Identity and Access Management

Best Practices

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Contents

1 Recommendations for Using IAM

To establish secure access to your Huawei Cloud resources, follow these recommendations for the Identity and Access Management (IAM) service.

Do Not Create Access Keys for Your Account

Your account has all the permissions required to access resources and make payments for the usage of resources. The password and access keys (AKs/SKs) are identity credentials for your account. The password is required for logging in to the console, and access keys are your secondary identity credentials that allow programmatic requests with development tools. Access keys are supplementary to the password and are not a must. Access keys can be lost or accidentally disclosed. To enhance account security, do not create access keys for your account.

Do Not Write Access Keys into Code

If you use APIs, CLI, or SDKs to access cloud services, do not write your access keys into the code.

Create Individual IAM Users

If someone needs to access resources in your account, do not share your password with them. Instead, create an individual IAM user for them and grant required permissions to the IAM user. You can also create an IAM user for yourself, grant the IAM user administrator permissions, and perform routine management using the IAM user.

Set Appropriate Access Type

You can set the access type of IAM users, including programmatic access and management console access. Note the following when you set the access type:

- If the user accesses Huawei Cloud services only by using the management console, select **Management console access** for **Access Type** and **Password** for **Credential Type**.
- If the user accesses Huawei Cloud services only through programmatic calls, select **Programmatic access** for **Access Type** and **Access key** for **Credential Type**.

- If the user needs to use a password as the credential for programmatic access to certain APIs, select **Programmatic access** for **Access Type** and **Password** for **Credential Type**.
- If the user needs to perform access key verification when using certain services in the console, such as creating a data migration job in the Cloud Data Migration (CDM) console, select **Programmatic access** and **Management console access** for **Access Type** and **Access key** and **Password** for **Credential Type**.

Grant Least Privilege

It is a standard security measure to grant users only the permissions required to perform specific tasks. You can achieve this by using IAM's system-defined or custom policies. The principle of least privilege (PoLP) helps you establish secure access to your Huawei Cloud resources.

For IAM users who access cloud services by using APIs, CLI, or SDKs, grant the users permissions by using custom policies to prevent losses due to accidental access key disclosure or loss.

Enable Virtual MFA

Multi-factor authentication (MFA) adds an additional layer of security protection on top of the identity credentials for an account. It is recommended that you enable MFA authentication for your account and privileged users created using your account. To log in to the management console, users must enter their usernames and passwords and a verification code generated by the bound virtual MFA device.

An MFA device can be based on hardware or software. Currently, Huawei Cloud supports software-based virtual MFA devices. It is a program that runs on a portable device (such as a mobile phone) and generates a six-digit verification code for identity authentication.

Set a Strong Password Policy

To ensure that IAM users only use complex passwords and change them periodically, set a password policy to define strong password requirements, such as minimum password length, and whether to allow consecutive identical characters in a password, and whether to allow previously used passwords.

Enable Critical Operation Protection

Enable critical operation protection to prevent misoperations. When you or users created using your account perform a critical operation, such as deleting a resource or generating an access key, you and users need to provide the password and a verification code to proceed with the operation.

Periodically Change Your Identity Credentials

Periodically changing your password and access keys can prevent risks caused by their accidental disclosure or loss.

- Set a password validity period to require you and users created using your account to change passwords. IAM will start to display a prompt 15 days before a password expires.
- You can create two access keys and use them interchangeably. For example, you can use access key 1 for a certain period, and then use access key 2 for the next period. You can also delete access key 1 and generate another access key.

Delete Unnecessary Identity Credentials

For users who only need to use the console, it is recommended that you do not create access keys for them, and delete any access keys that have already been created. If a user has not logged in for a long period, change the user's password and delete the user's access keys. In addition, set an account validity period to automatically disable user accounts that have not been used for a long time.

Delegate Resource Access to Applications Running on ECSs

Applications running on Elastic Cloud Servers (ECSs) can access other Huawei Cloud services only with a credential provided. To securely provide credentials for applications, create an agency in IAM to grant required permissions to the ECS where the applications run, and configure the agency for the ECS so that the applications can obtain temporary access keys. The ECS applies for a temporary credential from IAM to securely access resources based on the permissions granted through the agency. ECS automatically rotates temporary credentials to ensure that they are secure and valid.

When you start an ECS, you can specify an agency for the ECS as a startup parameter. Applications running on the ECS can access Huawei Cloud resources by providing the temporary access key obtained using the agency. The agency determines which applications can access specific resources.

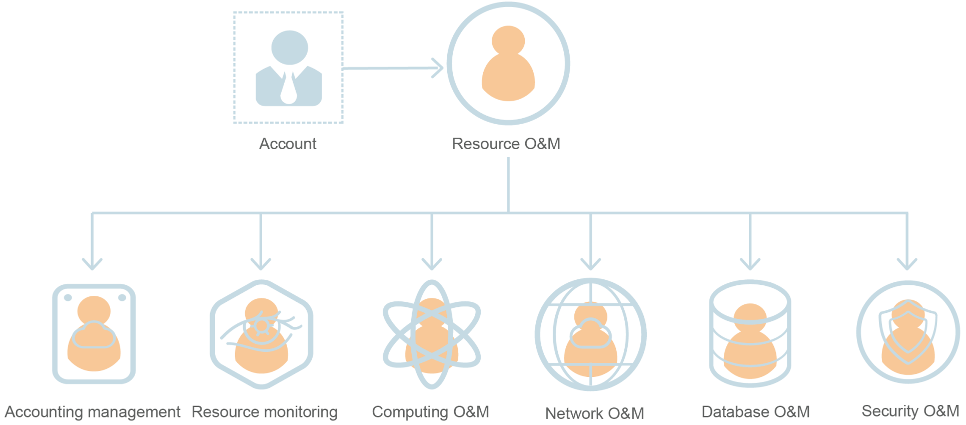
Enabling CTS

Cloud Trace Service (CTS) is a log audit service provided by Huawei Cloud. It collects, stores, and queries records of operations on IAM, facilitating security analysis, compliance audit, resource tracking, and fault locating. It is recommended that you enable the CTS service to record key IAM operations, such as creating and deleting IAM users.

2 Assigning Permissions to O&M Personnel

Assume that a company has purchased different resources on Huawei Cloud, and has multiple functional teams that need to use one or more types of resources. The company can use IAM to assign permissions to different personnel based on their job functions for refined permissions control.

Figure 2-1 Permissions management model



- Resource O&M team
- Accounting management team
- Resource monitoring team
- Computing O&M team
- Network O&M team
- Database O&M team
- Security O&M team

Assign required permissions to different functional teams in the company according to **Table 2-1**. For details about permissions of all Huawei Cloud services, see **System-defined Permissions**.

Table 2-1 System-defined permissions

Functional Team	Policy	Permissions Description
Resource O&M team	Tenant Administrator	Full permissions for all cloud services, including Billing Center, Resource Center, and My Account. The **Tenant Administrator** role includes the permissions for purchasing resources, managing renewals, and viewing bills. It does not include the permissions for the IAM service.
Accounting management team	BSS Administrator	Full permissions for Billing Center, Resource Center, and My Account. The **BSS Administrator** role includes the permissions for managing invoices, orders, contracts, and renewals, and viewing bills. **Users assigned only this role cannot purchase resources unless you grant them the administrator permissions of the corresponding service.**
Resource monitoring team	Tenant Guest	Read-only permissions for all cloud services except IAM.
Computing O&M team	ECS FullAccess	Full permissions for Elastic Cloud Server (ECS), including permissions for purchasing ECS resources. Users assigned only the **ECS FullAccess** policy cannot view the usage of ECS resources and other resources unless you assign them the **BSS Administrator** role.

Functional Team	Policy	Permissions Description
	CCE FullAccess	Full permissions for Cloud Container Engine (CCE), including permissions for purchasing CCE resources. Users assigned only the **CCE FullAccess** policy cannot view the usage of CCE resources and other resources unless you assign them the **BSS Administrator** role.
	AutoScaling FullAccess	Full permissions for Auto Scaling (AS), including purchasing AS resources. Users assigned only the **AutoScaling FullAccess** policy cannot view the usage of AS resources and other resources unless you assign them the **BSS Administrator** role.
Network O&M team	VPC FullAccess	Full permissions for Virtual Private Cloud (VPC), including purchasing VPC resources. Users assigned only the **VPC FullAccess** policy cannot view the usage of VPC resources and other resources unless you assign them the **BSS Administrator** role.
	ELB FullAccess	Full permissions for Elastic Load Balance (ELB), including purchasing load balancers. Users assigned only the **ELB FullAccess** policy cannot view the usage of ELB resources and other resources unless you assign them the **BSS Administrator** role.

Functional Team	Policy	Permissions Description
Database O&M team	RDS FullAccess	Full permissions for Relational Database Service (RDS), including purchasing RDS resources. Users assigned only the **RDS FullAccess** policy cannot view the usage of RDS resources and other resources unless you assign them the **BSS Administrator** role.
	DDS FullAccess	Full permissions for Document Database Service (DDS), including purchasing DDS resources. Users assigned only the **DDS FullAccess** policy cannot view the usage of DDS resources and other resources unless you assign them the **BSS Administrator** role.
	DDM FullAccess	Full permissions for Distributed Database Middleware (DDM).
Security O&M team	Anti-DDoS Administrator	Full permissions for Anti-DDoS.
	CAD Administrator	Full permissions for Advanced Anti-DDoS (AAD).
	KMS Administrator	Full permissions for Data Encryption Workshop (DEW), including purchasing DEW resources. Users assigned only the **KMS Administrator** role cannot view the usage of DEW resources and other resources unless you assign them the **BSS Administrator** role.

Assigning Permissions to O&M Personnel

The following is an example procedure for specifying an employee in the company as the network O&M owner in the **CN-Hong Kong** region. If you want to specify an employee as any other O&M owner, grant the required permissions to the employee according to **Table 2-1**.

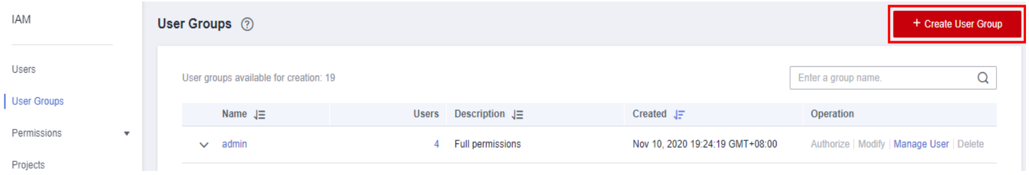
Step 1: Create a User Group and Assign Permissions

Step 1 Log in to the Huawei Cloud management console.

Step 2 On the management console, hover the mouse pointer over the username in the upper right corner and then choose **Identity and Access Management**.

Step 3 On the IAM console, choose **User Groups** in the navigation pane. Then click **Create User Group**.

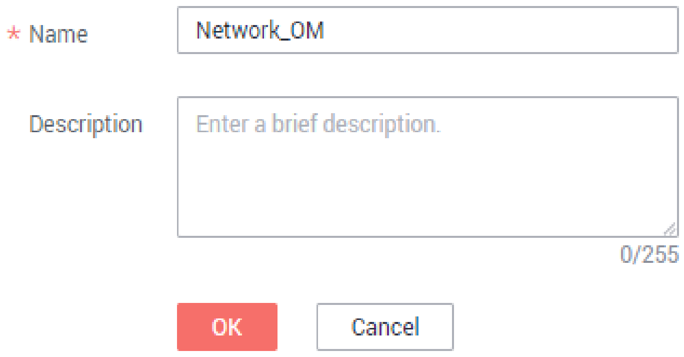
Figure 2-2 Creating a user group



User groups available for creation: 19

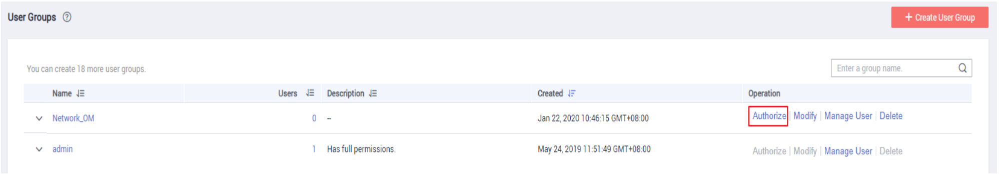
Name	Users	Description	Created	Operation
admin	4	Full permissions	Nov 10, 2020 19:24:19 GMT+08:00	Authorize | Modify | Manage User | Delete

Step 4 Enter the user group name **Network_OM**, and click **OK**.



* Name	Network_OM
Description	Enter a brief description.

Step 5 In the row containing the user group, click **Authorize**.



You can create 18 more user groups.

Name	Users	Description	Created	Operation
Network_OM	0	--	Jan 22, 2020 10:46:15 GMT+08:00	Authorize | Modify | Manage User | Delete
admin	1	Has full permissions.	May 24, 2019 11:51:49 GMT+08:00	Authorize | Modify | Manage User | Delete

Step 6 Search for and select **VPC FullAccess** and **ELB FullAccess**, and click **Next**.

Step 7 Specify the authorization scope as **Region-specific projects** and select **CN-Hong Kong**.

NOTE

- If users in the group need to view resource usage, attach the **BSS Administrator** role to the group for the same project.
- When specifying an employee as the security O&M owner according to **Table 2-1**, you must grant the employee other related permissions because the security services interwork with other cloud services. For more information, see **Assigning Dependency Roles**.

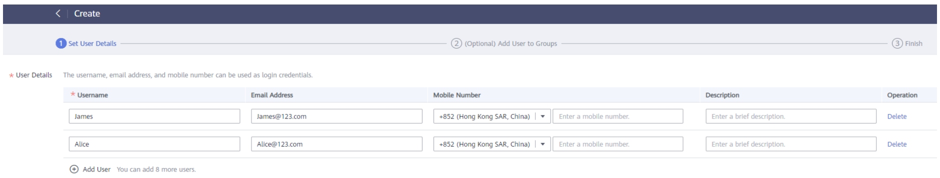
----End

Step 2: Create an IAM User

Step 1 In the navigation pane of the IAM console, choose **Users**. Then click **Create User**.

Step 2 Specify the user details and access type. To create more users, click **Add User**. A maximum of 10 users can be created at a time.

Figure 2-3 Configuring user information



* User Details The username, email address, and mobile number can be used as login credentials.

* Username	Email Address	Mobile Number		Description	Operation
James	James@123.com	+852 (Hong Kong SAR, China)	Enter a mobile number.	Enter a brief description.	Delete
Alice	Alice@123.com	+852 (Hong Kong SAR, China)	Enter a mobile number.	Enter a brief description.	Delete

⊕ Add User You can add 8 more users.

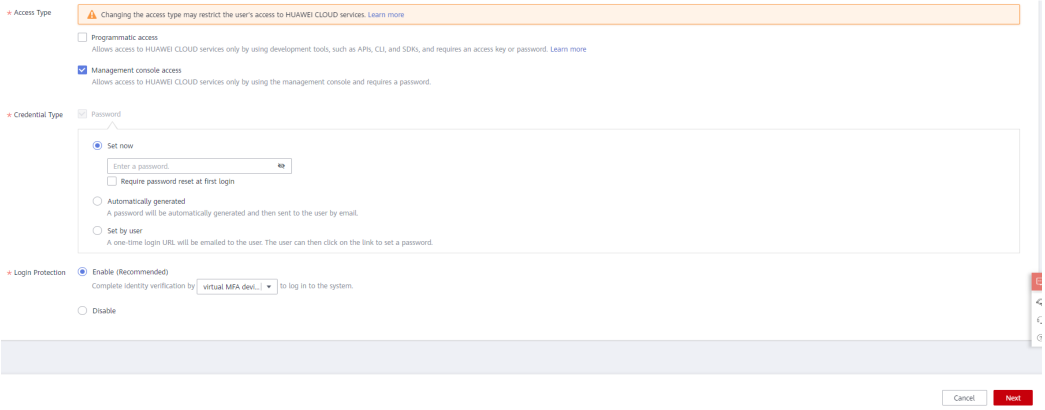
NOTE

- Users can log in to Huawei Cloud using the username, email address, or mobile number.
- If users forget their password, they can reset it through email address or mobile number verification. If no email addresses or mobile numbers have been bound to users, users need to contact the administrator to reset their passwords.

Table 2-2 User information

Parameter	Description
Username	Username that will be used to log in to Huawei Cloud, for example, **James** and **Alice**. This field is required.
Email Address	Email address of the IAM user that can be used as a login credential. IAM users can bind an email address after they are created. This field is required if you have specified **Set by user** as the credential type.
Mobile Number	Mobile phone number of the IAM user that can be used as a login credential. IAM users can bind a mobile number after they are created. This field is optional.
Description	Additional information about the IAM user. This field is optional.

Figure 2-4 Setting the access type



* Access Type

Changing the access type may restrict the user's access to HUAWEI CLOUD services. Learn more

□ Programmatic access
Allows access to HUAWEI CLOUD services only by using development tools, such as APIs, CLI, and SDKs, and requires an access key or password. Learn more

☑ Management console access
Allows access to HUAWEI CLOUD services only by using the management console and requires a password.

* Credential Type ☑ Password

● Set now
Enter a password.
□ Require password reset at first login

○ Automatically generated
A password will be automatically generated and then sent to the user by email.

○ Set by user
A one-time login URL will be emailed to the user. The user can then click on the link to set a password.

* Login Protection ● Enable (Recommended)
Complete identity verification by virtual MFA devi... to log in to the system.

○ Disable

- **Programmatic access**: Select this option to allow the user to access Huawei Cloud services using development tools, such as APIs, CLI, and SDKs. You can generate an **access key** or set a **password** for the user.
- **Management console access**: Select this option to allow the user to access Huawei Cloud services using the management console. You can set or generate a password for the user or request the user to set a password at first login.

NOTE

- If the user **accesses cloud services only by using the management console**, select **Management console access** for **Access Type** and **Password** for **Credential Type**.
- If the user **accesses cloud services only through programmatic calls**, select **Programmatic access** for **Access Type** and **Access key** for **Credential Type**
- If the user **needs to use a password as the credential for programmatic access** to certain APIs, select **Programmatic access** for **Access Type** and **Password** for **Credential Type**
- If the user needs to **perform access key verification** when using certain services in the console, select **Programmatic access** and **Management console access** for **Access Type** and **Access key** and **Password** for **Credential Type**. For example, the user needs to perform access key verification when creating a data migration job in the Cloud Data Migration (CDM) console.

Table 2-3 Setting the credential type and login protection

Credential Type and Login Protection	Description
Access key	After users are created, you can download the **access keys (AK/SK)** generated for these users. **Each user can have a maximum of two access keys.**

Credential Type and Login Protection		Description
Password	Set now	Set a password for the user and determine whether to require the user to reset the password at first login. If you are the user, select this option and set a password for login. You do not need to select **Require password reset at first login**.
	Automatically generated	The system automatically generates a login password for the user. After the user is created, download the EXCEL password file and provide the password to the user. The user can then use this password for login. **This option is available only when you create a single user.**
	Set by user	A one-time login URL will be emailed to the user. The user can click the link to log in to the console and set a password. If you do not use the IAM user, select this option and enter the email address and mobile number of the IAM user. The user can then set a password by clicking on the one-time login URL sent over email. The login URL is valid for **seven days**.
Login Protection	Enable (Recommended)	If login protection is enabled, the user will need to enter a verification code in addition to the username and password during login. Enable this function for account security. You can select SMS, email, or virtual MFA device for verification during login.
	Disable	If login protection is disabled, you can enable it later by following the instructions provided in **Viewing or Modifying IAM User Information**.

Step 3 (Optional) Click **Next** to add the users to user groups.

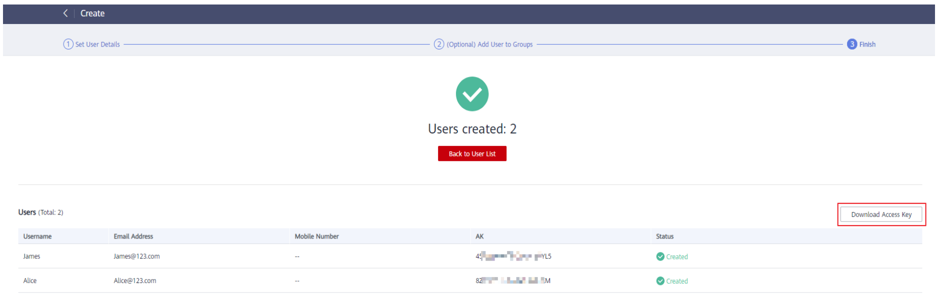
- The user will inherit the permissions assigned to the user groups to which the user belongs.
- You can also create new groups as required.

NOTE

- If the user will be an administrator, add the user to the default group **admin**.
- Each user can be added to multiple user groups.

Step 4 Click **Next**. If you have specified the access type as **Programmatic access** in **Step 2**, download the access key on the **Finish** page.

Figure 2-5 Users created successfully



Users (Total: 2)

Username	Email Address	Mobile Number	AK	Status
James	James@123.com	--	[redacted]	Created
Alice	Alice@123.com	--	[redacted]	Created

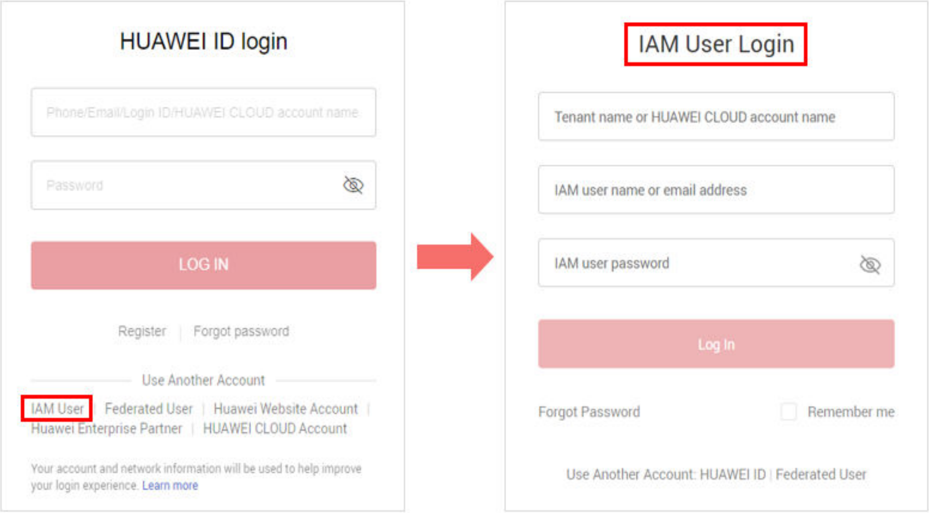
----End

Step 3: Log In as an IAM User and Verify Permissions

An IAM user can log in using different methods. The following describes how to log in through the login page. For more login methods, see **Logging In to Huawei Cloud**.

Step 1 On the Huawei Cloud login page, click **IAM User**.

Step 2 On the **IAM User Login** page, enter the account name, user name, and password of the created user.



HUAWEI ID login
Phone/Email/Login ID/HUAWEI CLOUD account name
Password
LOG IN
Register | Forgot password
Use Another Account
IAM User | Federated User | Huawei Website Account | Huawei Enterprise Partner | HUAWEI CLOUD Account
Your account and network information will be used to help improve your login experience. Learn more
IAM User Login
Tenant name or HUAWEI CLOUD account name
IAM user name or email address
IAM user password
Log In
Forgot Password
Remember me
Use Another Account: HUAWEI ID | Federated User

- Account name: Name of the account used to create the IAM user
- Username and password: The username and password specified for the IAM user

Step 3 On the management console, switch to the **CN-Hong Kong** region.

Step 4 Choose **Service List** > **Virtual Private Cloud**, **Elastic Load Balance**, and **Domain Name Service**, and perform operations on each service console to verify that the permissions have been successfully assigned.

Step 5 Choose a service other than the preceding services from **Service List** to ensure that the service cannot be accessed.

Step 6 On the management console, switch to a region other than **CN-Hong Kong** and ensure that the VPC, ELB, and DNS consoles cannot be accessed.

----End

3 Assigning System-defined Permissions for Common Cloud Services

Assign permissions for common cloud services to IAM users by referring to the following links:

- Creating a User and Granting ECS Permissions
- Creating a User and Granting Permissions
- Creating a User and Granting Permissions
- Creating a User and Granting EVS Permissions
- Creating a User and Granting Permissions
- Cluster Permissions (IAM-based)
- Access Management on Department Public Data
- Creating a User and Granting CBR Permissions
- Creating a User and Granting VPC Permissions
- Creating a User and Granting DCS Permissions
- Creating a User and Granting Permissions
- Creating a User and Assigning Permissions

4 Cross-Account Access Delegation and Resource Management

Company A and company B have created account A and account B, respectively. If account A wants to authorize account B to manage its resources, account A can create an agency in IAM to establish a trust relationship between the two accounts.

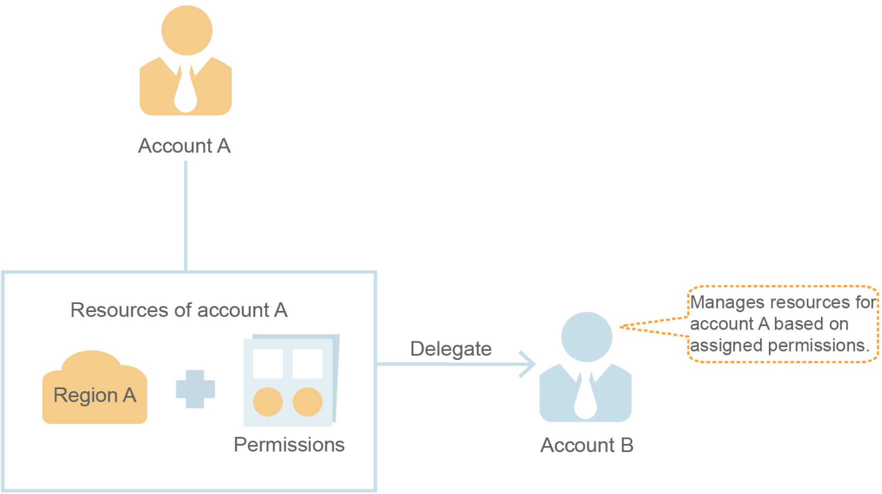
Requirements

- Account A has purchased different types of resources on Huawei Cloud. Account A wants to authorize account B to manage its VPC resources in the **CN-Hong Kong** region.
- Account B can authorize one or more employees (IAM users) of company B to manage account A's resources.
- Account A can modify or cancel the authorization provided to account B at any time.

Solution

- Account A creates an agency on the IAM console to authorize account B to manage its resources.
- Account B assigns permissions to its IAM users to manage account A's resources specified in the agency.
- Account A can modify or delete the agency at any time. Deleting the agency will automatically cancel the permissions assigned to account B and its IAM users for managing account A's resources.

Figure 4-1 Cross-account authorization model



Delegating an Account to Manage Resources

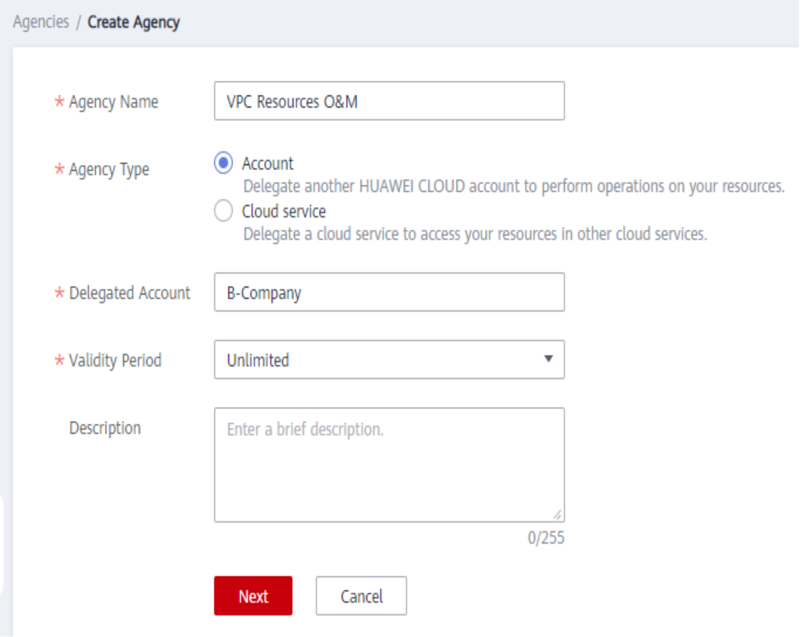
Account A performs the following procedure to delegate account B to manage its VPC resources in the **CN-Hong Kong** region.

Step 1 Log in to Huawei Cloud using account A. On the IAM console, choose **Agencies** in the navigation pane.

Step 2 Click **Create Agency**, and enter an agency name, for example, **VPC Resources O&M**.

Step 3 Select the **Account** agency type, and enter the delegated account name, for example, **B-Company**.

Step 4 Set **Validity Period** to **Unlimited**.



Agencies / Create Agency

* Agency Name: VPC Resources O&M

* 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.

* Delegated Account: B-Company

* Validity Period: Unlimited

Description: Enter a brief description.
0/255

Step 5 Click **Next**.

Step 6 Select **VPC FullAccess** and click **Next**.

Step 7 Specify the authorization scope as **Region-specific projects**, and select **CN-Hong Kong**.

Step 8 Click **OK**.

The agency is displayed in the agency list.

NOTE

Account A can modify the permissions or validity period of the agency or delete the agency based on service requirements.

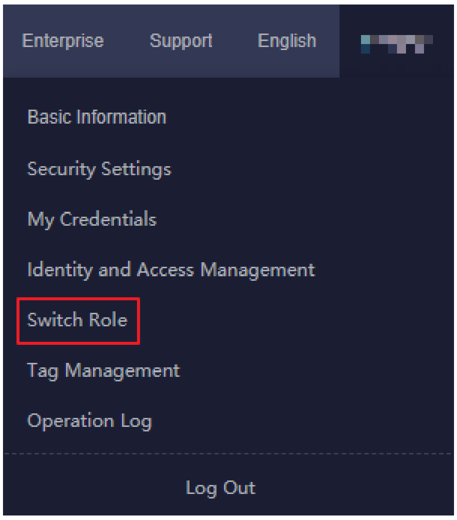
----End

Managing Resources of an Account

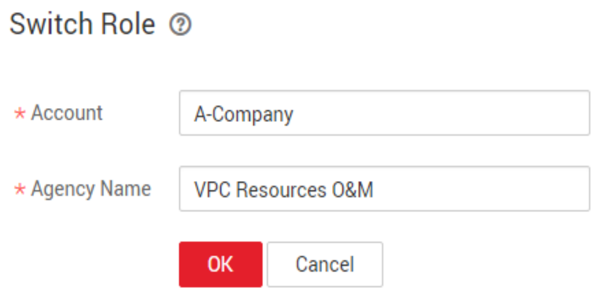
After the agency is created, account B can switch roles to account A to manage account A's resources. To do this, account B needs to have obtained account A's account name and the agency name.

Step 1 Log in to the Huawei Cloud management console using account B.

Step 2 Click the username in the upper right corner, and choose **Switch Role**.



Step 3 Enter the account name of account A. The agency created by account A is displayed automatically.



Switch Role

* Account	A-Company
* Agency Name	VPC Resources O&M

Step 4 Click **OK** to switch to account A.

----End

5 Agency Configuration

5.1 Authorizing IAM Users to Manage Resources of an Account

Company B is a professional O&M company. It becomes a delegated party after being authorized by company A. Company B assigns permissions to one or more of its IAM users to manage company A's resources.

Requirements

- Company B wants to authorize its employees (IAM users) to manage the delegated resources of company A.
- If company A creates multiple agencies for company B, company B can allocate the agencies to different employees. This will allow each employee to only manage resources of specific agencies.

Solution

- Account B creates users on the IAM console, and grants the permissions (including Agent Operator) required for managing delegated resources to the users.
- Account B creates a custom policy with only the permissions required to manage the delegated resources of an agency. Then, account B attaches the policy to the group to which a user belongs, so that the user can only manage the resources of the agency.

Procedure

Account B performs the following procedure to authorize IAM users to manage resources of specific agencies. After authorization, the IAM users of account B can switch their roles to account A to manage account A's resources. To do this, account B needs to have obtained the account (HUAWEI ID), agency name, and agency ID of the delegating party.

Step 1 Create a user group and grant permissions to it.

1. In the navigation pane, choose **User Groups**.
2. On the **User Groups** page, click **Create User Group**.
3. Enter the user group name, for example, **Agency Management**.
4. Click **OK**.

   The user group is displayed in the user group list.
5. In the row containing the target user group, click **Authorize**.

   NOTE

   - To authorize a user to manage only the resources of a specific agency, perform the following steps.
   - To authorize a user to manage the resources of all agencies, go to the **next step**.

   a. On the **Select Policy/Role** page, click **Create Policy** in the upper right.

   b. Enter a policy name, for example, **Agency 1 for Managing Company A**.

   c. Select **JSON** for **Policy View**.

   d. In the **Policy Content** area, enter the following content:

```
{
        "Version": "1.1",
        "Statement": [
                {
                        "Action": [
                                "iam:agencies:assume"
                        ],
                        "Resource": {
                                "uri": [
                                        "/iam/agencies/b36b1258b5dc41a4aa8255508xxx..."
                                ]
                        },
                        "Effect": "Allow"
                }
        ]
}
```

   NOTE

   Replace *b36b1258b5dc41a4aa8255508xxx...* with the agency ID obtained from a delegating party. Do not make any other changes.

   e. Click **Next**.
6. Select the **Agency 1 for Managing Company A** agency created in the **previous step** or the **Agent Operator** role.

   NOTE

   - The custom policy allows the user only to manage resources of a specific agency ID.
   - The **Agent Operator** role allows the user to manage the resources of all agencies.
7. Specify the authorization scope.
8. Click **OK**.

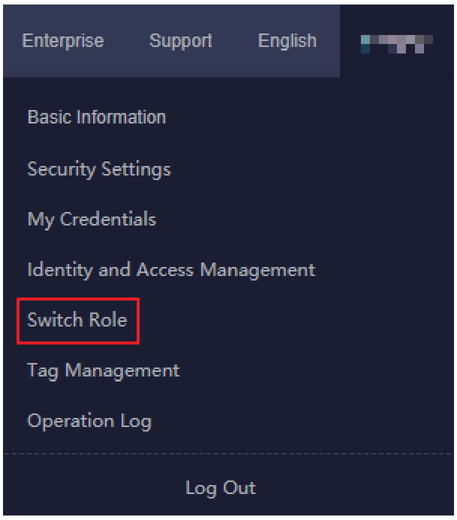
Step 2 Create a user and add the user to the user group.

1. In the navigation pane, choose **Users**.
2. On the **Users** page, click **Create User**.
3. On the **Create User** page, enter a username and email address.
4. For **Access Type**, select **Management console access**.

5. For **Credential Type**, select **Set by user**.
6. Enable login protection, select a verification mode, and click **Next**.
7. Select the user group **Agency Management** created in 2 and click **Create**.

Step 3 Switch the role.

1. Log in to Huawei Cloud as the user created in **Step 2**. For more information, see **Logging In as an IAM User**.
2. Click the username in the upper right corner, and choose **Switch Role**.



3. Enter the account name of the delegating party. The agency created by the delegating party is displayed automatically.

NOTE

If an agency other than the agencies created by the delegating party is displayed, a message is displayed indicating that you do not have access permissions. Select the correct agency in the **Agency Name** drop-down list box.

4. Click **OK** to switch to the delegating account.

----End

5.2 Configuring an Agency for an ECS

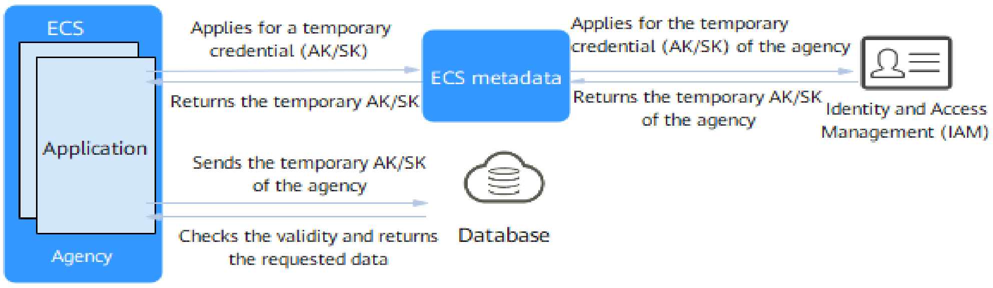
You can create an agency to delegate access to services offered by Huawei Cloud. This example shows how to create an agency and delegate permissions to Huawei Cloud Elastic Cloud Server (ECS), a scalable, on-demand provisioning cloud server.

Application Scenarios

Applications running on an ECS must provide security credentials to access Huawei Cloud services.

Applications can use long-term (such as username and password) or temporary credentials for access. Temporary credentials are more secure because they have a limited lifetime and are automatically rotated. To use temporary credentials to access Huawei Cloud resources, configure an agency with permissions delegated to the ECS where the applications are running, and the applications will get the temporary credential of the agency.

Figure 5-1 Obtaining a temporary credential


ECS
Application
Agency
Applies for a temporary credential (AK/SK)
Returns the temporary AK/SK
ECS metadata
Applies for the temporary credential (AK/SK) of the agency
Returns the temporary AK/SK of the agency
Identity and Access Management (IAM)
Sends the temporary AK/SK of the agency
Checks the validity and returns the requested data
Database

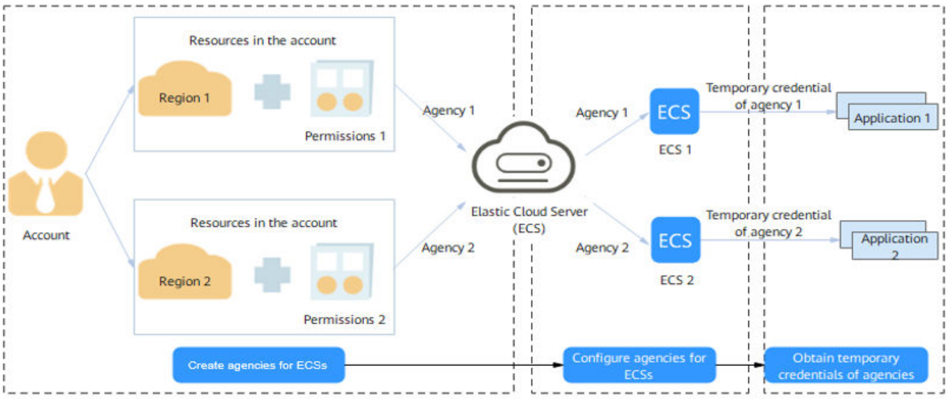
For example, configure an agency for the ECS to enable the applications running on an ECS to use a temporary credential to access a Huawei Cloud database. The ECS sends a request to get a temporary credential (AK/SK) from ECS metadata. The ECS metadata gets a temporary AK/SK of the agency from IAM and then returns the AK/SK to the ECS. The database allows access only after checking that the temporary credential sent from the ECS is valid.

Solution

Create an agency on the IAM console and specify the permissions and scope to delegate permissions to ECS. Configure the agency for the ECS where applications are running. Then the ECS will get a temporary credential of the agency to access resources based on the permissions assigned.

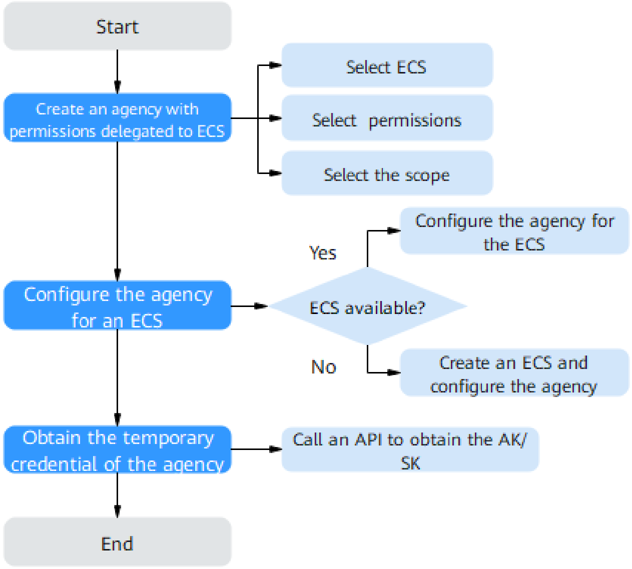
1. Create an agency with permissions delegated to ECS and select the permissions and scope for the agency.
2. Configure the created agency for the ECS. Only one agency can be configured for an ECS.
3. Obtain the temporary credential (AK/SK) of the agency to allow applications running on the ECS to access other Huawei Cloud resources based on the assigned permissions in the authorized scope.

Figure 5-2 ECS agency



Process Flow

Figure 5-3 Flowchart

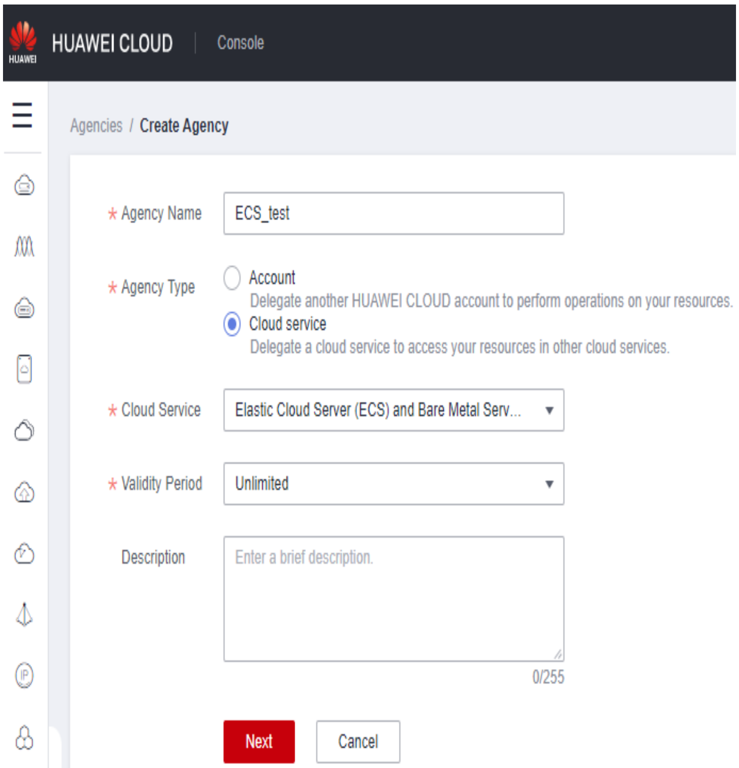

Start
Create an agency with permissions delegated to ECS
Select ECS
Select permissions
Select the scope
Configure the agency for the ECS
Yes
Configure the agency for an ECS
ECS available?
No
Create an ECS and configure the agency
Obtain the temporary credential of the agency
Call an API to obtain the AK/SK
End

Procedure

To allow applications running on an ECS to access resources in other Huawei Cloud services, do as follows:

Step 1 **Create an agency for ECS as the administrator.**

1. Log in to the IAM console.
2. On the IAM console, choose **Agencies** from the navigation pane on the left, and click **Create Agency** on the displayed page.
3. Enter an agency name.
4. Select **Cloud service** for **Agency Type** and **Elastic Cloud Server (ECS) and Bare Metal Server (BMS)** for **Cloud Service**.



Agencies / Create Agency

* Agency Name: ECS_test

* 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: Elastic Cloud Server (ECS) and Bare Metal Serv...

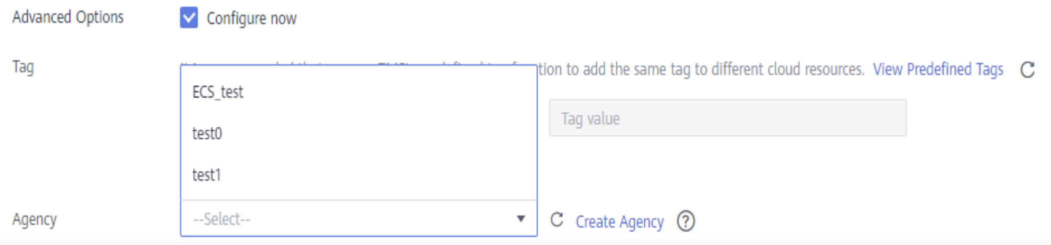
* Validity Period: Unlimited

Description: Enter a brief description.
0/255

5. Select a validity period.
6. (Optional) Enter a description for the agency to facilitate identification.
7. Click **Next**.
8. Select the permissions to be assigned to the agency, click **Next**, and specify the authorization scope.
9. Click **OK**.

Step 2 Configure the agency for the ECS as the administrator or an IAM user with ECS permissions.

- If there are no available ECSs, create one by referring to **Purchasing an ECS**. When configuring **advanced settings**, select the agency created in **Step 1** from the drop-down list.



Advanced Options ☑ Configure now

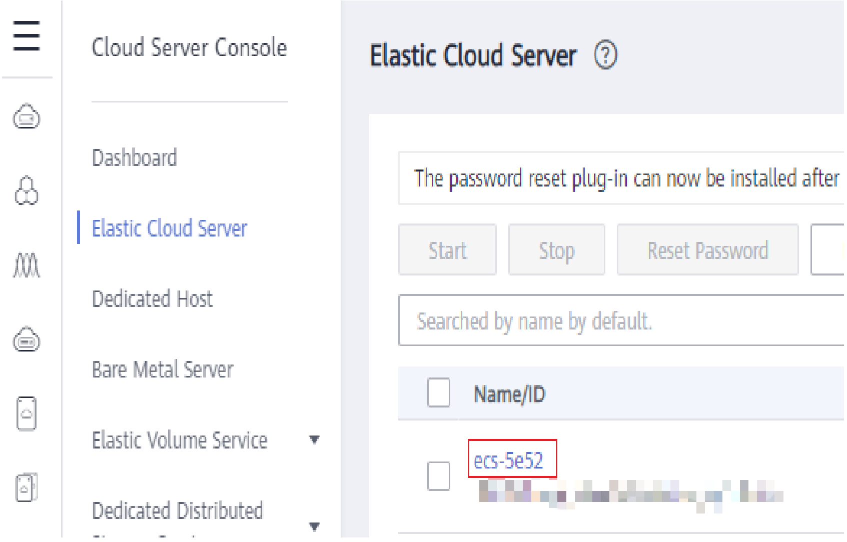
Tag: tion to add the same tag to different cloud resources. View Predefined Tags

Tag value

Agency: --Select--
ECS_test
test0
test1

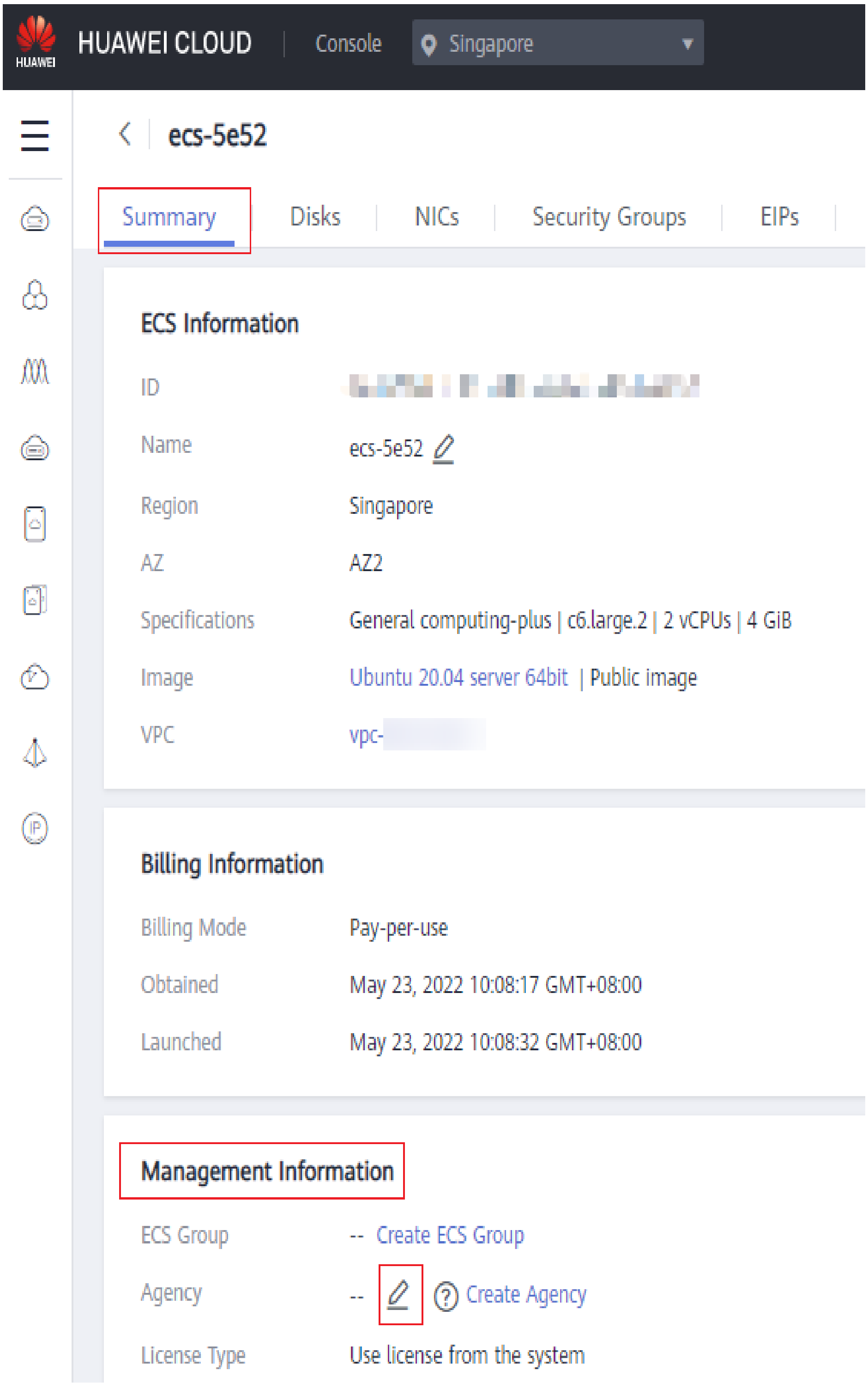
- If there are available ECSs, configure the created agency for an ECS as follows:

1. On the ECS console, click an ECS for which you want to configure the agency.



The password reset plug-in can now be installed after

2. In the **Management Information** area, click ✎ .



ECS Information

ID	[redacted]
Name	ecs-5e52
Region	Singapore
AZ	AZ2
Specifications	General computing-plus | c6.large.2 | 2 vCPUs | 4 GiB
Image	Ubuntu 20.04 server 64bit | Public image
VPC	vpc-[redacted]

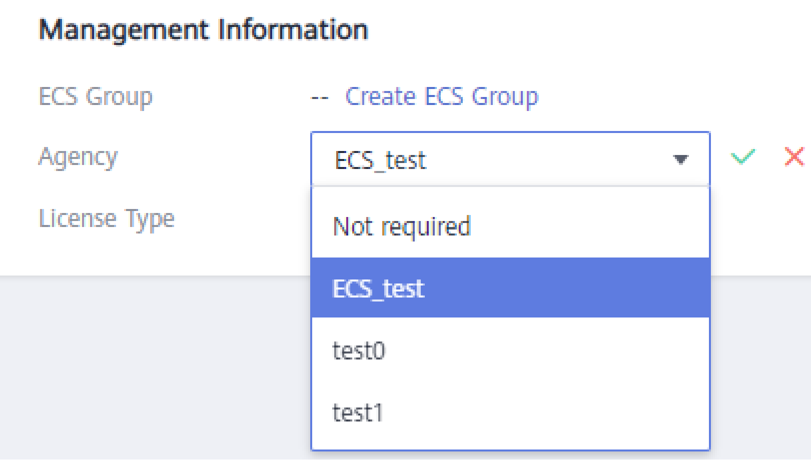
Billing Information

Billing Mode	Pay-per-use
Obtained	May 23, 2022 10:08:17 GMT+08:00
Launched	May 23, 2022 10:08:32 GMT+08:00

Management Information

ECS Group	-- Create ECS Group
Agency	-- Create Agency
License Type	Use license from the system

3. Select the agency created in **Step 1** from the drop-down list.



Management Information

ECS Group -- Create ECS Group

Agency ECS_test

License Type

4. Click ✓ to complete the configuration.

Step 3 Enable applications on the ECS to get a temporary credential.

Configure applications running on the ECS to call API **Security Key (OpenStack Metadata API)** to obtain the temporary credential (AK/SK) of the agency to access other Huawei Cloud services.

- URI

/openstack/latest/securitykey

- Method

Supports GET requests.

- Example

Linux:

curl http://169.254.169.254/openstack/latest/securitykey

Windows:

Invoke-RestMethod http://169.254.169.254/openstack/latest/securitykey

NOTE

ECS automatically rotates temporary credentials to ensure that they are secure and valid.

----End

6 Cross-Region Permissions Assignment (Original Multi-Project Management)

6.1 Scenario

Company A is an enterprise user of Huawei Cloud, and it has multiple project teams that require different resources and personnel. This section presents the best practice for multi-project management to address company A's requirements.

Requirements

- **Requirement 1**: Company A can purchase multiple types of resources in **CN-Hong Kong** and **AP-Singapore** for two project teams. Resources of the two project teams need to be isolated from each other. Access to specific cloud services needs to be authorized, for example, only authorized IAM users can access and use ECS.
- **Requirement 2**: Each member of the project teams can access only the resources of the project team to which the member belongs, and only has the permissions required to complete tasks.
- **Requirement 3**: Each project team makes payments only for the resources used by its members, and the project expenditures are clear.

Solution

- **Solution to requirement 1**: Enterprise Management (EPS) and Identity and Access Management (IAM) are two cloud services of Huawei Cloud that can isolate resources between projects. However, the implementation logic and functions of the two services are different.
  - Enterprise Management: You can create enterprise projects to group and manage resources across regions. Resources in enterprise projects are logically isolated from each other. **Each enterprise project can contain resources of multiple regions**, and resources can be added to or removed from enterprise projects. Specified resources of certain services, for example, a specific ECS, can be added to or removed from enterprise projects.

  – **IAM**: IAM projects group and physically isolate resources in a region, **and each IAM project can only contain resources in the same region.**

In conclusion, Enterprise Management provides more flexible cross-region resource isolation between projects than IAM. Therefore, it is recommended that company A use Enterprise Management to manage project resources. The solutions to the following requirements are proposed using the Enterprise Management service. For details about the two services, see **What Are the Differences Between IAM and Enterprise Management?**

- **Solution to requirement 2**: In IAM, company A creates IAM users for employees and adds the IAM users to different groups. In Enterprise Management, company A adds the user groups to the enterprise projects created to address **Requirement 1** and assigns required resource access permissions (see **Table 6-1**) to each user group.

Figure 6-1 Personnel management model of company A

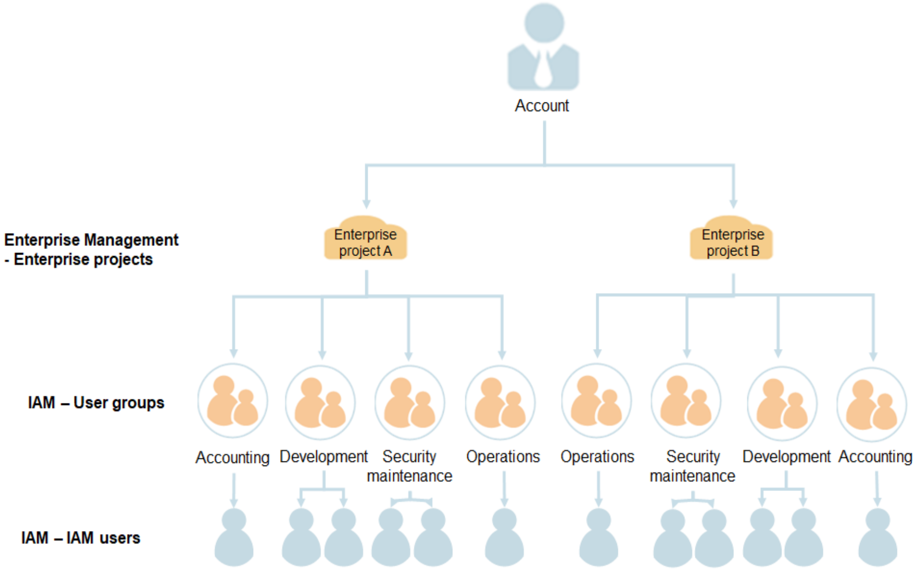


Table 6-1 User group permissions in company A

User Group	Responsibility	Permissions	Description
Accounting team	Project expenditure management	Enterprise Project BSS FullAccess	Permissions for accounting management of enterprise projects
Development team	Project development	ECS FullAccess	Full permissions for Elastic Cloud Server (ECS)
		OBS FullAccess	Full permissions for Object Storage Service (OBS)
		ELB FullAccess	Full permissions for Elastic Load Balance (ELB)

User Group	Responsibility	Permissions	Description
Security maintenance team	Security O&M of the project	ECS CommonOperations	Permissions for basic ECS operations
		CAD Administrator	Full permissions for Advanced Anti-DDoS (AAD)
Operations team	Overall operations of the project	EPS FullAccess	Full permissions for Enterprise Management, including modifying, enabling, disabling, and viewing enterprise projects

NOTE

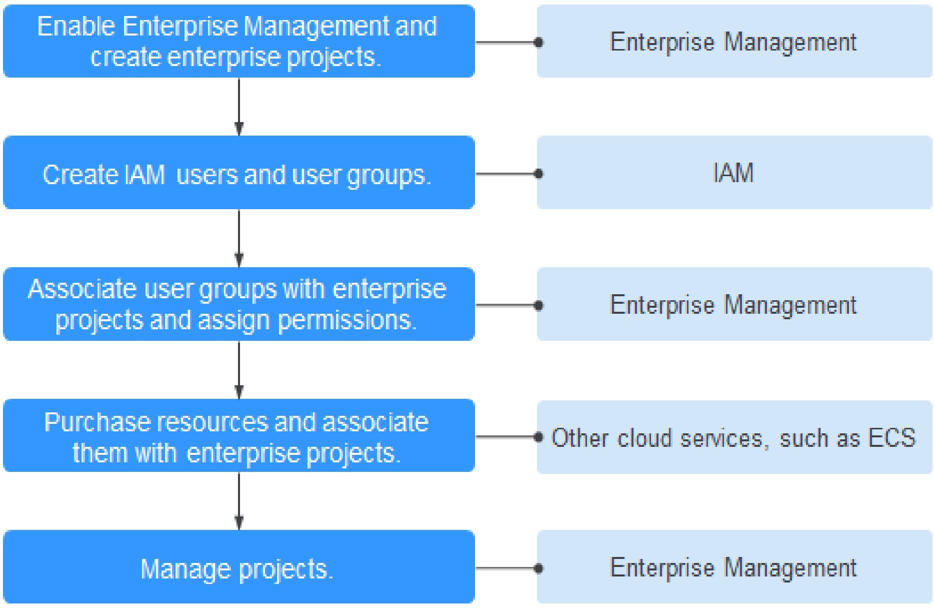
For details about permissions of all Huawei Cloud services, see **System-defined Permissions**.

- **Solution to requirement 3**: Company A uses Enterprise Management to manage renewals, orders, accounting, unsubscriptions, changes, and quotas of each enterprise project. For details, see **Enterprise Project Accounting Management**.

6.2 Procedure

The following figure illustrates the process of enterprise project management for addressing company A's requirements.

Figure 6-2 Enterprise project management process


Enable Enterprise Management and create enterprise projects.
Enterprise Management
Create IAM users and user groups.
IAM
Associate user groups with enterprise projects and assign permissions.
Enterprise Management
Purchase resources and associate them with enterprise projects.
Other cloud services, such as ECS
Manage projects.
Enterprise Management

Step 1: Enable the Enterprise Management service and create enterprise projects on the **Enterprise Management console**.

Step 2: On the **IAM console**, create a user group for each functional team, create IAM users for employees, and add the users to different user groups.

Step 3: On the **Enterprise Management console**, assign the required permissions to each user group, and add the user group to the corresponding enterprise project. Users in the group automatically inherit its permissions.

Step 4: Purchase resources on **other cloud service consoles** and associate the resources with the corresponding enterprise projects.

Follow-Up Operation: Enterprise Project Management: Perform personnel, resource, and accounting management on the **Enterprise Management console**.

Enabling Enterprise Management and Creating Enterprise Projects

Perform the following procedure to create two enterprise projects (A and B) on the Enterprise Management console. If you have enabled Enterprise Project, go to **Step 4**.

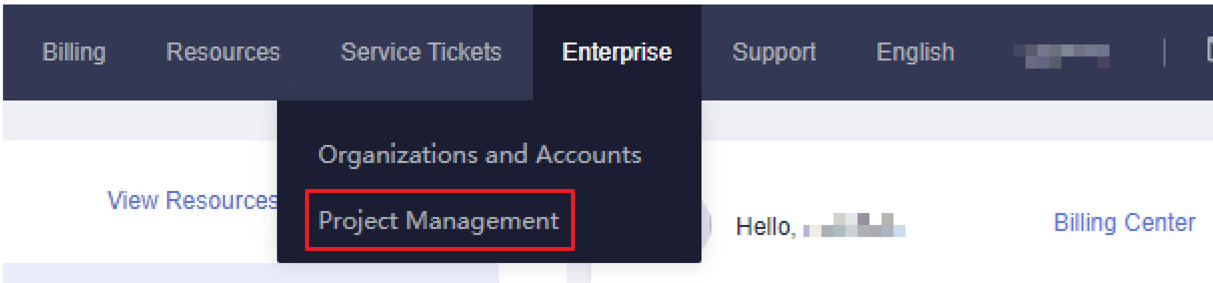
Step 1 Log in to the Huawei Cloud console, hover over the account name in the upper right corner and choose **Basic Information**.

Step 2 On the **Basic Information** page, click **Enable Enterprise Project Function**.

Step 3 Read and agree to the *Huawei Cloud Enterprise Management Agreement*, and click **Apply Now**.

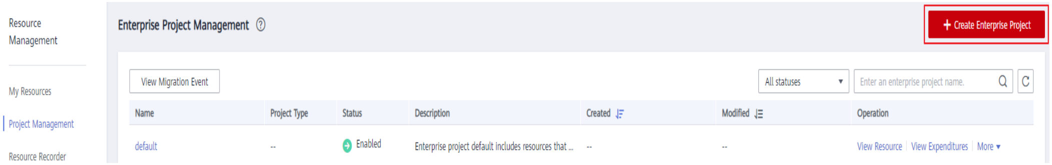
Step 4 On the Huawei Cloud management console, choose **Enterprise** > **Project Management**.

Figure 6-3 Accessing the Enterprise Project Management page



Step 5 On the **Enterprise Project Management Service** page, click **Create Enterprise Project**.

Figure 6-4 Creating an enterprise project



Name	Project Type	Status	Description	Created	Modified	Operation
default	--	Enabled	Enterprise project default includes resources that ...	--	--	View Resource | View Expenditures | More ▾

Step 6 Enter **Enterprise_Project_A** for **Name** and click **OK**.

Step 7 Repeat steps 5 to 6 to create **Enterprise_Project_B.**

The two enterprise projects are displayed on the **Enterprise Project Management Service** page.

----End

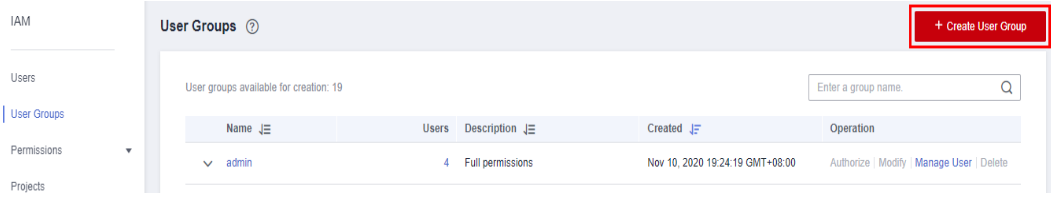
Creating IAM Users and User Groups

The following is an example procedure for creating a user group (**Enterprise Project A_Accounting**) and user (**Murphy**) and adding the user to the user group.

Step 1 Create a user group.

1. Go to Huawei Cloud management console, and choose **Service List** > **Management & Governance** > **Identity and Access Management**.
2. On the IAM console, choose **User Groups** in the navigation pane. Then click **Create User Group**.

Figure 6-5 Creating a user group



User groups available for creation: 19

Name	Users	Description	Created	Operation
admin	4	Full permissions	Nov 10, 2020 19:24:19 GMT+08:00	Authorize | Modify | Manage User | Delete

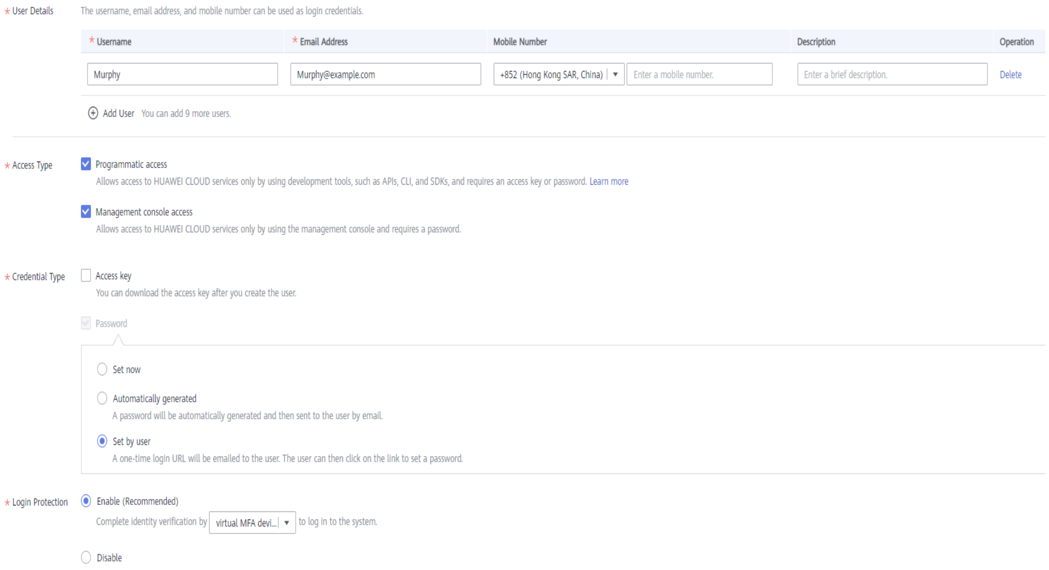
3. Set the user group name to **Enterprise Project A_Accounting** and click **OK**.
4. Repeat steps **2** to **3** to create the accounting, development, security maintenance, and operations teams for the two enterprise projects.

The user groups are displayed in the user group list.

Step 2 Create an IAM user and add the user to a user group.

1. In the navigation pane of the IAM console, choose **Users**. Then click **Create User**.
2. Specify the user information, select an **access type** (see **Figure 6-6**), and click **Next**.

Figure 6-6 Creating an IAM user



* User Details — The username, email address, and mobile number can be used as login credentials.

* Username	* Email Address	Mobile Number		Description	Operation
Murphy	Murphy@example.com	+852 (Hong Kong SAR, China)	Enter a mobile number.	Enter a brief description.	Delete

Add User   You can add 9 more users.

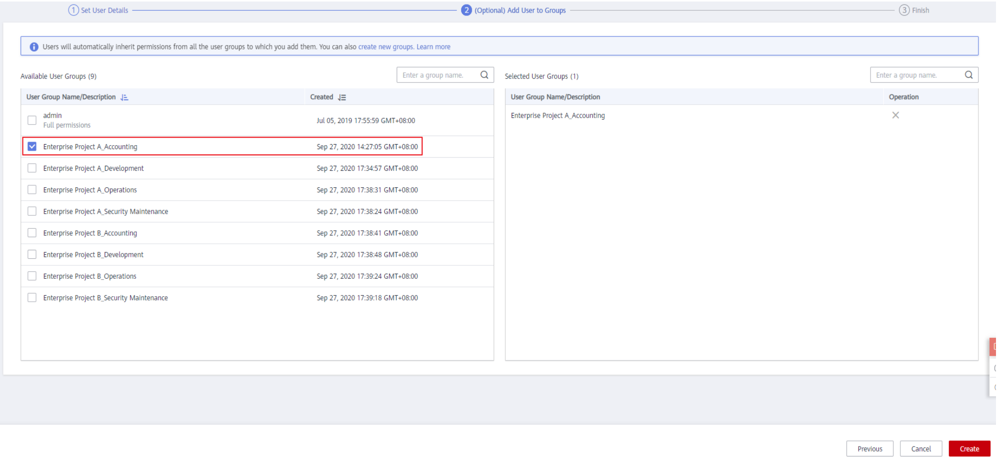
* Access Type
☑ Programmatic access
Allows access to HUAWEI CLOUD services only by using development tools, such as APIs, CLI, and SDKs, and requires an access key or password. Learn more
☑ Management console access
Allows access to HUAWEI CLOUD services only by using the management console and requires a password.

* Credential Type
□ Access key
You can download the access key after you create the user.
☑ Password
○ Set now
○ Automatically generated
A password will be automatically generated and then sent to the user by email.
● Set by user
A one-time login URL will be emailed to the user. The user can then click on the link to set a password.

* Login Protection
● Enable (Recommended)
Complete identity verification by virtual MFA devi... to log in to the system.
○ Disable

3. Add user **Murphy** to the user group **Enterprise Project A_Accounting** and click **Create**.

Figure 6-7 Adding the user to a user group



Users will automatically inherit permissions from all the user groups to which you add them. You can also create new groups. Learn more

Available User Groups (9)

	User Group Name/Description	Created
□	admin Full permissions	Jul 05, 2019 17:55:59 GMT+08:00
☑	Enterprise Project A_Accounting	Sep 27, 2020 14:27:05 GMT+08:00
□	Enterprise Project A_Development	Sep 27, 2020 17:34:57 GMT+08:00
□	Enterprise Project A_Operations	Sep 27, 2020 17:38:31 GMT+08:00
□	Enterprise Project A_Security Maintenance	Sep 27, 2020 17:38:24 GMT+08:00
□	Enterprise Project B_Accounting	Sep 27, 2020 17:38:41 GMT+08:00
□	Enterprise Project B_Development	Sep 27, 2020 17:38:48 GMT+08:00
□	Enterprise Project B_Operations	Sep 27, 2020 17:39:24 GMT+08:00
□	Enterprise Project B_Security Maintenance	Sep 27, 2020 17:39:18 GMT+08:00

Selected User Groups (1)

User Group Name/Description	Operation
Enterprise Project A_Accounting	×

4. Repeat steps **1** to **3** to create users for all employees and add the users to corresponding user groups.

The user is displayed in the user list. You can view the IAM users of each user group on the **Users** tab page.

----End

Associating User Groups with Enterprise Projects

Assign permissions to a user group and apply user group permissions to enterprise projects.

Step 1 Log in to the IAM console as an administrator.

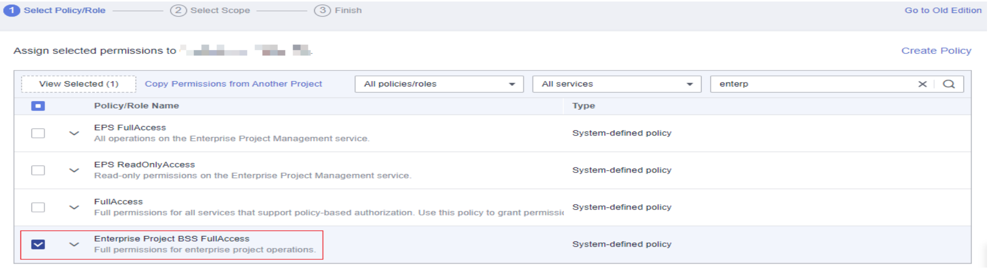
Step 2 In the user group list, locate the row containing the target user group and click **Authorize** in the **Operation** column.

Step 3 On the displayed page, search for **Enterprise Project BSS FullAccess** in the search box, select it, and click **Next**.

NOTE

You can create custom policies to supplement system-defined policies for fine-grained permissions management. For details, see **Creating a Custom Policy**.

Figure 6-8 Selecting permissions



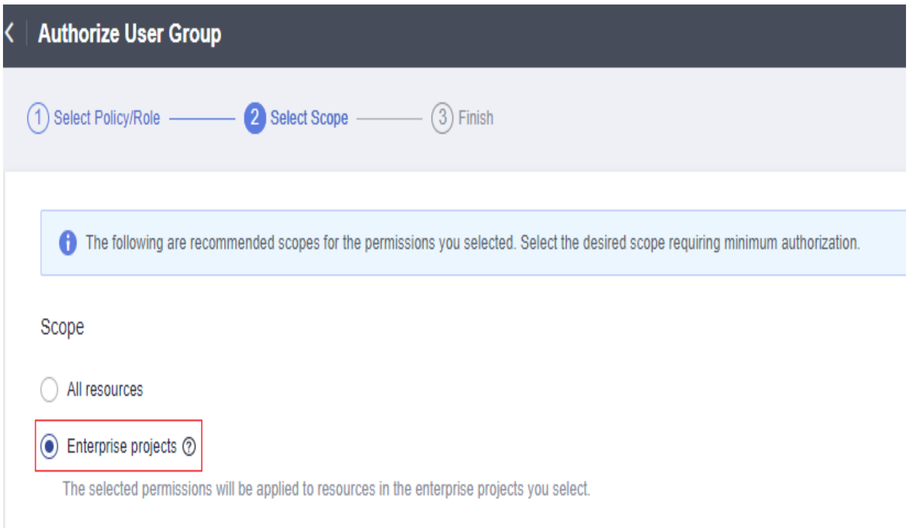
1 Select Policy/Role — 2 Select Scope — 3 Finish   Go to Old Edition

Assign selected permissions to [redacted]   Create Policy

View Selected (1)   Copy Permissions from Another Project   All policies/roles ▾   All services ▾   enterp

		Policy/Role Name	Type
□	⌄	EPS FullAccess All operations on the Enterprise Project Management service.	System-defined policy
□	⌄	EPS ReadOnlyAccess Read-only permissions on the Enterprise Project Management service.	System-defined policy
□	⌄	FullAccess Full permissions for all services that support policy-based authorization. Use this policy to grant permissi	System-defined policy
☑	⌄	Enterprise Project BSS FullAccess Full permissions for enterprise project operations.	System-defined policy

Step 4 Select the **Enterprise projects** authorization scope.



Authorize User Group

1 Select Policy/Role — 2 Select Scope — 3 Finish

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

Scope

○ All resources

● Enterprise projects

The selected permissions will be applied to resources in the enterprise projects you select.

Step 5 In the enterprise project list, select **Enterprise Project A**.

Step 6 Click **OK**.

----End

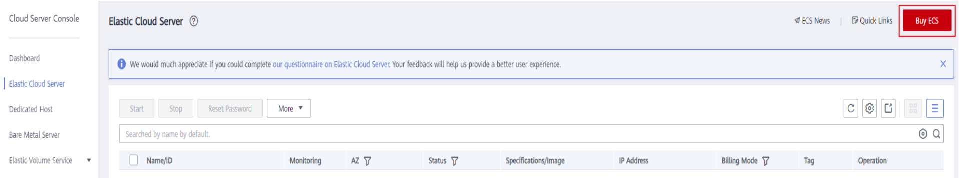
Purchasing Resources and Associating Them with Enterprise Projects

The following is an example procedure for purchasing an ECS and associating it with enterprise project A.

Step 1 Log in to the Huawei Cloud management console, click ☰ in the upper left corner, and choose **Compute** > **Elastic Cloud Server**.

Step 2 Click **Buy ECS** in the upper right corner.

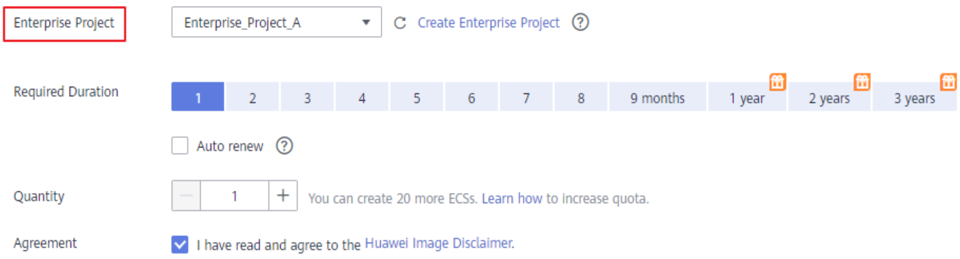
Figure 6-9 Buying an ECS



We would much appreciate if you could complete our questionnaire on Elastic Cloud Server. Your feedback will help us provide a better user experience.

Step 3 Specify the ECS information and select **Enterprise_Project_A** from the **Enterprise Project** drop-down list.

Figure 6-10 Selecting an enterprise project



Enterprise Project: Enterprise_Project_A

You can create 20 more ECSs. Learn how to increase quota.

☑ I have read and agree to the Huawei Image Disclaimer.

Step 4 Click **Next** in the lower right corner to view the resource details and submit the order.

Step 5 Repeat **Step 1** to **Step 4** to purchase required resources for the two enterprise projects.

To view the purchased resources, go to the Enterprise Management console and click **View Resource** in the row that contains enterprise project A or B.

NOTE

- Currently, Enterprise Management only supports **specific Huawei Cloud services**.
- If you have already purchased required resources, you can directly associate them with the two enterprise projects. For details, see **Adding Resources to an Enterprise Project**.

----End

Follow-Up Operation: Enterprise Project Management

After completing the preceding steps, you can manage your enterprise projects on the **Enterprise** > **Project Management** > **Enterprise Project Management Service** page.

- **Resource management**: Click **View Resource** to view the existing resources of an enterprise project and **add more resources to the enterprise project**.
- **Personnel management**: Choose **More** > **Permissions** to go to the IAM console to view the users and user groups associated with an enterprise project, and modify the users, user groups and their permissions for the enterprise project. For details, see **Personnel Management**.
- **Accounting management**: Click **View Expenditures** to view the orders and bills and manage renewals of an enterprise project. For details, see **Enterprise Project Accounting Management**.