

**Solution**  
**1.0.0**

# **Scheduled ECS Startup&Shutdown**

**Issue**            01  
**Date**             2024-04-01



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## Vulnerability

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<https://securitybulletin.huawei.com/enterprise/en/security-advisory>

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# 1 Solution Overview

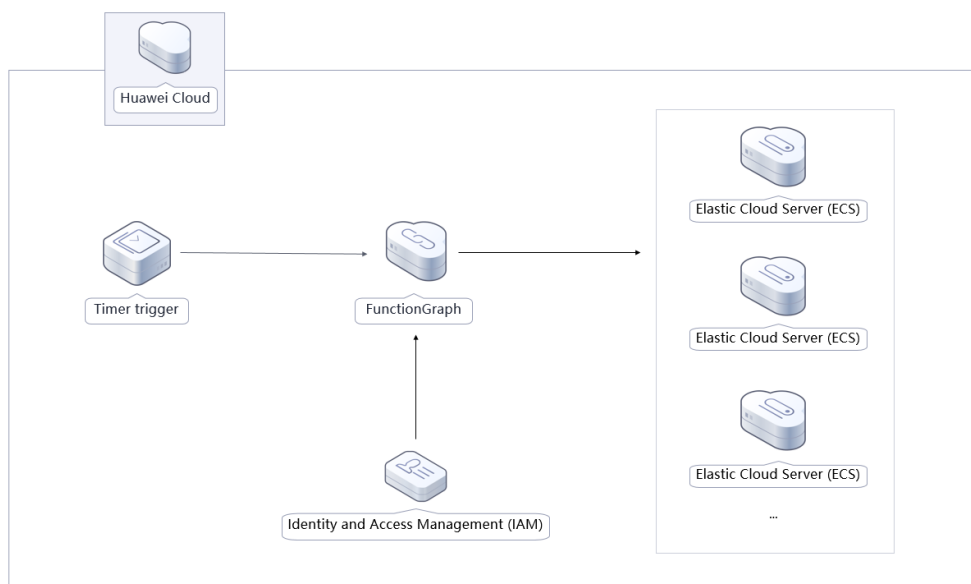
## Scenarios

This solution uses a FunctionGraph timer trigger to periodically start and stop Elastic Cloud Servers (ECSs). You can stop unused ECSs, and later start them when needed to reduce operations costs.

## Solution Architecture

This solution uses Huawei Cloud FunctionGraph to periodically start and stop ECSs. This solution architecture is illustrated below.

Figure 1-1 Architecture



This solution will:

- Create two functions in **FunctionGraph** to call the ECS APIs for periodically starting and stopping ECSs.

- Create a **timer** to periodically invoke the function code.
- Create an agency in **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 deployment**  
You can schedule ECS startup and shutdown in just a few clicks.
- **Customization based on open source**  
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, 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**.

# 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
FunctionGraph	<ul style="list-style-type: none"><li>• Region: AP-Singapore</li><li>• Product: FunctionGraph</li><li>• Pricing tier:<ul style="list-style-type: none"><li>≤ 1 million requests: \$0 USD per 1 million requests</li><li>&gt; 1 million requests: \$0.2 USD per 1 million requests</li></ul></li><li>• Metering duration:<ul style="list-style-type: none"><li>≤ 400,000 GB-seconds: \$0 USD per GB-second</li><li>&gt; 400,000 GB-seconds: \$0.00001667 USD per GB-second</li></ul></li></ul>	\$0 USD
Total		\$0 USD

# 3 Procedure

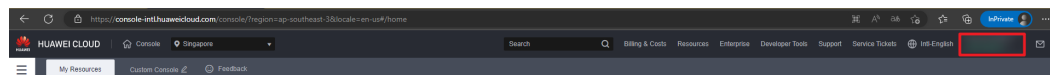
- [3.1 Preparations](#)
- [3.2 Quick Deployment](#)
- [3.3 Getting Started](#)
- [3.4 Quick Uninstallation](#)

## 3.1 Preparations

### Creating the rf\_admin\_trust Agency

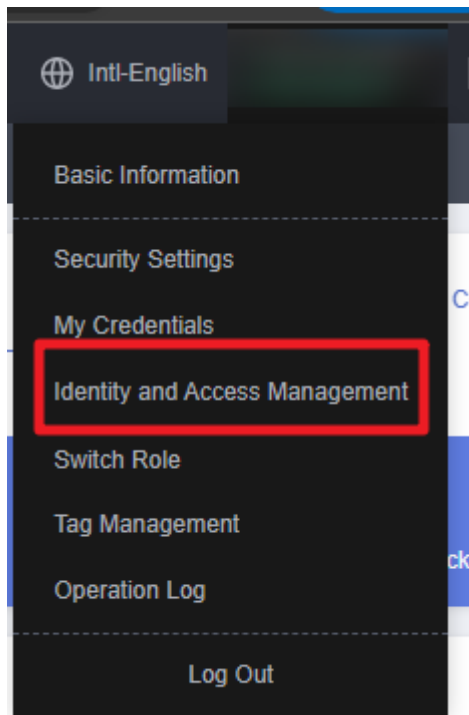
- Step 1** Log in to Huawei Cloud official website, open the [console](#), hover over the account name, and choose **Identity and Access Management**.

Figure 3-1 Console page



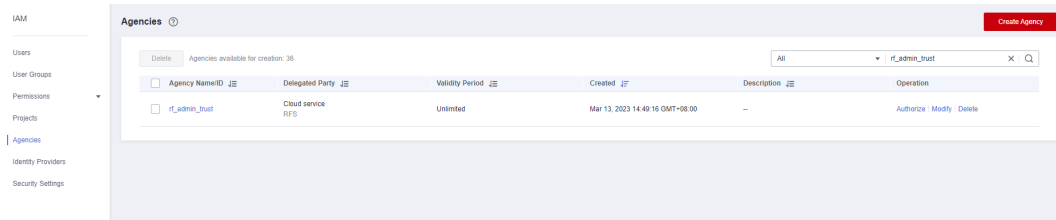


**Figure 3-2** Identity and Access Management



**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

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

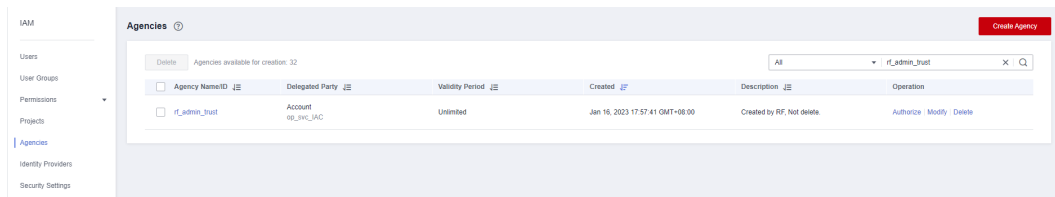
**i** The following are recommended scopes for the permissions you selected. Select the desired scope requiring minimum authorization.

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

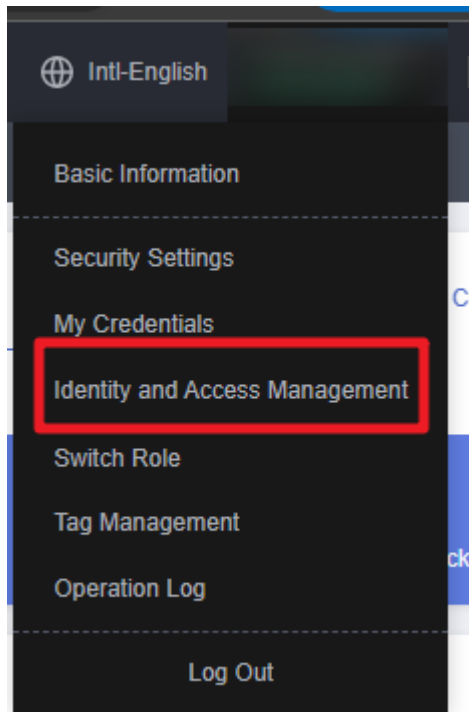


----End

## Creating the IAM Agency Management FullAccess Policy

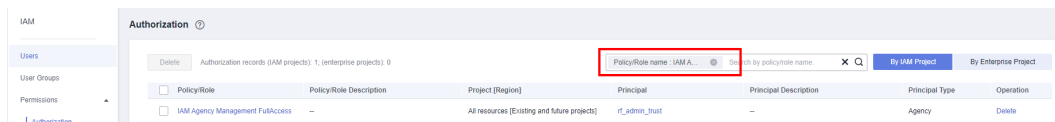
Step 1 Choose Identity and Access Management.

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.

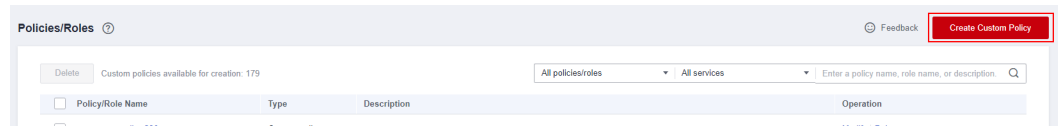
Figure 3-9 Permission list



- 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"  
}  
]
```

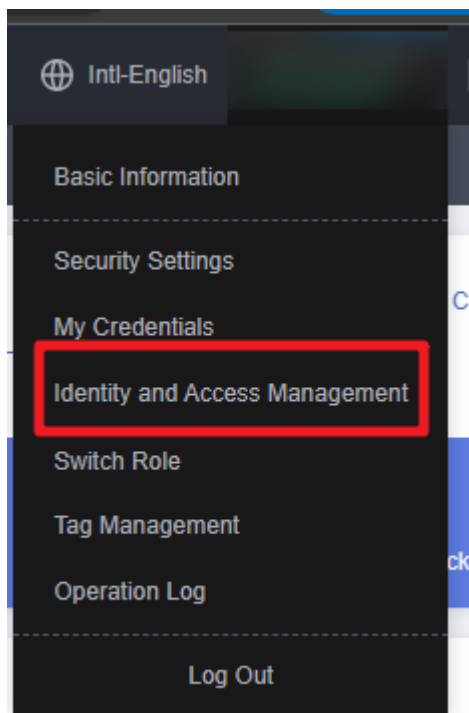
**Step 5** If no error message is displayed, the **IAM Agency Management FullAccess** policy is successfully created.

----End

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

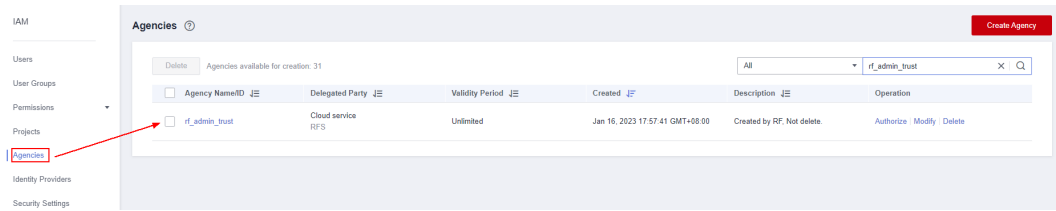
**Step 1** Choose **Identity and Access Management**.

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



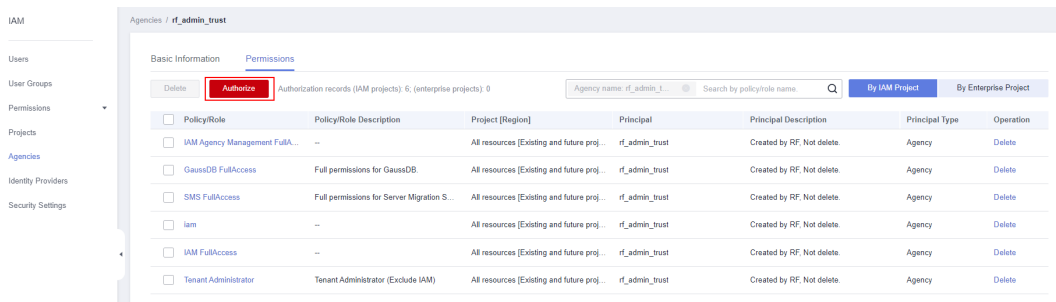
**Step 2** Choose **Agencies** in the left navigation pane and select the **rf\_admin\_trust** agency.

Figure 3-13 Agency list



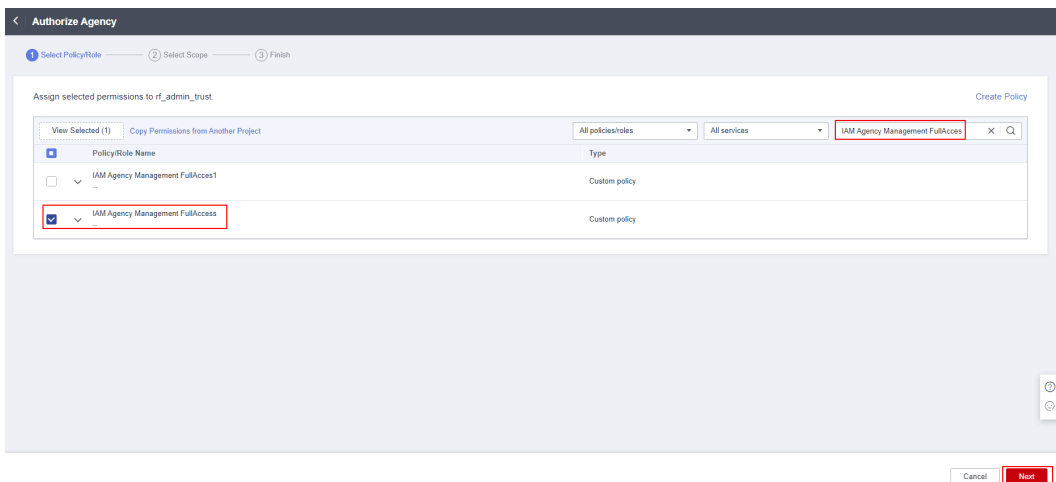
Step 3 Click the **Permissions** tab and click **Authorize**.

Figure 3-14 Permissions



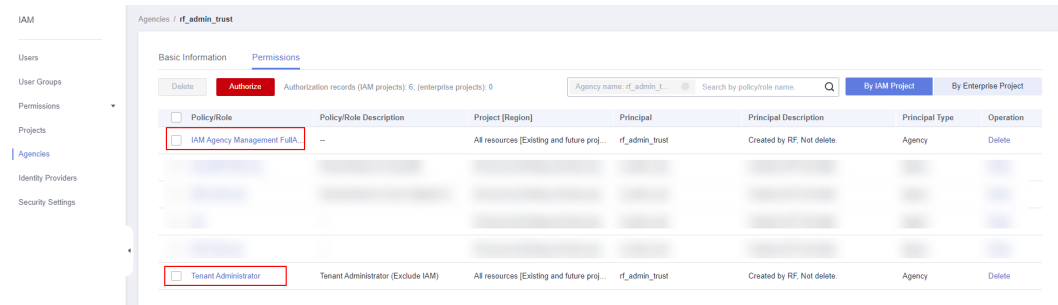
Step 4 Enter **IAM Agency Management FullAccess** in the search box, select the policy, click **Next**, and then click **OK**.

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 Scheduled Startup/Shutdown solution.

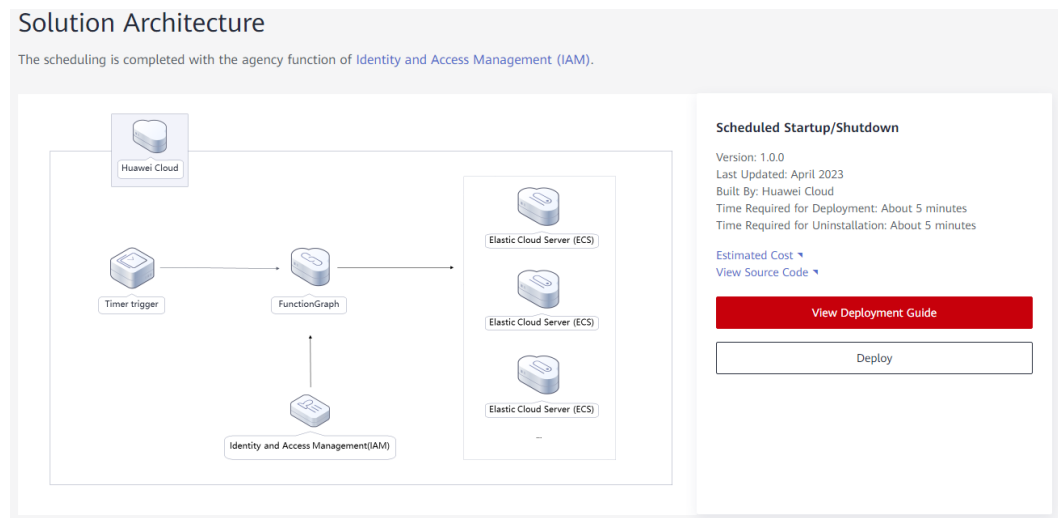
**Table 3-1** Parameter description

Parameter	Type	Mandatory	Description	Default Value
function_name	string	Yes	Function name, which identifies a function and serves as the prefix of other resource names. It must be unique and can contain 2 to 48 characters, including letters, digits, underscores (_), and hyphens (-). Start with a letter.	scheduled_power_on_and_power_off_demo
ids	string	Yes	IDs of the ECSs to periodically start or stop. Separate the IDs with spaces. For example, <b>id1 id2 ...</b>	Left blank
start_cron	string	Yes	Cron expression for periodical startup. Format: second minute hour day month week (optional). For example, <b>0 15 2 * * ?</b> (executed at 02:15:00 every day), <b>0 30 8 ? * Mon</b> (executed at 08:30:00 every Monday), <b>0 0 7 1 * ?</b> (executed at 07:00:00 on the first day of every month). For details about how to set a cron expression, see <a href="#">Appendix: Cron Expressions for a Function Timer Trigger</a> .	Left blank

Parameter	Type	Mandatory	Description	Default Value
stop_cron	string	Yes	Cron expression for periodical shutdown. Format: second minute hour day month week (optional). For example, <b>0 15 2 * * ?</b> (executed at 02:15:00 every day), <b>0 30 8 ? * Mon</b> (executed at 08:30:00 every Monday), <b>0 0 7 1 * ?</b> (executed at 07:00:00 on the first day of every month). For details about how to set a cron expression, see <a href="#">Appendix: Cron Expressions for a Function Timer Trigger</a> .	Left blank

**Step 1** Log in to Huawei Cloud Solution Best Practices, choose **Scheduled Startup/Shutdown**, and click **Deploy**.

**Figure 3-17** Deploying the solution

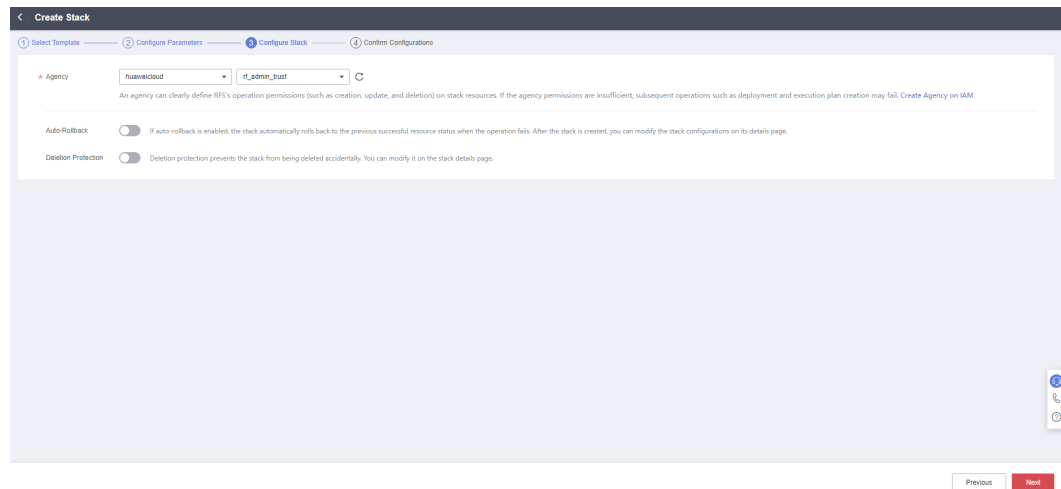


**Step 2** On the **Select Template** page, click **Next**.



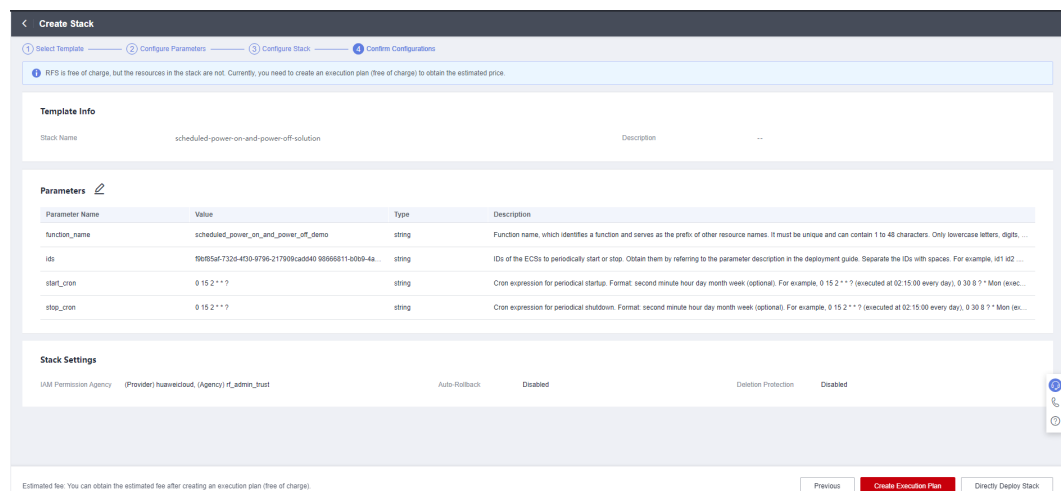


Figure 3-20 Configuring a stack



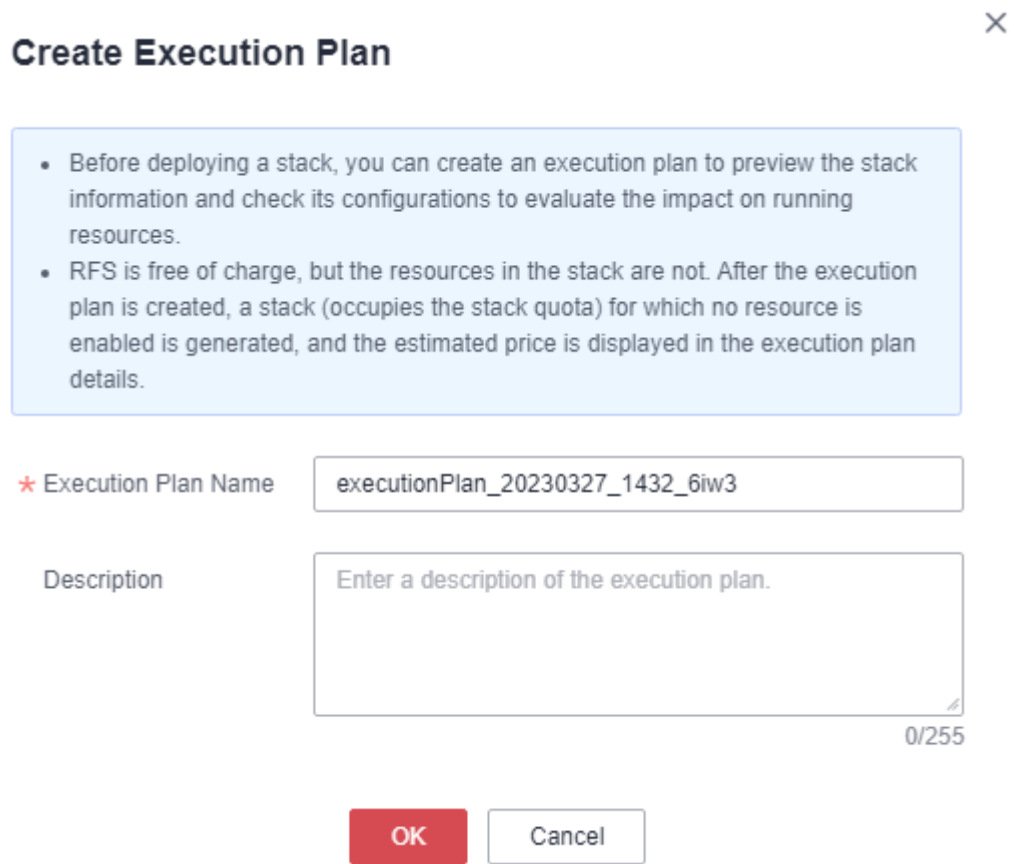
Step 5 On the **Confirm Configurations** page, click **Create Execution Plan**.

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

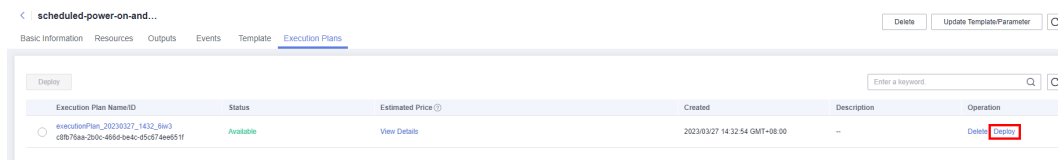
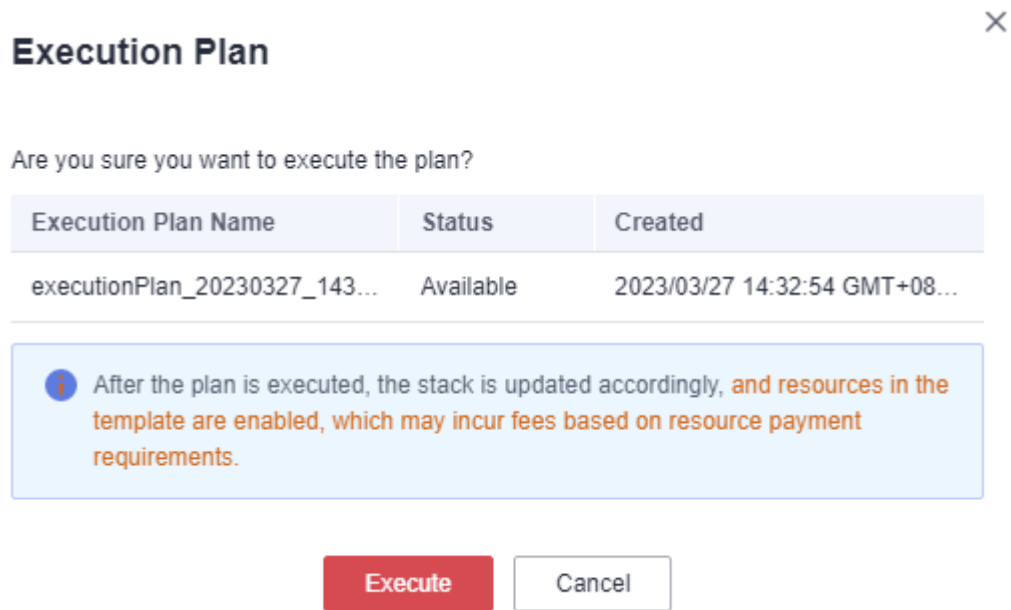
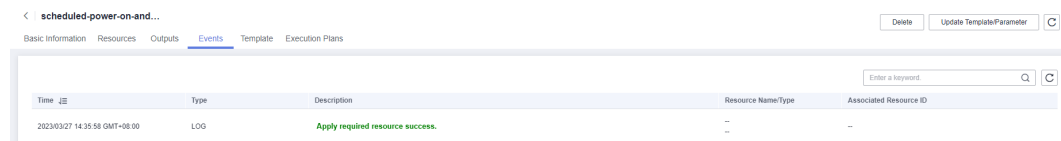


Figure 3-24 Confirming the execution plan



**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

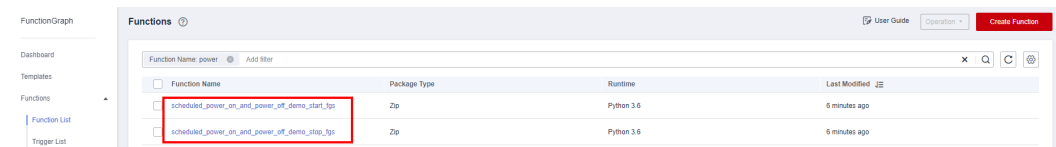


----End

### 3.3 Getting Started

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

Figure 3-26 Created functions



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

Figure 3-27 Startup trigger

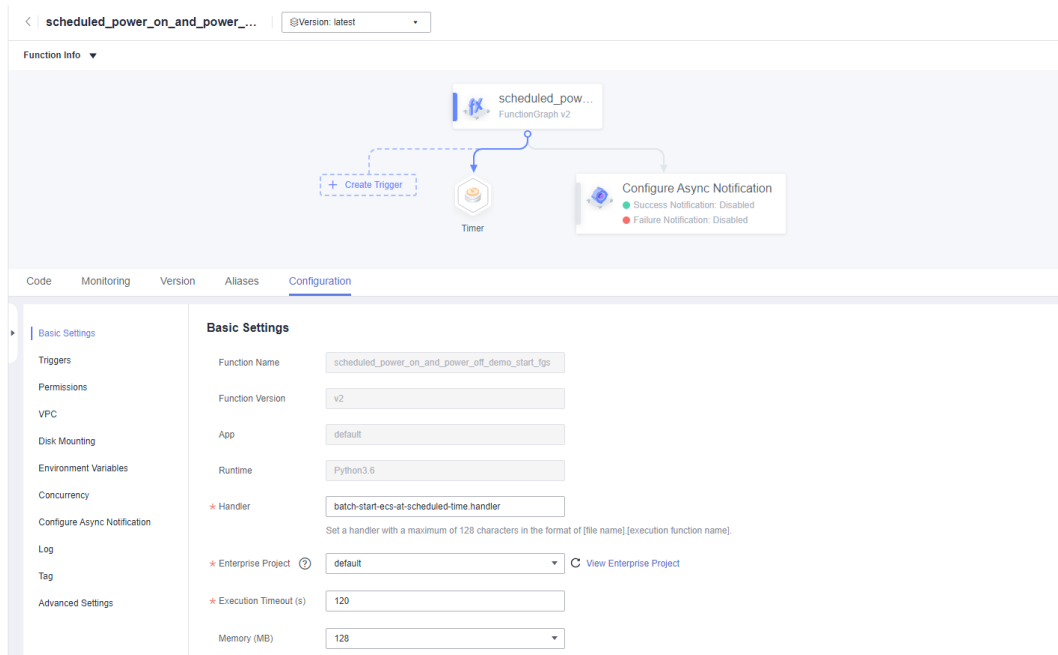
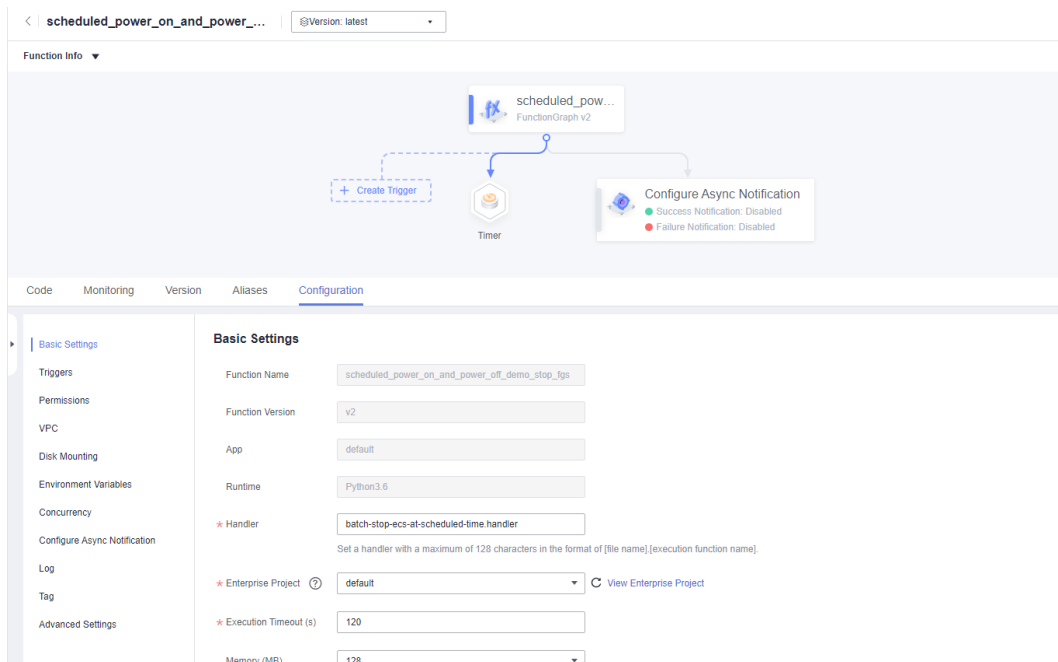
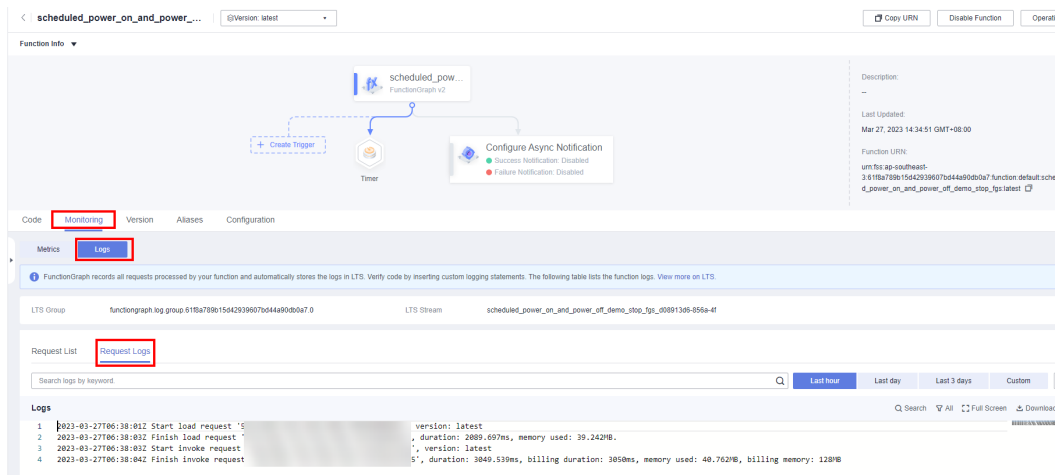


Figure 3-28 Shutdown trigger



**Step 3** On the **Monitoring** tab, check that each trigger started or stopped the specified ECSs at the specified time.

Figure 3-29 Request logs

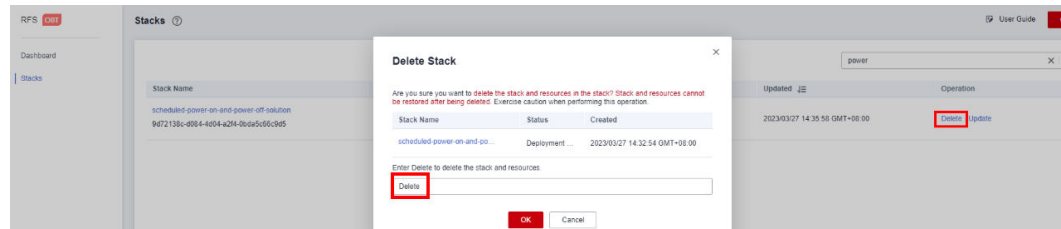


----End

## 3.4 Quick Uninstallation

- 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 Uninstalling the solution



----End

# 4 Appendix

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## Terms

- **Elastic Cloud Server (ECS):** ECS provides secure, scalable, on-demand compute resources, enabling you to flexibly deploy applications and workloads.
- **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

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**Table 5-1** Change history

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