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Basic Operation Procedure

EVS disks can be attached to servers and be used as system disks and data disks. Table 1-1 lists the disk purchasing methods.

**Table 1-1 Purchasing methods**

<table>
<thead>
<tr>
<th>Disk</th>
<th>Description</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>System disk</td>
<td>System disks are purchased along with servers and cannot be purchased separately.</td>
<td>● Instructions on Purchasing ECSs&lt;br&gt;● Creating a BMS Supporting Quick Provisioning</td>
</tr>
<tr>
<td>Data disk</td>
<td>Data disks can be purchased along with servers or separately.</td>
<td>● Instructions on Purchasing ECSs&lt;br&gt;● Creating a BMS Supporting Quick Provisioning&lt;br&gt;● Purchasing an EVS Disk</td>
</tr>
</tbody>
</table>

Figure 1-1 shows how to purchase a data disk separately.
1. Register with HUAWEI CLOUD and top up the account. For details, see 2 Step 1: Preparations.
2. Set the disk type, capacity, and name. For more information, see 3 Step 2: Purchase an EVS Disk.
3. Attach the separately purchased disk to a server. For more information, see the following topics:
   - 4.1 Attaching a Non-Shared Disk
   - 4.2 Attaching a Shared Disk
4. A disk cannot be used right away after being attached to a server. You must log in to the server and initialize the disk. For more information, see the following topics:
   - 5.1 Introduction to Data Disk Initialization Scenarios and Partition Styles
     - Windows
       - 5.2 Initializing a Windows Data Disk (Windows Server 2008)
       - 5.3 Initializing a Windows Data Disk (Windows Server 2016)
       - 5.6 Initializing a Windows Data Disk Larger Than 2 TB (Windows Server 2008)
       - 5.7 Initializing a Windows Data Disk Larger Than 2 TB (Windows Server 2012)
     - Linux
       - 5.4 Initializing a Linux Data Disk (fdisk)
- 5.5 Initializing a Linux Data Disk (parted)
- 5.8 Initializing a Linux Data Disk Larger Than 2 TB (parted)
Before using the EVS service, you need to make the following preparations:

- Register with HUAWEI CLOUD and Complete Real-Name Authentication
- Top Up Your Account

Register with HUAWEI CLOUD and Complete Real-Name Authentication

If you already have a HUAWEI CLOUD account, skip this part. If you do not have a HUAWEI CLOUD account, perform the following steps to create one:

2. On the displayed Register page, register an account as prompted.
   After you have successfully registered, the system automatically redirects you to your personal information page.
3. Complete real-name authentication by following the instructions in Real-Name Authentication.

Top Up Your Account

Ensure that your account has sufficient balance.

- For EVS price details, see Billing Modes.
- For details about how to top up an account, see Topping Up an Account.
Step 2: Purchase an EVS Disk

Scenarios

When a server is created, the system disk is automatically created and attached. You do not need to purchase the system disk separately.

Data disks can be purchased during or after the server creation. If you purchase data disks during the server creation, the system will automatically attach the data disks to the server. If you purchase data disks after the server creation, you need to manually attach the purchased data disks to the server.

This topic describes how to separately purchase disks on the EVS console.

Procedure

**Step 1** Log in to the management console.

**Step 2** Under Storage, click Elastic Volume Service.

The disk list page is displayed.

**Step 3** Click Buy Disk.

**Step 4** Configure basic disk information according to **Table 3-1**.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sub-Parameter</th>
<th>Description</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billing Mode</td>
<td>-</td>
<td>Mandatory You can pay for EVS disks in two ways:</td>
<td>Yearly/</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Yearly/Monthly</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Pay-per-use</td>
<td></td>
</tr>
</tbody>
</table>

Table 3-1 Parameter description
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sub-Parameter</th>
<th>Description</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region</td>
<td></td>
<td>Mandatory Resources are region-specific and cannot be used across regions through internal network connections. For low network latency and quick resource access, select the nearest region.</td>
<td></td>
</tr>
</tbody>
</table>
| AZ              |               | Mandatory Specifies the availability zone (AZ) where you want to create the disk. **NOTE**  
- Disks can only be attached to the servers in the same AZ.  
- The AZ of a disk cannot be changed after the disk has been created. | AZ1           |
| Disk Specifications | Disk Type | Mandatory The available disk types are as follows:  
- Common I/O (previous generation product)  
- High I/O  
- Ultra-high I/O  
**NOTE** When a disk is created from a snapshot, the disk type of the newly created disk will be consistent with that of the snapshot's source disk. | Ultra-high I/O |
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sub-Parameter</th>
<th>Description</th>
<th>Example Value</th>
</tr>
</thead>
</table>
| Capacity (GB) |               | Mandatory  
  Specifies the disk size. Only data disks can be created on the current page, and the disk capacity ranges from 10 GB to 32768 GB.  
  NOTE  
  - When you use a backup to create a disk, the disk capacity must be greater than or equal to the backup size. In the condition that you do not specify the disk capacity, if the backup size is smaller than 10 GB, the default capacity 10 GB will be used as the disk capacity; if the backup size is greater than 10 GB, the disk capacity will be consistent with the backup size.  
  - When you use a snapshot to create a disk, the disk capacity must be greater than or equal to the snapshot size. In the condition that you do not specify the disk capacity, if the snapshot size is smaller than 10 GB, the default capacity 10 GB will be used as the disk capacity; if the snapshot size is greater than 10 GB, the disk capacity will be consistent with the snapshot size.  
  - The system shows you the maximum number of disks as well as the maximum disk capacity allowed to purchase. To ensure effective resource usage, if the disk capacity you need exceeds the upper limit, click Increase Quota to obtain a higher quota. You can purchase the disk capacity you need after the request is approved. | 100 GB         |
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sub-Parameter</th>
<th>Description</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select Data Source</td>
<td></td>
<td>Optional</td>
<td></td>
</tr>
</tbody>
</table>
|                            | Create from backup | - If you choose **Create from backup**, the backup data is used to create the disk. Click **Select Data Source** and choose **Create from backup**. On the displayed page, select the target backup and click **OK**. **NOTE**  
  - One backup cannot be used for concurrent disk creation operations at the same time. For example, if you are creating disk A from a backup, this backup can be used to create another disk only after disk A has been created.  
  - If a disk is created from a backup of a system disk, the new disk can be used as a data disk only. | Create from backup: autobackup-001 |
|                            | Create from snapshot | - If you choose **Create from snapshot**, the snapshot data is used to create the disk. Click **Select Data Source** and choose **Create from snapshot**. On the displayed page, select the target snapshot and click **OK**. **NOTE**  
  - The disk type of the new disk is the same as that of the snapshot's source disk.  
  - The device type of the new disk is the same as that of the snapshot's source disk.  
  - The encryption attribute of the new disk is the same as that of the snapshot's source disk. | Create from snapshot: snapshot-001 |
<p>|                            | Create from image | - If you choose <strong>Create from image</strong>, the image data is used to create the disk. Click <strong>Select Data Source</strong> and choose <strong>Create from image</strong>. On the displayed page, select the target image and click <strong>OK</strong>. |                                            |</p>
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sub-Parameter</th>
<th>Description</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>NOTE</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The device type of the new disk is the same as that of the image's source disk.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- If a disk is created from an image, the encryption attribute of the disk will be the same as that of the image's source disk.</td>
<td></td>
</tr>
<tr>
<td>Auto Backup</td>
<td>-</td>
<td>Optional</td>
<td>Enable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If auto backup is enabled, the system automatically creates backups for the disk data at specified time points and deletes outdated backups according to the configured backup policy. When <strong>Enable</strong> is selected, a backup policy must be configured. You can either use the default backup policy or customize the policy based on your service requirements.</td>
<td></td>
</tr>
</tbody>
</table>
### Description

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sub-Parameter</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>More</td>
<td>Advanced Settings</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Share</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>SCSI</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Encryption</td>
<td>-</td>
</tr>
</tbody>
</table>

**Optional**

- **Share**
  
  If you select **Share**, a shared disk is created. A shared disk can be attached to up to 16 servers. If you do not select **Share**, a non-shared disk is created, and the disk can be attached to one server only.

  When you select both **SCSI** and **Share**, a shared SCSI disk is created.

  **NOTE**
  
  The sharing attribute of a disk cannot be changed after the disk has been created.

- **SCSI**
  
  If you select **SCSI**, a SCSI disk is created. Such disks allow the server OS to directly access the underlying storage media and send SCSI commands to the disks. If you do not select **SCSI**, a VBD disk is created. That said, the disk device type is VBD, the default device type.

  **NOTE**
  
  The device type of a disk cannot be changed after the disk has been created.

- **Encryption**
  
  The encryption function on this console is used for data disk encryption only. System disk encryption depends on images. For details, see the *Image Management Service User Guide*.

  To use the disk encryption function, select **Encryption**. The displayed dialog box contains the following parameters:

  - **Create Agency**
    
    An agency is a trust relationship between two tenants or services. A tenant can create an agency to grant resource access rights to another tenant or service. If the KMS access rights are not granted to EVS, the Create
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sub-Parameter</th>
<th>Description</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agency dialog box will be displayed. Otherwise, it will not be displayed.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Click Yes to grant the KMS access rights to EVS. After the rights have been granted, EVS can obtain KMS keys to encrypt or decrypt EVS disks.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After the KMS access rights have been granted, follow-up operations do not require the rights to be granted again.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KMS Key Name is displayed only after the KMS access rights have been granted. For details, see Create Agency above.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KMS Key Name is the identifier of the key, and you can use KMS Key Name to specify the KMS key that is to be used for encryption. One of the following keys can be used:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Default Master Key: After the KMS access rights have been granted to EVS, the system automatically creates a Default Master Key and names it evs/default.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMKs: Existing or newly created CMKs. For details, see Key Management Service &gt; Creating a CMK in the Data Encryption Workshop User Guide.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Note

- Before you use the EVS disk encryption function, KMS access rights need to be granted to EVS. If you have the right to grant the permission, grant the KMS access rights to EVS directly. If you do not have this permission, contact a user with the security administrator rights to grant KMS access rights to EVS, then repeat the preceding operations.
- The encryption attribute of a disk cannot be changed after the disk is created.

### Tag

Optional

During the EVS disk creation, you can tag the EVS resources. Tags identify cloud resources for purposes of easy categorization and quick search.

A tag is composed of a key-value pair.

- **Key**: Mandatory if the disk is going to be tagged
  
  A tag key is a string of no more than 36 characters. It consists of letters, digits, underscores (_), hyphens (-), and Unicode characters (\u4E00-\u9FFF).

- **Value**: Optional if the disk is going to be tagged
  
  A tag value is a string of no more than 43 characters. It consists of letters, digits, underscores (_), periods (.), hyphens (-), and Unicode characters (\u4E00-\u9FFF).

### Example Value

-
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sub-Parameter</th>
<th>Description</th>
<th>Example Value</th>
</tr>
</thead>
</table>
| Disk Name     |               | Mandatory  
  - If you create disks one by one, this parameter value is used as the actual disk name. The name can contain a maximum of 64 characters.  
  - If you create disks in a batch, this parameter value is used as the prefix of disk names, and one disk name will be composed of this parameter value and a four-digit number. The name can contain a maximum of 59 characters. |
|               |               | For example, if you create two disks and set volume for Disk Name, the EVS disk names will be volume-0001 and volume-0002.                                                                                                                                                  |
| Quantity      |               | Usage duration: This parameter is mandatory if you select Yearly/Monthly for Billing Mode. You can choose 1 month to 3 years for the usage duration.  
  - Disk quantity: This parameter is optional. The default value is set to 1, which means one disk will be created. Currently, you can create up to 100 disks at a time. |
|               |               | Disk validity period: 1 year  
  Disk quantity: 1                                                                                     |                                                                                                                                                                                                                  |

**Step 5**  Click **Next**.  
- If you select Yearly/Monthly for Billing Mode,  
  a. Check the disk details on the Confirm page.  
  b. Confirm the information and click Submit.
c. On the Pay page, select a desired payment method and confirm the payment. The system displays a message indicating payment processed successfully.

d. Click Back to Elastic Volume Service to return to the Elastic Volume Service page.

- If you select Pay-per-use for Billing Mode,
  a. Check the disk details on the Confirm page.
  b. Confirm the information and click Submit. The system displays a message indicating task submitted successfully.
  c. Click Back to Disk List to return to the Elastic Volume Service page.

**Step 6** In the disk list, view the disk status.

When the disk status changes to Available, the disk is successfully created.

----End
4 Step 3: Attach an EVS Disk

4.1 Attaching a Non-Shared Disk

Scenarios

Independently purchased EVS disks are data disks. In the disk list, the function of such disks is displayed as **Data disk**, and the status is displayed as **Available**. In this case, you need to attach the data disks to servers for use.

A system disk must be purchased during a server creation and is automatically attached. In the disk list, the function of such disks is displayed as **System disk**, and the status is displayed as **In-use**. After a system disk is detached from a server, the disk function changes to **Bootable disk**, and the status changes to **Available**.

**NOTE**

Bootable disks are the system disks detached from servers. A bootable disk can be re-attached to a server and be used as system disk or data disk depending on the device name selected.

This topic describes how to attach a non-shared EVS disk to a server. A non-shared EVS disk can be attached to only one server.

If your disk cannot be attached to a server, see [Why My EVS Disk Cannot Be Attached to a Server?](#).

Procedure

**Step 1** Log in to the management console.

**Step 2** Under **Storage**, click **Elastic Volume Service**.

The disk list page is displayed.

**Step 3** Locate the target disk in the list and click **Attach**.

**Step 4** Select the server and then select a device name from the drop-down list. Ensure that the EVS disk and server are in the same AZ.
One device name can be attached with one EVS disk only. For the mapping between device names displayed on the management console and those on the server, see What Is the Mapping Between Device Names and Disks? in the Elastic Cloud Server User Guide.

**Step 5** Click OK. A dialog box is displayed, showing “The attaching process is NOT completed yet. You must initialize the disk before using it”.

**Step 6** Click OK to return to the disk list page. The status of the disk is Attaching, indicating that the disk is being attached to the server. When the disk status changes to In-use, the disk is successfully attached.

**Step 7** Initialize the EVS disk.

After the disk has been attached to a server, the disk can be used only after you have initialized it. For details, see 5.1 Introduction to Data Disk Initialization Scenarios and Partition Styles.

---End

### 4.2 Attaching a Shared Disk

#### Scenarios

Independently purchased EVS disks are data disks. In the disk list, the function of such disks is displayed as Data disk, and the status is displayed as Available. In this case, you need to attach the data disks to servers for use.

This topic describes how to attach a shared disk.

If your disk cannot be attached to a server, see Why My EVS Disk Cannot Be Attached to a Server?

#### Constraints

- A shared disk can be attached to a maximum of 16 servers. These servers and the shared disk must be in the same AZ.
- If a shared disk is in the In-use state, ensure that the maximum number of servers that the disk can be attached to has not been reached.
- All the servers of a shared disk must run either Windows or Linux no matter the disk is attached to them in a batch or one by one.
  
  For example, if you attach a shared disk to multiple Windows servers in a batch and then detach it from all its servers, the disk cannot be attached to Linux servers later. This is because Windows and Linux support different file systems and cannot identify the original file system on the disk. Improper operations may damage the original file system.
- A shared disk can only be used as a data disk. It cannot be used as a system disk.

#### Procedure

**Step 1** Log in to the management console.
Step 2 Under Storage, click Elastic Volume Service.

The disk list page is displayed.

Step 3 Locate the target disk in the list and click Attach.

Shared EVS disks support batch attachment so that you can attach a shared EVS disk to multiple servers at a time. The left area in the Attach Disk dialog box shows the server list. After you select the target servers, the selected servers will be displayed in the right area.

Step 4 Select the target servers and then select a device name from the drop-down list for each server you selected. Ensure that the EVS disk and servers are in the same AZ.

One device name can be attached with one EVS disk only. If a device name has been used, it will no longer be displayed in the drop-down list and cannot be selected.

Step 5 Click OK. A dialog box is displayed, showing "The attaching process is NOT completed yet. You must initialize the disk before using it".

Step 6 Click OK to return to the disk list page. The status of the disk is Attaching, indicating that the disk is being attached to the servers. When the disk status changes to In-use, the disk is successfully attached.

NOTICE

If you simply attach a shared EVS disk to multiple servers, files cannot be shared between the servers as shared EVS disks do not have the cluster capability. Therefore, build a shared file system or deploy a cluster management system to share files between servers.

----End
5 Step 4: Initialize an EVS Data Disk

5.1 Introduction to Data Disk Initialization Scenarios and Partition Styles

Scenarios

After a disk is attached to a server, you need to log in to the server to initialize the disk, that is, format the disk. You must initialize a disk before accessing it.

- **System disk**
  A system disk does not require manual initialization because it is automatically created and initialized upon server creation. The default disk partition style is master boot record (MBR).

- **Data disk**
  - If a data disk is created along with a server, it will be automatically attached to the server.
  - If a data disk is created separately, you need to manually attach it to a server.

In both cases, you must initialize the data disk before using it. Choose a proper disk partition style base on your service plan.

Constraints

Disks created from backups, snapshots, or images do not need to be initialized. Otherwise, data on the disks may be lost.

Disk Partition Styles

*Table 5-1* lists the common disk partition styles. In Linux, different disk partition styles require different partitioning tools.
### Table 5-1 Disk partition styles

<table>
<thead>
<tr>
<th>Disk Partition Style</th>
<th>Maximum Disk Capacity Supported</th>
<th>Maximum Number of Partitions Supported</th>
<th>Linux Partitioning Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Boot Record (MBR)</td>
<td>2 TB</td>
<td>• 4 primary partitions</td>
<td>• fdisk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3 primary partitions and 1 extended partition</td>
<td>• parted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>With MBR, one may create several primary partitions and an extended partition. An extended partition</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>must be divided into several logical partitions before use.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>For example, if 6 partitions need to be created, you can create the partitions in the following two</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ways:</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 3 primary partitions and 1 extended partition, with the extended partition divided into 3 logical</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>partitions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 1 primary partition and 1 extended partition, with the extended partition divided into 5 logical</td>
<td></td>
</tr>
<tr>
<td>Guid Partition Table (GPT)</td>
<td>18 EB</td>
<td>Unlimited</td>
<td>parted</td>
</tr>
<tr>
<td></td>
<td>1 EB = 1048576 TB</td>
<td>Disk partitions created using GPT are not categorized.</td>
<td></td>
</tr>
</tbody>
</table>

**NOTICE**

The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Because a data disk currently supports up to 32 TB, use the GPT partition style if your disk capacity is larger than 2 TB.

If you change the disk partition style after the disk has been used, the data on the disk will be cleared. Therefore, select a proper disk partition style when initializing the disk.

### Partitioning Operation Guide

For a disk smaller than 2 TB, see the following topics:

- **5.2 Initializing a Windows Data Disk (Windows Server 2008)**
- **5.3 Initializing a Windows Data Disk (Windows Server 2016)**
5.2 Initializing a Windows Data Disk (Windows Server 2008)

Scenarios

This topic uses Windows Server 2008 R2 Enterprise 64bit to describe how to initialize a data disk attached to a server running Windows.

The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Therefore, use the GPT partition style if your disk capacity is larger than 2 TB. For details, see 5.6 Initializing a Windows Data Disk Larger Than 2 TB (Windows Server 2008). For details about disk partition styles, see 5.1 Introduction to Data Disk Initialization Scenarios and Partition Styles.

The method for initializing a disk varies depending on the OS running on the server. This document is used for reference only. For the detailed operations and differences, see the product documents of the corresponding OS.

NOTICE

When using a disk for the first time, if you have not initialized it, including creating partitions and file systems, the additional space added to this disk in an expansion later may not be normally used.

Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
  - For how to log in to an ECS, see the Elastic Cloud Server User Guide.
  - For how to log in to a BMS, see the Bare Metal Server User Guide.

Procedure

**Step 1** On the desktop of the server, right-click **Computer** and choose **Manage** from the shortcut menu.

The **Server Manager** window is displayed.

**Step 2** In the navigation tree, choose **Storage** > **Disk Management**.
The **Disk Management** window is displayed.

- If **Figure 5-1** is displayed, the new disk is offline. Go to **Step 3**.
- If **Figure 5-4** is displayed, the **Initialize Disk** window is prompted. Go to **Step 5**.

**Figure 5-1** Disk Management

![Disk Management Window](image)

**Step 3** Disks are displayed in the right pane. In the **Disk 1** area, right-click **Offline** and choose **Online** from the shortcut menu to online the disk.

**Figure 5-2** Online the disk

![Online Disk Window](image)
**NOTE**

If the disk is offline, you need to online the disk before initializing it.

**Step 4**  After making the disk online, the disk status changes from **Offline** to **Not Initialized**. Right-click the disk status and choose **Initialize Disk** from the shortcut menu, as shown in **Figure 5-3**.

**Figure 5-3 Initialize Disk**

![Initialize Disk](image)

**Step 5**  In the **Initialize Disk** dialog box, select the target disk, click **MBR (Master Boot Record)** or **GPT (GUID Partition Table)**, and click **OK**, as shown in **Figure 5-4**.
The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Because a data disk currently supports up to 32 TB, use the GPT partition style if your disk capacity is larger than 2 TB.

If you change the disk partition style after the disk has been used, the data on the disk will be cleared. Therefore, select a proper disk partition style when initializing the disk.

**Step 6** Right-click at the unallocated space and choose **New Simple Volume** from the shortcut menu, as shown in Figure 5-5.
Step 7  On the displayed **New Simple Volume Wizard** window, click **Next**.

Step 8  Specify the volume size and click **Next**. The default value is the maximum size.
Step 9 Assign the driver letter and click **Next**.

Step 10 Select **Format this volume with the following settings**, set parameters based on the actual requirements, and select **Perform a quick format**. Then, click **Next**.
**Figure 5-9** Format Partition

![Format Partition](image1)

**Figure 5-10** Completing the partition creation

![Completing the partition creation](image2)

**NOTICE**

The partition sizes supported by file systems vary. Therefore, you are advised to choose an appropriate file system based on your service requirements.
Step 11 Click Finish. Wait for the initialization to complete. When the volume status changes to Healthy, the initialization has finished successfully, as shown in Figure 5-11.

Figure 5-11 Disk initialization succeeded

---End

5.3 Initializing a Windows Data Disk (Windows Server 2016)

Scenarios

This topic uses Windows Server 2016 Standard 64bit to describe how to initialize a data disk attached to a server running Windows.

The method for initializing a disk varies depending on the OS running on the server. This document is used for reference only. For the detailed operations and differences, see the product documents of the corresponding OS.

---

**NOTICE**

When using a disk for the first time, if you have not initialized it, including creating partitions and file systems, the additional space added to this disk in an expansion later may not be normally used.
Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
  - For how to log in to an ECS, see the Elastic Cloud Server User Guide.
  - For how to log in to a BMS, see the Bare Metal Server User Guide.

Procedure

Step 1 On the desktop of the server, click the start icon in the lower left corner.

The Windows Server window is displayed.

Step 2 Click Server Manager.

The Server Manager window is displayed.

Figure 5-12 Server Manager

Step 3 In the upper right corner, choose Tools > Computer Management.

The Computer Management window is displayed.
Step 4 Choose **Storage > Disk Management**.

Disks are displayed in the right pane. If there is a disk that is not initialized, the system will prompt you with the **Initialize Disk** dialog box.

**Figure 5-14 Disk list**
Step 5 In the **Initialize Disk** dialog box, the to-be-initialized disk is selected. Select a disk partition style and click **OK**. In this example, **GPT (GUID Partition Table)** is selected.

The **Computer Management** window is displayed.

![Image of Computer Management (Windows Server 2016)](image)

**Figure 5-15** Computer Management (Windows Server 2016)

**NOTICE**

The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Because a data disk currently supports up to 32 TB, use the GPT partition style if your disk capacity is larger than 2 TB.

If you change the disk partition style after the disk has been used, the data on the disk will be cleared. Therefore, select a proper disk partition style when initializing the disk.

Step 6 Right-click at the unallocated disk space and choose **New Simple Volume** from the shortcut menu.

The **New Simple Volume Wizard** window is displayed.
Step 7 Follow the prompts and click Next.
The Specify Volume Size page is displayed.

Step 8 Specify the volume size and click Next. The system selects the maximum volume size by default. You can specify the volume size as required. In this example, the default setting is used.
The **Assign Drive Letter or Path** page is displayed.

**Figure 5-18 Assign Driver Letter or Path (Windows Server 2016)**

**Step 9** Assign a drive letter or path to your partition and click **Next**. The system assigns drive letter D by default. In this example, the default setting is used.

The **Format Partition** page is displayed.

**Figure 5-19 Format Partition (Windows Server 2016)**
**Step 10** Specify format settings and click **Next**. The system selects the NTFS file system by default. You can specify the file system type as required. In this example, the default setting is used.

The **Completing the New Simple Volume Wizard** page is displayed.

**Figure 5-20** Completing the New Simple Volume Wizard (Windows Server 2016)

---

**NOTICE**

The partition sizes supported by file systems vary. Therefore, you are advised to choose an appropriate file system based on your service requirements.

---

**Step 11** Click **Finish**.

Wait for the initialization to complete. When the volume status changes to **Healthy**, the initialization has finished successfully, as shown in **Figure 5-21**.
Figure 5-21 Disk initialization succeeded (Windows Server 2016)

Step 12 After the volume is created, click \(\text{disk} \) on the taskbar and check whether a new volume appears in **This PC**. In this example, New Volume (D:) is the new volume.

If New Volume (D:) appears, the disk is successfully initialized and no further action is required.
5.4 Initializing a Linux Data Disk (fdisk)

Scenarios

This topic uses CentOS 7.4 64bit to describe how to initialize a data disk attached to a server running Linux and use fdisk to partition the data disk.

The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Therefore, use the GPT partition style if your disk capacity is larger than 2 TB. In Linux, if you choose to use the GPT partition style, the fdisk partitioning tool cannot be used. Use the parted partitioning tool instead. For details about disk partition styles, see 5.1 Introduction to Data Disk Initialization Scenarios and Partition Styles.

The method for initializing a disk varies depending on the OS running on the server. This document is used for reference only. For the detailed operations and differences, see the product documents of the corresponding OS.

---End

**NOTICE**

When using a disk for the first time, if you have not initialized it, including creating partitions and file systems, the additional space added to this disk in an expansion later may not be normally used.
Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
  - For how to log in to an ECS, see the *Elastic Cloud Server User Guide*.
  - For how to log in to a BMS, see the *Bare Metal Server User Guide*.

Creating and Mounting a Partition

The following example shows you how a new primary partition can be created on a new data disk that has been attached to a server. The primary partition will be created using fdisk, and MBR is the default partition style. Furthermore, the partition will be formatted using the ext4 file system, mounted on `/mnt/sdc`, and configured automatic mounting at system start.

**Step 1** Run the following command to query information about the new data disk:

```
fdisk -l
```

Information similar to the following is displayed:

```
[root@ecs-test-0001 ~]# fdisk -l

Disk /dev/vda: 42.9 GB, 42949672960 bytes, 83886080 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x000bcb4e

Device Boot Start   End   Blocks   Id  System
/dev/vda1   * 2048 83886079 41942016   83  Linux

Disk /dev/vdb: 107.4 GB, 107374182400 bytes, 209715200 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

In the command output, the server contains two disks. `/dev/vda` is the system disk, and `/dev/vdb` is the new data disk.

**Step 2** Run the following command to enter fdisk to partition the new data disk:

```
fdisk /dev/vdb
```

Information similar to the following is displayed:

```
[root@ecs-test-0001 ~]# fdisk /dev/vdb
Welcome to fdisk (util-linux 2.23.2).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.
Device does not contain a recognized partition table.
Building a new DOS disklabel with disk identifier 0x38717fc1.
```

**Step 3** Enter `n` and press `Enter` to create a new partition.

Information similar to the following is displayed:
Command (m for help): n
Partition type:
  p   primary (0 primary, 0 extended, 4 free)
  e   extended

There are two types of disk partitions:
● Choosing p creates a primary partition.
● Choosing e creates an extended partition.

NOTE
If the MBR partition style is used, a maximum of 4 primary partitions, or 3 primary partitions and 1 extended partition can be created. The extended partition cannot be used directly and must be divided into logical partitions before use.

Disk partitions created using GPT are not categorized.

Step 4 In this example, a primary partition is created. Therefore, enter p and press Enter to create a primary partition.

Information similar to the following is displayed:
Select (default p): p
Partition number (1-4, default 1):

Partition number indicates the serial number of the primary partition. The value ranges from 1 to 4.

Step 5 Enter the serial number of the primary partition and press Enter. Primary partition number 1 is used in this example. One usually starts with partition number 1 when partitioning an empty disk.

Information similar to the following is displayed:
Partition number (1-4, default 1): 1
First sector (2048-209715199, default 2048):

First sector indicates the start sector. The value ranges from 2048 to 209715199, and the default value is 2048.

Step 6 Select the default start sector 2048 and press Enter.

The system displays the start and end sectors of the partition's available space. You can customize the value within this range or use the default value. The start sector must be smaller than the partition's end sector.

Information similar to the following is displayed:
First sector (2048-209715199, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-209715199, default 209715199):

Last sector indicates the end sector. The value ranges from 2048 to 209715199, and the default value is 209715199.

Step 7 Select the default end sector 209715199 and press Enter.

The system displays the start and end sectors of the partition's available space. You can customize the value within this range or use the default value. The start sector must be smaller than the partition's end sector.

Information similar to the following is displayed:
Last sector, +sectors or +size{K,M,G} (2048-209715199, default 209715199):
Using default value 209715199
Partition 1 of type Linux and of size 100 GiB is set
A primary partition has been created for the new data disk.

**Step 8** Enter `p` and press Enter to view details about the new partition.

Information similar to the following is displayed:

```
Command (m for help): p
```

```
Disk /dev/vdb: 107.4 GB, 107374182400 bytes, 209715200 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x38717fc1

Device Boot Start   End     Blocks  Id  System
/dev/vdb1   2048  209715199  104856576   83  Linux
```

Command (m for help):

Details about the `/dev/vdb1` partition are displayed.

**Step 9** Enter `w` and press Enter to write the changes to the partition table.

Information similar to the following is displayed:

```
Command (m for help): w
```

```
The partition table has been altered!
Calling ioctl() to re-read partition table.
Syncing disks.
```

The partition is created.

**NOTE**

In case that you want to discard the changes made before, you can exit fdisk by entering `q`.

**Step 10** Run the following command to synchronize the new partition table to the OS:

```
partprobe
```

**Step 11** Run the following command to set the file system format for the new partition:

```
mkfs -t File system format /dev/vdb1
```

In this example, run the following command to set the `ext4` file system for the new partition:

```
mkfs -t ext4 /dev/vdb1
```

Information similar to the following is displayed:

```
[root@ecs-test-0001 ~]# mkfs -t ext4 /dev/vdb1
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
6553600 inodes, 2621444 blocks
1310707 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=2174746624
800 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
```
Superblock backups stored on blocks:
32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
4096000, 7962624, 11239424, 20480000, 23887872

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

The formatting takes a period of time. Observe the system running status and do not exit.

**NOTICE**
The partition sizes supported by file systems vary. Therefore, you are advised to choose an appropriate file system based on your service requirements.

---

**Step 12** Run the following command to create a mount point:

```bash
mkdir Mount point
```

In this example, run the following command to create the `/mnt/sdc` mount point:

```bash
mkdir /mnt/sdc
```

**Step 13** Run the following command to mount the new partition on the created mount point:

```bash
mount Disk partition Mount point
```

In this example, run the following command to mount the new partition `/dev/vdb1` on `/mnt/sdc`:

```bash
mount /dev/vdb1 /mnt/sdc
```

**Step 14** Run the following command to view the mount result:

```
df -TH
```

Information similar to the following is displayed:

```
[root@ecs-test-0001 ~]# df -TH
Filesystem Type Size Used Avail Use% Mounted on
/dev/vda1 ext4 43G 1.9G 39G 5% /
devtmpfs devtmpfs 2.0G 0 2.0G 0% /dev
tmpfs tmpfs 2.0G 0 2.0G 0% /dev/shm
tmpfs tmpfs 2.0G 9.1M 2.0G 1% /run
tmpfs tmpfs 2.0G 0 2.0G 0% /sys/fs/cgroup
tmpfs tmpfs 398M 0 398M 0% /run/user/0
/dev/vdb1 ext4 106G 63M 101G 1% /mnt/sdc
```

New partition `/dev/vdb1` is mounted on `/mnt/sdc`.

**NOTE**

If the server is restarted, the mounting will become invalid. You can set automatic mounting for partitions at system start by modifying the `/etc/fstab` file. For details, see **Setting Automatic Mounting at System Start**.

----End
Setting Automatic Mounting at System Start

To automatically mount disk partitions at system start, do not specify partitions, for example `/dev/vdb1`, in `/etc/fstab` because the sequence of cloud devices, and therefore their names may change during the server stop and start. You are advised to use the universally unique identifier (UUID) in `/etc/fstab` to set automatic mounting at system start.

**NOTE**

UUID is the unique character string for disk partitions in a Linux system.

**Step 1** Run the following command to query the partition UUID:

```
blkid Disk partition
```

In this example, run the following command to query the UUID of the `/dev/vdb1` partition:

```
blkid /dev/vdb1
```

Information similar to the following is displayed:

```
[root@ecs-test-0001 ~]# blkid /dev/vdb1
/dev/vdb1: UUID="0b3040e2-1367-4abb-841d-ddb0b92693df" TYPE="ext4"
```

The UUID of the `/dev/vdb1` partition is displayed.

**Step 2** Run the following command to open the `/etc/fstab` file using the vi editor:

```
vi /etc/fstab
```

**Step 3** Press `i` to enter the editing mode.

**Step 4** Move the cursor to the end of the file and press `Enter`. Then, add the following information:

```
UUID=0b3040e2-1367-4abb-841d-ddb0b92693df /mnt/sdc                ext4    defaults        0 2
```

The preceding content is used for reference only. Add the information that is used in the environment. The parameters are described as follows:

- The first column indicates the partition UUID obtained in **Step 1**.
- The second column indicates the directory on which the partition is mounted. You can query the mount point using the `df -TH` command.
- The third column indicates the file system format of the partition. You can query the file system format using the `df -TH` command.
- The fourth column indicates the partition mount option. Normally, this parameter is set to `defaults`.
- The fifth column indicates the Linux dump backup option.
  - `0`: not use Linux dump backup. Normally, dump backup is not used, and you can set this parameter to `0`.
  - `1`: use Linux dump backup.
- The sixth column indicates the fsck option, that is, whether to use fsck to check the attached disk during startup.
  - `0`: not use fsck.
  - If the mount point is the root partition (`/`), this parameter must be set to `1`. 
When this parameter is set to 1 for the root partition, this parameter for other partitions must start with 2 so that the system checks the partitions in the ascending order of the values.

**Step 5** Press Esc, enter :wq, and press Enter.

The system saves the configurations and exits the vi editor.

**Step 6** Perform the following operations to verify the automatic mounting function:

1. Run the following command to unmount the partition:
   ```bash
   umount Disk partition
   ```
   In this example, run the following command:
   ```bash
   umount /dev/vdb1
   ```
2. Run the following command to reload all the content in the `/etc/fstab` file:
   ```bash
   mount -a
   ```
3. Run the following command to query the file system mounting information:
   ```bash
   mount | grep Mount point
   ```
   In this example, run the following command:
   ```bash
   mount | grep /mnt/sdc
   ```
   If information similar to the following is displayed, the automatic mounting function takes effect:
   ```bash
   root@ecs-test-0001 ~]# mount | grep /mnt/sdc
   /dev/vdb1 on /mnt/sdc type ext4 (rw,relatime,data=ordered)
   ```

---End

5.5 Initializing a Linux Data Disk (parted)

**Scenarios**

This topic uses CentOS 7.4 64bit to describe how to initialize a data disk attached to a server running Linux and use parted to partition the data disk.

The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Therefore, use the GPT partition style if your disk capacity is larger than 2 TB. In Linux, if you choose to use the GPT partition style, the fdisk partitioning tool cannot be used. Use the parted partitioning tool instead. For details about disk partition styles, see 5.1 Introduction to Data Disk Initialization Scenarios and Partition Styles.

The method for initializing a disk varies depending on the OS running on the server. This document is used for reference only. For the detailed operations and differences, see the product documents of the corresponding OS.

**NOTICE**

When using a disk for the first time, if you have not initialized it, including creating partitions and file systems, the additional space added to this disk in an expansion later may not be normally used.
Prerequisites
- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
  - For how to log in to an ECS, see the Elastic Cloud Server User Guide.
  - For how to log in to a BMS, see the Bare Metal Server User Guide.

Creating and Mounting a Partition

The following example shows you how a new partition can be created on a new data disk that has been attached to a server. The partition will be created using parted, and GPT is used as the partition style. Furthermore, the partition will be formatted using the ext4 file system, mounted on /mnt/sdc, and configured automatic mounting at system start.

Step 1
Run the following command to query information about the new data disk:

```
lsblk
```

Information similar to the following is displayed:

```
root@ecs-test-0001 ~]# lsblk
NAME   MAJ:MIN   RM  SIZE RO TYPE  MOUNTPOINT
vda    253:0    0   40G  0 disk  
└─vda1  253:1    0   40G  0 part  /
```

In the command output, the server contains two disks. /dev/vda is the system disk, and /dev/vdb is the new data disk.

Step 2
Run the following command to enter parted to partition the new data disk:

```
parted
```

```
New data disk
(parted)
```

Step 3
Enter `p` and press Enter to view the current disk partition style.

```
(parted) p
Error: /dev/vdb: unrecognised disk label
Model: Virtio Block Device (virtblk)
Disk /dev/vdb: 107GB
Sector size (logical/physical): 512B/512B
Partition Table: unknown
Disk Flags: (parted)
```

In the command output, the Partition Table value is unknown, indicating that no partition style is set for the new disk.

Step 4
Run the following command to set the disk partition style:

```
mklabel
```

Disk partition style
In this example, run the following command to set the partition style to GPT:
(Disk partition styles can be MBR or GPT.)

`mklabel gpt`

---

**NOTICE**

The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Because a data disk currently supports up to 32 TB, use the GPT partition style if your disk capacity is larger than 2 TB.

If you change the disk partition style after the disk has been used, the data on the disk will be cleared. Therefore, select a proper disk partition style when initializing the disk.

---

**Step 5**  
Enter `p` and press **Enter** to view the disk partition style.

Information similar to the following is displayed:

```
(parted) mklabel gpt  
(parted) p  
Model: Virtio Block Device (virtblk)  
Disk /dev/vdb: 107GB  
Sector size (logical/physical): 512B/512B  
Partition Table: gpt  
Disk Flags:  

<table>
<thead>
<tr>
<th>Number</th>
<th>Start</th>
<th>End</th>
<th>Size</th>
<th>File system</th>
<th>Name</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>(parted)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

In the command output, the **Partition Table** value is **gpt**, indicating that the disk partition style is GPT.

**Step 6**  
Enter `unit s` and press **Enter** to set the measurement unit of the disk to sector.

**Step 7**  
Run the following command and press **Enter**:

`mkpart Partition name Start sector End sector`

In this example, run the following command:

`mkpart test 2048s 100%`

In this example, one partition is created for the new data disk. Variable `2048s` indicates the disk start sector, and variable `100%` indicates the disk end sector. The two values are used for reference only. You can determine the number of partitions and the partition size based on your service requirements.

Information similar to the following is displayed:

```
(parted) mkpart opt 2048s 100%  
(parted) |
```

**Step 8**  
Enter `p` and press **Enter** to view details about the new partition.

Information similar to the following is displayed:

```
(parted) p  
Model: Virtio Block Device (virtblk)  
Disk /dev/vdb: 209715200s  
Sector size (logical/physical): 512B/512B  
Partition Table: gpt  
Disk Flags:  
```

---
Step 9  Enter q and press Enter to exit parted.

Information similar to the following is displayed:

(parte) q
Information: You may need to update /etc/fstab.

You can set automatic disk mounting by updating the /etc/fstab file. Before updating the file, set the file system format for the partition and mount the partition on the mount point.

Step 10  Run the following command to view the disk partition information:

lsblk

Information similar to the following is displayed:

[root@ecs-test-0001 ~]# lsblk
NAME   MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
vda    253:0    0   40G  0 disk
└─vda1 253:1    0   40G  0 part /

vdb    253:16   0  100G  0 disk
└─vdb1 253:17   0  100G  0 part

In the command output, /dev/vdb1 is the partition you created.

Step 11  Run the following command to set the file system format for the new partition:

mkfs -t File system format /dev/vdb1

In this example, run the following command to set the ext4 file system for the new partition:

mkfs -t ext4 /dev/vdb1

Information similar to the following is displayed:

[root@ecs-test-0001 ~]# mkfs -t ext4 /dev/vdb1
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
6553600 inodes, 26213888 blocks
1310694 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=2174746624
800 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
  32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
  4096000, 7962624, 11239424, 20480000, 23887872
Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

The formatting takes a period of time. Observe the system running status and do not exit.
The partition sizes supported by file systems vary. Therefore, you are advised to choose an appropriate file system based on your service requirements.

**Step 12** Run the following command to create a mount point:

```
mkdir Mount point
```

In this example, run the following command to create the `/mnt/sdc` mount point:

```
mkdir /mnt/sdc
```

**Step 13** Run the following command to mount the new partition on the created mount point:

```
mount Disk partition Mount point
```

In this example, run the following command to mount the new partition `/dev/vdb1` on `/mnt/sdc`:

```
mount /dev/vdb1 /mnt/sdc
```

**Step 14** Run the following command to view the mount result:

```
df -TH
```

Information similar to the following is displayed:

```
[root@ecs-test-0001 ~]# df -TH
Filesystem     Type      Size  Used Avail Use% Mounted on
/dev/vda1      ext4       43G  1.9G   39G   5% /
devtmpfs       devtmpfs  2.0G     0  2.0G   0% /dev
tmpfs          tmpfs     2.0G     0  2.0G   0% /run
tmpfs          tmpfs     2.0G     0  2.0G   0% /sys/fs/cgroup
tmpfs          tmpfs     398M     0  398M   0% /run/user/0
/dev/vdb1      ext4      106G   63M  101G   1% /mnt/sdc
```

New partition `/dev/vdb1` is mounted on `/mnt/sdc`.

**NOTE**

If the server is restarted, the mounting will become invalid. You can set automatic mounting for partitions at system start by modifying the `/etc/fstab` file. For details, see Setting Automatic Mounting at System Start.

---End

**Setting Automatic Mounting at System Start**

To automatically mount disk partitions at system start, do not specify partitions, for example `/dev/vdb1`, in `/etc/fstab` because the sequence of cloud devices, and therefore their names may change during the server stop and start. You are advised to use the universally unique identifier (UUID) in `/etc/fstab` to set automatic mounting at system start.

**NOTE**

UUID is the unique character string for disk partitions in a Linux system.
**Step 1** Run the following command to query the partition UUID:

```bash
blkid Disk partition
```

In this example, run the following command to query the UUID of the */dev/vdb1* partition:

```bash
blkid /dev/vdb1
```

Information similar to the following is displayed:

```
[root@ecs-test-0001 ~]# blkid /dev/vdb1
/dev/vdb1: UUID="0b3040e2-1367-4abb-841d-ddb0b92693df" TYPE="ext4"
```

The UUID of the */dev/vdb1* partition is displayed.

**Step 2** Run the following command to open the **fstab** file using the **vi** editor:

```bash
vi /etc/fstab
```

**Step 3** Press `i` to enter the editing mode.

**Step 4** Move the cursor to the end of the file and press **Enter**. Then, add the following information:

<table>
<thead>
<tr>
<th>UUID</th>
<th>Directory</th>
<th>Filesystem</th>
<th>Mount Options</th>
<th>Dump</th>
<th>Fsck</th>
</tr>
</thead>
<tbody>
<tr>
<td>0b3040e2-1367-4abb-841d-ddb0b92693df</td>
<td>/mnt/sdc</td>
<td>ext4</td>
<td>defaults</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The preceding content is used for reference only. Add the information that is used in the environment. The parameters are described as follows:

- The first column indicates the partition UUID obtained in **Step 1**.
- The second column indicates the directory on which the partition is mounted. You can query the mount point using the **df -TH** command.
- The third column indicates the filesystem format of the partition. You can query the filesystem format using the **df -TH** command.
- The fourth column indicates the partition mount option. Normally, this parameter is set to **defaults**.
- The fifth column indicates the Linux dump backup option.
  - 0: not use Linux dump backup. Normally, dump backup is not used, and you can set this parameter to 0.
  - 1: use Linux dump backup.
- The sixth column indicates the fsck option, that is, whether to use fsck to check the attached disk during startup.
  - 0: not use fsck.
  - 1: use fsck.
  - If the mount point is the root partition (/), this parameter must be set to 1.

When this parameter is set to 1 for the root partition, this parameter for other partitions must start with 2 so that the system checks the partitions in the ascending order of the values.

**Step 5** Press **Esc**, enter **:wq**, and press **Enter**.

The system saves the configurations and exits the vi editor.

**Step 6** Perform the following operations to verify the automatic mounting function:

1. Run the following command to unmount the partition:

```bash
umount Disk partition
```
In this example, run the following command:
```
umount /dev/vdb1
```
2. Run the following command to reload all the content in the `/etc/fstab` file:
```
mount -a
```
3. Run the following command to query the file system mounting information:
```
mount | grep Mount point
```
In this example, run the following command:
```
mount | grep /mnt/sdc
```
If information similar to the following is displayed, the automatic mounting function takes effect:
```
root@ecs-test-0001 ~]# mount | grep /mnt/sdc
/dev/vdb1 on /mnt/sdc type ext4 (rw,relatime,data=ordered)
```

--- End

5.6 Initializing a Windows Data Disk Larger Than 2 TB (Windows Server 2008)

Scenarios

This topic uses Windows Server 2008 R2 Standard 64bit to describe how to initialize a data disk whose capacity is larger than 2 TB. In the following operations, the capacity of the example disk is 3 TB.

The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Therefore, use the GPT partition style if your disk capacity is larger than 2 TB. For details, see 5.6 Initializing a Windows Data Disk Larger Than 2 TB (Windows Server 2008). For details about disk partition styles, see 5.1 Introduction to Data Disk Initialization Scenarios and Partition Styles.

The method for initializing a disk varies depending on the OS running on the server. This document is used for reference only. For the detailed operations and differences, see the product documents of the corresponding OS.

---

**NOTICE**

When using a disk for the first time, if you have not initialized it, including creating partitions and file systems, the additional space added to this disk in an expansion later may not be normally used.

---

**Prerequisites**

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
  - For how to log in to an ECS, see the *Elastic Cloud Server User Guide*.
  - For how to log in to a BMS, see the *Bare Metal Server User Guide*. 
Procedure

**Step 1** On the desktop of the server, click **Start**.

The **Start** window is displayed.

**Step 2** Right-click **Computer** and choose **Manage** from the short-cut menu.

The **Server Manager** window is displayed.

**Figure 5-23 Server Manager (Windows Server 2008)**

**Step 3** Disks are listed in the right pane. If the new disk is in the offline state, bring it online before initialize it.

In the **Disk 1** area, right-click and choose **Online** from the shortcut menu.

When the Disk 1 status changes from **Offline** to **Not Initialized**, the disk has been brought online.
Step 4  In the Disk 1 area, right-click and choose Initialize Disk from the shortcut menu. The Initialize Disk dialog box is displayed.

Step 5  In the Initialize Disk dialog box, the to-be-initialized disk is selected. In this example, the disk capacity is larger than 2 TB. Therefore, select GPT (GUID Partition Table) and click OK.

The Server Manager window is displayed.
The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Because a data disk currently supports up to 32 TB, use the GPT partition style if your disk capacity is larger than 2 TB.

If you change the disk partition style after the disk has been used, the data on the disk will be cleared. Therefore, select a proper disk partition style when initializing the disk.

**Step 6** Right-click at the unallocated disk space and choose **New Simple Volume** from the shortcut menu.

The **New Simple Volume Wizard** window is displayed.
Step 7 Follow the prompts and click **Next**.

The **Specify Volume Size** page is displayed.

Step 8 Specify the volume size and click **Next**. The system selects the maximum volume size by default. You can specify the volume size as required. In this example, the default setting is used.

The **Assign Drive Letter or Path** page is displayed.
Step 9  Assign a drive letter or path to your partition and click **Next**. The system assigns drive letter D by default. In this example, the default setting is used.

The **Format Partition** page is displayed.

**Figure 5-30 Format Partition (Windows Server 2008)**

Step 10  Specify format settings and click **Next**. The system selects the NTFS file system by default. You can specify the file system type as required. In this example, the default setting is used.

The **Completing the New Simple Volume Wizard** page is displayed.
The partition sizes supported by file systems vary. Therefore, you are advised to choose an appropriate file system based on your service requirements.

**Step 11** Click **Finish**.

Wait for the initialization to complete. When the volume status changes to **Healthy**, the initialization has finished successfully, as shown in *Figure 5-32*. 
Step 12 After the volume is created, click and check whether a new volume appears in Computer. In this example, New Volume (D:) is the new volume.

If New Volume (D:) appears, the disk is successfully initialized and no further action is required.

Figure 5-33 Computer (Windows Server 2008)
5.7 Initializing a Windows Data Disk Larger Than 2 TB (Windows Server 2012)

Scenarios

This topic uses Windows Server 2012 R2 Standard 64bit to describe how to initialize a data disk whose capacity is larger than 2 TB. In the following operations, the capacity of the sample disk is 3 TB.

The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Therefore, use the GPT partition style if your disk capacity is larger than 2 TB. For details, see 5.6 Initializing a Windows Data Disk Larger Than 2 TB (Windows Server 2008). For details about disk partition styles, see 5.1 Introduction to Data Disk Initialization Scenarios and Partition Styles.

The method for initializing a disk varies depending on the OS running on the server. This document is used for reference only. For the detailed operations and differences, see the product documents of the corresponding OS.

NOTICE

When using a disk for the first time, if you have not initialized it, including creating partitions and file systems, the additional space added to this disk in an expansion later may not be normally used.

Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
  - For how to log in to an ECS, see the Elastic Cloud Server User Guide.
  - For how to log in to a BMS, see the Bare Metal Server User Guide.

Procedure

Step 1 On the desktop of the server, click in the lower area.

The Server Manager window is displayed.
Step 2  In the upper right corner, choose Tools > Computer Management. The Computer Management window is displayed.

Step 3  Choose Storage > Disk Management.
Disks are displayed in the right pane.
Figure 5-36 Disk list

Step 4 (Optional) If the new disk is in the offline state, bring it online before initializing it.

In the Disk 1 area, right-click and choose Online from the shortcut menu.

When the status of Disk 1 changes from Offline to Not Initialized, the disk has been brought online.

Figure 5-37 Bring online succeeded (Windows Server 2012)

Step 5 In the Disk 1 area, right-click and choose Initialize Disk from the shortcut menu.
The Initialize Disk dialog box is displayed.

**Figure 5-38 Initialize Disk (Windows Server 2012)**

Step 6 In the Initialize Disk dialog box, the to-be-initialized disk is selected. In this example, the disk capacity is larger than 2 TB. Therefore, select GPT (GUID Partition Table) and click OK.

The Computer Management window is displayed.

**Figure 5-39 Computer Management (Windows Server 2012)**
NOTICE

The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Because a data disk currently supports up to 32 TB, use the GPT partition style if your disk capacity is larger than 2 TB.

If you change the disk partition style after the disk has been used, the data on the disk will be cleared. Therefore, select a proper disk partition style when initializing the disk.

**Step 7** Right-click at the unallocated disk space and choose **New Simple Volume** from the shortcut menu.

The **New Simple Volume Wizard** window is displayed.

**Figure 5-40** New Simple Volume Wizard (Windows Server 2012)

**Step 8** Follow the prompts and click **Next**.

The **Specify Volume Size** page is displayed.
**Figure 5-41** Specify Volume Size (Windows Server 2012)

**Step 9** Specify the volume size and click **Next**. The system selects the maximum volume size by default. You can specify the volume size as required. In this example, the default setting is used.

The **Assign Drive Letter or Path** page is displayed.

**Figure 5-42** Assign Driver Letter or Path (Windows Server 2012)

**Step 10** Assign a drive letter or path to your partition and click **Next**. The system assigns drive letter D by default. In this example, the default setting is used.
The **Format Partition** page is displayed.

**Figure 5-43** Format Partition (Windows Server 2012)

---

**Step 11** Specify format settings and click **Next**. The system selects the NTFS file system by default. You can specify the file system type as required. In this example, the default setting is used.

The **Completing the New Simple Volume Wizard** page is displayed.

**Figure 5-44** Completing the New Simple Volume Wizard (Windows Server 2012)
The partition sizes supported by file systems vary. Therefore, you are advised to choose an appropriate file system based on your service requirements.

**Step 12** Click Finish.

Wait for the initialization to complete. When the volume status changes to Healthy, the initialization has finished successfully, as shown in Figure 5-45.

**Figure 5-45** Disk initialization succeeded (Windows Server 2012)

**Step 13** After the volume is created, click and check whether a new volume appears in This PC. In this example, New Volume (D:) is the new volume.

If New Volume (D:) appears, the disk is successfully initialized and no further action is required.
5.8 Initializing a Linux Data Disk Larger Than 2 TB (parted)

Scenarios

This topic uses CentOS 7.4 64bit to describe how to use parted to initialize a data disk whose capacity is larger than 2 TB. In the following operations, the capacity of the sample disk is 3 TB.

The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Therefore, use the GPT partition style if your disk capacity is larger than 2 TB. In Linux, if you choose to use the GPT partition style, the fdisk partitioning tool cannot be used. Use the parted partitioning tool instead. For details about disk partition styles, see 5.1 Introduction to Data Disk Initialization Scenarios and Partition Styles.

The method for initializing a disk varies depending on the OS running on the server. This document is used for reference only. For the detailed operations and differences, see the product documents of the corresponding OS.

---

NOTICE

When using a disk for the first time, if you have not initialized it, including creating partitions and file systems, the additional space added to this disk in an expansion later may not be normally used.
Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
  - For how to log in to an ECS, see the Elastic Cloud Server User Guide.
  - For how to log in to a BMS, see the Bare Metal Server User Guide.

Creating and Mounting a Partition

The following example shows you how a new partition can be created on a new data disk that has been attached to a server. The partition will be created using parted, and GPT is used as the partition style. Furthermore, the partition will be formatted using the ext4 file system, mounted on `/mnt/sdc`, and configured automatic mounting at system start.

**Step 1** Run the following command to query information about the new data disk:

```bash
lsblk
```

Information similar to the following is displayed:

```
[root@ecs-centos74 ~]# lsblk
NAME   MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
vda    253:0    0  40G  0 disk
├─vda1 253:1    0   1G  0 part /boot
└─vda2 253:2    0  39G  0 part /
```

In the command output, the server contains two disks. `/dev/vda` is the system disk, and `/dev/vdb` is the new data disk.

**Step 2** Run the following command to enter parted to partition the new data disk:

```bash
parted
```

In this example, run the following command:

```bash
parted /dev/vdb
```

Information similar to the following is displayed:

```
[root@ecs-centos74 ~]# parted /dev/vdb
GNU Parted 3.1
Using /dev/vdb
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted)
```

**Step 3** Enter `p` and press Enter to view the current disk partition style.

Information similar to the following is displayed:

```
(parted) p
Error: /dev/vdb: unrecognised disk label
Model: Virtio Block Device (virtblk)
Disk /dev/vdb: 3299GB
Sector size (logical/physical): 512B/512B
Partition Table: unknown
Disk Flags: (parted)
```

In the command output, the Partition Table value is `unknown`, indicating that no partition style is set for the new disk.
Step 4  Run the following command to set the disk partition style:

`mklabel Disk partition style`

In this example, run the following command to set the disk partition style to GPT:

```
(Disk partition styles can be MBR or GPT.)
```

`mklabel gpt`

**NOTICE**

The maximum disk capacity supported by MBR is 2 TB, and that supported by GPT is 18 EB. Because a data disk currently supports up to 32 TB, use the GPT partition style if your disk capacity is larger than 2 TB.

If you change the disk partition style after the disk has been used, the data on the disk will be cleared. Therefore, select a proper disk partition style when initializing the disk.

Step 5  Enter `p` and press **Enter** to view the disk partition style.

Information similar to the following is displayed:

```
(parted) mklabel gpt
(parted) p
Model: Virtio Block Device (virtblk)
Disk /dev/vdb: 3299GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number Start End Size File system Name Flags

(parted)
```

Step 6  Enter `unit s` and press **Enter** to set the measurement unit of the disk to sector.

Step 7  Run the following command and press **Enter**:

```
mkpart Partition name Start sector End sector
```

In this example, run the following command:

`mkpart opt 2048s 100%`

In this example, one partition is created for the new data disk. Value **2048s** indicates the disk start sector, and **100%** indicates the disk end sector. The two values are used for reference only. You can determine the number of partitions and the partition size based on your service requirements.

Information similar to the following is displayed:

```
Warning: The resulting partition is not properly aligned for best performance.
Ignore/Cancel? Ignore
```

If the preceding warning message is displayed, enter **Ignore** to ignore the performance warning.

Step 8  Enter `p` and press **Enter** to view details about the new partition.

Information similar to the following is displayed:
Model: Virtio Block Device (virtblk)
Disk /dev/vdb: 6442450944s
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

<table>
<thead>
<tr>
<th>Number</th>
<th>Start</th>
<th>End</th>
<th>Size</th>
<th>File system</th>
<th>Name</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2048s</td>
<td>6442448895s</td>
<td>6442446848s</td>
<td></td>
<td>opt</td>
<td></td>
</tr>
</tbody>
</table>

Details about the dev/vdb1 partition are displayed.

**Step 9**  Enter `q` and press `Enter` to exit parted.

**Step 10**  Run the following command to view the disk partition information:

```bash
lsblk
```

Information similar to the following is displayed:

```
NAME   MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
vda    253:0    0  40G  0 disk
   └─vda1 253:1    0   1G  0 part /boot
vda2 253:2    0   39G  0 part /
vdb    253:16   0   3T  0 disk
   └─vdb1 253:17   0   3T  0 part
```

In the command output, /dev/vdb1 is the partition you created.

**Step 11**  Run the following command to set the file system format for the new partition:

```bash
mkfs -t File system format /dev/vdb1
```

In this example, run the following command to set the ext4 file system for the new partition:

```bash
mkfs -t ext4 /dev/vdb1
```

Information similar to the following is displayed:

```
[root@ecs-centos74 ~]# mkfs -t ext4 /dev/vdb1
mke2fs 1.42.9 (28-Dec-2013)
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=0 blocks, Stripe width=0 blocks
201326592 inodes, 805305856 blocks
40265292 blocks (5.00%) reserved for the super user
First data block=0
Maximum filesystem blocks=2952790016
24576 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Superblock backups stored on blocks:
  32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
  4096000, 7962624, 11239424, 20480000, 23887872, 71663616, 78675968,
  102400000, 214990848, 512000000, 550731776, 644972544
Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done
```

The formatting takes a period of time. Observe the system running status and do not exit.
**NOTICE**

The partition sizes supported by file systems vary. Therefore, you are advised to choose an appropriate file system based on your service requirements.

---

**Step 12** Run the following command to create a mount point:

```bash
mkdir Mount point
```

In this example, run the following command to create the `/mnt/sdc` mount point:

```bash
mkdir /mnt/sdc
```

**Step 13** Run the following command to mount the new partition on the created mount point:

```bash
mount Disk partition Mount point
```

In this example, run the following command to mount the new partition `/dev/vdb1` on `/mnt/sdc`:

```bash
mount /dev/vdb1 /mnt/sdc
```

**Step 14** Run the following command to view the mount result:

```bash
df -TH
```

Information similar to the following is displayed:

```
[root@ecs-centos74 ~]# df -TH
Filesystem  Type      Size  Used Avail Use% Mounted on
/dev/vda2    ext4       42G  1.5G  38G   4% / 
devtmpfs     devtmpfs  2.0G     0  2.0G   0% /dev
tmpfs        tmpfs     2.0G     0  2.0G   0% /dev/shm
tmpfs        tmpfs     2.0G  8.9M  2.0G   1% /run
tmpfs        tmpfs     2.0G  8.9M  2.0G   1% /run
/dev/vda1    ext4      1.1G  153M  801M  17% /boot
/dev/vdb1    ext4      3.3T   93M  3.1T   1% /mnt/sdc
```

New partition `dev/vdb1` is mounted on `/mnt/sdc`.

----End

**Setting Automatic Mounting at System Start**

To automatically mount disk partitions at system start, do not specify partitions, for example `/dev/vdb1`, in `/etc/fstab` because the sequence of cloud devices, and therefore their names may change during the server stop and start. You are advised to use the universally unique identifier (UUID) in `/etc/fstab` to set automatic mounting at system start.

**NOTE**

UUID is the unique character string for disk partitions in a Linux system.

**Step 1** Run the following command to query the partition UUID:

```bash
blkid Disk partition
```
In this example, run the following command to query the UUID of the `/dev/vdb1` partition:

```
blkid /dev/vdb1
```

Information similar to the following is displayed:

```
[root@ecs-test-0001 ~]# blkid /dev/vdb1
/dev/vdb1: UUID="0b3040e2-1367-4abb-841d-ddb0b92693df" TYPE="ext4"
```

The UUID of the `/dev/vdb1` partition is displayed.

**Step 2** Run the following command to open the `fstab` file using the vi editor:

```
vi /etc/fstab
```

**Step 3** Press `i` to enter the editing mode.

**Step 4** Move the cursor to the end of the file and press `Enter`. Then, add the following information:

```
UUID=0b3040e2-1367-4abb-841d-ddb0b92693df /mnt/sdc                ext4    defaults        0 2
```

The preceding content is used for reference only. Add the information that is used in the environment. The parameters are described as follows:

- The first column indicates the partition UUID obtained in **Step 1**.
- The second column indicates the directory on which the partition is mounted. You can query the mount point using the `df -TH` command.
- The third column indicates the file system format of the partition. You can query the file system format using the `df -TH` command.
- The fourth column indicates the partition mount option. Normally, this parameter is set to `defaults`.
- The fifth column indicates the Linux dump backup option.
  - 0: not use Linux dump backup. Normally, dump backup is not used, and you can set this parameter to 0.
  - 1: use Linux dump backup.
- The sixth column indicates the fsck option, that is, whether to use fsck to check the attached disk during startup.
  - 0: not use fsck.
  - 1: use fsck.

When the parameter is set to 1 for the root partition, this parameter for other partitions must start with 2 so that the system checks the partitions in the ascending order of the values.

**Step 5** Press `Esc`, enter `.wq`, and press `Enter`.

The system saves the configurations and exits the vi editor.

**Step 6** Perform the following operations to verify the automatic mounting function:

1. Run the following command to unmount the partition:
   ```
   umount Disk partition
   ```
   In this example, run the following command:
   ```
   umount /dev/vdb1
   ```
2. Run the following command to reload all the content in the `/etc/fstab` file:
   ```bash
   mount -a
   ```

3. Run the following command to query the file system mounting information:
   ```bash
   mount | grep Mount point
   ```
   In this example, run the following command:
   ```bash
   mount | grep /mnt/sdc
   ```
   If information similar to the following is displayed, the automatic mounting function takes effect:
   ```bash
   root@ecs-test-0001 ~]# mount | grep /mnt/sdc
   /dev/vdb1 on /mnt/sdc type ext4 (rw,relatime,data=ordered)
   ```

----End
6 Example: Quickly Creating and Using an EVS Disk
## Change History

<table>
<thead>
<tr>
<th>Release Date</th>
<th>What's New</th>
</tr>
</thead>
</table>
| 2018-09-26   | This issue is the third official release, which incorporates the following change:  
  - Modified the parameter list for purchasing disks according to the modifications made on the console. |
| 2018-06-30   | This issue is the second official release, which incorporates the following changes:  
  - Added section Initializing a Windows Data Disk Greater Than 2 TB (Windows Server 2008).  
  - Added section Initializing a Windows Data Disk Greater Than 2 TB (Windows Server 2012).  
  - Added section Initializing a Linux Data Disk Greater Than 2 TB (parted). |
| 2018-06-15   | This issue is the first official release. |