## Image Recognition

# API Reference

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# 1 Before You Start

## 1.1 Overview

Image Recognition is a technology that uses computers to process, analyze, and understand images to identify objects in different modes, including Image Tagging.

Image Recognition provides services through open Application Programming Interfaces (APIs). You can obtain the inference result by accessing and calling APIs in real time. It helps you collect key data automatically and build an intelligent business system, thereby improving service efficiency.

You can perform related operations based on the API description, syntax, parameter description, and examples provided in this document. For details about all supported operations, see **API Overview**.

If you plan to access Image Recognition through an API, ensure that you are familiar with Image Recognition concepts. For details, see the **Image Recognition Service Overview**.

Additionally, Image Recognition offers software development kits (SDKs) for multiple programming languages. For details about how to use SDKs, see **HUAWEI CLOUD SDKs**.

## 1.2 API Calling

Image Recognition provides Representational State Transfer (REST) APIs, allowing you to call APIs using HTTPS. For details about API calling, see **Calling APIs**.

## 1.3 Endpoints

An endpoint is the request address for calling an API. Endpoints vary depending on services and regions. For the endpoints of all services, see **Regions and Endpoints**.

**Table 1-1** lists the endpoints of Image Recognition. Select a desired one based on the service requirements.

**Table 1-1** Endpoints for Image Recognition

| Region | Endpoint Region | Endpoint |
| --- | --- | --- |
| CN-Hong Kong | ap-southeast-1 | image.ap-southeast-1.myhuaweicloud.com |
| LA-Santiago | la-south-2 | image.la-south-2.myhuaweicloud.com |

# 1.4 Limitations and Constraints

For details, see the API description and **Constraints** in the *Image Recognition Service Overview*.

# 1.5 Concepts

- Account

  An account is created upon successful registration with HUAWEI CLOUD. The account has full access permissions for all of its cloud services and resources. It can be used to reset user passwords and grant user permissions. The account is a payment entity and should not be used directly to perform routine management. For security purposes, create IAM users and grant them permissions for routine management.

- User

  A user is created in IAM using an account to use cloud services. Each user has its own identity credentials (password and access keys).

  An IAM user can view the account ID and user ID on the **My Credentials** page of the console. The account name, username, and password will be required for API authentication.

- Region

  A region is a physical location where cloud resources are deployed. Availability zones (AZs) in the same region can communicate with each other over an intranet but AZs in different regions cannot communicate with each other. Deploying cloud resources in different regions can better suit certain user requirements or comply with local laws or regulations.

- Availability Zone (AZ)

  AZs are physically isolated locations in a region, but are interconnected through an internal network for enhanced application availability.

# 2 API Overview

Image Recognition provides Huawei-developed APIs. By using the APIs of Image Recognition, you can perform the operations described in **Table 2-1**.

**Table 2-1** API description

| API | Description |
| --- | --- |
| **Image Tagging (v1.0)** | This API can recognize hundreds of scenes and thousands of objects and their properties in natural images, making intelligent album management, picture retrieval and classification, and scene- or object-based advertising more intuitive. |

# 3 Calling APIs

## 3.1 Applying for a Service

Before using Image Recognition, you must apply for your desired services of Image Recognition. The following is the procedure for applying for services of Image Recognition.

NOTE

- If you use Image Recognition for the first time, apply for your desired services first. You only need to apply for a service once.

**Step 1** Log in to the HUAWEI CLOUD product page and click **Console** in the upper right corner. The **Console** page is displayed.

**Step 2** Click **Service List** and choose **AI > Image Recognition**. The **Image Recognition** management console is displayed.

**Step 3** On the **Commercial Services** or **Beta Services** tab page, find out your desired services. For details about how to apply for a beta service, go to **Step 4**. For details about how to apply for a commercial service, go to **Step 5**.

**Step 4** Click **Apply for Open Beta Test**.

NOTE

The OBT application is manually reviewed. Generally, it takes one to two days for approval. In the case of holidays, the approval may take longer.

**Step 5** Click **Apply for Service**.

**Step 6** After the OBT or service application is approved, the service is enabled.

**Step 7** If you need to perform image recognition on data stored in OBS, enable OBS authorization. For details, see the **Image Recognition Getting Started**.

**----End**

# 3.2 Making an API Request

This section describes the structure of a REST API request, and uses the IAM API for **obtaining a user token** as an example to demonstrate how to call an API. The obtained token can then be used to authenticate the calling of other APIs.

## Request URI

A request URI is in the following format:

**{URI-scheme} :// {Endpoint} / {resource-path} ? {query-string}**

Although a request URI is included in the request header, most programming languages or frameworks require the request URI to be transmitted separately.

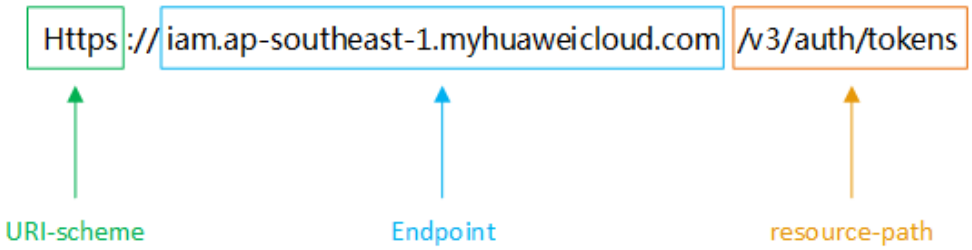
**Table 3-1** URI parameter description

| Parameter | Description |
| --- | --- |
| URI-scheme | Protocol used to transmit requests. All APIs use HTTPS. |
| Endpoint | Domain name or IP address of the server bearing the REST service. The endpoint varies between services in different regions. It can be obtained from **Endpoints**.<br>For example, the endpoint of IAM in the **CN-Hong Kong** region is **iam.ap-southeast-1.myhuaweicloud.com**. |
| resource-path | Access path of an API for performing a specified operation.<br>Obtain the path from the URI of an API. For example, the **resource-path** of the API used to obtain a user token is **/v3/auth/tokens**. |
| Query string | Query parameter, which is optional. Ensure that a question mark (?) is included before a query parameter that is in the format of "Parameter name=Parameter value". For example, **? limit=10** indicates that a maximum of 10 pieces of data is to be viewed. |

For example, to obtain an IAM token in the **CN-Hong Kong** region, obtain the endpoint of IAM (**iam.ap-southeast-1.myhuaweicloud.com**) for this region and the **resource-path** (**/v3/auth/tokens**) in the URI of the API used to **obtain a user token**. Then, construct the URI as follows:

```
https://iam.ap-southeast-1.myhuaweicloud.com/v3/auth/tokens
```

**Figure 3-1** Example URI




NOTE

To simplify the URI display in this document, each API is provided only with a **resource-path** and a request method. The **URI-scheme** of all APIs is **HTTPS**, and the endpoints of all APIs in the same region are identical.

## Request Methods

The HTTP protocol defines the following request methods that can be used to send a request to the server:

**Table 3-2** HTTP-defined request methods

| Method | Description |
| --- | --- |
| GET | Requests the server to return specified resources. |
| PUT | Requests the server to update specified resources. |
| POST | Requests the server to add resources or perform special operations. |
| DELETE | Requests the server to delete specified resources, for example, an object. |
| HEAD | Same as GET except that the server must return only the response header. |
| PATCH | Requests the server to update partial content of a specified resource.<br>If the resource does not exist, a new resource will be created. |

For example, in the case of the API used to **obtain a user token**, the request method is **POST**. The request is as follows:

```
POST https://iam.ap-southeast-1.myhuaweicloud.com/v3/auth/tokens
```

## Request Header

You can also add additional header fields to a request, such as the fields required by a specified URI or HTTP method. For example, to request for the authentication information, add **Content-Type**, which specifies the request body type.

Common request header fields are as follows:

**Table 3-3** Common request header fields

| Parameter | Description | Mandatory | Example |
| --- | --- | --- | --- |
| X-Sdk-Date | Specifies the time when the request is sent. The time is in **YYYYMMDD'T'HHMMSS'Z'** format.<br>The value is the current GMT time of the system. | No<br>This field is mandatory for AK/SK-based authentication. | 20150907T101459Z |
| Authorization | Specifies signature authentication information.<br>The value can be obtained from the request signing result. | No<br>This field is mandatory for AK/SK-based authentication. | SDK-HMAC-SHA256 Credential=ZIRRKMTWPTQFQI1WKNKB/20150907//ec2/sdk_request, SignedHeaders=content-type;host;x-sdk-date, Signature=55741b610f3c9fa3ae40b5a8021ebf7ebc2a28a603fc62d25cb3bfe6608e1994 |
| Host | Specifies the server domain name and port number of the resource being requested. The value can be obtained from the URL of a service API. The value is *hostname[:port]*.<br>If the port number is not specified, the default port is used. The default port number for **https** is **443**. | No<br>This field is mandatory for AK/SK-based authentication. | code.test.com<br>or<br>code.test.com:443 |
| Content-Type | Specifies the MIME type of the request body. | Yes | application/json |
| Content-Length | Specifies the length of the request body. The unit is byte. | This field is mandatory for POST and PUT requests, but must be left blank for GET requests. | 3495 |

| Parameter | Description | Mandatory | Example |
| --- | --- | --- | --- |
| X-Project-Id | Specifies the project ID. This field is used to obtain the token for each project.<br>This field is mandatory for the request from a DeC or multi-project user. | No | e9993fc787d94b6c886cbaa340f9c0f4 |
| X-Auth-Token | Specifies the user token. | No<br>This field is mandatory for token-based authentication. | - |

NOTE

In addition to supporting token-based authentication, public cloud APIs also support authentication using access key ID/secret access key (AK/SK). During AK/SK-based authentication, an SDK is used to sign the request, and the **Authorization** (signature information) and **X-Sdk-Date** (time when the request is sent) header fields are automatically added to the request.

For more information about authentication using the AK/SK, see the **API Request Signing Guide**.

For details about other fields in the header, see the HTTPS protocol documentation.

The API used to **obtain a user token** does not require authentication. Therefore, only the **Content-Type** field needs to be added to requests for calling the API. An example of such requests is as follows:

```
POST https://iam.ap-southeast-1.myhuaweicloud.com/v3/auth/tokens
Content-Type: application/json
```

## Request Body

The body of a request is often sent in a structured format (JSON or XML) as specified in the **Content-Type** header field. The request body transfers content except the request header.

The request body varies between APIs. Some APIs do not require the request body, such as the APIs requested using the GET and DELETE methods.

In the case of the API used to **obtain a user token**, the request parameters and parameter description can be obtained from the API request. The following provides a sample request with the body included. Set the username (**username**), account name (**domainname**), login password (********), and project name (**xxxxx**). To learn how to obtain these values, see **Obtaining Account, IAM User, and Project Information**.

> **NOTE**
>
> The **scope** parameter specifies where a token takes effect. You can set **scope** to an account or a project under an account. In the following example, the token takes effect only for the resources in a specified project. For more information about this API, see **Obtaining a User Token**.

```
POST https://iam.ap-southeast-1.myhuaweicloud.com/v3/auth/tokens
Content-Type: application/json

{
    "auth": {
        "identity": {
            "methods": [
                "password"
            ],
            "password": {
                "user": {
                    "name": "username",
                    "password": "********",
                    "domain": {
                        "name": "domainname"
                    }
                }
            }
        },
        "scope": {
            "project": {
                "name": "xxxxx"
            }
        }
    }
}
```

If all data required for the API request is available, you can send the request to call the API through **curl**, **Postman**, or coding. In the response to the API used to **obtain a user token**, **x-subject-token** is the desired user token. This token can then be used to authenticate the calling of other APIs.

# 3.3 Authentication

Requests for calling an API can be authenticated using either of the following methods:

- Token-based authentication: Requests are authenticated using a token.
- AK/SK-based authentication: Requests are authenticated by encrypting the request body using an AK/SK pair.

## Token-based Authentication

> **NOTE**
>
> The validity period of a token is 24 hours. When using a token for authentication, cache it to prevent frequently calling the IAM API used to obtain a user token.

A token specifies temporary permissions in a computer system. During API authentication using a token, the token is added to requests to get permissions for calling the API.

When calling the API to **obtain a user token**, you must set **auth.scope** in the request body to **project**.

```
{
    "auth": {
        "identity": {
            "methods": [
                "password"
            ],
            "password": {
                "user": {
                    "name": "username",
                    "password": "********",  //The password is that of the current account. If you log in using a subaccount, set this parameter to the password of the subaccount.
                    "domain": {
                        "name": "domainname"
                    }
                }
            }
        },
        "scope": {
            "project": {
                "name": "xxxxxxxx"
            }
        }
    }
}
```

After a token is obtained, the **X-Auth-Token** header field must be added to requests to specify the token when calling other APIs. For example, if the token is **ABCDEFJ....**, **X-Auth-Token: ABCDEFJ....** can be added to a request as follows:

```
GET https://iam.ap-southeast-1.myhuaweicloud.com/v3/auth/projects
Content-Type: application/json
X-Auth-Token: ABCDEFJ....
```

## Procedure

To use token-based authentication, obtain the user token, and add **X-Auth-Token** to the request header of the service API when making an API call.

This section describes how to make an API call using token-based authentication.

**Step 1** Send **POST https://***IAM endpoint***/v3/auth/tokens** to obtain the endpoint of IAM and the region name in the body. For details, see **Regions and Endpoints**.

A sample request body is as follows:

```
{
  "auth": {
    "identity": {
      "methods": [
        "password"
      ],
      "password": {
        "user": {
          "name": "username",  //Username
          "password": "password",  //The password is that of the current account. If you log in using a subaccount, set this parameter to the password of the subaccount.
          "domain": {
            "name": "domainname"  //Account name
          }
        }
      }
    },
    "scope": {
      "project": {
        "name": "ap-southeast-1" //Region of Image Recognition
      }
    }
```

```
 }
}
```

NOTE

To obtain the username and account name in the preceding sample code, do as follows:

1. Log in to the management console after registration.
2. Hover the cursor on the username and choose **My Credentials** from the drop-down list. Check the username and account. The password is the one corresponding to the username.
3. For **project**, see the name of the valid project in the project list.

**Step 2** Obtain the token. The token value is the **X-Subject-Token** value in the response header.

**Step 3** To call a service API, add the **X-Auth-Token** header to the request and set its value to the token obtained in **Step 2**.

**----End**

## Example

- cURL
  a. Create the **data.json** file. The following shows the content of the file, in which you need to change ***username***, ***password***, and ***domainname*** as required.

```
{
    "auth": {
        "identity": {
            "password": {
                "user": {
                    "name": "username",
                    "password": "password",
                    "domain": {
                        "name": "domainname"
                    }
                }
            },
            "methods": [
                "password"
            ]
        },
        "scope": {
            "project": {
                "name": "ap-southeast-1"
            }
        }
    }
}
```

  b. Run the following command to obtain the token. The **header.txt** file is created in the current directory.

```
curl -X POST https://iam.myhuaweicloud.com/v3/auth/tokens --header 'content-type: application/json'  -d "@data.json" -D header.txt
```

  c. Open the **header.txt** file. The following information is displayed. The value of **X-Subject-Token** is the obtained token.

```
HTTP/1.1 201 Created
...
Transfer-Encoding: chunked
Connection: keep-alive
X-Iam-Trace-Id: ed91b739-783X-409e-96cc-74573adf027a
X-Subject-Token: MIIMkgYJKoZIhvcNAQcCoIIM...
```

```
Strict-Transport-Security: max-age=31536000; includeSubdomains;
...
```

d. Run the following command to call the service, for example, Image Tagging. Set **x-auth-token** to the token obtained in the previous step.

```
curl -X POST https://image.ap-southeast-1.myhuaweicloud.com/v1.0/image/tagging \
  --header 'Content-Type: application/json' \
  --header "X-Auth-Token: $TOKEN" -d '
 {
      "image":"",
      "url":"https://ais-sample-data.obs.myhuaweicloud.com/tagging-normal.jpg",
      "language": "zh",
      "limit": 5,
      "threshold": 30.0
}'
```

- Java

```
package com.huawei.ais.demo;

import java.io.File;
import java.io.IOException;
import java.net.URISyntaxException;

import com.alibaba.fastjson.JSON;
import com.alibaba.fastjson.serializer.SerializerFeature;
import org.apache.commons.codec.binary.Base64;
import org.apache.commons.io.FileUtils;
import org.apache.commons.io.IOUtils;
import org.apache.http.Header;
import org.apache.http.HttpResponse;
import org.apache.http.entity.ContentType;
import org.apache.http.entity.StringEntity;
import org.apache.http.message.BasicHeader;

import com.alibaba.fastjson.JSONArray;
import com.alibaba.fastjson.JSONObject;
import com.huawei.ais.sdk.util.HttpClientUtils;

/**
 * Access the service using token-based authentication.
 */
public class TokenDemo {
        private static final String projectName = "ap-southeast-1"; // Configuration of the CN-Hong
Kong region
    public static int connectionTimeout = 5000; //Timeout limit for connecting to the target URL
    public static int connectionRequestTimeout = 1000;//Timeout limit for obtaining available
connections from the connection pool
    public static int socketTimeout =  5000;//Timeout limit for obtaining a server response

    /**
     * Construct a token request object for accessing the service using token-based authentication.
     *
 * @param username Username
 * @param passwd Password
 * @param domainName Domain name
 * @param projectName Project name
 * @return Construct the JSON object of the access.
     */
    private static String requestBody(String username, String passwd, String domainName, String
projectName) {
        JSONObject auth = new JSONObject();

        JSONObject identity = new JSONObject();

        JSONArray methods = new JSONArray();
        methods.add("password");
        identity.put("methods", methods);

        JSONObject password = new JSONObject();
```

```
        JSONObject user = new JSONObject();
        user.put("name", username);
        user.put("password", passwd);

        JSONObject domain = new JSONObject();
        domain.put("name", domainName);
        user.put("domain", domain);

        password.put("user", user);

        identity.put("password", password);

        JSONObject scope = new JSONObject();

        JSONObject scopeProject = new JSONObject();
        scopeProject.put("name", projectName);

        scope.put("project", scopeProject);

        auth.put("identity", identity);
        auth.put("scope", scope);

        JSONObject params = new JSONObject();
        params.put("auth", auth);
        return params.toJSONString();
    }

    /**
 * Obtain the token parameter. Note that this function aims to extract the token from the header in the HTTP response body.
 * The parameter name is X-Subject-Token.
     *
     * @param username   Username
 * @param password   Password
 * @param projectName Region name.
 * @return Response body containing the token string
     * @throws URISyntaxException
     * @throws UnsupportedOperationException
     * @throws IOException
     */
    private static String getToken(String username, String password, String projectName)
            throws URISyntaxException, UnsupportedOperationException, IOException {
        String requestBody = requestBody(username, password, username, projectName);
String url ="https://iam.myhuaweicloud.com/v3/auth/tokens";
        Header[] headers = new Header[] { new BasicHeader("Content-Type",
ContentType.APPLICATION_JSON.toString()) };
        StringEntity stringEntity = new StringEntity(requestBody,
                "utf-8");

        HttpResponse response = HttpClientUtils.post(url, headers, stringEntity, connectionTimeout,
connectionRequestTimeout, socketTimeout);
        Header[] xst = response.getHeaders("X-Subject-Token");
        return xst[0].getValue();
    }

    /**
 * Use the file encoded by Base64 to access the service using token-based authentication.
 * @param token Token-based authentication string
 * @param formFile File path
     * @throws IOException
     */
    public static void requestImageTaggingBase64(String token, String formFile) throws IOException {
        String url = ServiceAccessBuilder.getCurrentEndpoint(projectName)+"/v1.0/image/tagging";
        Header[] headers = new Header[] {new BasicHeader("X-Auth-Token", token) ,new
BasicHeader("Content-Type", "application/json")};
        String requestBody=toBase64Str(formFile);
        StringEntity stringEntity = new StringEntity(requestBody, "utf-8");
        try {
            HttpResponse response = HttpClientUtils.post(url, headers, stringEntity, connectionTimeout,
```

```
connectionRequestTimeout, socketTimeout);
            System.out.println(response);
            String content = IOUtils.toString(response.getEntity().getContent());
            System.out.println(JSON.toJSONString(JSON.parse(content.toString()),
SerializerFeature.PrettyFormat));
        } catch (Exception e) {
            e.printStackTrace();
        }
    }

    /**
 * Object (JSON string) to be accessed whose binary file is encoded by Base64.
     *
 * @param file File name
 * @return Contain the JSON object in file character stream after Base64 encoding.
     * @throws IOException
     */
    public static String toBase64Str(String file) throws IOException{
        byte[] fileData = FileUtils.readFileToByteArray(new File(file));
        String fileBase64Str = Base64.encodeBase64String(fileData);
        JSONObject json = new JSONObject();
        json.put("image", fileBase64Str);
        return json.toJSONString();
    }

    /**
 * Invoke the main entrypoint function.
     */
    public static void main(String[] args) throws URISyntaxException, UnsupportedOperationException,
IOException {
        String username = "zhangshan";    // Enter the username.
        String password = "*******";      // Enter the password.

        String token = getToken(username, password, projectName);
        System.out.println(token);
        requestImageTaggingBase64(token, "data/image-tagging-demo-1.jpg");
    }
}
```

## AK/SK-based Authentication

NOTE

AK/SK-based authentication and token-based authentication apply only to requests whose body size is less than 12 MB.

In AK/SK-based authentication, AK/SK is used to sign requests and the signature is then added to the requests for authentication.

- AK: access key ID, which is a unique identifier used in conjunction with a secret access key to sign requests cryptographically.
- SK: secret access key used in conjunction with an AK to sign requests cryptographically. It identifies a request sender and prevents the request from being modified.

In AK/SK-based authentication, you can use an AK/SK to sign a request based on the signature algorithm or use a dedicated signature SDK to sign a request. For details about how to sign requests and use the signing SDK **API Request Signing Guide**.

**NOTICE**

The signing SDK is only used for signing requests and is different from the SDKs provided by services.

## Obtaining the AK/SK

**Step 1** Log in to the management console after registration.

**Step 2** Hover the cursor on the username and choose **My Credentials** from the drop-down list. On the **My Credentials** page, click the **Access Keys** tab.

**Step 3** Click **Add Access Key**. The **Add Access Key** dialog box is displayed.

**Step 4** Enter the login password of the current user and the verification code received in the email or on the mobile phone. Click **OK** to download the access key.

**NOTE**

- For users created in IAM that have not bound any email address or mobile number, only the login password needs to be entered
- Keep the access key secure.

**----End**

## Demo Code

The following code shows how to sign a request and use **AisAccess** to send an HTTPS request:

The demo code is classified into the following classes to demonstrate signing and sending the HTTP request:

**ResponseProcessUtils**: tool class used to process the returned result

**ImageTaggingDemo**: example class of using Image Tagging. It is used to configure the AK, SK, and region parameters.

- **ResponseProcessUtils.java**

```
package com.huawei.ais.demo;

import java.io.FileOutputStream;
import java.io.IOException;
import java.nio.ByteBuffer;
import java.nio.channels.FileChannel;

import org.apache.http.HttpResponse;

import com.alibaba.fastjson.JSON;
import com.alibaba.fastjson.JSONObject;
import com.cloud.sdk.util.Base64;
import com.huawei.ais.sdk.util.HttpClientUtils;

/**
 * Tool class used to verify the information returned from service access
 */
public class ResponseProcessUtils {

    /**
     * Print the HTTP status code after the service access is complete.
```

```
     *
     * @param response Response object
     */
    public static void processResponseStatus(HttpResponse response) {
        System.out.println(response.getStatusLine().getStatusCode());
    }

    /**
     * Convert the service access result into a character stream, which is used for displaying the JSON
data.
     *
     * @param response Response object
     * @throws UnsupportedOperationException
     * @throws IOException
     */
    public static void processResponse(HttpResponse response) throws
UnsupportedOperationException, IOException {
        System.out.println(HttpClientUtils.convertStreamToString(response.getEntity().getContent()));
    }

    /**
     * Create the Base64-encoded image file.
     *
     * @param response
     * @throws UnsupportedOperationException
     * @throws IOException
     */
    public static void processResponseWithImage(HttpResponse response, String fileName) throws
UnsupportedOperationException, IOException {
        String result = HttpClientUtils.convertStreamToString(response.getEntity().getContent());
        JSONObject resp = JSON.parseObject(result);
        String imageString = (String)resp.get("result");
        byte[] fileBytes = Base64.decode(imageString);
        writeBytesToFile(fileName, fileBytes);
    }

    /**
     *  Write a byte array to a file to create a binary file (for example, an image).
     * @param fileName File name
     * @param data Data
     * @throws IOException
     */
    public static void writeBytesToFile(String fileName, byte[] data) throws IOException{

        FileChannel fc = null;
        try {
            ByteBuffer bb = ByteBuffer.wrap(data);
            fc = new FileOutputStream(fileName).getChannel();
            fc.write(bb);

        } catch (Exception e) {
            e.printStackTrace();
            System.out.println(e.getMessage());
        }
        finally {
            fc.close();
        }
    }
}
```

- **ImageTaggingDemo.java**

```
package com.huawei.ais.demo.image;

import com.alibaba.fastjson.JSON;
import com.alibaba.fastjson.JSONObject;
import com.alibaba.fastjson.serializer.SerializerFeature;
import com.huawei.ais.demo.ResponseProcessUtils;
import com.huawei.ais.demo.ServiceAccessBuilder;
import com.huawei.ais.sdk.AisAccess;
import com.huawei.ais.sdk.util.HttpClientUtils;
```

```
import org.apache.commons.codec.binary.Base64;
import org.apache.commons.io.FileUtils;
import org.apache.http.HttpResponse;
import org.apache.http.entity.StringEntity;


import java.io.File;
import java.io.IOException;


/**
 *  Example class of using Image Tagging
 */
public class ImageTaggingDemo {
    //
    // Example function of using Image Tagging
    //
    private static void imageTaggingDemo() throws IOException {

// 1. Configure the basic information for accessing Image Tagging and generate a client connection object.

        AisAccess service = ServiceAccessBuilder.builder()
                    .ak("######")                    // your ak
                    .sk("######")                    // your sk
                    .region("ap-southeast-1")          // Configuration of Image Recognition in the CN-Hong Kong region
                    .connectionTimeout(5000)           // Timeout limit for connecting to the target URL
                    .connectionRequestTimeout(1000)    // Timeout limit for obtaining available connections from the connection pool
                    .socketTimeout(20000)              // Timeout limit for obtaining server response data
                    .build();

        try {
            //
            // 2. Construct the parameters required for accessing Image Tagging.
            //
            String uri = "/v1.0/image/tagging";
            byte[] fileData = FileUtils.readFileToByteArray(new File("data/image-tagging-demo-1.jpg"));
            String fileBase64Str = Base64.encodeBase64String(fileData);

            JSONObject json = new JSONObject();
            json.put("image", fileBase64Str);
            json.put("threshold", 60);
            StringEntity stringEntity = new StringEntity(json.toJSONString(), "utf-8");

            // 3. Pass the URI and required parameters for accessing Image Tagging.
            // Pass the parameters in JSON objects and call the service using POST.
            HttpResponse response = service.post(uri, stringEntity);

            // 4. Check whether the API call is successful. If 200 is returned, the API call succeeds. Otherwise, it fails.
            ResponseProcessUtils.processResponseStatus(response);

            // 5. Process the character stream returned by the service and output the recognition result.
            JSONObject jsonObject = JSON.parseObject(HttpClientUtils.convertStreamToString(response.getEntity().getContent()));
            System.out.println(JSON.toJSONString(JSON.parse(jsonObject.toString()), SerializerFeature.PrettyFormat));
        } catch (Exception e) {
            e.printStackTrace();
        } finally {

             // 6. Disconnect the client connection.
            service.close();
        }
    }
```

```
    //
    // Main entrypoint function
    //
    public static void main(String[] args) throws IOException {
        // Test entrypoint function
        imageTaggingDemo();
    }
}
```

# 3.4 Response

## Status Code

After sending a request, you will receive a response, including a status code, response header, and response body.

A status code is a group of digits, ranging from 1*xx* to 5*xx*. It indicates the status of a request. For more information, see **Status Codes**.

For example, if status code **201** is returned for calling the API used to **obtain a user token**, the request is successful.

## Response Header

Similar to a request, a response also has a header, for example, **Content-Type**.

**Table 3-4** Response header

| Parameter | Description |
| --- | --- |
| Content-Length | Indicates the length of the response body. The unit is byte. |
| Date | Indicates the time when a request response is returned. |
| Content-Type | Indicates the MIME type of the response body. |

In the response header fields for the API used to **obtain a user token**, the **x-subject-token** header field is the desired user token. See **Figure 3-2**. This token can then be used to authenticate the calling of other APIs.

**Figure 3-2** Header fields of the response to the request for obtaining a user token


## Response Body

The body of a response is often returned in structured format as specified in the **Content-Type** header field. The response body transfers content except the response header.

The following is part of the response body for the API used to **obtain a user token**.

```
{
    "token": {
        "expires_at": "2019-02-13T06:52:13.855000Z",
        "methods": [
            "password"
        ],
        "catalog": [
            {
                "endpoints": [
                    {
                        "region_id": ap-southeast-1,
.....
```

If an error occurs during API calling, an error code and a message will be displayed. The following shows an error response body.

```
{
    "error_msg": "The format of message is error",
    "error_code": "AS.0001"
}
```

In the response body, **error_code** is an error code, and **error_msg** provides information about the error.

# 4 Image Recognition APIs

## 4.1 Image Tagging (v2.0)

### Function

Natural images have extensive semantic meanings because one image contains a wide variety of tags. This API can recognize hundreds of scenes and thousands of objects and their properties in natural images, making intelligent album management, picture retrieval and classification, and scene- or object-based advertising more intuitive. After you upload the image to be processed, Image Tagging returns tags and confidence scores to you.

### Prerequisites

- Before using Image Tagging, you need to apply for the service and complete authentication. For details, see **Applying for a Service** and **Authentication**.
- By default, the maximum number of concurrent API calls is 10. To increase concurrency, contact Huawei technical support.

### URI

URI format

POST /v2/{project_id}/image/tagging

**Table 4-1** Path parameters

| Parameter | Mandatory | Type | Description |
| --- | --- | --- | --- |
| project_id | Yes | String | Indicates the project ID.<br>Log in to the HUAWEI CLOUD management console, click the username in the upper right corner, and select **My Credentials** from the drop-down list. On the displayed page, choose **API Credentials** in the left navigation pane and obtain the project ID in a specific region from the right pane. |

## Request Parameters

**Table 4-2** Request header parameters

| Parameter | Mandatory | Type | Description |
| --- | --- | --- | --- |
| X-Auth-Token | Yes | String | Indicates the user token.<br>The token can be obtained by calling the IAM API used to obtain a user token. The value of **X-Subject-Token** in the response header is the user token. |

**Table 4-3** Request body parameters

| Parameter | Mandatory | Type | Description |
| --- | --- | --- | --- |
| image | No | String | Configure either this parameter or **url**.<br>Indicates the Base64 character string converted from the image. The size cannot exceed 10 MB. The image resolution of the narrow sides must be greater than 15 pixels, and that of the wide sides cannot exceed 4096 pixels. The supported image formats include JPG, PNG, and BMP. |

| Parameter | Mandatory | Type | Description |
| --- | --- | --- | --- |
| url | No | String | Configure either this parameter or **image**.<br>Indicates the URL of an image. The options are as follows:<br>• HTTP/HTTPS URLs on the public network<br>• OBS URLs. To use OBS data, authorization is required, including service authorization, temporary authorization, and anonymous public authorization. For details, see **Configuring the Access Permission of OBS**.<br>**NOTE**<br>• The API response time depends on the image download time. If the image download takes a long time, the API call will fail.<br>• Ensure that the storage service where the image to be detected resides is stable and reliable. OBS is recommended for storing image data.<br>• The region of OBS must be consistent with that of Image Recognition. |
| language | No | String | **zh**: indicates that the language of the returned tag is Chinese.<br>**en**: indicates that the language of the returned tag is English.<br>The default value is **zh**. |
| threshold | No | Float | Indicates the threshold (0 to 100) of the confidence score. The tags whose confidence score is lower than the threshold will not be returned.<br>Default value: **60**.<br>Minimum value: **0**<br>Maximum value: **100**<br>Default value: **0.0** |
| limit | No | Integer | Indicates the maximum number of tags that can be returned. The default value is **50**. |

## Response Parameters

**Status code: 200**

**Table 4-4** Response body parameters

| Parameter | Type | Description |
| --- | --- | --- |
| result | **result** object | Indicates the content of the image tag when the API is successfully called.<br>This parameter is not included when the API fails to be called. |

**Table 4-5** result parameters

| Parameter | Type | Description |
| --- | --- | --- |
| tags | Array of **ImageTaggingItemBody** objects | Indicates the list of tags. |

**Table 4-6** ImageTaggingItemBody parameters

| Parameter | Type | Description |
| --- | --- | --- |
| confidence | String | Indicates the confidence. The float value is converted into a string and returned. The value ranges from 0 to 100. |
| type | String | Indicates the tag type. Possible values are as follows:<br>**object**: entity tag<br>**scene**: scenario tag<br>**concept**: concept tag |
| tag | String | Indicates the tag name. |
| i18n_tag | **i18n_tag** object | Indicates the multi-language output of the tag. |
| i18n_type | **i18n_type** object | Indicates the multi-language output of the tag type. |
| instances | Array of **ImageTaggingInstance** objects | Indicates the object bounding box information. If this parameter is left empty, there is no object bounding box. |

**Table 4-7** i18n_tag parameters

| Parameter | Type | Description |
| --- | --- | --- |
| zh | String | Indicates the Chinese tag. |
| en | String | Indicates the English tag. |

**Table 4-8** i18n_type parameters

| Parameter | Type | Description |
| --- | --- | --- |
| zh | String | Indicates the Chinese tag type. |
| en | String | Indicates the English tag type. |

**Table 4-9** ImageTaggingInstance parameters

| Parameter | Type | Description |
| --- | --- | --- |
| bounding_box | Object | Indicates the position of the object bounding box. It contains the following four values:<br>**width**: width of the bounding box<br>**height**: height of the bounding box<br>**top_left_x**: distance from the upper left corner of the bounding box to the vertical axis<br>**top_left_y**: distance from the upper left corner of the bounding box to the horizontal axis |
| confidence | String | Indicates the tag confidence. The float value is converted into a string and returned. The float value ranges from 0 to 100. |

**Status code: 400**

**Table 4-10** Response body parameters

| Parameter | Type | Description |
| --- | --- | --- |
| error_code | String | Indicates the error code of a failed API call. For details, see **Error Codes**.<br>This parameter is not included when the API is successfully called. |
| error_msg | String | Indicates the error message of a failed API call.<br>This parameter is not included when the API is successfully called. |

## Example Requests

- Method 1: Use a Base64-encoded image.

```
POST https://{endpoint}/v2.0/image/tagging

{
  "image" : "/9j/4AAQSkZJRgABAgEASABIAAD/
4RFZRXhpZgAATU0AKgAAAAgABwESAAMAAAABAAEAAAEaAAUAAAABAAAAYgEbAA...",
  "url" : "",
  "language" : "zh",
  "limit" : 5,
  "threshold" : 70.0
}
```

- Method 2: Use an image URL.

```
POST https://{endpoint}/v2.0/image/tagging

{
  "image" : "",
  "url" : "https://BucketName.obs.myhuaweicloud.com/ObjectName",
  "language" : "zh",
  "limit" : 5,
  "threshold" : 70.0
}
```

## Example Responses

**Status code: 200**

Response for a successful API call

```
{
  "result" : {
    "tags" : [ {
      "confidence" : "37.51",
      "instances" : [ {
        "confidence" : "92.38",
        "bounding_box" : {
          "height" : 133.32496056189905,
          "top_left_x" : 53.134917332575874,
          "top_left_y" : 254.21347984900842,
          "width" : 117.5866567171537
        }
      } ],
      "tag": "Person",
      "i18n_tag" : {
        "en" : "person",
        "zh": "Chinese character for person"
      },
      "type": "Human",
      "i18n_type" : {
        "en" : "Human",
        "zh": "Chinese characters for human"
      }
    } ]
  }
}
```

**Status code: 400**

Response for a failed API call

```
{
  "error_code" : "AIS.0005",
  "error_msg" : "The service does not exist."
}
```

## Status Codes

| Status Code | Description |
| --- | --- |
| 200 | The API is successfully called. |
| 400 | The API fails to be called. |

## Error Codes

For details, see **Error Codes**.

# 5 APIs (Deprecated)

## 5.1 Image Tagging (v1.0)

### Function

Image Tagging can accurately identify hundreds of scenes and thousands of common objects and their attributes in natural images. It makes intelligent album management, photo retrieval and classification, and scene- or object-based advertising more intuitive. After you upload the image to be processed, Image Tagging returns tags and confidence scores to you.

### URI

URI format

POST /v1.0/image/tagging

### Request Parameters

**Table 5-1** Parameter description

| Parameter | Mandatory | Type | Description |
| --- | --- | --- | --- |
| image | false | String | Configure either this parameter or **url**.<br>Indicates the Base64 character string converted from the image. The size cannot exceed 10 MB. The image resolution of the narrow sides must be greater than 15 pixels, and that of the wide sides cannot exceed 4096 pixels. The supported image formats include JPG, PNG, and BMP. |

| Parameter | Mandatory | Type | Description |
| --- | --- | --- | --- |
| url | false | String | Configure either this parameter or **image**.<br>Indicates the URL of an image. The options are as follows:<br>• HTTP/HTTPS URLs on the public network<br>• OBS URLs. To use OBS data, authorization is required, including service authorization, temporary authorization, and anonymous public authorization. For details, see **Configuring the Access Permission of OBS**.<br>**NOTE**<br>• The API response time depends on the image download time. If the image download takes a long time, the API call will fail.<br>• Ensure that the storage service where the image to be detected resides is stable and reliable. OBS is recommended for storing image data.<br>• The region of OBS must be consistent with that of Image Recognition. |
| language | false | String | **zh**: indicates that the language of the returned tag is Chinese.<br>**en**: indicates that the language of the returned tag is English.<br>The default value is **zh**. |
| limit | false | Integer | Indicates the maximum number of tags that can be returned. The default value is **30**. |
| threshold | false | Float | Indicates the threshold of the confidence score. The value ranges from 0 to 100. If you input a value beyond the value range, the default value is used.<br>Default value: **0** |

## Response Parameters

**Table 5-2** describes the response parameters.

**Table 5-2** Parameter description

| Parameter | Type | Description |
| --- | --- | --- |
| result | JSON | Indicates the content of the image tag when the API is successfully called.<br>This parameter is not included when the API fails to be called. |
| tags | List | Indicates the list of tags. |
| confidence | Float | Indicates the confidence score. The value ranges from 0 to 100. |
| tag | String | Indicates the tag name. |
| type | String | Indicates the tag type. Possible values are as follows:<br>• **object**: entity tag<br>• **scene**: scenario tag<br>• **concept**: concept tag |
| i18n_tag | JSON | Indicates the internationalization field of the tag. (**i18n** is only an internationalization flag and has no special meaning.)<br>• **zh**: Chinese<br>• **en**: English |
| error_code | String | Indicates the error code of a failed API call. For details, see **Error Codes**.<br>This parameter is not included when the API is successfully called. |
| error_msg | String | Indicates the error message of a failed API call.<br>This parameter is not included when the API is successfully called. |

## Examples

- Example request (Method 1: Use a Base64-encoded image.)

```
POST https://image.ap-southeast-1.myhuaweicloud.com/v1.0/image/tagging

Request Header:
Content-Type:application/json
X-Auth-Token:
MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...

Request Body:
{
 "image":"/9j/4AAQSkZJRgABAgEASABIAAD/
4RFZRXhpZgAATU0AKgAAAAgABwESAAMAAAABAAEAAAEaAAUAAAABAAAAYgEbAAUAAAABAAAAag
EoAAMAAAABAAIAAAExAAIAAAAcAAAAcgEyAAIAAAAUAAAAjodpAAQAAAABAAAApAAAANAACvyAAA
AnEAAK/
IAAACcQQWRvYmUgUGhvdG9zaG9wIENTMyBXaW5kb3dzADIwMTc6MTA6MjAgMTA6NDU6MzYAAAA
AA6ABAAMAAAAB//
8AAKACAAQAAAABAAALIKADAAQAAAABAAAGQAAAAAAAAAAGAQMAAwAAAAEABgAAARoABQAAA
```

```
AEAAAEeARsABQAAAAEAAAEmASgAAwAAAAEAAgAAAgEABAAAAAEAAAEuAgIABAAAAAEAABAj...",
  "url": "",
  "language": "en",
  "limit": 5,
  "threshold": 60.0
}
```

- Example request (Method 2: Use the URL redirecting to an image file.)

```
POST https://image.ap-southeast-1.myhuaweicloud.com/v1.0/image/tagging

Request Header:
Content-Type:application/json
X-Auth-Token:
MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...

Request Body:
{
  "image":"",
  "url":"https://<bucketName>.obs.<region>.myhuaweicloud.com/<objectName>",
  "language": "en",
  "limit": 5,
  "threshold": 60.0
}
```

- Example of a successful response

```
{
  "result":{
     "tags":[
      {
          "confidence": 38.51,
          "tag":"sky",
          "i18n_tag":
          {
              "en": "sky",
              "zh": "Chinese characters for sky"
          },
          "type": "object"
      },
      {
          "confidence": 25.75,
          "tag":"landscape",
          "i18n_tag":
          {
              "en": "landscape",
              "zh": "Chinese characters for landscape"
           },
          "type": "scene"
      }
      ]
   }
}
```

- Example of a failed response

```
{
   "error_code": "AIS.0014",
   "error_msg": "The JSON format of the input data is incorrect."
}
```

## Return Values

- Normal

  200

- Abnormal

| Return Value | Description |
| --- | --- |
| 400 | • The request cannot be understood by the server due to malformed syntax. The client should not repeat the request without modifications.<br>• The request parameter is incorrect. |
| 401 | The request requires user authentication. |
| 403 | No operation permission. |
| 404 | The server has not found anything matching the Request-URI. |
| 500 | The server encountered an unexpected condition which prevented it from fulfilling the request. |

### Error Codes

For details about error codes, see **Error Codes**.

## 5.2 Recapture Detection

### Function

As a statistical method in the retailing industry, barcodes are used to calculate retailers' sales volumes as the evidence of sales incentives. This API can recognize whether a barcode image is the original one or the one that is recaptured or printed for recapturing by using the deep neural network algorithm. It enables you to detect the invalid barcode images and makes the statistics more precise and valid.

NOTE

Currently, only barcodes of Huawei products. For other service scenarios, **submit a service ticket** to reach technical support.

### Prerequisites

- Before using Recapture Detection, you need to apply for the service and complete authentication. For details, see **Applying for a Service** and **Authentication**.
- By default, the maximum number of concurrent API calls is 1. To increase concurrency, contact Huawei technical support.

### URI

URI format

POST /v1.0/image/recapture-detect

## Request Message

Table 5-3 describes the request parameters.

**Table 5-3** Parameter description

| Parameter | Mandatory | Type | Description |
| --- | --- | --- | --- |
| image | Configure either this parameter or **url**. | String | Indicates the Base64 character string converted from the image. The size cannot exceed 10 MB. The image resolution of the narrow sides must be greater than 15 pixels, and that of the wide sides cannot exceed 4096 pixels. The supported image formats include JPG, PNG, and BMP. |
| url | Configure either this parameter or **image**. | String | Indicates the URL of an image. The options are as follows:<br>• HTTP/HTTPS URLs on the public network<br>• HUAWEI CLOUD OBS URLs. To use OBS data, authorization is required, including service authorization, temporary authorization, and anonymous public authorization. For details, see **Configuring the Access Permission of OBS**.<br>**NOTE**<br>The API response time depends on the image download time. If the image download takes a long time, the API call will fail.<br>Ensure that the storage service where the image to be detected resides is stable and reliable. You are advised to use HUAWEI CLOUD OBS. |
| threshold | No | Float | Indicates the threshold used to identify whether an image is real or fake. The default value is **0.95**. The value ranges from 0 to 1. If you input a value beyond the value range, the default value is used. |
| scene | No | List | Indicates the detection scenario. Currently, only the **recapture** scenario is supported. This parameter can be left empty. If it is left empty, the detection results of all scenarios are returned. |

## Response Message

Table 5-4 describes the response parameters.

**Table 5-4** Parameter description

| Parameter | Type | Description |
| --- | --- | --- |
| result | JSON | Indicates the content of the image tag when the API is successfully called.<br>This parameter is not included when the API fails to be called. |
| suggestion | String | Indicates the conclusion. Possible values are as follows:<br>• **true**: indicates that the image is valid.<br>• **false**: indicates that image is a fake one.<br>• **uncertainty**: indicates that whether the image is valid or fake is uncertain. |
| category | String | Indicates the tag (if **suggestion** is **true**, the value will be a null string. Otherwise, the value will not be a null string).<br>**recapture**: indicates that the image is a recaptured one. |
| score | Float | Indicates the overall confidence score. The value ranges from 0 to 1. |
| detail | List | Indicates the recognition result details. |
| label | String | Indicates the tag value. Possible values are as follows:<br>• **original**: indicates that the image is the original one.<br>• **recapture**: indicates that the image is a recaptured one. |
| confidence | Float | Indicates the confidence score. The value ranges from 0 to 1. |
| error_code | String | Indicates the error code of a failed API call. For details, see **Error Codes**.<br>This parameter is not included when the API is successfully called. |
| error_msg | String | Indicates the error message of a failed API call.<br>This parameter is not included when the API is successfully called. |

## Examples

- Example request (Method 1: Use a Base64-encoded image.)

```
POST https://image.ap-southeast-1.myhuaweicloud.com/v1.0/image/recapture-detect

Request Header:
Content-Type:application/json
```

```
X-Auth-Token:
MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...

Request Body:
{
 "image":"/9j/4AAQSkZJRgABAgEASABIAAD/
4RFZRXhpZgAATU0AKgAAAAgABwESAAMAAAABAAEAAAEaAAUAAAABAAAAYgEbAAUAAAABAAAAag
EoAAMAAAABAAIAAAExAAIAAAAcAAAAcgEyAAIAAAAUAAAAjodpAAQAAAABAAAApAAAANAACvyAAA
AnEAAK/
IAAACcQQWRvYmUgUGhvdG9zaG9wIENTMyBXaW5kb3dzADIwMTc6MTA6MjAgMTA6NDU6MzYAAAA
AA6ABAAMAAAAB//
8AAKACAAQAAAABAAALIKADAAQAAAABAAAGQAAAAAAAAAAGAQMAAwAAAAEABgAAARoABQAAA
AEAAAEeARsABQAAAAEAAAEmASgAAwAAAAEAAgAAAgEABAAAAAEAAAEuAgIABAAAAAEAABAj...",
  "url": "",
  "threshold":0.99,
  "scene":["recapture"]
}
```

- Example request (Method 2: Use the URL redirecting to an image file.)

```
POST https://image.ap-southeast-1.myhuaweicloud.com/v1.0/image/recapture-detect

Request Header:
Content-Type:application/json
X-Auth-Token:
MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...

Request Body:
{
  "image":"",
  "url":"https://<bucketName>.obs.<region>.myhuaweicloud.com/<objectName>",
  "threshold":0.99,
  "scene":["recapture"]
}
```

- Example successful response

```
{
  "result": {
    "suggestion": "false",
    "category": "recapture",
    "score": "0.9998",
    "detail": [
      {
        "label": "recapture",
        "confidence": "0.9998"
      }
    ]
  }
}
```

- Example failed response

```
{
    "error_code": "AIS.0105",
    "error_msg": "Recognize Failed"
}
```

## Return Value

- Normal

  200

- Abnormal

| Return Value | Description |
| --- | --- |
| 400 | • The request cannot be understood by the server due to malformed syntax. The client should not repeat the request without modifications.<br>• The request parameter is incorrect. |
| 401 | The request requires user authentication. |
| 403 | No operation permission. |
| 404 | The server has not found anything matching the Request-URI. |
| 500 | The server encountered an unexpected condition which prevented it from fulfilling the request. |

### Error Codes

For details about error codes, see **Error Codes**.

## 5.3 Dark Enhance

### Function

This API is applicable to the scenarios where human eyes or machines cannot distinguish objects in the dark when photographing images. It enhances dark areas, so that objects in the dark areas are visible, highlighting the effective visual information in the images. After you upload the image to be processed, Dark Enhance returns the enhanced image to you.

### Prerequisites

- Before using Dark Enhance, you need to apply for the service and complete authentication. For details, see **Applying for a Service** and **Authentication**.
- By default, the maximum number of concurrent API calls is 1. To increase concurrency, contact Huawei technical support.

### URI

URI format

POST /v1.0/vision/dark-enhance

### Request Message

**Table 5-5** describes the request parameters.

**Table 5-5** Parameter description

| Parameter | Mandatory | Type | Description |
| --- | --- | --- | --- |
| image | Configure either this parameter or **file**. | String | Indicates the Base64 character string converted from the image. The size cannot exceed 10 MB. The supported image formats include JPG, PNG, and BMP. |
| file | Configure either this parameter or **image**. | File | Indicates the image file.<br>**NOTE**<br>• The request parameter is not recommended.<br>• The parameter is reserved for the compatible services to support such API. The following will not provide the example request and response corresponding to the parameter. |
| brightness | No | Float | Indicates luminance. A larger value indicates higher luminance. The default value is **0.9**. The value ranges from 0 to 1. |

## Response Message

- **Table 5-6** describes the response parameters of Base64-encoded character strings.

  **Table 5-6** Parameter description

  | Parameter | Type | Description |
  | --- | --- | --- |
  | result | String | Indicates the Base64 character string converted from the image when the API is successfully called.<br>This parameter is not included when the API fails to be called. |
  | error_code | String | Indicates the error code of a failed API call. For details, see **Error Codes**.<br>This parameter is not included when the API is successfully called. |
  | error_msg | String | Indicates the error message of a failed API call.<br>This parameter is not included when the API is successfully called. |

- **Table 5-7** describes the response parameters of image files.

**Table 5-7** Parameter description

| Parameter | Type | Description |
| --- | --- | --- |
| error_code | String | Indicates the error code of a failed API call. For details, see **Error Codes**.<br>This parameter is not included when the API is successfully called. |
| error_msg | String | Indicates the error message of a failed API call.<br>This parameter is not included when the API is successfully called. |

## Examples

- Example request (Use a Base64-encoded image.)

```
POST https://image.ap-southeast-1.myhuaweicloud.com/v1.0/vision/dark-enhance

Request Header:
Content-Type:application/json
X-Auth-Token:
MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...

Request Body:
{
  "image":"/9j/4AAQSkZJRgABAgEASABIAAD/
4RFZRXhpZgAATU0AKgAAAAgABwESAAMAAAABAAEAAAEaAAUAAAABAAAAYgEbAAUAAAABAAAAag
EoAAMAAAABAAIAAAExAAIAAAAcAAAAcgEyAAIAAAAUAAAAjodpAAQAAAABAAAApAAAANAACvyAAA
AnEAAK/
IAAACcQQWRvYmUgUGhvdG9zaG9wIENTMyBXaW5kb3dzADIwMTc6MTA6MjAgMTA6NDU6MzYAAAAA
AA6ABAAMAAAAB//
8AAKACAAQAAAABAAALIKADAAQAAAABAAAGQAAAAAAAAAAGAQMAAwAAAAEABgAAARoABQAAA
AEAAAEeARsABQAAAAEAAAEmASgAAwAAAAEAAgAAAgEABAAAAAEAAAEuAgIABAAAAAEAABAj...",
  "brightness":0.9
}
```

- Example successful response

```
{
 "result":"/9j/4AAQSkZJRgABAgEASABIAAD/
4RFZRXhpZgAATU0AKgAAAAgABwESAAMAAAABAAEAAAEaAAUAAAABAAAAYgEbAAUAAAABAAAAag
EoAAMAAAABAAIAAAExAAIAAAAcAAAAcgEyAAIAAAAUAAAAjodpAAQAAAABAAAApAAAANAACvyAAA
AnEAAK/
IAAACcQQWRvYmUgUGhvdG9zaG9wIENTMyBXaW5kb3dzADIwMTc6MTA6MjAgMTA6NDU6MzYAAAAA
AA6ABAAMAAAAB//
8AAKACAAQAAAABAAALIKADAAQAAAABAAAGQAAAAAAAAAAGAQMAAwAAAAEABgAAARoABQAAA
AEAAAEeARsABQAAAAEAAAEmASgAAwAAAAEAAgAAAgEABAAAAAEAAAEuAgIABAAAAAEAABAj..."
}
```

- Example failed response

```
{
    "error_code": "AIS.0105",
    "error_msg": "Recognize Failed"
}
```

## Return Value

- Normal

  200

- Abnormal

| Return Value | Description |
| --- | --- |
| 400 | • The request cannot be understood by the server due to malformed syntax. The client should not repeat the request without modifications.<br>• The request parameter is incorrect. |
| 401 | The request requires user authentication. |
| 403 | No operation permission. |
| 404 | The server has not found anything matching the Request-URI. |
| 500 | The server encountered an unexpected condition which prevented it from fulfilling the request. |

# 5.4 Defog

## Function

When a camera takes photos in smoggy weather, the image quality will be poor because the shooting scene is unclear. This API can remove both uniform and non-uniform haze from images using the image defog algorithm. After you upload the image to be processed, Defog returns the processed image to you.

## Prerequisites

- Before using Defog, you need to apply for the service and complete authentication. For details, see **Applying for a Service** and **Authentication**.
- By default, the maximum number of concurrent API calls is 1. To increase concurrency, contact Huawei technical support.

## URI

URI format

POST /v1.0/vision/defog

## Request Message

**Table 5-8** describes the request parameters.

**Table 5-8** Parameter description

| Parameter | Mandatory | Type | Description |
| --- | --- | --- | --- |
| image | Configure either this parameter or **file**. | String | Indicates the Base64 character string converted from the image. The size cannot exceed 10 MB. The supported image formats include JPG, PNG, and BMP. |
| file | Configure either this parameter or **image**. | File | Indicates the image file. |
| gamma | No | Float | Indicates the gamma correction value. The default value is **1.5**. The value ranges from 0.1 to 10. |
| natural_look | No | Boolean | Indicates whether to keep the normal look. The default value is **true**. If the parameter is set to **false**, the image is defogged, but the visual effect may be unnatural. |

## Response Message

- **Table 5-9** describes the response parameters of Base64-encoded character strings.

  **Table 5-9** Parameter description

  | Parameter | Type | Description |
  | --- | --- | --- |
  | result | String | Indicates the Base64 character string converted from the image when the API is successfully called.<br>This parameter is not included when the API fails to be called. |
  | error_code | String | Indicates the error code of a failed API call. For details, see **Error Codes**.<br>This parameter is not included when the API is successfully called. |
  | error_msg | String | Indicates the error message of a failed API call.<br>This parameter is not included when the API is successfully called. |

- **Table 5-10** describes the response parameters of image files.

**Table 5-10** Parameter description

| Parameter | Type | Description |
| --- | --- | --- |
| error_code | String | Indicates the error code of a failed API call. For details, see **Error Codes**.<br>This parameter is not included when the API is successfully called. |
| error_msg | String | Indicates the error message of a failed API call.<br>This parameter is not included when the API is successfully called. |

## Examples

- Example request (Method 1: Use a Base64-encoded image.)

```
POST https://image.ap-southeast-1.myhuaweicloud.com/v1.0/vision/defog

Request Header:
Content-Type:application/json
X-Auth-Token:
MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...
Request Body:
{
  "image":"/9j/4AAQSkZJRgABAgEASABIAAD/
4RFZRXhpZgAATU0AKgAAAAgABwESAAMAAAABAAEAAAEaAAUAAAABAAAAYgEbAAUAAAABAAAAag
EoAAMAAAABAAIAAAExAAIAAAAcAAAAcgEyAAIAAAAUAAAAjodpAAQAAAABAAAApAAAANAACvyAAA
AnEAAK/
IAAACcQQWRvYmUgUGhvdG9zaG9wIENTMyBXaW5kb3dzADIwMTc6MTA6MjAgMTA6NDU6MzYAAAAA
AA6ABAAMAAAAB//
8AAKACAAQAAAABAAALIKADAAQAAAABAAAGQAAAAAAAAAAGAQMAAwAAAAEABgAAARoABQAAA
AEAAAEeARsABQAAAAEAAAEmASgAAwAAAAEAAgAAAgEABAAAAAEAAAEuAgIABAAAAAEAABAj...",
  "gamma":1.5,
  "natural_look":true
}
```

- Example request (Method 2: Use an image file.)

```
POST https://image.ap-southeast-1.myhuaweicloud.com/v1.0/vision/defog

Request Header:
X-Auth-Token:
MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...

Request Body(form-data):
file: File (image file)
gamma:1.5
natural_look:true
```

Method 1: Use a Base64-encoded image.

- Example successful response

```
{
 "result":"/9j/4AAQSkZJRgABAgEASABIAAD/
4RFZRXhpZgAATU0AKgAAAAgABwESAAMAAAABAAEAAAEaAAUAAAABAAAAYgEbAAUAAAABAAAAag
EoAAMAAAABAAIAAAExAAIAAAAcAAAAcgEyAAIAAAAUAAAAjodpAAQAAAABAAAApAAAANAACvyAAA
AnEAAK/
IAAACcQQWRvYmUgUGhvdG9zaG9wIENTMyBXaW5kb3dzADIwMTc6MTA6MjAgMTA6NDU6MzYAAAAA
AA6ABAAMAAAAB//
8AAKACAAQAAAABAAALIKADAAQAAAABAAAGQAAAAAAAAAAGAQMAAwAAAAEABgAAARoABQAAA
AEAAAEeARsABQAAAAEAAAEmASgAAwAAAAEAAgAAAgEABAAAAAEAAAEuAgIABAAAAAEAABAj..."
}
```

- Example failed response

```
{
    "error_code": "AIS.0105",
    "error_msg": "Recognize Failed"
}
```

Method 2: Use an image file.

- Sample response

  When the API is successfully called, the byte stream of the image file is returned.

- Failed sample response

```
{
    "error_code": "AIS.0105",
    "error_msg": "Recognize Failed"
}
```

### Return Value

- Normal

  200

- Abnormal

| Return Value | Description |
| --- | --- |
| 400 | • The request cannot be understood by the server due to malformed syntax. The client should not repeat the request without modifications.<br>• The request parameter is incorrect. |
| 401 | The request requires user authentication. |
| 403 | No operation permission. |
| 404 | The server has not found anything matching the Request-URI. |
| 500 | The server encountered an unexpected condition which prevented it from fulfilling the request. |

## 5.5 Super Resolution

### Function

This API can compensate insufficient or lost image information due to excessively insufficient pixels or compression. It uses deep learning algorithms to add missing information to images to achieve better visual effect. After you upload the image to be processed, Super Resolution returns the processed image to you.

### Prerequisites

- Before using Super Resolution, you need to apply for the service and complete authentication. For details, see **Applying for a Service** and **Authentication**.
- By default, the maximum number of concurrent API calls is 1. To increase concurrency, contact Huawei technical support.

## URI

URI format

POST /v1.0/vision/super-resolution

## Request Message

Table 5-11 describes the request parameters.

**Table 5-11** Parameter description

| Parameter | Mandatory | Type | Description |
| --- | --- | --- | --- |
| image | Configure either this parameter or **file**. | String | Indicates the Base64 character string converted from the image. The size cannot exceed 10 MB. The supported image formats include JPG, PNG, and BMP. |
| file | Configure either this parameter or **image**. | File | Indicates the image file. |
| scale | No | Integer | Indicates the magnification factor. The default value is **3**. The value can be **3** or **4**. |
| model | No | String | Indicates the algorithm model. The default value is **ESPCN**.<br>Possible values are as follows:<br>**ESPCN**: Efficient Sub-Pixel Convolutional Neural Network<br>**SRCNN**: Super-Resolution Convolutional Neural Network |

## Response Message

- Table 5-12 describes the response parameters of Base64-encoded character strings.

  **Table 5-12** Parameter description

  | Parameter | Type | Description |
  | --- | --- | --- |
  | result | String | Indicates the Base64 character string converted from the image when the API is successfully called.<br>This parameter is not included when the API fails to be called. |

| Parameter | Type | Description |
| --- | --- | --- |
| error_code | String | Indicates the error code of a failed API call. For details, see **Error Codes**.<br>This parameter is not included when the API is successfully called. |
| error_msg | String | Indicates the error message of a failed API call.<br>This parameter is not included when the API is successfully called. |

- **Table 5-13** describes the response parameters of image files.

**Table 5-13** Parameter description

| Parameter | Type | Description |
| --- | --- | --- |
| error_code | String | Indicates the error code of a failed API call. For details, see **Error Codes**.<br>This parameter is not included when the API is successfully called. |
| error_msg | String | Indicates the error message of a failed API call.<br>This parameter is not included when the API is successfully called. |

## Examples

- Example request (Method 1: Use a Base64-encoded image.)

```
POST https://image.ap-southeast-1.myhuaweicloud.com/v1.0/vision/super-resolution

Request Header:
Content-Type:application/json
X-Auth-Token:
MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...
Request Body:
{  "image":"/9j/4AAQSkZJRgABAgEASABIAAD/
4RFZRXhpZgAATU0AKgAAAAgABwESAAMAAAABAAEAAAEaAAUAAAABAAAAYgEbAAUAAAABAAAAag
EoAAMAAAABAAIAAAExAAIAAAAcAAAAcgEyAAIAAAAUAAAAjodpAAQAAAABAAAApAAAANAACvyAAA
AnEAAK/
IAAACcQQWRvYmUgUGhvdG9zaG9wIENTMyBXaW5kb3dzADIwMTc6MTA6MjAgMTA6NDU6MzYAAAA
AA6ABAAMAAAAB//
8AAKACAAQAAAABAAALIKADAAQAAAABAAAGQAAAAAAAAAAGAQMAAwAAAAEABgAAARoABQAAA
AEAAAEeARsABQAAAAEAAAEmASgAAwAAAAEAAgAAAgEABAAAAAEAAAEuAgIABAAAAAEAABAj...",
  "scale":3,
  "model":"ESPCN"
}
```

- Example request (Method 2: Use an image file.)

```
POST https://image.ap-southeast-1.myhuaweicloud.com/v1.0/vision/super-resolution

Request Header:
X-Auth-Token:
MIINRwYJKoZIhvcNAQcCoIINODCCDTQCAQExDTALBglghkgBZQMEAgEwgguVBgkqhkiG...

Request Body(form-data):
file: File (image file)
```

```
scale:3
model:ESPCN
```

Method 1: Use a Base64-encoded image.

- Example successful response

```
{
 "result":"/9j/4AAQSkZJRgABAgEASABIAAD/
4RFZRXhpZgAATU0AKgAAAAgABwESAAMAAAABAAEAAAEaAAUAAAABAAAAYgEbAAUAAAABAAAAag
EoAAMAAAABAAIAAAExAAIAAAAcAAAAcgEyAAIAAAAUAAAAjodpAAQAAAABAAAApAAAANAACvyAAA
AnEAAK/
IAAACcQQWRvYmUgUGhvdG9zaG9wIENTMyBXaW5kb3dzADIwMTc6MTA6MjAgMTA6NDU6MzYAAAA
AA6ABAAMAAAAB//
8AAKACAAQAAAABAAALIKADAAQAAAABAAAGQAAAAAAAAAAGAQMAAwAAAAEABgAAARoABQAAA
AEAAAEeARsABQAAAAEAAAEmASgAAwAAAAEAAgAAAgEABAAAAAEAAAEuAgIABAAAAAEAABAj..."
}
```

- Example failed response

```
{
   "error_code": "AIS.0105",
   "error_msg": "Recognize Failed"
}
```

Method 2: Use an image file.

- Example successful response

  When the API is successfully called, the byte stream of the image file is returned.

- Example failed response

```
{
   "error_code": "AIS.0105",
   "error_msg": "Recognize Failed"
}
```

## Return Value

- Normal

  200

- Abnormal

| Return Value | Description |
| --- | --- |
| 400 | • The request cannot be understood by the server due to malformed syntax. The client should not repeat the request without modifications.<br>• The request parameter is incorrect. |
| 401 | The request requires user authentication. |
| 403 | No operation permission. |
| 404 | The server has not found anything matching the Request-URI. |
| 500 | The server encountered an unexpected condition which prevented it from fulfilling the request. |

# 6 Application Examples

## 6.1 Python 3 API Example

This section uses Image Tagging as an example to describe how to call Python 3 APIs.

```
# encoding:utf-8

import requests
import base64

url = "https://{endpoint}/v1.0/image/tagging"
token = "Actual token value obtained by the user"
headers = {'Content-Type': 'application/json', 'X-Auth-Token': token}

imagepath = r'data/image-tagging.jpg'
with open(imagepath, "rb") as bin_data:
    image_data = bin_data.read()
image_base64 = base64.b64encode(image_data).decode("utf-8")  # Use Base64 encoding of images.
data= {"image": image_base64]}  # Set either the URL or the image.

response = requests.post(url, headers=headers, json=data, verify=False)
print(response.text)
```

**Table 6-1** Parameter description

| Parameter | Description |
| --- | --- |
| url | API request URL, for example, https://{endpoint}/v1.0/image/tagging. |
| token | A token is a user's access credential, which includes user identities and permissions. When you call an API to access a cloud service, a token is required for identity authentication.<br>For details about how to obtain the token, see **Authentication**. |
| imagePath | Image path. An image file path or image URL is supported. The URL can be an HTTP/HTTPS or OBS URL. |

# 6.2 Java API Example

This section uses Image Tagging as an example to describe how to call Java APIs.

```
package com.huawei.ais.demo;
import com.huawei.ais.sdk.util.HttpClientUtils;

import java.io.File;
import java.io.IOException;
import java.net.URISyntaxException;

import org.apache.http.Header;
import org.apache.http.HttpResponse;
import org.apache.http.entity.StringEntity;
import org.apache.commons.codec.binary.Base64;
import org.apache.commons.io.FileUtils;
import org.apache.commons.io.IOUtils;
import com.alibaba.fastjson.JSONObject;

import org.apache.http.entity.ContentType;
import org.apache.http.message.BasicHeader;

/**
 * This demo is used only for tests. You are advised to use the SDK.
 * Before using this demo, configure the dependent JAR package. Obtain this package by downloading the
SDK.
 */

public class ImageTaggingDemo {
    public static void main(String[] args) throws URISyntaxException, UnsupportedOperationException,
IOException{
        TokenDemo();
    }

    public static void TokenDemo() throws URISyntaxException, UnsupportedOperationException,
IOException {

        String url = "https://{endpoint}/v1.0/image/tagging";
        String token = "Actual token value obtained by the user";
        String imgPath = "data/image-tagging.jpg"; //File path or URL of the image to be recognized.

        JSONObject params = new JSONObject();
        try {
            if (imgPath.indexOf("http://") != -1 || imgPath.indexOf("https://") != -1) {
                params.put("url", imgPath);
            } else {
                byte[] fileData = FileUtils.readFileToByteArray(new File(imgPath));
                String fileBase64Str = Base64.encodeBase64String(fileData);
                params.put("image", fileBase64Str);
            }

            Header[] headers = new Header[]{new BasicHeader("X-Auth-Token", token), new
BasicHeader("Content-Type", ContentType.APPLICATION_JSON.toString())};
            StringEntity stringEntity = new StringEntity(params.toJSONString(), "utf-8");
            HttpResponse response = HttpClientUtils.post(url, headers, stringEntity);
            String content = IOUtils.toString(response.getEntity().getContent(), "utf-8");
            System.out.println(content);
        }
        catch (Exception e) {
            e.printStackTrace();
        }
    }
}
```

**Table 6-2** Parameter description

| Parameter | Description |
| --- | --- |
| url | API request URL, for example, https://{endpoint}/v1.0/image/tagging. |
| token | A token is a user's access credential, which includes user identities and permissions. When you call an API to access a cloud service, a token is required for identity authentication.<br>For details about how to obtain the token, see **Authentication**. |
| imgPath | Image path. An image file path or image URL is supported. The URL can be an HTTP/HTTPS or OBS URL. |

# 6.3 PHP API Example

This section uses Image Tagging as an example to describe how to call PHP APIs.

```
<?php

function TokenRequest() {
    $url = "https://{endpoint}/v1.0/image/tagging";
     $token = "Actual token value obtained by the user";
    $imagePath = __DIR__.'data/image-tagging.jpg';

    $data = array();
    if (stripos($imagePath, 'http://') !== false || stripos($imagePath, 'https://') !== false) {
        $data['url'] = $imagePath;
    } else {
        if($fp = fopen($imagePath,"rb", 0))
        {
            $gambar = fread($fp,filesize($imagePath));
            fclose($fp);

            $fileBase64 = chunk_split(base64_encode($gambar));
        } else {
            echo "Failed to read the image.";
            return;
        }
        $data['image'] = $fileBase64;
    }

    $curl = curl_init();
    $headers = array(
        "Content-Type:application/json",
        "X-Auth-Token:" . $token
    );

    /* Setting the request body */
    curl_setopt($curl, CURLOPT_URL, $url);
    curl_setopt($curl, CURLOPT_HTTPHEADER, $headers);
    curl_setopt($curl, CURLOPT_POST, 1);
    curl_setopt($curl, CURLOPT_POSTFIELDS, json_encode($data));
    curl_setopt($curl, CURLOPT_RETURNTRANSFER, TRUE);
    curl_setopt($curl, CURLOPT_NOBODY, FALSE);
    curl_setopt($curl, CURLOPT_SSL_VERIFYPEER, false);
    curl_setopt($curl, CURLOPT_TIMEOUT, 30);

    $response = curl_exec($curl);
    $status = curl_getinfo($curl, CURLINFO_HTTP_CODE);
```

```
    curl_close($curl);
    echo $response;
}

TokenRequest();
```

**Table 6-3** Parameter description

| Parameter | Description |
| --- | --- |
| url | API request URL, for example, https://{endpoint}/v1.0/image/tagging. |
| token | A token is a user's access credential, which includes user identities and permissions. When you call an API to access a cloud service, a token is required for identity authentication.<br>For details about how to obtain the token, see **Authentication**. |
| imagePath | Image path. An image file path or image URL is supported. The URL can be an HTTP/HTTPS or OBS URL. |

# 7 Appendix

## 7.1 Status Codes

Table 7-1 describes status codes.

**Table 7-1** Status codes

| Status Code | Message | Description |
| --- | --- | --- |
| 100 | Continue | The client continues sending the request.<br>The server has received the initial part of the request and the client should continue sending the remaining part. |
| 101 | Switching Protocols | The requester has asked the server to switch protocols and the server has agreed to do so. The target protocol must be more advanced than the source protocol. For example, the current HTTPS protocol is switched to a later version. |
| 200 | OK | The server has successfully processed the request. |
| 201 | Created | The request for creating a resource has been fulfilled. |
| 202 | Accepted | The request has been accepted for processing, but the processing has not been completed. |
| 203 | Non-Authoritative Information | The server successfully processed the request, but is returning information that may be from another source. |

| Status Code | Message | Description |
| --- | --- | --- |
| 204 | No Content | The server has successfully processed the request, but has not returned any content.<br>The status code is returned in response to an HTTP OPTIONS request. |
| 205 | Reset Content | The server has fulfilled the request, but the requester is required to reset the content. |
| 206 | Partial Content | The server has successfully processed a part of the GET request. |
| 300 | Multiple Choices | There are multiple options for the location of the requested resource. The response contains a list of resource characteristics and addresses from which the user or user agent (such as a browser) can choose the most appropriate one. |
| 301 | Moved Permanently | The requested resource has been assigned a new permanent URI, and the new URI is contained in the response. |
| 302 | Found | The requested resource resides temporarily under a different URI. |
| 303 | See Other | Retrieve a location.<br>The response to the request can be found under a different URI and should be retrieved using a GET or POST method. |
| 304 | Not Modified | The requested resource has not been modified. When the server returns this status code, it does not return any resources. |
| 305 | Use Proxy | The requested resource must be accessed through a proxy. |
| 306 | Unused | The HTTP status code is no longer used. |
| 400 | Bad Request | The request is invalid.<br>The client should not repeat the request without modifications. |
| 401 | Unauthorized | The status code is returned after the client provides the authentication information, indicating that the authentication information is incorrect or invalid. |
| 402 | Payment Required | This status code is reserved for future use. |

| Status Code | Message | Description |
| --- | --- | --- |
| 403 | Forbidden | The server understood the request, but is refusing to fulfill it.<br>The client should not repeat the request without modifications. |
| 404 | Not Found | The requested resource cannot be found.<br>The client should not repeat the request without modifications. |
| 405 | Method Not Allowed | The method specified in the request is not supported for the requested resource.<br>The client should not repeat the request without modifications. |
| 406 | Not Acceptable | The server cannot fulfill the request according to the content characteristics of the request. |
| 407 | Proxy Authentication Required | This status code is similar to 401, but indicates that the client must first authenticate itself with the proxy. |
| 408 | Request Timeout | The server times out when waiting for the request.<br>The client may repeat the request without modifications at any later time. |
| 409 | Conflict | The request could not be completed due to a conflict with the current state of the resource.<br>This status code indicates that the resource that the client attempts to create already exits, or the request fails to be processed because of the update of the conflict request. |
| 410 | Gone | The requested resource is no longer available.<br>The status code indicates that the requested resource has been deleted permanently. |
| 411 | Length Required | The server refuses to process the request without a defined Content-Length. |
| 412 | Precondition Failed | The server does not meet one of the preconditions that the requester puts on the request. |

| Status Code | Message | Description |
| --- | --- | --- |
| 413 | Request Entity Too Large | The request is larger than that a server is able to process. The server may close the connection to prevent the client from continuing the request. If the server cannot process the request temporarily, the response will contain a Retry-After header field. |
| 414 | Request URI Too Long | The URI provided was too long for the server to process. |
| 415 | Unsupported Media Type | The server is unable to process the media format in the request. |
| 416 | Requested Range Not Satisfiable | The requested range is invalid. |
| 417 | Expectation Failed | The server fails to meet the requirements of the Expect request-header field. |
| 422 | Unprocessable Entity | The request is well-formed but is unable to be processed due to semantic errors. |
| 429 | Too Many Requests | The client sends excessive requests to the server within a given time (exceeding the limit on the access frequency of the client), or the server receives excessive requests within a given time (beyond its processing capability). In this case, the client should repeat requests after the time specified in the Retry-After header of the response expires. |
| 500 | Internal Server Error | The server is able to receive but unable to understand the request. |
| 501 | Not Implemented | The server does not support the function required to fulfill the request. |
| 502 | Bad Gateway | The server was acting as a gateway or proxy and received an invalid response from the upstream server. |
| 503 | Service Unavailable | The requested service is invalid.<br>The client should not repeat the request without modifications. |
| 504 | Gateway Timeout | The request cannot be fulfilled within a given time. This status code is returned to the client only when the **Timeout** parameter is specified in the request. |

| Status Code | Message | Description |
| --- | --- | --- |
| 505 | HTTP Version Not Supported | The server does not support the HTTPS protocol version used in the request. |

# 7.2 Error Codes

## Function

A customized message is returned when errors occur in an extended API of HUAWEI CLOUD. This section describes error codes and their meanings.

## Format of an Error Response Body

If an error occurs during API calling, the system returns an error code and message to you. The following shows the format of an error response body:

```
STATUS CODE 400
{
   "error_code": "AIS.0014",
   "error_msg": "The JSON format of the input data is incorrect."
}
```

## Error Code Description

If an error occurs during API calling, no result is returned. You can locate the cause of an error using the error code of each API.

The returned message body contains a specific error code and error message. If you fail to locate the cause of the error, contact customer service and provide the error code so that we can help you solve the problem as soon as possible.

If an error code starting with **APIGW** is returned after you call an API, rectify the fault by referring to the instructions provided in **API Gateway Error Codes**.

| Status Code | Error Code | Description | Description | Handling Measure |
| --- | --- | --- | --- | --- |
| 400 | AIS.0002 | The authentication token is abnormal. | The authentication token is abnormal. | Check whether the token is correct. |

| Status Code | Error Code | Description | Description | Handling Measure |
|---|---|---|---|---|
| 400 | AIS.0003 | Failed to complete the request because of an internal service error. | Failed to complete the request because of an internal service error. | Contact HUAWEI CLOUD technical support. Submit a **service ticket**. |
| 400 | AIS.0004 | The request is unauthorized. | The request is unauthorized. | The service has not been subscribed to. Subscribe to the service first. For details about how to subscribe to a service, see **Image Recognition Getting Started**. |
| 400 | AIS.0007 | The service has not been enabled yet. | The service has not been enabled yet. | Subscribe to the service. |
| 400 | AIS.0010 | The header is missing or left empty. | The header is missing or left empty. | The HTTP request lacks mandatory header information. Check whether mandatory fields such as **Content-type** exist. |
| 400 | AIS.0011 | The request parameter is missing or left empty. | The request parameter is missing or left empty. | Check whether mandatory fields are missing in the request body. For details, see the request description of the corresponding API. |
| 400 | AIS.0012 | The request parameter is not supported. | The request parameter is not supported. | Check whether the fields in the request are valid. For details, see the request description of the corresponding API. |
| 400 | AIS.0013 | The request method is not allowed. | The request method is not allowed. | Check the request method. |
| 400 | AIS.0014 | The JSON format of the input data is incorrect. | The JSON format of the input data is incorrect. | Check the JSON format of the input data. |

| Status Code | Error Code | Description | Description | Handling Measure |
|---|---|---|---|---|
| 400 | AIS.0015 | Base64 decoding of the input data is incorrect. | Base64 decoding of the input data is incorrect. | The Base64 encoding of the image is incorrect. Check the Base64 content. |
| 400 | AIS.0020 | The size of the request body exceeds the upper limit. | The size of the request body exceeds the upper limit. | Check the request body size. |
| 400 | AIS.0021 | The requested file type is not supported. | The requested file type is not supported. | Check the type of the requested file. |
| 400 | AIS.0022 | The URL is invalid. | The URL is invalid. | Check the URL format. |
| 400 | AIS.0023 | The file stored on OBS is oversized. | The file stored on OBS is oversized. | Check whether the image format is supported. For details, see **Constraints**. |
| 400 | AIS.0024 | Failed to obtain the file from OBS. The signature has expired or fails to pass the authentication. | Failed to obtain the file from OBS. The signature has expired or fails to pass the authentication. | The signature has expired or fails to pass the authentication. |
| 400 | AIS.0025 | The file stored on OBS is empty. | The file stored on OBS is empty. | Upload the file to OBS first. |
| 400 | AIS.0026 | The token type is incorrect. The token of the project type must be used. | The token type is incorrect. The token of the project type must be used. | Use a token of the project type. |

| Status Code | Error Code | Description | Description | Handling Measure |
|---|---|---|---|---|
| 400 | AIS.0027 | The account has been frozen. | The account has been frozen. | Check whether the account is in arrears. |
| 400 | AIS.0028 | The job is not owned by the current user. | The job is not owned by the current user. | Check the current account. |
| 400 | AIS.0029 | Failed to download the file from the Internet. Check whether the URL of the file is correct and supported. | Failed to download the file from the Internet. Check whether the URL of the file is correct and supported. | Check whether the URL of the file is correct and supported. |
| 400 | AIS.0030 | Failed to find the job. The job has expired or the passed job_id is incorrect. Check whether job_id is correct. | Failed to find the job. The job has expired or the passed **job_id** is incorrect. Check whether **job_id** is correct. | The task has expired and is cleared, or the job ID is incorrect. Check whether the job ID is correct. |
| 400 | AIS.0031 | The maximum number of uncompleted jobs has been reached. The submission of new jobs has been suspended. | The maximum number of uncompleted jobs has been reached. The submission of new jobs has been suspended. | The submission of new jobs has been suspended. |

| Status Code | Error Code | Description | Description | Handling Measure |
|---|---|---|---|---|
| 400 | AIS.0032 | The monthly free calls have been used up. To continue to use the service, top up your account. | The monthly free calls have been used up. To continue to use the service, top up your account. | To continue to use the service, top up your account. |
| 400 | AIS.0201 | An exception occurred during the process of obtaining the input image. | An exception occurred during the process of obtaining the input image. | Check the input image and obtain the image again. |
| 400 | AIS.0202 | The image format is not supported. | The image format is not supported. | Check whether the image format is supported. |
| 400 | AIS.0203 | The input parameter does not meet the requirements. | The input parameter does not meet the requirements. | Check the parameter. |
| 400 | AIS.0204 | The color depth is not supported. | The color depth is not supported. | Check the configuration. |
| 400 | AIS.0205 | The resolution of the image exceeds the upper limit. | The resolution of the image exceeds the upper limit. | Check whether the image format is supported. |
| 400 | AIS.0206 | Algorithm calculation failed. | Algorithm calculation failed. | Check the configuration. Contact HUAWEI CLOUD technical support. Submit a **service ticket**. |

| Status Code | Error Code | Description | Description | Handling Measure |
| --- | --- | --- | --- | --- |
| 400 | AIS.0501 | The input parameter is invalid. | The input parameter is invalid. | Check the parameter. |
| 400 | AIS.0502 | The image format is not supported. | The image format is not supported. | Check whether the image format is supported. For details, see **Constraints**. |
| 400 | AIS.0503 | The image is damaged. | The image is damaged. | Check whether the image is damaged. If yes, re-upload an image file that meets the requirements. |
| 400 | AIS.0504 | The image size does not meet requirements. | The image size does not meet requirements. | Check whether the image size meets requirements. |
| 400 | AIS.0505 | Failed to run the algorithm. | Failed to run the algorithm. | Check the configuration. Contact HUAWEI CLOUD technical support. Submit a **service ticket**. |
| 400 | AIS.0506 | An internal error occurred. | An internal error occurred. | Contact HUAWEI CLOUD technical support. Submit a **service ticket**. |
| 400 | APIG.0101 | The API does not exist or has not been published. | The API does not exist or has not been published. | Check whether the API information is correct and whether the service is available in the **corresponding region**. Check whether the URL of the API is spelled correctly and whether the HTTP request method (such as POST and GET) is correct. Check whether the domain name and URI configured for service call are correct. For details about the domain name, see **Regions and Endpoints**. |

| Status Code | Error Code | Description | Description | Handling Measure |
| --- | --- | --- | --- | --- |
| 400 | APIG.0301 | 1. Incorrect IAM authentication information: Failed to decrypt the token. Check whether the entered token is complete.<br>2. The validity period of a token is 24 hours. If the token expires, obtain a new token and pass it.<br>3. The AK/SK authentication fails. Check whether the AK/SK is correct and whether the account is restricted due to arrears. | 1. Incorrect IAM authentication information: Failed to decrypt the token. Check whether the entered token is complete.<br>2. The validity period of a token is 24 hours. If the token expires, obtain a new token and pass it.<br>3. The AK/SK authentication fails. Check whether the AK/SK is correct and whether the account is restricted due to arrears. | **decrypt token fail**: The token request authentication information of **x-auth-token** in the HTTP request header is incorrect. Check the sent request and token.<br>**token expires**: The token expires. Obtain a new token and pass it.<br>**verify aksk signature fail**: Check whether the AK and SK are correct and whether the account is in arrears. |
| 400 | APIG.0201 | The request body is oversized. | The request body is oversized. | Check whether the request body is oversized. For details, see **Constraints**. |

| Status Code | Error Code | Description | Description | Handling Measure |
| --- | --- | --- | --- | --- |
| 400 | APIG.0308 | The request is sent too fast and exceeds the default rate limit of the service. | The request is sent too fast and exceeds the default rate limit of the service. | The request is sent too fast and reaches the rate limit of the API. Reduce the request speed. If you have higher requirements on the request speed, submit a **service ticket**. |
| 400 | ModelArts.0203 | Invalid token. | Invalid token. | Check whether the token is correct. |
| 400 | ModelArts.4101 | The token is empty. | The token is empty. | The HTTP request header does not contain the token request authentication information of **x-auth-token**. Check the request. |
| 400 | ModelArts.4102 | Failed to parse the token. | Failed to parse the token. | The token request authentication information of **x-auth-token** in the HTTP request header is incorrect. Check the sent request and token. |
| 400 | ModelArts.4103 | The token is invalid. | The token is invalid. | The token request authentication information of **x-auth-token** in the HTTP request header is incorrect. Check the sent request and token. |
| 400 | ModelArts.4104 | The length of the request body is invalid. | The length of the request body is invalid. | Check the request body length. |
| 400 | ModelArts.4105 | The JSON format of the request body is incorrect. | The JSON format of the request body is incorrect. | Check the JSON format of the request body. |
| 400 | ModelArts.4106 | The account is restricted. | The account is restricted. | Check the user resource status. For details about the account restriction reason, see the description of the account center. |

| Status Code | Error Code | Description | Description | Handling Measure |
|---|---|---|---|---|
| 400 | ModelArts.4107 | An exception occurred when obtaining the temporary AK/SK. | An exception occurred when obtaining the temporary AK/SK. | Contact HUAWEI CLOUD technical support and **submit a service ticket**. |
| 400 | ModelArts.4201 | The request URL does not contain the service ID. | The request URL does not contain the service ID. | Check the service ID in the request URL. |
| 400 | ModelArts.4202 | The request URL format is invalid. | The request URL format is invalid. | Check the request URL format. |
| 400 | ModelArts.4203 | No access permission. | No access permission. | Check the access permission. |
| 400 | ModelArts.4204 | The API is not subscribed to. | The API is not subscribed to. | Subscribe to this API. For details, see **Applying for a Service**. If the service has been subscribed to, check whether the region where the service is subscribed to is the same as the region where the service is called. If the region is correct, check whether the URL of the API is spelled correctly and whether the HTTP request method (such as POST and GET) is correct. |
| 400 | ModelArts.4601 | The external URL is invalid. | The external URL is invalid. | Check whether the entered URL is correct. |
| 400 | ModelArts.4603 | The file failed to be downloaded from the external URL. | The file failed to be downloaded from the external URL. | Check whether the entered URL is correct. |

| Status Code | Error Code | Description | Description | Handling Measure |
| --- | --- | --- | --- | --- |
| 400 | ModelArts.4702 | The OBS agency failed to be queried. | The OBS agency failed to be queried. | Check whether the OBS agency has been enabled for the service. |
| 400 | ModelArts.4703 | The OBS URL is invalid. | The OBS URL is invalid. | Check the entered OBS URL. |
| 400 | ModelArts.4704 | Failed to obtain the OBS file. | Failed to obtain the OBS file. | Failed to download the OBS file. Check whether the file exists. |
| 400 | ModelArts.4705 | The OBS file is oversized. | The OBS file is oversized. | Use a file that meets the service size limit as the input. For details, see **Constraints**. |
| 400 | ModelArts.4706 | The OBS file does not exist. | The OBS file does not exist. | Failed to download the OBS file. Check whether the file exists. |
| 400 | Other | If other error codes are displayed, **submit a service ticket**. | | |

# 7.3 Configuring Access Permissions of OBS

Multimedia files such as images and audio files in the Enterprise Intelligence (EI) services can be directly processed by OBS. This reduces service usage costs, shortens service response time, and improves service experience.

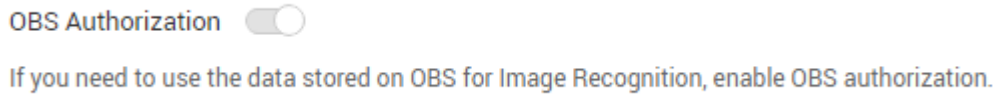
To ensure data security, a service can used authorized URLs (**https://<bucket-name>.<endpoint>/<object-name>**) to access files stored on OBS after it is granted with the permission. If not permitted, services cannot directly obtain user data. To obtain the user data, public read authorization must be enabled or a temporarily authorized URL must be provided.

## Service Authorization

To use data in OBS, you need to enable OBS authorization. Log in to the Content Moderation management console and click **Service Management**. Enable **OBS Authorization**. After the authorization is enabled, you can use the authorized URL to access the service.

**Figure 7-1** OBS Authorization




NOTE

The region of OBS must be consistent with that of Image Recognition.

### Enabling Public Read Authorization

For details about how to enable public read authorization, see **Permission Control** in the *Object Storage Service Console Operation Guide*. Then, you can access the data on OBS using the URL after the corresponding files are uploaded to OBS. The URL can also serve as EI services' API request parameter for using related service APIs.

### Using Temporary Request Authentication

Public read authorization is easy to use. However, when it is enabled, sensitive information, such as private data, may be disclosed. In this scenario, the temporary authorization function provided by OBS can be used.

OBS allows users to construct a specific URL for objects in OBS. The URL contains authentication information. Any user can use the URL to access the specified object in OBS, but the URL is valid only before the expiry time specified by **Expires**. After a user issues temporary authorization, other users can perform desired operations without knowing the user's secret access key.

For details about how to use the OBS temporary authorization function, see section "Authorized Access" in the **Object Storage Service SDK Reference**. Download the related SDK and sample code, and compile code to obtain the related URL.

## 7.4 Obtaining a Project ID and Name

### Scenarios

A project ID or name is required for some requests when an API is called. Therefore, obtain the project ID and name before calling the API. Use either of the following methods:

- **Obtaining a Project ID and Name from the Console**
- **Obtaining a Project ID by Calling an API**

### Obtaining a Project ID and Name from the Console

To do so, perform the following operations:

1. Sign up and log in to the console.

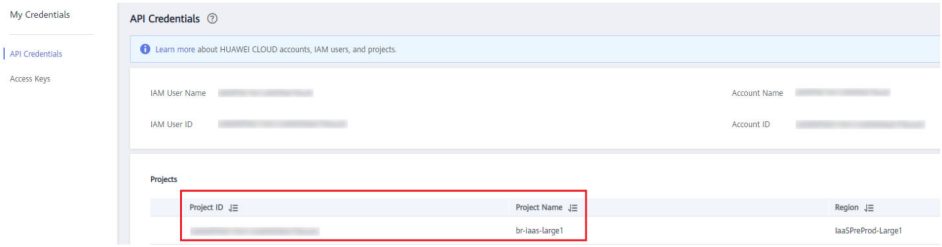
2. In the upper right corner of the page, click the username and choose **My Credentials** from the drop-down list. The **My Credentials** page is displayed.

   NOTE

   If you have logged in to the official HUAWEI CLOUD website but not the console, click your username in the upper right corner and choose **My Account** from the drop-down list. On the **Basic Information** page, click **Manage** following **Security Credentials**. Then, the **My Credentials** page is displayed.

3. On the **API Credentials** page, view the project ID and name in the **Projects** area.

   **Figure 7-2** Viewing the project ID

   If there are multiple projects, unfold the target region and obtain the project ID from the **Project ID** column.

## Obtaining a Project ID by Calling an API

A project ID can be obtained by calling a specific API. For details, see **Querying Project Information Based on the Specified Criteria**.

The API for obtaining a project ID is **GET https://*{iam-endpoint}*/v3/projects**. To obtain *{iam-endpoint}*, see **Regions and Endpoints**.

The following is an example response. For example, if ModelArts is deployed in the **ap-southeast-1** region, the value of **name** in the response body is **ap-southeast-1**. The value of **id** in **projects** is the project ID.

```
{
    "projects": [{
        "domain_id": "65382450e8f64ac0870cd180d14e684b",
        "is_domain": false,
        "parent_id": "65382450e8f64ac0870cd180d14e684b",
        "name": "ap-southeast-1",
        "description": "",
        "links": {
            "next": null,
            "previous": null,
            "self": "https://www.example.com/v3/projects/a4a5d4098fb4474fa22cd05f897d6b99"
        },
        "id": "a4a5d4098fb4474fa22cd05f897d6b99",
        "enabled": true
    }],
    "links": {
        "next": null,
        "previous": null,
        "self": "https://www.example.com/v3/projects"
    }
}
```

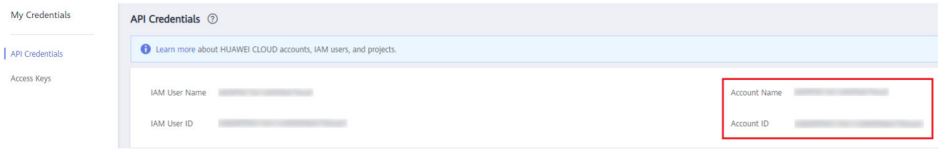
# 7.5 Obtaining an Account Name and ID

When you call APIs, certain requests require the account name and ID. To obtain an account name and ID, do as follows:

1. Sign up and log in to the console.
2. Hover the cursor on the username and choose **My Credentials** from the drop-down list.

   On the **API Credentials** page, view the account name and ID.

**Figure 7-3** Viewing the account name and ID



# 8 Change History

| Release Date | What's New |
| --- | --- |
| 2019-05-09 | This is the first official release. |