

**Solution**

# Reinstalling the OS of ECSs

**Issue** 1.0  
**Date** 2023-08-08



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# 1 Solution Overview

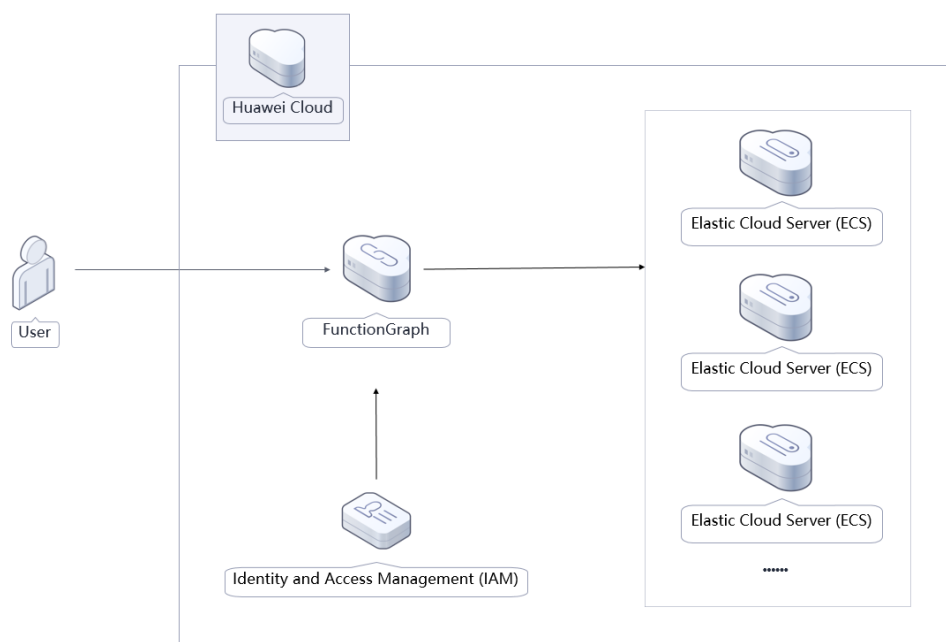
## Scenarios

This solution uses a FunctionGraph function to change or reinstall the OS of multiple Elastic Cloud Servers (ECSs).

## Architecture

You can change or reinstall the OS of multiple ECSs on Huawei Cloud. The following figure shows the solution architecture.

**Figure 1-1** Solution architecture



This solution will:

- Create a FunctionGraph function to call the ECS API used to reinstall or change the OS.

- Create an agency in Identity and Access Management (IAM) to delegate FunctionGraph to access ECS in the relevant region.

## Advantages

This solution has the following advantages:

- **Serverless**  
The serverless architecture frees you from underlying resource O&M and availability and scalability issues.
- **Easy to deploy**  
You can reinstall or change the OS of multiple ECSs with just a few clicks.
- **Customizable**  
This solution is open-source and free for commercial use. You can also make custom development according to the practical requirements.

## Constraints

- Before deploying this solution, register a HUAWEI ID, enable Huawei Cloud services, and complete real-name authentication. Ensure that your account is not in arrears or frozen.
- For details about the notes, constraints, and prerequisites for reinstalling the OS, see [Reinstalling the OS](#).
- For details about the notes, constraints, prerequisites, and billing rules for changing the OS, see [Changing the OS](#).

# 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
<a href="#">FunctionGraph</a>	<ul style="list-style-type: none"><li>• <b>Function Type: Event Function</b></li><li>• <b>Region: AP-Singapore</b></li><li>• <b>Runtime: Python 3.6</b></li><li>• <b>Memory: 128 MB</b></li></ul>	Total price = Price for requests + Price for execution duration <ul style="list-style-type: none"><li>• Requests (example: ≤ 1 million per month): \$0 USD</li><li>• Execution duration (example: 400,000 GB-seconds per month): \$0 USD</li></ul>
Total		\$0 USD

# 3 Procedure

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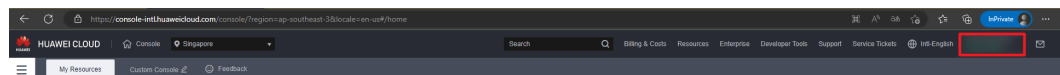
- [3.1 Preparations](#)
- [3.2 Quick Deployment](#)
- [3.3 Getting Started](#)
- [3.4 Quick Uninstallation](#)

## 3.1 Preparations

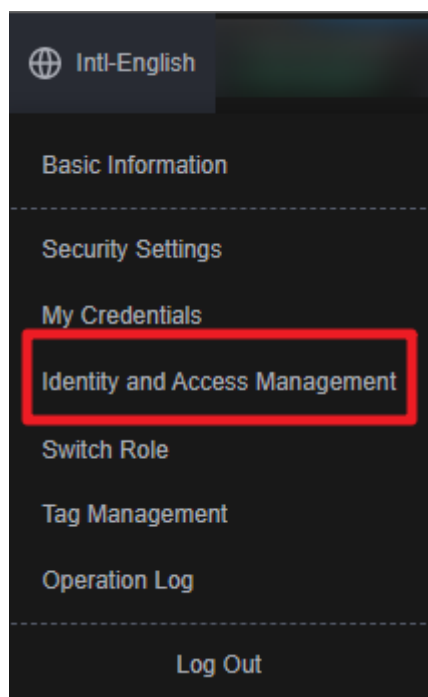
### Creating the `rf_admin_trust` Agency

- 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

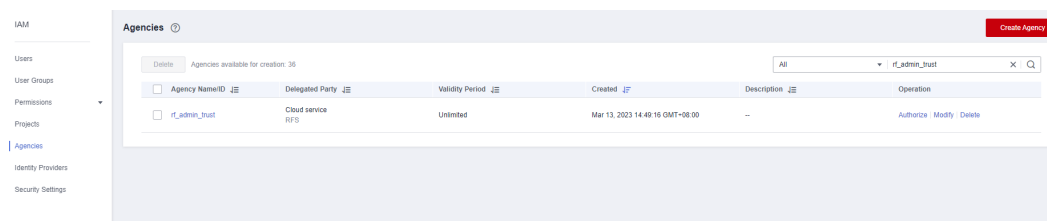


**Figure 3-2** Identity and Access Management



**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/role

Authorize Agency

1 Select Policy/Role 2 Select Scope 3 Finish

Assign selected permissions to rf\_admin\_trust1. Create Policy

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

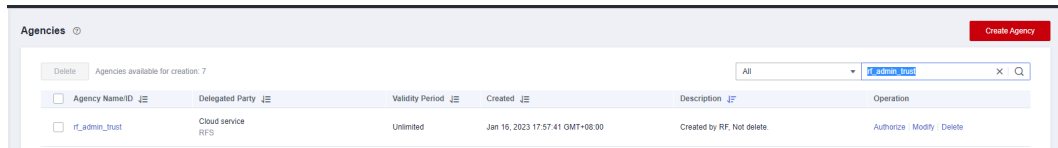
**i** The following are recommended scopes for the permissions you selected. Select the desired scope requiring minimum authorization.

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

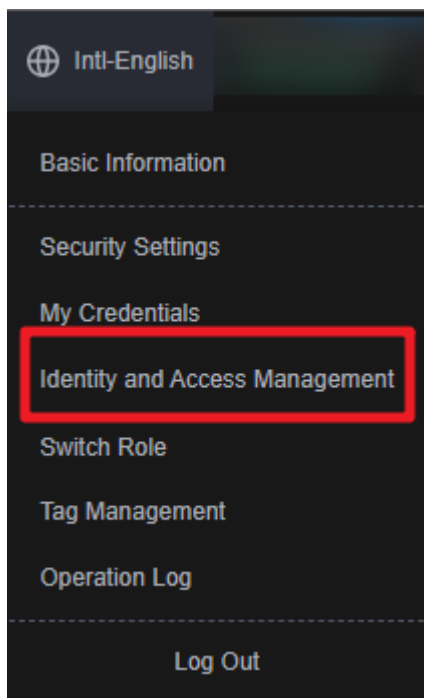


----End

## Creating the IAM Agency Management FullAccess Policy

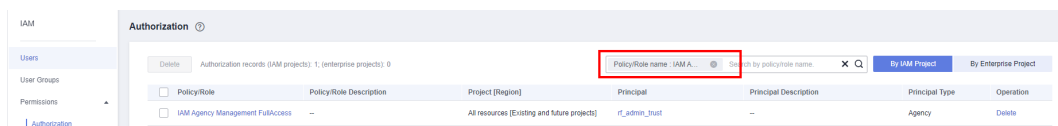
Step 1 Choose **Identity and Access Management**.

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.

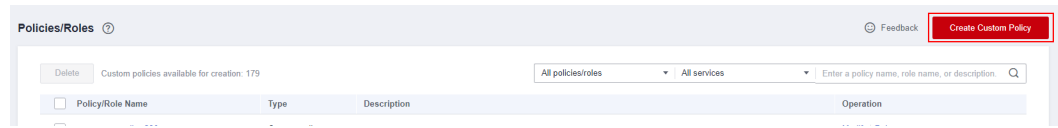
Figure 3-9 Permission list



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

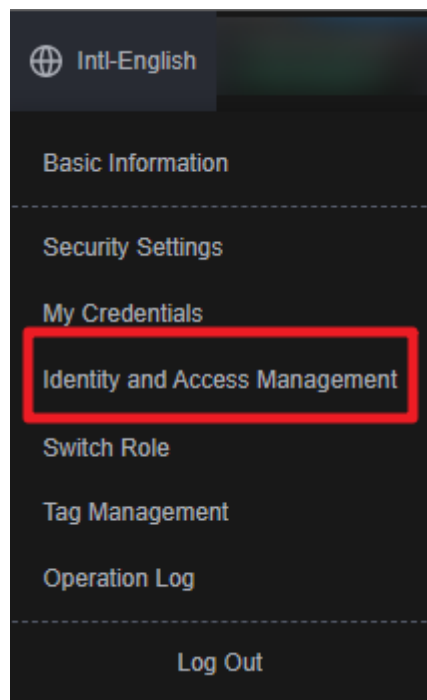
**Step 5** If no error message is displayed, the **IAM Agency Management FullAccess** policy is successfully created.

----End

## Assigning the IAM Agency Management FullAccess Policy to Agency rf\_admin\_trust

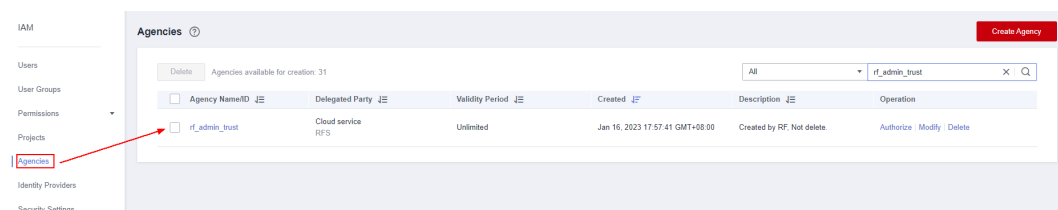
**Step 1** Choose **Identity and Access Management**.

**Figure 3-12** Identity and Access Management



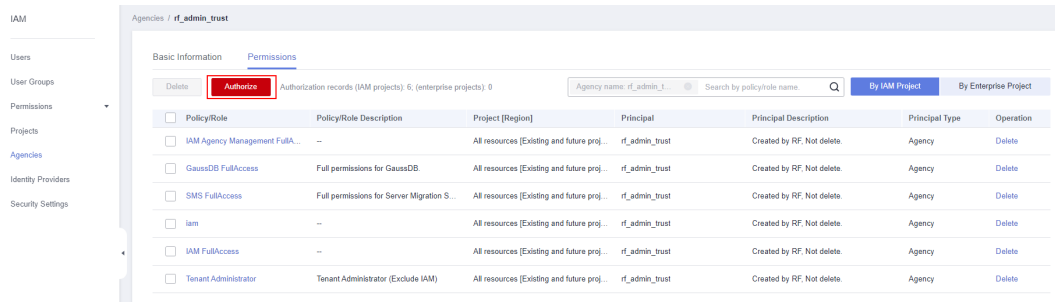
**Step 2** Choose **Agencies** in the left navigation pane and select the **rf\_admin\_trust** agency.

**Figure 3-13** Agency list



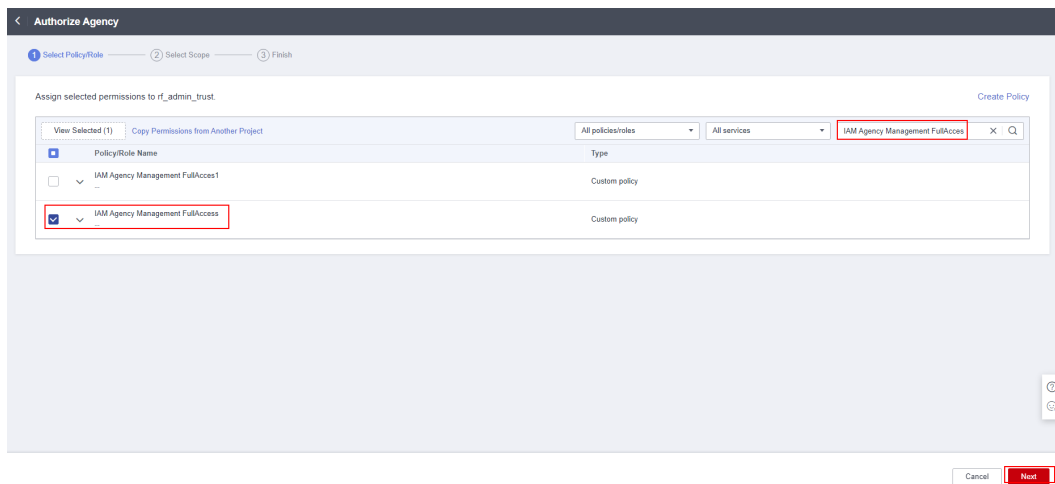
**Step 3** Click the **Permissions** tab and click **Authorize**.

**Figure 3-14** Permissions



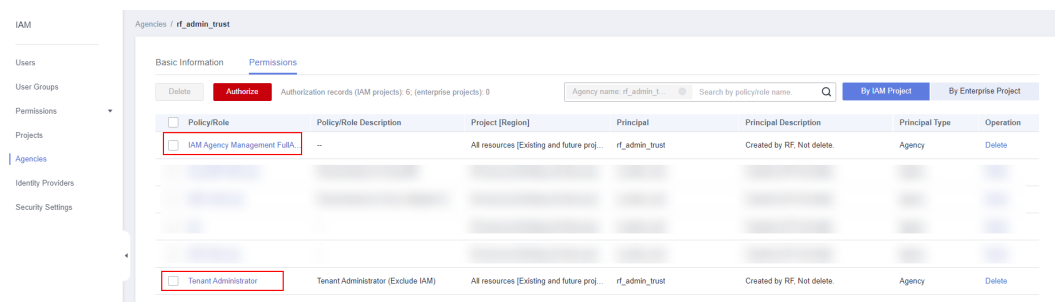
**Step 4** Enter **IAM Agency Management FullAccess** in the search box, select the policy, click **Next**, and then click **OK**.

**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

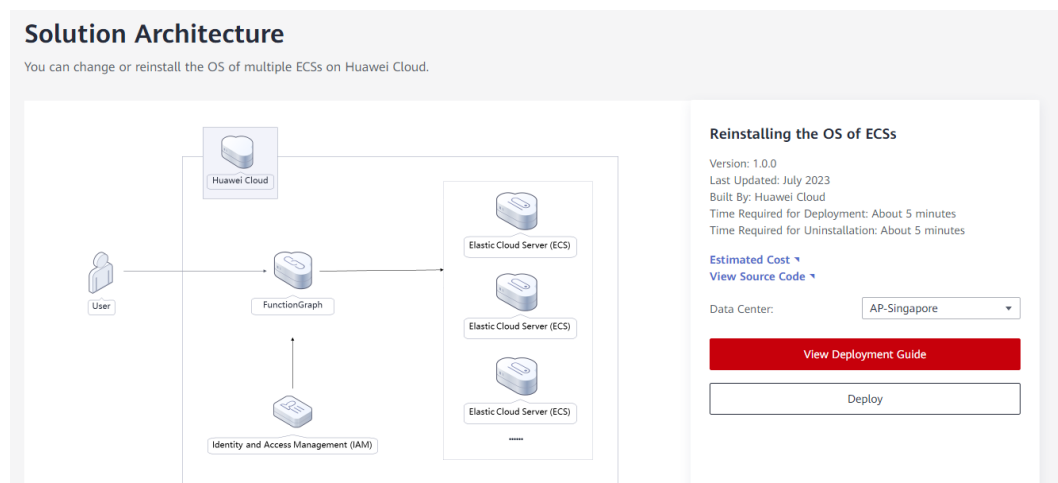
This section describes how to deploy the **Reinstalling the OS of ECSs** solution.

**Table 3-1** Parameter description

Parameter	Type	Mandatory	Description	Default Value
function_name	string	Yes	Function name in the format <i>{function_name}_fgs</i> , which identifies a function and serves as the prefix of other resource names. It must be unique and can contain 1 to 56 characters, including letters, digits, underscores (_), and hyphens (-). It must start with a letter.	batch_reinstall_os_demo
image_id	string	Yes	Enter <b>reinstall</b> to reinstall the OS or enter the image ID to change the OS. View the image ID in <a href="#">Public Images</a> . Default value: <b>reinstall</b> .	reinstall
ids	string	Yes	IDs of the ECSs to reinstall or change the OS. Separate the IDs with spaces. For example, <b>id1 id2 ...</b>	None
passwords	string	Yes	Passwords of the ECSs corresponding to the IDs. Separate the passwords with spaces. For example, <b>password1 password2 ...</b>	None

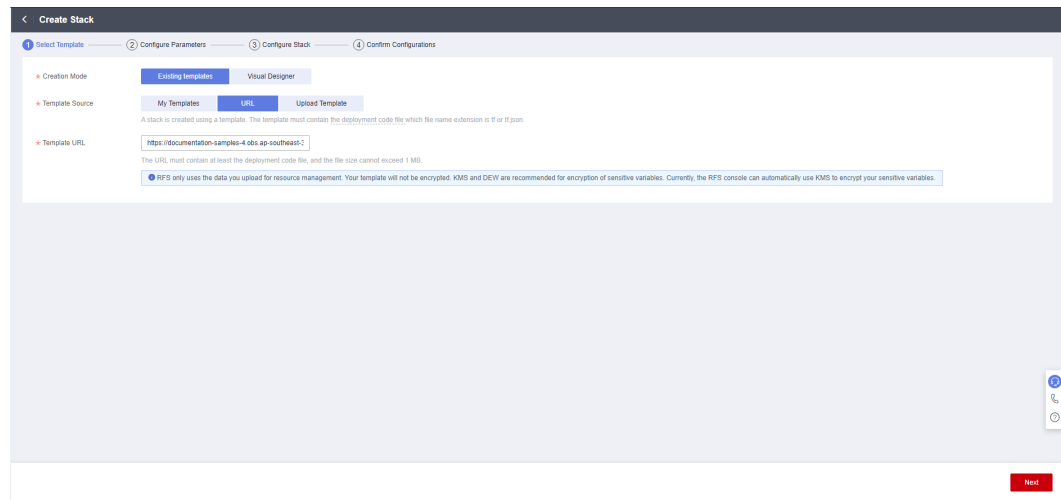
**Step 1** Log in to [Huawei Cloud Solution Best Practices](#), choose **Reinstalling the OS of ECSs**, and click **Deploy**.

**Figure 3-17** Solution Practices



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

Figure 3-18 Creating a stack

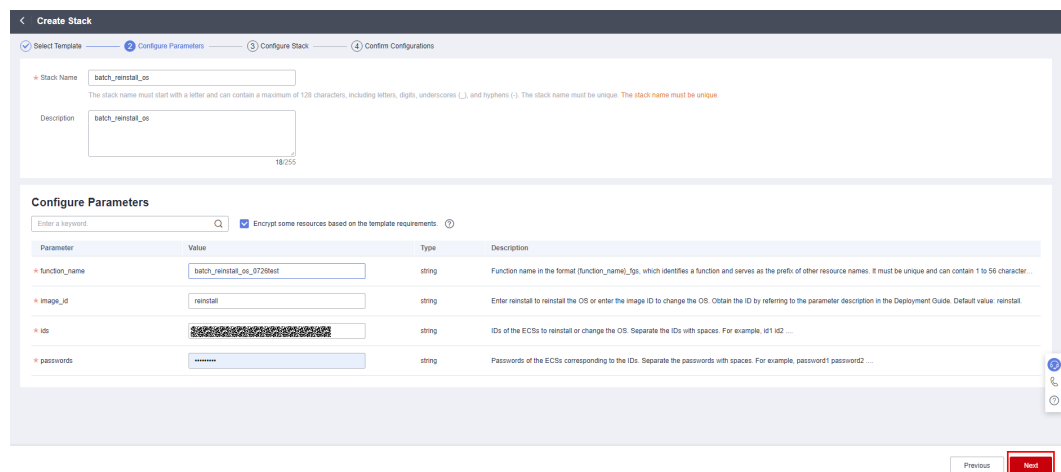


**Step 3** On the **Configure Parameters** page, enter a stack name, configure parameters based on [Table 3-1](#), and click **Next**.

**CAUTION**

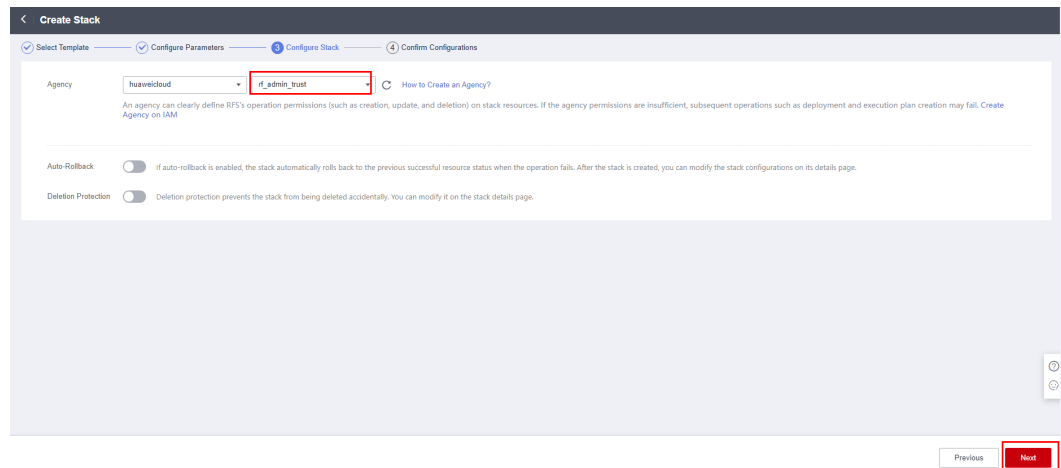
- This procedure uses reinstalling the OS as an example, that is, setting the **image\_id** parameter to **reinstall**. To change the OS, specify the image ID. Obtain the image ID according to [Table 3-1](#).

Figure 3-19 Configuring parameters



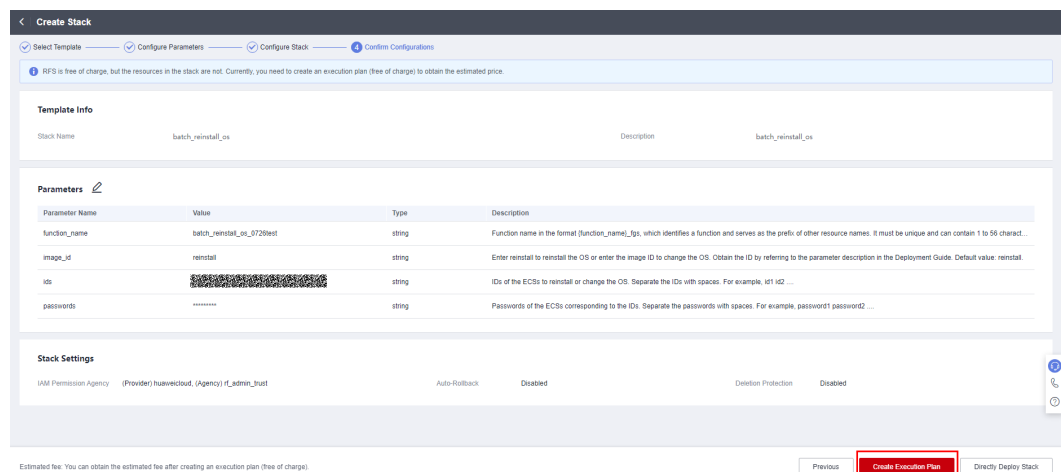
**Step 4** On the displayed page, select **rf\_admin\_trust** from the **Agency** drop-down list and click **Next**.

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

**Create Execution Plan** ×

**i** To preview your resource change information, you can create an execution plan.

★ Execution Plan Name

Description  0/255

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

Figure 3-23 Execution plan created

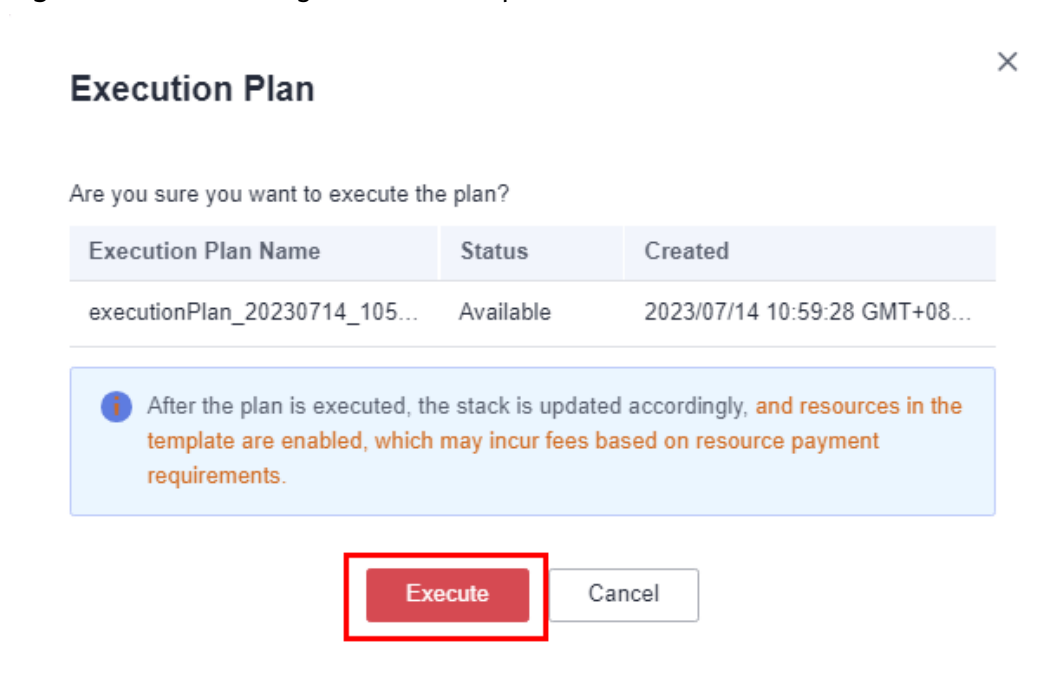
batch-reinstall-os Delete Update Template/Parameter C

Basic Information Resources Outputs Events Template Execution Plans

Deploy  Q C

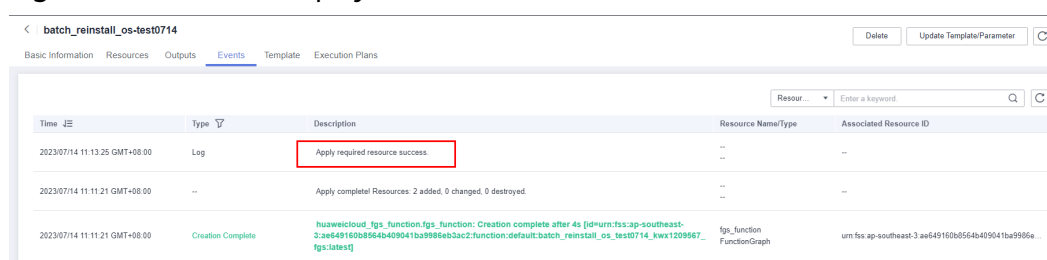
Execution Plan Name/ID	Status	Estimated Price	Created	Description	Operation
<input type="radio"/> executionPlan_20230714_1058_qpnb 71c3c217-9b0c-4269-ba4f-c9d468b851ef	Available	<a href="#">View Details</a>	2023/07/14 10:59:28 GMT+08:00	--	<input type="button" value="Deploy"/> <input type="button" value="Delete"/>

**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

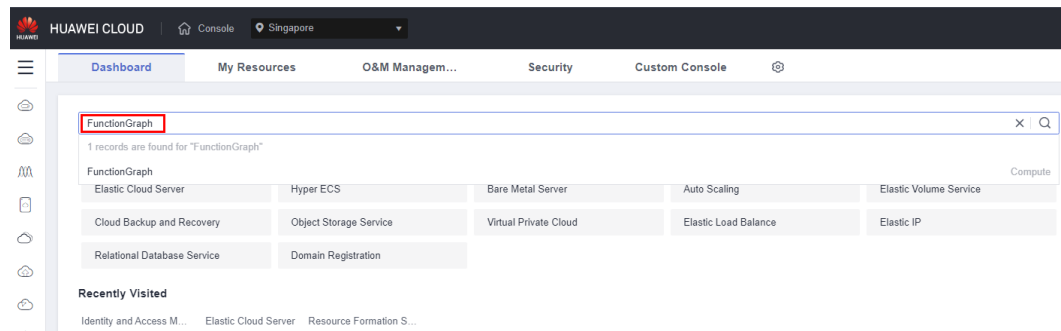


----End

## 3.3 Getting Started

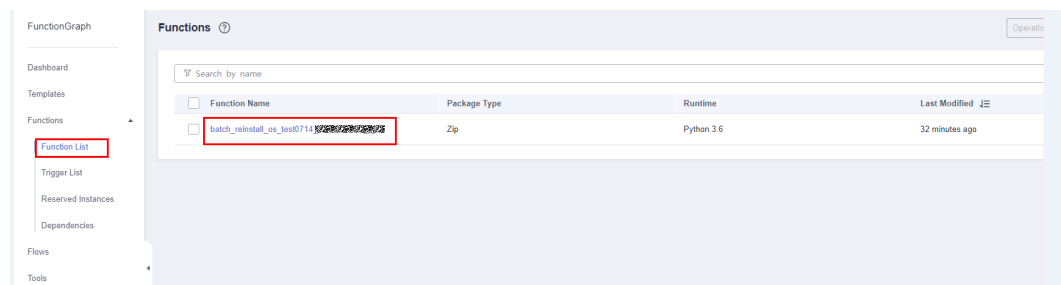
**Step 1** Log in to the [Huawei Cloud console](#), search for **FunctionGraph**, and go to the function list.

Figure 3-26 Huawei Cloud console



Step 2 View the function created for this solution.

Figure 3-27 Created function



Step 3 Go to the function details page, and click **Test**. In the displayed dialog box, select **blank-template**, and click **Create** to create a test event.

Figure 3-28 Function details page

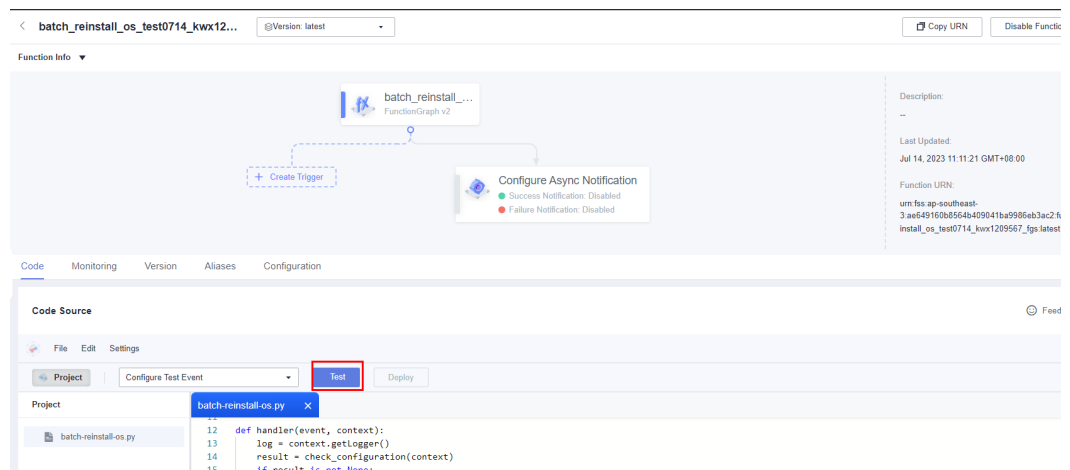
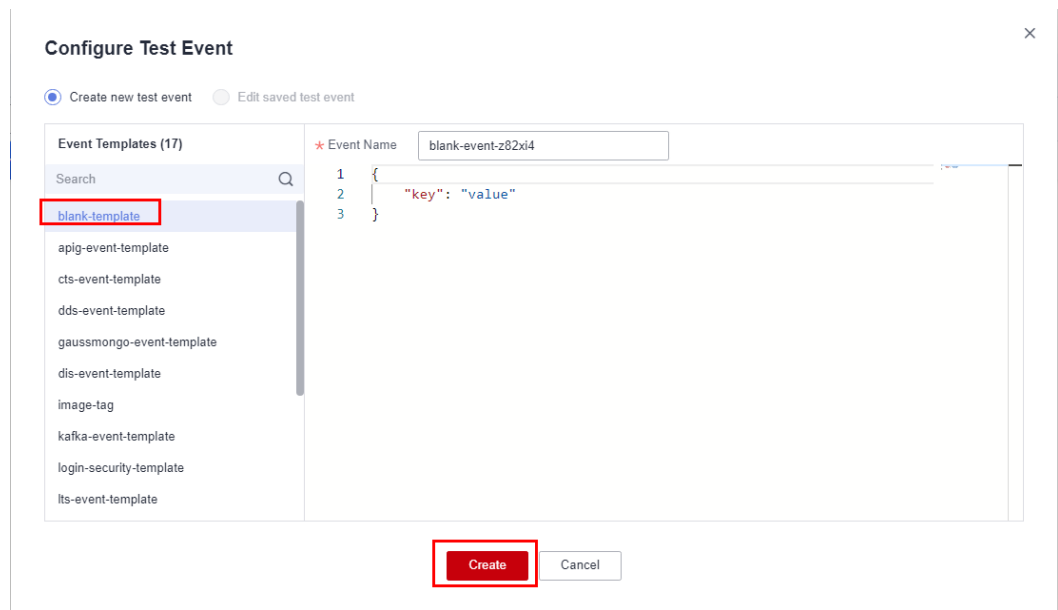


Figure 3-29 Configuring a test event



**Step 4** On the function details page, click **Test** to invoke the function to reinstall or change the OS. If information similar to the following is returned, the execution is successful.

Figure 3-30 Invoking a function

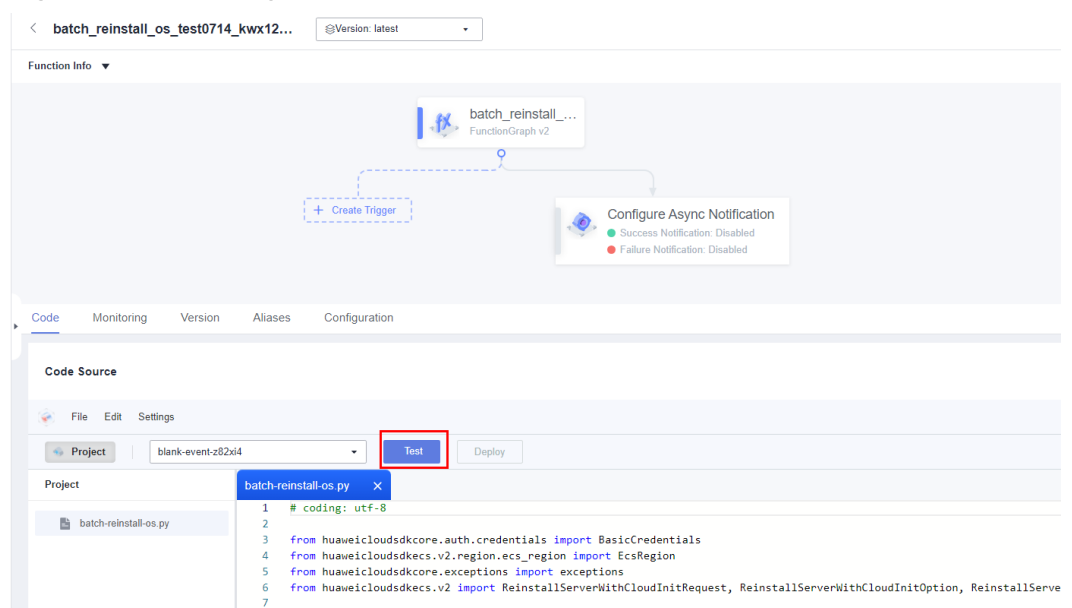
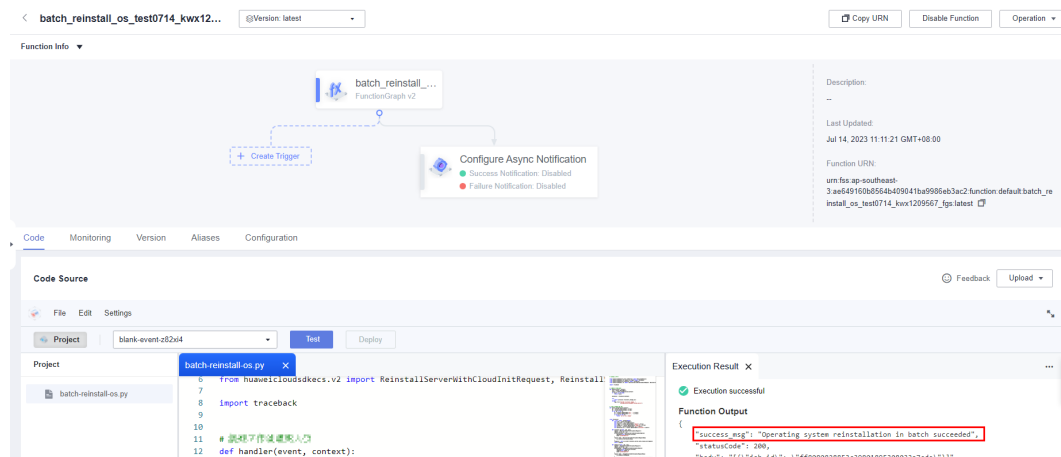
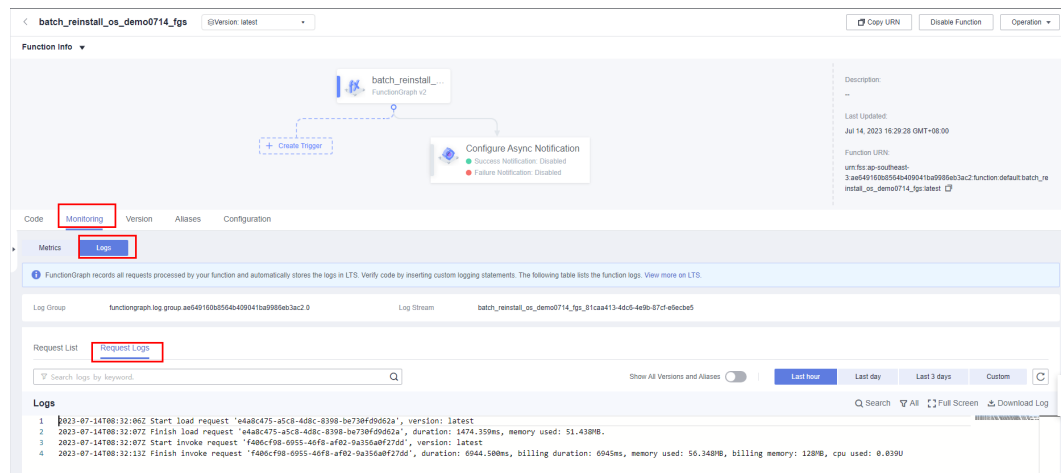


Figure 3-31 Execution successful



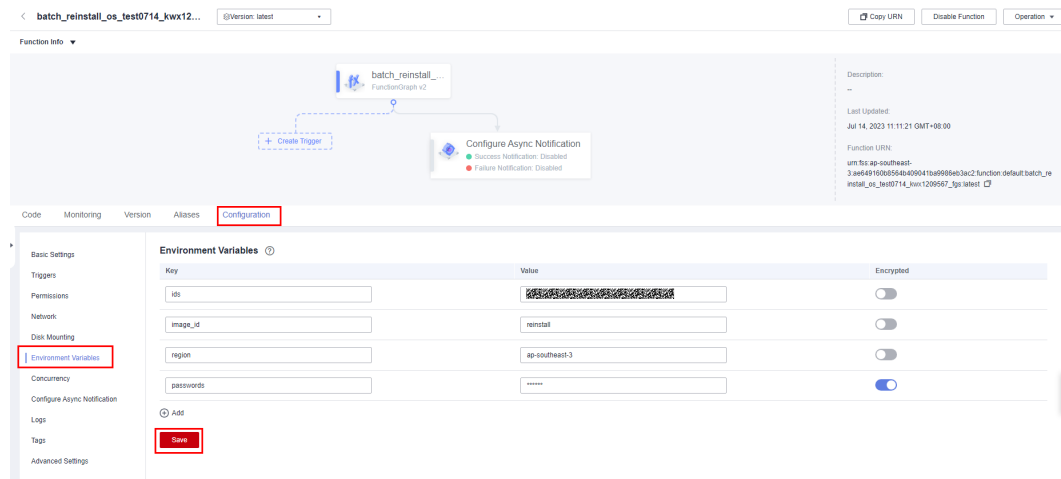
Step 5 On the **Monitoring** tab, view the request logs about OS reinstallation.

Figure 3-32 Request logs



Step 6 To reinstall or change the OS of other ECSs, go to the function details page, choose **Configuration > Environment Variables**, enter variable values by referring to [Table 3-1](#), and click **Save**. Then invoke the function again by referring to [Step 4](#).

Figure 3-33 Setting environment variables

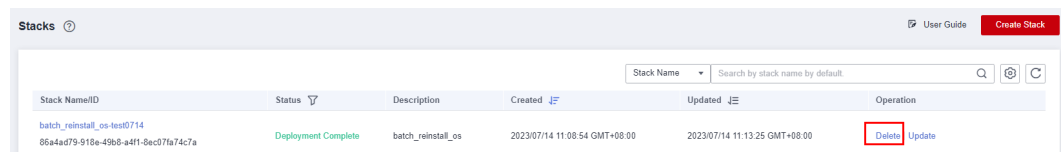


----End

## 3.4 Quick Uninstallation

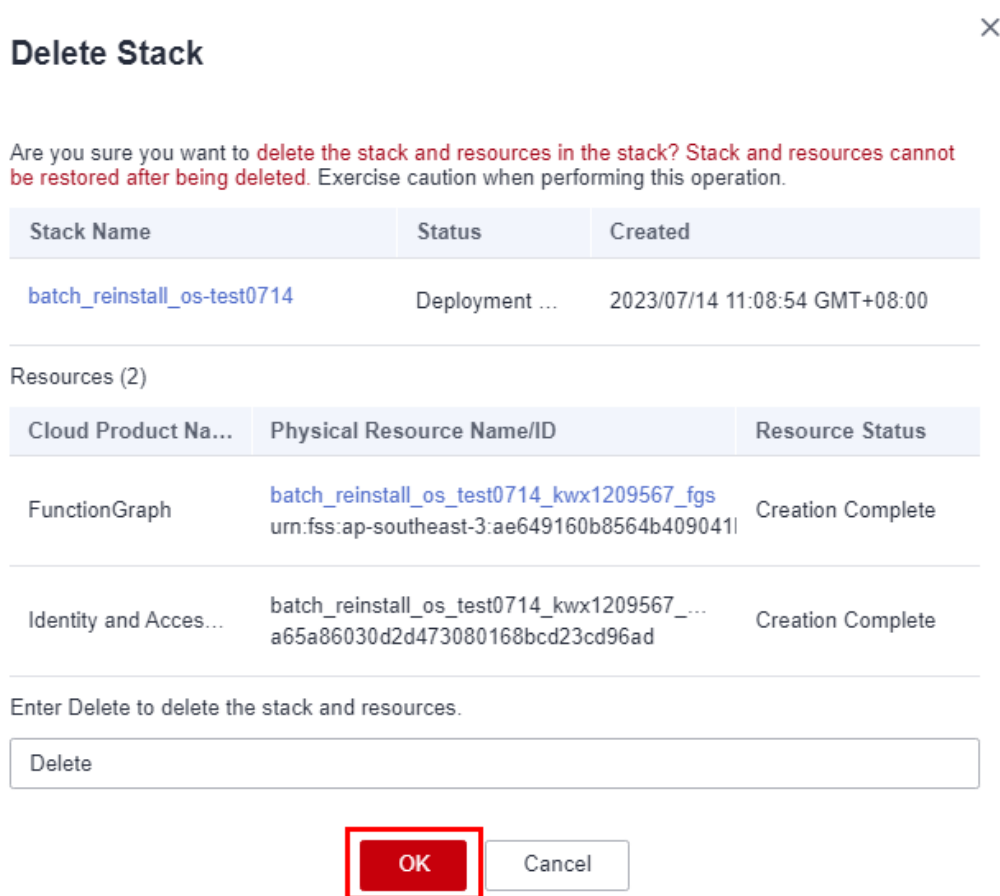
Step 1 Click **Delete** in the row where the solution stack is.

Figure 3-34 Deleting the stack



Step 2 Enter **Delete** and click **OK**.

Figure 3-35 Confirming the stack deletion



----End

# 4 Appendix

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## Terms

Concepts, cloud service introduction, and proper nouns:

- Elastic Cloud Server (ECS): a scalable and on-demand cloud server. It helps you to efficiently set up reliable, secure, and flexible application environments, ensuring stable service running and improving O&M efficiency.
- FunctionGraph: hosts event-driven functions in a serverless context while ensuring high availability, high scalability, and zero maintenance. All you need to do is write your code and set the execution conditions. You pay only for what you use and you are not charged when your code is not running.
- Identity and Access Management (IAM): a basic service provided by Huawei Cloud for permissions management, access control, and identity authentication. You can use IAM to create and manage users and user groups, grant permissions to allow or deny their access to cloud services and resources, and configure policies to improve account and resource security. IAM also provides you with multiple secure access credentials.



# 5 Change History

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**Table 5-1** Change history

Released On	Description
2022-09-30	This issue is the first official release.
2023-03-08	Revised the procedure.