Image Management Service

FAQs

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1.1 How Do I Select an Image?

When creating an ECS or BMS, you can select an appropriate image from multiple image types with different OSs based on the following factors:

- **Region and AZ**
- **Image Type**
- **Image Fee**
- **OS**

**Region and AZ**

An image is a regional resource. You cannot use an image to create an instance across regions. For example, when creating an instance in **CN North-Beijing1**, you can select an image only from **CN North-Beijing1**. For more regions, see [Region and AZ](#).

If you want to use an image in another region to create an instance, copy the image to the current region first. For details, see [Replicating Images Across Regions](#).

**Image Type**

Images are classified into public images, private images, shared images, and Marketplace images. Private images are classified into system disk images, data disk images, and full-ECS images. For details, see [What Is Image Management Service?](#).

**Image Fee**

You may be charged for using an image. For details, see [What Are the Charging Standards of IMS?](#).

**OS**

When selecting an OS, consider the following factors:
• Architecture types

<table>
<thead>
<tr>
<th>System Architecture</th>
<th>Applicable Memory</th>
<th>Constraints</th>
</tr>
</thead>
</table>
| 32-bit               | Smaller than 4 GB | • If the instance memory is greater than 4 GB, the 32-bit OS cannot be used.  
• A 32-bit OS allows addressing only within a 4 GB memory range. An OS with more than 4 GB memory cannot be accessed. |
| 64-bit               | 4 GB or larger    | If your application requires more than 4 GB memory or the memory may need to be expanded to more than 4 GB, use a 64-bit OS. |

• OS types

<table>
<thead>
<tr>
<th>OS Type</th>
<th>Applicable Scenario</th>
<th>Constraints</th>
</tr>
</thead>
</table>
| Windows   | • Runs programs developed on Windows (for example, .NET).  
• Supports databases such as SQL Server. (You need to install the database.) | The system disk must be no less than 40 GB, and the memory must be no less than 1 GB. |
| Linux     | • Runs high-performance server applications (for example, Web) and supports common programming languages such as PHP and Python.  
• Supports databases such as MySQL. (You need to install the database.) | The system disk must be no less than 40 GB, and the memory must be no less than 512 MB. |

1.2 How Do I Select an OS?

• Windows
  Used for development platforms or operating services that run Windows.  
The system disk must be no less than 40 GB, and the memory must be no less than 1 GB.  
Internet Information Services (IIS) and SQL Server can be installed.

• Linux
  Used for development platforms or operating services that run Linux. CentOS and Ubuntu are provided. CentOS is recommended.
The system disk must be no less than 40 GB, and the memory must be no less than 512 MB.

- OS with greater than 4 GB memory
  Because 32-bit OSs allow addressing only within a 4 GB memory range, if the required memory capacity is 4 GB or larger, select a 64-bit OS.

1.3 What Do I Do If I Cannot Find a Desired Image?

HUAWEI CLOUD supports the following public images: Windows, CentOS, SUSE, Debian, openSUSE, Fedora, Ubuntu, EulerOS, and CoreOS. You can view the OS type and version on the Public Images page on the management console.

- If you cannot find a desired image, you can download the image file from the official OS website and then create a private image from the image file. For details, see Creating a Windows System Disk Image from an External Image File or Creating a Linux System Disk Image from an External Image File. The external image file can be in the VMDK, VHD, QCOW2, RAW, VHDX, QED, VDI, QCOW, ZVHD2, or ZVHD format.

- If you have an ISO file and the OS matching the file is supported by the cloud platform (for details, see Formats and OSs Supported for External Image Files), you can use either of the following methods to create a private image:
  a. Create a private image on the management console. For details, see Creating a Windows System Disk Image from an ISO File or Creating a Linux System Disk Image from an ISO File.
  b. Use VirtualBox to create a private image. For details, see Creating a Windows Image Using VirtualBox and an ISO File or Creating a Linux Image Using VirtualBox and an ISO File.

If you fail to create a private image after the preceding operations, you are advised to create a service ticket to contact HUAWEI CLOUD technical support.

1.4 What Do I Do If I Want to Set Up an OpenVPN Environment But No Image Containing OpenVPN Is Available?

A public image does not contain applications such as OpenVPN. You need to manually set up the environment or install OpenVPN from an image on the Marketplace.

1.5 What Are the Charging Standards of IMS?

When you use public images to create ECSs, you will be charged the license fees of some commercial OSs. ECS fees are also related to the flavor. For details, see Price Calculator.

Private images are free. Table 1-1 provides the pricing details of resources related to private images.
### Table 1-1 IMS pricing details

<table>
<thead>
<tr>
<th>Operation</th>
<th>Billing Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>System and data disk images</td>
<td>OBS storage space</td>
</tr>
<tr>
<td>Full-ECS images</td>
<td>CSBS or CBR backup storage</td>
</tr>
<tr>
<td>Marketplace images</td>
<td>Determined by the image provider.</td>
</tr>
<tr>
<td>External image files uploaded to an OBS bucket</td>
<td>OBS storage space (You are advised to delete unneeded image files.)</td>
</tr>
</tbody>
</table>
| Cross-region replication of system disk image and data disk images | ● OBS storage space and traffic for cross-region replication  
● OBS space for storing the newly replicated image |
| Cross-region replication of full-ECS images    | ● CSBS or CBR storage space and traffic for cross-region replication  
● CSBS or CBR space for storing the newly replicated image |

**NOTE**

System disk images and data disk images are stored in OBS buckets invisible to users. Images are managed and maintained through IMS. In addition, the storage space is charged following the OBS charging rules.

- For OBS pricing details, see [OBS Pricing Details](#).
- For CSBS pricing details, see [CSBS Pricing Details](#).
- For CBR pricing details, see [CBR Pricing Details](#).
- License
  - If you use CentOS or Ubuntu images to create ECSs, you are not charged for the OS license.
  - If you use Windows images to create ECSs, you are charged for the OS license. The billing mode can be **Yearly/Monthly** or **Metered**, which is the same as that of ECSs.

### 1.6 How Do I Increase the Image Quota?

**What Is Quota?**

Quotas are enforced for service resources on the platform to prevent unforeseen spikes in resource usage. Quotas can limit the number or amount of resources available to users, such as the maximum number of ECSs or EVS disks that can be created.

If the existing resource quota cannot meet your service requirements, you can apply for a higher quota.
How Do I View My Quotas?

1. Log in to the management console.
2. Click 🗺 in the upper left corner and select the desired region and project.
3. In the upper right corner of the page, choose Resources > My Quotas. The Service Quota page is displayed.

![My Quotas](image)

4. View the used and total quota of each type of resources on the displayed page. If a quota cannot meet service requirements, click Increase Quota to adjust it.

How Do I Apply for a Higher Quota?

1. Log in to the management console.
2. In the upper right corner of the page, choose Resources > My Quotas. The Service Quota page is displayed.

![My Quotas](image)

3. Click Increase Quota.
4. On the Create Service Ticket page, configure parameters as required. In Problem Description area, fill in the content and reason for adjustment.
5. After all necessary parameters are configured, select I have read and agree to the Tenant Authorization Letter and Privacy Statement and click Submit.

1.7 What Are the Differences Between Images and Backups?

CBR and Image Management Service (IMS) have some complementary functions and can be used together in certain scenarios. Like CBR, IMS can also be used to back up ECSs.

Differences Between Backups and Images

Table 1-2 lists the differences between them.

<table>
<thead>
<tr>
<th>Item</th>
<th>CBR</th>
<th>IMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concept</td>
<td>A backup contains the status, configuration, and data of a cloud server or disk stored at a specific time point for recovery in case of a fault. It is used to ensure data security and improve availability.</td>
<td>An image provides all information required for starting a cloud server. It is used to create a cloud server and deploy software environments in batches. A system disk image contains an OS and pre-installed application software for running services. A data disk image contains service data. A full-ECS image contains both a system disk image and data disk images.</td>
</tr>
<tr>
<td>Item</td>
<td>CBR</td>
<td>IMS</td>
</tr>
<tr>
<td>------------------</td>
<td>----------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| Usage method     | • Data storage location: Unlike server or disk data, backups are stored in OBS. Deleting a disk will not clear its backups.  
• Operation object: A server or disk can be backed up at a given point in time. CBR supports automatic backup and automatic deletion by configuring backup policies.  
• Usage: Backups can be used to restore data to the original server or disk, or to create a new disk or full-ECS image.  
• Support exporting to a local PC: No | • Data storage location: Unlike server or disk data, backups are stored in OBS. If a server or disk that is created using an image is deleted, the image will not be cleared.  
• Operation object: The system disk and data disks of a server can be used to create private images. You can also create private images using external image files.  
• Usage: System disk images or full-ECS images can be used to create new servers, and data disk images can be used to create new disks for service migration.  
• Support exporting to a local PC: Yes However, full-ECS images cannot be exported to a local PC. |
| Application scenarios | CBR applies to the following scenarios:  
• Data backup and restoration  
• Rapid service deployment and migration | IMS applies to the following scenarios:  
• Server migration to the cloud or between clouds  
• Deploying a specific software environment  
• Deploying software environments in batches  
• Backing up server operating environments |
| Advantages | Supports automatic backup. Data on a server or disk at a certain time point can be retained periodically or quantitatively. You can back up on-premises VMware VMs, synchronize the backups to the cloud, and then use the backups to restore data to new ECSs. | Supports system disk backup. You can import the data disk image of a local server or a server provided by another cloud platform to IMS and then use the image to create an EVS disk. |
Although backups and images are stored in OBS, you cannot view backup and image data in OBS, because they do not occupy your resources. Backup fees are charged according to CBR's billing standard, and image storage fees are charged according to OBS's billing standard.

### Relationship Between Backups and Images

1. You can use an ECS backup to create a full-ECS image.
2. Before creating a full-ECS image for an ECS, you need to back up the target ECS.

#### 1.8 How Can I Back Up the Current Status of an ECS for Restoration in the Case of a System Fault?

You can back up the ECS in either of the following ways:

- **(Recommended)** Use CBR to create a scheduled backup task for the ECS. When the ECS is faulty, select the backup corresponding to the time point to which the ECS is to be restored, create a full-ECS image from the backup, and use the image to apply for a new ECS. Alternatively, you can change the image of the faulty ECS.
- Create a system disk image from the ECS. When the ECS is faulty, use the system disk image to apply for a new ECS or change the image of the faulty ECS.
- Create a snapshot for the system disk of the ECS. When the ECS is faulty, you can roll it back from the snapshot.

#### 1.9 How Is BIOS Different from UEFI?

<table>
<thead>
<tr>
<th>Boot Mode</th>
<th>Description</th>
<th>Highlight</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS</td>
<td>Basic Input Output System (BIOS) stores important basic input/output programs of ECSs, system settings, self-test programs upon system startup, and automatic startup programs.</td>
<td>Provides basic settings and control for ECSs.</td>
</tr>
<tr>
<td>Boot Mode</td>
<td>Description</td>
<td>Highlight</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------</td>
<td>-----------</td>
</tr>
<tr>
<td>UEFI</td>
<td>UEFI, an acronym for Unified Extensible Firmware Interface, is a specification that defines a software interface between an OS and platform firmware. UEFI can be used to automatically load an OS from a pre-boot operating environment.</td>
<td>Shortens the OS startup time and the time that the OS needs to recover from the sleep state.</td>
</tr>
</tbody>
</table>
2 Image Creation

2.1 Image Creation FAQs

How Many Private Images Can be Created Under an Account?
At present, you can create a maximum of 50 private images under an account within a region. To create more private images, submit a service ticket to increase your quota. For details, see How Do I Increase the Image Quota?

Should I Stop the ECS Before Using It to Create a Private Image?
No. You can create an image from a running ECS. However, if data is written to the ECS during image creation, the data is not contained in the created image.

Where Can I View the Image Creation Progress? How Long Does It Take to Create an Image?
Log in to the management console. Choose Computing > Image Management Service and click the Private Images tab. View the image creation progress in the Status column.

The time required for creating an image depends on the network speed, image file type, and disk size of the instance to which the image belongs.

Will a Private Image Be Automatically Deleted by the System If I Unsubscribe from or Delete the ECS Used to Create the Image?
Private images created using ECSs are stored in OBS buckets. Unsubscribing or deleting the ECS used to create a private image does not affect the image.

Can I Select a Private Image Created Under a Subaccount When Creating an ECS Under the Main Account?
Yes.
Private images created under a subaccount are visible to the main account and all the other subaccounts (if any) under the main account.
If the private image is a system disk image or full-ECS image, you can select **Private Image** when creating an ECS. Then, select this image from the drop-down list.

If the private image is a data disk image, select **Image** for **Data Source** when creating an EVS disk. Then, select this image in the displayed dialog box.

In addition, private images created under the main account are visible to all of its subaccounts.

### 2.2 Full-ECS Image FAQs

#### What Is a Full-ECS Image?

A full-ECS image contains the OS, applications, and service data of an ECS. Generally, a full-ECS image is used to migrate all data of an ECS. For example:

- Sharing an ECS with other tenants
- Migrating an ECS from **CN North-Beijing1** to **CN South-Guangzhou**
- Migrating data from an old ECS to a new one

#### Why Do I Have to Select a Vault When Creating a Full-ECS Image? Do I Need to Pay for the Vault?

When creating a full-ECS image from a CBR backup, you must select a vault. The vault functions as a storage container, in which images and backups are stored. You need to pay for the vault.

When creating a full-ECS image from a CSBS backup, the storage space of the full-ECS image is occupied. Vaults are not open to users.

Therefore, no matter which backup type you select, you need to pay for the vault. Selecting a vault does not mean that you need to pay extra fees for the vault.

#### Where Can I View the Data Disk Information of a Successfully Created Full-ECS Image?

After a full-ECS image is created, only the system disk information (**Disk Capacity**) is displayed in the image list and image details. You can view the data disk information in CSBS or CBR. Whether to view the data disk details in CSBS or CBR depends on the type of backup from which the full-ECS image is created.

The following describes how to view the data disk details in CBR:

1. In the private image list, click the full-ECS image name. Image details are displayed.
2. Locate **Source** and click the backup ID following it. The CBR details page is displayed.
3. Click the **Disk Backup** tab. Details about the system disk and data disks are displayed.

**Figure 2-2 Disk backup**

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Disk Name</th>
<th>Used As</th>
<th>Disk Capacity (GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>manuahdk_3x43_ecs-37389_</td>
<td>Available</td>
<td>ecs-37389-volume-0000</td>
<td>System Disk</td>
<td>40</td>
</tr>
<tr>
<td>manuahdk_3x43_ecs-37389_</td>
<td>Available</td>
<td>ecs-37389-volume-0001</td>
<td>Data Disk</td>
<td>100</td>
</tr>
</tbody>
</table>

**What Are the Restrictions on Using a Full-ECS Image?**

- A full-ECS image cannot be published as a Marketplace image.
- A full-ECS image cannot be exported. You are advised to create images for the system disk and data disks separately and then export the images.
- A full-ECS image supports only cross-region replication and does not support in-region replication.
- Only the full-ECS image created from a CBR backup is shareable with other tenants.

**2.3 How Can I Use a Backup to Create an EVS Disk or ECS?**

You can use CSBS backups to create ECSs and use VBS backups to create EVS disks.

- CSBS backups cannot be directly used to create ECSs. You need to use a backup to create a private image and then use the private image to create ECSs.

  For details about how to create a private image from a CSBS backup, see Creating a Full-ECS Image from a CSBS Backup. For details about how to create ECSs from a private image, see Creating an ECS from an Image.

- VBS backups can be directly used to create EVS disks. For details, see Using a Backup to Create a Disk.
2.4 Can I Use Images in Formats Other Than Those Specified in This Document?

No, you cannot. Currently, only the VMDK, VHD, RAW, QCOW2, VHDX, QED, VDI, QCOW, ZVHD2, and ZVHD are supported.

Images of the -flat.vmdk format and image file packages containing snapshot volumes or delta volumes are not supported. You can use qemu-img to convert the format of an image into a supported one before uploading it to the cloud platform.

NOTE

For how to install and use qemu-img on Windows, visit the following website:
https://cloudbase.it/qemu-img-windows/

2.5 How Do I Import an OVF or OVA File to the Cloud Platform?

Scenarios

Open Virtualization Format (OVF) and Open Virtualization Appliance (OVA) contain necessary information for deploying cloud services.

The files contained in an OVF folder are mandatory for defining and deploying cloud servers. The OVF file uses .ovf as the file name extension and contains an OVF descriptor and an XML file.

An OVA file is a single compressed package. All cloud server information is encapsulated in the package. An OVA file contains all file types in an OVF package. OVA is a compression mode of OVF, that is, compressing OVF files into a single file.

This section describes how to import OVF and OVA files to the cloud platform.

Windows

- If you choose to export an OVF template and save it to the OvfLib folder in drive C, the template name is MyVm. After the export is complete, the generated folder content is as follows (the VMDK file can be uploaded to the cloud platform):
  
  C:\OvfLib\MyVm\MyVm.ovf
  C:\OvfLib\MyVm.mf
  C:\OvfLib\MyVm-disk1.vmdk

- If you choose the OVA format and define the template name as MyVm, the C: \MyVm.ova file will be generated. The VMDK file obtained after decompression can be uploaded to the cloud platform.
**NOTE**
You can import an image file in the VHD, VMDK, QCOW2, RAW, VHDX, QCOW, VDI, QED, ZVHD, or ZVHD2 format to create a private image. QCOW2 image files are recommended. If you need to import an image file in other formats, use the `qemu-img` tool to convert the image format before importing the image file.

**Linux**

- If you choose to export the OVF template, upload the VMDK file generated in the folder to the cloud platform.
- If you choose to export the OVA template and define the template name as `MyVm`, perform the following operations:
  a. Run the following command to view the OVA file:
     ```
     file MyVm.ova
     ```
     The command output is as follows:
     ```
     MyVm.ova: POSIX tar archive (GNU)
     ```
     The command output contains the following two files:
     ```
     $ tar tf MyVm.ova
     ```
     ```
     MyVm.ovf
     MyVm.vmdk
     ```
  b. Run the following command to decompress the OVA package:
     ```
     tar xvf MyVm.ova
     ```
     The extracted folder contains the following files:
     ```
     MyVm.ovf
     MyVm.vmdk
     ```
     The image file in the VMDK format can be uploaded to the cloud platform.

**NOTE**
You can import an image file in the VHD, VMDK, QCOW2, RAW, VHDX, QCOW, VDI, QED, ZVHD, or ZVHD2 format to create a private image. QCOW2 image files are recommended. If you need to import an image file in other formats, use the `qemu-img` tool to convert the image format before importing the image file.

### 2.6 How Do I Create a Full-ECS Image Using an ECS That Has a Spanned Volume?

An ECS used to create a Windows full-ECS image cannot have a spanned volume. Otherwise, data may be lost when the full-ECS image is used to create ECSs.

If the ECS has a spanned volume, back up the data in the spanned volume and then delete this volume from the ECS. Use the ECS to create a full-ECS image. Use the full-ECS image to create an ECS. You can also use the backup to create a spanned volume if necessary.

**NOTE**
If a Linux ECS has a volume group or a logical volume consisting of multiple physical volumes, back up the data in the volume group or logical volume and delete the volume group or logical volume before creating a full-ECS image using this ECS to prevent data loss.
2.7 Why Is Sysprep Required for Creating a Private Image from a Windows ECS?

Why Is Sysprep Required?

For a user that needs to be added to the domain and uses the domain account to log in to Windows, the Sysprep operation is required before creating private images. Otherwise, the image will contain information about the original ECS, especially the SID. ECSs with the same SID cannot be added to a domain. If Windows does not require any user or ECS to be added to the domain, you do not need to run Sysprep.

**NOTICE**

- Before running Sysprep, ensure that Windows is activated.
- For details about Sysprep, visit [https://docs.microsoft.com/en-us/previous-versions/windows/it-pro/windows-vista/cc721940(v=ws.10)?redirectedfrom=MSDN](https://docs.microsoft.com/en-us/previous-versions/windows/it-pro/windows-vista/cc721940(v=ws.10)?redirectedfrom=MSDN).

Restrictions on Running Sysprep

Due to OS limitations, Sysprep can only be used for configuring a new Windows installation. You can run Sysprep multiple times to install and configure Windows. However, you can reset and activate Windows OS only three times, and you are not allowed to use Sysprep to re-configure the existing Windows OS.

**NOTE**

In the Windows command line, enter the following command to check how many times you can run Sysprep in the displayed Windows Script Host dialog box:

```
slmgr /dlv
```

If the value of Remaining Windows rearm count is 0, you cannot run Sysprep.

2.8 What Do I Do If the ECS Created from a Windows Image Fails to Start After Running Sysprep?

**Symptom**

1. After Sysprep is executed, the following message is displayed when you start the ECS.
Then, the following information is displayed in the dialog box:

Windows could not parse or process the unattend answer file for pass [specialize]. A component or setting specified in the answer file does not exist. The error was detected while processing settings for component [Microsoft-Windows-Shell-Setup].

2. Click OK. The following information is displayed in the dialog box:

The computer accidentally restarts or encounters an error. Windows installation cannot continue. Click OK to restart the computer and restart the installation.

3. Open setupact.log in C:\Windows\Panther and check whether the log contains the following information.

Solution

1. Create an ECS from a public image. (You are advised to use a public image to create another ECS because Sysprep can be executed only for certain times.)

2. Create an Unattend.xml file or modify the Unattend.xml file provided by the system.
   - If you create an Unattend.xml file, ensure that the created file is used when you run Sysprep. For details about the file, visit:
   - If you modify the Unattend.xml file (in the C:\Program Files\Cloudbase Solutions\Cloudbase-Init\conf directory), delete the RunSynchronous part from the file.
3. Run Sysprep. For details, see Running Sysprep.

---

**NOTICE**

If you use the `Unattend.xml` file created by yourself, check the `Unattend.xml` path when running Sysprep to ensure that the newly created `Unattend.xml` file is used.

---

4. Create an image from the ECS where Sysprep has been executed.

## 2.9 What Is the Impact If I Do Not Pre-configure an ECS Used to Create a Private Image?

Before using an ECS or external image file to create a private image, you need to pre-configure the VM where the ECS or image file is located. If you do not perform the pre-configuration, there will be the following impacts:

1. If you do not set the IP address obtaining mode to DHCP for the ECS NICs or do not delete residual udev rules, ECSs created from the registered private image retain the configuration of the source image file, or the ECS NICs do not start from eth0. In this case, you need to remotely log in to the ECS to configure it.

2. If you do not configure the image used to create a Linux ECS, the following issues may occur during the ECS creation:
   - Customized passwords cannot be injected.
   - Certificated cannot be injected.
   - Other customized configurations cannot be performed on the ECS.

3. If you do not delete the automatic attaching detection information of user disks from the `fstab` file, the ECSs created from the private image may fail to start.

## 2.10 What Can I Do If I Configure an Incorrect OS or System Disk Size During Private Image Registration Using an Image File?

If you select an incorrect OS, ECSs may fail to be created from the private image. If the configured system disk size is less than the system disk size in the image file, the image will fail to be created.

In this case, delete the incorrect image and create a private image again using the correct parameter settings.
2.11 Why Does the Error Message Displayed on Task Center Indicates That the System Disk Size of the External Image File Exceeds the Maximum System Disk Size When a VHD Image File Failed to Be Uploaded?

If you fail to register an external image file as a private image and the error message displayed on Task Center indicates that the system disk size of the external image file exceeds the maximum system disk size you have configured, possible causes include:

1. The system disk size you have configured is less than the system disk size of the VM on the original platform. Confirm the system disk size of the image file and register it again.

2. The VHD image file is generated using `qemu-img` or similar tools and the virtual size of the VHD image is inconsistent with that of the original VM. For details, see [https://bugs.launchpad.net/qemu/+bug/1490611](https://bugs.launchpad.net/qemu/+bug/1490611). In this case, run the `qemu-img info` command.

   ```
   [xxxx@xxxxx test]$ qemu-img info 2g.vhd
   image: 2g.vhd
   file format: vpc
   virtual size: 2.0G (2147991552 bytes)
   disk size: 8.0K
   cluster_size: 2097152
   ```

   Check whether the virtual size value is an integer in GB. As shown in the preceding command output, `2147991552 bytes (2.0004 G)` is larger than `2 G`. Therefore, you need to configure a value larger than `2 GB` for the system disk size.
3 Image Optimization

3.1 Why Do I Need to Install and Update VMTools for Windows?

Why Do I Need to Install VMTools?

VMTools provides the VirtIO driver (a para-virtualization driver) for high-performance disks and NICs of ECSs.

- A standard Windows OS does not have the VirtIO driver.
- Public images provided on the platform have VMTools by default.
- You need to install VMTools for private images. For details, see Installing UVP VMTools.

Why Do I Need to Update VMTools?

The platform periodically synchronizes issues from the virtio community and releases updated versions every month. This ensures that known issues found in the community or R&D tests can be avoided on the latest driver.

When Do I Need to Update VMTools?

- If a major error occurs, you are advised to update VMTools immediately. This issue has not occurred. If other issues occur, choose whether to update VMTools based on your requirements.
- The platform updates the VMTools stored in the OBS bucket on a regular basis to ensure that the VMTools you download when creating private images is the latest version.
- Public images on the platform are updated on a regular basis to ensure that the latest version of VMTools is installed.
- The document is updated on a regular basis in accordance with VMTools in the OBS bucket to ensure that the download link of VMTools provided in the document is the latest.
What Operations Do I Need to Perform?

- Update Windows private images or drivers in running Windows ECSs as prompted.
- If you have any technical issue or question, contact the customer service.

3.2 What Changes Will Be Made to an Image File Used for Registering a Private Image?

If you enable automatic configuration when registering a private image using an image file, the system will perform the following operations:

**Linux**

- Check whether drivers related to the PV driver exist. If yes, delete them.
- Modify the `grub` and `syslinux` configuration files to add the OS kernel boot parameters and change the disk partition name (`UUID=UUID of the disk partition`).
- Change the names of the disk partitions in the `/etc/fstab` file (`UUID=UUID of the disk partition`).
- Check whether the `initrd` file has the Xen and IDE drivers. If no, load the Xen and IDE drivers.
- Modify X Window configuration file `/etc/X11/xorg.conf` to prevent display failures.
- Delete services of VMware tools.
- Record the latest automatic modification made to the image into `/var/log/rainbow_modification_record.log`.
- Linux OSs automatically copy the built-in VirtIO driver to initrd or initramfs. For details, see [Formats and OSs Supported for External Image Files](#).

**NOTE**

For image files in the following scenarios, this function does not take effect after Enable automatic configuration is selected:

- Image files whose `/usr` directory is an independent partition
- Fedora 29 64-bit and Fedora 30 64-bit image files that use the XFS file system
- Image files that use SUSE 12 SP4 64bit and the ext4 file system

**Windows**

- Restore the IDE driver to enable the system to use the IDE driver for its initial start.
- Delete the registry keys of the mouse and keyboard and generate the registry keys on the new platform to ensure that the mouse and keyboard are available.
- Restore the PV driver registry key to rectify the failure to install drivers and Xen driver conflict.
- Inject the VirtIO driver offline to solve the problem that the system cannot start when UVP VMTools is not installed.
- Restore DHCP. The system dynamically obtains information such as the IP address based on the DHCP protocol.

### 3.3 What Initial Configuration Needs to Be Performed on the ECS, BMS, or Image File Before It Is Used to Create an Image?

**ECS or Image File Configurations**

**Table 3-1 ECS configurations**

<table>
<thead>
<tr>
<th>OS</th>
<th>Configuration Item</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>• Setting the NIC to DHCP</td>
<td>Creating a System Disk Image from a Windows ECS</td>
</tr>
<tr>
<td></td>
<td>• Enabling remote desktop connection</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Installing the one-click password reset plug-in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• (Optional) Installing Cloudbase-Init</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Installing the Guest OS drivers, including the PV driver and UVP VMTools</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Running Sysprep</td>
<td></td>
</tr>
<tr>
<td>Linux</td>
<td>• Setting the NIC to DHCP</td>
<td>Creating a System Disk Image from a Linux ECS</td>
</tr>
<tr>
<td></td>
<td>• Installing the one-click password reset plug-in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• (Optional) Installing Cloud-Init</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Deleting files in the network rule directory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Changing the disk identifier in the GRUB configuration file to UUID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Changing the disk identifier in the fstab file to UUID</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Installing native Xen and KVM drivers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Detaching data disks of an ECS</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3-2 Image file configurations

<table>
<thead>
<tr>
<th>OS</th>
<th>Configuration Item</th>
<th>Reference</th>
</tr>
</thead>
</table>
| Windows | ● Setting the NIC to DHCP  
● Enabling remote desktop connection  
● Installing the Guest OS drivers, including the PV driver and UVP VMTools  
● (Optional) Installing Cloudbase-Init  
● (Optional) Enabling NIC multi-queue | [Preparing an Image File (Windows)]   |
| Linux  | ● Deleting files in the network rule directory  
● Setting the NIC to DHCP  
● Installing native Xen and KVM drivers  
● Changing the disk identifier in the GRUB configuration file to UUID  
● Changing the disk identifier in the fstab file to UUID  
● Deleting the automatic attachment information of non-system disks from the `/etc/fstab` file  
● (Optional) Installing Cloud-Init  
● (Optional) Enabling NIC multi-queue | [Preparing an Image File (Linux)]    |

**NOTE**

- When registering an external image file as a private image, you are advised to perform the preceding operations on the VM where the external image file is located.
- If the Guest OS driver is installed on the ECS, the cloud platform will check the image file after you select **Enable automatic configuration**. If the GuestOS driver is not installed, the cloud platform will try to install the driver.
**BMS or Image File Configurations**

**Table 3-3 BMS configurations**

<table>
<thead>
<tr>
<th>OS</th>
<th>Configuration Item</th>
<th>Reference</th>
</tr>
</thead>
</table>
| Windows| ● Installing the **bms-network-config** software package  
      ● Installing Cloudbase-Init  
      ● Deleting residual files in the OS | **Creating a Private Image from a BMS**             |
| Linux  | ● Installing the **bms-network-config** software package  
      ● Installing Cloud-Init  
      ● Deleting residual files in the OS | **Creating a Private Image from a BMS**             |

**Table 3-4 Image file configurations**

<table>
<thead>
<tr>
<th>OS</th>
<th>Configuration Item</th>
<th>Reference</th>
</tr>
</thead>
</table>
| Windows| ● Installing the V5 server driver  
      ● Installing Cloudbase-Init  
      ● Installing the **bms-network-config** software package  
      ● (Optional) Installing the SDI iNIC driver  
      ● (Optional) Installing the One-Click Password Reset Plug-in  
      ● Setting the Windows time zone  
      ● Setting the virtual memory  
      ● (Optional) Configuring automatic Windows update  
      ● Configuring the SID | **Private Image Creation Guide**                     |
<table>
<thead>
<tr>
<th>OS</th>
<th>Configuration Item</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td>● Installing and configuring Cloud-Init.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Modifying the hardware device driver that boots the OS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Installing the <code>bms-network-config</code> software package</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● (Optional) Installing the SDI iNIC driver</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● (Optional) Installing the Hi1822 NIC driver</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● (Optional) Installing the IB driver</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● (Optional) Installing the V5 server driver</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● (Optional) Installing the UltraPath software</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● (Optional) Installing the one-click password reset plug-in</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Performing security configuration</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Configuring remote login to the BMS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Configuring automatic root partition expansion</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Private Image Creation Guide</strong></td>
<td></td>
</tr>
</tbody>
</table>

3.4 What Do I Do If the Initial Configurations of a Windows External Image File Are Not Completed Before the File Is Exported?

The ECS where the external image file is located is not configured as instructed in *Windows image file requirements* before the image file is exported. You are advised to follow the process in *Figure 3-1* to configure the ECS.
Image Management Service
FAQs
3 Image Optimization

**Figure 3-1 Image creation process**

1. Upload an image file to the OBS bucket.
2. Select the image file and register it as a private image.
3. Create an ECS from the registered private image.
4. Remotely log in to the ECS to configure it.
5. Create a private image from the ECS.

---

**Step 1: Upload the Image File**

Upload the external image file to the OBS bucket. For details, see **Uploading an External Image File (Windows)**.

**Step 2 Register the External Image File as a Private Image**

On the management console, select the uploaded image file and register it as an uninitialized private image. For details, see **Registering an External Image File as a Private Image (Windows)**.

**Step 3: Create an ECS**

1. Log in to the management console.
2. Under **Computing**, click **Image Management Service**. The IMS console is displayed.
3. Click the **Private Images** tab to display the image list.
4. Locate the row that contains the uninitialized private image and click **Apply for Server** in the **Operation** column.
5. Set parameters as promoted to create the ECS. Pay attention to the following:
   - You are advised to select **Pay-per-use** for **Billing Mode** because the ECS will be deleted when you finish with it.
   - Bind an EIP to the ECS so that you can upload the Guest OS driver installation package to the ECS or download the Guest OS driver installation package from the ECS.
   - You must add inbound rules for the security group of the ECS to ensure that the ECS can be accessed.
– If the image file has Cloudbase-Init installed and configured, set a password and log in to the ECS using the password as prompted. If Cloudbase-Init is not installed, use the password or certificate contained in the image file to log in to the ECS.

For details, see Purchasing an ECS.

6. Perform the following steps to check whether the private image is available:
   a. Check whether the ECS can start successfully. If yes, the Guest OS driver required by the ECS has been automatically installed on the cloud platform. If no, install the Guest OS driver by referring to 4 in Step 4: Configure the ECS.
   b. Check whether you can log in to the ECS using your configured password or key. If yes, Cloudbase-Init has been installed. If no, use the password or key contained in the image file to log in to the ECS and install Cloudbase-Init as instructed in Installing and Configuring Cloudbase-Init.
   c. Check whether the NIC is set to DHCP by referring to 2 in Step 4: Configure the ECS.
   d. Use MSTSC to log in to the ECS. If the login is successful, remote desktop connection is enabled on the ECS. If the login fails, enable remote desktop connection by referring to 3 in Step 4: Configure the ECS.

If the ECS meets the preceding requirements, the private image is available. You can clear the environment as instructed in (Optional) Clear the Environment.

Step 4: Configure the ECS

Remotely log in to the ECS created in Step 3: Create an ECS to configure the network and install drivers.

1. Log in to the ECS.
2. Check whether the NIC is set to DHCP. If the ECS is configured with a static IP address, change its IP address assignment mode to DHCP as instructed in Setting the NIC to DHCP.
3. Enable remote desktop connection for the ECS as needed. For details about how to enable this function, see Enabling Remote Desktop Connection.
4. Install drivers.

The proper running of ECSs depends on the XEN Guest OS driver (PV driver) and KVM Guest OS driver (UVP VMTools). If the drivers are not installed, the performance of ECSs will be affected and some functions will be unavailable. Therefore, you must install the Guest OS driver when using an external image file to create a private image.

**NOTE**

To avoid an installation failure, perform the following operations before starting the installation:

- Uninstall third-party virtualization platform tools, such as Citrix Xen Tools and VMware Tools. For how to uninstall the tools provided by a third-party virtualization platform, see the corresponding documents of the cloud platform.
- Disable your antivirus and intrusion detection software. You can enable the software after the Guest OS driver is installed.
- For details about how to install the PV driver, see Installing the PV Driver.
- For details about how to install UVP VMTools, see Installing UVP VMTools.

After the drivers are installed, you need to clear system logs. For details, see Clearing System Logs.

5. (Optional) Configure value-added functions.
- Install and configure Cloudbase-Init. For details, see Installing and Configuring Cloudbase-Init.
- Enable NIC multi-queue. For details, see How Do I Set NIC Multi-Queue Feature of an Image?

Step 5: Create an Image from the ECS

Create a private image from the ECS. For details, see Creating a System Disk Image from a Windows ECS.

(Optional) Clear the Environment

In the preceding steps, storage fees are charged for the uninitialized image file, and extra fees are charged for the created ECS. Therefore, you are advised to clear the environment after the image is registered.

- Delete the uninitialized image registered in Step 2 Register the External Image File as a Private Image.
- Delete the ECS created in Step 3: Create an ECS.
- Delete the image files stored in the OBS bucket.

3.5 What Do I Do If the Initial Configurations of a Linux External Image File Are Not Completed Before the File Is Exported?

The ECS where the external image file is located is not configured as instructed in Linux image file requirements before the image file is exported. You are advised to follow the process in Figure 3-2 to configure the ECS.
Step 1: Upload the Image File

Upload the external image file to the OBS bucket. For details, see Uploading an External Image File (Linux).

Step 2 Register the External Image File as a Private Image

On the management console, select the uploaded image file and register it as an uninitialized private image. For details, see Registering an External Image File as a Private Image (Linux).

Step 3: Create an ECS

Create an ECS from the uninitialized private image.

1. Log in to the management console.
3. Click the Private Images tab to display the image list.
4. Locate the row that contains the uninitialized private image and click Apply for Server in the Operation column.
5. Set parameters as promoted to create the ECS. Pay attention to the following:
   - You are advised to select Pay-per-use for Billing Mode because the ECS will be deleted when you finish with it.
   - You must add inbound rules for the security group of the ECS to ensure that the ECS can be accessed.
– If Cloud-Init has been installed in the image file, set a login password as prompted. If Cloud-Init is not installed, use the password or certificate contained in the image file to log in.

For details, see Purchasing an ECS.

6. Perform the following steps to check whether the private image is available:

   a. Check whether the ECS can start successfully. If yes, the native Xen and KVM drivers required by the ECS have been automatically installed on the cloud platform. If no, install the native Xen and KVM drivers by referring to 3 in Step 4: Configure the ECS.

   b. Check whether you can log in to the ECS using your configured password or key. If yes, Cloud-Init has been installed. If no, use the password or key contained in the image file to log in to the ECS and install Cloud-Init as instructed in Installing Cloud-Init.

   c. Check the network configuration by referring to Step 4: Configure the ECS.

   If the ECS meets the preceding requirements, the private image is available. You can clear the environment as instructed in (Optional) Clear the Environment.

Step 4: Configure the ECS

Remotely log in to the ECS created in Step 3: Create an ECS to configure the network and install drivers.

1. Log in to the ECS.

2. Configuring the network.

   – Run the `ifconfig` command to check whether the private IP address of the ECS is the same as that displayed on the console. If they are inconsistent, delete files in the network rule directory as instructed in Deleting Files in the Network Rule Directory.

   – Check whether the NIC is set to DHCP. If the ECS is configured with a static IP address, change its IP address assignment mode to DHCP as instructed in Setting the NIC to DHCP.

   – Run the `service sshd status` command to check whether the SSH service is enabled. If it is disabled, run the `service sshd start` command to enable it. Ensure that your firewall (for example, Linux iptables) allows SSH access.

3. Install drivers.

   To ensure the network performance and basic functions of the ECS created from the private image, you must install native Xen and KVM drivers on the ECS from which the image is created. Before installing native Xen and KVM drivers, uninstall the PV driver.

   ![NOTE]

   It is recommended that you disable your antivirus and intrusion detection software. You can enable the software again after Xen and KVM drivers are installed.

   – Uninstall the PV driver. For details, see Uninstalling the PV Driver from a Linux ECS.
- Install native Xen and KVM drivers. For details, see Installing Native Xen and KVM Drivers.

After the drivers are installed, you need to clear log files and historical records. For details, see Clearing System Logs.

4. Configure a file system.
- Change the disk identifier of the GRUB configuration file to UUID. For details, see Changing the Disk Identifier in the GRUB Configuration File to UUID.
- Change the disk identifier of the fstab file to UUID. For details, see Changing the Disk Identifier in the fstab File to UUID.
- Clear the automatic attachment information of non-system disks in the /etc/fstab file to prevent impacts on subsequent data disk attachment. For details, see Detaching Data Disks from an ECS.

5. (Optional) Configure value-added functions.
- Install and configure Cloud-Init. For details, see Installing Cloud-Init and Configuring Cloud-Init.
- Enable NIC multi-queue. For details, see How Do I Set NIC Multi-Queue Feature of an Image?

**Step 5: Create an Image from the ECS**

Create a private image from the ECS. For details, see Creating a System Disk Image from a Linux ECS.

**(Optional) Clear the Environment**

In the preceding steps, storage fees are charged for the uninitialized image file, and extra fees are charged for the created ECS. Therefore, you are advised to clear the environment after the image is registered.

- Delete the uninitialized image registered in Step 2 Register the External Image File as a Private Image.
- Delete the ECS created in Step 3: Create an ECS.
- Delete the image files stored in the OBS bucket.

**3.6 How Do I Set NIC Multi-Queue Feature of an Image?**

**Scenarios**

Single-core CPU performance cannot meet the requirement of processing NIC interruptions incurred with the increase of network I/O bandwidth. Multiple NIC queuing enables multiple CPUs to process ECS NIC interruptions, thereby improving network PPS and I/O performance.

**ECSs Supporting NIC Multi-Queue**

NIC multi-queue can be enabled on an ECS only when the ECS specifications, virtualization type, and image OS meet the requirements described in this section.
For details about the ECS specifications that support NIC multi-queue, see ECS Types.

**NOTE**

If the number of NIC queues is greater than 1, NIC multi-queue is supported.

- Only KVM ECSs support NIC multi-queue.
- The Linux public images listed in Table 3-6 support NIC multi-queue.

**NOTE**

- Windows OSs have not commercially supported NIC multi-queue. If you enable NIC multi-queue in a Windows image, starting an ECS created using such an image may be slow.
- You are advised to upgrade the kernel version of the Linux ECS to 2.6.35 or later. Otherwise, NIC multi-queue is not supported.

Run the `uname -r` command to obtain the kernel version. If the kernel version is earlier than 2.6.35, contact technical support to upgrade the kernel.

Table 3-5 Windows ECSs that support NIC multi-queue

<table>
<thead>
<tr>
<th>OS</th>
<th>Image</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows</td>
<td>Windows Server 2008 WEB R2 64bit</td>
<td>Supported using private images</td>
</tr>
<tr>
<td></td>
<td>Windows Server 2008 Enterprise SP2 64bit</td>
<td>Supported using private images</td>
</tr>
<tr>
<td></td>
<td>Windows Server 2008 R2 Standard/Datacenter/Enterprise 64bit</td>
<td>Supported using private images</td>
</tr>
<tr>
<td></td>
<td>Windows Server 2008 R2 Enterprise 64bit_WithGPUdriver</td>
<td>Supported using private images</td>
</tr>
<tr>
<td></td>
<td>Windows Server 2012 R2 Standard 64bit_WithGPUdriver</td>
<td>Supported using private images</td>
</tr>
<tr>
<td></td>
<td>Windows Server 2012 R2 Standard/Datacenter 64bit</td>
<td>Supported using private images</td>
</tr>
</tbody>
</table>

Table 3-6 Linux ECSs that support NIC multi-queue

<table>
<thead>
<tr>
<th>OS</th>
<th>Image</th>
<th>Status</th>
<th>NIC Multi-Queue Enabled by Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td>Ubuntu 14.04/16.04 Server 64bit</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>OpenSUSE 42.2 64bit</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>SUSE Enterprise 12 SP1/SP2 64bit</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
## Operation Instructions

The ECS described in the following section is assumed to meet the requirements on specifications and virtualization type.

- If the ECS was created using a public image listed in **ECSs Supporting NIC Multi-Queue**, NIC multi-queue has been enabled on the ECS by default. Therefore, you do not need to perform the operations described in this section.
- In the ECS was created using a private image and the external image file is listed in **ECSs Supporting NIC Multi-Queue**, perform the following operations to enable NIC multi-queue:
  a. Importing the External Image File to the IMS Console
  b. Setting NIC Multi-Queue for the Image
  c. Creating an ECS from a Private Image
  d. Running the Script for Configuring NIC Multi-Queue

### Importing the External Image File to the IMS Console

For details, see **Registering an External Image File as a Private Image (Linux)**. After the image file is imported, view the value of NIC Multi-Queue on the page providing details about the image.

- If the value is **Supported**, go to Creating an ECS from a Private Image.
- If the value is **Not supported**, go to Setting NIC Multi-Queue for the Image.

### Setting NIC Multi-Queue for the Image

Windows OSs do not support the NIC multi-queue function. If you add multi-queue tags to Windows OS images and enable the multi-queue function, the startup speed of ECS OSs may become slow.

Use either of the following methods to set the NIC multi-queue attribute.

**Method 1:**

<table>
<thead>
<tr>
<th>OS</th>
<th>Image</th>
<th>Status</th>
<th>NIC Multi-Queue Enabled by Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>CentOS</td>
<td>6.8/6.9/7.0/7.1/7.2/7.3/7.4/7.5/7.6 64bit</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Debian</td>
<td>8.0.0/8.8.0/8.9.0/9.0.0 64bit</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Fedora</td>
<td>24/25 64bit</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>EulerOS</td>
<td>2.2 64bit</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
1. Log in to the management console.
2. Under **Computing**, click **Image Management Service**.
3. On the displayed **Private Images** page, locate the row that contains the target image and click **Modify** in the **Operation** column.
4. Set the NIC multi-queue attribute of the image.

**Method 2:**
1. Log in to the management console.
2. Under **Computing**, click **Image Management Service**.
3. On the displayed **Private Images** page, click the name of the target image.
4. In the upper right corner of the displayed image details page, click **Modify**. In the displayed **Modify Image** dialog box, set parameter **NIC Multi-Queue**.

**Method 3:** Add **hw_vif_multiqueue_enabled** to an image through the API.
1. For details about how to obtain the token, see **Authentication**.
2. For details about how to call an API to update image information, see **Updating Image Information (Native OpenStack API)**.
3. Add **X-Auth-Token** to the request header.
   The value of **X-Auth-Token** is the token obtained in step 1.
4. Add **Content-Type** to the request header.
   The value of **Content-Type** is **application/openstack-images-v2.1-json-patch**.
   The request URI is in the following format:
   PATCH /v2/images/{image_id}
   The request body is as follows:
   ```
   [
   {  
   "op":"add",  
   "path": "/hw_vif_multiqueue_enabled",  
   "value": "true"  
   }
   ]
   Figure 3-3 shows an example request body for changing the NIC multi-queue attribute.

Figure 3-3 Example request body
Creating an ECS from a Private Image

For details, see Purchasing an ECS. Note the following when setting the parameters:

- **Region**: Select the region where the private image is located.
- **Image**: Select Private image and then the desired image from the drop-down list.

Running the Script for Configuring NIC Multi-Queue

Windows OSs do not support the NIC multi-queue function. If you add multi-queue tags to Windows OS images and enable the multi-queue function, the startup speed of ECS OSs may become slow.

For Linux OSs, the script for automatically configuring NIC multi-queue is provided. If an ECS has multiple NICS, running the script will automatically enable multi-queue for all the NICS.

1. Log in to the ECS and run the following command to check the number of queues supported by and enabled for a NIC:

   ```bash
   ethtool -l NIC
   ```

   **Example**:
   ```shell
   [root@localhost ~]# ethtool -l eth0   #View the number of queues used by NIC eth0.
   Channel parameters for eth0:
   Pre-set maximums:
   RX:               0
   TX:               0
   Other:            0
   Combined:         4   #The NIC supports a maximum of four queues.
   Current hardware settings:
   RX:               0
   TX:               0
   Other:            0
   Combined:         1   #One queue has been enabled for the NIC.
   ```

   If the values of the two **Combined** fields are the same, NIC multi-queue has been enabled. No further action is required.

2. Run the following command to download the configuration script multi-queue-hw:

   ```bash
   wget https://ecs-instance-driver.obs.myhwclouds.com/multi-queue-hw
   ```

   The download path is `https://ecs-instance-driver.obs.myhwclouds.com/multi-queue-hw`.

3. Run the following command to assign execution permissions to the script:

   ```bash
   chmod +x multi-queue-hw
   ```

4. Run the following command to move the `multi-queue-hw` script to the `/etc/init.d` directory:

   ```bash
   mv multi-queue-hw /etc/init.d
   ```

   Enter `y` when the following information is displayed:

   ```shell
   mv: overwrite '/etc/init.d/multi-queue-hw'?
   ```

5. Run the following command to run the script:

   ```bash
   /etc/init.d/multi-queue-hw start
   ```

   The script takes effect immediately after being executed. However, if you stop an ECS, the NIC multi-queue will become invalid.
6. Add startup configuration for each OS so that NIC multi-queue is automatically enabled upon the ECS startup.
   - For CentOS, Red Hat, Fedora, EulerOS, SUSE, and OpenSUSE, run the following command:
     ```
     chkconfig multi-queue-hw on
     ```
   - For Ubuntu, run the following command:
     ```
     update-rc.d multi-queue-hw defaults 90 10
     ```
   - For Debian, run the following command:
     ```
     systemctl enable multi-queue-hw
     ```

3.7 How Do I Optimize a System Disk Image So That It Can Be Used to Create ECSs Quickly?

**Scenarios**

If a system disk image supports fast ECS creation, the time required for creating ECSs from it can be greatly reduced. Existing system disk images may not support this function. You are advised to optimize the images using the image replication function.

If image A cannot be used to quickly create ECSs, you can replicate it to generate image copy_A, which can be used to quickly create ECSs.

**Constraints**

Full-ECS images and ISO images cannot be optimized using this method.

**Check Whether an Image Supports Fast ECS Creation**

1. Log in to the management console.
2. Under **Computing**, click **Image Management Service**.
3. Click the **Private Images** tab to display the image list.
4. Click the name of the target image.
5. On the displayed image details page, check the value of **Fast ECS Creation**.
Optimize an Image

1. Locate the target system disk image, click More in the Operation column, and select Replicate from the drop-down list. The Replicate Image dialog box is displayed.

2. Set Replication Mode to Within Region and set other parameters based on Replicating Images Within a Region.

3. After the image is successfully replicated, the generated image can be used to quickly create ECSs.
4.1 Image Sharing FAQs

How Many Tenants Can I Share an Image with at Most?

128

How Many Shared Images Can I Obtain at Most?

No.

Can I Share Images Between My Accounts of the China Site and International Site?

Yes. You can share images between your accounts of the China and international sites, but only in regions that are available at both sites. For example, you cannot share images in the CN North-Beijing4 region of the China site with your account of the international site which does not have this region.

Do Shared Images Affect My Private Image Quota?

No.

If I Want to Share a System Disk Image to Another Account, Should the Account Purchase an ECS in Advance?

No. The account can use the shared image to apply for ECSs.

Is There Any Restriction on the Region When I Create ECSs Using a Shared Image?

Yes. You can only create ECSs in the same region as the shared image.
Can I Share Accepted Shared Images with Other Tenants?

You cannot directly share such images with other tenants. If you do need to do so, you can replicate the shared images to private images and share the private images.

Can I Use an Image I Have Shared with Others to Create an ECS?

Yes. After sharing an image with other tenants, you can still use the image to create an ECS and use the created ECS to create a private image.

Can I Delete a Shared Image If My Image Quota Becomes Insufficient?

Yes. You can delete a shared image without requiring any operation by the image recipient. After you delete the image, the image recipient cannot use it any longer. To prevent impact on the image recipient's services, inform the image recipient in advance so that the image recipient can back up data.

What Are the Risks of Creating ECSs Using a Shared Image?

The image owner can view, stop sharing, or delete the image at any time. After the shared image is deleted, you will be unable to reinstall the OSs of the ECSs created from the shared image or create ECSs with the same configurations using the shared image.

HUAWEI CLOUD does not ensure the integrity and security of the images shared by other accounts. To prevent risks, you are advised to choose images shared by trusted accounts.

What Are the Risks of Sharing Images with Other Tenants?

Data, files, and software may be disclosed. Before sharing images, you must delete sensitive data and important files. The image recipient can use the shared image to create ECSs and use the created ECSs to create private images. If the created private images are shared with other tenants, data is disclosed in a wider range.

How Do I Share an Image with an IAM User?

In the Share Image dialog box, add the account name of the IAM user. For details, see Sharing Specified Images. After the image is shared, log in to the IAM management console and choose Image Management Service > Images Shared with Me to view the shared image to be accepted. That is, after an image is shared with an IAM account, all IAM users under the account can receive the shared image.

How Do I Replicate an Image Between Projects in a Region?

Cross-region image replication allows you to replicate images between regions. Image sharing allows you to replicate images between projects in the same region.

In the Share Image dialog box, enter your account name, select the target project, and click Add, as instructed in Sharing Specified Images. After the image is
shared, switch to the target project. On the Image Management Service >
Images Shared with Me page, you can view the shared image to be accepted.

Can I Specify a Region or an AZ for Sharing an Image?
No. When sharing an image, you can specify only an account name and cannot
specify a region or an AZ. That is, an image can be shared only in the same region.
In addition, an image can be used in any AZ in a region.

How Can I Use a Rejected Image?
If you have rejected an image shared by another tenant, but now want to use it,
two methods are available:
- Method 1
  Ask the image owner to add you to the tenants with whom the image is
  shared. For details, see Adding Tenants Who Can Use Shared Images.
- Method 2
  Accept the rejected image again. For details, see Accepting Rejected Images.

4.2 Encrypted Image FAQs

How Can I Share an Encrypted Image or Publish It in Marketplace?
You are not allowed to share an encrypted image or publish it in the Marketplace
directly. If you want to do this, you can replicate the image to generate an
unencrypted one, and share or publish the unencrypted image in the Marketplace.

How Can I Change an Unencrypted Image to an Encrypted One?
If you want to store an unencrypted image in an encrypted way, you can select an
encryption key and replicate the image to generate an encrypted image.

Constraints
- An encrypted image cannot be shared with other tenants, published in the
  Marketplace, or replicated across regions.
- The key used for encrypting the image cannot be changed.

4.3 Can I Use Private Images of Other Tenants?
Yes.
You can share a private image with another account. For details, see Sharing
Specified Images.
4.4 How Do I Share a Full-ECS Image Created from a CSBS Backup with Other Tenants?

Scenarios

Only full-ECS images created from CBR backups can be shared. To share a full-ECS image created from a CSBS backup, you must migrate the CSBS backup to the CBR service. This section describes the migration process.

Procedure

1. Log in to the management console.
2. Under Storage, click Cloud Backup and Recovery. The CBR console is displayed.
3. In the upper right corner, click Migrate to CBR. The window shown in Figure 4-1 is displayed.

Figure 4-1 Notice

Migration of Backup Services from CSBS & VBS to Cloud Backup and Recovery (CBR)

Dear Huawei users:

The HUAWEI CLOUD CBR service has been launched on June 30, 2019. CBR integrates Cloud Server Backup Service (CSBS) and Volume Backup Service (VBS). From June 30, 2019 to August 30, 2019, CSBS, VBS, and CBR all provide services. Please complete your service migration as soon as possible. After the migration, CSBS and VBS cannot be accessed. Pay attention to the following changes:

1. Function extension: CBR provides a wider service scope than CSBS. Besides cloud server backup, CBR also provides cloud disk backup, application backup, storage backup, and VMware backup.
2. Usage: To use CBR, you need to create vaults first. The backup capacity cannot exceed the vault capacity. If you need to expand the backup capacity, expand the vault capacity first. Backup policies are bound to vaults.
3. Billing mode: CBR is charged based on the capacity of vaults.

4. Click Yes and wait until the backup data is successfully migrated.

After the migration is successful, the full-ECS image created from the CSBS backup can be shared with other tenants. Select the full-ECS image and click Share.

4.5 Can I Install the Exported System Disk Image of an ECS on a Physical Server?

No. The system disk image of an ECS is a VM file that contains a system running environment and does not have an installation boot program. Therefore, the image cannot be directly installed on a physical server.
4.6 Can I Download a Public Image Provided by HUAWEI CLOUD to My Local PC?

Currently, you cannot directly download a public image provided by HUAWEI CLOUD. You can use the public image to create an ECS, use the ECS to create a private image, export the private image to your OBS bucket, and download the private image to your local PC.

Helpful links are as follows:

- Creating a System Disk Image from a Windows ECS or Creating a System Disk Image from a Linux ECS
- Exporting Images

**NOTE**

Windows and SUSE Linux public images and the private images created from these public images cannot be exported.
5 Accounts and Permissions

5.1 How Do I Create an IMS Agency?

Scenarios

During cross-region image replication, an agency is required to verify the cloud service permissions in the destination region. Therefore, you need to create a cloud service agency in advance. This section describes how to create an IMS agency.

Background Information

An agency is a trust relationship established between you and other HUAWEI CLOUD accounts or cloud services. If you have purchased multiple types of cloud resources on HUAWEI CLOUD, you can create an agency through IAM to establish a trust relationship with a professional company or cloud service for secure and efficient O&M on certain types of your resources.

Procedure

1. Log in to the management console.
2. In the upper right corner of the page, click the username and select Identity and Access Management.
3. In the navigation pane, choose Agencies.
4. Click Create Agency.
5. On the Create Agency page, set the following parameters:
   - **Agency Name**: Enter an agency name, such as `ims_administrator_agency`.
Figure 5-1 Creating an agency

- **Agency Type**: Select **Cloud service**.
- **Cloud Service**: This parameter is available if you select **Cloud service** for **Agency Type**. Click **Select**. In the displayed **Select Cloud Service** dialog box, select **Image Management Service (IMS)** and click **OK**.
- **Validity Period**: Select **Unlimited**.
- **Description**: This parameter is optional. You can enter **Agency with IMS Administrator privileges**.
- **Permissions**: Click **Assign Permissions**. By default, **Policy View** is displayed. Enter **IMS Administrator** in the search box, select the **IMS Administrator** check box, select the target region or sub-project in the **Project [Region]** column, and click **OK**, as shown in Figure 5-2.

In cross-region image replication, the agency must have the administrator permissions in both the source and destination regions. For example, if you want to replicate an image from CN North-Beijing4 to CN East-Shanghai1, the agency must have the **IMS Administrator** permissions in both regions.
6. Click **OK**.
6 Cloud-Init Operations

6.1 What Can I Do After Installing Cloud-Init on an ECS?

Introduction to Cloud-Init

Cloud-Init is an open-source cloud initialization tool. When creating an ECS from an image with Cloud-Init, you can use the user data injection function to inject customized initialization information (for example, setting the ECS login password). You can also configure and manage a running ECS by querying and using metadata. If Cloud-Init is not installed, you cannot configure an ECS. As a result, you can only use the password in the image file to log in to the ECS.

Installation Methods

You are advised to install Cloud-Init or Cloudbase-Init on the ECS to be used to create a private image so that new ECSs created from the private image support custom configurations.

- For Windows OSs, download and install Cloudbase-Init. For how to install Cloudbase-Init, see Installing and Configuring Cloudbase-Init.
- For Linux OSs, download and install Cloud-Init. For how to install Cloud-Init, see Installing Cloud-Init. For how to configure Cloud-Init, see Configuring Cloud-Init.
6.2 What Do I Do If Injecting the Key or Password Using Cloud-Init Fails After NetworkManager Is Installed?

Symptom

A major cause is that the version of Cloud-Init is incompatible with that of NetworkManager. In Debian 9.0 and later versions, NetworkManager is incompatible with Cloud-Init 0.7.9.

Solution

Uninstall the current Cloud-Init and install Cloud-Init 0.7.6 or an earlier version.

For details about how to install Cloud-Init, see Installing Cloud-Init.

6.3 How Do I Install growpart for SUSE 11 SP4?

Scenarios

growpart for SUSE and openSUSE is an independent toolkit that does not start with cloud-*. Perform the following operations to install growpart:

Procedure

1. Run the following commands to check whether Cloud-Init and growpart have been installed:

   \texttt{rpm -qa | grep cloud-init}

   The command output is as follows:

   \texttt{cloud-init-0.7.8-39.2}

   \texttt{rpm -qa | grep growpart}

   The command output is as follows:

   \texttt{growpart-0.29-8.1}

2. Run the following command to uninstall Cloud-Init and growpart:

   \texttt{zypper remove cloud-init growpart}

3. Run the following commands to clear residual files:

   \texttt{rm -fr /etc/cloud/*}

   \texttt{rm -fr /var/lib/cloud/*}

4. Run the following command to install growpart:

   \texttt{zypper install http://download.opensuse.org/repositories/home:/garloff:/OTC/cloudinit/SLE_11_SP4/noarch/growpart-0.27-1.1.noarch.rpm}

5. Run the following command to install python-oauth:

   \texttt{zypper install http://download.opensuse.org/repositories/home:/garloff:/OTC/cloudinit/SLE_11_SP4/x86_64/python-oauth-1.0.1-35.1.x86_64.rpm}
6. Run the following command to install Cloud-Init:

```bash
zypper install http://download.opensuse.org/repositories/home:/garloff:/OTC:/cloudinit/SLE_11_SP4/x86_64/cloud-init-0.7.6-27.23.1.x86_64.rpm
```

7. Run the following commands to check whether growpart, python-oauth, and Cloud-Init have been installed successfully:

```bash
rpm -qa | grep growpart
```

The command output is as follows:

```
growpart-0.27-1.1
```

```bash
rpm -qa | grep python-oauth
```

The command output is as follows:

```
python-oauthlib-0.6.0-1.5
python-oauth-1.0.1-35.1
```

```bash
rpm -qa | grep cloud-init
```

The command output is as follows:

```
cloud-init-0.7.6-27.19.1
```

8. Run the following command to check the configuration:

```bash
chkconfig cloud-init-local on; chkconfig cloud-init on; chkconfig cloud-config on; chkconfig cloud-final on
```

### 6.4 How Do I Configure a Linux Private Image That Can Automatically Expand Its Root Partition?

**Constraints**

- An image whose root partition file system is xfs cannot automatically expand its partitions.
- An image that has the LVM partition cannot automatically expand its partitions.
- Images whose file system is ext3 or ext4 are recommended.

**NOTE**

After OS partitions of old versions are expanded, the OS must be restarted to update the file system.

**Installation of growpart on Different OSs**

To enable private images to automatically expand the root partition, install growpart.

<table>
<thead>
<tr>
<th>OS</th>
<th>Tool Package</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debian/Ubuntu</td>
<td>cloud-init, cloud-utils, and cloud-initramfs-growroot</td>
</tr>
</tbody>
</table>
### OS | Tool Package
--- | ---
Fedora/CentOS | cloud-init, cloud-utils, and cloud-utils-growpart
SUSE/OpenSUSE | cloud-init and growpart

#### NOTE
For Debian 9, use method 1 to install growpart. If the installation fails, use method 2 to install growpart.

**Method 1:**
Run the following command to install growpart:

```bash
apt-get install -y -f cloud-init cloud-utils cloud-initramfs-growroot
```

**Method 2:**
If method 1 fails, it may be because the installation source of Debian 9.0.0 is faulty. Therefore, you need to download dependency packages `cloud-utils` and `cloud-initramfs-growroot` and install them.

1. Run the following command to download the dependent packages:
   ```bash
   wget Package download path
   ```
   You can obtain the dependent packages from the following paths:
   ```bash
   http://ftp.br.debian.org/debian/pool/main/c/cloud-utils/cloud-utils_0.29-1_all.deb
   http://ftp.br.debian.org/debian/pool/main/c/cloud-initramfs-tools/cloud-initramfs-growroot_0.18.debian5_all.deb
   ```
2. Run the following command to rectify the dependent packages:
   ```bash
   apt --fix-broken install
   ```
3. Run the following command to install the dependent packages:
   ```bash
   dpkg -i cloud-utils package path cloud-initramfs-growroot package path
   ```
   An example command is `dpkg -i /root/cloud-utils_0.29-1_all.deb /root/cloud-initramfs-growroot_0.18.debian5_all.deb`.
   For other Debian versions, run the following command to install dependent packages:
   ```bash
   apt-get update; apt-get install cloud-utils cloud-initramfs-growroot
   ```

#### Procedure
Take the following as two examples of image disk partitioning:

If the root partition is the last partition, see [Root partition at the last](#).

If the root partition is not the last partition, see [Root partition not at the last](#).

#### NOTE
If the `parted` command fails, ensure that the `parted` tool has been installed on the OS. Perform the following operations to install the tool:

- For CentOS, run the following command:
  ```bash
  yum install parted
  ```
- For Debian, run the following command:
  ```bash
  apt-get install parted
  ```
Root partition at the last (/dev/xvda1: swap and /dev/xvda2: root)

For example, if the system disk size of CentOS 6.5 64-bit is 40 GB, perform the following operations to configure a Linux private image that can automatically expand its root partition:

a. Run the following command to query the partitions of /dev/xvda:

```bash
parted -l /dev/xvda
```

As shown in the command output, the root partition is the second partition and is 38.7 GB.

```
Model: Xen Virtual Block Device (xvd)
Disk /dev/xvda: 42.7GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos

Number Start End Size Type File system Flags
1 1049kB 4296MB 4295MB primary linux-swap(v1)
2 4296MB 42.9GB 38.7GB primary ext4 boot
```

b. Install growpart to ensure that the image can automatically expand its root partition.

Run the following command to install growpart:

```bash
yum install cloud-*
```

**NOTE**

growpart may be contained in the cloud-utils-growpart/cloud-utils/cloud-initramfs-tools/cloud-init package. You can run the preceding command directly and then run the `growpart` command to check whether growpart has been installed successfully.

c. Run the following command to obtain the file system type and UUID:

```bash
blkid
```

The command output is as follows:

```
/dev/xvda1: UUID="25ec3bdb-ba24-4561-bcdc-802edf42b85f" TYPE="swap"
/dev/xvda2: UUID="1a1ce4de-e56a-4e1f-864d-31b7d9dfb547" TYPE="ext4"
```

d. Stop the ECS and use it to create a private image.

```
[root@sluo-ecs-e6dc-resizefs ~]# poweroff
Connection closed by foreign host.
Disconnected from remote host at 11:08:54.
Type ‘help’ to learn how to use Xshell prompt.
```

e. Use the created image to provision an ECS with a 50 GB system disk. Log in to the ECS and run the following command to query the expanded partitions:

```bash
parted -l /dev/xvda
```

As shown in the command output, the root partition has been expanded automatically.

```
Model: Xen Virtual Block Device (xvd)
Disk /dev/xvda: 53.7GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos

Number Start End Size Type File system Flags
1 1049kB 4296MB 4295MB primary linux-swap(v1)
2 4296MB 53.7GB 49.4GB primary ext4 boot
```

f. Run the following command to check whether disks are attached to the VM successfully:

```bash
df -Th
```
The command output is as follows:

<table>
<thead>
<tr>
<th>Filesystem</th>
<th>Type</th>
<th>Size</th>
<th>Used</th>
<th>Avail</th>
<th>Use%</th>
<th>Mounted on</th>
</tr>
</thead>
<tbody>
<tr>
<td>/dev/xvda2</td>
<td>ext4</td>
<td>49.4G</td>
<td>2.6G</td>
<td>46.8G</td>
<td>4%</td>
<td>/dev/shm</td>
</tr>
<tr>
<td>tmpfs</td>
<td>tmpfs</td>
<td>4295M</td>
<td>0</td>
<td>4295M</td>
<td>0%</td>
<td>/</td>
</tr>
</tbody>
</table>

- **Root partition not at the last** (for example, `/dev/xvda1: root` and `/dev/xvda2: swap`)

For example, if the system disk size of CentOS 7.3 64-bit is 40 GB, perform the following operations to configure a Linux private image that can automatically expand its root partition:

a. Run the following command to query the partitions of `/dev/xvda`:

   ```bash
   parted -l /dev/xvda
   ```

   As shown in the command output, the root partition is the first partition and is 40.9 GB. The swap partition is the second partition.

   ```
   Model: Xen Virtual Block Device (xvd)
   Disk /dev/xvda: 42.9GB
   Sector size (logical/physical): 512B/512B
   Partition Table: msdos
   Disk Flags: 
   
   Number  Start   End     Size    Type     File system     Flags
   1      1049kB  41.0GB  40.9GB  primary  ext4            boot
   2      41.0GB  42.9GB  2000MB  primary  linux-swap(v1)
   ```

b. Run the following command to check the configuration of the `/etc/fstab` file:

   ```bash
   tail -n 3 /etc/fstab
   ```

   As shown in the command output, UUIDs of the two partitions are displayed.

   ```
   #
   UUID=7c4fce5d-f8f7-4ed6-8463-f2bd22d0ddea /                       ext4    defaults        1 1
   UUID=5de3cf2c-30c6-4fb2-9e63-830439d4e674 swap                    swap    defaults        0 0
   ```

c. Run the following command to open the `/etc/fstab` file and press `i` to enter editing mode:

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

d. Delete the swap partition configuration, press `Esc` to exit editing mode, and run the following command to save the configuration:

   ```bash
   wq!
   ```

e. Run the following command to check whether the configuration has been modified:

   ```bash
   tail -n 3 /etc/fstab
   ```

   As shown in the command output, only the UUID of the root partition is displayed.

   ```
   UUID=7c4fce5d-f8f7-4ed6-8463-f2bd22d0ddea /                       ext4    defaults        1 1
   ```

f. Run the following command to stop the swap device:

   ```bash
   swapoff -a
   ```

g. Run the following command to query the partitions of `/dev/xvda`:

   ```bash
   parted /dev/xvda
   ```

   The command output is as follows:

   ```
   [root@test-0912 bin]# parted /dev/xvda
   GNU Parted 3.1
   Using /dev/xvda
   ```
Welcome to GNU Parted! Type ‘help’ to view a list of commands.
(parted)

h. Run the following command to query the disk partitions:

   p

   The command output is as follows:

   (parted) p
   Model: Xen Virtual Block Device (xvd)
   Disk /dev/xvda: 42.9GB
   Sector size (logical/physical): 512B/512B
   Partition Table: msdos
   Disk Flags:

   Number  Start   End     Size    Type     File system     Flags
   1      1049kB  4296MB  4295MB  primary  linux-swap(v1)
   2      4296MB  42.9GB  38.7GB  primary  xfs             boot

   (parted)

i. Run the following command to delete the second partition:

   rm 2

   The command output is as follows:

   (parted) rm 2
   (parted)

j. Run the following command to query the disk partitions:

   p

   The command output is as follows:

   (parted) p
   Model: Xen Virtual Block Device (xvd)
   Disk /dev/xvda: 42.9GB
   Sector size (logical/physical): 512B/512B
   Partition Table: msdos
   Disk Flags:

   Number  Start   End     Size    Type     File system  Flags
   1      1049kB  41.0GB  40.9GB  primary  ext4         boot

   (parted)

k. Type quit.

l. Run the following command to query the partitions of /dev/xvda:

   parted -l /dev/xvda

   As shown in the command output, the swap partition is deleted.

   Model: Xen Virtual Block Device (xvd)
   Disk /dev/xvda: 42.9GB
   Sector size (logical/physical): 512B/512B
   Partition Table: msdos
   Disk Flags:

   Number  Start   End     Size    Type     File system  Flags
   1      1049kB  41.0GB  40.9GB  primary  ext4         boot

m. Install growpart to ensure that the image can automatically expand its root partition.

   Run the following command to install growpart:

   yum install cloud-*

   NOTE

   growpart may be contained in the cloud-utils-growpart/cloud-utils/cloud-
initramfs-tools/cloud-init package. You can run the preceding command directly
and then run the growpart command to check whether growpart has been
installed successfully.
n. Run the following command to expand the swap partition of the `/dev/xvda` disk to the first partition to which the root partition belongs:

```
 growpart /dev/xvda 1
```

The following information is displayed:

```
CHANGED: partition=1 start=2048 old: size=79978496 end=79980544 new: size=83873317,end=83875365
```

o. Run the following command to query the partitions of `/dev/xvda`:

```
 parted -l /dev/xvda
```

As shown in the command output, the expanded root partition is 107 GB.

```
Model: Xen Virtual Block Device (xvd)
Disk /dev/xvda: 42.9GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

<table>
<thead>
<tr>
<th>Number</th>
<th>Start</th>
<th>End</th>
<th>Size</th>
<th>Type</th>
<th>File system</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1049kB</td>
<td>42.9GB</td>
<td>42.9GB</td>
<td>primary</td>
<td>ext4</td>
<td>boot</td>
</tr>
</tbody>
</table>
```

p. Run the following command to obtain the file system type and UUID:

```
 blkid
```

The following information is displayed:

```
/dev/xvda1: UUID="7c4fce5d-f8f7-4ed6-8463-f2bd22d0ddea" TYPE="ext4"
```

q. Stop the ECS and use it to create a private image.

```
[root@sluo-ecs-e6dc-resizefs ~]# poweroff
Connection closed by foreign host.
Disconnected from remote host at 11:08:54.
Type `help´ to learn how to use Xshell prompt.
```

r. Use the created image to provision an ECS with a 100 GB system disk. Log in to the ECS and run the following command to query the partitions of `/dev/xvda`:

```
 parted -l /dev/xvda
```

As shown in the command output, the root partition has been expanded automatically.

```
Model: Xen Virtual Block Device (xvd)
Disk /dev/xvda: 107GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

<table>
<thead>
<tr>
<th>Number</th>
<th>Start</th>
<th>End</th>
<th>Size</th>
<th>Type</th>
<th>File system</th>
<th>Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1049kB</td>
<td>107GB</td>
<td>107GB</td>
<td>primary</td>
<td>ext4</td>
<td>boot</td>
</tr>
</tbody>
</table>
```

**NOTE**

The value of **Size** is the size of the expanded root partition.
7.1 Can I Change the Image After Successfully Purchasing an ECS?

Yes.
If you select an incorrect image or your service requirements change, you can change the image of your ECS.
HUAWEI CLOUD allows you to change the image type (public images, private images, shared images, and Marketplace images) and OS. For details, see Changing the OS.

7.2 Can an ECS Created from a Private Image Have Different Hardware Specifications from the ECS Used to Create the Private Image?

When you use a private image to create an ECS, you can specify the system disk size of the ECS. However, the disk size must be greater than or equal to the system disk size of the image and less than 1024 GB. However, specifications of the CPU, memory, bandwidth, and data disk specifications can be different if necessary.

7.3 Can I Specify the System Disk Size When Create an ECS Using an Image?

If you use an image to create an ECS, you can specify the system disk size of the ECS. However, the disk size must be greater than or equal to the system disk size of the image and smaller than 1024 GB.
7.4 How Do I Delete Redundant Network Connections to a Windows ECS?

Method 1

1. Press Win+R. In the displayed dialog box, enter regedit and press Enter to open the registry editor.
2. Open the following registry key:
   HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\NetworkList\Profiles
   Profiles may contain multiple subitems, and the subitem names contain digits and letters. Click each subitem in sequence and query the Data column of ProfileName in the right pane.
3. Double-click ProfileName and set Value Data to the name of the network to be changed.
4. Restart the ECS for the modification to take effect.

Method 2

1. Press Win+R. In the displayed dialog box, enter regedit and press Enter to open the registry editor.
2. Open the following registry keys:
   HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\NetworkList\Profiles
   HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\NetworkList\Signatures\Unmanaged
3. Delete the directories shown in the following figure:

   Image Management Service
   FAQs
   Issue 09 (2020-01-30)  Copyright © Huawei Technologies Co., Ltd. 54
7.5 What Do I Do If No Partition Is Found During the Startup of an ECS Created from an Imported Private Image?

Symptom

This may be caused by the disk partition ID change after the cross-platform image import. As a result, no partition can be found based on the original disk partition ID in the image. In this case, you need to change the disk partition in the image (UUID=UUID of the disk partition).

Solution

The following uses openSUSE 13.2 as an example to describe how to change the partition name.

1. Run the following command to query the disk partition ID:

   ```bash
   ls -l /dev/disk/by-id/
   ```

   The example command output is as follows.

   ```bash
   total 0
   lrwxrwxrwx 1 root root 10 Jul 22 01:35 ata-QEMU_HARDDISK_QM00001 -> ../../xvda
   lrwxrwxrwx 1 root root 11 Jul 22 01:35 ata-QEMU_HARDDISK_QM00001-part1 -> ../../xvda1
   lrwxrwxrwx 1 root root 11 Jul 22 01:35 ata-QEMU_HARDDISK_QM00001-part10 -> ../../xvda10
   lrwxrwxrwx 1 root root 11 Jul 22 01:35 ata-QEMU_HARDDISK_QM00001-part12 -> ../../xvda2
   lrwxrwxrwx 1 root root 11 Jul 22 01:35 ata-QEMU_HARDDISK_QM00001-part5 -> ../../xvda5
   lrwxrwxrwx 1 root root 11 Jul 22 01:35 ata-QEMU_HARDDISK_QM00001-part6 -> ../../xvda6
   lrwxrwxrwx 1 root root 11 Jul 22 01:35 ata-QEMU_HARDDISK_QM00001-part7 -> ../../xvda7
   lrwxrwxrwx 1 root root 11 Jul 22 01:35 ata-QEMU_HARDDISK_QM00001-part8 -> ../../xvda8
   ```
ata-QEMU_HARDDISK_xxx and scsi-SATA_QEMU_HARDDISK_xxx indicate that the disk of the ECS is simulated using Quick EMUlator (QEMU). The content at the left of -> is the disk partition ID, and that at the right of -> is the partition name.

2. Run the following command to query the disk partition UUID:

```bash
ls -l /dev/disk/by-uuid/
```

The example command output is as follows.

```
total 0
lrwxrwxrwx 1 root root 11 Jul 22 01:35 45ecd7a0-29da-4402-a017-4564a62308b8 -> ../../xvda5
lrwxrwxrwx 1 root root 11 Jul 22 01:35 55386c6a-9e32-41d4-af7a-e79596221f51 -> ../../xvde
lrwxrwxrwx 1 root root 11 Jul 22 01:35 55f36660-9bac-478c-a701-7ecc5347f789 -> ../../xvda1
```

The content at the left of -> is the disk partition UUID, and that at the right of -> is the partition name. Obtain the relationship between the disk partition name, partition ID, and partition UUID.

3. Run the following command to check the partition names in the /etc/fstab file:

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

The example command output is as follows.

```
/dev/disk/by-id/scsi-SATA_QEMU_HARDDISK_QM00001-part5 / ext3 defaults,errors=panic 1 1
/dev/disk/by-id/scsi-SATA_QEMU_HARDDISK_QM00001-part1 /boot ext3 defaults,errors=panic 1 2
```

The values in the first column are the disk partition IDs.

4. Press i to enter editing mode. Change the disk partition ID in the row that contains /dev/disk/xxx in the /etc/fstab file in step 3 to UUID=UUID of the disk partition based on the query results in step 1 and step 2.

The modified content is as follows.

```
UUID=45ecd7a0-29da-4402-a017-4564a62308b8 / ext3 defaults,errors=panic 1 1
UUID=780f36bc-0ada-4c98-9a8d-44570d6533d /boot ext3 defaults,errors=panic 1 2
```

The modified command is as follows.

```
UUID=45ecd7a0-29da-4402-a017-4564a62308b8 / ext3 defaults,errors=panic 1 1
```

The values in the first column are the disk partition IDs.
sysfs /sys sysfs noauto 0 0
proc /proc proc defaults 0 0
usbsfs /proc/bus/usbsfs noauto 0 0
depts /dev/pts devpts mode=0620,gid=5 0 0
/dev/cdrom /media/ udf,iso9660 noexec,noauto,nouser,nodev,nosuid 1 2
tmpfs /dev/shm tmpfs noexec,nodev,nosuid 0 0

**NOTE**

Ensure that the UUIDs are correctly modified. Otherwise, the ECS cannot start properly.

5. Press **Esc**, enter **:wq**, and press **Enter**. The system saves the configuration and exits the vi editor.

6. Check the partition names in the system boot configuration file.
The system boot configuration files for different OSs vary. Confirm the boot configuration file of the current OS.
   - Grand Unified Boot Loader (GRUB) configuration file
     - /boot/grub/grub.conf
     - /boot/grub/menu.lst
     - /boot/grub/grub.cfg
     - /boot/grub2/grub.cfg
   - Syslinux configuration file
     - /extlinux.conf
     - /boot/syslinux/extlinux.conf
     - /boot/extlinux/extlinux.conf
     - /boot/syslinux/syslinux.cfg
     - /syslinux/syslinux.cfg
     - /syslinux.cfg

The boot file in this example is **/boot/grub/menu.lst**. Run the following command to check it:

```
vi /boot/grub/menu.lst
```

default 0
timeout 3
title xxx Server OS - xxxxxx
kernel /boot/vmlinuz-3.0.101-0.47.52-default root=/dev/disk/by-id/scsi-SATA_QEMU_HARDDISK_QM00001-part5 resume= memmap=0x2000000$0x3E000000
nmi_watchdog=2 crashkernel=512M-:256M console=ttys0,115200 console=ttys0 xen_emul_unplug=all
initrd /boot/initrd-3.0.101-0.47.52-default

7. Press **i** to enter editing mode and change the partition names in the system boot configuration file.

Change the disk partition name in the **/boot/grub/menu.lst** file in 6 to **UUID=UUID of the disk partition** based on the query results in 1 and 2.

default 0
timeout 3
title xxx Server OS - xxxxxx
kernel /boot/vmlinuz-3.0.101-0.47.52-default root=UUID=45ecd7a0-29da-4402-a017-4564a62308b8
resume= memmap=0x2000000$0x3E000000 nmi_watchdog=2 crashkernel=512M-:256M
7.6 What Do I Do If the Disks of an ECS Created from a CentOS Image Cannot Be Found?

Symptom

Generally, this is because the xen-blkfront.ko module is not loaded during the startup. You need to modify OS kernel startup parameters. Figure 7-2 shows the startup screen after the login to the ECS.

Solution

Perform the following operations to modify OS kernel boot parameters:

NOTE

These operations must be performed after the OS starts. You are advised to modify kernel boot parameters in the ECS used for creating the image.

1. Run the following command to log in to the OS:

   ```
   lsinitrd /boot/initramfs-`uname -r`\:img |grep -i xen
   ```

   - If the command output contains `xen-blkfront.ko`, contact the customer service.
   - If no command output is displayed, go to 2.

2. Back up the GRUB configuration file.

   ```
   cp /boot/grub/grub.conf /boot/grub/grub.conf.bak
   ```

   - If the ECS runs CentOS 6, run the following command:

     ```
     cp /boot/grub/grub.conf /boot/grub/grub.conf.bak
     ```

   - If the ECS runs CentOS 7, run the following command:

     ```
     cp /boot/grub2/grub.cfg /boot/grub2/grub.cfg.bak
     ```

3. Use the vi editor to open the GRUB configuration file. Run the following command (using CentOS 7 as an example):

   ```
   console=ttyS0,115200 console=tty0 xen_emul_unplug=all
   initrd /boot/initrd-3.0.101-0.47.52-default
   ```
vi /boot/grub2/grub.cfg

4. Add `xen_emul_unplug=all` to the default boot kernel.

```
NOTE
```

Search for the line that contains `root=UUID=` and add `xen_emul_unplug=all` to the end of the line.

```
menuentry 'CentOS Linux (3.10.0-229.el7.x86_64) 7 (Core) with debugging' --class centos --class gnu-linux --class gnu --class os --unrestricted $menuentry_id_option 'gnulinux-3.10.0-229.el7.x86_64-advanced-bf3cc825-7638-48d8-8222-cd2f412dd0de' {
    load_video
    set gfxpayload=keep
    insmod gzio
    insmod part_msdos
    insmod ext2
    set root='hd0,msdos1'
    if [ x$feature_platform_search_hint = xy ]; then
      search --no-floppy --fs-uuid --set=root --hint='hd0,msdos1'  bf3cc825-7638-48d8-8222-cd2f412dd0de
    else
      search --no-floppy --fs-uuid --set=root bf3cc825-7638-48d8-8222-cd2f412dd0de
    fi
    linux16 /boot/vmlinuz-3.10.0-229.el7.x86_64 root=UUID=bf3cc825-7638-48d8-8222-cd2f412dd0de xen_emul_unplug=all ro crashkernel=auto rhgb quiet systemd.log_level=debug systemd.log_target=kmsg
    initrd16 /boot/initramfs-3.10.0-229.el7.x86_64.img
```

5. Press `Esc`, enter `.wq`, and press `Enter` to exit the vi editor.

6. Create an image using the ECS, upload and register the image on the cloud platform.

7.7 What Should I Do If an ECS Starts Slowly?

**Symptom**

If an ECS starts slowly, you can change the default timeout duration to speed up the startup.

**Solution**

1. Log in to the ECS.
2. Run the following command to switch to user `root`:
   ```
   sudo su
   ```
3. Run the following command to query the version of the GRUB file:
   ```
   rpm -qa | grep grub
   ```

   **Figure 7-3 Querying the GRUB file version**

4. Set `timeout` in the GRUB file to 0.
   - If the GRUB file version is earlier than 2:
     ```
     Open /boot/grub/grub.cfg or /boot/grub/menu.lst and set timeout to 0.
     ```
   - If the GRUB file version is 2:
     ```
     ```
Open `/boot/grub2/grub.cfg` and set the value of `timeout` to 0.

**Figure 7-4 Modifying the timeout duration**

---

### 7.8 What Do I Do If One-Click Password Resetting Plug-In Fails to Start?

#### Scenarios

If the plug-in fails to start after it has been installed, you need to add the following content to the `rc` file:

- /CloudrResetPwdAgent/bin/cloudResetPwdAgent.script start
- /CloudResetPwdUpdateAgent/bin/cloudResetPwdUpdateAgent.script start

#### NOTE

- If `exit 0` is displayed at the end of the file, add the following statement to the row just before `exit 0`: If `exit 0` is not displayed, add the following content at the end of the file.
- ECSs created using a SUSE 11 SP4 image must have 4 GB or a larger memory.

#### Procedure

- For CoreOS OSs, run the following commands to start the plug-in:
  ```
cat > /etc/systemd/system/cloudResetPwdAgent.service <<EOT
[Unit]
Description=cloudResetPwdAgent service
Wants=local-fs.target
Requires=local-fs.target
[Service]
Type=simple
ExecStart=/CloudrResetPwdAgent/bin/cloudResetPwdAgent.script start
RemainAfterExit=yes
ExecStop=/CloudrResetPwdAgent/bin/cloudResetPwdAgent.script stop
KillMode=none
[Install]
WantedBy=multi-user.target
EOT
systemctl enable cloudResetPwdAgent.service
cat > /etc/systemd/system/cloudResetPwdUpdateAgent.service <<EOT
[Unit]
Description=cloudResetPwdUpdateAgent service
Wants=local-fs.target
Requires=local-fs.target
[Service]
Type=simple
ExecStart=/CloudResetPwdUpdateAgent/bin/cloudResetPwdUpdateAgent.script start
RemainAfterExit=yes
ExecStop=/CloudResetPwdUpdateAgent/bin/cloudResetPwdUpdateAgent.script stop
KillMode=none
[Install]
WantedBy=multi-user.target
EOT
systemctl enable cloudResetPwdUpdateAgent.service
```
- SUSE, Ubuntu, and Debian
  a. Run the following command to open the rc file:
     ```
     vi /etc/init.d/rc
     ```
  b. Press i to enter editing mode and add the following content at the end of the file:
     ```
     /CloudrResetPwdAgent/bin/cloudResetPwdAgent.script start
     /CloudResetPwdUpdateAgent/bin/cloudResetPwdUpdateAgent.script start
     ```
  c. Press Esc, enter `:wq`, and press Enter to save the configuration and exit.
- CentOS Linux 7
  a. Run the following commands to open the rc.local file:
     ```
     chmod +x /etc/rc.d/rc.local
     vi /etc/rc.d/rc.local
     ```
  b. Press i to enter editing mode and add the following content at the end of the file:
     ```
     /CloudrResetPwdAgent/bin/cloudResetPwdAgent.script start
     /CloudResetPwdUpdateAgent/bin/cloudResetPwdUpdateAgent.script start
     ```
  c. Press Esc, enter `:wq`, and press Enter to save the configuration and exit.
- openSUSE 13
  a. Run the following command to open the boot.local file:
     ```
     vi /etc/init.d/boot.local
     ```
  b. Press i to enter editing mode and add the following content at the end of the file:
     ```
     /CloudrResetPwdAgent/bin/cloudResetPwdAgent.script start
     /CloudResetPwdUpdateAgent/bin/cloudResetPwdUpdateAgent.script start
     ```
  c. Press Esc, enter `:wq`, and press Enter to save the configuration and exit.
- Debian 8
  a. Run the following commands to open the rc.local file:
     ```
     touch /etc/rc.d/rc.local
     chmod +x /etc/rc.d/rc.local
     vi /etc/rc.d/rc.local
     ```
  b. Press i to enter editing mode and add the following content at the end of the file:
     ```
     /CloudrResetPwdAgent/bin/cloudResetPwdAgent.script start
     /CloudResetPwdUpdateAgent/bin/cloudResetPwdUpdateAgent.script start
     ```
  c. Press Esc, enter `:wq`, and press Enter to save the configuration and exit.
- Fedora 20
  a. Run the following commands to open the rc.local file:
     ```
     touch /etc/rc.d/rc.local
     chmod +x /etc/rc.d/rc.local
     vi /etc/rc.d/rc.local
     ```
  b. Press i to enter editing mode and add the following content at the end of the file:
     ```
     /CloudrResetPwdAgent/bin/cloudResetPwdAgent.script start
     /CloudResetPwdUpdateAgent/bin/cloudResetPwdUpdateAgent.script start
     ```
  c. Press Esc, enter `:wq`, and press Enter to save the configuration and exit.
- Other OSs
  a. Run the following command to open the rc.local file:
vi /etc/rc.d/rc

b. Press i to enter editing mode and add the following content at the end of the file:
/CloudrResetPwdAgent/bin/cloudResetPwdAgent.script start
/CloudResetPpwdUpdateAgent/bin/cloudResetPpwdUpdateAgent.script start
c. Press Esc, enter :wq, and press Enter to save the configuration and exit.

7.9 How Do I Resolve the Issue That an ECS Created from a Windows Image Fails to Start When I Have Selected Enable Automatic Configuration During Image Registration?

Symptom
This issue is probably caused by the failure of offline VirtIO driver injection.

Solution
When you inject the VirtIO driver for a Windows ECS offline, there are some restrictions:
- If the boot mode of the image file is UEFI, the VirtIO driver cannot be injected offline.
- It is recommended that you disable Group Policy Object (GPO). Some policies may cause the failure to inject the VirtIO driver offline.
- It is recommended that you stop the antivirus software. Otherwise, the VirtIO driver may fail to be injected offline.

To update the VirtIO driver, you must install UVP VMTools. For how to install UVP VMTools, see Optimizing a Windows Private Image

7.10 What Do I Do If an Exception Occurs When I Start an ECS Created from an Image Using the UEFI Boot Mode?

Symptom
An ECS created from a private image using the UEFI boot mode cannot start.

Possible Causes
The image OS uses the UEFI boot mode, but the uefi attribute is not added to the image attributes.
Handling Method

1. Delete the ECS that fails to start.
2. Call the API to update the image attributes and change the value of `hw_firmware_type` to `uefi`.
   API URI: PATCH /v2/cloudimages/{image_id}
   For details about how to call the API, see Updating Image Information.
3. Use the updated image to create an ECS again.
## 8 Change History

<table>
<thead>
<tr>
<th>Released On</th>
<th>Description</th>
</tr>
</thead>
</table>
| **2020-01-30** | This issue is the ninth official release. Added the following content:  
  - How Can I Use a Backup to Create an EVS Disk or ECS?  
  - Can I Install the Exported System Disk Image of an ECS on a Physical Server?  
  - Can I Download a Public Image Provided by HUAWEI CLOUD to My Local PC? |
| **2019-12-30** | This issue is the eighth official release. Added the following content:  
  - What Do I Do If I Want to Set Up an OpenVPN Environment But No Image Containing OpenVPN Is Available?  
  - How Can I Back Up the Current Status of an ECS for Restoration in the Case of a System Fault? |
| **2019-11-30** | This issue is the seventh official release. Added the following content:  
  - What Are the Differences Between Images and Backups?  
  - Full-ECS Image FAQs  
Modified the following content:  
Adjusted the structure of the document. |
<table>
<thead>
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<th>Released On</th>
<th>Description</th>
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| 2019-09-30  | This issue is the sixth official release. Added the following content:  
● What Do I Do If I Cannot Find a Desired Image?  
● Image Creation FAQs  
● Image Sharing FAQs  
● Encrypted Image FAQs  
● How Do I Optimize a System Disk Image So That It Can Be Used to Create ECSs Quickly? |
| 2019-04-30  | This issue is the fifth official release. Added the following content: Why Do I Need to Install and Update VMTools for Windows?  
Deleted the following content:  
What Do I Do If I Cannot Create an Image in ZVHD2 Format Using an API? |
| 2019-04-09  | This issue is the fourth official release. Deleted the following content:  
What Do I Do If the Provided OS Images Cannot Meet My Requirement? |
| 2019-03-30  | This issue is the third official release. Added the following content:  
What Do I Do If an Exception Occurs When I Start an ECS Created from an Image Using the UEFI Boot Mode?  
Modified the following content:  
What Changes Will Be Made to an Image File Used for Registering a Private Image? |
| 2019-02-15  | This issue is the second official release. Added the following content:  
● How Do I Increase the Image Quota?  
● What Can I Do After Installing Cloud-Init on an ECS? |
| 2019-01-10  | This issue is the first official release. |