

Solution

Serverless Video Transcoding

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1 Solution Overview

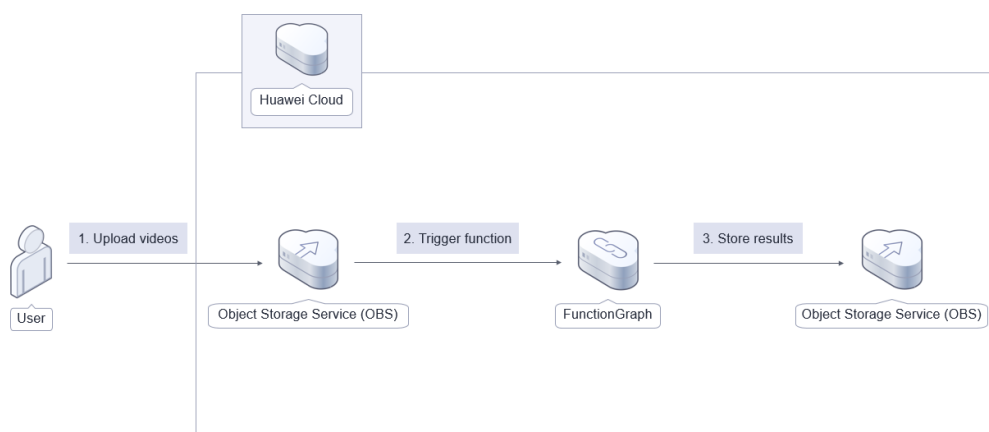
Scenarios

This solution uses a FunctionGraph Object Storage Service (OBS) trigger to transcode video files in an OBS bucket. The transcoding parameters are configured using environment variables. This solution depends on the third-party library ffmpeg for automatic transcoding, reducing labor costs.

Solution Architecture

This solution uses FunctionGraph to transcode video files uploaded to an OBS bucket. This solution architecture is illustrated below.

Figure 1-1 Architecture



This solution will:

- Create two OBS buckets for storing original and transcoded video files, respectively.

- Create an agency in Identity and Access Management (IAM) to delegate FunctionGraph to access video files uploaded to an OBS bucket.
- Create a video transcoding function and an OBS trigger in FunctionGraph.

Advantages

- Ease of use
The serverless architecture frees you from resource O&M to focus on services.
- Low cost
You pay only for what you use.
- Easy deployment
You can configure FunctionGraph and OBS resources in just a few clicks.

Constraints

- Before deploying this solution, ensure that you have an account with access to the target region and sufficient balance for purchasing the resources listed in [2 Resource and Cost Planning](#).
- Ensure that OBS buckets are empty before deleting them.

2 Resource and Cost Planning

This solution deploys the resources listed in the following table. The costs are only estimates and may differ from the final prices. For details, see [pricing details](#).

Table 2-1 Resource and cost planning

Huawei Cloud Service	Example Configuration	Monthly Cost
Object Storage Service	<ul style="list-style-type: none">• Region: AP-Singapore• Billing Mode: Pay-per-use• Product Type: Object storage• Storage Class: Standard• Data Redundancy Policy: Multi-AZ storage• Pay per Use Pricing, Standard (USD): 0.0250/GB per month Traffic: Upload traffic to OBS: Free	It is estimated that 1 GB data will be added every month, which will cost \$0.025 USD. The storage cost of this solution is low. For details, see the monthly bill.

Huawei Cloud Service	Example Configuration	Monthly Cost
FunctionGraph	<ul style="list-style-type: none"> ● Region: AP-Singapore ● Product: FunctionGraph ● Pricing tier: <ul style="list-style-type: none"> ≤ 1 million requests: \$0 USD per 1 million requests > 1 million requests: \$0.2 USD per 1 million requests ● Metering duration: <ul style="list-style-type: none"> ≤ 400,000 GB-seconds: \$0 USD per GB-second > 400,000 GB-seconds: \$0.00001667 USD per GB-second 	\$0 USD
Total		About \$0.1390 USD

3 Procedure

- [3.1 Preparations](#)
- [3.2 Quick Deployment](#)
- [3.3 Getting Started](#)
- [3.4 Quick Uninstallation](#)

3.1 Preparations

Creating the `rf_admin_trust` Agency

- Step 1** Log in to Huawei Cloud official website, open the [console](#), hover over the account name, and choose **Identity and Access Management**.

Figure 3-1 Console page

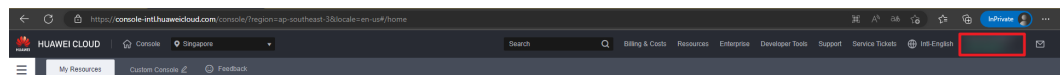
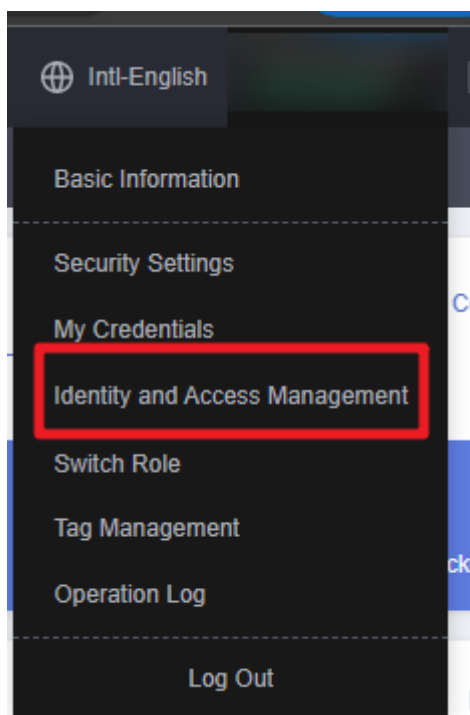
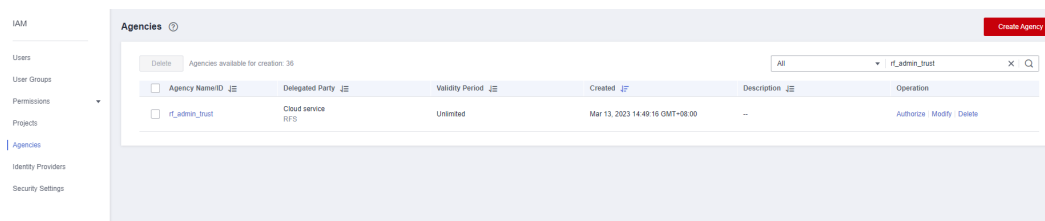


Figure 3-2 Identity and Access Management



Step 2 Choose **Agencies** in the left navigation pane and search for the **rf_admin_trust** agency.

Figure 3-3 Agency list



- If the agency is found, skip the following steps.
- If the agency is not found, perform the following steps to create it.

Step 3 Click **Create Agency** in the upper right corner of the page. On the displayed page, enter **rf_admin_trust** for **Agency Name**, select **Cloud service** for **Agency Type**, select **RFS** for **Cloud Service**, and click **Next**.

Figure 3-4 Creating an agency

Agencies / Create Agency

* Agency Name

* Agency Type Account
Delegate another HUAWEI CLOUD account to perform operations on your resources.
 Cloud service
Delegate a cloud service to access your resources in other cloud services.

* Cloud Service

* Validity Period

Description
0/255

Step 4 Search for **Tenant Administrator**, select it in the search results, and click **Next**.

Figure 3-5 Selecting a policy

Authorize Agency

1 Select Policy/Role 2 Select Scope 3 Finish

Assign selected permissions to rf_admin_trust1. Create Policy

View Selected (1) Copy Permissions from Another Project

Policy/Role Name	Type
<input type="checkbox"/> DME AdministratorAccess Data Model Engine tenant administrator with full permissions.	System-defined policy
<input checked="" type="checkbox"/> Tenant Administrator Tenant Administrator (Exclude IAM)	System-defined role
<input type="checkbox"/> CS Tenant Admin Cloud Stream Service Tenant Administrator, can manage multiple CS users	System-defined role

Step 5 Select **All resources** and click **OK**.

Figure 3-6 Selecting a scope

Authorize Agency

1 Select Policy/Role 2 Select Scope 3 Finish

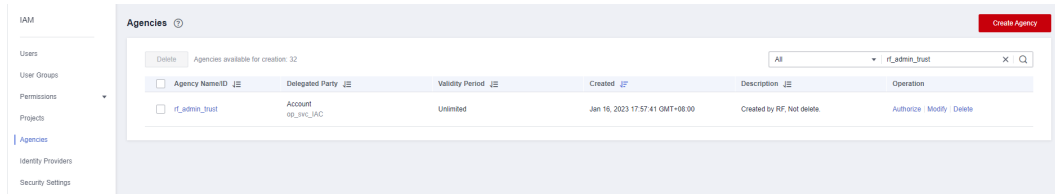
i The following are recommended scopes for the permissions you selected. Select the desired scope requiring minimum authorization.

Scope

All resources
IAM users will be able to use all resources, including those in enterprise projects, region-specific projects, and global services under your account based on assigned permissions.
[Show More](#)

Step 6 Check that the **rf_admin_trust** agency is displayed in the agency list.

Figure 3-7 Agency list

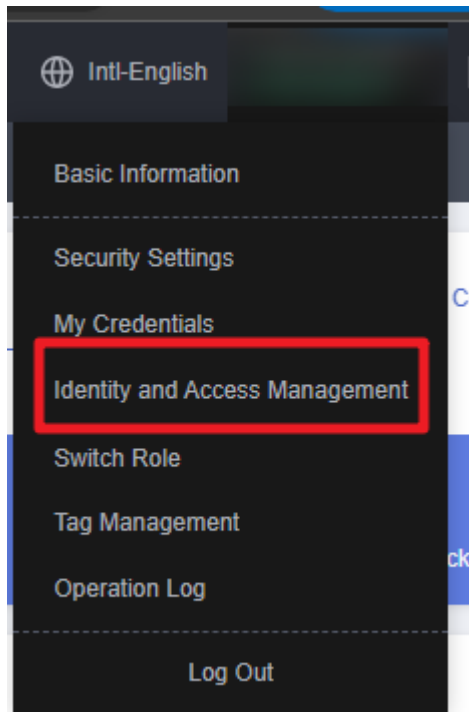


----End

Creating the IAM Agency Management FullAccess Policy

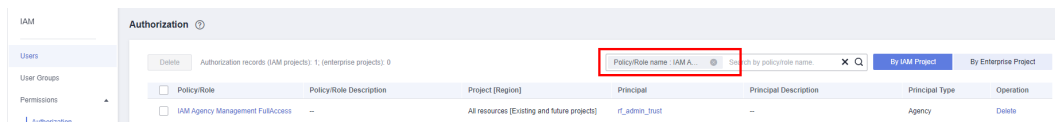
Step 1 Choose Identity and Access Management.

Figure 3-8 Identity and Access Management



Step 2 Choose Permissions > Authorization, enter IAM Agency Management FullAccess in the search box, and check whether this policy exists.

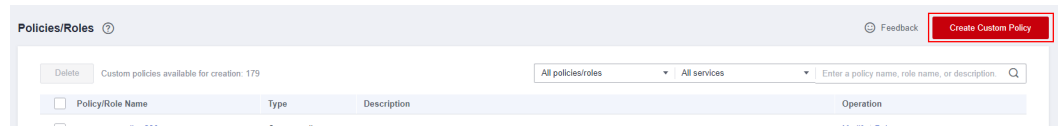
Figure 3-9 Permission list



- If the policy is found, you do not need to create it.
- If the policy is not found, create it.

Step 3 Choose Permissions > Policies/Roles, and click Create Custom Policy.

Figure 3-10 Clicking Create Custom Policy



Step 4 Enter policy name **IAM Agency Management FullAccess**, select **JSON**, enter the following JSON code in the **Policy Content** text box, and click **OK**.

Figure 3-11 Creating a custom policy

★ Policy Name

Policy View Visual editor JSON

★ Policy Content

```

1 {
2   "Version": "1.1",
3   "Statement": [
4     {
5       "Effect": "Allow",
6       "Action": [
7         "iam:agencies:updateAgency",
8         "iam:permissions:listRolesForAgencyOnDomain",
9         "iam:permissions:revokeRoleFromAgencyOnDomain",
10        "iam:permissions:listRolesForAgency",
11        "iam:permissions:checkRoleForAgencyOnProject",
12        "iam:roles:listRoles",
13        "iam:agencies:deleteAgency",
14        "iam:permissions:checkRoleForAgency",
15        "iam:permissions:listRolesForAgencyOnProject",
16        "iam:permissions:checkRoleForAgencyOnDomain",
17        "iam:agencies:listAgencies",
18        "iam:permissions:grantRoleToAgencyOnDomain",
19        "iam:permissions:revokeRoleFromAgencyOnProject",
20        "iam:agencies:getAgency",
21        "iam:agencies:createAgency",
22        "iam:permissions:grantRoleToAgency",
23        "iam:permissions:grantRoleToAgencyOnProject",
24        "iam:permissions:revokeRoleFromAgency"
25      ]
26    }
27  ]
28 }
    
```

Description

Scope Global services

```

{
  "Version": "1.1",
  "Statement": [
    {
      "Action": [
        "iam:agencies:createAgency",
        "iam:agencies:listAgencies",
        "iam:agencies:getAgency",
        "iam:agencies:deleteAgency",
        "iam:agencies:updateAgency",
        "iam:permissions:revokeRoleFromAgencyOnProject",
        "iam:permissions:revokeRoleFromAgencyOnDomain",
        "iam:permissions:revokeRoleFromAgency",
        "iam:permissions:grantRoleToAgencyOnDomain",
        "iam:permissions:grantRoleToAgencyOnProject",
        "iam:permissions:grantRoleToAgency",
        "iam:permissions:revokeRoleFromAgency"
      ]
    }
  ]
}
    
```

```
"iam:permissions:listRolesForAgencyOnDomain",  
"iam:permissions:listRolesForAgencyOnProject",  
"iam:permissions:checkRoleForAgencyOnDomain",  
"iam:permissions:checkRoleForAgencyOnProject",  
"iam:permissions:listRolesForAgency",  
"iam:permissions:checkRoleForAgency",  
"iam:roles:listRoles"  
  ],  
  "Effect": "Allow"  
}  
]
```

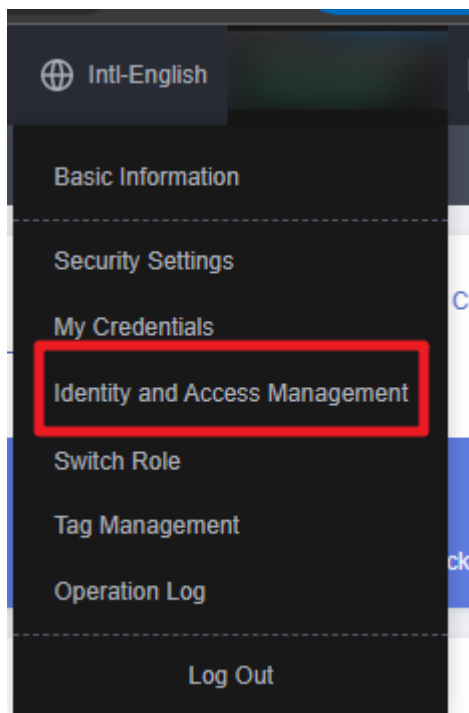
Step 5 If no error message is displayed, the **IAM Agency Management FullAccess** policy is successfully created.

----End

Assigning the IAM Agency Management FullAccess Policy to Agency rf_admin_trust

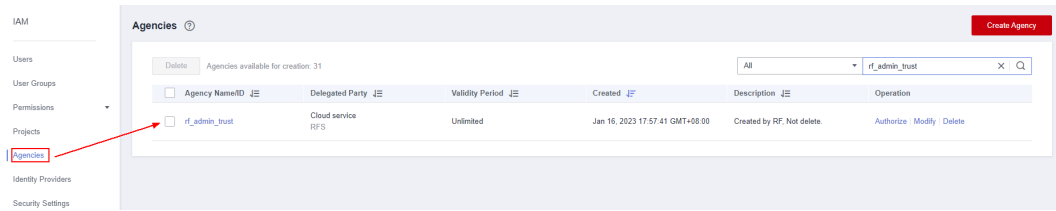
Step 1 Choose **Identity and Access Management**.

Figure 3-12 Identity and Access Management



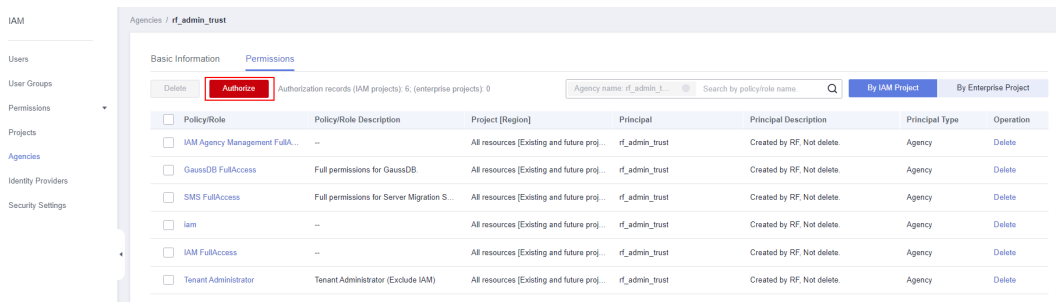
Step 2 Choose **Agencies** in the left navigation pane and select the **rf_admin_trust** agency.

Figure 3-13 Agency list



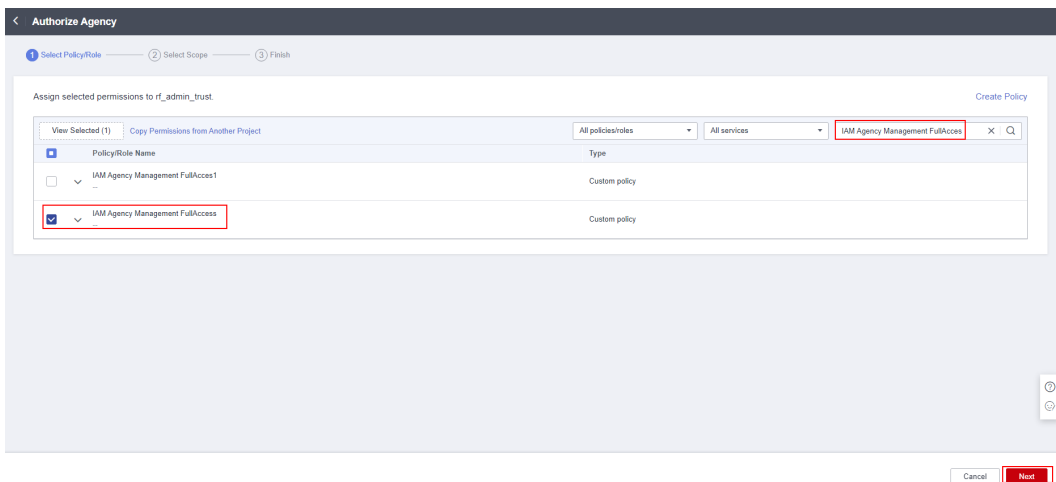
Step 3 Click the **Permissions** tab and click **Authorize**.

Figure 3-14 Permissions



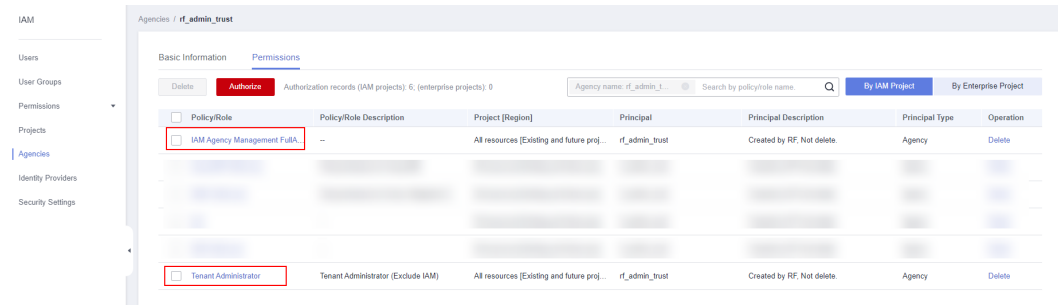
Step 4 Enter **IAM Agency Management FullAccess** in the search box, select the policy, click **Next**, and then click **OK**.

Figure 3-15 Configuring the IAM Agency Management FullAccess policy



Step 5 Check that the **rf_admin_trust** agency has the **Tenant Administrator** and **IAM Agency Management FullAccess** permissions.

Figure 3-16 Permissions



----End

3.2 Quick Deployment

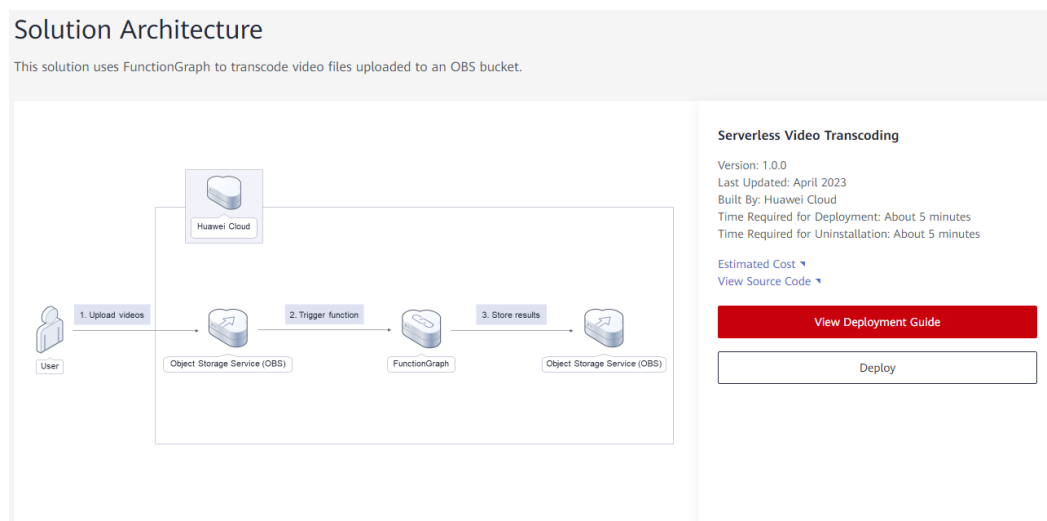
This section describes how to deploy the Serverless Video Transcoding solution.

Table 3-1 Parameter description

Parameter	Type	Mandatory	Description	Default Value
src_video_bucket_name	String	Yes	Name of an OBS bucket for storing the original videos. The name must be unique and can contain 3 to 55 characters, including lowercase letters, digits, and hyphens (-). Do not start or end with a hyphen.	Left blank
transcode_bucket_name	String	Yes	Name of an OBS bucket for storing transcoded videos. The name must be unique and can contain 3 to 56 characters, including lowercase letters, digits, and hyphens (-). Do not start or end with a hyphen.	Left blank
dst_format	String	Yes	Target format to transcode videos to. For example, avi , flv , and m3u8 .	Left blank
dst_height	String	Yes	Target resolution height to transcode videos to. For example, 720 .	Left blank
dst_width	String	Yes	Target resolution width to transcode videos to. For example, 1280 .	Left blank

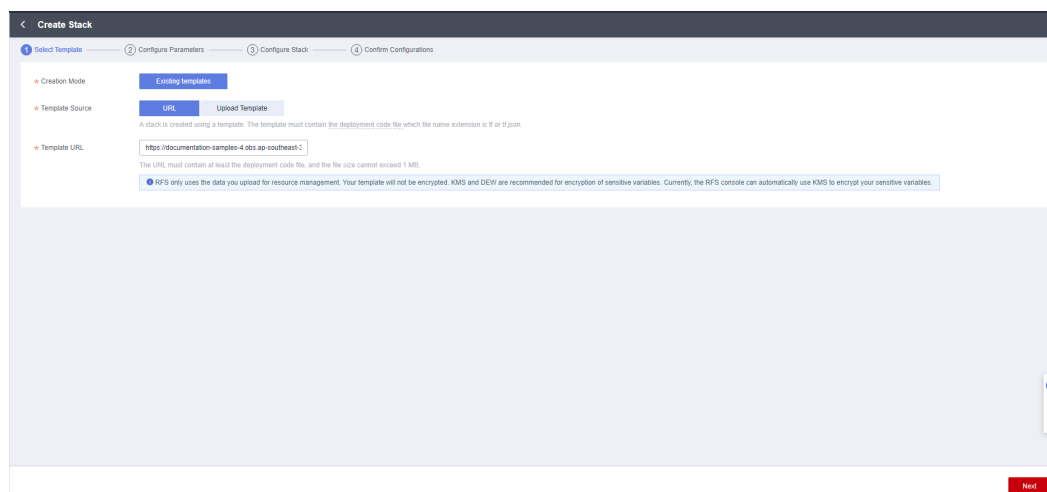
Step 1 Log in to Huawei Cloud Solution Best Practices, choose **Serverless Video Transcoding**, and click **Deploy**.

Figure 3-17 Selecting a solution



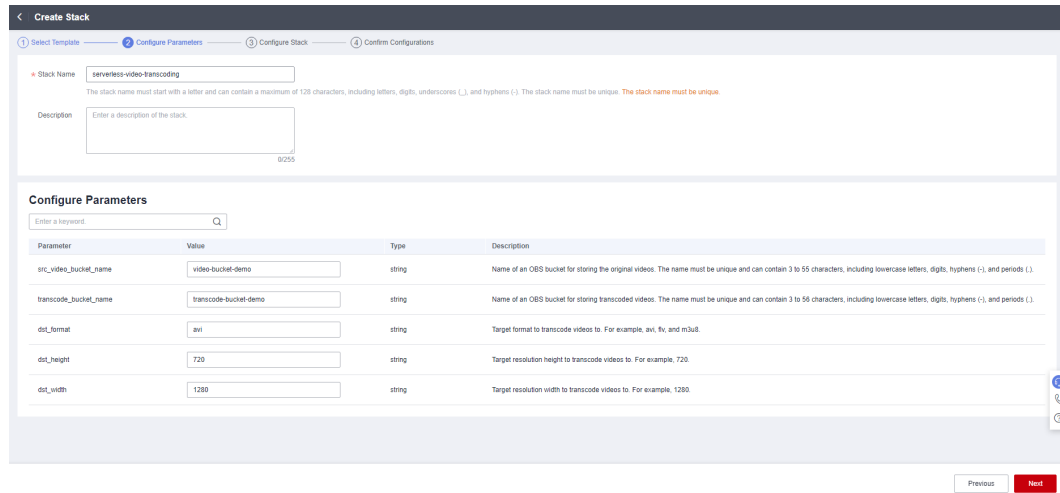
Step 2 On the **Select Template** page, click **Next**.

Figure 3-18 Selecting a template



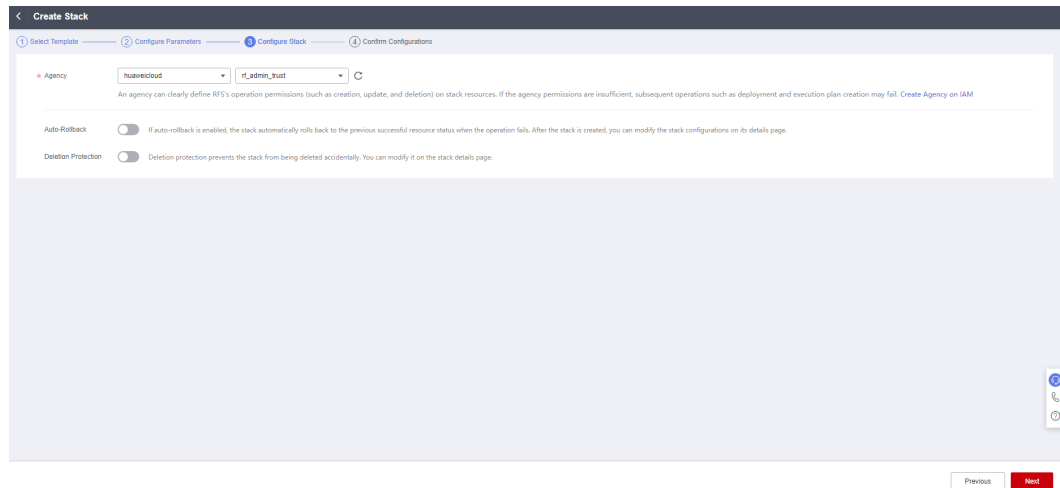
Step 3 On the **Configure Parameters** page, configure parameters by referring to **Table 3-1** and click **Next**.

Figure 3-19 Configuring parameters



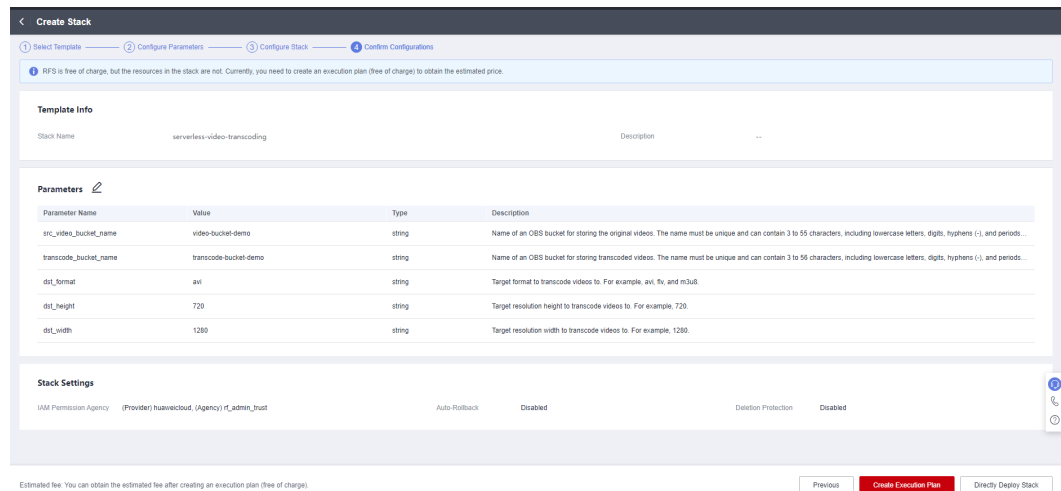
Step 4 On the displayed page, select **rf_admin_trust** from the **Agency** drop-down list and click **Next**.

Figure 3-20 Configuring a stack



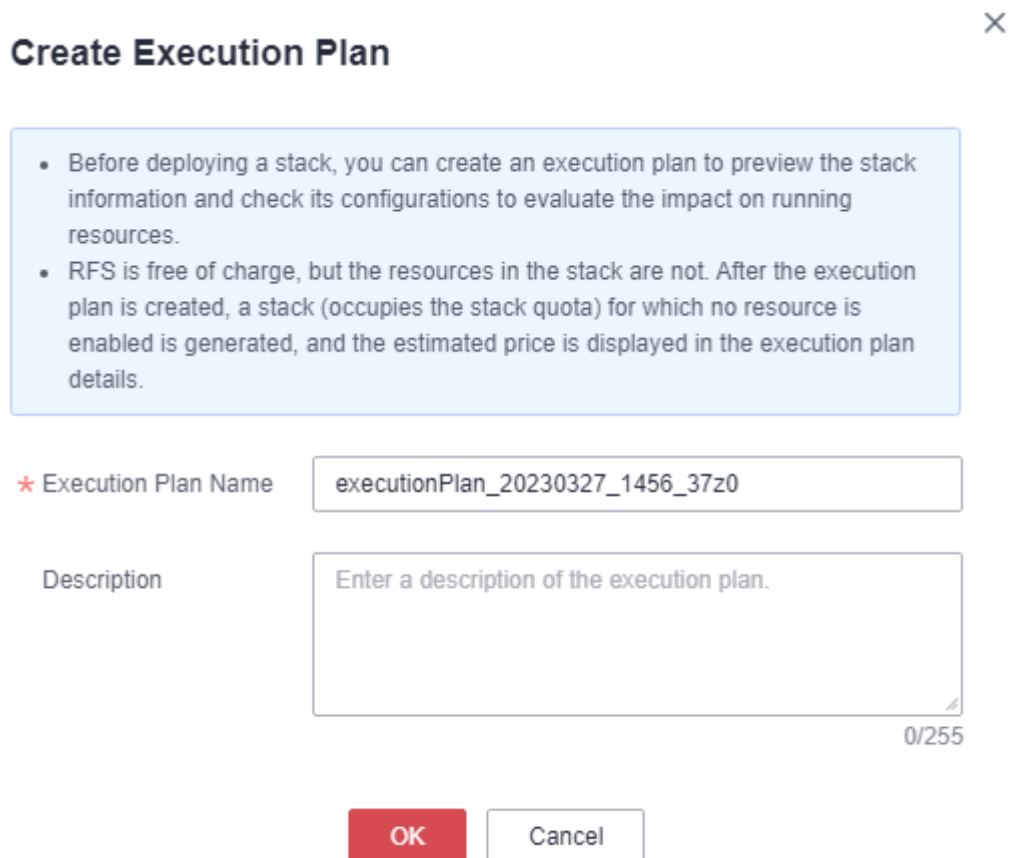
Step 5 On the **Confirm Configurations** page, click **Create Execution Plan**.

Figure 3-21 Confirming configurations



Step 6 In the displayed **Create Execution Plan** dialog box, enter an execution plan name and click **OK**.

Figure 3-22 Creating an execution plan



Step 7 Click **Deploy**. In the displayed dialog box, click **Execute**.

Figure 3-23 Execution Plans tab

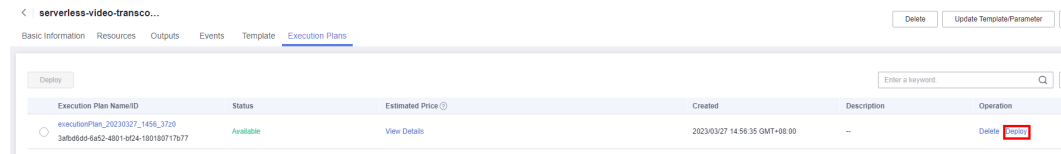
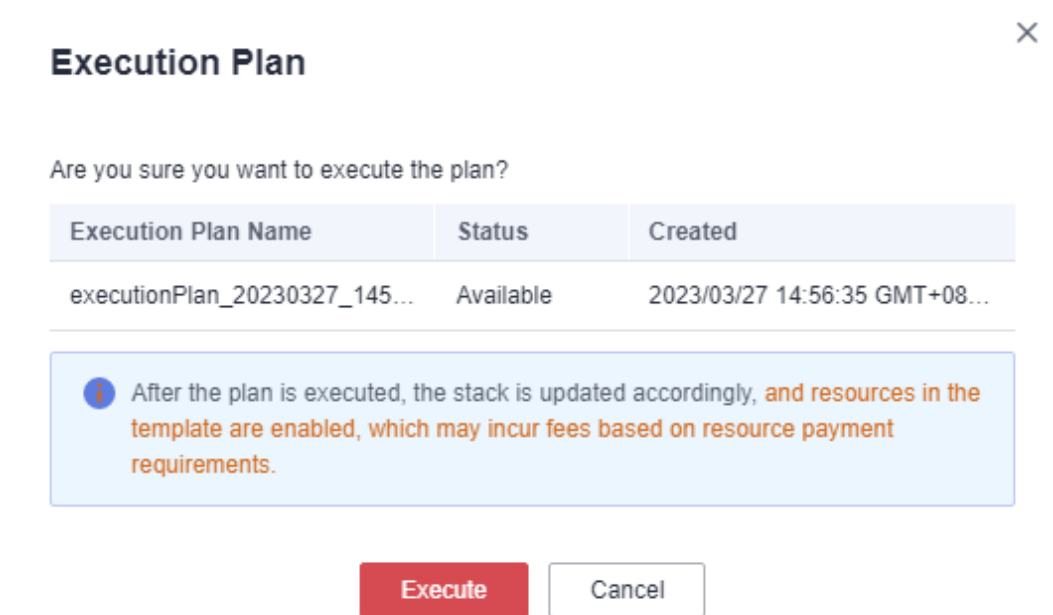
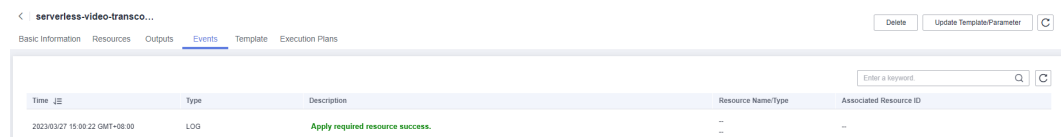


Figure 3-24 Confirming the execution plan



Step 8 Click the **Events** tab and check whether the message "Apply required resource success." is displayed. If yes, the solution is successfully deployed.

Figure 3-25 Solution deployed

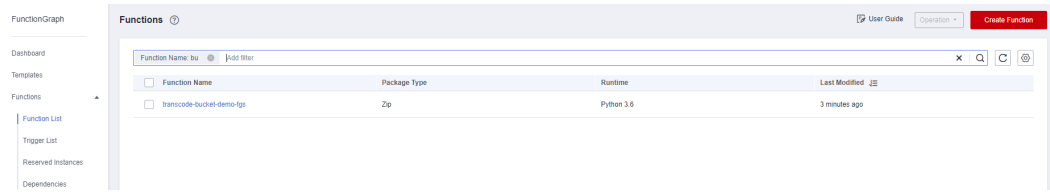


----End

3.3 Getting Started

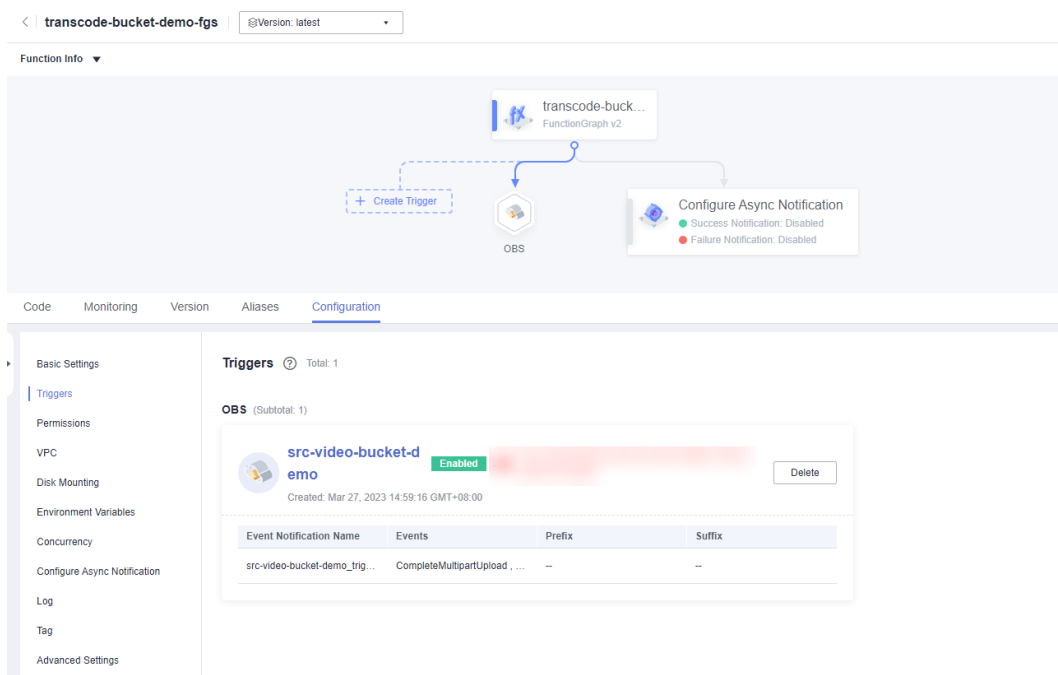
Step 1 Go to the [FunctionGraph console](#), and view the created function in the function list.

Figure 3-26 Created function



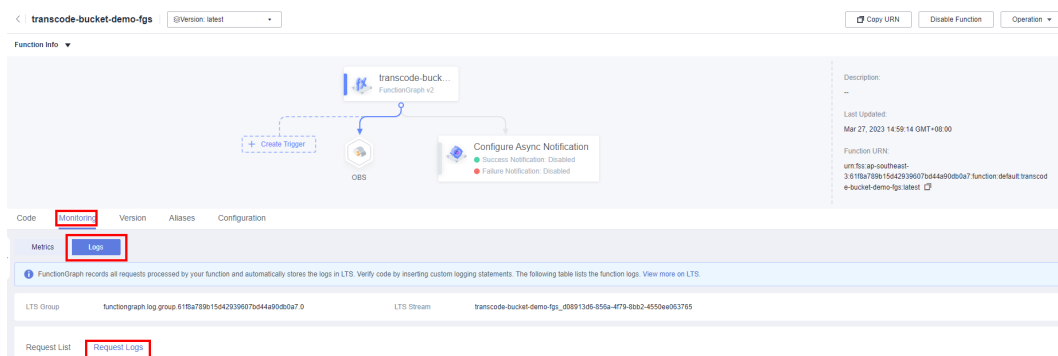
Step 2 On the details page of the function, view the created trigger.

Figure 3-27 Video transcoding trigger



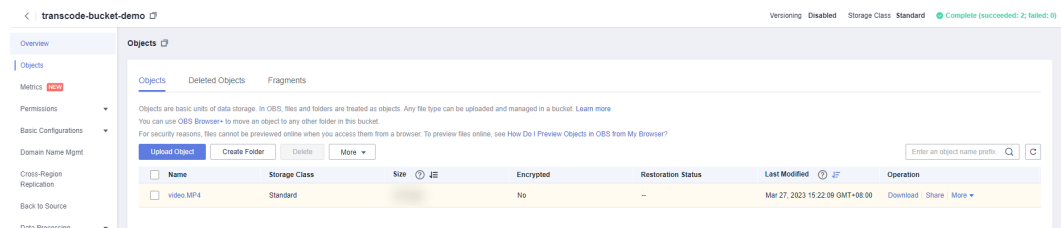
Step 3 On the **Monitoring** tab, view the logs of function execution triggered by uploading video files to the bucket that stores the original video files.

Figure 3-28 Request logs



Step 4 View the transcoded video files in the specified bucket.

Figure 3-29 Transcoded video files



----End

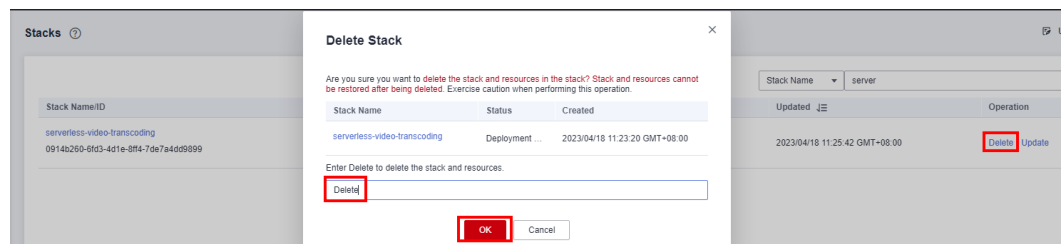
3.4 Quick Uninstallation

NOTICE

Ensure that OBS buckets are empty before deleting them.

- Step 1** Log in to the [Application Orchestration Service \(AOS\) console](#). On the **Stacks** page, locate the row containing the solution stack you created in [Step 3](#), and click **Delete** in the **Operation** column. In the displayed **Delete Stack** dialog box, enter **Delete** in the text box and click **OK**.

Figure 3-30 Deleting a stack



----End

4 Appendix

Terms

- **Object Storage Service (OBS):** OBS provides stable, secure, efficient, and easy-to-use cloud storage that lets you store virtually any volume of unstructured data in any format and access it from anywhere using REST APIs.
- **FunctionGraph:** FunctionGraph allows you to run your code without provisioning or managing servers, while ensuring high availability and scalability. All you need to do is upload your code and set execution conditions, and FunctionGraph will take care of the rest. You pay only for what you use and you are not charged when your code is not running.
- **Identity and Access Management (IAM):** IAM enables you to easily manage users and control their access to Huawei Cloud services and resources.

5 Change History

Table 5-1 Change history

Released On	Description
2023-04-30	This issue is the first official release.