Alibaba Cloud
Elastic Compute Service

Snapshots

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Generic conventions

Table -1: Style conventions

Style	Description	Example
	This warning information indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	 Danger: Resetting will result in the loss of user configuration data.
	This warning information indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	 Warning: Restarting will cause business interruption. About 10 minutes are required to restore business.
	This indicates warning information, supplementary instructions, and other content that the user must understand.	 Notice: Take the necessary precautions to save exported data containing sensitive information.
	This indicates supplemental instructions, best practices, tips, and other content that is good to know for the user.	 Note: You can use Ctrl + A to select all files.
>	Multi-level menu cascade.	Settings > Network > Set network type
Bold	It is used for buttons, menus , page names, and other UI elements.	Click OK.
`Courier font`	It is used for commands.	Run the `cd / d C :/ windows` command to enter the Windows system folder.
Italics	It is used for parameters and variables.	`bae log list --instanceid` *Instance_ID*
[] or [a|b]	It indicates that it is a optional value, and only one item can be selected.	`ipconfig` *[-all|-t]*

Style	Description	Example
{} or {a|b}	It indicates that it is a required value, and only one item can be selected.	`swich {stand | slave}`

Contents

1 Snapshot overview

A snapshot is a stateful data file of a disk or Shared Block Storage at a point in time. A snapshot is commonly used to back up data, restore data, and create custom images.

Note:
When you create a snapshot, the I/O performance of Block Storage will degrade by up to 10%, resulting in a transient I/O speed decrease. We recommend that you create snapshots during off-peak hours.

Scenarios

You can use snapshots in the following scenarios to protect your data:

- Disaster recovery and backup: Create snapshots for disks to be used as base data of other disks to implement zone-disaster recovery and geo-disaster recovery. For more information, see #unique_4.
- Version rollback: Roll back disks by using snapshots if system errors occur after an upgrade. For more information, see #unique_5.
- Environment duplication: Create an instance that has the same environment as an existing instance by creating a custom image from the system disk snapshot of the existing instance and then create an instance from the custom image. For more information, see #unique_6 and #unique_7.
- Data development: Provide near-real-time data for applications such as data mining, report query, and development and test by creating snapshots of production data.
- Data recovery and restoration:
  - Restore the data on your disks by using snapshots in scenarios such as incorrect data being mistakenly stored on the disk, mistakenly released ECS instances, data errors caused by application errors, or malicious read and write operations .
  - Use snapshots to regularly back up critical disk data and eliminate the risk of data loss resulting from incorrect operations, attacks, or viruses.
  - Create one or more snapshots when you replace your OS, update your applicatio ns, or migrate your service data so that you can restore your data in the event any failure occurs.

Snapshot types

Snapshots can be categorized into the following types based on how they are created:

- Manual snapshot: a disk snapshot that you manually create.
- Automatic snapshot: a disk snapshot that is created automatically based on an automatic snapshot policy. You create and apply an automatic snapshot policy to a disk. Then ECS will create snapshots automatically for the disk at specified points in time. For information about automatic snapshot policies, see Automatic snapshot policy overview.

Snapshots can also be categorized into the following types based on the portion of data contained within them:

- Full snapshot: the first snapshot of a disk that contains all of the data on the disk at the time of snapshot creation.
- Incremental snapshot: a disk snapshot created after the initial full snapshot of a disk. An incremental snapshot contains the portion of data that has been changed relative to the preceding snapshot. For more information, see #unique_9.

Billing

A snapshot is billed based on the amount of the storage space used by a snapshot. After you create a disk snapshot, you can view the size of the snapshot by using the Snapshot Chains feature in the ECS console. You can also view the total size of all snapshots in a region by using the Snapshot Size feature in the ECS console.

For more information about the billing methods and unit price of snapshot storage space, see #unique_10.

Service advantages

The Alibaba Cloud snapshot service provides high snapshot quotas and flexible snapshot policies. The following table describes the user benefits and typical scenarios of the service.

Item	Description	User benefit	Typical scenario
Snapshot quotas	Each disk can have up to 256 manual snapshots and 256 automatic snapshots.	Longer protection cycle with a finer granularity	· Snapshot for non-critical service data disks are created at 00:00 every day. These snapshots can store backup data of more than 16 months. · Snapshots for critical service data disks are created every four hours. These snapshots can store backup data of more than four months.
Automatic snapshot policies	In an automatic snapshot policy, you can customize when a snapshot is created, how often a snapshot is created in a week, and how long a snapshot is stored. You can also query the number and other details of the disks that are associated with the automatic snapshot policy.	More flexible protection policies	· You can select up to 24 different hour-long intervals for which to create an automatic snapshot each day. · Snapshots can be created automatically on multiple days each week. · Snapshots can be stored for a specified period of time or stored permanently. Note: When the snapshot quota is reached, the system automatically deletes the earliest snapshot.

Technical advantages

The following table describes the advantages of the Alibaba Cloud ECS snapshot service over traditional snapshot services.

Metric	ECS snapshot service	Traditional snapshot service
Capacity	Unlimited capacity, ensuring that all of your service data can be protected.	Limited capacity. Only the initially purchased storage capacity is available, and only critical data can be protected.
Scalability	Support for Auto Scaling. You can scale storage devices within seconds.	Lower scalability. Storage scaling is constrained by performance, available capacity, and vendor support.

Metric	ECS snapshot service	Traditional snapshot service
Total cost of ownership (TCO)	Charged based on the amount of the storage space used by your snapshots.	You must spend a large amount upfront and pay for costly software licenses, reserved storage space, upgrade, and maintenance.
Security	Support for the encryption service. You can set ECS disk encryption as necessary to encrypt your disk snapshots. However, a non-encrypted snapshot cannot be converted to an encrypted snapshot. Similarly, an encrypted snapshot cannot be converted to a non-encrypted snapshot. For more information, see ECS disk encryption.	Encryption attributes and policies rely on the underlying storage logic. If the storage architecture has defects in its security design, created snapshots may not be secure.
Impact on performance	Redirect-on-write (ROW) · The impact of snapshot tasks on storage I/O performance is reduced. · Snapshots do not affect your service and can be created at any time without affecting user experience.	Copy-on-write (COW) or other techniques such as ROW. COW has an impact on the data write capability of the source system.

Related operations

- #unique_4
- #unique_12
- #unique_5
- #unique_13

2 Snapshot concepts

Alibaba Cloud ECS offers the snapshot service to create snapshots for disks and Shared Block Storage (hereinafter referred to as disks) as scheduled operations. Such operations allow you to retain disk data for one or more specific points in time. Snapshots can guarantee service security while also improving your application deployment efficiency.

Incremental snapshots

After a disk is formatted, data blocks are divided based on logical block addressing (LBA). All service data that is written to data blocks is measured using snapshots. The first snapshot of a disk is a full snapshot that does not contain empty data blocks. Subsequent snapshots are incremental snapshots, which are copies of service data and dirty data generated since the last snapshot. Therefore, each data block is copied multiple times and is stored across multiple snapshots. The figure below illustrates the preceding concepts. In the figure, snapshots 1, 2, and 3 represent the first, second, and third snapshots of a disk.

When a snapshot is created, the file system checks all the data blocks, and only data blocks with data changes are copied to the snapshot.

- Snapshot 1 copies all data on the disk for the specific point in time that the snapshot is created.
- Snapshot 2 copies only data blocks B1 and C1 that have been modified since snapshot 1. Data blocks A and D are referenced from snapshot 1.
- Snapshot 3 copies only data block B2 that has been modified since snapshot 2. Data blocks A and D are referenced from snapshot 1, and data block C1 is referenced from snapshot 2.
- If you roll back the disk to the state of snapshot 3, the Roll Back Disk feature copies data blocks A, B2, C1, and D to the disk to replicate snapshot 3.
- If you delete snapshot 2, data block B1 is deleted, but data block C1 is retained because it is being referenced in other snapshots. If you roll back a disk to snapshot 3, data block C1 will still be recovered.

Snapshot chain

A snapshot chain contains all snapshots of a specific disk. Each disk has a snapshot chain. The disk and the snapshot chain share an identical ID. A snapshot chain records the relationships between data blocks and contains the following information:

- Snapshot capacity: the storage space occupied by each snapshot in the snapshot chain.

  > Note:
  > The snapshot service is billed by snapshot capacity. You can use the snapshot chain to check the snapshot capacity of each disk.

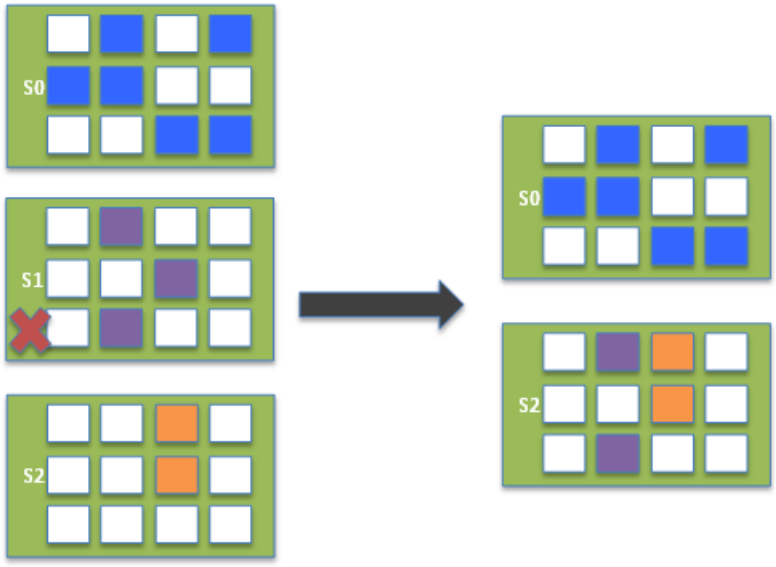
- Snapshot quota: Each disk can have up to 256 manual snapshots and 256 automatic snapshots. For more information, see Limits.

  > Note:
  > If the snapshot quota has been reached, but more automatic snapshots are required, the earliest automatic snapshots are deleted first to make room for new automatic snapshots. If you want to create manual snapshots, then you must first delete unneeded snapshots. For more information, see #unique_16 and Delete a snapshot.

- Snapshot node: Each node in the snapshot chain represents a snapshot of the corresponding disk. Each snapshot chain can have up to 512 snapshot nodes made up of 256 manual snapshot nodes and 256 automatic snapshot nodes.

Snapshot deletion

If you no longer need a snapshot, you can delete it. If the number of snapshots exceeds the snapshot quota, you must delete some snapshots to release storage space. The figure below shows the workflow and logic when you delete a snapshot from a snapshot chain. In this example, snapshot S1 is deleted.



1. Alibaba Cloud ECS analyzes all of the data blocks in snapshot S1 to be deleted, and then deletes the data blocks that are not referenced by other snapshots in the chain .
2. Alibaba Cloud ECS adds the dirty data blocks of snapshot S1 to snapshot S2. Other snapshots record the information of 10 data blocks altogether:
   - Six data blocks from snapshot S0
   - Two dirty data blocks from snapshot S1
   - Two data blocks from snapshot S2

3 Use snapshots

3.1 Activate ECS Snapshot

You must activate the Alibaba Cloud ECS Snapshot service before you can create snapshots.

Procedure

1. Log on to the ECS console.
2. In the left-side navigation pane, choose Storage & Snapshots > Snapshots.
3. View the statement on the Notifications page that appears, and click OK to activate the ECS Snapshot service.

> Note:
> After you activate ECS Snapshot, you are billed based on the size and storage duration of the created snapshot. Snapshot fees will be deducted from your account balance. Make sure you have compared the snapshot size and the expected fees. For more information about snapshot billing, see Pricing.

What's next

Create a snapshot

3.2 Create a snapshot

This topic describes how to create a snapshot. A snapshot is a copy of data on a disk at a specific point in time. Snapshots are commonly used to back up data and create custom images.

Scenarios

You can create a snapshot in data backup scenarios to eliminate the risk of data loss. Specifically, you can create a snapshot if you need to:

- Modify critical system files.
- Back up service data.
- Recover mistakenly released instances.
- Mitigate network attacks.

- Change the operating system.
- Provide data support for a production environment.

Additionally, you can use a snapshot to create a custom image to quickly deploy an application environment for a large number of ECS instances.

Limits

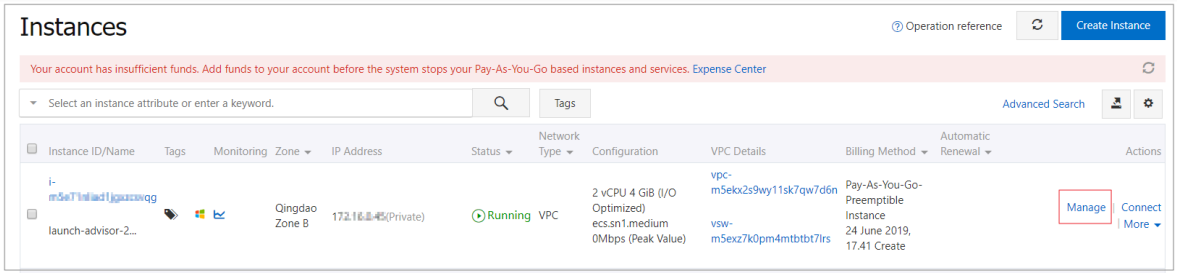
- Snapshots are charged based on the storage resources you actually use. For more information, see #unique_10.
- Creating a snapshot may have a slight impact on disk performance and I/O speeds. We recommend that you create snapshots during off-peak hours.
- A snapshot only records data at a specific point in time. Therefore, incrementa l data generated when the snapshot is created will not be synchronized to the snapshot.
- To ensure that a snapshot is successfully created, we recommend that you do not modify the ECS instance status (that is, stop or restart the instance) when the snapshot is being created.
- If you want to create a snapshot of an instance, the instance must be in the Running or Stopped state.
- If you want to create a snapshot of a cloud disk, the disk must be in the In Use or Expired state.

   Note:
  A snapshot being created for a cloud disk in an Expired state will be released at the same time the cloud disk is released.
- Manually created snapshots can only be manually deleted. Therefore, you need to delete unnecessary snapshots regularly to prevent these snapshots from incurring fees. For more information, see #unique_22.
- If you create an extended volume by using a multi-partition single disk, the snapshot that you created can be used to roll back the disk.
- If you create a dynamic extended volume by using multiple disks and no I/O operation is performed on data in the volume, the snapshot that you created can be used to roll back the disk. If I/O operations are continuously performed in the extended volume, data consistency of the rolled-back disk is uncertain.

Create a snapshot in the ECS console

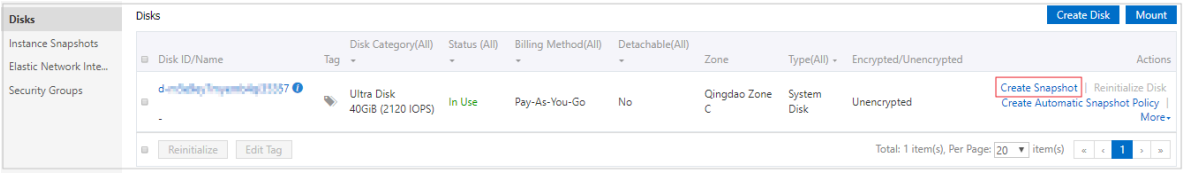
To create a snapshot in the ECS console, follow these steps:

1. Find the instance for which you want to create a snapshot, and then click Manage in the Actions column.



2. In the left-side navigation pane, click Disks, find the target disk, and then click Create Snapshot.

> **Note:**
> You can select only one disk at a time. The Type can be a system disk or a data disk.



3. Enter a name for the snapshot and click OK.

4. In the left-side navigation pane, click Instance Snapshots. The snapshot creation progress, estimated time remaining, and snapshot status are displayed.

You can also create a snapshot as indicated on the Storage & Snapshots > Disks page.

Create a snapshot by using an API

The following procedure describes how to use Alibaba Cloud CLI to call API actions to create a snapshot. For more information, see Quick start for ECS APIs.

1. Obtain the instance ID.
   - If you have remotely connected to an ECS instance, you can obtain the instance ID by using metadata. For example, to query the ID of a Linux instance, run the following command:

     ```
     curl   http :// 100 . 100 . 100 . 200 / 2016 - 01 - 01 / meta -
     data / instance - id
     ```

   - In your local computer, you can obtain the instance ID by calling DescribeInstances:

     ```
     aliyun   ecs   DescribeIn  stances  -- output   cols = InstanceId
     , InstanceNa  me
     ```

2. Obtain the disk ID by calling the API #unique_27:

   ```
   aliyun   ecs   DescribeDi  sks  -- RegionId   cn - hangzhou  --
   InstanceId  ' i - 0xi1ioe ******** 166cq ' -- output   cols =
   DiskId
   ```

3. Call CreateSnapshot to create a snapshot based on the disk ID:

   ```
   aliyun   ecs   CreateSnap  shot  -- DiskId   d - bp19pjyf12
   hebpXXXXXX
   ```

   The snapshot-creating task is initiated if the following information is returned:

   ```
   {" RequestId ":" 16B856F6 - EFFB - 4397 - 8A8A - CB73FAXXXX  XX ","
    SnapshotId ":" s - bp1afnc98r  8kjhXXXXXX "}
   ```

4. Call DescribeSnapshots to query the progress. When `" SnapshotId "=" s - bp1afnc98r  8kjhXXXXXX "` and `" Status ":" accomplish  ed "` are displayed, it means that the snapshot has been created.

   ```
   aliyun   ecs   DescribeSn  apshots  -- RegionId   cn - hangzhou
    -- InstanceId   i - bp1afnc98r  8k69XXXXXX  -- output   cols =
   SnapshotId , Status
   ```

Time required

The time required for creating a snapshot is dependent on the capacity of the disk.

Following the content covered in Snapshot concepts, the first disk snapshot is a full snapshot, and therefore its creation requires a relatively long period of time. In contrast, subsequent snapshots require shorter periods of time. The amount of time needed to create subsequent snapshots is dependent on the amount of data generated since the last snapshot. Generally, the greater the amount of data, the longer time it will take to create the snapshot.

What to do next

After you create a snapshot, you can:

- Roll back a cloud disk.
- Create a cloud disk by using the snapshot.
- Create a custom image by using the snapshot.

3.3 Roll back a disk by using a snapshot

This topic describes how to roll back a disk by using a snapshot. You can perform a disk rollback when your OS is unresponsive, when an incorrect operation was performed, or when rolling back an application version is required. After you roll back the system disk, the current key pair or password of the corresponding instance is attached automatically.

> Warning:
> Before you roll back a disk, create a snapshot of the disk to ensure that you can perform data recovery if needed. Disk rollback is irreversible. Exercise caution when performing this action.

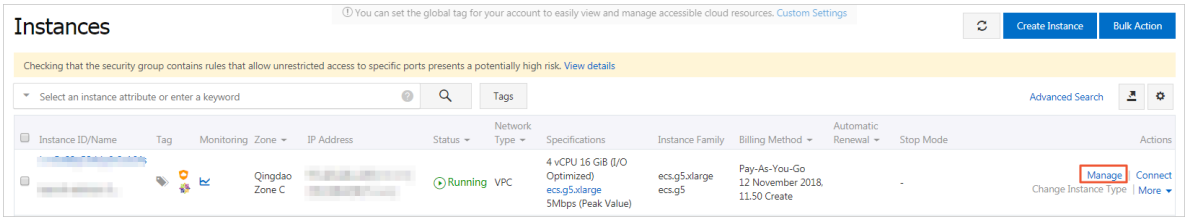
Prerequisites

- A snapshot of the disk to be rolled back is created, and no new snapshot is being created for the disk. For more information, see created a snapshot.
- The disk has not been released.
- The disk to be rolled back is attached to an ECS instance, and the corresponding instance is stopped. For more information, see Attach to an ECS instance and Stop an instance.

> Note:
> - After you replace the system disk, old system disk snapshots cannot be used to roll back the new system disk.
> - Pay-As-You-Go VPC instances may not be restarted in No fees for stopped VPC instances mode after you roll back the disk. We recommend that you disable No fees for stopped VPC instances before you stop the instance.

Procedure

1. Log on to the ECS console.
2. In the left-side navigation pane, click Instances.
3. Select the target region.
4. Locate the instance whose disk you want to roll back, and then click Manage.



5. In the left-side navigation pane, click Instance snapshots.
6. Select the target snapshot, and then click Roll Back Disk in the Actions column.

> Note:
> Only one disk can be rolled back at a time. When you roll back a disk, other disks attached to the instance are not affected. After the rollback, the entire disk (rather than a partition or a directory) recovers to its status at a specified point in time.

7. In the displayed dialog box, click OK.

> Note:
> If you select Start Instance After Disk Rollback, the instance is restarted after you roll back the disk.

Related APIs

#unique_37

What to do next

If you create a snapshot of a disk and then you scale out the disk, you need to log on to the instance to expand the capacity of the file system after disk rollback. For more information, see:

- Linux - Resize a data disk.
- Windows - Resize a data disk.

3.4 Reduce snapshot fees

This topic describes how to manage your snapshots and reduce snapshot fees.

Maintain an appropriate number of snapshots

The snapshot fee is based on the amount of storage space used by the snapshots. More snapshots require more disk storage space and result in higher snapshot fees. We recommend that you maintain an appropriate number of snapshots for your specific service requirements. The following table lists recommended retention periods for different scenarios.

Scenario	Snapshot creation frequency	Retention period	Description
Core application	Once every day or every other day	Several months or longer	We recommend that you create and store snapshots based on data importance.
Non-core application	Once every week or every other week	Several days or weeks	We recommend that you create and store snapshots based on data importance.
System disk	Whenever needed	One or two snapshots	We recommend that you do not store critical application data in the system disk.
Software upgrade		Delete snapshots immediately after they are used.	We recommend that you delete snapshots immediately after they are used to reduce fees.
Modification of critical files			
Migration of application data			
Test environment			

Delete snapshots

You can delete snapshots that are no longer needed to free up space or when the maximum number of snapshots has been reached. For more information, see #unique_41.

Disable unnecessary snapshot policies

You can disable unnecessary snapshot policies to avoid redundancy and reduce the amount of storage space used by snapshots. For more information, see #unique_16.

> Note:
> To improve the operation error tolerance of your services, we recommend that you retain at least one snapshot policy for core services.

3.5 View the snapshot size

This topic describes how to view the size of all snapshots on a single disk or under a single Alibaba Cloud region.

Prerequisite

At least one snapshot of a disk is created. For more information, see Create a snapshot.

View the snapshot size of a single disk

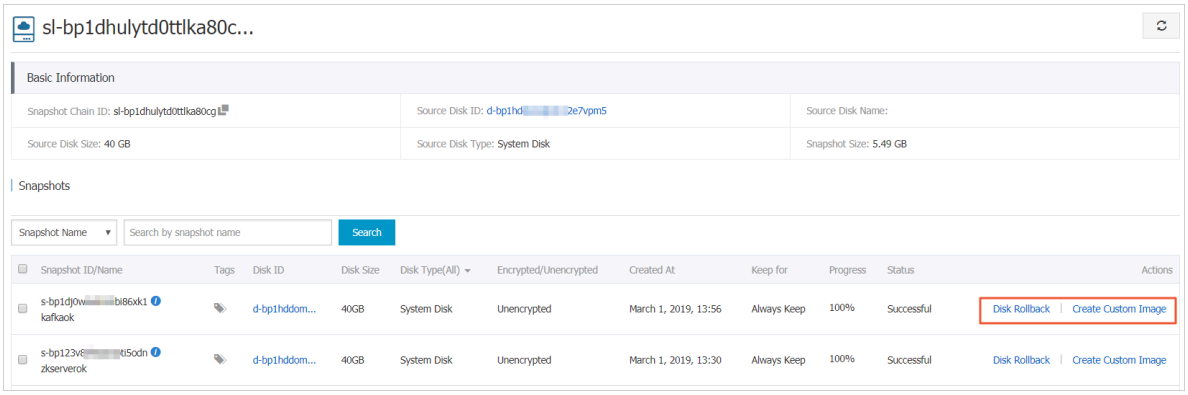
A snapshot chain records the reference relationships among all the snapshots in a cloud disk or in a shared block storage device (hereinafter referred to as disk). Each disk contains a snapshot chain, whose ID is identical to the disk ID. Additionally, each snapshot chain contains a number of relationships among data blocks. To view the size of all snapshots in a disk, follow these steps:

1. Log on to the ECS console.
2. Select the target region.
3. In the left-side navigation pane, choose Snapshots and Images > Snapshots.
4. Locate the disk ID of the target snapshot.

   > Note:
   > At least one snapshot must be created for the disk.

5. In the left-side navigation pane, click Snapshot Chains.

6. View the number and size of all snapshots in the disk according to the disk ID obtained in step 4.
7. (Optional) In the Actions column of the snapshot chain, click Details to open the Snapshot Chain Details dialog box. You can check the snapshot details of the disk and roll back a cloud disk or create a custom image by using a snapshot.



Related API: DescribeSnapshotLinks.

View the snapshot size of a region

To view the size of all the snapshots in a region, follow these steps:

1. Log on to the ECS console.
2. Select the target region.
3. In the left-side navigation pane, choose Snapshots and Images > Snapshots.
4. Set the time duration.

> **Note:**
> You can at most query what changes occurred to the snapshot size in the past 15 days.

You can view the size of all snapshots created in the specified time duration in the selected region.

Related API: DescribeSnapshotsUsage.

3.6 Delete a snapshot

You can delete snapshots that are no longer needed to free up space or when the maximum number of snapshots has been reached. This topic describes the procedure

to delete a snapshot in the ECS console. This procedure applies to both manual snapshots and automatic snapshots.

Prerequisites

- You have created a snapshot. For more information, see #unique_4.
- If a snapshot has been used to create custom images, you must delete those custom images before the snapshot can be deleted. For more information, see #unique_46.

Procedure

1. Log on to the ECS console.
2. In the left-side navigation pane, choose Storage & Snapshots > Snapshots.
3. In the top navigation bar, select a region.
4. Select one or more snapshots to be deleted and click Delete at the bottom of the page.
5. In the Delete dialog box that appears, select Delete or Force Delete.

   Note:
   To delete snapshots that have been used to create cloud disks, you must select Force Delete and then Proceed to Forcibly Delete. After a snapshot is deleted, you cannot perform operations that depend on the status of the original snapshot data, such as the operation to reinitialize a cloud disk.
6. Click OK.

More information
#unique_48

4 Automatic snapshot policies

4.1 Automatic snapshot policy overview

Automatic snapshot policies allow snapshots to be created regularly. These policies can be applied to both system disks and data disks. Automatic snapshot policies improve data security and operation error tolerance.

Scenarios

Automatic snapshot policies allow snapshots to be created regularly at the scheduled time. These policies can protect disk data and improve system security and operation error tolerance. When your applications such as personal website or databases deployed on an ECS instance encounter security attacks or system vulnerabilities, you may not be able to manually create snapshots. In these cases, you can then use the most recent automatic snapshot to roll back affected cloud disks and reduce losses.

You can also specify an automatic snapshot policy to create snapshots before regular system maintenance tasks. This eliminates the need to manually create snapshots and ensure that snapshots are not forgotten to be created.

Limits

Note the following points when you use automatic snapshot policies:

- An account can have up to 100 automatic snapshot policies in a single region.
- When the maximum number of snapshots is reached, the earliest automatic snapshot will be deleted automatically. This does not apply to manual snapshots.
- Modifying the snapshot retention period of an automatic snapshot policy will only affect new snapshots created after the modification. The retention period of existing snapshots will not be modified.
- You cannot create manual snapshots while an automatic snapshot is being created. You must wait until after the automatic snapshot has been created.
- You can only apply automatic snapshot policies to cloud disks that are in the In Use state.
- Automatic snapshot policies cannot be applied to local disks.

Related operations

- #unique_51
- #unique_16
- #unique_52
- Modify an automatic snapshot policy
- #unique_54

Related APIs

- #unique_55
- #unique_56
- #unique_57
- #unique_58
- #unique_59
- #unique_60

4.2 Create an automatic snapshot policy

This topic describes how to create an automatic snapshot policy in the ECS console.

Prerequisites

The snapshot feature has been enabled. For more information, see #unique_62.

Procedure

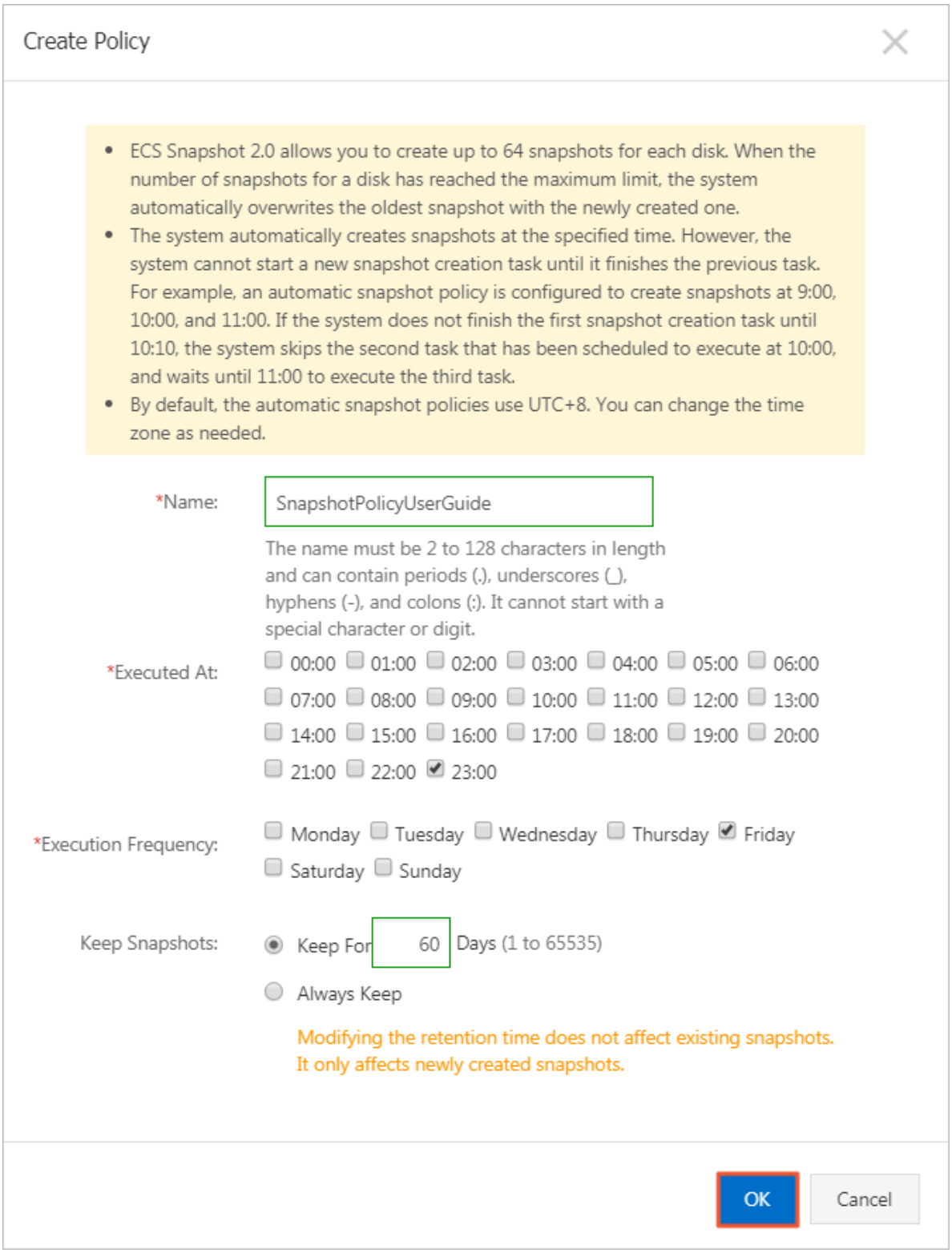
1. Log on to the ECS console.
2. In the left-side navigation pane, choose Storage & Snapshots > Snapshots.
3. In the top navigation bar, select a region.
4. On the Snapshots page, click the Automatic Snapshot Policies tab.
5. In the upper-right corner of the Automatic Snapshot Policies page, click Create Policy.
6. In the Create Policy dialog box that appears, configure the following parameters as prompted.
   - Name: specifies the policy name.
   - Executed At: Select one or more points in time from 00:00 to 23:00.

     Note:

Creating a snapshot may temporarily reduce the I/O performance of a block storage device by about 10%. We recommend that you create snapshots during off-peak hours.

- **Execution Frequency: Select one or more days of the week.**
- **Keep Snapshots: specifies the number of days to retain the snapshot. Valid values: 1 to 65,536. Default value: 30. If you select Always Keep and the**

maximum number of snapshots is reached, the system will delete the earliest automatic snapshot.



7. Click OK.

What's next

We recommend that you specify cloud disks to execute an automatic snapshot policy immediately after the policy is created. Click Apply Policy in the Actions column corresponding to the new policy to go to the Create Automatic Snapshot Policy page. For more information, see #unique_16.

More information
#unique_55

4.3 Apply or disable an automatic snapshot policy

You can apply automatic snapshot policies to cloud disks. When the policy is applied, snapshots are created based on the settings of the automatic snapshot policy.

Prerequisites

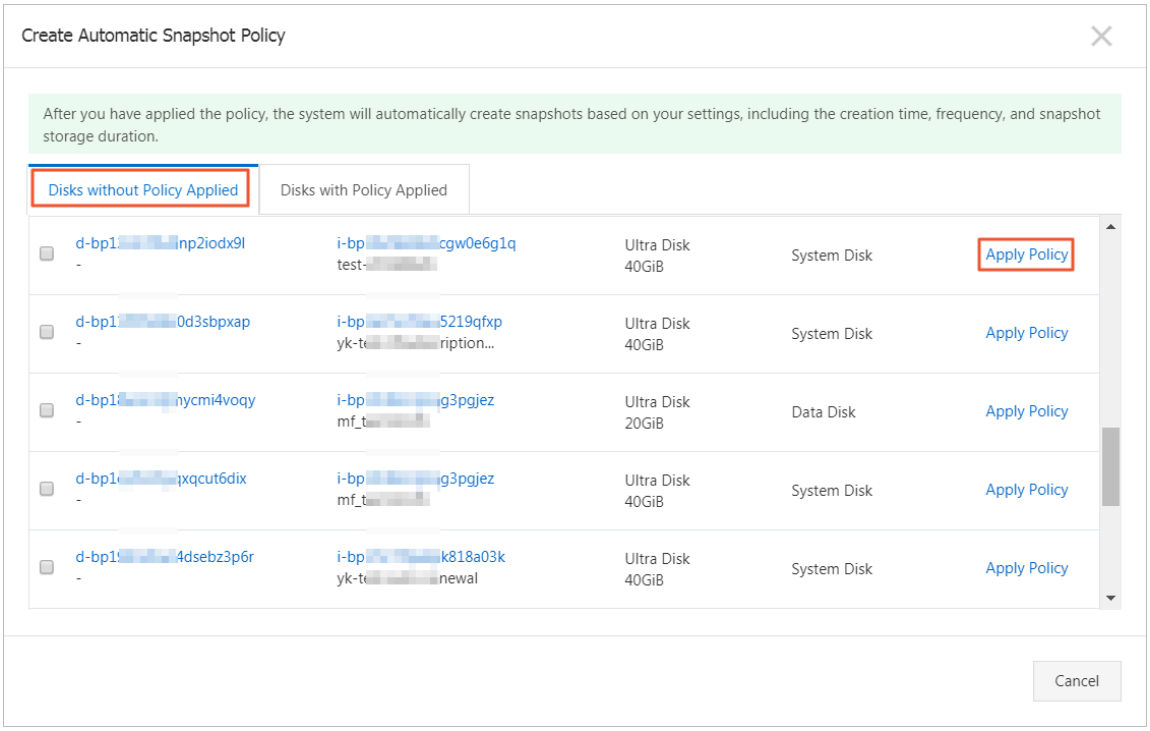
You have created at least one automatic snapshot policy. For more information, see #unique_51.

Method 1: Apply or disable an automatic snapshot policy on the Snapshots page

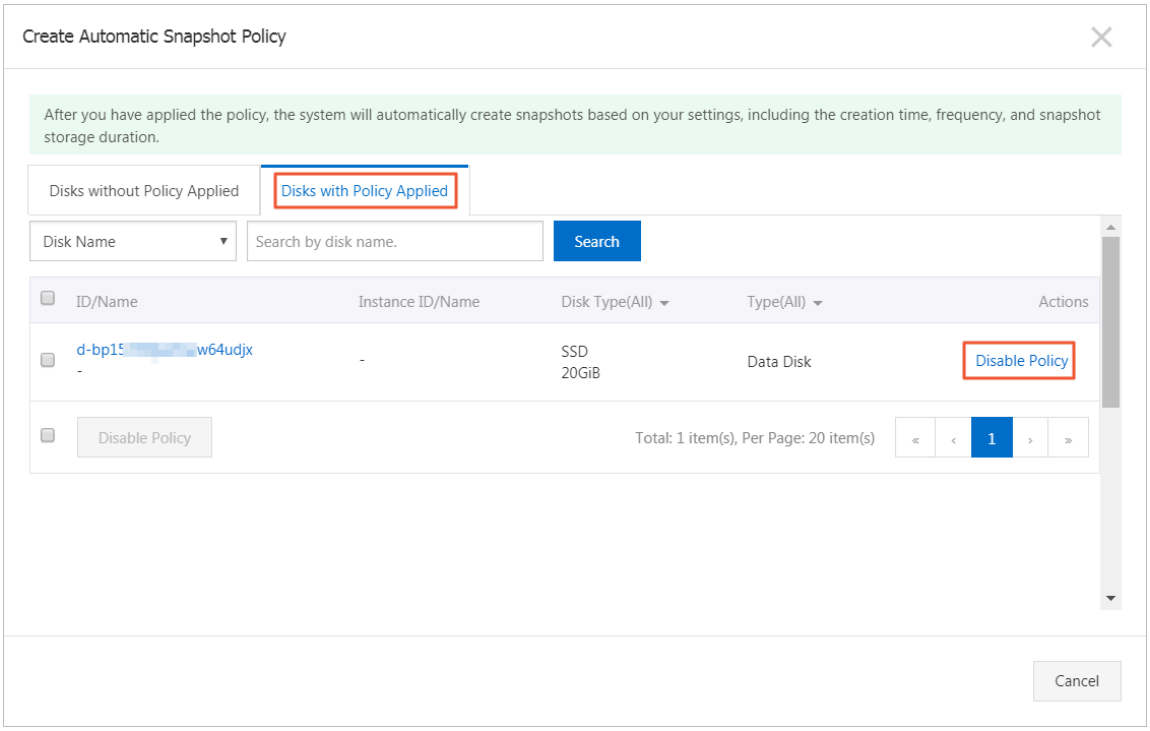
On the Snapshots page of the ECS console, you can apply or disable an automatic snapshot policy on the system disk or a data disk.

1. Log on to the ECS console.
2. In the left-side navigation pane, choose Storage & Snapshots > Snapshots.
3. In the top navigation bar, select a region.
4. On the Snapshots page, click the Automatic Snapshot Policies tab.
5. On the Automatic Snapshot Policies page, find the automatic snapshot policy to be applied and click Apply Policy in the Actions column.
6. On the Create Automatic Snapshot Policy page, click the Disks without Policy Applied tab.
   - The procedure to apply an automatic snapshot policy: Click the Disks without Policy Applied tab. Find the disk to which you want to apply the automatic

snapshot policy and click Apply Policy. Alternatively, select multiple disks and click Apply Policy at the bottom of the page.



- The procedure to disable an automatic snapshot policy: Click the Disks with Policy Applied tab. Find the disk to which the automatic snapshot policy is applied and click Disable Policy. Alternatively, select multiple disks and click Disable Policy at the bottom of the page.



7. In the upper-right corner of the Create Automatic Snapshot Policy page, click the  icon to finish this process.

Method 2: Apply an automatic snapshot policy when creating an instance

When creating an ECS instance, you can apply an existing automatic snapshot policy to the system disk or a data disk.

1. Log on to the ECS console.
2. In the left-side navigation pane, choose Instances & Images > Instances.
3. In the upper-right corner of the Instances page, click Create Instance. For more information about how to create an ECS instance, see #unique_64.

   In the Storage section of the Basic Configurations page, select Apply Automatic Snapshot Policy for the system disk or a data disk and then select an automatic snapshot policy.

Method 3: Apply an automatic snapshot policy when creating a cloud disk

You can apply an automatic snapshot policy to a cloud disk when the disk is being created.

1. Log on to the ECS console.
2. In the left-side navigation pane, choose Storage & Snapshots > Disks.
3. In the upper-right corner of the page, click Create Disk. For more information about how to create a cloud disk, see #unique_65 or #unique_66.

   Select Apply Automatic Snapshot Policy and then an automatic snapshot policy.

Method 4: Apply or disable an automatic snapshot policy on the Disks page

On the Disks page of the ECS console, you can apply or disable an automatic snapshot policy on the system disk or a data disk.

1. Log on to the ECS console.
2. In the left-side navigation pane, choose Storage & Snapshots > Disks.
3. In the top navigation bar, select a region.
4. Find the automatic snapshot policy to be applied or disabled and click Create Automatic Snapshot Policy in the Actions column.
5. On the Create Automatic Snapshot Policy dialog box that appears, turn on or off the Automatic Snapshot Policy switch.

6. Click OK.

Result

After you apply or disable an automatic snapshot policy on the system disk or a data disk, you can view the changed number in the Applied Disks column on the Automatic Snapshot Policies page.

At the scheduled creation time, a snapshot with the auto2.0 prefix will be added. Snapshots created with automatic snapshot policies use a uniform auto2.0_yyyyMMdd_SnapshotPolicyId naming format. For example, the auto2.0_20170731_sp-m5e2w2jutw8bv31***** name indicates that the automatic snapshot was created on July 31, 2017.

- auto2.0: indicates an automatic snapshot.
- yyyyMMdd: the date when the snapshot is created. yyyy stands for year, MM for month, and dd for day.
- SnapshotPolicyId: the ID of the automatic snapshot policy used.

More information
#unique_67
#unique_68
#unique_69
#unique_70

4.4 Delete automatic snapshots when releasing a disk

You can enable the delete automatic snapshots when releasing a disk feature to delete automatic snapshots of a disk when the disk is released and reduce the amount of disk space occupied by snapshots.

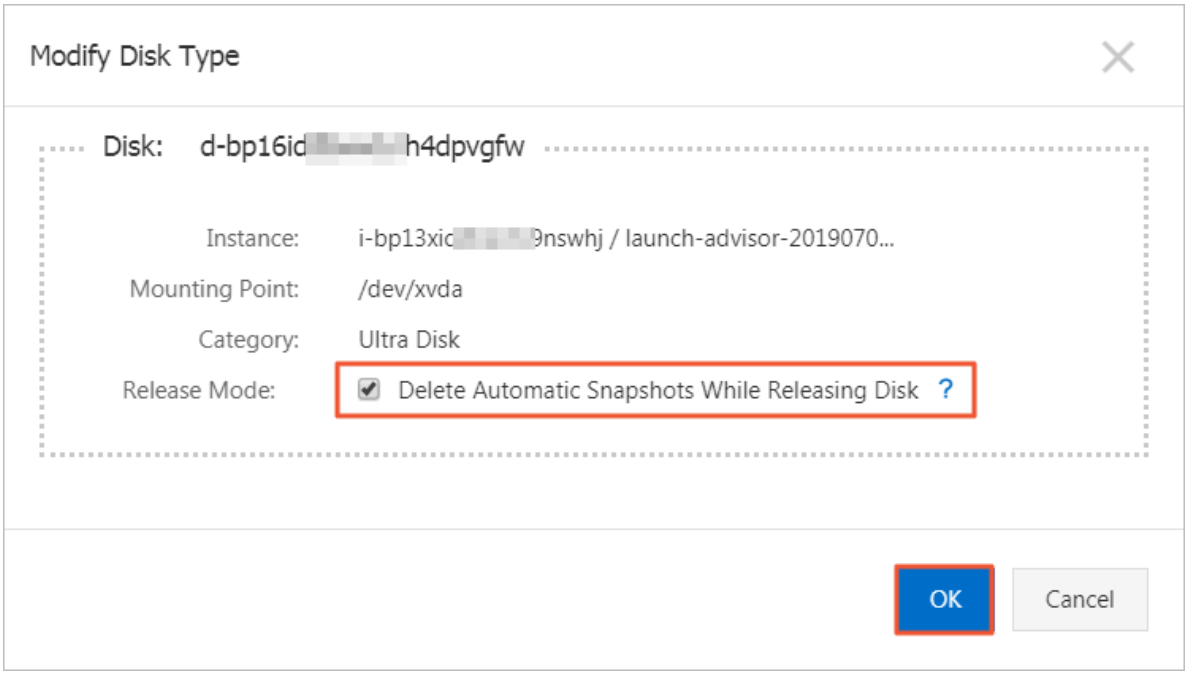
Prerequisites

- You have created at least one automatic snapshot policy. For more information, see #unique_51.
- You have applied an automatic snapshot policy to a cloud disk. For more information, see #unique_16.

Procedure

1. Log on to the ECS console.
2. In the left-side navigation pane, choose Storage & Snapshots > Disks.
3. In the top navigation bar, select a region.

4. Find the cloud disk for which you want to enable the feature, choose More > Modify Disk Property in the Actions column.
5. In the Modify Disk Property dialog box that appears, select or clear Delete Automatic Snapshots While Releasing Disk.



Note:
When you clear Delete Automatic Snapshots While Releasing Disk, the retention period of the automatic snapshot policy applies. You can also modify the retention period of the automatic snapshot policy. For more information, see Modify an automatic snapshot policy.

6. Click OK.

More information
#unique_72

4.5 Modify an automatic snapshot policy

You can modify the name, creation time, execution frequency, and retention period of an automatic snapshot policy at any time after the policy is created.

Prerequisites

You have created at least one automatic snapshot policy. For more information, see #unique_51.

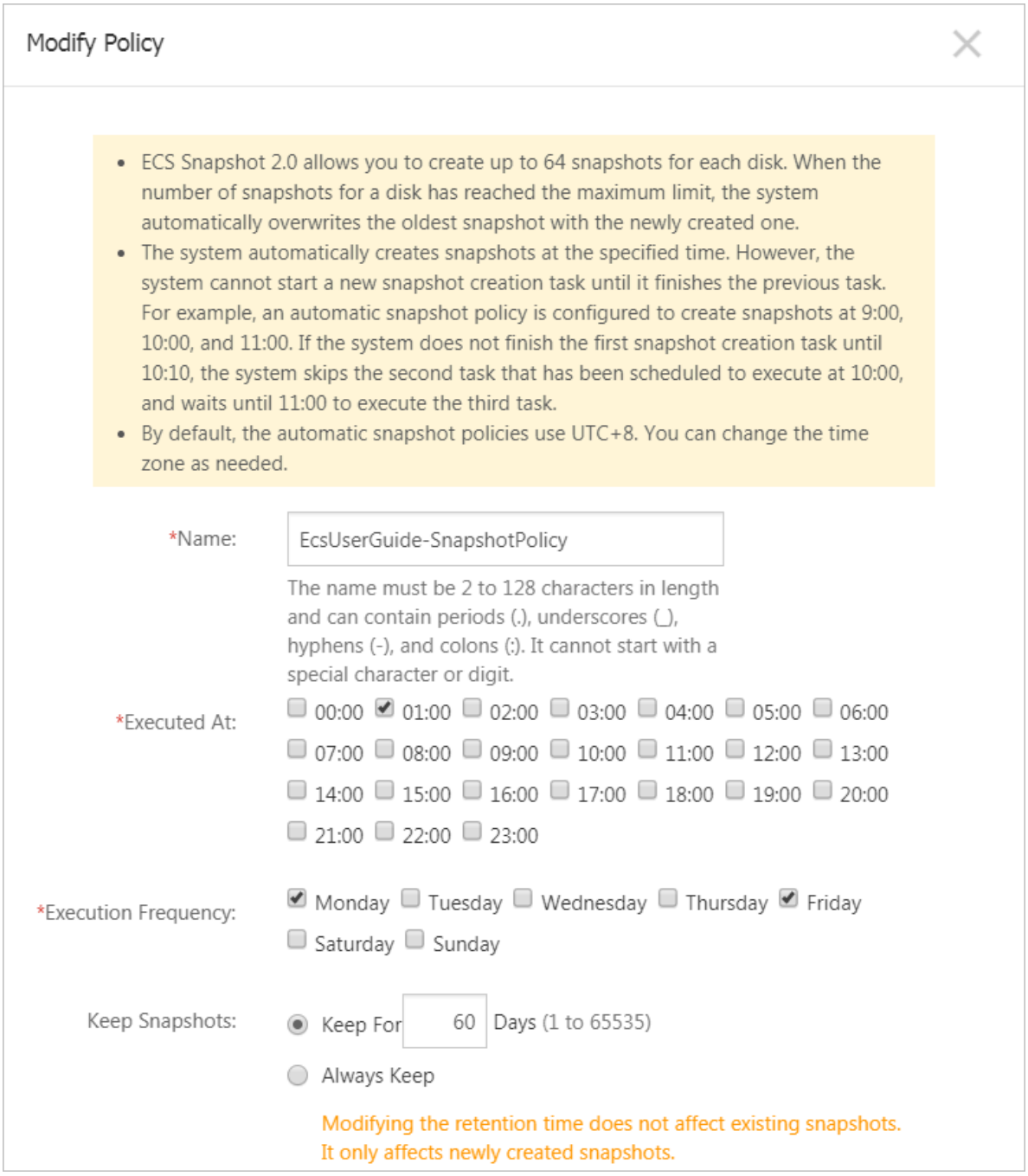
Procedure

1. Log on to the ECS console.
2. In the left-side navigation pane, choose Storage & Snapshots > Snapshots.
3. In the top navigation bar, select a region.
4. On the Snapshots page, click the Automatic Snapshot Policies tab.
5. On the Automatic Snapshot Policies page, find the automatic snapshot policy to be modified and click Modify Policy in the Actions column.
   - Name: specifies the policy name.
   - Executed At: Select one or more points in time from 00:00 to 23:00.

      Note:
     Creating a snapshot may temporarily reduce the I/O performance of a block storage device by about 10%. We recommend that you create snapshots during off-peak hours.
   - Execution Frequency: Select one or more days of the week.
   - Keep Snapshots: specifies the number of days to retain the snapshot. Valid values: 1 to 65,536. Default value: 30. If you select Always Keep and the maximum number of snapshots is reached, the system will delete the earliest automatic snapshot.

      Note:

Modifying the snapshot retention period of an automatic snapshot policy will only affect new snapshots created after the modification. The retention period of existing snapshots will not be modified.



6. Click OK.

More information
#unique_74

4.6 Delete an automatic snapshot policy

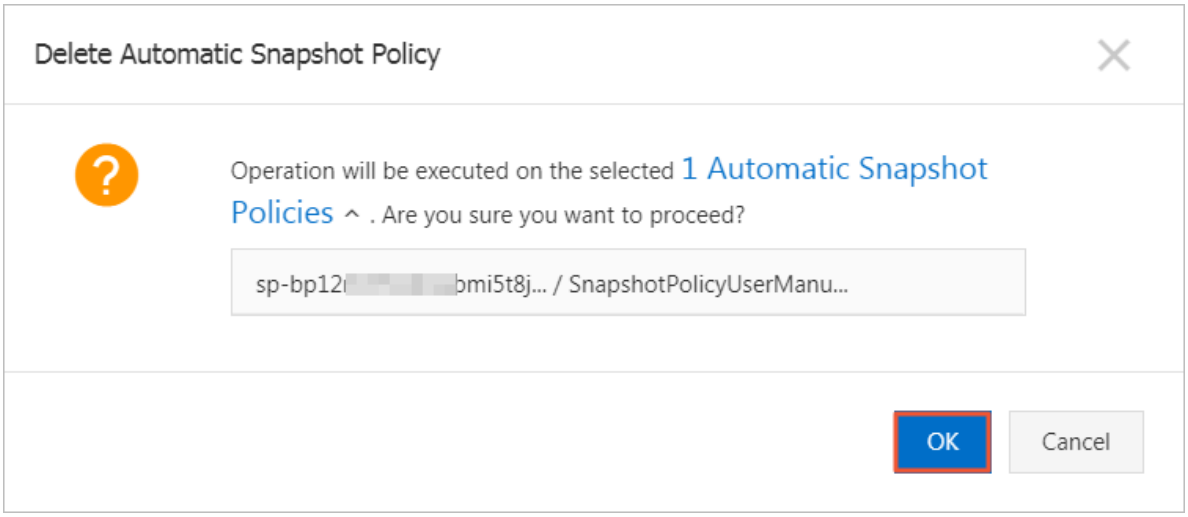
You can delete automatic snapshot policies that are no longer needed. When you delete the policy, all cloud disks to which the policy was applied are no longer affected.

Prerequisites

You have created at least one automatic snapshot policy. For more information, see #unique_51.

Procedure

1. Log on to the ECS console.
2. In the left-side navigation pane, choose Storage & Snapshots > Snapshots.
3. In the top navigation bar, select a region.
4. On the Snapshots page, click the Automatic Snapshot Policies tab.
5. Find the automatic snapshot policy to be deleted and click Delete Policy in the Actions column.
6. In the message that appears, click OK.



More information

#unique_76

5 Snapshot FAQ

This topic lists frequently asked questions related to ECS snapshots.

- OSS-related questions
  - #unique_78/unique_78_Connect_42_section_wnf_qh1_4gb
  - Can a custom image that was created from a snapshot be saved to an OSS bucket?
- Billing-related questions
  - How is the storage fee for snapshots calculated?
  - Where can I view a list of snapshot prices by Alibaba Cloud region?
  - What impact will overdue payments have on my stored snapshots?
  - I use snapshots frequently. How can I reduce the amount of fees incurred?
- Snapshot and Block Storage type-related questions
  - Do automatic snapshots differ from or conflict with manual snapshots?
  - Can I create snapshots for local disks?
  - I have created a snapshot for an encrypted data disk and generated an image, but I cannot share the image. Why?
- Snapshot capacity-related questions
  - Will deleting files in an ECS instance free up storage space?
  - Why is the snapshot size larger than the disk size displayed in the file system?
  - What is the relationship between a file system and a disk or a snapshot?
- Snapshot deletion-related questions
  - How can I prevent snapshots from being deleted by Alibaba Cloud?
  - How can I delete snapshots to reduce backup cost?
  - Will automatic snapshots be deleted after the system disk is changed, the instance expires, or the disk is released?
  - How can I delete snapshots that have been used to create images and disks?
- Automatic snapshot policy-related questions
  - If I have used an automatic snapshot to create a custom image or a disk, will the automatic snapshot policy fail to be executed?
  - Can I create multiple snapshot policies for a disk?

- Disk rollback with snapshot-related questions
  - How can I avoid losing data due to incorrect operations?
  - After I change the system disk, can a snapshot of the previous system disk be used to roll back the new system disk?

If I have activated OSS, will snapshots automatically be saved to my OSS buckets?

No. Snapshots are not saved to existing OSS buckets. Snapshots are stored independently of your OSS buckets. You do not need to create new buckets for snapshots.

Can a custom image that was created from a snapshot be saved to an OSS bucket?

Yes. You can export the image to your OSS bucket to download in the future. For more information, see #unique_79. However, custom images cannot be directly stored to an OSS bucket.

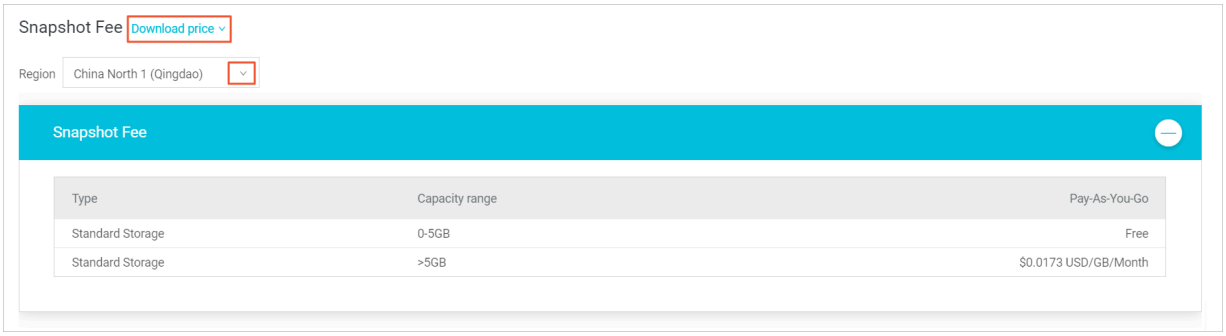
How is the storage fee for snapshots calculated?

Snapshots will soon be billed on a pay-as-you-go basis. The price per GiB used to store snapshots is the same as that of OSS standard storage and is charged on a monthly basis. For information about snapshot prices by Alibaba Cloud region, go to the Pricing tab of the Elastic Compute Service page. The time when snapshots will begin billing will be posted on the Alibaba Cloud Notice List.

For information about examples of pay-as-you-go billing, see Billing of snapshots.

Where can I view a list of snapshot prices by Alibaba Cloud region?

The price per GiB used to store snapshots is the same as that of OSS standard storage and is charged on a monthly basis. For information about snapshot prices by Alibaba Cloud region, go to the Pricing tab of the Elastic Compute Service page. Scroll down to the Snapshot Fee section to view the price list by region. You can also download a list of snapshot prices in CSV or JSON format by clicking Download price.



What impact will overdue payments have on my stored snapshots?

Snapshots will be suspended 24 hours after your account has overdue payments. After your account has overdue payments:

- In the first 15 days, all existing snapshots will be retained, but no new snapshots can be created. Snapshots whose retention period expires during this period will be deleted.
- After 15 days, all snapshots will be deleted except for those that have been used to create disks or custom images.

You can recharge your account to resume the snapshot service. For more information, see Recharging.

I use snapshots frequently. How can I reduce the amount of fees incurred?

We recommend that you maintain a manageable number of snapshots, and delete unneeded snapshots. For more information, see #unique_22.

Do automatic snapshots differ from or conflict with manual snapshots?

No. Both manual snapshots and automatic snapshots are data files of a disk or Shared Block Storage device for a point in time. However, you cannot create manual snapshots while automatic snapshots are being created. You must wait until the automatic snapshots are finished being created.

Can I create snapshots for local disks?

No. If you want to improve the availability of applications, we recommend that you create data redundancy at the application layer or create deployment sets for clusters .

I have created a snapshot for an encrypted data disk and generated an image, but I cannot share the image. Why?

To ensure data privacy, custom images created from encrypted snapshots cannot be shared. We recommend that you use unencrypted snapshots to create custom images and share with other users.

Will deleting files in an ECS instance free up storage space?

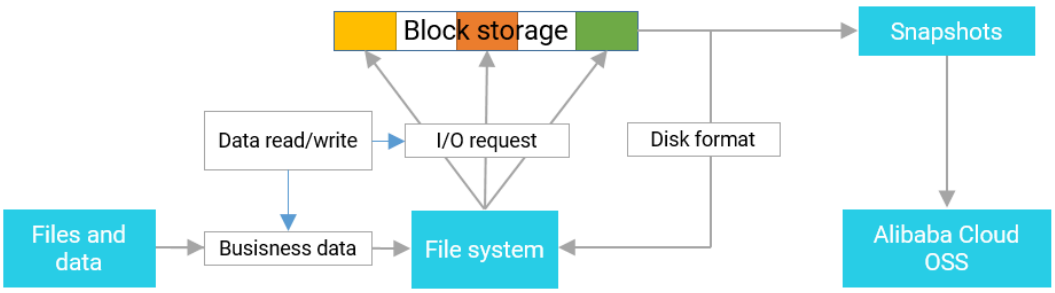
No. When you delete files in an ECS instance, only tags are added to the file headers but space is not cleared in the cloud disks.

Why is the snapshot size larger than the disk size displayed in the file system?

- Issue: You have created a snapshot after deleting files in the ECS instance. However , the size of the snapshot has not been reduced or larger than that of the disk size displayed in the file system.
- Cause: When snapshots are created, a mechanism identifies empty blocks to reduce the size of the snapshot. However, empty blocks will be occupied when you format the file system, delete files, and write data to blocks. Because of this, the snapshot size may be larger than the disk size currently displayed in the file system. Specific causes:
  - File system metadata is occupying disk space.
  - The file system has written data to a large number of blocks divided equally from the logical block address during initialization. This operation also will occupy disk space.
  - To improve performance, the file system only adds tags to the headers of files when they are deleted. Because the disk cannot detect delete instructions, these data blocks marked for deletion will still be allocated and copied to the snapshots.
  - The KVM virtio block and Xen block front drivers do not support the `TRIM` instruction, used to prompt that data in the logical block address is no longer in use and can be deleted.

What is the relationship between a file system and a disk or a snapshot?

You can create a file system in a disk partition. The file system manages disk space. These management tasks take the form of I/O requests in the disk. The disk records the states of data blocks and copies data to OSS as needed. This process is how snapshots are created. The following figure shows the relationship between a file system and a snapshot.



> **Note:**
> In the preceding figure, any data blocks with data written to them will be recorded in the snapshot, even if the related files have been deleted from the disk. In the file system, only tags are added to the headers of files to be deleted but space is not cleared in the disks.

How can I prevent snapshots from being deleted by Alibaba Cloud?

- Manual snapshots will never be deleted by Alibaba Cloud regardless of whether their corresponding disk or instance has been released.
- To prevent automatic snapshots from being deleted, you can set the Keep Snapshots parameter to Always Keep when modifying the automatic snapshot policy. Then, only the earliest snapshots will be deleted when the quota of the snapshots is reached. For more information, see Modify an automatic snapshot policy. For more information about the snapshot quota, see #unique_80.

How can I delete snapshots to reduce backup cost?

- Manual snapshots: You can delete manual snapshots.
- Automatic snapshots: You can delete automatic snapshots. When the maximum number of snapshots has been reached, the system will delete the earliest automatic snapshot.

Will automatic snapshots be deleted after the system disk is changed, the instance expires, or the disk is released?

- If Delete Automatic Snapshots While Releasing Disk is selected for the automatic snapshot policy, the automatic snapshots will be deleted when the corresponding instance or disk is released.
- If Delete Automatic Snapshots While Releasing Disk is not selected for the automatic snapshot policy, the retention period specified by the automatic snapshot policy applies. You can Modify an automatic snapshot policy as needed.

How can I delete snapshots that have been used to create images and disks?

- You can delete snapshots that have been used to create disks. After a snapshot is deleted, you cannot perform operations that depend on the status of the original snapshot data, such as the operation to reinitialize a disk.
- If the snapshot has been used to create custom images, you must delete those custom images before the snapshot can be deleted.

- You can delete images that have been used to create instances. After a snapshot is deleted, you cannot perform operations that depend on the status of the original snapshot data, such as the operation to reinitialize a disk.

If I have used an automatic snapshot to create a custom image or a disk, will the automatic snapshot policy fail to be executed?

No.

Can I create multiple snapshot policies for a disk?

No.

How can I avoid losing data due to incorrect operations?

You can create snapshots to back up data in advance before you perform operations that carry risks to your data. For example, you can create a snapshot if you need to modify critical system files, migrate instances from a classic network to a VPC, back up data, restore an instance that was released accidentally, prevent network attacks, change operating systems, or provide data support for a production environment. If an error occurs, you can roll back the disk in time to reduce risks. For more information, see #unique_4 and #unique_5.

After I change the system disk, can a snapshot of the previous system disk be used to roll back the new system disk?

No.