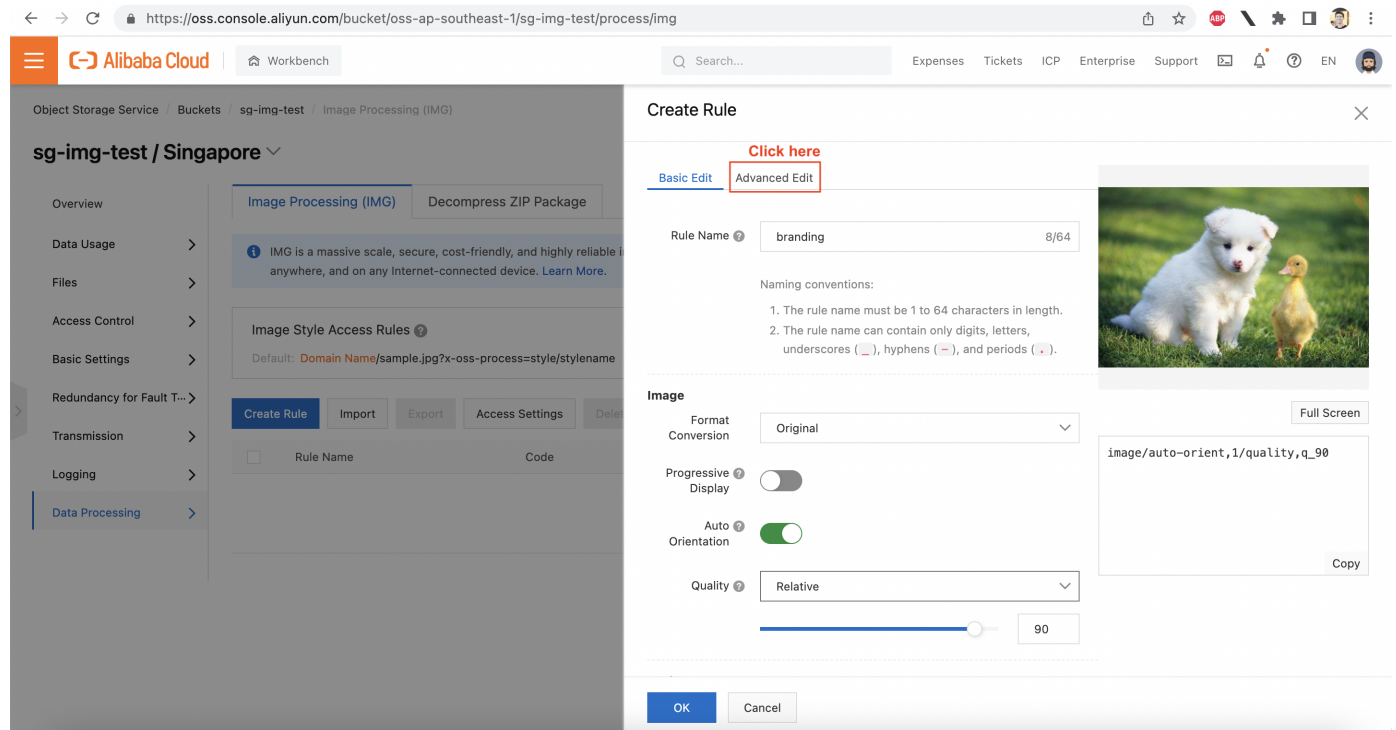
Let's try making one ourselves!

Creating Our Own "Image Enhancement & Branding" Style

Let's create a style that applies the following operations:

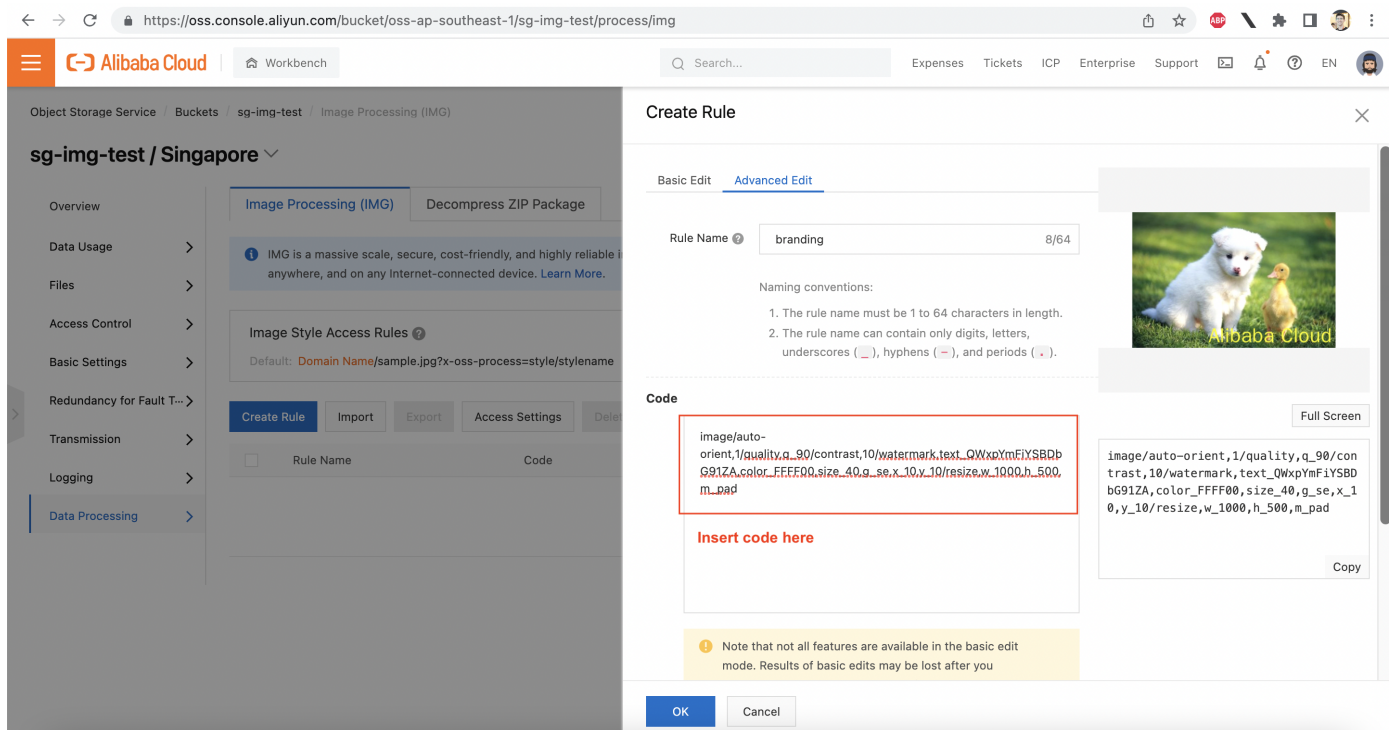
- Resize images to 1000x500, padding as necessary
- Enhance contrast
- Add a watermark in the lower right-hand corner that says "Alibaba Cloud" (in yellow)

First, open up the "Create Rule" dialog:

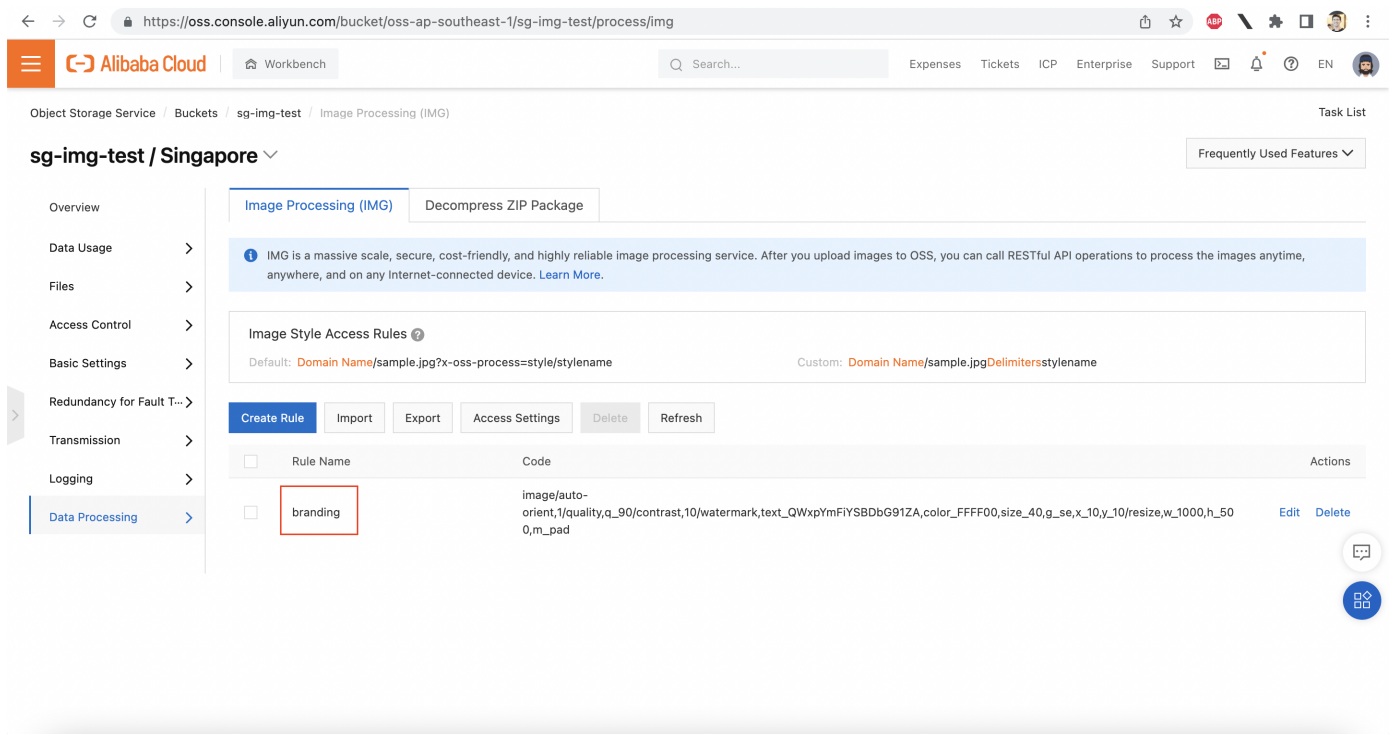


Then, switch to "Advanced Edit" and paste in the following:

```
image/auto-orient,1/quality,q_90/contrast,10/watermark,text_QWxpYmFiYSBDbG91ZA,col
```

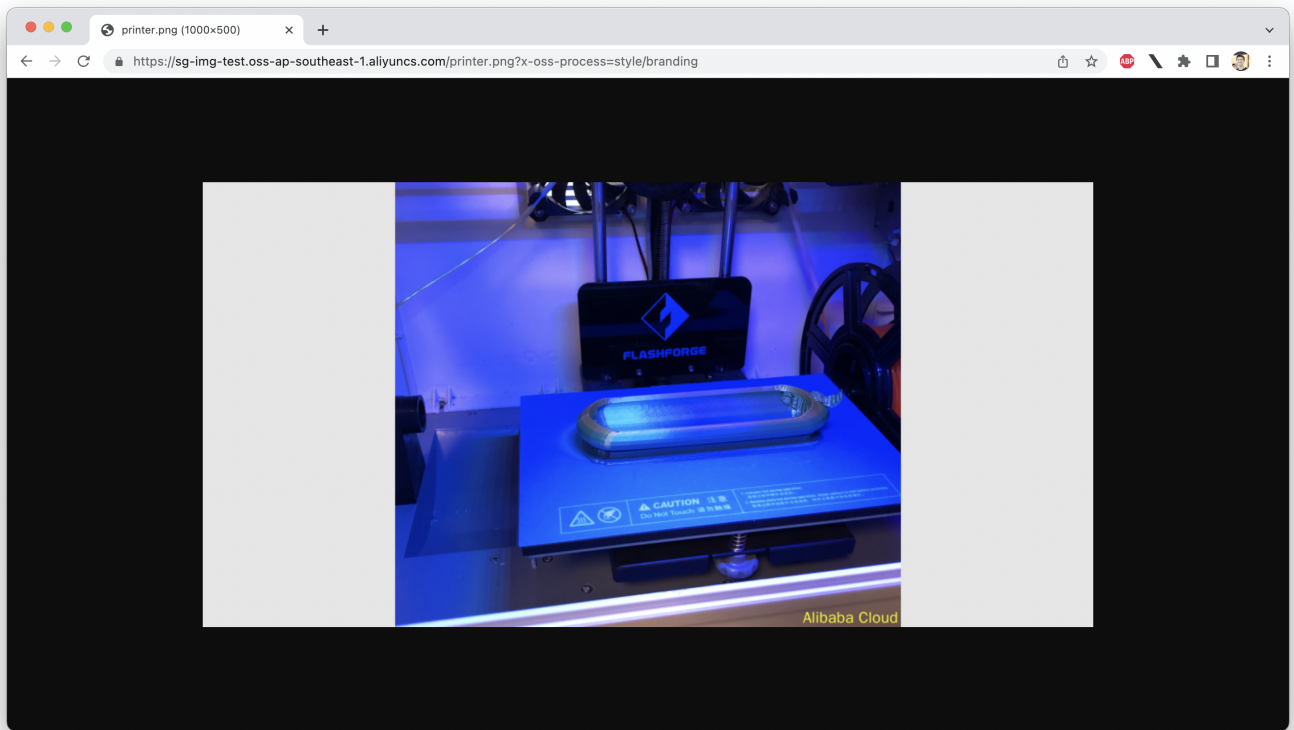


Click "OK" to save the new style, which will now appear in the list of image processing rules:



Now we can easily use the new style just by adding `?x-oss-process=style/branding` to the end of image URLs, like this:

`https://sg-img-test.oss-ap-southeast-1.aliyuncs.com/printer.png?x-oss-process=styl`



Easy!

Next Steps

Be sure to check out the [full list of OSS image processing features](#). I highly recommend playing around with the image processing features on your own, to get a feel for what's possible!

I've Got A Question!

Great! Reach out to me at jierui.pjr@alibabacloud.com and I'll do my best to answer in a future Friday Q&A blog.

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