

# Alibaba Cloud

Elastic Compute Service

Tag & Resource









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# Document conventions

Style	Description	Example
 <b>Danger</b>	A danger notice indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	 <b>Danger:</b> Resetting will result in the loss of user configuration data.
 <b>Warning</b>	A warning notice indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	 <b>Warning:</b> Restarting will cause business interruption. About 10 minutes are required to restart an instance.
 <b>Notice</b>	A caution notice indicates warning information, supplementary instructions, and other content that the user must understand.	 <b>Notice:</b> If the weight is set to 0, the server no longer receives new requests.
 <b>Note</b>	A note indicates supplemental instructions, best practices, tips, and other content.	 <b>Note:</b> You can use Ctrl + A to select all files.
>	Closing angle brackets are used to indicate a multi-level menu cascade.	Click <b>Settings&gt; Network&gt; Set network type</b> .
<b>Bold</b>	<b>Bold</b> formatting is used for buttons, menus, page names, and other UI elements.	Click <b>OK</b> .
<b>Courier font</b>	Courier font is used for commands	Run the <code>cd /d C:/window</code> command to enter the Windows system folder.
<i>Italic</i>	Italic formatting is used for parameters and variables.	<code>bae log list --instanceid</code> <i>Instance_ID</i>
[ ] or [a b]	This format is used for an optional value, where only one item can be selected.	<code>ipconfig [-all -t]</code>
{ } or {a b}	This format is used for a required value, where only one item can be selected.	<code>switch {active stand}</code>

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# 1.Tags

## 1.1. Overview

Tags can be used to identify resources. Tags allow enterprises and individuals to categorize their ECS resources and simplify the search and management of resources.

### Scenarios

Tags can make your search more efficient and allow you to perform batch operations on resources. For example:

- You can bind different tags to environments such as production and test environments, operating systems such as Windows and Linux, and mobile platforms such as iOS and Android. For example, create the `Test:Server-Windows` tag and bind this tag to all the Windows ECS instances that are in the test environment. You can find these instances based on the tag and perform batch operations on these instances.

#### Example 2 of tag usage scenarios

Examples of batch operations:

- Replace the image to deploy applications.
  - Upgrade patches.
  - Create security group rules to control access.
  - Use Operation Orchestration Service (OOS) to batch start, stop, or restart ECS instances.
  - Use Cloud Assistant to run an O&M script on multiple ECS instances.
- In team or project management, you can add tags such as `CostCenter:aliyun` to groups, projects, or departments. Then, you can categorize the objects, and implement itemized billing and cross authorization based on tags on the Billing Management page of the ECS console.

#### Example of tag usage scenarios

For more information, see the following topics:

- [Create a resource with a specific tag](#)
- [Control access to resources by using tags](#)
- [Use tags to grant access to ECS instances by group](#)

### Precautions

- Each tag consists of a key-value pair.
- A tag must have a unique tag key.

For example, an ECS instance is bound to the `city:shanghai` tag. If the instance is subsequently bound to the `city:newyork` tag, the `city:shanghai` tag is automatically unbound from the instance.

- Tag information is not shared across regions. For example, tags created in the China (Hangzhou) region are not visible to the China (Shanghai) region.
- Tags are deleted when they are not bound to any resources.

- For more information about the best practices for tag design, see [Best practices for tag design](#).

## Limits

For more information about limits and quotas of tags, see the "Tag limits" section in [Limits](#).

## Services that support tags

The following table lists Alibaba Cloud services and resources that support tags.

Service	Resource	API operation
Elastic Compute Service (ECS)	<ul style="list-style-type: none"> <li>• ECS instance</li> <li>• Reserved instance</li> <li>• Elastic Block Storage (EBS)</li> <li>• Snapshot</li> <li>• Automatic snapshot policy</li> <li>• Image</li> <li>• Security group</li> <li>• Elastic network interface (ENI)</li> <li>• Dedicated host</li> <li>• SSH key pair</li> <li>• Launch template</li> </ul>	<ul style="list-style-type: none"> <li>• Bind a tag: <a href="#">TagResources</a></li> <li>• Unbind a tag: <a href="#">UntagResources</a></li> <li>• Search for resources based on tags: <a href="#">ListTagResources</a></li> </ul>
Auto Scaling	Scaling group	<ul style="list-style-type: none"> <li>• Bind a tag: <a href="#">TagResources</a></li> <li>• Unbind a tag: <a href="#">UntagResources</a></li> <li>• Search for resources based on tags: <a href="#">ListTagResources</a></li> </ul>
Virtual Private Cloud (VPC)	<ul style="list-style-type: none"> <li>• VPC</li> <li>• VSwitch</li> <li>• Route table</li> <li>• Elastic IP address (EIP)</li> </ul>	<ul style="list-style-type: none"> <li>• Bind a tag: <a href="#">TagResources</a></li> <li>• Unbind a tag: <a href="#">UntagResources</a></li> <li>• Search for resources based on tags: <a href="#">ListTagResources</a></li> </ul>
ApsaraDB for Redis	ApsaraDB for Redis instance	<ul style="list-style-type: none"> <li>• Bind a tag: <a href="#">TagResources</a></li> <li>• Unbind a tag: <a href="#">UntagResources</a></li> <li>• Search for resources based on tags: <a href="#">ListTagResources</a></li> </ul>

Service	Resource	API operation
Alibaba Cloud Content Delivery Network (CDN)	Domain name	<ul style="list-style-type: none"> <li>Bind a tag: <a href="#">TagResources</a></li> <li>Unbind a tag: <a href="#">UntagResources</a></li> <li>Query the tags of the current user: <a href="#">DescribeUserTags</a></li> <li>Search for resources based on tags: <a href="#">DescribeTagResources</a></li> </ul>
Key Management Service (KMS)	Customer master key (CMK)	<ul style="list-style-type: none"> <li>Bind a tag: <a href="#">TagResource</a></li> <li>Unbind a tag: <a href="#">UntagResource</a></li> <li>Search for resources based on tags: <a href="#">ListResourceTags</a></li> </ul>
Apsara PolarDB	Cluster	<ul style="list-style-type: none"> <li>Bind a tag: <a href="#">TagResources</a></li> <li>Unbind a tag: <a href="#">UntagResources</a></li> </ul>
Object Storage Service (OSS)	Bucket	Add, delete, modify, or query tags for a bucket: <a href="#">bucket-tagging</a>
ApsaraDB for RDS	ApsaraDB for RDS instance	<ul style="list-style-type: none"> <li>Bind a tag: <a href="#">Create and bind tags</a></li> <li>Unbind a tag: <a href="#">Unbind tags</a></li> <li>Search for resources based on tags: <a href="#">Query tags</a></li> </ul>
AnalyticDB for PostgreSQL	AnalyticDB for PostgreSQL instance	Query resources based on tags: <a href="#">DescribeDBInstances</a>
Cloud Enterprise Network (CEN)	CEN instance	<ul style="list-style-type: none"> <li>Bind a tag: <a href="#">TagResources</a></li> <li>Unbind a tag: <a href="#">UntagResources</a></li> <li>Search for resources based on tags: <a href="#">DescribeCens</a></li> </ul>
Smart Access Gateway (SAG)	Cloud Connect Network (CCN)	Query resources based on tags: <a href="#">DescribeCloudConnectNetworks</a>
Cloud Security Scanner	Assets	<ul style="list-style-type: none"> <li>Create assets with tags: <a href="#">AddAssets</a></li> <li>Query assets based on tags: <a href="#">DescribeAssetsByTags</a></li> <li>Add a tag: <a href="#">AddAssetTags</a></li> <li>Query the tags of the current user: <a href="#">DescribeUserTags</a></li> </ul>

Service	Resource	API operation
Apsara File Storage NAS	File system	<ul style="list-style-type: none"> <li>Bind a tag: <a href="#">AddTags</a></li> <li>Unbind a tag: <a href="#">RemoveTags</a></li> <li>Search for resources based on tags: <a href="#">DescribeTags</a></li> </ul>
Operation Orchestration Service (OOS)	<ul style="list-style-type: none"> <li>OOS template</li> <li>OOS operation tasks</li> </ul>	<ul style="list-style-type: none"> <li>Bind a tag: <a href="#">TagResources</a></li> <li>Unbind a tag: <a href="#">UntagResources</a></li> <li>Search for resources based on tags: <a href="#">ListTagResources</a></li> </ul>

## 1.2. Create or bind a tag

This topic describes how to create or bind a tag to resources in the ECS console. If multiple resources that are associated with each other exist in your account, you can bind tags to the resources. This allows you to categorize and manage the resources in a centralized manner.

itemized billing batch search tag ecs

### Context


- For more information about resource types to which you can bind tags, see [Overview](#).
- A maximum of 20 tags can be bound for a resource. If the number of tags bound to a resource exceeds the upper limit, you must unbind some of the tags before you bind new tags.

### Procedure

- Log on to the [ECS console](#).
- In the left-side navigation pane, click **Tags**.
- In the top navigation bar, select a region.
- On the **Tags** tab, click **Create/Bind Tags**.
- In the **Create/Bind Tags** dialog box, perform the following steps:
  - Create a tag or select an existing tag. Click **Next**.

- Tag Key:** required. You can select an existing tag key or enter a new tag key. You can perform fuzzy search by prefix and bind up to 10 tag keys at a time.


The tag key can be up to 128 characters in length and cannot contain *http://* or *https://*. It cannot start with *acs:* or *aliyun*.

 **Note** If you want to bind an existing tag, select its tag key. If you want to create a tag, enter a new tag key.



- **Tag Value:** optional. You can select an existing tag value or enter a tag value.

The tag value can be up to 128 characters in length and cannot contain *http://* or *https://*. It cannot start with *acs:* or *aliyun*.

 **Note** If you want to bind an existing tag, select its tag value.

- Click **Next**.
- Select one or more resources of the same type and click **OK**. For example, you can select four ECS instances.
- (Optional) Click **Bind Other Resources** to go back to the **Select Resources** step and continue to select one or more resources of the same type.
- Click **Close**.

## Result

On the **Tags** tab, select the tags you have bound and click the **Refresh** icon to view the list of resources to which the tags are bound.

## Related information

- [TagResources](#)

# 1.3. Search for resources by tag

After you bind tags to resources, you can use one of the following methods to quickly search for resources. Exact match and fuzzy search are supported.

itemized billing batch search tag ECS

## Search for resources on the Tags page

- Log on to the [ECS console](#).
- In the left-side navigation pane, click **Tags**.
- In the top navigation bar, select a region.
- Click the **Tags** tab and select a tag key from the tag list.
- In the corresponding tag value list, view values in the **Bind Resources** and **Cloud Monitoring Application Groups** columns.

- Click a tag value. Click **Resources** tab to view the resources bound to the tag. You can click a resource ID to go to the resource details page.

## Search for resources on the Resources page

In the ECS console, pages of instances, disks, snapshots, images, security groups, and Elastic Network Interface allow you to set tags to search for these resources. For example, you can complete the following steps to search for ECS instances:

- Log on to the [ECS console](#).
- In the left-side navigation pane, choose **Instances & Images > Instances**.

3. In the top navigation bar, select a region.
4. On the **Instances** page, click **Tags** and then select a tag key. If you do not select a tag value, all ECS instances to which the tag key is bound are displayed.



## Related information

### References

- [Create or bind a tag](#)
- [Delete or unbind a tag](#)
- [ListTagResources](#)
- [DescribeInstances](#)

# 1.4. Use the tag editor to manage resource tags

The tag editor is a tool to query and manage tags. You can use this tool to query 5,000 resource data entries across services and regions. You can also use it to edit resource tags and export resource information.

## Context

The tag editor allows you to query the following ECS resources: instances, Block Storage devices, images, snapshots, security groups, Elastic Network Interfaces, dedicated hosts, and SSH key pairs.

## Search resources

1. Log on to the [ECS console](#).
2. In the left-side navigation pane, click **Tags**.
3. On the **Tags** page, click the **Tag Editor** tab.
4. In the **Search** section, configure query conditions and click **Search**.



In the **Search Results** section, you can click the  icon to set the items to be displayed.

## Edit tags of selected resources



You can edit tags for multiple found resources at a time.

1. In the **Search Results** section, select one or more resources, and click **Edit Tags**.
2. **Manage resource tags.**
  - Click **Add Tag** to add tags to the selected resources.
  - Click **Delete Tag** to delete tags from the selected resources.
  - After a tag that is bound to a resource is deleted, you can click **Cancel Deletion** to restore the tag.
3. Click **Submit**.

## Export resource information

You can export the information of found resources.

1. In the **Search Results** section, select one or more resources, and then click **Export**.
2. Use one of the following methods to export information of resources:

 **Note** You can click the  icon to view all properties of the selected resources or customize properties to be displayed.

- In the **Export** drop-down list, click **Export All Data** to export information of the selected resources as a CSV file.
- In the **Export** drop-down list, click **Export Visible Columns** to export the displayed information as a CSV file.

## Related information

- [TagResources](#)
- [ListTagResources](#)
- [UntagResources](#)
- [DescribeInstances](#)

# 1.5. Create a resource with a specific tag

This topic describes how to attach a custom policy to a RAM user. This allows the RAM user to bind specific tags when the RAM user creates ECS resources. Otherwise, the ECS resources cannot be created. The combination of tags and RAM user allows different RAM users to have different access and operation permissions on cloud resources based on their tags.

## Prerequisites

A RAM user is created under your Alibaba Cloud account. For more information, see [Create a RAM user](#).

## Context

You can bind tags to the resources of ECS and other Alibaba Cloud services. For more information about the services that support tags, see [Services that support tags](#). By default, you can select whether to bind tags when you create resources. If you want to bind a specific tag when you create a resource, you can create a custom policy. This allows you to control the operations of your RAM users on resources by binding specific tags to the resources.

## Step 1: Create a RAM policy by using your Alibaba Cloud account and attach the RAM policy to the RAM user

To create a resource bound with a specific tag, you must create and attach a custom policy to the RAM user. In this step, the `BindTagForRes` custom policy is assigned to the `userTest` RAM user. When the RAM user creates an ECS resource, the RAM user must bind a specific tag to the resource and select a VPC bound with a tag. In this example, the `user:lisi` tag is bound to the VPC and the `owner:zhangsan` tag must be bound to the ECS resource.

1. Log on to the [RAM console](#) by using an Alibaba Cloud account.

2. Create the BindTagForRes custom policy. For more information, see [Create a custom policy](#). The following policy is used in this step. You can configure permissions based on your business needs.

```
{
  "Statement": [
    {
      "Effect": "Allow",
      "Action": "ecs:*",
      "Resource": "*",
      "Condition": {
        "StringEquals": {
          "ecs:tag/owner": "zhangsan"
        }
      }
    },
    {
      "Effect": "Allow",
      "Action": "ecs:*",
      "Resource": "*",
      "Condition": {
        "StringEquals": {
          "vpc:tag/user": "lisi"
        }
      }
    },
    {
      "Action": [
        "ecs:DescribeTagKeys",
        "ecs:ListTagResources",
        "ecs:DescribeTags",
        "ecs:DescribeKeyPairs",
        "ecs:DescribeImages",
        "ecs:DescribeSecurityGroups",
        "ecs:DescribeLaunchTemplates",
        "ecs:DescribeDedicatedHosts",
        "ecs:DescribeDedicatedHostTypes",
        "ecs:DescribeAutoSnapshotPolicyEx",
        "vpc:DescribeVpcs",
        "vpc:DescribeVSwitches",
        "bss:PayOrder"
      ],
    }
  ],
}
```

```


    "Effect": "Allow",
    "Resource": "*"
  },
  {
    "Effect": "Deny",
    "Action": [
      "ecs:DeleteTags",
      "ecs:UntagResources",
      "ecs:CreateTags",
      "ecs:TagResources"
    ],
    "Resource": "*"
  }
],
"Version": "1"
}

```

Permission policy	Parameter	Description
Permission to create or access a resource bound with a tag	<pre>"ecs:tag/owner": "zhangsan"</pre>	<ul style="list-style-type: none"> <li>When a resource is created, the resource must be bound with this tag.</li> <li>You can control access to resources bound with this tag.</li> </ul>
API permission to query tags	<ul style="list-style-type: none"> <li><code>ecs:DescribeTagKeys</code></li> <li><code>ecs:ListTagResources</code></li> <li><code>ecs:DescribeTags</code></li> </ul>	You can query tags in the ECS console.


Permission policy	Parameter	Description
API permission to query ECS resources	<ul style="list-style-type: none"> <li>◦ <code>ecs:DescribeKeyPairs</code></li> <li>◦ <code>ecs:DescribeImages</code></li> <li>◦ <code>ecs:DescribeSecurityGroups</code></li> <li>◦ <code>ecs:DescribeLaunchTemplates</code></li> <li>◦ <code>ecs:DescribeDedicatedHosts</code></li> <li>◦ <code>ecs:DescribeDedicatedHostTypes</code></li> <li>◦ <code>ecs:DescribeAutoSnapshotPolicyEx</code></li> </ul>	You can filter resources by tag. This permission is required when you create resources in the ECS console. The resources include key pairs, images, security groups, instances, dedicated hosts, and snapshots.
API permission to query VPC resources	<ul style="list-style-type: none"> <li>◦ <code>vpc:DescribeVpcs</code></li> <li>◦ <code>vpc:DescribeVSwitches</code></li> </ul>	You can query existing VPCs and VSwitches.
API permission to pay for orders	<code>bss:PayOrder</code>	This operation applies only to subscription resources.
API permission to disable tag-related operations	<ul style="list-style-type: none"> <li>◦ <code>ecs:DeleteTags</code></li> <li>◦ <code>ecs:UntagResources</code></li> <li>◦ <code>ecs:CreateTags</code></li> <li>◦ <code>ecs:TagResources</code></li> </ul>	This permission disables tag-related API operations and avoids loss of control permissions on resources caused by modifications on tags. You can grant this permission when necessary. Exercise caution when you perform this operation.
Policy for VPCs to bind tags	<code>"vpc:tag/user": "lisi"</code>	The policy requires that a VPC must be bound with a tag. You can also specify whether to require a VPC to be bound with a tag.

3. Attach the custom policy to the RAM user or group to which you want to control access. For more information, see [Grant permissions to a RAM role](#). In this step, the BindTagForRes custom policy is attached to the userTest RAM user.

 **Note** Problems may occur if you attach the BindTagForRes custom policy to an existing RAM user that is attached with multiple permission policies.

## Step 2: Create and configure a VPC by using the Alibaba Cloud account

The custom policy created in Step 1 requires that you select a VPC that is bound with the `user:lisi` tag when you create an ECS resource. Therefore, you must create a VPC and bind the VPC with a tag. If the VPC is not bound with a specific tag, you cannot create the ECS resource.


 **Note** You cannot bind a tag to a VPC when the VPC is being created. You must call the `TagResources` operation to bind a tag to the VPC after the VPC is created.

1. Create a VPC by using the Alibaba Cloud account. For more information, see [Create a VPC](#).
2. Call the `TagResources` operation to bind the `user:lisi` tag to the VPC. You can also bind other tags to the VPC.
3. Call the `ListTagResources` operation to query the VPC created in this step. If the response contains `"TagKey": "user"` and `"TagValue": "lisi"`, the VPC is bound with the `user:lisi` tag.

## Step 3: Create an ECS resource by using the RAM user

Log on to the ECS console as the `userTest` RAM user and create an ECS instance bound with a tag.

1. Log on to the [ECS console](#).
2. In the left-side navigation pane, choose **Instances & Images > Instances**.
3. In the top navigation bar, select a region.
4. Click **Create Instance** to create an instance.

 **Note** You must select the VPC bound with the `user:lisi` tag in Step 2 and bind the `owner:zhangsan` tag to the ECS instance. If you do not bind the `owner:zhangsan` tag, the ECS instance cannot be created, and the `You are not authorized to create ECS instances` message is displayed.

## What to do next

You can bind specific tags to existing resources. This allows you to control access to these resources. You can also access resources bound with specific tags. For more information, see [Control access to resources by using tags](#).

# 1.6. Use OOS to modify a tag value of multiple resources

This topic describes how to modify a tag value of multiple resources at a time by using an Operation Orchestration Service (OOS) custom template.

## Prerequisites

A tag is bound to resources. For more information, see [Create or bind a tag](#).

## Context

In this topic, a custom template is created in OOS. This template can be used to modify a tag value of hundreds of ECS instances at a time. In this example, a tag value of the ECS instances is changed from OldTagValue to NewTagValue. The corresponding tag key-value pair is changed from TagKey:OldTagValue to TagKey:NewTagValue .

### Note

- You can use the OOS custom template to modify a tag value for up to 1,000 resources at a time. If the number of resources is greater than 1,000, you must execute the template multiple times.
- You can use the OOS custom template to modify the tag values of any resources that support tagging in the same region. You can modify the API operations in the template to make it applicable to various resources. For more information about resources that support tagging, see [Overview](#). For information about the resources that OOS supports, see [List of supported cloud services](#).

## Step 1: Create a custom template

You can perform the following steps to create an OOS custom template to modify a tag value of multiple resources.

1. Log on to the [OOS console](#).
2. In the top navigation bar, select a region.
3. In the left-side navigation pane, click **My Templates**.
4. Click **Create Template**.
5. In the Create Template dialog box, click the **Empty Templates** tab, select **Empty Templates**, and then click **OK**.
6. In the **Basic Information** section on the right of the Create Template page, enter a template name in the Template Name field and add tags.
7. Click the **JSON** tab and write code in the code editor. Sample code:

```
{
  "Description": "Modify a tag value of multiple resources at a time",
  "FormatVersion": "OOS-2019-06-01",
  "Parameters": {
    "operatId": {
      "Description": "Define the operation ID",
      "Type": "String",
      "MinLength": 1,
      "MaxLength": 64
    },
    "tagKey": {
      "Description": "Current tag key",
      "Type": "String",
      "MinLength": 1,
      "MaxLength": 64
    }
  }
}
```



```
    "MinLength": 1,
    "MaxLength": 64
  },
  "tagValue": {
    "Description": "Current tag value",
    "Type": "String",
    "MinLength": 1,
    "MaxLength": 64
  },
  "newTagValue": {
    "Description": "New tag value",
    "Type": "String",
    "MinLength": 1,
    "MaxLength": 64
  }
},
"Tasks": [
  {
    "Name": "DescribeInstances_ECS",
    "Action": "ACS::ExecuteAPI",
    "Description": {
      "en": "Filter ECS instances by tag"
    },
    "Properties": {
      "Service": "ECS",
      "API": "DescribeInstances",
      "AutoPaging": true,
      "Parameters": {
        "Tags": [
          {
            "Key": "{{ tagKey }}",
            "Value": "{{ tagValue }}"
          }
        ]
      }
    }
  },
  {
    "Outputs": {
      "Instances": {
        "Type": "List",
        "ValueSelector": "Instances.Instance[].InstanceId"
      }
    }
  }
]
```

```

    }
  },
  {
    "Name": "TagResources_ECS_Instances",
    "Action": "ACS::ExecuteAPI",
    "Description": {
      "en": "Update the tag of ECS instances"
    },
    "Properties": {
      "Service": "ECS",
      "API": "TagResources",
      "Parameters": {
        "Tags": [
          {
            "Key": "{{ tagKey }}",
            "Value": "{{ newTagValue }}"
          }
        ],
        "ResourceType": "Instance",
        "ResourceIds": [
          "{{ACS::TaskLoopItem}}"
        ]
      }
    },
    "Loop": {
      "MaxErrors": "100%",
      "Concurrency": 20,
      "Items": "{{DescribeInstances_ECS.Instances}}"
    }
  }
  ],
  "Outputs": {}
}

```

8. Click **Create Template**.

## Step 2: Execute the custom template


You can perform the following steps to execute the template created in Step 1 to modify a tag value of multiple resources.

1. In the left-side navigation pane, click **My Templates**.
2. Find the template created in Step 1 and click **Create Execution** in the **Actions** column.

3. On the **Create** page, enter an execution description and select an execution mode in the **Basic Information** step. Then, click **Next: Parameter Settings**.
4. In the **Parameter Settings** step, configure parameters and click **Next: OK**.

You must configure the following parameters in this step:

- **operateId**: the operation ID, which is used to identify an operation. You can enter an operation ID.
  - **tagKey**: the current tag key. In this example, the current tag key is `TagKey`.
  - **tagValue**: the current tag value. In this example, the current tag value is `OldTagValue`.
  - **newTagValue**: the new tag value. In this example, the new tag value is `NewTagValue`.
5. Click **Create**. The execution details page appears. You can view the execution results.

 **Note** If the execution fails, you can check the logs for the cause of the failure and make adjustments accordingly.

## 1.7. Use OOS to bind tags to multiple ECS resources at a time

You can use Operation Orchestration Service (OOS) to bind tags to multiple ECS resources within the same region to control permissions on these ECS resources based on tags.

### Context


You can bind tags for the resources of ECS and other Alibaba Cloud services by using OOS custom templates. For more information about the services that support tags, see [Services that support tags](#). In this topic, a custom template is created in OOS to bind the `owner:zhangsan` tag to ECS instances within the same region.

 **Note** The resources must be located within the same region for a tag to bind.

### Step 1: Create a custom policy and a RAM role

Create a RAM role named `OOSServiceRole` for OOS and attach permissions to the role.

1. Log on to the [RAM console](#) by using an Alibaba Cloud account.
2. Create a custom policy named `OOSAutoBindTag`. For more information about how to create a custom policy, see [Create a custom policy](#). The following policy is created.

 **Note** This policy targets ECS instances, and the permissions in the policy are set to `ecs:DescribeInstances`. You can set the permissions based on your business needs. For example, if you want to bind tags to multiple security groups, you can replace `ecs:DescribeInstances` with `ecs:DescribeSecurityGroups`.

```

{
  "Version": "1",
  "Statement": [
    {
      "Action": [
        "ecs:DescribeInstances",
        "ecs:TagResources"
      ],
      "Resource": "*",
      "Effect": "Allow"
    }
  ]
}

```

3. Create the OOSServiceRole RAM role. For more information, see [Create a RAM role for a trusted Alibaba Cloud service](#).
4. Attach the custom policy to the RAM role. For more information, see [Grant permissions to a RAM role](#). In this step, the OOSAutoBindTag custom policy is attached to the OOSServiceRole RAM role.
5. Attach the AliyunOOSFullAccess system policy to the OOSServiceRole RAM role. Add permissions as shown in the following figure.



## Step 2: Bind tags to multiple resources at a time

1. Log on to the [OOS console](#).
2. In the top navigation bar, select a region.
3. In the left-side navigation pane, click **My Templates**.
4. Create a custom template.
  - i. On the **My Templates** page, click **Create Template**.
  - ii. In the **Create Template** dialog box that appears, click the **Empty Templates** tab, select **Empty Templates**, and then click **OK**.
  - iii. On the **Create Template** page, click the **YAML** tab to edit the template. Enter **OOSAutoBindTag** in the **Template Name** field in the upper-right corner of the page. After you edit the template, click **Create Template**.

The following code provides an example.

```

FormatVersion: OOS-2019-06-01
Description: Tag Resources Without The Specified Tags
Parameters:
  tags:
    Type: Json
    Description:

```

en: The tags to select ECS instances.

**AssociationProperty:** Tags

**regionId:**

**Type:** String

**Description:**

en: The region to select ECS instances.

**OOSAssumeRole:**

**Description:**

en: The RAM role to be assumed by OOS.

**Type:** String

**Default:** OOSServiceRole

**RamRole:** OOSServiceRole

**Tasks:**

- **Name:** getInstanceByTags

**Action:** 'ACS::ExecuteAPI'

**Description:** "

**Properties:**

**Service:** ECS

**API:** DescribeInstances

**Parameters:**

**Tags:** '{{ tags }}'

**RegionId:** '{{ regionId }}'

**Outputs:**

**InstanceIds:**

**Type:** List

**ValueSelector:** 'Instances.Instance[].InstanceId'

- **Name:** getAllInstances

**Action:** 'ACS::ExecuteAPI'

**Description:** "

**Properties:**

**Service:** ECS

**API:** DescribeInstances

**Parameters:**

**RegionId:** '{{regionId}}'

**Outputs:**

**InstanceIds:**

**Type:** List

**ValueSelector:** 'Instances.Instance[].InstanceId'

```

- Name: TagResources_ECS_Instances
  Action: 'ACS::ExecuteAPI'
  Description:

  en: 'tag ecs instances, which are without the specified tags.'
  Properties:
    Service: ECS
    API: TagResources
    Parameters:
      Tags: '{{ tags }}'
      RegionId: '{{regionId}}'
      ResourceType: Instance
      ResourceIds:
        - '{{ACS::TaskLoopItem}}'
    Loop:
      MaxErrors: 100%
      Concurrency: 20
      Items:
        'Fn::Difference':
          - '{{ getAllInstances.InstanceIds }}'
          - '{{ getInstancesByTags.InstanceIds }}'
    Outputs:
      InstanceIds:
        Type: List
        Value:
          'Fn::Difference':
            - '{{ getAllInstances.InstanceIds }}'
            - '{{ getInstancesByTags.InstanceIds }}'

```

The following section describes the parameters.

- **tags**: the tags bound to ECS instances.
- **regionId**: the region ID of the ECS instances to which the selected tags are bound.
- **OOSAssumeRole**: the RAM role used by OOS.

Permissions:

- **DescribeInstances**: filters resources based on source tags.
- **TagResources**: creates tags for or bind tags to specified resources.

## 5. Execute the custom template.

- i. In the left-side navigation pane, click **My Templates**. On the My Templates page, find the `OOSAutoBindTag` custom template that you created in Step 5, and click **Create Execution** in the **Actions** column.



- ii. Keep the default settings or select another execution mode, and click **Next: Parameter Settings**.
- iii. In the **Parameter Settings Required** step, set the parameters and click **Next: OK**.

The following parameters are configured in this example:



- `tags`: Select the `owner:zhangsan` tag.
- `regionId`: Select the region of the instances, such as `cn-shanghai`. For more information, see .
- `oosAssumeRole`: Use the `OOSServiceRole` RAM role.

- iv. In the **OK** step, click **Create Execution**.
- v. On the execution details page that appears, click the **Advanced View** tab.
- vi. Click the **Execution Result** tab on the right of the page.

View the execution result, which demonstrates that the `owner:zhangsan` tag is bound to all the ECS instances within the selected region.



If **Failed** is displayed for **Execution Status**, you can view the information about the execution status and execution logs to make corresponding adjustments.

## 1.8. Control access to resources by using tags

After you attach tags to your resources, you can use tags to group, categorize, and control access to resources. This topic uses an ECS instance as an example to describe how to attach a policy to a RAM user and allow the user to control access to ECS instances by using tags.

### Prerequisites

You have created a RAM user by using an Alibaba Cloud account. For more information, see [Create a RAM user](#).

### Context

Tags are used to identify cloud resources. They help you classify, search for, and aggregate cloud resources with the same characteristics from different dimensions. This simplifies resource management. You can attach multiple tags to each cloud resource.

Alibaba Cloud implements policy-based access control. You can configure RAM policies based on roles of RAM users. You can define multiple tags in each policy and attach one or more policies to RAM users or RAM user groups.

You can attach tags to ECS resources and resources of other Alibaba Cloud services. By default, all resources within the current region are displayed in the resource list. If you want to control which resources are accessible to RAM users, you can create a custom policy and use tags to implement access control.

## Step 1: Use an Alibaba Cloud account to create a policy and attach it to a RAM user

In this step, create a custom policy named UseTagAccessRes and attach the policy to the RAM user userTest. The UseTagAccessRes policy states that RAM users must specify the `owner: zhangsan` and `environment: production` tags before they can access ECS resources.

1. Log on to the [RAM console](#) by using an Alibaba Cloud account.
2. For more information about how to create the UseTagAccessRes custom policy, see [Create a custom policy](#). The following code shows how to configure multiple tags for resources in a policy:



```


{
  "Statement": [
    {
      "Effect": "Allow",
      "Action": "ecs:*",
      "Resource": "*",
      "Condition": {
        "StringEquals": {
          "ecs:tag/owner": "zhangsan",
          "ecs:tag/environment": "production"
        }
      }
    },
    {
      "Action": [
        "ecs:DescribeTagKeys",
        "ecs:DescribeTags"
      ],
      "Effect": "Allow",
      "Resource": "*"
    },
    {
      "Effect": "Deny",
      "Action": [
        "ecs>DeleteTags",
        "ecs:UntagResources",
        "ecs>CreateTags",
        "ecs:TagResources"
      ],
      "Resource": "*"
    }
  ],
  "Version": "1"
}

```

Policy	Policy content	Description
--------	----------------	-------------


Policy	Policy content	Description
Grants the permission to access resources that are attached with specific tags	<ul style="list-style-type: none"> <li>○ "ecs:tag/owner": "zhangsan"</li> <li>○ "ecs:tag/environment": "production"</li> </ul>	This policy allows you to control access to resources that are attached with the specified tags.
Grants the permission to query tags	<ul style="list-style-type: none"> <li>○ ecs:DescribeTagKeys</li> <li>○ ecs:DescribeTags</li> </ul>	This policy grants the permission to query tags.
Does not grant permissions to call tag-related API operations	<ul style="list-style-type: none"> <li>○ ecs&gt;DeleteTags</li> <li>○ ecs:UntagResources</li> <li>○ ecs&gt;CreateTags</li> <li>○ ecs:TagResources</li> </ul>	This policy must exclude all tag-related API operations from its permissions. This ensures that users will not be deprived of permissions due to tag modifications.

3. Attach the custom policy to RAM users or user groups whose access you want to control. For more information, see [Grant permissions to a RAM role](#). In this step, attach the UseTagAccessRes policy to the RAM user userTest.

 **Note** To attach the UseTagAccessRes policy to an existing RAM user, note that multiple policies attached to a single RAM user may cause problems.

## Step 2: Use an Alibaba Cloud account to attach tags to existing resources


You can attach tags to existing resources to control access to the resources. In this step, use an Alibaba Cloud account to create an ECS instance and attach tags to the instance.

 **Note** If you have no existing ECS instances, create an instance first. For more information, see [Creation method overview](#).

1. Log on to the [ECS console](#).
2. In the left-side navigation pane, click Tags.
3. Click **Create/Bind Tags** to create the `owner: zhangsan` and `environment: production` tags and attach the tags to an existing instance. For more information about how to attach a tag to a resource, see [Create or bind a tag](#).

## Step 3: Use credentials of a RAM user to access instances that are attached with tags

Log on to the ECS console and access instances with tags by using credentials of the RAM user userTest who is attached with the UseTagAccessRes policy.

 **Note** The ECS resources that can be attached tags include instances, Block Storage devices, snapshots, images, security groups, ENIs, dedicated hosts, SSH key pairs, and instance launch templates. This step uses an ECS instance as an example.

1. Log on to the [ECS console](#).
2. In the left-side navigation pane, choose **Instances & Images > Instances**.
3. Select the specified region. No instance is displayed on the Instances page.

4. You can specify tags to view resources.

## 1.9. Implement automatic resource monitoring by group based on tags

You can bind a tag to multiple ECS instances that run the same business. Then, you can use the application groups feature of Cloud Monitor to configure smart tag synchronization for these instances. Cloud Monitor automatically assigns the ECS instances that are bound with the same tag to the same application group to implement automatic resource monitoring by group. In ECS, only ECS instances support this feature.

### Context

The application groups feature of Cloud Monitor allows you to manage alarm rules and view monitoring data by group. This makes management less complex. For more information, see [Application groups](#). In this topic, ECS instances that are automatically created in a scaling group are bound with the `testKey:testValue` tag. Then, Cloud Monitor uses the configuration rules of the application group to identify and assign the ECS instances to the application group based on the tag.

You can use one of the following methods to automatically monitor resources by group based on tags.

- Create resources that are bound with tags or bind tags to existing resources. Then, use Cloud Monitor to create an application group for which the smart tag synchronization feature is enabled. Make sure that the tags that match the application group are the same as those bound to the resources.
- Create an application group for which the smart tag synchronization feature is enabled, and add a custom tag to the matching rules of the application group. Then, create resources that are bound with the same tag as the application group or bind the same tag as the application group to existing resources. Then, the resources are automatically assigned to the application group.

### Step 1: Create instances that are bound with the same tag

You can create instances that are bound with the same tag or bind a tag to existing instances. For more information, see [Create or bind a tag](#). Alternatively, you can perform the following operations to use Auto Scaling to bind a tag to the instances in a scaling group.

1. Log on to the [Auto Scaling console](#).

2. Create a scaling group. Select a multi-zone scaling policy to implement high-availability auto scaling. For more information, see [Create a scaling group](#).

3. Create a scaling configuration. Make sure that the `testKey:testValue` tag is bound to the scaling configuration. For more information, see [Create a scaling configuration](#).

4. Go to the details page of the created scaling group. click **Instances** to view the ECS instances that are automatically created in the scaling group.

## Step 2: Create a Cloud Monitor application group

1. Log on to the [Cloud Monitor console](#).
2. Create a Cloud Monitor application group. For more information, see [Create an application group](#). In this example, select **Smart tag synchronization creation** as the creation method, and add the `testKey:testValue` tag to the matching rule to create an application group. Then, the instances that are bound with this tag are assigned to the created application group.

- i. Select **Smart tag synchronization creation** as the creation method.

- ii. In the Match Rule section, set Resource Tag Key to `testKey` and specify the Tag Value parameter. You can set a tag value range. In this example, the tag value range is **Contain** `testValue`.

## Step 3: View monitoring information about the ECS instances

You can use one of the following methods to view the information about the ECS instances:

**Method 1: View the monitoring information about the ECS instances based on their application group in the Cloud Monitor console.**

1. Log on to the [Cloud Monitor console](#).
2. In the left-side navigation pane, click **Application Groups**.
3. In the search bar, select **Resource tags**, and enter `testKey` to search for the application group.

4. Click `testKey-testValue-53** / 22*****` in the Group Name / Group ID column to view the resources in the group. The automatically created ECS instances in the scaling group are automatically assigned to the application group.

**Method 2: View the monitoring information about the ECS instances in the ECS console.**

1. Log on to the [ECS console](#).

2. In the left-side navigation pane, click **Tags**.
3. In the top navigation bar, select a region.
4. On the **Tags** tab of the **Tags** page, click **Custom Tags**. On the **All Custom Tags** page, click **Enable** in the **Automatically Create Cloud Monitoring Application Groups** column to create a Cloud Monitor application group. In the **Automatically Create Cloud Monitoring Application Groups** column, **Enabled** is displayed with a green check mark for the tags for which application group are created.



5. Enter `testKey` in the search box to search for the `testKey:testValue` tag.
6. Click **View Monitoring Information** in the **Cloud Monitoring Application Group** column.



Go to the **CloudMonitor** tab to view the monitoring, alarm, and event information about the ECS instances in the application group that correspond to this key.

## What's next

Monitor ECS instances in real time by using Cloud Monitor. For more information, see [Overview](#).

# 1.10. Delete or unbind a tag

This topic describes how to delete or unbind a tag in the ECS console. You can unbind a tag from a resource when the tag is no longer needed. If you unbind a tag from a resource and the tag is not bound to any other resources, this tag is automatically deleted.

itemized billing batch search tag ECS remove tags

## Prerequisites

The resource is bound to a tag.

## Context

Before you unbind a tag, take note of the following items:

- You can unbind up to 20 tags at a time.
- If you unbind a tag from all its resources such as ECS instances, snapshots, and security groups, this tag is deleted.

## Procedure

1. Log on to the [ECS console](#).
2. In the left-side navigation pane, click **Tags**.
3. On the **Tags** page, click a tag key.
4. In the tag value list, click a tag value.
5. On the **Tag Value** page that appears, click the **Resources** tab.
6. Select one or more resources, move the pointer over **Batch Operation**, and click **Unbind Tags**.



7. On the **Resources** tab, click **Refresh** to check whether the tags are unbound.

## What's next

If you implement access control or automated O&M, or generate bill reports based on tags, you need to pay attention to the business changes caused by tag unbinding. For more information, see the "Considering ramifications of future changes" section in [Best practices for tag design](#).

## Related information

- [UntagResources](#)

# 1.11. Best practices for tag design

This topic introduces the best practices for tag design in ECS. Tags can be used to manage, categorize, and search for resources.

## Scenarios

Tags can be used to categorize and manage resources by group. The resources include personnel, finance, and cloud product resources. Tags are applicable in the following common scenarios:

- Management of application publishing procedures
- Resource tracking and tag-based group search and resource management
- Tag- and group-based automated O&M using Alibaba Cloud services such as Operation Orchestration Service, Resource Orchestration Service, Auto Scaling, and Cloud Assistant
- Tag-based cost and cost allocation management
- Resource- or role-based access control

## Principles

You must implement the best tagging practices based on the following principles:

- [Mutual exclusivity](#)
- [Collective exhaustion](#)
- [Limited values](#)
- [Considering ramifications of future changes](#)
- [Simplified design](#)

## Mutual exclusivity

Mutual exclusivity is implemented to ensure that multiple tags cannot be assigned to the same resource attribute. For example, if you have used tag key `key="owner"` to represent the owner attribute, you cannot use other tag keys such as *own*, *belonger*, or *owner* to represent this attribute again.

## Collective exhaustion

Collective exhaustion means that when planning resources, you must plan tags at the same time and prioritize the tag keys. All resources must be bound with the planned tag keys and their corresponding key values.

- Each tag key-value pair must be named in a standard format.
- Collective exhaustion is a prerequisite for future tag-based access control, cost tracking, automated O&M, and group search.

## Limited values

Limited values are implemented to remove excess tag key values and retain only core tag key values.

This principle simplifies procedures such as resource management, access control, automated O&M, and cost allocation. You can also use tags and automation tools under this principle to manage resources. ECS allows you to control tags through API operations in SDKs, to make it easy to automatically manage, retrieve, and filter resources.

## Considering ramifications of future changes

During the planning stage, you must consider the impact of adding or deleting tag key values to have the flexibility to modify tags.

When you modify tags, the tag-based access control, automated O&M, and related billing reports may be changed. For corporate or personal business, the best practice is to create business-related tag groups to manage resources in technical, business, and security dimensions. When using automated O&M tools to manage resources and services, you can add automation-specific tags to aid in the automation efforts.

## Simplified design

Simplified design is implemented to simplify the use of tag keys by creating tag keys with fixed dimensions during the tag planning stage. This principle can reduce operation errors caused by too many tag keys.

- You can create business-related tag groups to manage resources in technical, business, and security dimensions.
- When using automated O&M tools to manage resources and services, you can add automation-specific tags.

## Example of designing tag keys

The following table lists the tag naming examples with common dimensions. We recommend that you use lowercase letters to name tags.

Dimension	Tag key	Tag value
Organization	<ul style="list-style-type: none"> <li>• company</li> <li>• department</li> <li>• organization</li> <li>• team</li> <li>• group</li> </ul>	Organization-specific names
Business	<ul style="list-style-type: none"> <li>• product</li> <li>• business</li> <li>• module</li> <li>• service</li> </ul>	Business-specific names

Dimension	Tag key	Tag value
Role	<ul style="list-style-type: none"> <li>• role</li> <li>• user</li> </ul>	<ul style="list-style-type: none"> <li>• network administrator</li> <li>• application administrator</li> <li>• system administrator</li> <li>• opsuser</li> <li>• devuser</li> <li>• testuser</li> </ul>
Purpose	<ul style="list-style-type: none"> <li>• purpose</li> <li>• use</li> </ul>	Specific purposes
Project	<ul style="list-style-type: none"> <li>• From project dimensions: <ul style="list-style-type: none"> <li>◦ project</li> <li>◦ risk</li> <li>◦ schedule</li> <li>◦ subtask</li> <li>◦ environment</li> </ul> </li> <li>• From personnel dimensions: <ul style="list-style-type: none"> <li>◦ sponsor</li> <li>◦ member</li> <li>◦ decisionmaker or owner</li> <li>◦ creator</li> </ul> </li> </ul>	Project-related values
Business departments (to implement cost allocation and business tracking)	<ul style="list-style-type: none"> <li>• costcenter</li> <li>• businessunit</li> <li>• biz</li> <li>• financecontact</li> </ul>	Department-related values
Owner from the financial dimension (to identify the resource owner)	owner	Names or emails
Customers from the financial dimension (to identify the clients that a particular group of resources serves)	Custom values or true values	Customer names
Projects from the financial dimension (to determine the resource-supported projects)	project	Project names
Orders from the financial dimension	order	Order category IDs

## Related topics



- [Search for resources by tag](#)

## Related API operations

- [TagResources](#)
- [ListTagResources](#)
- [UntagResources](#)