

Cloud Infinite

Best Practices

Product Documentation



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Contents

Best Practices

- Copyright Protection Solutions

- Image Processing Practices

 - Downsizing Image with CI

 - Hybrid Watermarking

- Workflow Practices

 - Using Custom Function to Manage COS Files

Best Practices

Copyright Protection Solutions

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Background

As the network infrastructure gets improved, various major platforms see an explosive growth of image and video content volumes. While enjoying the profits of web and app traffic, creators and platforms also face the risks of unauthorized content use and infringement upon intellectual property rights. To address these problems, CI provides advanced features such as document watermark, visible and blind watermarks for images and videos, and video DNA. These features make an easy-to-connect and cost-effective one-stop copyright protection solution suitable in various business scenarios.

Overview of Image Copyright Protection Solutions

Visible image watermark

Visible image watermarks have been widely used on various social media and UGC platforms. The characteristics and strengths of CI's visible watermark feature are as detailed below:

Text and image watermarks are supported.

Tiled watermark is supported.

It is easy to connect. Its GUI-based console allows you to preview the watermark effect in real time.

You can configure the watermark style and perform multiple image processing operations in one single API call.

The watermark is highly visible and has a good warning effect.

You can implement image processing during download by adding relevant parameters to the image download link in COS as instructed in the product documentation. Below is a sample image link:

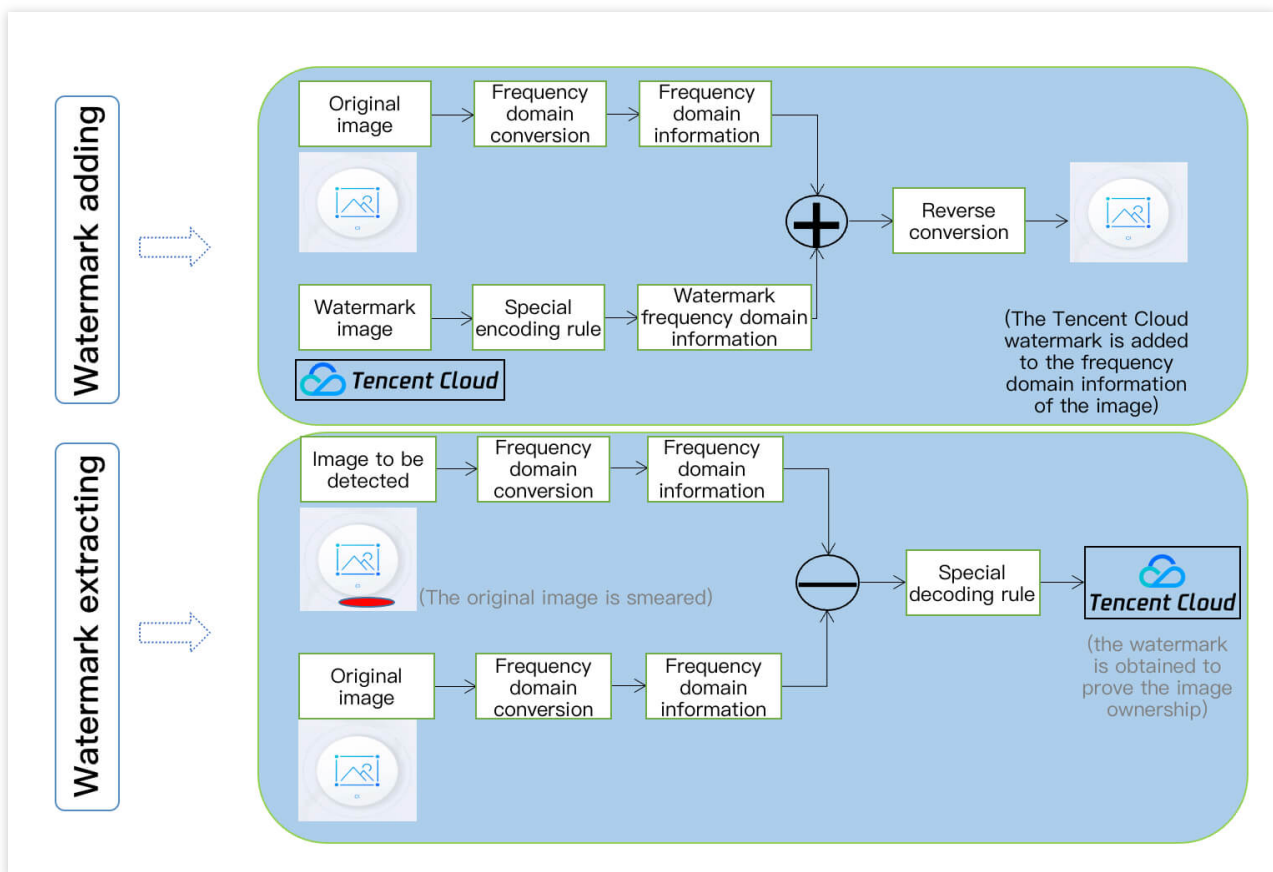


```
https://examples-1251000004.cos.ap-shanghai.myqcloud.com/sample.jpeg?watermark/2/te
```

Visible watermarks are suitable for scenarios where the brand awareness is high and the image copyright needs to be highlighted, such as product images. This solution has many strengths, including high cost-effectiveness, ease of configuration, and low processing latency. However, if a visible watermark is smeared or covered, the image will lose the protection. Moreover, it also compromises the visual experience. If you have high requirements for the watermark protection capabilities and image quality, you can choose the blind watermark solution as described below.

Blind image watermark

The blind watermark feature is a more secure watermark mode. It allows you to add a watermark to the input image information **without displaying the watermark** or significantly affecting the image quality. If you think your image might have been stolen, you can extract the blind watermark from the suspected image to prove that the image **belongs to you**. A blind watermark has powerful protection capabilities. Even if an image is rotated, cropped, smeared, or compressed, the decoding algorithm can still extract the watermark information in most cases. The processes of adding and extracting a blind watermark are as shown below:



Overview of Video Copyright Protection Solutions

CI can hide images and strings in a video in a way they can hardly be detected or modified. By identifying the watermark hidden in the video content, you can confirm the content creator, copyright owner, and spreaders and check whether the video content is tampered with. Such watermarks are difficult to detect or modify, yet they don't compromise the video integrity and watch experience.

A digital watermark is transparent, robust, secure, and traceable. Currently, CI's digital watermark service well protects the copyright of content in Tencent services such as Tencent Video and WeChat Channels and has been certified by ChinaDRM.

You can also customize the digital watermark content. The effects before and after a digital watermark is added are as shown below:



Note:

In addition to the video digital watermark feature, CI also offers other copyright protection solutions like video DNA and video encryption. To try them out, [contact us](#) for application.

Overview of File Copyright Protection Solutions

CI provides the following two file copyright protection solutions for your choice as needed:

Using image processing to convert files to watermarked images

CI's file transcoding feature can transcode a COS file to images by adding parameters to the file download link. It can add a custom watermark at the same time by adding watermark parameters to the link. This feature implements lightweight file distribution while preventing the file content from being stolen. Below is a sample file link:



```
https://ci-h5-demo-1258125638.cos.ap-chengdu.myqcloud.com/defaults/defaultSlides.pp
```

Converting files into watermarked HTML webpages

The file-to-HTML conversion feature allows you to **directly view the file content on a webpage** while retaining file interactions, such as animations and transitions in slides as well as sheet switch in spreadsheets on the webpage.

You can also add relevant parameters to the file link to convert the file and configure **watermark and copy protection features**. Below is a sample file link:



```
https://ci-h5-demo-1258125638.cos.ap-chengdu.myqcloud.com/defaults/defaultSlides.pp
```

Directly adding watermarks to PDF files

You can upload a PDF file to a bucket and call the PDF watermark API to add a watermark to it. In addition, you can also set the bucket access permission to private-read and generate a signature for the file link with parameters. This prevents the original file from being read without authorization.

Note:

This API is currently in beta. To try it out, [contact us](#) for application.

Image Processing Practices

Downsizing Image with CI

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Overview

As your business grows, the used storage space and traffic of [COS](#) increase rapidly, especially for image services, the most critical part of the web. Due to the sync loading feature of HTML, an image is usually loaded only after the previous image is fully loaded, yet lowering the resolution locally will lose most of the details in images. [CI](#) provides the extremely cost-effective [image compression](#) feature to greatly reduce the image size. This document takes HEIF as an example.

For billing details, see [Image Advanced Compression Fees](#).

The HEIF compression feature can convert images into the HEIF format. HEIF offers over 80% smaller file sizes at the same quality compared with JPG and has the highest compression speed.

AVIF is a new compressed image format based on AV1, which can only be viewed in newer browsers.

Image compatibility is as follows:

Format	Android 12	iOS 15.4	Windows 11	Compression
PNG	✓	✓	✓	None
JPG	✓	✓	✓	None
AVIF	×	×	Extension required	↓ 50+%
HEIF	✓	✓	Extension required	↓ 30+%
TPG	QQ Browser only	QQ Browser only	QQ Browser only	↓ 50+%
WebP	✓	✓	✓	↓ 20+%

Prerequisites

You have logged in to the [CI console](#) and activated the CI service.

You have created and bound a storage bucket. For more information, see [Configuring Buckets](#).

You have activated [image advanced compression](#).

Directions

Processing existing data

Processing through job

1. Create a template as instructed in Image Processing.

The main parameters are as follows:

Resize Mode: Select **No-scaling**.

Output Format: Select **AVIF** or **HEIF**.

2. Create a job as instructed in Creating Image Processing Job.

Note:

The operations are tedious if you need to batch process data. In this case, we recommend you [process data through a workflow](#).

Processing through workflow

1. Create a template as instructed in Image Processing.

The main parameters are as follows:

Resize Mode: Select **No-scaling**.

Output Format: Select **AVIF** or **HEIF**.

2. Create an image workflow as instructed in Creating Workflow.

The main parameters are as follows:

Input Bucket Name: Select the bound bucket.

Format Match: Select **Image file**.

Configure Workflow: Select **Image processing**.

3. On the workflow management page, find the newly created workflow and click **Run Workflow**.

4. Set the scanning mode to **Run workflow for multiple files**, configure other parameters as needed, and click **Run workflow**. For detailed directions, see [Triggering Workflow](#).

Processing uploaded data

Data workflow (recommended)

On the workflow management page, find the newly created workflow and set **Run upon Upload** to **Enabled**.

API method

Images are only processed in real time and cannot be stored as files through the API method. Therefore, you need to keep adding parameters during image upload to have images automatically stored. For more information, see [Persistent Image Processing](#).

Here, you need to customize the `rules` parameter, which can be viewed in the image processing section of the workflow details.

Summary

Image size comparison

The following is an example:

Original Image (MB)	HEIF (MB)	AVIF (MB)
7.91	3.2	1.8
18	13	3.2
30	14	6.9

As can be clearly seen, HEIF and AVIF greatly reduce the size of the original JPG or PNG image. If there are 100,000 10 MB images in a folder, AVIF can save more than 300 GB space, which reduces storage fees and traffic fees by 24 USD and 102 USD respectively every month in a STANDARD storage pack for regions in the Chinese mainland.

Strengths and shortcomings

Type	Advanced Compression	Traditional Compression
Speed	Fast processing in the cloud	Local processing subject to device conditions
Definition	Almost lossless	Lossy
Compression ratio	Very high	General
Cost	Low	Subject to device conditions
Compatibility	Medium	Very high

We recommend you use the HEIF format on iOS and use WebP or AVIF format on Windows.

FAQs

What should I do if processing fails for large images?

Size limit:

The input image cannot be larger than 32 MB, with its width and height not exceeding 30,000 pixels respectively, and the total number of pixels not exceeding 250 million.

The width and height of the output image cannot exceed 9,999 pixels respectively.

For an animated input image, the total number of pixels (width * height * number of frames) cannot exceed 250 million.

If the above limits are exceeded, processing will fail. We recommend you use Photoshop or other software tools to reduce the image size before processing.

What should I do if processing cannot start?

Check whether you have activated the CI service and enabled the image advanced compression feature and whether your account balance is sufficient.

What should I do if processing takes too long?

Generally speaking, it takes 10 minutes to process an image. If processing takes a longer time, restart the job. If the problem persists, check whether the image content is too complex and optimize it if so.

If the problem persists, [submit a ticket](#) for assistance.

Hybrid Watermarking

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Overview

The basic image processing feature of CI enables you to add an [image](#) or [text watermark](#) to images. However, in actual business scenarios, an image may contain both a fixed logo watermark and a dynamically changing text watermark (username). For such scenarios, the following integration methods are provided. You can select an appropriate one based on your actual business scenario.

Method Comparison

Method	Pros	Cons
1	It is easy to integrate and implement.	The watermark size cannot change dynamically with the image size or tiled.
2	It can better fit the image when the image size changes frequently.	It is difficult to integrate and is charged processing fees twice.

How to Use

Method 1. Using a pipeline operator to add two types of watermarks with only one URL

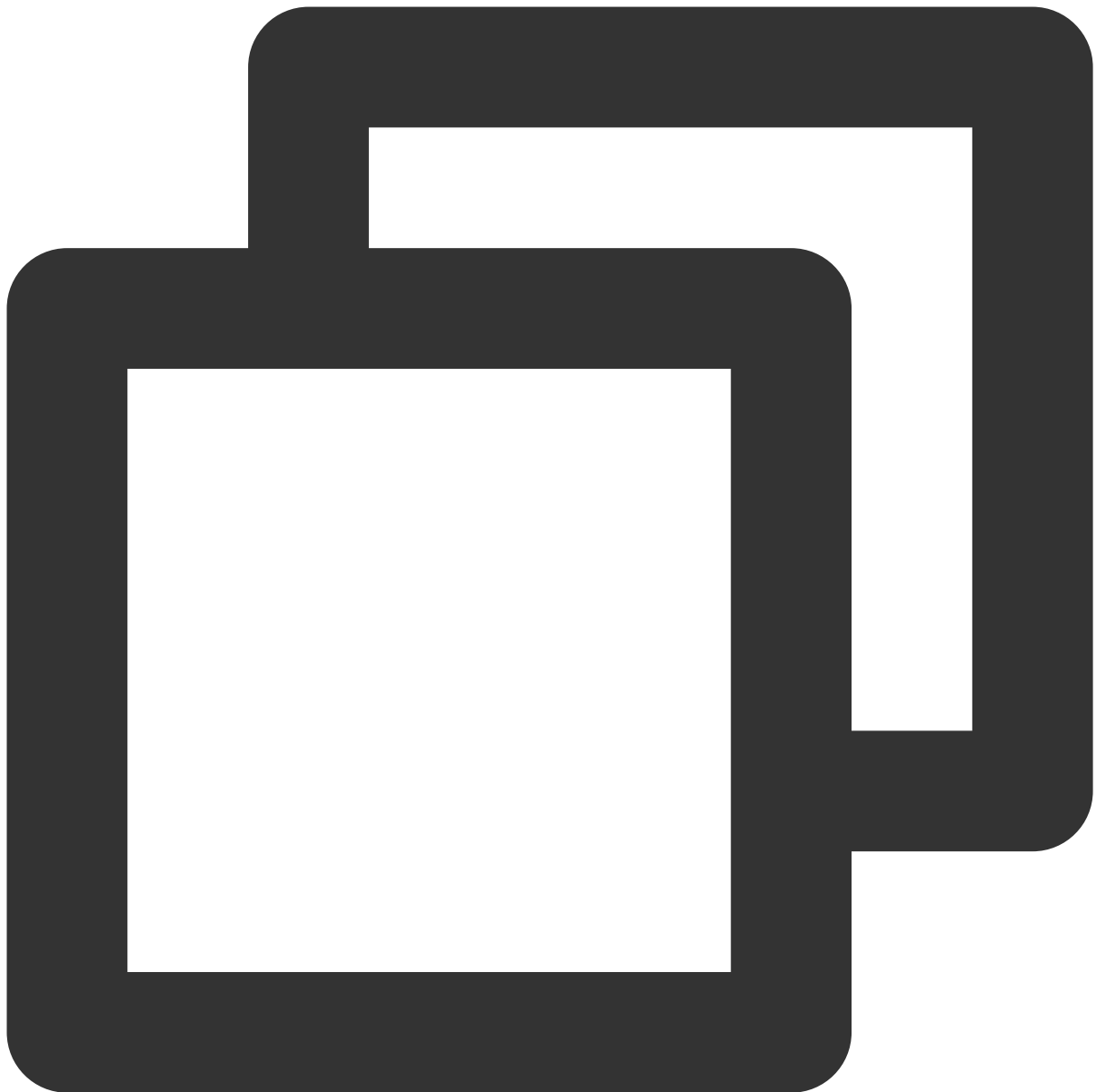
The basic image processing feature of CI allows you to use [pipeline operators](#) "|" to process an image multiple times with only one request at a one-time charge of processing and traffic fees. This method greatly reduces the latency and additional fees caused by repeated requests.

Directions

1. Define the image watermark parameters as instructed in [Image Watermarking](#).

If you are unfamiliar with API parameters, you can add a style in the console to generate parameters as instructed in [Basic Processing](#).

Below are the processing parameters:



```
watermark/1/image/aHR0cDovL2V4YW1wbGVzLTEyNTgxMjU2MzguY29zLmFwLWd1YW5nemhvdS5teXFjb
```

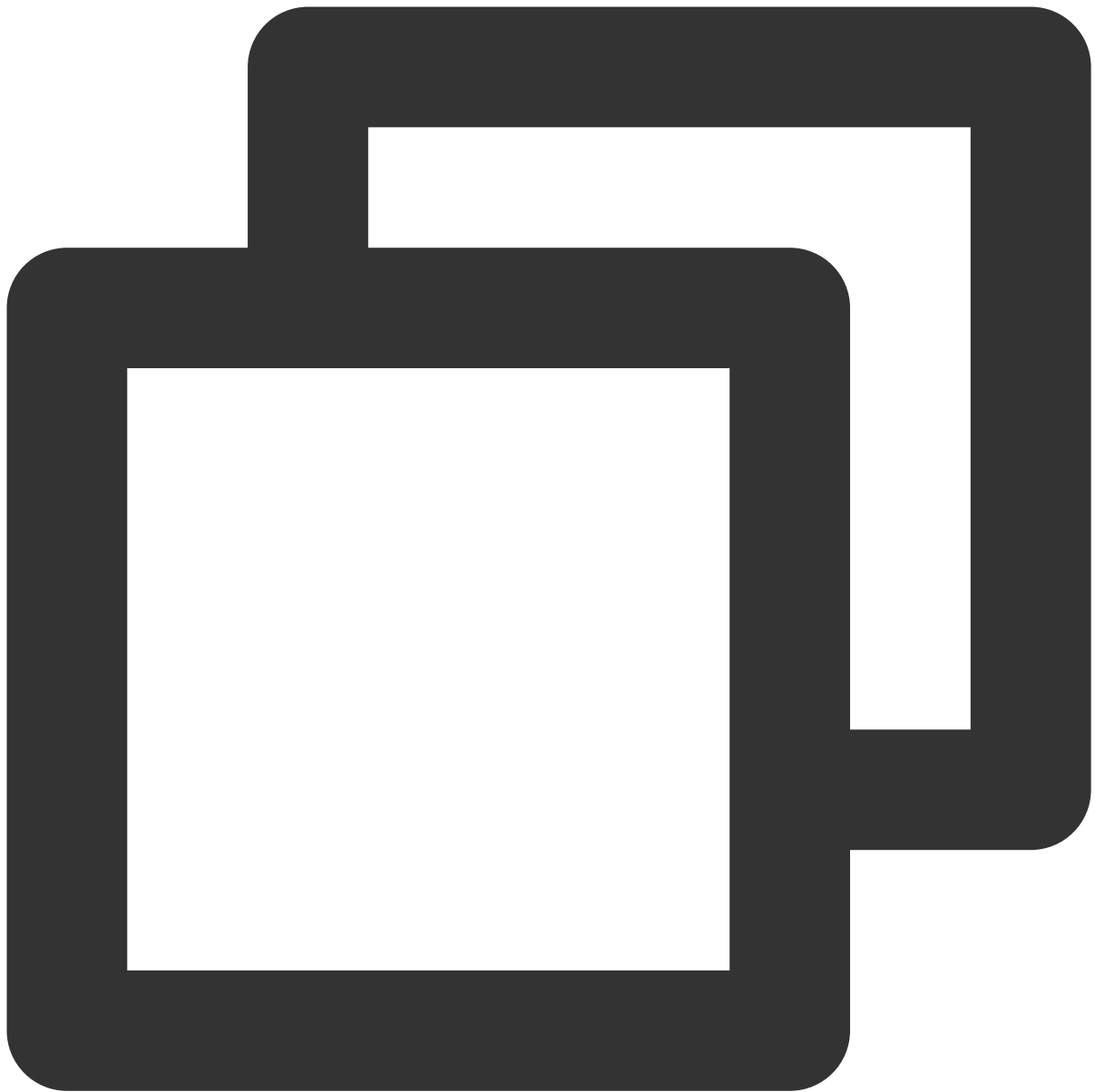
Note:

Here,

`aHR0cDovL2V4YW1wbGVzLTEyNTgxMjU2MzguY29zLmFwLWd1YW5nemhvdS5teXFjbG91ZC5jb20vbG9nby5wbmc` is the URL-safe Base64-encoded URL of the image watermark (image stored in the COS bucket).

2. Define the text watermark parameters as instructed in [Text Watermarking](#).

If you are unfamiliar with API parameters, you can add a style in the console to generate parameters as instructed in [Basic Processing](#).

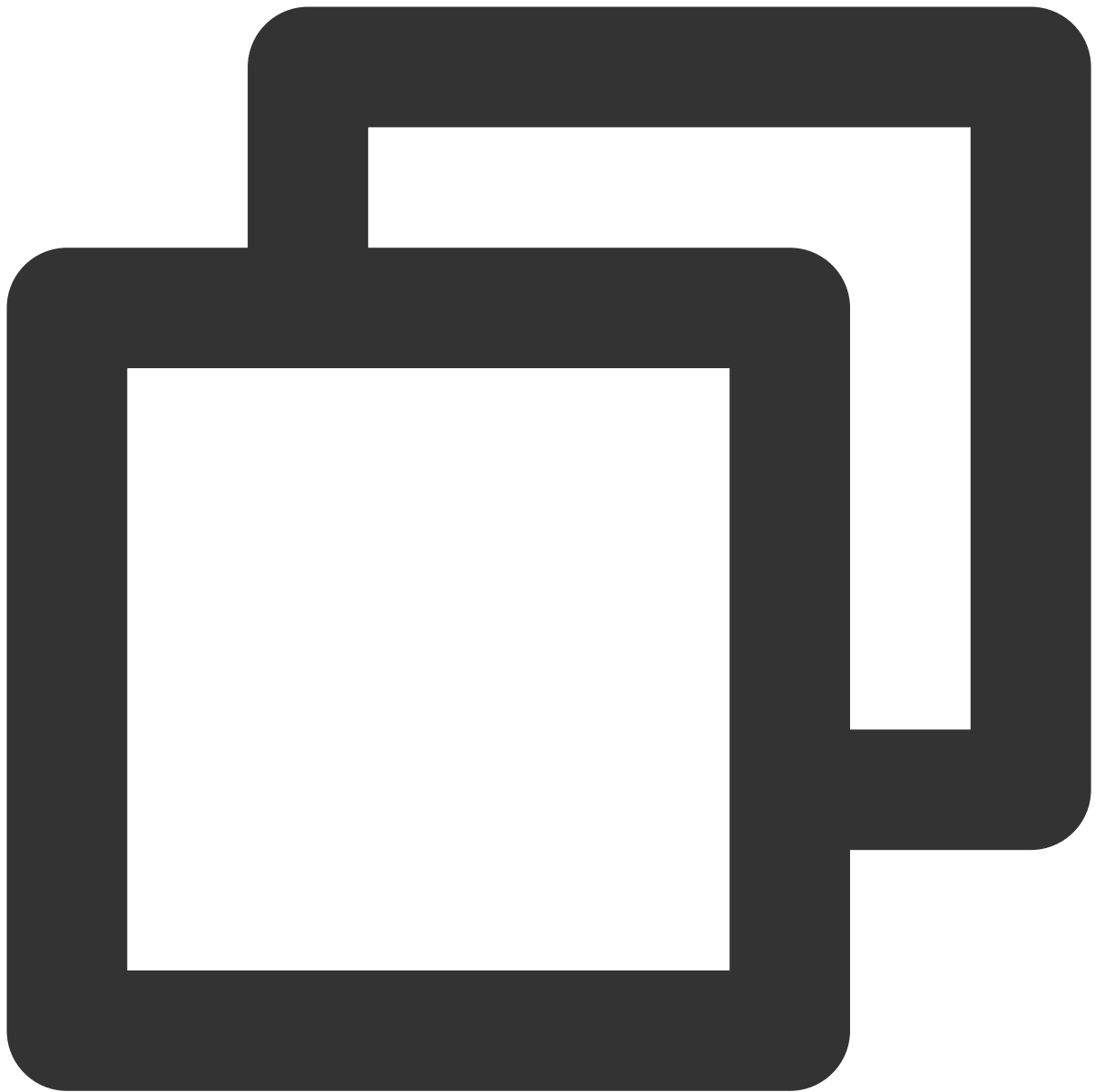


```
watermark/2/text/VU100iAxMjM0NTY3OA/font/SGVsdmV0aWNhLmRmb250/fontsize/36/fill/IzAw
```

Note:

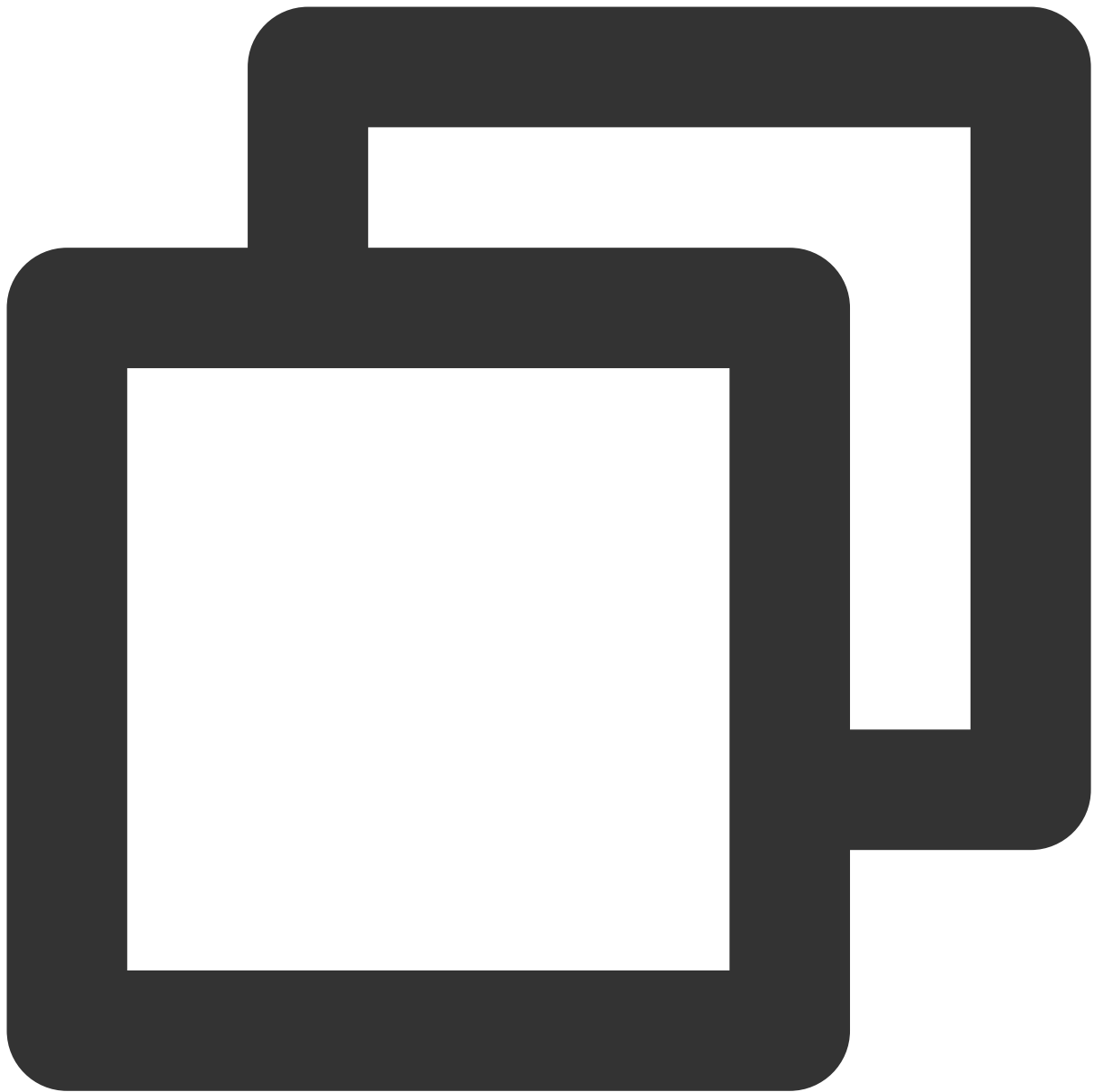
Here, `VU100iAxMjM0NTY3OA` is the URL-safe Base64-encoded text of `UIN: 12345678` .

3. Use a pipeline operator to concatenate image and text watermark parameters:



```
watermark/2/text/VU100iAxMjM0NTY3OA/font/SGVsdmV0aWNhLmRmb250/fontsize/36/fill/IzAw
```

4. Add the concatenated parameters at the end of the image download URL:



```
https://examples-1258125638.cos.ap-guangzhou.myqcloud.com/preview.png?watermark/2/t
```

To shorten the URL, you can add the part of the image watermark (unchanged) as the `watermark1` style in the console as instructed in [Basic Processing](#).

In this way, the URL can be shortened to:



```
https://examples-1258125638.cos.ap-guangzhou.myqcloud.com/preview.png/watermark1?wa
```

If you need to change the text content later, you only need to replace `VU100iAxMjM0NTY3OA` in the URL with the updated Base64 code; for example, `UIN: 88888888` is encoded into `VU100iA4ODg4ODg4OA`, so you only need to change the URL to the following content to replace the text:



```
https://examples-1258125638.cos.ap-guangzhou.myqcloud.com/preview.png/watermark1?wa
```

Method 2. Printing the text and image watermarks onto a transparent image and using the output image as the final image watermark

1. Upload a 400x400 px transparent PNG image to the bucket as instructed in [File Management](#).

For example: `https://examples-1258125638.cos.ap-guangzhou.myqcloud.com/transparent.png`

2. Generate and concatenate image and text watermark parameters as instructed in **steps 1–3 of method 1**.

3. Add the concatenated parameters at the end of the download URL of the transparent PNG image:



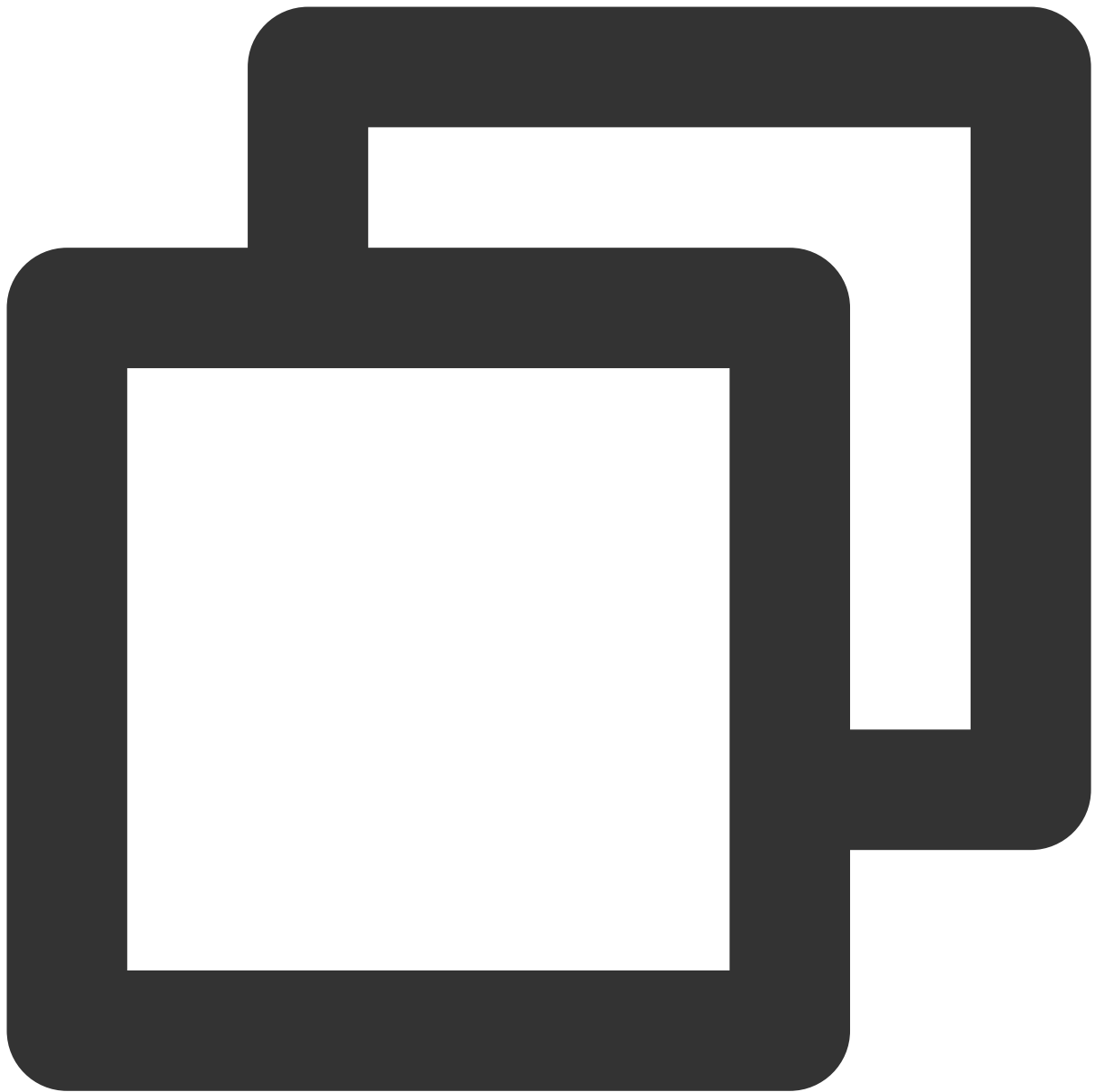
```
https://examples-1258125638.cos.ap-guangzhou.myqcloud.com/transparent.png?watermark
```

4. Use the transparent image as the image watermark and add the watermark to the original image:



```
https://examples-1258125638.cos.ap-guangzhou.myqcloud.com/preview.png?watermark/1/i
```

You can also use the `scatype` parameter to scale the image watermark proportionally to the image size and use the `batch` parameter to tile the image watermark.



<https://examples-1258125638.cos.ap-guangzhou.myqcloud.com/preview.png?watermark/1/i>

Workflow Practices

Using Custom Function to Manage COS Files

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Overview

COS workflow provides a series of processing capabilities for media files such as audios, videos, and images. You can flexibly and quickly create a media processing workflow as needed. To satisfy your needs for customization and guarantee the flexibility, COS workflow offers the custom function feature for you to implement custom logic in SCF by configuring function nodes in a workflow.

To make this feature easier to use, COS workflow provides common function feature templates and integrates their creation to node configuration steps, facilitating subsequent processing of source and output files. Currently, supported basic operations include modifying object attributes, moving objects, and deleting objects.

Use Cases

You want to move or transition source files after media processing to reduce the storage costs.

You want to tag output files or modify their headers after media processing to facilitate subsequent business use.

Solution Strengths

Out-of-the-box service: You can use the service after simple configuration, with no need to develop the function logic or care about the complex deployment process.

Flexible configuration: You can configure nodes of common features as needed to perform different business operations on source and output files.

Easy extension: You can modify the function logic to meet more customization requirements.

Directions

1. Log in to the [COS console](#).
2. Click **Bucket List** on the left sidebar.
3. Click the target bucket to enter the bucket details page.
4. On the left sidebar, select **Data Processing Workflow > Workflow Management** and click **Create Workflow**.

5. On the workflow creation page, configure the media processing node required by the business such as

Audio/Video Transcoding. For more information, see [Workflow](#).

6. On the workflow creation page, add the **Custom Function** node and select a required common feature function.

If you haven't created a function of this type, click **Create**.

Create a common feature function as follows:

6.1 Enter the basic function configuration: Enter the function name prefix, select **Authorize SCF Service**, and click **Next**.

6.2 Configure attributes: Set the storage class and custom header based on the business needs and click **Next**.

6.3 Select the object to be processed. You can perform this operation only on the workflow source file.

6.4 Click **OK**.

6.5 COS workflow encapsulates processes such as function creation, version release, and alias-based stream switch.

Wait for the workflow to be created.

6.6 After the creation, select the function instance just created and click **OK**.

6.7 Click **Save**.

Operation Verification

1. Log in to the [COS console](#).

2. Click **Bucket List** on the left sidebar.

3. Click the target bucket to enter the bucket details page.

4. On the left sidebar, select **Data Processing Workflow > Workflow** to enter the workflow management page.

5. Enable the workflow just created, go to the specified bucket, upload a media file, and wait for the workflow to be executed.

6. After the workflow execution is completed:

You can see that media processing succeeded, and the output file was generated.

The storage class and custom header have been set for the source file.