

Image Management Service

FAQs

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1 Image Consulting

1.1 How Do I Select an Image?

When creating an ECS or a BMS, you can select an image 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 in a different region. For example, when creating an instance in region A, you can only select an image that is already in region A. For more information, see [Region and AZ](#).

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

Image Type

Images are classified into public, private, KooGallery, and shared images.

Table 1-1 Image types

Image Type	Description	Availability/Security	Billing
Public	A public image is a standard, widely used image. It contains an OS and preinstalled public applications and is available to all users. Public images are very stable and their OS and any included software have been officially authorized for use.	High	Free
KooGallery	KooGallery is an online store where you can purchase third-party images that have the OS, application environments, and software preinstalled. You can use these images to deploy websites and application development environments in just a few clicks. No additional configuration is required.	Medium high	Free/Charged
Private	A private image contains an OS or service data, preinstalled public applications, and a user's personal applications. Private images are only available to the users who created them.	Medium	Free
Shared	A shared image is a private image another user has shared with you.	Low	Free

You can select an image as follows:

- If you only need an OS, select a public image.
- If you need a complete software environment, such as a Magento e-commerce system, select a KooGallery image.
- If you want to clone an existing ECS, select a private image.
- If you want to use an image shared by others, select a shared image.

Image Fee

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

OS

When selecting an OS, consider the following factors:

- Architecture types

System Architecture	Applicable Memory	Constraints
32-bit	Smaller than 4 GB	<ul style="list-style-type: none"> If the instance memory is greater than 4 GB, a 32-bit OS cannot be used. A 32-bit OS only allows addressing 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 of memory or the memory may need to be expanded to more than 4 GB, use a 64-bit OS.

- OS types

OS Type	Applicable Scenario	Constraints
Windows	<ul style="list-style-type: none"> Programs developed for Windows (for example, .NET). Databases such as SQL Server. (You need to install the database.) 	The system disk must be at least 40 GB, and there must be at least 1 GB of memory.
Linux	<ul style="list-style-type: none"> High-performance server applications (for example, Web) and common programming languages such as PHP and Python Databases such as MySQL. (You need to install the database.) 	The system disk must be at least 40 GB, and there must be at least 512 MB of memory.

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

Huawei Cloud supports the following public images: CentOS, Debian, openSUSE, Fedora, Ubuntu, EulerOS, and CoreOS. You can view OS types and versions on the **Public Images** page on the management console. If you cannot find a desired image, you have the following options:

- Download an image file from the official OS website and then use the file to create a private image. 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 VMDK, VHD, QCOW2, RAW, VHDX, QED, VDI, QCOW, ZVHD2, or ZVHD format.

- If you already have an ISO file and the OS is supported by the cloud platform (for details, see [External Image File Formats and Supported OSs](#)), you can create a private image as follows:
 - 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 the image belongs to another tenant, ask the tenant to share it with you. For details about image sharing, see [Sharing Specified Images](#).
- Find private images in KooGallery.

If after trying all of these methods, you are still unable to obtain the desired image, you are advised to [create a service ticket](#) to contact Huawei Cloud technical support.

1.3 Are There Any Public Images Already Containing Certain Applications, Such as OpenVPN or PyTorch?

No public image contains applications like OpenVPN or PyTorch.

You need to manually install OpenVPN or PyTorch or search for eligible images in KooGallery.

For details, see [Image Types](#).

1.4 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 1-2 Differences between backups and images

Item	CBR	IMS
Concept	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.	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 data of the system disk and data disks.
Usage method	<ul style="list-style-type: none"> ● 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 	<ul style="list-style-type: none"> ● 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	<ul style="list-style-type: none"> ● Data backup and restoration ● Rapid service deployment and migration 	<ul style="list-style-type: none"> ● Server migration to the cloud or between clouds ● Deploying a specific software environment ● Deploying software environments in batches ● Backing up server operating environments

Item	CBR	IMS
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.

NOTE

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 the CBR billing standards, and image storage fees are charged according to the OBS billing standards.

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.
3. A backup is compressed when it is used to create an image, so the size of the generated image may be smaller than the backup size.

1.5 Can I Tailor an Image?

Yes, but you'd better not.

When you import an external image file, you are advised to import the image that contains the official OS release version. Do not tailor or highly customize the release version. Otherwise, problems may occur.

OS vendors do not always update OS release versions regularly. Some versions are no longer maintained, and these deprecated versions no longer receive security patches. Ensure that you read the update notifications from OS vendors and update your OS so that it runs properly.

If the End of Support (EOS) of an OS arrives, you can still use images containing this OS, but Huawei Cloud will no longer provide technical support for these images, such as locating new problems and rectifying defects. For more information, see [EOS Plan](#).

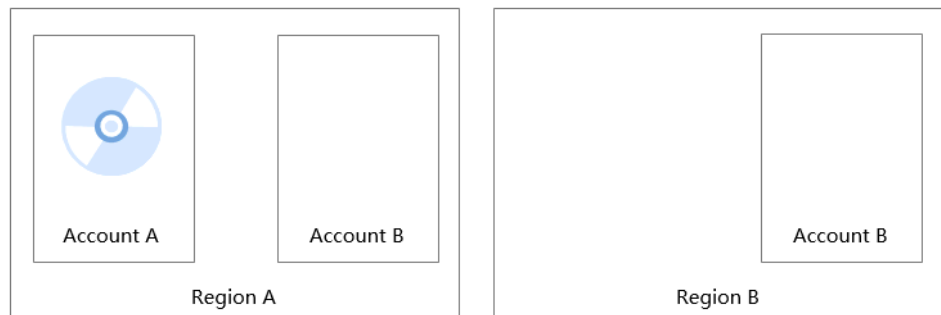
1.6 How Do I Migrate an ECS to a Different Region of Another Account?

You can perform the migration in either of the following ways:

- Use the ECS to create a private image, migrate the image to a different region of another account, and then use the image to create a new ECS. You can migrate a private image in either of the following ways:
 - Replicate the image to another region of the same account and share it with another account.



- Share the image with another account in the same region. Under the target account, accept the shared image, replicate it as a private image, and replicate it to another region.



For details about cross-region image replication, image sharing, and replication of shared images, see [Replicating Images Across Regions](#), [Sharing Specified Images](#), [Replicating a Shared Image](#).

- Use Server Migration Service (SMS) to migrate the ECS.
SMS can migrate x86 physical servers or VMs on private or public clouds to Huawei Cloud ECSs. For details, see [Moving Huawei Cloud ECSs from Multiple Accounts to a Single Account](#).

1.7 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 any of the following ways:

- (Recommended) Use CBR to create a scheduled backup for the ECS. If the ECS fails, select a backup you want to use to restore the ECS, create a full-ECS image from the backup, and use the image to create a new ECS or to reinstall the OS of the ECS.
- Create a system disk image from the ECS. If the ECS fails, use the system disk image to create a new ECS or to reinstall the OS.
- Create a snapshot for the system disk of the ECS. If the ECS fails, you can restore the system disk data from the snapshot.

1.8 How Can I Apply a Private Image to an Existing ECS?

- You can use the image to change the ECS OS if the image is in the same region as the ECS. When you change the OS, select that image. For details about how to change the OS, see [Changing the OS](#).

Figure 1-1 Changing the OS

Change OS ×

Note the following points before you change the OS:

- All the data on the system disk, and any snapshots, will be lost. [Back up the data before you continue.](#)
- Not all OSs support SCSI disks. If the new OS does not support SCSI disks, any SCSI disks attached to the ECS will become unavailable. [Learn more](#)
- The ECS will be automatically restarted after the OS change. Any custom settings (such as the DNS or hostname) will be reset to their default settings.

[Hide](#)

Current Configuration

ECS Name	IP address	Specifications	Image	System Disk
ecs-1	192.168.1.1 (Privat...	1 vCPU 2 GiB ...	CentOS 7.5 64bit (64-bit)	40 GiB

Stop the ECS (The ECS must be stopped before its OS can be changed.)

Image: Public image **Private image** Shared image Marketplace image

[Create Private Image](#)

Login Mode: **Key pair** Password

Key Pair: [Create Key Pair](#)

Cancel OK

- If the image and the ECS are in different regions, replicate the image to the region where the ECS is, and then use the image to change the ECS OS. For details, see [Replicating Images Across Regions](#).

1.9 Can I Import Data from a Data Disk Image to a Data Disk?

No.

A data disk image can only be used to apply for a new disk and its data cannot be imported to a disk. To import the data, perform the following operations:

- Use the data disk image to create a temporary disk.
- Attach the temporary disk to the ECS where the target disk is located.
- Copy data from the temporary disk to the target disk. Then, delete the temporary disk.

1.10 Can I Use Private Images of Other Accounts?

Yes.

You can use the private images other accounts shared with you.
For details, see [Sharing Specified Images](#).

2 End-of-Support for OSs

2.1 What Do I Do If CentOS Linux Is No Longer Maintained?

CentOS has planned to stop maintaining CentOS Linux. Huawei Cloud will stop providing CentOS Linux public images. This section describes the impacts and tells you how to address the situation.

Background

On December 8, 2020, CentOS announced its plan to stop maintaining CentOS Linux and launched CentOS Stream. For more information, see [CentOS Project shifts focus to CentOS Stream](#).

CentOS Linux 8 ended on December 31, 2021, and CentOS Linux 7 will end on June 30, 2024. CentOS Linux 9 and later versions will not be released, and patches will no longer be updated.

Impacts

CentOS Linux users will be affected as follows:

- After December 31, 2021, CentOS Linux 8 users will not be able to obtain any maintenance or support services, including problem fixing and function updates.
- After June 30, 2024, CentOS Linux 7 users will not be able to obtain any maintenance or support services, including problem fixing and function updates.

Huawei Cloud users will be affected as follows:

- CentOS Linux 8 public images will continue for a certain time. ECSs created from CentOS Linux 8 images will not be affected, but the images will no longer be updated.
- Huawei Cloud will synchronize with CentOS for the support of CentOS Linux. After December 31, 2021, support services will no longer be available for CentOS 8. The support for CentOS 7 will continue until June 30, 2024.

Solution

You can change or migrate the OS so that the services originally running in CentOS Linux can continue to run in other OSs.

- Change CentOS Linux to one of those listed in [Table 2-2](#).
If you want to change the ECS OS and the software is loosely coupled with the OS, change it. This does not affect the ECS configurations (such as NICs, disks, and VPNs).
 - For details about how to change to Huawei Cloud EulerOS, see [Changing an OS to Huawei Cloud EulerOS](#).
 - For details about how to change to CentOS Stream or Rocky Linux, see [Changing the OS](#).
- Migrate CentOS Linux to Huawei Cloud EulerOS.
If you want to change the OS but retain OS parameter settings, migrate the OS to Huawei Cloud EulerOS. This does not affect the ECS configurations (such as NICs, disks, and VPNs).
For details, see [Migrating an OS to Huawei Cloud EulerOS](#).

The following table describes the differences between the two methods.

Table 2-1 Differences between OS change and OS migration

Item	Changing an OS	Migrating an OS
Data backup	<ul style="list-style-type: none">• Data in all partitions of the system disk will be cleared, so you are advised to back up the system disk data prior to an OS change.• Data in data disks remains unchanged.	<ul style="list-style-type: none">• System disk data is not cleared, but you are still advised to back up the system disk data to prevent any exception in system software.• Data in data disks remains unchanged.
Custom settings	After the OS is changed, custom settings such as DNS and hostname will be reset and need to be reconfigured.	After the OS is migrated, custom settings such as DNS and hostname do not need to be reconfigured.

Table 2-2 Available OSs

OS	Description	Intended User
Huawei Cloud EulerOS	Huawei Cloud EulerOS (HCE) is an openEuler-based cloud operating system. HCE offers cloud native, high-performing, secure, and easy-to-migrate capabilities. This accelerates service migration to the cloud and promotes application innovation. You can use it to replace operating systems such as CentOS and EulerOS.	Individuals or enterprises that want to continue to use free images in an open source community
CentOS Stream	CentOS Stream is a continuous delivery distribution provided by CentOS.	Individuals or enterprises that are used to CentOS and desire continuous updates
Rocky Linux	Rocky Linux is a community-driven enterprise-class OS. It is a downstream release of Red Hat Enterprise Linux (RHEL). Rocky Linux is fully compatible with and as stable as CentOS.	Individuals or enterprises that want to continue to use free images in an open source community
AlmaLinux	AlmaLinux is an open-source, community-driven Linux distribution developed by the CloudLinux team. It fills the gap left by the discontinuation of the CentOS Linux stable release. AlmaLinux can remain 1:1 compatibility with upstream RHEL. You can use it for OS changes without stopping your server.	Individuals or enterprises that want to continue to use free images in an open source community
Debian and Ubuntu	They are Linux distributions that differ in use and compatibilities.	Individuals or enterprises that can afford the OS change costs

2.2 EOS Plan

If the End of Support (EOS) of an OS arrives, you can still use images containing this OS, but Huawei Cloud will no longer provide technical support for these images, such as locating new problems and rectifying defects.

This section provides the OS EOS plan.

- [HuaweiCloudEulerOS](#)

- [EulerOS](#)
- [CentOS](#)
- [Debian](#)
- [Ubuntu](#)
- [Red Hat](#)
- [FreeBSD](#)
- [OpenSUSE](#)
- [SUSELinux](#)
- [Fedora](#)
- [RockyLinux](#)
- [AlmaLinux](#)
- [WindowsServer](#)

 **NOTE**

- EulerOS and Huawei Cloud EulerOS are developed by Huawei which provides technical support for the OSs until their end of life (EOL).
- For third-party OSs, when their EOL arrives, Huawei Cloud will stop providing technical support for the images that contain these OSs.

OS EOS

- Huawei Cloud EulerOS

Version	EOS Date
Huawei Cloud EulerOS 2.0	2028-06-30
Huawei Cloud EulerOS 1.1	2026-06-30

- EulerOS

Version	EOS Date
EulerOS 2.0SP8	2024-06-30
EulerOS 2.0SP5	2023-06-30
EulerOS 2.0SP3	2022-09-30
EulerOS 2.0SP2	2021-12-30
EulerOS 2.0SP1	2020-12-30

- CentOS

Version	Mainstream End Date	Extended End Date
CentOS 8	2021-12-31	2021-12-31
CentOS 7	2020-08-06	2024-06-30

Version	Mainstream End Date	Extended End Date
CentOS 6	2017-05-10	2020-11-30

- Debian

Version	EOS Date
Debian 13	Unknown
Debian 12	Unknown
Debian 11	Unknown
Debian 10	2022-09-10
Debian 9	2020-07-18
Debian 8	2018-06-17
Debian 7	2016-04-25

- Ubuntu

Version	EOS Date
Ubuntu 22.04 LTS	2032-04
Ubuntu 20.04 LTS	2030-04
Ubuntu 18.04 LTS	2028-04
Ubuntu 16.04 LTS	2026-04
Ubuntu 14.04 LTS	2024-04

- Red Hat

Version	EOS Date
Red Hat 9	2027-05-31
Red Hat 8	2024-05-31
Red Hat 7	2019-08-06
Red Hat 6	2016-05-10

- FreeBSD

Version	EOS Date
FreeBSD 13.0	Three months after the release of FreeBSD 13.1

Version	EOS Date
FreeBSD 12.3	2022-08-21
FreeBSD 12.2	2022-03-31
FreeBSD 12.1	2021-01-31
FreeBSD 12.0	2020-02-04
FreeBSD 11.4	2021-09-30
FreeBSD 11.3	2020-09-30
FreeBSD 11.2	2019-10-31
FreeBSD 11.1	2018-09-30
FreeBSD 11.0	2017-11-30

- OpenSUSE

Version	EOS Date
OpenSUSE 15.3	2022-11-30
OpenSUSE 15.2	2022-01-04
OpenSUSE 15.1	2021-02-02
OpenSUSE 15.0	2019-12-03
OpenSUSE 42.3	2019-07-01
OpenSUSE 42.2	2018-01-26
OpenSUSE 42.1	2017-05-17

- SUSE Linux

Version	Mainstream End Date	Extended End Date
SUSE Linux Enterprise Server 15 SP4	Six months after the release of SUSE Linux Enterprise Server 15 SP5	Unknown
SUSE Linux Enterprise Server 15 SP3	2022-12-31	2025-12-31
SUSE Linux Enterprise Server 15 SP2	2021-12-31	2024-12-31
SUSE Linux Enterprise Server 15 SP1	2021-01-31	2024-06-31

Version	Mainstream End Date	Extended End Date
SUSE Linux Enterprise Server 15	2019-12-31	2022-12-31
SUSE Linux Enterprise Server 12 SP5	2024-10-31	2027-10-31
SUSE Linux Enterprise Server 12 SP4	2020-06-30	2023-06-30
SUSE Linux Enterprise Server 12 SP3	2019-06-30	2022-06-30
SUSE Linux Enterprise Server 12 SP2	2018-03-31	2021-03-31
SUSE Linux Enterprise Server 12 SP1	2017-05-31	2020-05-31
SUSE Linux Enterprise Server 12	2016-06-30	2019-07-01

- Fedora

Version	EOS Date
Fedora 35	2022-12-13
Fedora 34	2022-06-07
Fedora 33	2021-11-30
Fedora 32	2021-05-25
Fedora 31	2020-11-24
Fedora 30	2020-05-26
Fedora 29	2019-11-26
Fedora 28	2019-05-28
Fedora 27	2018-11-30

- Rocky Linux

Version	EOS Date
Rocky Linux 8.5	2031-11-14

- AlmaLinux

Version	EOS Date
AlmaLinux 8.5	2031-11

- Windows Server

Version	Mainstream End Date	Extended End Date
Windows Server 2019	2024-01-09	2029-01-09
Windows Server 2016	2022-01-11	2027-01-12
Windows Server 2012	2018-10-09	2023-10-10
Windows Server 2012 R2	2018-10-19	2023-10-10
Windows Server 2008	Ended	Ended
Windows Server 2003	Ended	Ended

3 Image Creation

3.1 General Creation FAQ

How Can I Use an ECS to Quickly Provision Identical ECSs?

If you have an ECS with applications deployed, you can use the ECS to create a private image and then use the image to create identical ECSs. In this way, you do not need to deploy applications repeatedly.

- [Creating a System Disk Image from a Windows ECS](#)
- [Creating a System Disk Image from a Linux ECS](#)
- [Creating an ECS from an Image](#)

How Many Private Images Can I Create Under an Account?

You can create up to 50 private images under a given account within a region. If you need more, submit a service ticket to increase your quota. For details, see [Managing Quotas](#).

Do I Have to Stop the ECS Before Using It to Create a Private Image?

No. You can create an image from a running ECS. But the data that was written into the ECS during the image creation will not be included in the image.

Where Can I Check the Image Creation Progress? How Long Does It Take to Create an Image?

Log in to the management console. Choose **Compute > Image Management Service** and click the **Private Images** tab. Check the image creation progress in the **Status** column.

Creating an image may take a period of time because it requires to install Xen and KVM drivers, load the OS kernel, and configure GRUB boot. In addition, the network speed, image file type, and disk size all have impacts on how long the entire process takes.

Can I Use a Private Image of an IAM User Under My Account to Create an ECS?

Yes.

Private images created by an IAM user are visible to the account that the IAM user belongs to as well as all other IAM users (if any) under this account.

- You can use a system disk image or full-ECS image to create an ECS.
- You can use a data disk image to create an EVS disk.

In addition, private images created by an account are visible to IAM users under this account.

3.2 Full-ECS Image FAQ

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 users
- Migrating an ECS from one region to another, for example, from CN East-Shanghai1 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 is where your image and backup are stored. You need to pay for the vault.

When creating a full-ECS image from a CSBS backup, the space used to store the image and CSBS backup is not open to users but still need to be billed.

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

Where Can I Check the Data Disk Details of a Full-ECS Image?

To check data disk details, you need to go to the CSBS or CBR console, depending on where the full-ECS image is created from. That is because only system disk information (**Disk Capacity**) is displayed in the image list and image details after a 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 backup details page is displayed.

Figure 3-1 Image details

Name	cbr_switch_test	ID	ecc65532-7431-49e0-971a-b1912f4e1e2b
Image Type	Full-ECS image	Disk Capacity (GB)	--
OS	Ubuntu 16.04 server 64bit	Status	Normal
Minimum Memory	1 GB	Maximum Memory	4096 GB
Released	No	Created	2023/01/14 09:05:42 GMT+08:00
Completed	2023/01/14 09:05:50 GMT+08:00	Source	CBR backup: manualbk_vault-d9cd-aaa0
Description	--	OS Type	Linux
NIC Multi-Queue	Supported	Enterprise Project	default

3. Click the **Disk Backup** tab. Details about the system disk and data disks are displayed.

Figure 3-2 Disk backup

Name	Status	Disk Name	Used As	Disk Capacity (GB)
manualbk_3c43_ecs-37389...	Available	ecs-373896-volume-0000	System Disk	40
manualbk_3c43_ecs-37389...	Available	ecs-373896-volume-0001	Data Disk	100

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

- A full-ECS image cannot be published in KooGallery.
- 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 is shareable only when it is created from a CBR backup or from an ECS that has never had a CSBS backup.
- A full-ECS image cannot be replicated within the same region.

3.3 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 use a private image to create ECSs, 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](#).

3.4 Is There Any Difference Between the Image Created from a CSBS/CBR Backup and That Created from an ECS?

No.

You can create a full-ECS image from an ECS, a CSBS backup, or a CBR backup.

When you create a full-ECS image from an ECS, the system first creates a backup for the ECS and then uses the backup to create an image. Therefore, the image is essentially created from an ECS backup no matter you use an ECS or a CSBS/CBR backup.

3.5 Why Can't I Find an ISO Image When I Want to Use It to Create an ECS or Change the OS of an ECS?

- An ISO image is only an intermediate product and is not be available on the ECS console. The final product is a system disk image that has an OS and drivers installed.
- You are not advised to use a temporary ECS as a normal ECS because it has limited functionality. For example, disks cannot be attached to it.

For details about how to create a private image using an ISO file, see:

- [Creating a Windows System Disk Image from an ISO File](#)
- [Creating a Linux System Disk Image from an ISO File](#)

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

You are not advised to use a Windows ECS that has a spanned volume to create a full-ECS image. If you create such an image and then use it to create new ECSs, data may be lost.

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

NOTE

If a Linux ECS has a volume group or a logical volume consisting of multiple physical volumes, to ensure you do not lose any data, back up data in the volume group or logical volume and delete the volume group or logical volume before using this ECS to create a full-ECS image.

3.7 Why Is Sysprep Required for Creating a Private Image from a Windows ECS?

Why Is Sysprep Required?

Sysprep is used to generalize images. It removes server-specific information, like the security identifier (SID), from an image so that ECSs created from this image can have unique SIDs in a domain. If your windows ECSs do not need to be joined to a domain, Sysprep is not required.

CAUTION

Before running Sysprep, ensure that Windows is activated.

Restrictions on Running Sysprep

Sysprep can only be used to configure new installations of Windows and not to reconfigure an existing installation. You can run Sysprep as many times as required to build and to configure your installation of Windows. However, you can reset Windows activation only up to three times.

NOTE

In the Windows command line, run the following command to check how many times you can run Sysprep:

```
slmgr /dlv
```

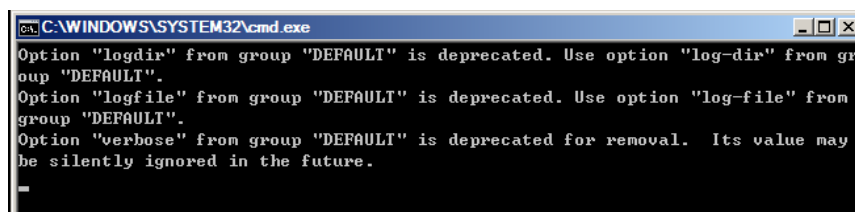
In the displayed **Windows Script Host** dialog box, if the value of **Remaining Windows rearm count** is **0**, you cannot run Sysprep.

3.8 How Do I Handle the Startup Failure of a Windows ECS Created from a Windows Image Generalized by Sysprep?

Symptom

1. When you start the ECS, information similar to the following is displayed.

Figure 3-3 Message displayed



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**. The log contains the following information.

Figure 3-4 Viewing ECS logs

```

115 2018-08-28 23:43:15, Info [SETUPGDC.EXE] Running commands is already in progress.
116 2018-08-28 23:43:15, Info [0x000000] PANTER CRackboard:Open: C:\Windows\panther\command.exe(CommandExec) succeeded.
117 2018-08-28 23:44:33, Error [SETUPGDC.EXE] Hit an error (hr = 0x80000001) while running cmd.exe /c ""C:\Program Files\Cloudbase Solutions\Cloudbase-Init\Python\Scripts\cloudbase-init-unattend.conf" %* exit 1 || exit 21
118 2018-08-28 23:44:33, Info [0x000000] PANTER CRackboard:Close: C:\Windows\panther\command.exe(CommandExec) succeeded.
119 2018-08-28 23:44:33, Info [SETUPGDC.EXE] SetupGDC returning with exit code (4).
120 2018-08-28 23:44:53, Info [windeploy.exe] Process exited with exit code (0x1f).
121 2018-08-28 23:44:53, Error [windeploy.exe] Setup.exe failed, returning exit code (0x1f).
122 2018-08-28 23:44:53, Error [windeploy.exe] Failure occurred during online installation. Online installation cannot complete at this time. hr = 0x80004003
123 2018-08-28 23:44:53, Info [windeploy.exe] Flushing registry to disk....
124 2018-08-28 23:44:53, Info [windeploy.exe] Flush took 16 ms..
    
```

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:
 - <https://docs.microsoft.com/en-us/windows-hardware/manufacture/desktop/update-windows-settings-and-scripts-create-your-own-answer-file-sxs>
 - <https://docs.microsoft.com/en-us/windows-hardware/manufacture/desktop/sysprep--system-preparation--overview>
 - 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.

Figure 3-5 Deleting the RunSynchronous snippet

```

- <settings pass="specialize">
- <component language="neutral" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:wcm="http://schemas.microsoft.com
versionScope="nonSxS" publicKeyToken="31bf3856ad364e35" processorArchitecture="amd64" name="Microsoft-Windows-Deployment">
  <RunSynchronous>
    <RunSynchronousCommand wcm:action="add">
      <Order>1</Order>
      <Path>cmd.exe /c ""C:\Program Files\Cloudbase Solutions\Cloudbase-Init\Python\Scripts\cloudbase-init.exe" --config-file
      Solutions\Cloudbase-Init\conf\cloudbase-init-unattend.conf" && exit 1 || exit 2"</Path>
      <Description>Run Cloudbase-Init to set the hostname</Description>
      <WillReboot>OnRequest</WillReboot>
    </RunSynchronousCommand>
  </RunSynchronous>
</component>
</settings>
</unattend>
    
```

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.

3.9 What Do I Do If I Cannot Create an Image in ZVHD2 Format Using an API?

Symptom

When you create a ZVHD2 image using an API, the image is created in the ZVHD format.

Solution

Check whether your token contains the **op_gated_lld** role (**op_gated_lld** is the OBT tag, which can be viewed in the body of the response message of the API used to obtain a user token). The ZVHD2 image has the lazy loading feature. If the current environment does not support this feature or this feature is in the OBT phase, the ZVHD2 image will fail to be created.

Contact the customer service to ensure that the current environment supports lazy loading. Obtain a new token and use the new token to create an image.

4 Image Sharing

4.1 General Sharing FAQ

How Many Tenants, Projects, or Organizations Can I Share an Image With?

A system disk image or data disk image can be shared with up to 128 tenants, but a full-ECS image can only be shared with up to 10 tenants.

How Many Images Can Be Shared with Me?

There is no limit.

Can I Share Images Between My Accounts at the Chinese Mainland Website and International Website?

Yes. You can share images between your accounts of the Chinese Mainland and International websites, but only in regions that are available on both websites. For example, you cannot share images in the CN North-Beijing1 region of the Chinese Mainland website with your account of the International website which does not have this region.

Do Shared Images Affect My Private Image Quota?

No.

I Shared an Image to an Account But the Account Did Not Accept or Reject the Image. Will My Image Sharing Quota Be Consumed?

No.

Where Can I View the Images Shared with Me?

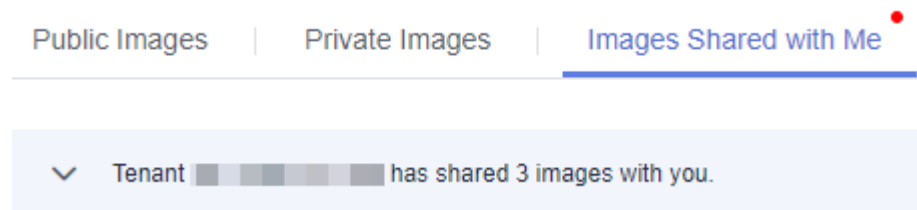
Switch to the region where the shared image is, and choose **Service List > Compute > Image Management Service > Images Shared with Me**.

If you are a multi-project user, make clear which of your projects will receive the shared image. Switch to the region where the project is and select the project.

Then, choose **Service List > Compute > Image Management Service > Images Shared with Me**.

If the image is not accepted, a red dot is displayed on the **Images Shared with Me** tab page (as shown in [Figure 4-1](#)) and a message is displayed, asking you whether to accept the shared image. After the image is accepted, it is displayed in the list on the **Images Shared with Me** tab page.

Figure 4-1 Images Shared with Me



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

No. The account can use the shared image to create 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 Images Shared with Me with Others?

You cannot directly share such images with other tenants. If you do need to do so, you can replicate a shared image as a private image and then share it.

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

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

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 use it to create a new ECS or change the OS of an existing ECS.

The cloud platform does not ensure the integrity or security of images shared by other accounts. You are advised to choose only images shared by trusted accounts.

What Are the Risks of Sharing Images?

Data, files, and software may be disclosed. Before sharing an image, you must take care to delete any sensitive data or important files from the image. 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 others, any data leakage that occurs can be quite widespread.

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 target project IDs, and click **OK**, as instructed in [Sharing Specified Images](#). After the image is shared, switch to the target projects. On the **Image Management Service > Images Shared with Me** page, you can view the shared image to be accepted.

How Do I Share an Image Across Regions?

To share an image across regions, you can use either of the following methods:

- Replicate the image to the destination region and then share it.
- Share the image and then replicate it to the destination region.

For example, if you want to share a private image in the CN-Hong Kong region to the CN East-Shanghai2 region with another account, use either of the following methods:

Method 1:

1. Replicate the private image from the CN-Hong Kong region to the CN East-Shanghai2 region. In the CN East-Shanghai2 region, the image is named as **copy_image**.
For details, see [Replicating Images Across Regions](#).
2. Share **copy_image** with the target account.
For details, see [Sharing Specified Images](#).

Method 2:

1. Share the private image with the target account in the CN-Hong Kong region.
For details, see [Sharing Specified Images](#).
2. After accepting the shared image, the target account replicates it as a private image named **copy_image**.
For details, see [Replicating a Shared Image](#).
3. The target account replicates **copy_image** from the CN-Hong Kong region to the CN East-Shanghai2 region.
For details, see [Replicating Images Across Regions](#).

Can I Specify a Region or an AZ for Sharing an Image?

No. When sharing an image, you can only specify a project ID. You cannot specify a region or an AZ. An image can only be shared within a given region. Once shared, it can be used in any AZ in that region.

Can I Restore My Data Disks from a Data Disk Image Shared by Another Account?

No. You can only use a shared image to create a new data disk but not to restore your existing data disks. However, you can use the new data disk to restore data. For details, see [Can I Import Data from a Data Disk Image to a Data Disk?](#)

Can I Share My ECS and Its EIP with Another Account?

You can share an ECS by sharing a full-ECS image but the EIP cannot be shared.

What Can I Do If I Want to 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 share the image with you again. For details, see [Adding Tenants Who Can Use Shared Images](#).
- Method 2
Accept the rejected image again. For details, see [Accepting Rejected Images](#).

NOTE

If the image is also shared with your account or organization and is not refused, you can still use the image under the account or organization.

4.2 How Will I Be Billed for Sharing an Image?

- If it is a system or data disk image, the OBS storage is free.
- If it is a full-ECS image, you will be billed for the space used to store the CBR backup.

NOTE

Full-ECS images created from a CBR backup can be shared but those created from a CSBS backup cannot.

4.3 What Are the Differences Between Sharing Images and Replicating Images?

- Sharing images:
You can only share images within a region with other users. To share an image across regions, replicate the image to the target region and then share it. For details, see [Sharing Images](#).
- Replicating images:
 - In-region: You can convert encrypted and unencrypted images into each other or enable some advanced features (such as fast ECS creation from an image) by replicating an image within a region.
 - Cross-region: If you need to deploy servers or back up data across regions, cross-region replication will be your choice. It can be used

together with image sharing for cross-region, cross account image replication.

The following table describes the details.

Scenario	Operation	Description	Helpful Link
Sharing	Share	The image is shared with another user in the same region. The target user can use the image (with the same ID as the source image) but the image is still owned by the user who shared it.	Sharing Specified Images
In-region replication under the same account	Replicate	This is used for conversion between encrypted and unencrypted images or for enabling advanced features (such as fast ECS creation from an image).	Replicating Images Within a Region
Cross-region replication under the same account	Replicate	After the replication is complete, a new image is generated in the target region. The new image has a different ID from the source image.	Replicating Images Across Regions
Cross-region, cross-account replication	Replicate and share	Replicate the image to the target region and share it with other accounts.	Replicating Images Across Regions and Sharing Specified Images

4.4 Why Can't I Share My Images?

- Some images cannot be shared. Therefore, the **Share** option is not provided for them in the **Operation** column. The following images cannot be shared:
 - KooGallery images
 - Encrypted images
 - Full-ECS images created from a CSBS backup
- Images can only be shared within the same region. If you are attempting to share an image across regions, your attempt will fail.

Solutions:

- Solution 1: Replicate the image to the target region and then share it.
- Solution 2: Export the image to a local directory and then use the target account to import it to the target region.

5 OS

5.1 How Do I Select an OS?

- **Windows**
Used for development platforms or services that run Windows.
The system disk must be at least 40 GB, and there must be at least 1 GB of memory.
Internet Information Services (IIS) and SQL Server can be installed.
- **Linux**
Used for development platforms or services that run Linux. CentOS and Ubuntu are provided. CentOS is recommended.
The system disk must be at least 40 GB, and there must be at least 512 MB of memory.
- If your servers require more than 4 GB of memory, select a 64-bit OS because 4 GB is the maximum memory a 32-bit OS can access.

5.2 How Is BIOS Different from UEFI?

Table 5-1 Differences between the UEFI and BIOS boot modes

Boot Mode	Description	Highlight
BIOS	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.	Provides basic settings and control for ECSs.

Boot Mode	Description	Highlight
UEFI	Unified Extensible Firmware Interface (UEFI) 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.	Boots up or recovers from sleep state faster.

5.3 What Do I Do If I Cannot Change the Resolution of a Windows OS Booted in UEFI Mode?

Symptoms

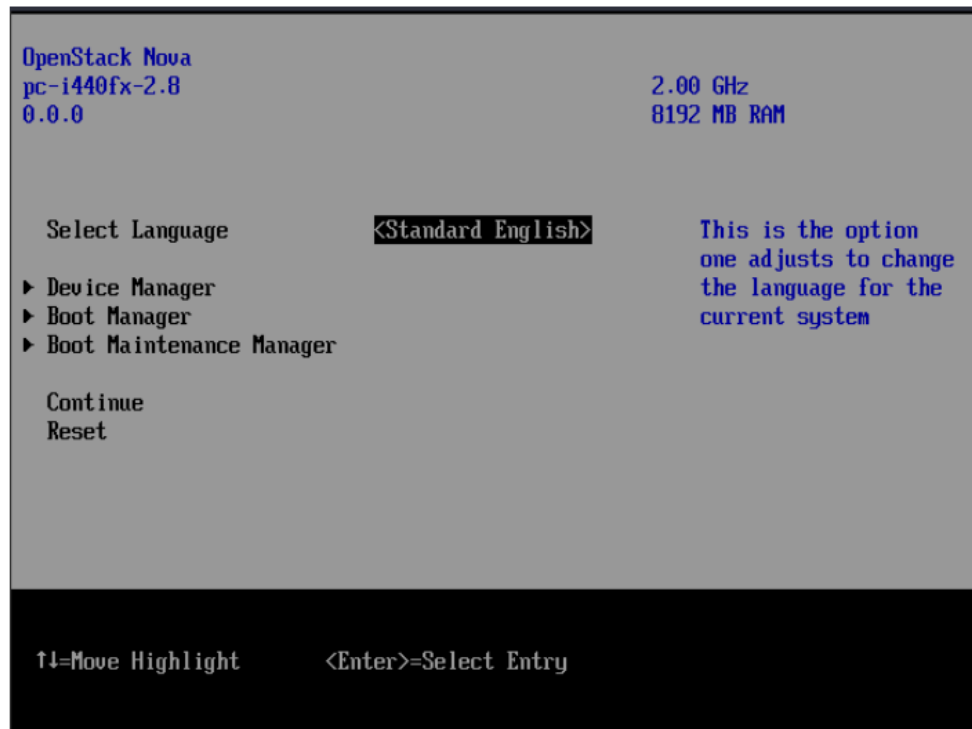
The resolution of a Windows OS booted in UEFI mode cannot be changed in display settings.

Possible Causes

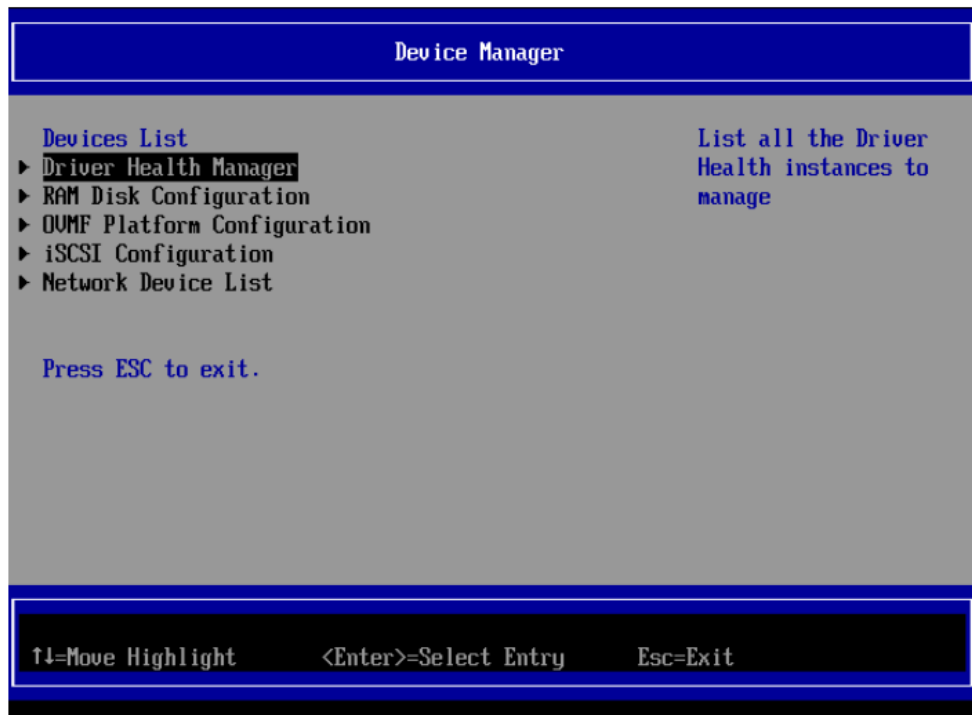
By default, x86 Windows cloud servers on Huawei Cloud are booted in BIOS mode. If users migrate Windows servers from other vendors or a local IDC, the servers may be booted in UEFI mode. The resolution of servers booted in UEFI mode cannot be changed in display settings.

Solutions

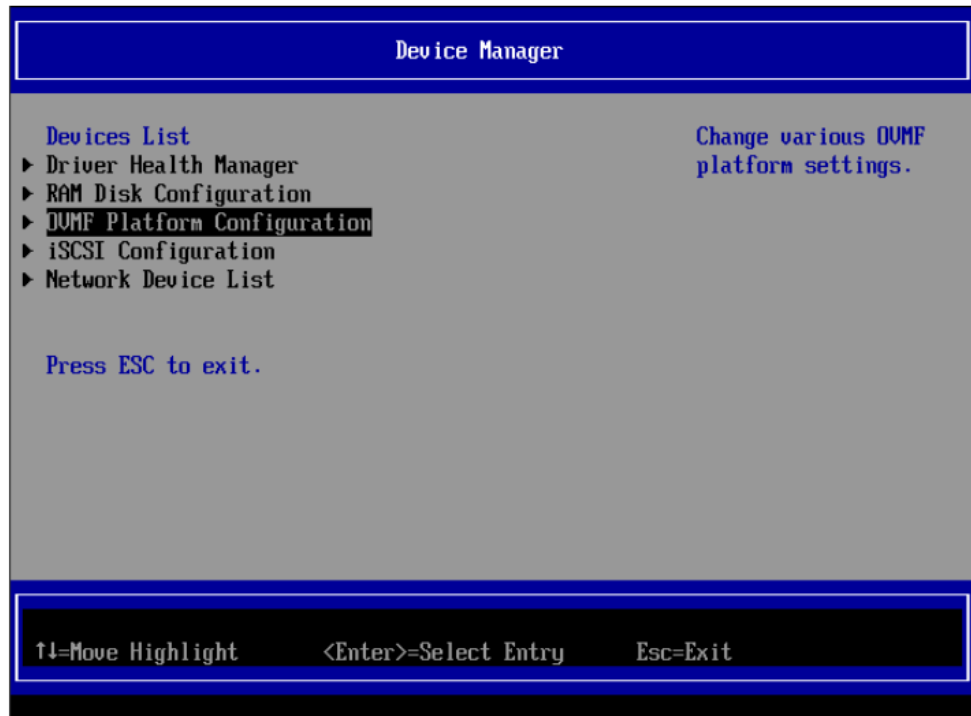
1. Log in to the Windows cloud server using VNC. Open the **Start** menu, click the **Power** button, and choose **Restart**. During the restart, press **Esc** on your keyboard quickly and repeatedly to enter the BIOS configuration.



2. Use the up and down arrow keys on the keyboard to select **Device Manager** and press **Enter**.



3. Use the up and down arrow keys to select **OVMF Platform Configuration** and press **Enter**.



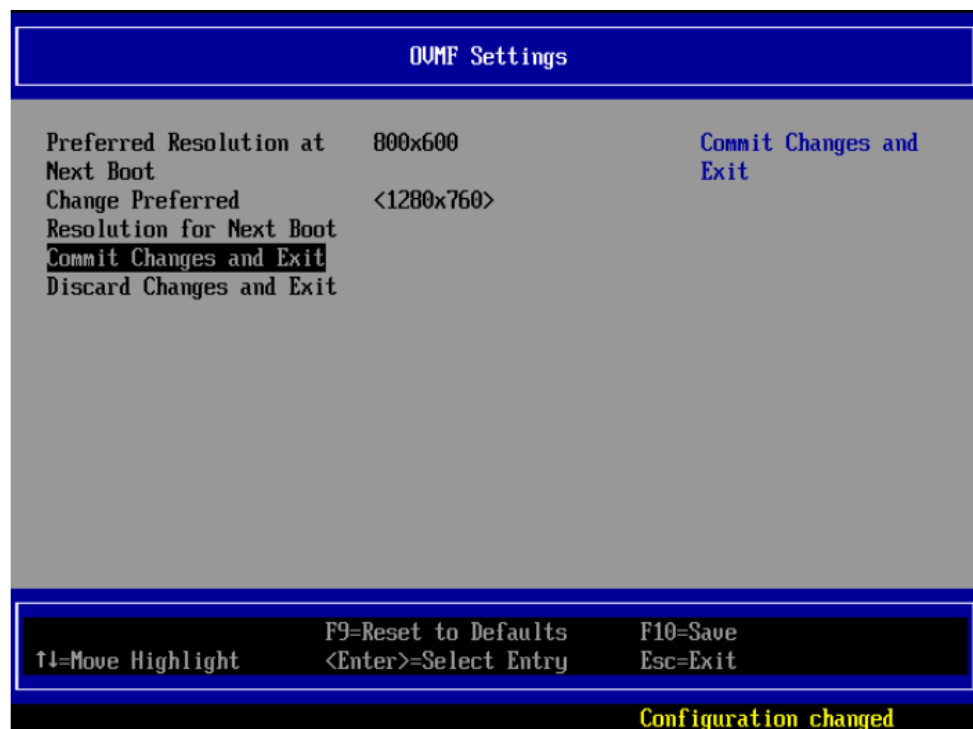
4. Use the up and down arrow keys to select **Change Preferred** (it is selected by default).

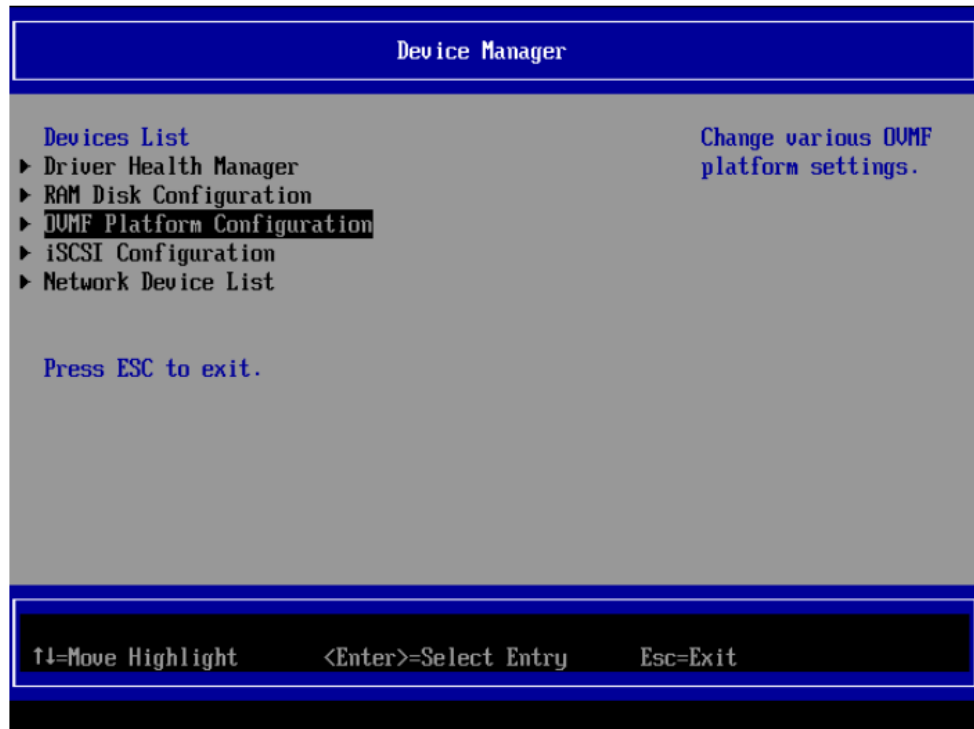


5. In the **Change Preferred** line, use the up and down arrow keys to change the resolution (for example, the resolution is changed from 800x600 to 1280x760), and press **Enter**.



6. Use the up and down arrow keys to select **Commit Changes and Exit** and press **Enter** to save the settings and exit. Then, press **Esc** to exit the BIOS configuration.

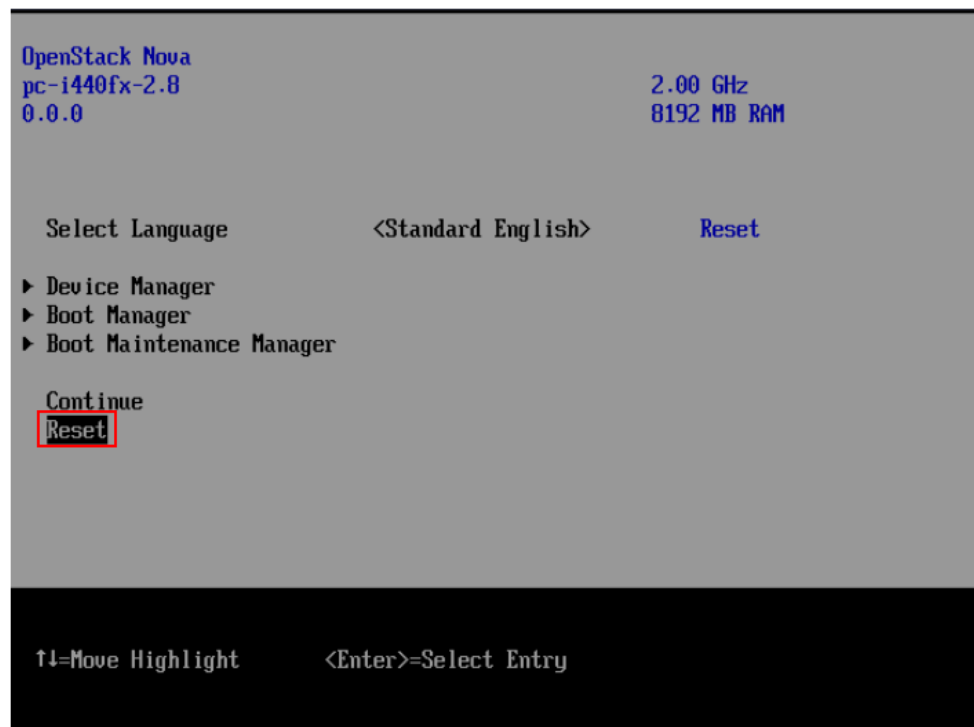




7. Use the up and down arrow keys to select **Reset** and press **Enter** to restart the cloud server.

 **NOTE**

You must select **Reset**. If you select **Continue**, you need to restart the cloud server again to make the BIOS configuration take effect.



8. Log in to the cloud server and check the desktop resolution.

After logging in to the cloud server, right-click the desktop and choose **Display settings** from the shortcut menu. The desktop resolution is 1280x760 which is the same as that configured in BIOS.

5.4 How Do I Delete Redundant Network Connections from a Windows ECS?

Method 1

1. Press **Win+R**. In the displayed dialog box, enter **regedit** and press **Enter** to open the registry editor.

NOTE

Modifying a registry may cause a system startup failure. So, back up the registry before modifying it.

2. Open the following registry key:

**HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT
\CurrentVersion\NetworkList\Profiles**

Click each item under **Profiles** and query the **Data** column of **ProfileName** in the right pane.

3. Double-click **ProfileName** and set **Value Data** to the name of a new network.
4. Restart the ECS for the change to take effect.

Method 2

1. Press **Win+R**. In the displayed dialog box, enter **regedit** and press **Enter** to open the registry editor.

NOTE

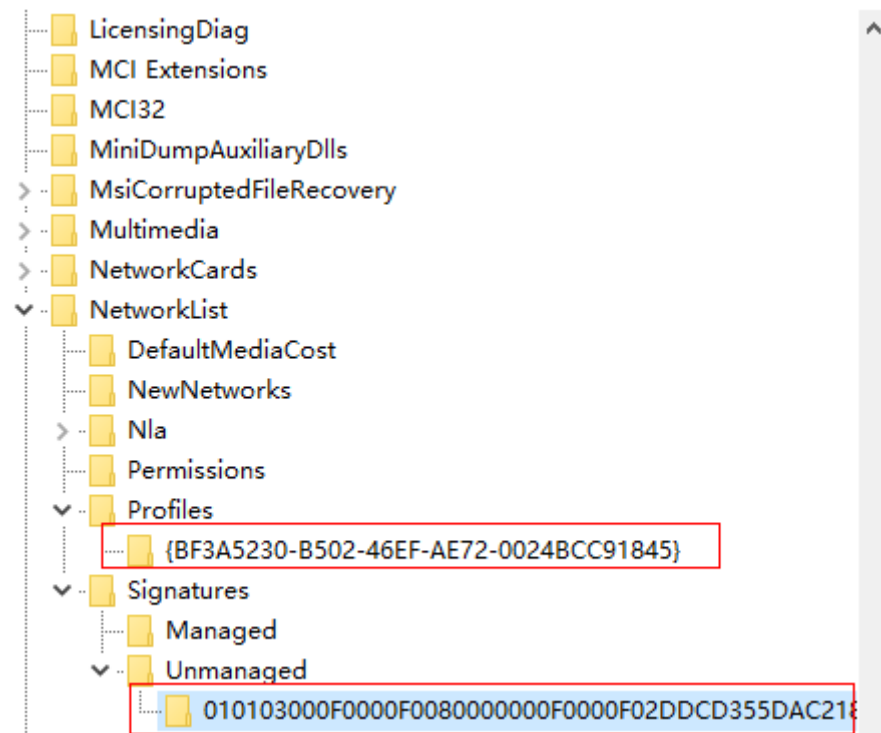
Modifying a registry may cause a system startup failure. So, back up the registry before modifying it.

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.

Figure 5-1 Registry directory

5.5 What Do 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 5-2 Querying the GRUB file version

```
[root@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx]# rpm -qa | grep grub  
grub2-2.02-0.44.el7.centos.x86_64
```

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 5-3 Modifying the timeout duration

```
#boot=/dev/sda
default=0
timeout=8
splashimage=(hd0,1)/boot/grub/splash.xpm.gz
hiddenmenu
title CentOS (2.6.32-696.16.1.el6.x86_64)
  root (hd0,1)
  kernel /boot/vmlinuz-2.6.32-696.16.1.el6.x86_64 ro root=UUID=2bc0f5fd-e8
19-4ba5-8ce8-8fe12b6efc24 rd_NO_LUKS rd_NO_LVM LANG=en_US.UTF-8 rd_NO_MD SYSFONT
=latarcyrheb-sun16 crashkernel=auto KEYBOARDTYPE=pc KEYTABLE=us rd_NO_DM rhgb q
quiet
```

5.6 What Do I Do If the One-Click Password Resetting Plug-In Failed to Start?

Symptom

The one-click password reset plug-in failed to start after it is installed.

Solution

Add the following content to the ECS configuration (the configuration file path varies depending on the OS. For details, see [Procedure](#)):

```
/CloudrResetPwdAgent/bin/cloudResetPwdAgent.service start
```

NOTE

- If **exit 0** is displayed at the end of the file, add the preceding content to the line just before **exit 0**. If **exit 0** is not displayed, add the preceding content to the end of the file.
- ECSs created from a SUSE 11 SP4 image must have 4 GB or a larger memory.

Procedure

- CoreOS

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.service start
RemainAfterExit=yes
ExecStop=/CloudrResetPwdAgent/bin/cloudResetPwdAgent.service stop
KillMode=none
[Install]
WantedBy=multi-user.target
EOT
systemctl enable cloudResetPwdAgent.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 the editing mode and add the following content to the end of the file:

```
/CloudrResetPwdAgent/bin/cloudResetPwdAgent.service start
```

- c. Press **Esc**, enter **:wq**, and press **Enter** to save the configuration and exit.
- CentOS Linux 7
 - a. Run the following commands to make **rc.local** executable, and then to open the file:
chmod +x /etc/rc.d/rc.local
vi /etc/rc.d/rc.local
 - b. Press **i** to enter the editing mode and add the following content to the end of the file:
`/CloudrResetPwdAgent/bin/cloudResetPwdAgent.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 the editing mode and add the following content to the end of the file:
`/CloudrResetPwdAgent/bin/cloudResetPwdAgent.script start`
 - c. Press **Esc**, enter **:wq**, and press **Enter** to save the configuration and exit.
- Debian 8
 - a. Run the following command to open the **rc.local** file:
vi /etc/rc.local
 - b. Press **i** to enter the editing mode and add the following content to the end of the file:
`/CloudrResetPwdAgent/bin/cloudResetPwdAgent.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 the editing mode and add the following content to the end of the file:
`/CloudrResetPwdAgent/bin/cloudResetPwdAgent.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 the editing mode and add the following content to the end of the file:
`/CloudrResetPwdAgent/bin/cloudResetPwdAgent.script start`
 - c. Press **Esc**, enter **:wq**, and press **Enter** to save the configuration and exit.

5.7 Why Can't I Find My Private Image When I Want to Use It to Create an ECS or Change the OS of an ECS?

When you create an ECS or change the OS of an existing ECS, some of your private images are not shown. One possible cause is that the x86 and Arm architectures are incompatible with each other, or that there is an incompatibility issue between UEFI and BIOS boot modes.

- If a private image is created from a x86 ECS, this image will be invisible to you when you create an Arm (Kunpeng) ECS or change the OS of an Arm (Kunpeng) ECS, and vice versa.
- If you use an external image file to create a private image and select the x86 architecture, this image will be invisible to you when you create an Arm (Kunpeng) ECS or change the OS of an Arm (Kunpeng) ECS, and vice versa.
- If a private image is created from an ECS in BIOS boot mode, this image will be invisible to you when you create an ECS in UEFI boot mode or change the OS of an ECS in UEFI boot mode, and vice versa.
- If you use an external image file to create a private image and select the BIOS boot mode, this image will be invisible to you when you create an ECS in UEFI boot mode or change the OS of an ECS in UEFI boot mode, and vice versa.

6 Image Import

6.1 Can I Use Images in Formats not Described in This Document?

No. Currently, only VMDK, VHD, RAW, QCOW2, VHDX, QED, VDI, QCOW, ZVHD2, ISO, and ZVHD formats are supported.

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

NOTE

For details about image file format conversion, see [Converting the Image Format Using qemu-img](#).

6.2 What Are the Impacts 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 ECS or the source VM of the image file. If you do not perform the pre-configuration, there are some potential impacts:

1. If you do not delete network rule files from the **udev** directory, those rules will be applied to newly created ECSs. Also, if you do not configure DHCP, the NICs of newly created ECSs will not start from eth0. You need to remotely log in to the new ECSs to resolve these issues.
2. When creating Linux ECSs:
 - Custom passwords cannot be injected.
 - Certificates cannot be injected.
 - Other custom configurations cannot be applied to new ECSs.
3. If you do not delete the automatic mount configuration from the **fstab** file, new ECSs may fail to start.

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

Scenarios

Open Virtualization Appliance (OVA) is a single file archive (with the .ova extension) of all of the files comprising an Open Virtualization Format (OVF) package. OVF is a package of the files required for defining and deploying VMs. An OVF package generally includes .ovf, .mf, and .vmdk files.

- An .ovf file is an XML descriptor that defines the metadata of a VM, such as the name and hardware requirements, and contains information about other files in the OVF package.
- An .mf file contains the SHA hash codes of all the files in the package and is used to prevent the image file from being tampered with.
- A .vmdk file is a virtual disk file that is used to create a disk image. An OVF package may contain multiple .vmdk files.

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

Procedure

Manually extract VMDK files from an OVF or OVA template and upload them to an OBS bucket. Then, you can select one of them from the bucket when you use an external file to create a system or data disk image.

NOTE

The following assumes that the OVF or OVA template contains only one VMDK file. If there are multiple VMDK files (for example, there are three VMDK files, one used as a system disk image file and the others as data disk image files), upload them to an OBS bucket and register them as a system disk image and data disk images, respectively.

- The source VM runs Windows.
 - If you choose to export an OVF template named **MyVm** and save it to the **OvfLib** folder in drive C, the following files will be generated in the folder (the VMDK file can be uploaded to the cloud platform):

```
C
├─OvfLib
│  └─MyVm
│     └─MyVm.ovf
│     └─MyVm.mf
│     └─MyVm-disk1.vmdk
```

- If you choose to export an OVA template and name it **MyVm**, the **C:\MyVm.ova** file will be generated. The VMDK file extracted from **MyVm.ova** can be uploaded to the cloud platform.

NOTE

You can import an image file in VHD, VMDK, QCOW2, RAW, VHDX, QCOW, VDI, QED, ZVHD, or ZVHD2 format to create a private image.

For details, see [Creating a Windows System Disk Image Using an External Image File](#) or [Creating a Data Disk Image Using an External Image File](#).

- The source VM runs Linux.
 - If you choose to export an OVF template, upload the VMDK file generated in the folder to the cloud platform.
 - If you choose to export an OVA template and name it **MyVm**, perform the following operations:

- i. Run the following command to check the OVA file:

file MyVm.ova

The command output is as follows:

```
MyVm.ova: POSIX tar archive (GNU)
```

MyVm.ova contains the following two files:

```
$tar tf MyVm.ova
```

```
MyVm.ovf
```

```
MyVm.vmdk
```

- ii. Run the following command to decompress **MyVm.ova**:

tar xvf MyVm.ova

The extracted folder contains the following files:

```
MyVm.ovf
```

```
MyVm.vmdk
```

The .vmdk image file 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.

For details, see [Creating a Linux System Disk Image Using an External Image File](#) or [Creating a Data Disk Image Using an External Image File](#).

6.4 What Do I Do If I Chose the Wrong OS or System Disk Capacity When Registering a Private Image?

If you selected the wrong OS, the ECS creation may fail when the image is used.

If the system disk capacity you configured is less than the one in the image file, image registration will fail.

In such cases, delete the image and create a new one using the correct settings.

6.5 Why Did My VHD Upload Fail? Why Does the System Say the System Disk in the VHD Image File Is Larger Than What I Specified on the Management Console?

The possible causes may be:

1. Too small a value was specified when registering the image. Check the system disk capacity in the VHD image file. Specify a value at least this large when you use the VHD image file to register an image.

2. The VHD's actual disk size is larger than its virtual size. This can happen if the VHD image file was generated using **qemu-img** or a similar tool. For details, see <https://bugs.launchpad.net/qemu/+bug/1490611>.

Run the following command to check the VHD image file information:

```
[xxxx@xxxx 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
```


The virtual size is always an integer number of GBs. As a result, if an actual size is, like in the example here, **2147991552 bytes (2.0004 GB)**, the virtual size will be only **2 GB**. In this example, you need to specify an integer larger than the actual size 2.0004 GB. The system disk capacity on the management console can only be an integer value, so you enter an integer larger than 2 GB.

6.6 How Do I Import Existing Huawei Cloud Private Images to a Specified Region?

Scenarios

You can import existing private images on Huawei Cloud to a specified region to migrate them between regions. To do so, you can use [cross-region image replication](#) or export and then import the images. This section describes how to import an image from a **CN North** to a **CN South** region.

Procedure

1. Export the image from the **CN North** region.
 - a. Log in to the management console.
 - b. Under **Compute**, click **Image Management Service**.
The IMS console is displayed.
 - c. Locate the row that contains the image to be exported, click **More** in the **Operation** column and select **Export**.
 - d. In the displayed **Export Image** dialog box, set the following parameters:
 - **Fast Export:** To export an image larger than 128 GB, you must enable fast export, and you cannot specify the format of the exported image. After the image is exported, you can convert it to a regular format. For details, see [Converting the Image Format Using qemu-img-hw](#).
 - **Format:** Select one from **qcow2**, **vmdk**, **vhd**, and **zvhd** as you need.
 - **Name:** Enter a name that is easy to identify.
 - **Storage Path:** Click  to expand the bucket list and select an OBS bucket for storing the exported image.
 - e. Click **OK**.

You can view the image export progress in the **Task Center**. After the image is successfully exported, you can download it from the OBS bucket on the OBS console or using OBS Browser.

2. Create an OBS bucket in the **CN South** region. Upload the image file downloaded in step **1** to the OBS bucket in the **CN South** region.
3. Register the image file in the OBS bucket as a private image.

7 Image Export

7.1 Can I Download My Private Images to a Local PC?

Yes. You can download private images as instructed in [Exporting an Image](#).

Currently, only images in VMDK, VHD, QCOW2, or ZVHD format can be exported.

The default format of a private image is ZVHD2. Images exported in different formats may vary in size.

For more information, see [Exporting an Image](#).

7.2 Can I Use the System Disk Image of an ECS on a BMS After I Export It from the Cloud Platform?

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. So, it cannot be used on a BMS.

For how to create a BMS private image, see *Bare Metal Server User Guide*.

You can use either of the following methods to create a BMS private image:

- [Creating a Private Image from a BMS](#)
- [Creating a Private Image from an External Image File](#)

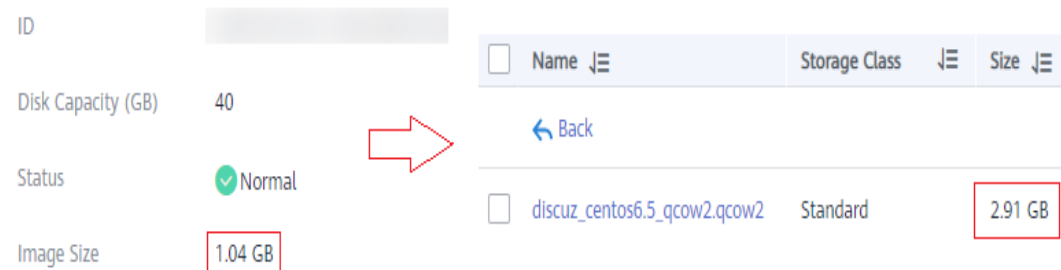
7.3 Why Is the Image Size in an OBS Bucket Different from That Displayed in IMS?

Symptom

When a private image is exported to an OBS bucket, the image size in the bucket is different from that displayed in IMS.

For example, the size of a private image is 1.04 GB on the IMS console, but in an OBS bucket, the size is 2.91 GB.

Figure 7-1 Example



Cause Analysis

The default format of a private image is ZVHD2, but it may be stored in a different format (VMDK, VHD, QCOW2, or ZVHD) in an OBS bucket after it is exported. The format conversion may lead to size changes.

For more information, see [Exporting an Image](#).

7.4 Can I Download a Public Image to My PC?

You cannot directly download a public image. However, 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 then download the image.

Helpful links:

- [Creating a System Disk Image from a Windows ECS](#) or [Creating a System Disk Image from a Linux ECS](#)
- [Exporting an Image](#)

NOTE

- Windows, SUSE, Red Hat, Ubuntu, and Oracle Linux public images and the private images created from these public images cannot be exported.
- However, if a Windows, SUSE, Red Hat, Ubuntu, or Oracle Linux private image is created from an external image file, this private image can be exported.

7.5 What Are the Differences Between Import/Export and Fast Import/Export?

Item	Description	Helpful Link
Import	<p>Import an external image file to the Huawei Cloud management console for creating a private image.</p> <p>External image files in the following formats can be imported: VMDK, VHD, QCOW2, RAW, VHDX, QED, VDI, QCOW, ZVHD2, and ZVHD.</p> <p>Maximum file size: 128 GB</p> <p>During the import, operations such as driver injection will be performed in the background. Therefore, the import takes a longer time than fast import.</p>	<ul style="list-style-type: none">• Creating a Windows System Disk Image from an External Image File• Creating a Linux System Disk Image from an External Image File• Creating a Data Disk Image from an External Image File
Fast import	<p>When importing an external image file in the RAW or ZVHD2 format to the Huawei Cloud management console, you can select Enable Fast Create, as shown in Figure 7-2. The import is fast because the system does not perform any operations like driver injection.</p> <p>Verify that:</p> <ul style="list-style-type: none">• The image file converted to the RAW format has been optimized as required and a bitmap file has been generated for it.• The image file converted to the ZVHD2 format has been optimized as required. <p>Maximum file size: 1 TB</p>	Fast Import of an Image File
Export	<p>You can export private images to OBS buckets and download them to your local PC for further use on other cloud platforms.</p> <p>Maximum file size: 128 GB (If an image file is larger than 128 GB, use fast export.)</p> <p>You can specify the format of the exported image file. Currently, only QCOW2, VMDK, VHD, and ZVHD are supported.</p>	Exporting an Image

Item	Description	Helpful Link
Fast export	<p>On the Export Image page, select Enable following Fast Export, as shown in Figure 7-3. You cannot specify the format of the exported image file. After the export is complete, you can use a tool to convert the exported image to your desired format.</p> <p>The file size is not limited.</p> <p>Encrypted images do not support fast export.</p>	Exporting an Image

Figure 7-2 Fast import of an image file

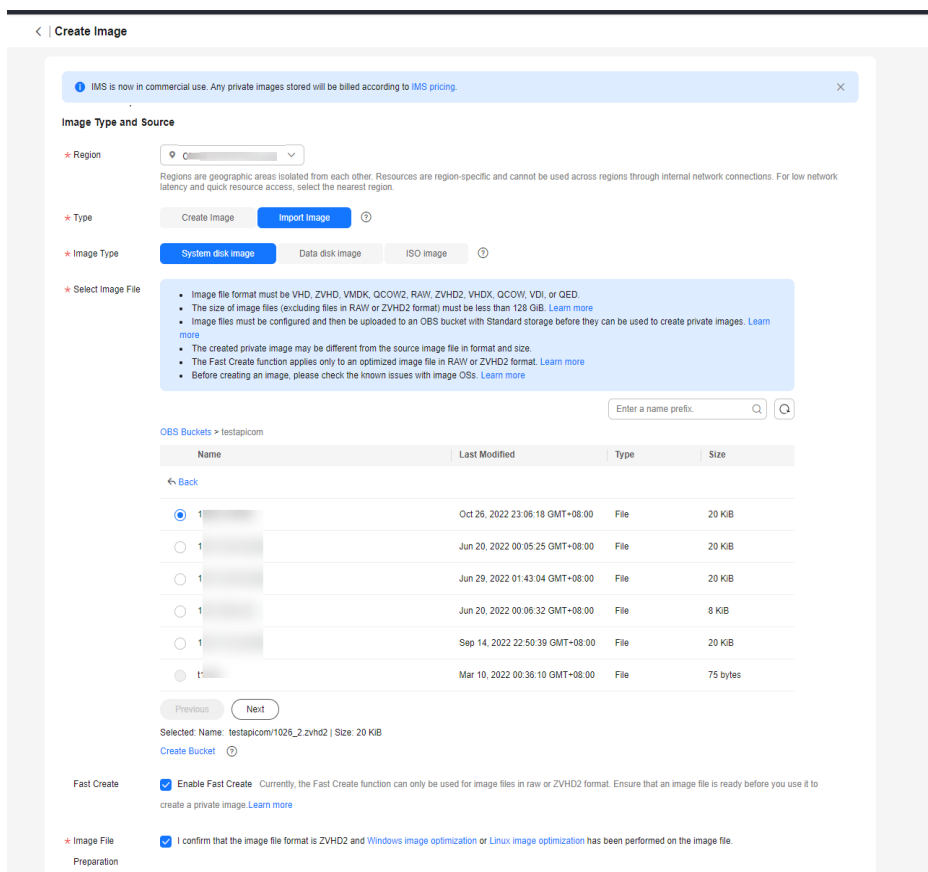


Figure 7-3 Fast export

Export Image ×

- Images can be exported only to an OBS bucket with Standard storage, and the image size cannot exceed 1 TiB.
- Images larger than 128 GiB only support fast export, and the format of the exported images cannot be specified. See [Exporting Images](#).
- Images stored in the OBS will be billed according to standard [OBS Pricing](#).

Image Details

Image Name		OS Type	Linux
OS	CentOS 7.5 64bit	Image Size	1.34 GiB ⓘ

Fast Export Enable

* Name .zvhd2

* Storage Path

Cancel OK

7.6 Why the Export Option Is Unavailable for My Image?

Some images cannot be exported. So, the **Export** option is not provided for them in the **Operation** column. The following images cannot be exported:

- Public images
- Full-ECS images
- ISO images
- Private images created from a Windows or SUSE public image
- Private images created from a KooGallery image

8 Image Optimization

8.1 Must I Install Guest OS Drivers on an ECS?

Installing Guest OS drivers on an ECS improves your experience in using the ECS. In addition, it also ensures high reliability and stability of ECSs.

- Windows ECSs: Install PV and VirtIO drivers on ECSs.
- Linux ECSs: Install Xen PV and VirtIO drivers and add them to initrd.

8.2 Why Do I Need to Install and Update VirtIO Drivers for Windows?

Why Do I Need to Install VirtIO Drivers?

VirtIO drivers are paravirtualized drivers that provide high-performance disks and NICs for ECSs.

- Windows does not have VirtIO drivers installed by default.
- Public images have VirtIO drivers by default.
- You need to install VirtIO drivers for private images. For details, see [Installing VirtIO Drivers](#).

Why Do I Need to Update VirtIO Drivers?

This ensures that known issues identified by the community can be eliminated from drivers as soon as possible.

What Do I Need to Do?

- Upgrade VirtIO drivers in Windows private images or running Windows ECSs.
- If you have any technical issues or questions, contact the customer service.

8.3 What Will the System Do to an Image File When I Use the File to Register a Private Image?

You are advised to enable automatic configuration when registering a private image using an image file. Then, the system will perform the following operations:

Linux

- Check whether any PV drivers exist. If yes, the system deletes them.
- Modify the **grub** and **syslinux** configuration files to add OS kernel boot parameters and change disk partition names to UUID.
- Change disk partition names in the **/etc/fstab** file to UUID.
- Check whether the **initrd** file has Xen and IDE drivers. If no, the system will load the Xen and IDE drivers.
- Modify the 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**.
- Copy built-in VirtIO drivers to **initrd** or **initramfs**. For details, see [External Image File Formats and Supported OSs](#).

NOTE

For the following image files, the system does not copy built-in VirtIO drivers after **Enable automatic configuration** is selected:

- Image files whose **/usr** directory is an independent partition
- Fedora 29 64bit, Fedora 30 64bit, and CentOS 8.0 64bit image files that use the XFS file system
- SUSE 12 SP4 64bit image files that use the ext4 file system

Windows

- Restore the IDE driver so that the OS can use this driver for its initial start.
- Delete the registry keys of the mouse and keyboard and generate the registry keys again to ensure that the mouse and keyboard are available on the new cloud platform.
- Restore the PV driver registry key to rectify driver installation failures and Xen driver conflicts.
- Restore DHCP so that the OS will dynamically obtain information such as the IP address based on the DHCP protocol.

8.4 How Do I Configure an ECS, a BMS, or an Image File Before I Use It to Create an Image?

ECS or Image File Configurations

Table 8-1 ECS configurations

OS	Configuration	Reference
Windows	<ul style="list-style-type: none"> • Configure DHCP. • Enable remote desktop connection. • Install the one-click password reset plug-in. • (Optional) Install Cloudbase-Init. • Install Guest OS drivers (PV and VirtIO drivers). • Run Sysprep. 	Creating a System Disk Image from a Windows ECS
Linux	<ul style="list-style-type: none"> • Configure DHCP. • Install the one-click password reset plug-in. • (Optional) Install Cloud-Init. • Delete files from the network rule directory. • Change disk identifiers in the GRUB file to UUID. • Change disk identifiers in the fstab file to UUID. • Install native Xen and KVM drivers. • Detach data disks from the ECS. 	Creating a System Disk Image from a Linux ECS

Table 8-2 Image file configurations

OS	Configuration	Reference
Windows	<ul style="list-style-type: none"> • Configure DHCP. • Enable remote desktop connection. • Install Guest OS drivers (PV and VirtIO drivers). • (Optional) Install Cloudbase-Init. • (Optional) Enable NIC multi-queue. • (Optional) Configure an IPv6 address. 	Preparing an Image File (Windows)
Linux	<ul style="list-style-type: none"> • Delete files from the network rule directory. • Configure DHCP. • Install native Xen and KVM drivers. • Change disk identifiers in the GRUB file to UUID. • Change disk identifiers in the fstab file to UUID. • Delete the automatic mount configuration of non-system disks from the <code>/etc/fstab</code> file. • (Optional) Install Cloud-Init. • (Optional) Enable NIC multi-queue. • (Optional) Configure an IPv6 address. 	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.
- When registering a Windows external image file as a private image, if the Guest OS drivers are installed, the cloud platform will check the image file after you select **Enable automatic configuration**. If the GuestOS drivers are not installed, the cloud platform will try to install them.

BMS or Image File Configurations

Table 8-3 BMS configurations

OS	Configuration	Reference
Windows	<ul style="list-style-type: none">• Install the bms-network-config package.• Install Cloudbase-Init.• Delete residual files from the OS.	Creating a Private Image from a BMS
Linux	<ul style="list-style-type: none">• Install software in the bms-network-config package.• Install Cloud-Init.• Delete residual files from the OS.	Creating a Private Image from a BMS

Table 8-4 Image file configurations

OS	Configuration	Reference
Windows	<ul style="list-style-type: none">• Install drivers for x86 V5 BMSs.• Install Cloudbase-Init.• Install software in the bms-network-config package.• (Optional) Install the SDI iNIC driver.• (Optional) Install the one-click password reset plug-in.• Set the Windows time zone.• Set the virtual memory.• (Optional) Configure automatic Windows update.• Configure SID.	Private Image Creation Guide

OS	Configuration	Reference
Linux	<ul style="list-style-type: none">• Install and configure Cloud-Init.• Modify the hardware device driver that boots the OS.• Install software in the bms-network-config package.• (Optional) Install the SDI iNIC driver.• (Optional) Install the Hi1822 NIC driver.• (Optional) Install the IB driver.• (Optional) Install drivers for x86 V5 BMSs.• (Optional) Install the UltraPath software.• (Optional) Install the one-click password reset plug-in.• Perform security configuration.• Configure remote login to the BMS.• Configure automatic root partition expansion.	Private Image Creation Guide

8.5 What Do I Do If a Windows Image File Is Not Pre-Configured When I Use It to Register a Private Image?

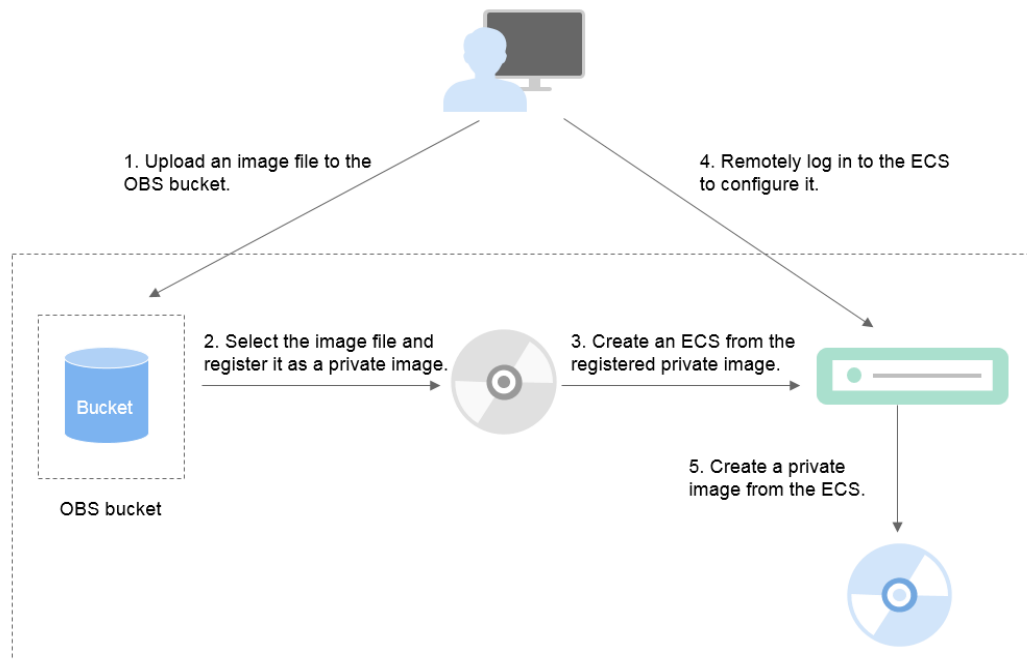
If an image file is not configured as instructed in [Preparing an Image File \(Windows\)](#) before it is exported from the original platform, you can use it to create an ECS, configure the ECS, and use the ECS to create a private image. [Figure 8-1](#) shows the process.

CAUTION

An ECS can run properly only after Xen Guest OS drivers (PV drivers) and KVM Guest OS drivers (VirtIO drivers) are installed on it. Without these drivers, the performance of this ECS will be affected and some functions will be unavailable. Ensure that the drivers have been installed for the image file before it is exported from the original platform. Otherwise, the ECSs created from the image will fail to start.

- To install PV drivers, see [Installing PV Drivers](#).
 - To install VirtIO drivers, see [Installing VirtIO Drivers](#).
-

Figure 8-1 Image creation process



Step 1: Upload the Image File

Upload the external image file to an OBS bucket. For details, see [Uploading an Image File \(Windows\)](#).

Step 2 Register the Image File as a Private Image

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

Step 3: Create an ECS

1. Access the IMS console.
 - a. Log in to the management console.
 - b. Under **Compute**, click **Image Management Service**.
The IMS console is displayed.
2. Click the **Private Images** tab.
3. Locate the row that contains the private image and click **Apply for Server** in the **Operation** column.
4. Set parameters as promoted to create an ECS. Note that:
 - You are advised to select **Pay-per-use** for **Billing Mode** because the ECS will be deleted when you are finished with it.
 - Bind an EIP to the ECS so that you can upload installation packages to the ECS or download them from the ECS.
 - You must add inbound rules for the ECS security groups to ensure that the ECS can be accessed.

- If the image file has Cloudbase-Init installed, set a password and log in to the ECS using the password when prompted. If Cloudbase-Init is not installed, use the password or certificate contained in the image file to log in the ECS.

For details, see [Purchasing a Custom ECS](#).

5. Check the ECS to see if the private image used to create the ECS has been pre-configured.
 - a. Check whether the ECS can be successfully started. If it can, Guest OS drivers have been installed for the image file on the original platform or the drivers have been automatically installed for the private image on the cloud platform. If the ECS cannot start up, install Guest OS drivers for the image file on the original platform and go back to [Step 1: Upload the Image File](#).
 - b. Check whether you can log in to the ECS using your configured password or key. If you can, Cloudbase-Init has been installed. If you cannot, 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 DHCP is configured by referring to [2](#) in [Step 4: Configure the ECS](#).
 - d. Use MSTSC to log in to 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 has been pre-configured. Skip [Step 4: Configure the ECS](#) and [Step 5: Create a Private Image from the ECS](#).

Step 4: Configure the ECS

Remotely log in to the ECS created in [Step 3: Create an ECS](#) to configure it.

1. Log in to the ECS.
2. Check whether DHCP is configured. If the ECS is configured with a static IP address, change its IP address assignment mode to DHCP as instructed in [Configuring 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. (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 Enable NIC Multi-Queue for an Image?](#)
 - Configure an IPv6 address. For details, see [How Do I Configure an ECS to Use DHCPv6?](#)

Step 5: Create a Private Image from the ECS

For details, see [Creating a System Disk Image from a Windows ECS](#).

(Optional) Clear the Environment

After the image registration is complete, delete the image file as well as the intermediate private image and ECS to avoid generating any additional charges.

- Delete the image registered in [Step 2 Register the Image File as a Private Image](#).
- Delete the ECS created in [Step 3: Create an ECS](#).
- Delete the image file from the OBS bucket.

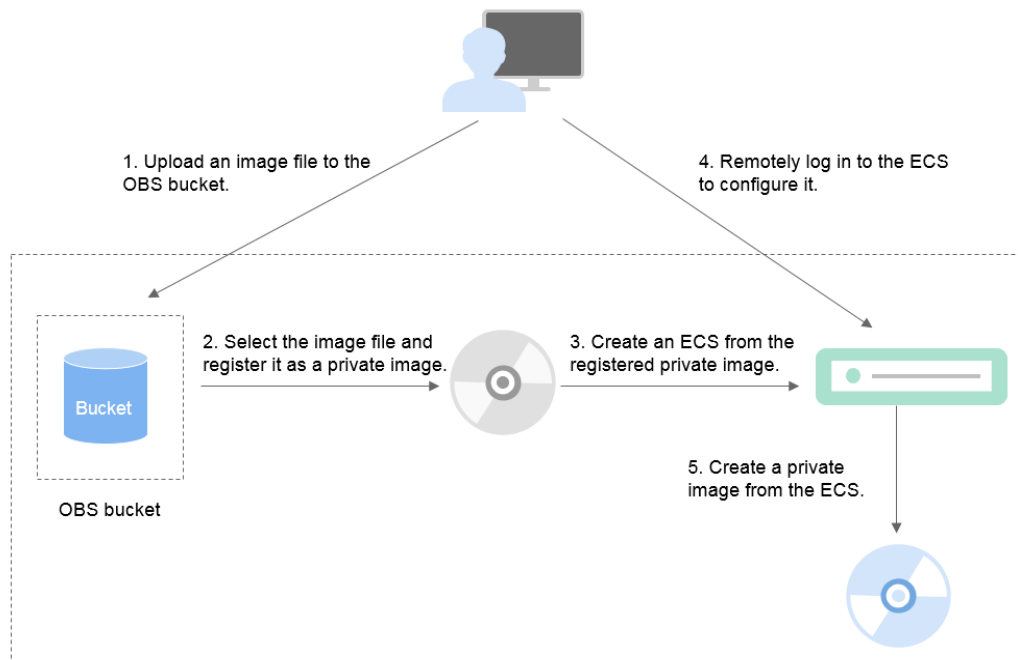
8.6 What Do I Do If a Linux Image File Is Not Pre-Configured When I Use It to Register a Private Image?

If an image file is not configured as instructed in [Preparing an Image File \(Linux\)](#) before it is exported from the original platform, you can use it to create an ECS, configure the ECS, and use the ECS to create a private image. [Figure 8-2](#) shows the process.

CAUTION

An ECS can run properly only after Xen and KVM drivers are installed on it. If no such drivers are installed, the performance of the ECS will be affected and some functions will be unavailable. Ensure that KVM drivers have been installed for the image file before it is exported from the original platform. Otherwise, the ECSs created from the image will fail to start.

- For Xen, install native Xen and KVM drivers. For details, see [How Do I Install Native Xen and KVM Drivers?](#)
 - For KVM, install native KVM drivers. For details, see [Installing Native KVM Drivers](#).
-

Figure 8-2 Image creation process

Step 1: Upload the Image File

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

Step 2 Register the Image File as a Private Image

On the management console, select the uploaded image file and register it as a 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 private image.

1. Access the IMS console.
 - a. Log in to the management console.
 - b. Under **Compute**, click **Image Management Service**.
The IMS console is displayed.
2. Click the **Private Images** tab.
3. Locate the row that contains the private image and click **Apply for Server** in the **Operation** column.
4. Set parameters as promoted to create an 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 security groups 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 a Custom ECS](#).

5. Check the ECS to see if the private image used to create the ECS has been pre-configured.
 - a. Check whether the ECS can be successfully started. If the start succeeds, Xen and KVM drivers have been installed for the external image file on the original platform or the drivers have been automatically installed for the private image on the cloud platform. If the start failed, install Xen and KVM drivers for the image file and start from [Step 1: Upload the Image File](#) again.
 - b. Check whether you can log in to the ECS using your configured password or key. If you can, Cloud-Init has been installed. If you cannot, 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 has been pre-configured. Skip [Step 4: Configure the ECS](#) and [Step 5: Create a Private Image from the ECS](#).

Step 4: Configure the ECS

Remotely log in to the ECS created in [Step 3: Create an ECS](#) to configure it.

1. Log in to the ECS.
2. Configure 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 from the network rule directory as instructed in [Deleting Files from the Network Rule Directory](#).
 - Check whether DHCP is configured. If the ECS is configured with a static IP address, change its IP address assignment mode to DHCP as instructed in [Configuring DHCP](#).
 - Run the **service sshd status** command to check whether SSH 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. Configure a file system.
 - Change disk identifiers in the GRUB file to UUID. For details, see [Changing Disk Identifiers in the GRUB File to UUID](#).
 - Change disk identifiers in the fstab file to UUID. For details, see [Changing Disk Identifiers in the fstab File to UUID](#).
 - Clear the automatic mount configuration of non-system disks in the **/etc/fstab** file. For details, see [Detaching Data Disks from an ECS](#).
4. (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 Enable NIC Multi-Queue for an Image?](#)
- Configure an IPv6 address. For details, see [How Do I Configure an ECS to Use DHCPv6?](#)

Step 5: Create a Private 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

After the image registration is complete, delete the image file as well as the intermediate private image and ECS to avoid generating any additional charges.

- Delete the image registered in [Step 2 Register the Image File as a Private Image](#).
- Delete the ECS created in [Step 3: Create an ECS](#).
- Delete the image file from the OBS bucket.

8.7 How Do I Optimize an Image?

Scenarios

Second-generation general-purpose ECSs use KVM. To create this type of ECSs from an image, you must ensure that the image has KVM drivers installed. Otherwise, you may fail to start or log in to these ECSs.

IMS provides automatic image optimization to install the drivers.

NOTE

- Not all images can be optimized. You can check whether an image can be optimized on the console.

Constraints

- After an image is automatically optimized, a new private image will be generated.
- Only Linux images can be optimized automatically.
For details about how to manually optimize a Linux private image, see [Optimizing a Linux Private Image](#).
- Only the new image generated by an image optimization can be used to create second-generation general-purpose ECSs. After the optimization is complete, you can delete the original image.

Procedure

1. Log in to the management console.
2. Under **Compute**, click **Image Management Service**.

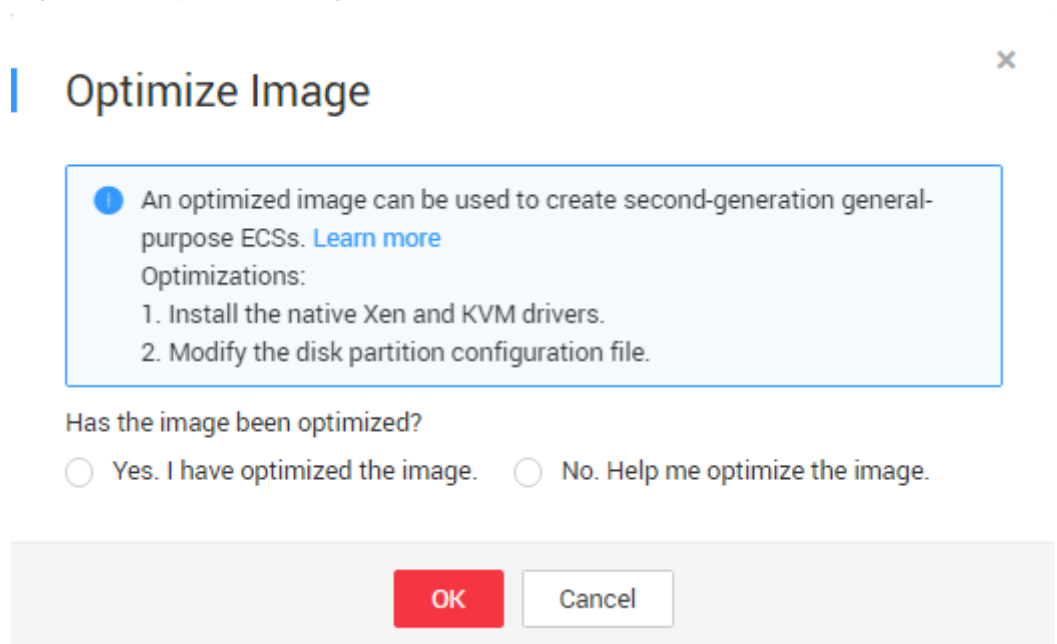
3. Click the **Private Images** tab.
4. Locate the image to be optimized, click **More** in the **Operation** column, and select **Optimize** from the drop-down list.

 **NOTE**

If you cannot find **Optimize** from **More**, this image does not support automatic optimization.

5. In the displayed dialog box, select whether to automatically optimize the image.

Figure 8-3 Optimize Image



6. Click **OK**.

8.8 How Do I Use a Private Image Created from a First-Generation ECS to Create a Second-Generation ECS?

Scenario

For general-purpose and memory-optimized ECSs, the second generation has a different virtualization architecture and driver type from the first generation. Therefore, you must optimize a private image created from a first-generation ECS before using it to create a second-generation ECS.

Procedure

The following operations use a general-purpose ECS as an example.

Method 1: automatic image optimization

1. Log in to the management console.

2. Under **Compute**, click **Image Management Service**.
3. On the **Image Management Service** page, click **Private Images** to display the image list.
4. Automatically optimize the image. For details, see [How Do I Optimize an Image?](#)

 **NOTE**

Only Linux images can be optimized automatically.

5. Use the optimized private image to create a second-generation ECS.

Method 2: manual image optimization

1. Log in to the management console.
2. Under **Compute**, click **Image Management Service**.
3. On the **Image Management Service** page, click **Private Images** to display the image list.
4. Use this image to create a first-generation ECS.

 **NOTE**

If first-generation ECSs have been sold out, use method 1.

5. Optimize the image.
 - For Windows, see [Optimizing a Windows Private Image](#).
 - For Linux, see [Optimizing a Linux Private Image](#).
6. Use the optimized general-purpose first-generation ECS to create a private image.
7. Use the private image to create a second-generation ECS.

8.9 How Do I Enable NIC Multi-Queue for an Image?

Scenarios

Network I/O bandwidth can keep increasing to the point where a single vCPU cannot process all of the NIC interrupts. NIC multi-queue allows multiple vCPUs to process NIC interrupts, thereby improving network PPS and I/O performance.

ECSs Supporting NIC Multi-Queue

NIC multi-queue can only be enabled on an ECS with the specifications and virtualization type described in this section.

- For details about the ECS specifications that support NIC multi-queue, see [ECS Types](#).

 **NOTE**

If there are more than 1 NIC queue, NIC multi-queue is supported.

- Only KVM ECSs support NIC multi-queue.

Operation Instructions

If an ECS has the required specifications and virtualization type, perform the following operations to enable NIC multi-queue:

NOTE

Currently, NIC multi-queue is only available for Ethernet NICs.

1. [Register the External Image File as a Private Image.](#)
2. [Enable NIC Multi-Queue for the Image.](#)
3. [Create an ECS from the Private Image.](#)
4. [Run a Script to Enable NIC Multi-Queue on the ECS.](#)

Register the External Image File as a Private Image

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 image details page.

- If the value is **Supported**, go to [Create an ECS from the Private Image](#).
- If the value is **Not supported**, go to [Enable NIC Multi-Queue for the Image](#).

Enable NIC Multi-Queue for the Image

Windows has not commercially supported NIC multi-queue. If you enable NIC multi-queue for a Windows image, an ECS created from such an image may take longer than normal to start.

Use any of the following methods to enable NIC multi-queue for an image:

Method 1:

1. Access the IMS console.
 - a. Log in to the management console.
 - b. Under **Compute**, click **Image Management Service**.
The IMS console is displayed.
2. On the displayed **Private Images** page, locate the row that contains the image and click **Modify** in the **Operation** column.
3. Enable NIC multi-queue for the image.

Method 2:

1. Access the IMS console.
 - a. Log in to the management console.
 - b. Under **Compute**, click **Image Management Service**.
The IMS console is displayed.
2. On the displayed **Private Images** page, click the name of the image.
3. In the upper right corner of the displayed image details page, click **Modify**. In the displayed **Modify Image** dialog box, enable NIC multi-queue for the image.

Method 3: Add `hw_vif_multiqueue_enabled` to the image using an API.

1. Obtain a token. For details, see [Authentication](#).
2. Call an API to update image information. For details, 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.
Set **Content-Type** to **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
  }
]
```

Create an ECS from the Private Image

Use the registered private image to create an ECS. For details, see [Purchasing a Custom 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.

Run a Script to Enable NIC Multi-Queue on the ECS

Windows has not commercially supported NIC multi-queue. If you enable NIC multi-queue for a Windows image, an ECS created from such an image may take longer than normal to start.

For Linux, a script is provided to automatically enable NIC multi-queue. If an ECS has multiple NICs, the script will automatically enable multi-queue for all of them.

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

```
ethtool -l NIC
```

Example output:

```
[root@localhost ~]# ethtool -l eth0 # 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. Download the configuration script **multi-queue-hw**.
wget https://ecs-instance-driver.obs.cn-north-1.myhuaweicloud.com/multi-queue-hw
The download address is <https://ecs-instance-driver.obs.cn-north-1.myhuaweicloud.com/multi-queue-hw>.
3. Make the script executable.
chmod +x multi-queue-hw
4. Move the **multi-queue-hw** script into the **/etc/init.d** directory.
mv multi-queue-hw /etc/init.d
Enter **y** when prompted:

```
mv: overwrite '/etc/init.d/multi-queue-hw'?
```
5. Run the script.
/etc/init.d/multi-queue-hw start
NIC multi-queue is enabled immediately after the script is executed but is disabled again if the ECS stops.
6. Enable NIC multi-queue at startup.
 - For CentOS, Red Hat, Fedora, EulerOS, SUSE, and openSUSE:
chkconfig multi-queue-hw on
 - For Ubuntu:
update-rc.d multi-queue-hw defaults 90 10
 - For Debian:
systemctl enable multi-queue-hw

8.10 How Do I Configure an ECS to Use DHCPv6?

Scenarios

IPv6 addresses are used to deal with IPv4 address exhaustion. If an ECS uses an IPv4 address, the ECS can run in dual-stack mode after IPv6 is enabled for it. Then, the ECS will have two IP addresses to access the intranet and Internet: an IPv4 address and an IPv6 address.

In some cases, an ECS cannot dynamically acquire an IPv6 address even if it meets all the requirements in [Constraints](#). You need to configure the ECS to dynamically acquire IPv6 addresses. For public images:

- By default, dynamic IPv6 address assignment is enabled for Windows public images. You do not need to configure it. The operations in [Windows Server 2012](#) and [Windows Server 2008](#) are for your reference only.
- Before enabling dynamic IPv6 address assignment for a Linux public image, check whether IPv6 has been enabled and then whether dynamic IPv6 address assignment has been enabled. Currently, IPv6 is enabled for all Linux public images.

Constraints

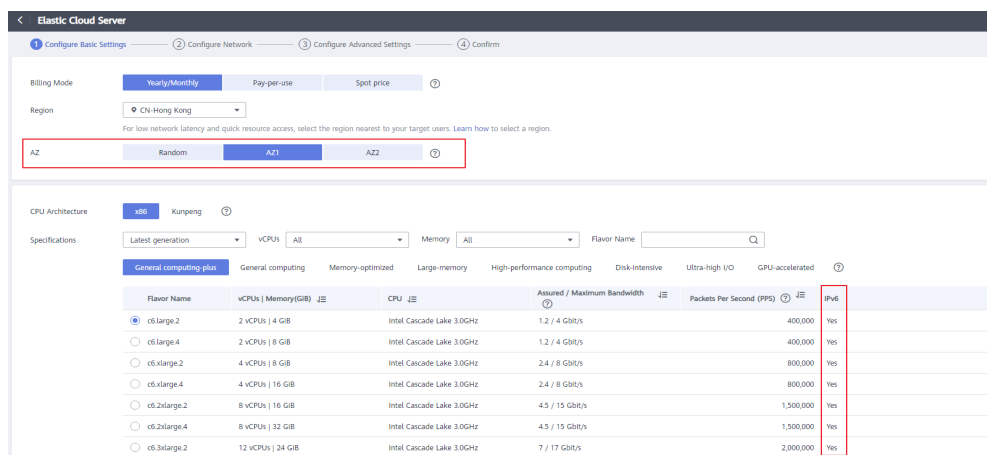
- Ensure that IPv6 has been enabled on the subnet where the ECS works.

If IPv6 is not enabled on the subnet, enable it by referring to [Enabling IPv6 for an ECS](#). IPv6 cannot be disabled once it is enabled.

- Ensure that the ECS flavor supports IPv6.

The ECS flavors that support IPv6 vary depending on regions and AZs. Check whether an ECS flavor supports IPv6 after you select a region and AZ on the management console.

Figure 8-4 Checking whether an ECS flavor supports IPv6



If the value of **IPv6** is **Yes** for an ECS flavor, the flavor supports IPv6.

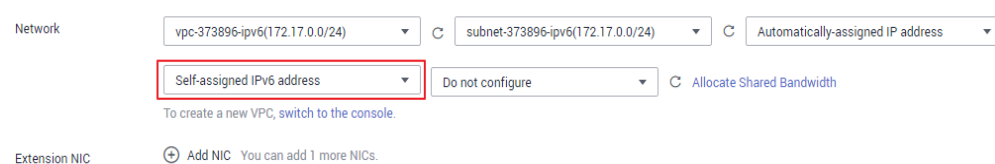
NOTE

AZ and **Flavor** determine whether IPv6 is supported.

After you select an AZ, if **IPv6** is not displayed or the value of **IPv6** is **No**, IPv6 is not supported by any or certain flavors in the AZ.

- Ensure that **Self-assigned IPv6 address** is selected during ECS creation.

Figure 8-5 Self-assigned IPv6 address



- After the ECS is started, its hot-swappable NICs cannot automatically acquire IPv6 addresses.
- Only ECSs can work in dual-stack mode and BMSs cannot.
- Only one IPv6 address can be bound to a NIC.
- Check that the ECS network configuration is correct.

For details about the check method, see [Checking the ECS Network Configuration](#).

If the network configuration is incorrect, [submit a service ticket](#).

Procedure

- Windows: Windows Server 2012/2008 is used as an example to describe how to enable dynamic assignment of IPv6 addresses in Windows.

- Linux: Dynamic assignment of IPv6 addresses can be enabled automatically (recommended) or manually.

If a private image created from a CentOS 6.x or Debian ECS with automatic IPv6 address assignment enabled is used to create an ECS in an environment that does not support IPv6, the ECS may start slow because of IPv6 address assignment timeout. You can set the timeout duration for assigning IPv6 addresses by referring to [Setting the Timeout Duration for IPv6 Address Assignment](#).



Table 8-5 Enabling dynamic assignment of IPv6 addresses for different OSs

OS	Automatically/ Manually Enabling	Reference
Windows Server 2012	Automatically	Windows Server 2012
Windows Server 2008	Automatically	Windows Server 2008
Linux	Automatically (recommended)	Linux (Automatically Enabling Dynamic Assignment of IPv6 Addresses)
Linux	Manually	Linux (Manually Enabling Dynamic Assignment of IPv6 Addresses)

Enabling IPv6 for an ECS

NOTE

After IPv6 is enabled on the subnet where the ECS works, an IPv6 CIDR block is automatically assigned to the subnet. IPv6 cannot be disabled once it is enabled.

- Log in to the management console.
- Click  in the upper left corner and select the desired region and project.
- Click . Under **Compute**, click **Elastic Cloud Server**.
- Click the target ECS to go to the detail page.
- In the **ECS Information** area, click the VPC name.
- Click the number in the **Subnets** column.
The **Subnets** page is displayed.
- In the subnet list, locate the target subnet and click its name.
The subnet details page is displayed.
- In the **Subnet Information** area, click **Enable** for **IPv6 CIDR Block**.
- Click **OK**.

Windows Server 2012

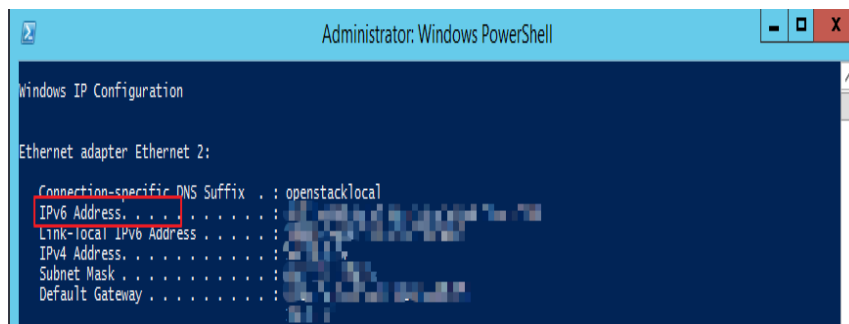
Step 1 Check whether IPv6 is enabled for the ECS.

Run the following command in the CMD window to check it:

ipconfig

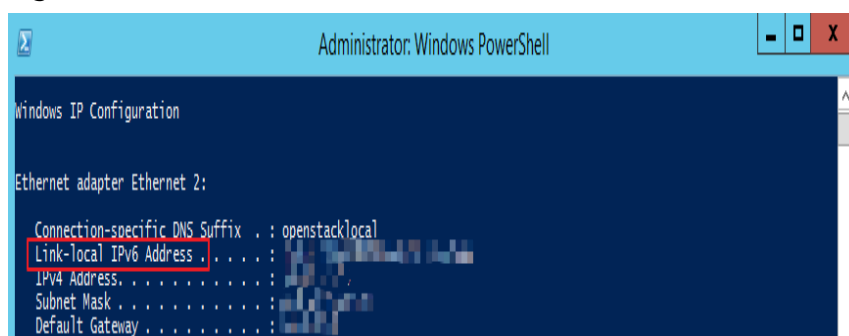
- If an IPv6 address and a link-local IPv6 address are displayed, IPv6 is enabled and dynamic IPv6 assignment is also enabled.

Figure 8-6 Querying the IPv6 address



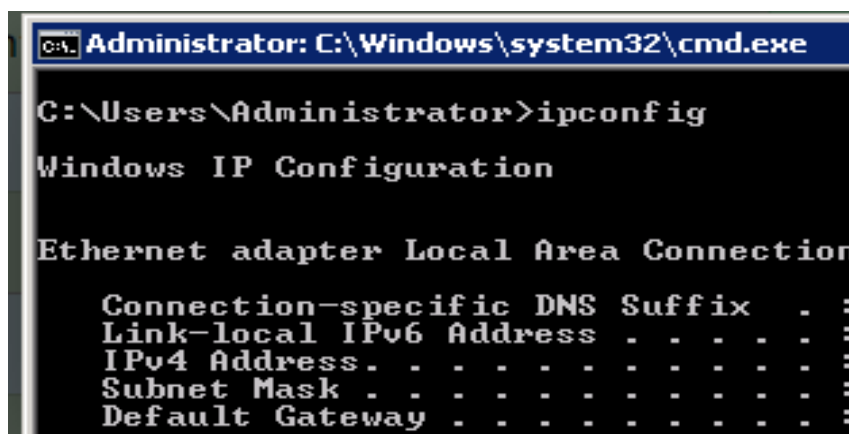
- If only a link-local IPv6 address is displayed, IPv6 is enabled but dynamic IPv6 assignment is not enabled. Go to [Step 2](#).

Figure 8-7 Link-local IPv6 address



- If neither an IPv6 address nor link-local IPv6 address is displayed, IPv6 is disabled. Go to [Step 3](#).

Figure 8-8 IPv6 disabled



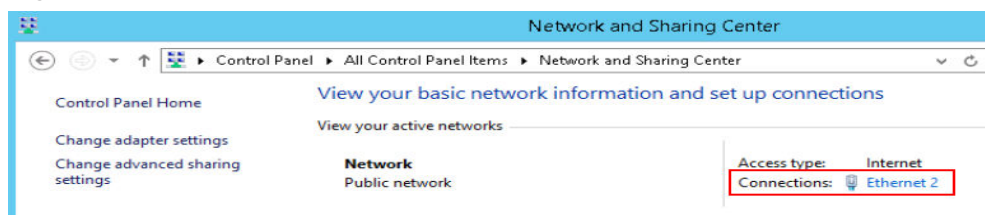
 **NOTE**

By default, dynamic IPv6 address assignment is enabled for Windows public images, as shown in [Figure 8-6](#). No additional configuration is required.

Step 2 Enable dynamic IPv6 address assignment.

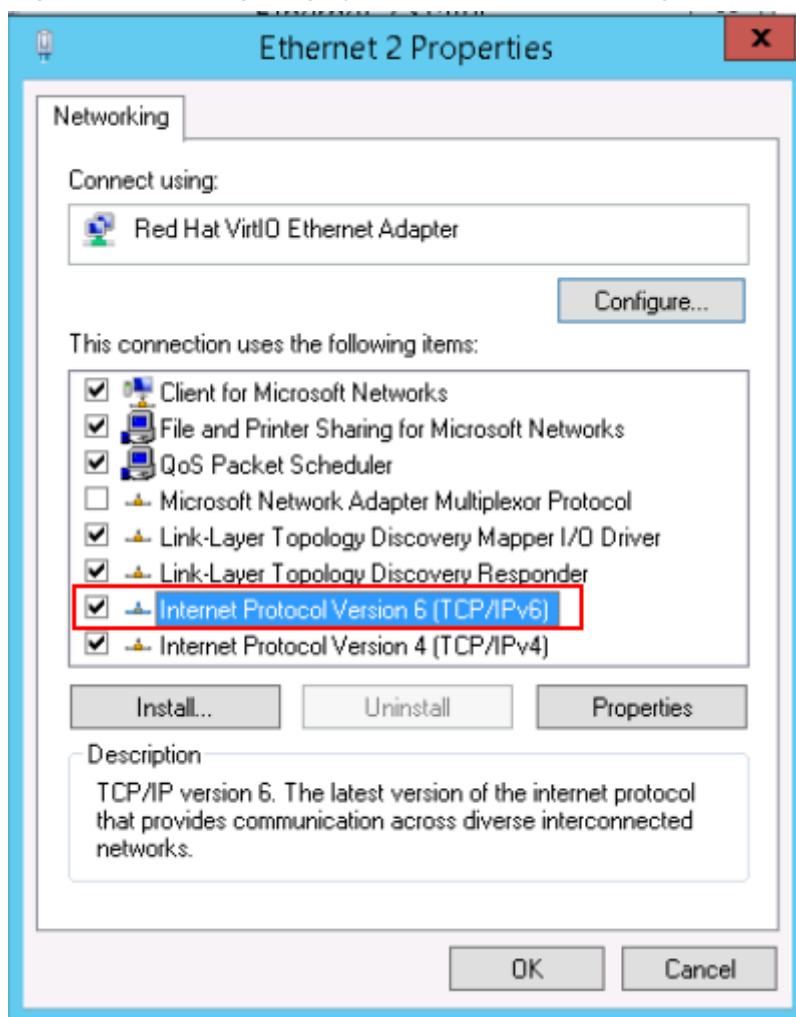
1. Choose **Start > Control Panel**.
2. Click **Network and Sharing Center**.
3. Click the Ethernet connection.

Figure 8-9 Ethernet connection



4. In the **Ethernet Status** dialog box, click **Properties** in the lower left corner.
5. Select **Internet Protocol Version 6 (TCP/IPv6)** and click **OK**.

Figure 8-10 Configuring dynamic IPv6 address assignment

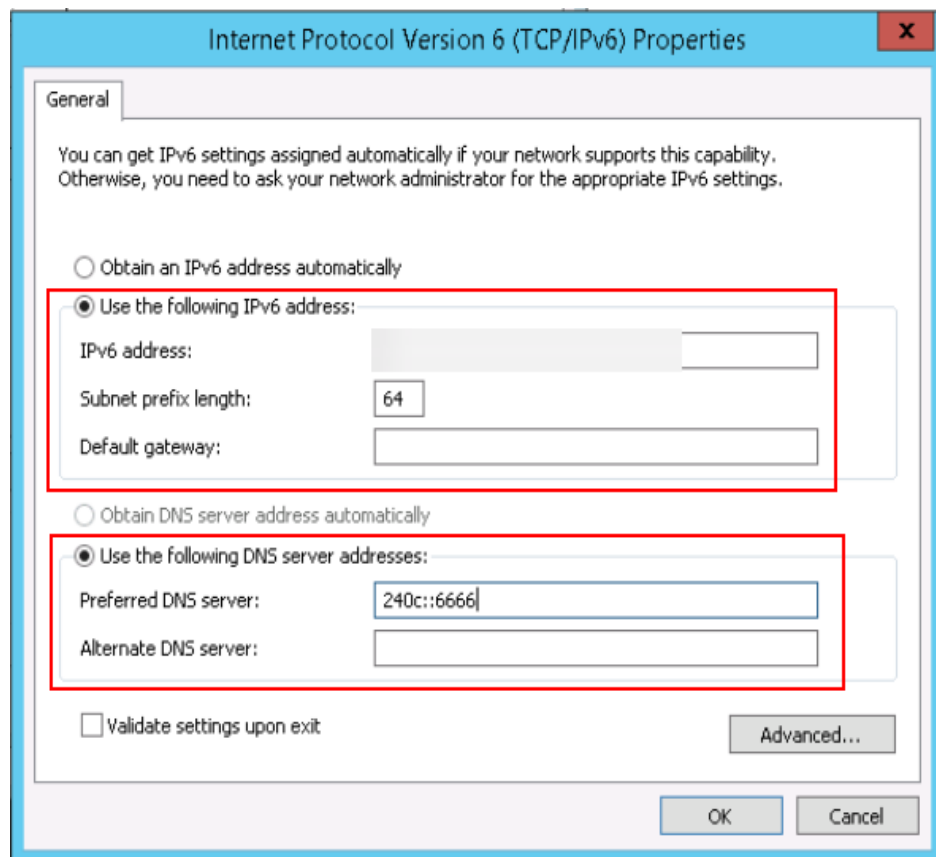


6. Perform **Step 1** to check whether dynamic IPv6 address assignment is enabled.

Step 3 Enable and configure IPv6.

1. In the **Internet Protocol Version 6 (TCP/IPv6) Properties** dialog box, configure an IPv6 address and a DNS server address.
 - **IPv6 address:** IPv6 address allocated during ECS creation. Obtain the value from the ECS list on the console.
 - **Subnet prefix length: 64**
 - **Preferred DNS server: 240c::6666** (recommended)

Figure 8-11 Configuring an IPv6 address and a DNS server address



2. (Optional) Run the following command depending on your ECS OS.
For Windows Server 2012, run the following command in PowerShell or CMD:
Set-NetIPv6Protocol -RandomizeIdentifiers disabled
3. Perform **Step 1** to check whether dynamic IPv6 address assignment is enabled.

----End

Windows Server 2008

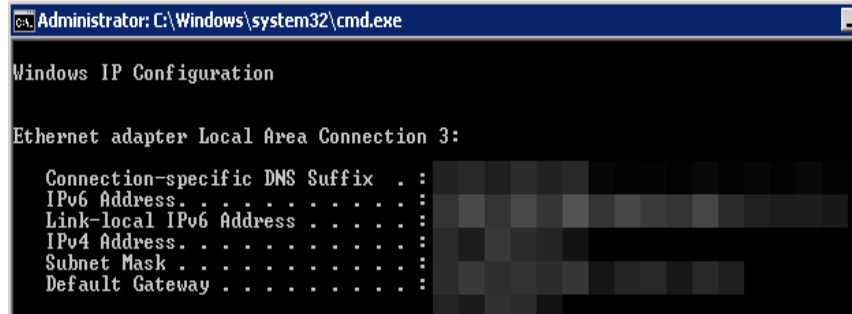
Step 1 Check whether IPv6 is enabled for the ECS.

Run the following command in the CMD window to check it:

ipconfig

- If an IPv6 address and a link-local IPv6 address are displayed, IPv6 is enabled and dynamic IPv6 assignment is also enabled.

Figure 8-12 Querying the IPv6 address



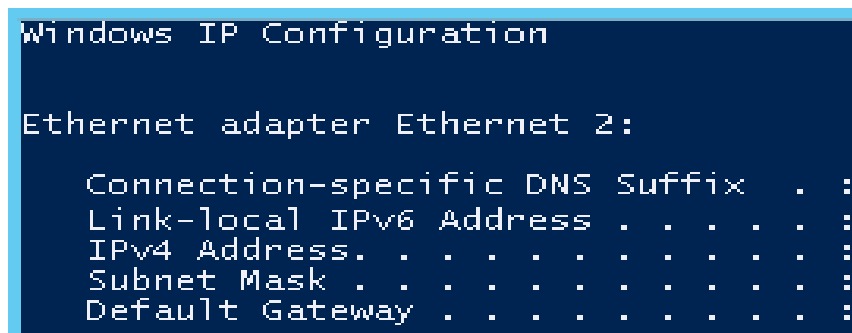
```
Administrator: C:\Windows\system32\cmd.exe
Windows IP Configuration

Ethernet adapter Local Area Connection 3:

    Connection-specific DNS Suffix . . : 
    IPv6 Address. . . . . : 
    Link-local IPv6 Address . . . . . : 
    IPv4 Address. . . . . : 
    Subnet Mask . . . . . : 
    Default Gateway . . . . . :
```

- If only a link-local IPv6 address is displayed, IPv6 is enabled but dynamic IPv6 assignment is not enabled. Go to [Step 2](#).

Figure 8-13 Link-local IPv6 address



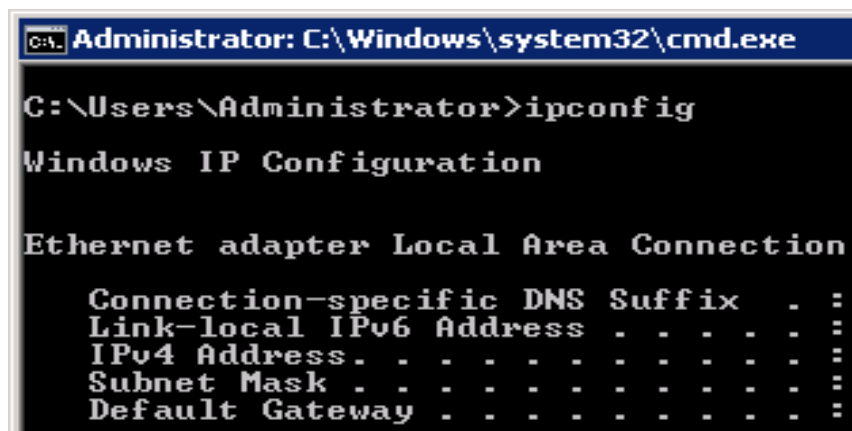
```
Windows IP Configuration

Ethernet adapter Ethernet 2:

    Connection-specific DNS Suffix . . : 
    Link-local IPv6 Address . . . . . : 
    IPv4 Address. . . . . : 
    Subnet Mask . . . . . : 
    Default Gateway . . . . . :
```

- If neither an IPv6 address nor link-local IPv6 address is displayed, IPv6 is disabled. Go to [Step 3](#).

Figure 8-14 IPv6 disabled



```
Administrator: C:\Windows\system32\cmd.exe
C:\Users\Administrator>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix . . : 
    Link-local IPv6 Address . . . . . : 
    IPv4 Address. . . . . : 
    Subnet Mask . . . . . : 
    Default Gateway . . . . . :
```

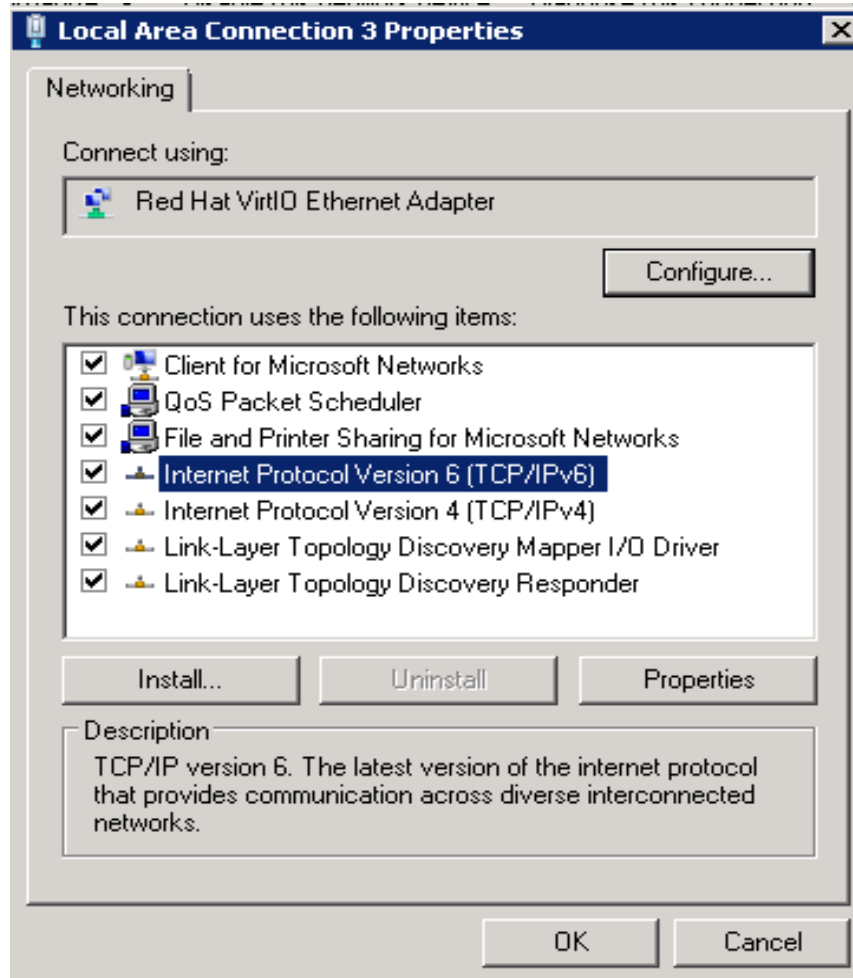
NOTE

By default, dynamic IPv6 address assignment is enabled for Windows public images, as shown in [Figure 8-12](#). No additional configuration is required.

Step 2 Enable dynamic IPv6 address assignment.

1. Choose **Start > Control Panel**.
2. Click **Network and Sharing Center**.
3. Click **Change adapter settings**.
4. Right-click the local network connection and choose **Properties**.
5. Select **Internet Protocol Version 6 (TCP/IPv6)** and click **OK**.

Figure 8-15 Configuring dynamic IPv6 address assignment

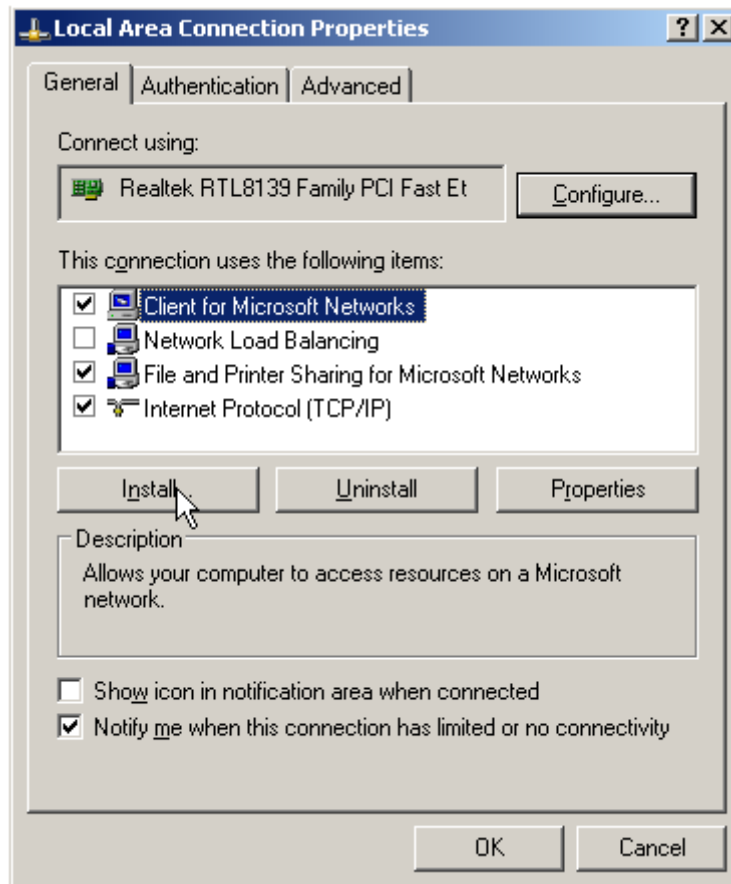


6. Perform **Step 1** to check whether dynamic IPv6 address assignment is enabled.

Step 3 Enable and configure IPv6.

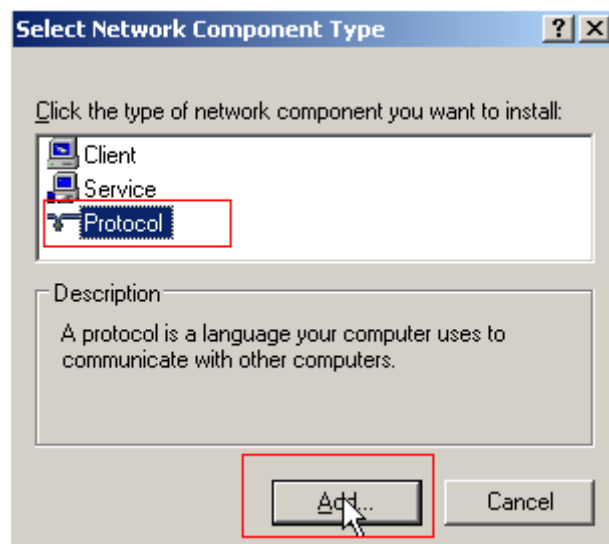
1. Choose **Start > Control Panel > Network Connection > Local Connection**.
2. Select **Properties**, select the following options, and click **Install**.

Figure 8-16 Enabling and configuring IPv6

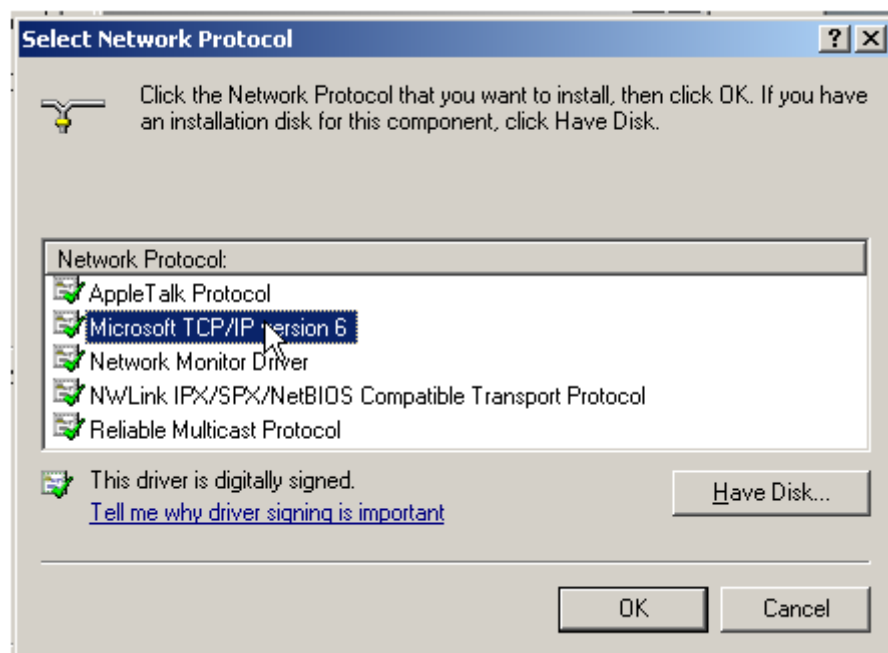


3. Select **Protocol** and click **Add**.

Figure 8-17 Adding the protocol



4. Select **Microsoft TCP/IP Version 6** and click **OK**.

Figure 8-18 Network protocols

- (Optional) Run the following commands depending on your ECS OS.
For Windows Server 2008, run the following command in PowerShell or CMD:
netsh interface ipv6 set global randomizeidentifiers=disable
Disable the local connection and then enable it again.
To disable the local connection, choose **Start > Control Panel > Network and Internet > Network and Sharing Center > Change Adapter Options**. Right-click the local connection and choose **Disable** from the shortcut menu.
To enable the local connection, choose **Start > Control Panel > Network and Internet > Network and Sharing Center > Change Adapter Options**. Right-click the local connection and choose **Enable** from the shortcut menu.
- Perform [Step 1](#) to check whether dynamic IPv6 address assignment is enabled.

----End

Linux (Automatically Enabling Dynamic Assignment of IPv6 Addresses)

The **ipv6-setup-xxx** tool can be used to enable Linux OSs to automatically acquire IPv6 addresses. *xxx* indicates a tool, which can be *rhel* or *debian*.

You can also enable dynamic IPv6 address assignment by following the instructions in [Linux \(Manually Enabling Dynamic Assignment of IPv6 Addresses\)](#).

CAUTION

- When you run **ipv6-setup-xxx**, the network service will be automatically restarted. As a result, the network is temporarily disconnected.
- If a private image created from a CentOS 6.x or Debian ECS with automatic IPv6 address assignment enabled is used to create an ECS in an environment that does not support IPv6, the ECS may start slow because of IPv6 address assignment timeout. Set the timeout duration for assigning IPv6 addresses to 30s by referring to [Setting the Timeout Duration for IPv6 Address Assignment](#) and try to create a new private image again.

Step 1 Run the following command to check whether IPv6 is enabled for the ECS:

ip addr

- If only an IPv4 address is displayed, IPv6 is disabled. Enable it by referring to [Setting the Timeout Duration for IPv6 Address Assignment](#).

Figure 8-19 IPv6 disabled

```
eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP qlen 1000
link/ether fa:16:3e: b d b d ff:ff:ff:ff:ff:ff
inet b d b d scope global noprefixroute dynamic eth0
    valid_lft 1193sec preferred_lft 1193sec
```

- If a link-local address (starting with fe80) is displayed, IPv6 is enabled but dynamic assignment of IPv6 addresses is not enabled.

Figure 8-20 IPv6 enabled

```
eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
link/ether fa:16:3e: b d b d ff:ff:ff:ff:ff:ff
inet b d b d scope global noprefixroute dynamic eth0
    valid_lft 76391sec preferred_lft 76391sec
inet6 fe80::f816: b d b d /64 scope link
    valid_lft forever preferred_lft forever
```

- If the following address is displayed, IPv6 is enabled and an IPv6 address has been assigned:

Figure 8-21 IPv6 enabled and an IPv6 address assigned

```
eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
link/ether fa:16:3e:75:af:4c b d b d ff:ff:ff:ff:ff:ff
inet b d b d scope global noprefixroute dynamic eth0
    valid_lft 86395sec preferred_lft 86395sec
inet6 2407:c080:802: b d b d /128 scope global dynamic
    valid_lft 7496sec preferred_lft 7196sec
inet6 fe80::f816:3eff: b d b d /64 scope link noprefixroute
    valid_lft forever preferred_lft forever
```

NOTE

IPv6 is enabled for Linux public images by default, as shown in [Figure 8-20](#).

Step 2 Enable IPv6 for the ECS.

1. Run the following command to check whether IPv6 is enabled for the kernel:
sysctl -a | grep ipv6
 - If a command output is displayed, IPv6 is enabled.
 - If no information is displayed, IPv6 is disabled. Go to [Step 2.2](#) to load the IPv6 module.

2. Run the following command to load the IPv6 module:
modprobe ipv6
3. Add the following content to the `/etc/sysctl.conf` file:
net.ipv6.conf.all.disable_ipv6=0
4. Save the configuration and exit. Then, run the following command to load the configuration:
sysctl -p

Step 3 Enable dynamic IPv6 address assignment for the ECS.

1. Download **ipv6-setup-rhel** or **ipv6-setup-debian** with a required version and upload it to the target ECS.

ipv6-setup-xxx modifies the configuration file of a NIC to enable dynamic IPv6 address assignment or adds such a configuration file for a NIC, and then restarts the NIC or network service. **Table 8-6** lists the paths for obtaining **ipv6-setup-rhel** and **ipv6-setup-debian**.

Table 8-6 Download paths of **ipv6-setup-rhel** and **ipv6-setup-debian**

Series	Release Version	How to Obtain
RHEL	<ul style="list-style-type: none"> – CentOS 6/7 – EulerOS 2.2/2.3 – Fedora 25 	https://ecs-instance-driver.obs.cn-north-1.myhuaweicloud.com/ipv6/ipv6-setup-rhel
Debian	<ul style="list-style-type: none"> – Ubuntu 16/18 – Debian 8/9/10 	https://ecs-instance-driver.obs.cn-north-1.myhuaweicloud.com/ipv6/ipv6-setup-debian

2. Run the following command to make **ipv6-setup-xxx** executable:
chmod +x ipv6-setup-xxx
3. Run the following command to enable dynamic IPv6 address assignment for a NIC:

./ipv6-setup-xxx --dev [dev]

Example:

./ipv6-setup-xxx --dev eth0

 **NOTE**

- To enable dynamic IPv6 address assignment for all NICs, run the **./ipv6-setup-xxx** command.
- To learn how to use **ipv6-setup-xxx**, run the **./ipv6-setup-xxx --help** command.

----End

Linux (Manually Enabling Dynamic Assignment of IPv6 Addresses)

⚠ CAUTION

If a private image created from a CentOS 6.x or Debian ECS with automatic IPv6 address assignment enabled is used to create an ECS in an environment that does not support IPv6, the ECS may start slow because of IPv6 address assignment timeout. Set the timeout duration for assigning IPv6 addresses to 30s by referring to [Setting the Timeout Duration for IPv6 Address Assignment](#) and try to create a new private image again.

Step 1 Run the following command to check whether IPv6 is enabled for the ECS:

ip addr

- If only an IPv4 address is displayed, IPv6 is disabled. Enable it by referring to [Step 2](#).

Figure 8-22 IPv6 disabled

```
eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP qlen 1000
link/ether fa:16:3e: brd ff:ff:ff:ff:ff:ff
inet brd scope global noprefixroute dynamic eth0
valid_lft 1193sec preferred_lft 1193sec
```

- If a link-local address (starting with fe80) is displayed, IPv6 is enabled but dynamic assignment of IPv6 addresses is not enabled.

Figure 8-23 IPv6 enabled

```
eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
link/ether fa:16:3e:75:af:4c brd ff:ff:ff:ff:ff:ff
inet brd scope global noprefixroute dynamic eth0
valid_lft 76391sec preferred_lft 76391sec
inet6 fe80::f816: /64 scope link
valid_lft forever preferred_lft forever
```

- If the following address is displayed, IPv6 is enabled and an IPv6 address has been assigned:

Figure 8-24 IPv6 enabled and an IPv6 address assigned

```
eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
link/ether fa:16:3e:75:af:4c brd ff:ff:ff:ff:ff:ff
inet brd scope global noprefixroute dynamic eth0
valid_lft 86395sec preferred_lft 86395sec
inet6 2407:c080:802: /128 scope global dynamic
valid_lft 7496sec preferred_lft 7196sec
inet6 fe80::f816:3eff: /64 scope link noprefixroute
valid_lft forever preferred_lft forever
```

📖 NOTE

IPv6 is enabled for Linux public images by default, as shown in [Figure 8-23](#).

Step 2 Enable IPv6 for the ECS.

1. Run the following command to check whether IPv6 is enabled for the kernel:
sysctl -a | grep ipv6
 - If a command output is displayed, IPv6 is enabled.
 - If no information is displayed, IPv6 is disabled. Go to [Step 2.2](#) to load the IPv6 module.

2. Run the following command to load the IPv6 module:
modprobe ipv6
3. Add the following content to the `/etc/sysctl.conf` file:
net.ipv6.conf.all.disable_ipv6=0
4. Save the configuration and exit. Then, run the following command to load the configuration:
sysctl -p

Step 3 Enable dynamic IPv6 address assignment for the ECS.

- Ubuntu 18.04/20.04
 - a. Run the following command to access `/etc/netplan/`:
cd /etc/netplan
 - b. Run the following command to list the configuration file:
ls

Figure 8-25 Configuration file name

```
root@ecs-: /etc/netplan# ls
01-netcfg.yaml  01-network-manager-all.yaml
```

- c. Run the following command to edit the configuration file:
vi 01-network-manager-all.yaml
- d. Append the following content to the configuration file (pay attention to the yaml syntax and text indentation):
ethernets:
eth0:
 dhcp6: true

Figure 8-26 Edited configuration file

```
# Let NetworkManager manage all devices on this system
network:
  version: 2
  renderer: NetworkManager
  ethernets:
    eth0:
      dhcp6: true
```

Save the changes and exit.

- e. Run the following command to make the changes take effect:
sudo netplan apply
- Ubuntu 22.04
 - a. Run the following command to access `/etc/netplan/`:
cd /etc/netplan
 - b. Run the following command to list the configuration file:
ls

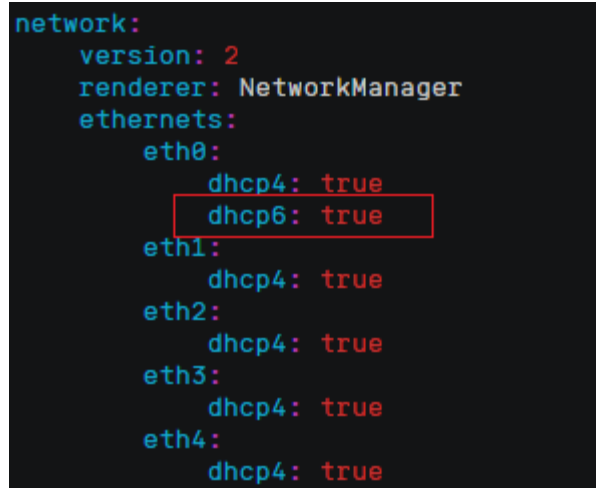
Figure 8-27 Configuration file name

```
root@ecs-485b:/etc/netplan# ls
01-netcfg.yaml
```

- c. Run the following command to edit the configuration file:
vi 01-netcfg.yaml
- d. Append the following content to the configuration file **01-netcfg.yaml** (pay attention to the yaml syntax and text indentation):

```
ethernets:  
  eth0:  
    dhcp6: true
```

Figure 8-28 Edited configuration file



```
network:  
  version: 2  
  renderer: NetworkManager  
  ethernets:  
    eth0:  
      dhcp4: true  
      dhcp6: true  
    eth1:  
      dhcp4: true  
    eth2:  
      dhcp4: true  
    eth3:  
      dhcp4: true  
    eth4:  
      dhcp4: true
```

Save the changes and exit.

- e. Run the following command to make the changes take effect:
sudo netplan apply
- f. Run the following command to edit **/etc/NetworkManager/NetworkManager.conf**:
vi /etc/NetworkManager/NetworkManager.conf
- g. Append the following content to the configuration file **NetworkManager.conf** (pay attention to the file format and indentation):

```
[main]  
plugins=ifupdown,keyfile  
dhcp=dhclient  
  
[ifupdown]  
managed=true  
  
[device]  
wifi.scan-rand-mac-address=no
```


Figure 8-29 Modification result

```
[main]
plugins=ifupdown,keyfile
dhcp=dhclient

[ifupdown]
managed=true

[device]
wifi.scan-rand-mac-address=no
```

- h. Run the following command for the configuration to take effect:
systemctl restart NetworkManager

- Debian

- a. Add the following content to the **/etc/network/interfaces** file:

```
auto lo
iface lo inet loopback
auto eth0
iface eth0 inet dhcp
iface eth0 inet6 dhcp
pre-up sleep 3
```

- b. Add configurations for each NIC to the **/etc/network/interfaces** file. The following uses eth1 as an example:

```
auto eth1
iface eth1 inet dhcp
iface eth1 inet6 dhcp
pre-up sleep 3
```

- c. Run the following command to restart the network service:
service networking restart

 **NOTE**

If no IPv6 address is assigned after the NICs are brought down and up, you can run this command to restart the network.

- d. Perform **Step 1** to check whether dynamic IPv6 address assignment is enabled.

- CentOS, EulerOS, or Fedora

- a. Open the configuration file **/etc/sysconfig/network-scripts/ifcfg-eth0** of the primary NIC.

Add the following configuration items to the file:

```
IPV6INIT=yes
DHCPV6C=yes
```

- b. Edit the **/etc/sysconfig/network** file to add or modify the following line:
NETWORKING_IPV6=yes

- c. For an ECS running CentOS 6, you need to edit the configuration files of its extension NICs. For example, if the extension NIC is eth1, you need to edit **/etc/sysconfig/network-scripts/ifcfg-eth1**.

Add the following configuration items to the file:

```
IPV6INIT=yes
DHCPV6C=yes
```

In CentOS 6.3, dhcpv6-client requests are filtered by **ip6tables** by default. So, you also need to add a rule allowing the dhcpv6-client request to the **ip6tables** file.

- i. Run the following command to add the rule to **ip6tables**:
ip6tables -A INPUT -m state --state NEW -m udp -p udp --dport 546 -d fe80::/64 -j ACCEPT
- ii. Run the following command to save the rule in **ip6tables**:
service ip6tables save

Figure 8-30 Example command

```
[root@ecs-cd02 log]# ip6tables -A INPUT -m state --state NEW -m udp -p udp --dport 546 -d fe80::/64 -j ACCEPT
nf_comtrack version 0.5.0 (7964 buckets, 31856 max)
[root@ecs-cd02 log]# service ip6tables save
ip6tables: Saving firewall rules to /etc/sysconfig/ip6tables OK ]
```

- d. (Optional) For CentOS 7/CentOS 8, change the IPv6 link-local address mode of extension NICs to EUI64.
 - i. Run the following command to query the NIC information:
nmcli con

Figure 8-31 Querying NIC information

```
[root@ecs-166b ~]# nmcli con
NAME                UUID                                  TYPE      DEVICE
System eth0         5fb06bd0-0bb0-7ffb-45f1-d6edd65f3e03  ethernet  eth0
Wired connection 1  9c92fad9-6ecb-3e6c-eb4d-8a47c6f50c04  ethernet  eth1
Wired connection 1  3a73717e-65ab-93e8-b518-24f5af32dc0d  ethernet  eth2
```

- ii. Run the following command to change the IPv6 link-local address mode of eth1 to EUI64:
nmcli con modify "Wired connection 1" ipv6.addr-gen-mode eui64

NOTE

The NIC information varies depending on the CentOS series. In the command, *Wired connection 1* needs to be replaced with the value in the **NAME** column of the queried NIC information.

- iii. Run the following commands to bring eth1 down and up:
ifdown eth1
ifup eth1
- e. Restart the network service.
 - i. For CentOS 6, run the following command to restart the network service:
service network restart
 - ii. For CentOS 7/EulerOS/Fedora, run the following command to restart the network service:
systemctl restart NetworkManager
- f. Perform **Step 1** to check whether dynamic IPv6 address assignment is enabled.
 - SUSE, openSUSE, or CoreOS
SUSE 11 SP4 does not support dynamic IPv6 address assignment.
No additional configuration is required for SUSE 12 SP1 or SUSE 12 SP2.
No additional configuration is required for openSUSE 13.2 or openSUSE 42.2.

No additional configuration is required for CoreOS 10.10.5.

----End


Checking the ECS Network Configuration

1. Run the following command to check whether the ECS network service is normal:

```
systemctl status NetworkManager
```

If the network service is normal, the command output shows **active (running)** and the service status is **enabled**.

Figure 8-32 Network service status



```
Welcome to Huawei Cloud Service
[root@ecs-~]# systemctl status NetworkManager
* NetworkManager.service - Network Manager
  Loaded: loaded (/usr/lib/systemd/system/NetworkManager.service; enabled; vendor preset: enabled)
  Active: active (running) since Tue 2024-05-21 18:32:01 CST; 24h ago
  Docs: man:NetworkManager(8)
  Main PID: 581 (NetworkManager)
  CGroup: /system.slice/NetworkManager.service
          └─581 /usr/sbin/NetworkManager --no-daemon
          └─585 /usr/sbin/dhclient -d -q -t /usr/libexec/nm-dhcp-helper -pf /var/run/dhclient-eth0.pid -lf /var/lib/NetworkManager/dhclient-5fb8b0d0-8bb8-77fb-45f1-d5ed65f3e83-eth0....
```

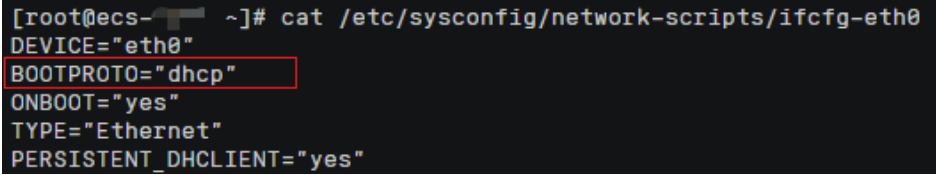
2. Run the following command to check how the ECS NIC obtains an IP address:

```
cat /etc/sysconfig/network-scripts/ifcfg-ethx
```

NOTE

- **ethx** needs to be replaced with a specific NIC, for example, **eth0**.
- This command takes CentOS 7 as an example.

Figure 8-33 Method for ECS NIC to obtain an IP address



```
[root@ecs-~]# cat /etc/sysconfig/network-scripts/ifcfg-eth0
DEVICE="eth0"
BOOTPROTO="dhcp"
ONBOOT="yes"
TYPE="Ethernet"
PERSISTENT_DHCLIENT="yes"
```

- If the value of **BOOTPROTO** is **dhcp**, the ECS NIC obtains an IP address using dynamic DHCP. Then, perform [3](#).
 - If the value of **BOOTPROTO** is **static**, the network of the ECS NIC is statically configured. Then, perform [4](#).
3. If the ECS NIC obtains an IP address using dynamic DHCP, run the following command to check whether the DHCP process is normal:

```
systemctl status NetworkManager
```

If the command output contains **dhclient**, the process is running properly.

Figure 8-34 Checking the DHCP process



```
[root@ecs-~]# systemctl status NetworkManager
* NetworkManager.service - Network Manager
  Loaded: loaded (/usr/lib/systemd/system/NetworkManager.service; enabled; vendor preset: enabled)
  Active: active (running) since Tue 2024-05-21 18:32:01 CST; 1 day 4h ago
  Docs: man:NetworkManager(8)
  Main PID: 581 (NetworkManager)
  CGroup: /system.slice/NetworkManager.service
          └─581 /usr/sbin/NetworkManager --no-daemon
          └─585 /usr/sbin/dhclient -d -q -t /usr/libexec/nm-dhcp-helper -pf /var/run/dhclient-eth0.pid -lf /var/lib/NetworkManager/dhclient-5fb8b0d0-8bb8-77fb-45f1-d5ed65f3e83-eth0....
```

4. If the network of the ECS NIC is statically configured, run the following command to check whether the IP address configuration has taken effect:

ip a

If the IP address configuration in the command output is **forever**, the configuration has taken effect.

Figure 8-35 Checking the static configuration

```
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    link/ether fa:16:3e:fc:fc:14 brd ff:ff:ff:ff:ff:ff
    inet 10.0.0.24/24 brd 10.0.0.255 scope global noprefixroute eth0
        valid_lft forever preferred_lft forever
    inet6 fc00:f816:3eff:fcfc:fc14/64 scope link
        valid_lft forever preferred_lft forever
```

Setting the Timeout Duration for IPv6 Address Assignment

After automatic IPv6 address assignment is configured on an ECS running CentOS 6.x or Debian, the ECS will be created as a private image. When this image is used to create an ECS in an environment that IPv6 is unavailable, the ECS may start slow because acquiring an IPv6 address times out. Before creating the private image, you can set the timeout duration for acquiring IPv6 addresses to 30s as follows:

- CentOS 6.x:
 - a. Run the following command to edit the **dhclient.conf** file:
vi /etc/dhcp/dhclient.conf
 - b. Press **i** to enter editing mode and add the timeout attribute to the file.
timeout 30;
 - c. Enter **:wq** to save the settings and exit.
- Debian 7.5:
 - a. Run the following command to edit the **networking** file:
vi /etc/init.d/networking
 - b. Press **i** to enter editing mode and add the timeout attribute.

Figure 8-36 Modification 1

```
115 case "$1" in
116 start)
117     if init_is_upstart; then
118         exit 1
119     fi
120     process_options
121     check_ifstate
122
123     if [ "$CONFIGURE_INTERFACES" = no ]
124     then
125         log_action_msg "Not configuring network interfaces, see /etc/default/networking"
126         exit 0
127     fi
128     set -f
129     exclusions=$(process_exclusions)
130     log_action_begin_msg "Configuring network interfaces"
131     if /usr/bin/timeout 30 ifup -a $exclusions $verbose && ifup_hotplug $exclusions $verbose
132     then
133         log_action_end_msg $?
134     else
135         log_action_end_msg $?
136     fi
137     ;;
138
139 stop)
140     if init_is_upstart; then
141         exit 0
142     fi
143     check_network_file_systems
144     check_network_swap
145
146     log_action_begin_msg "Deconfiguring network interfaces"
147     if /usr/bin/timeout 30 ifdown -a --exclude=lo $verbose; then
148         log_action_end_msg $?
```

Figure 8-37 Modification 2

```
154 reload)
155     process_options
156
157     log_action_begin_msg "Reloading network interfaces configuration"
158     state=$(cat /run/network/ifstate)
159     [ /usr/bin/timeout 30 ifdown -a --exclude=lo $verbose || true
160     if /usr/bin/timeout 30 ifup --exclude=lo $state $verbose ; then
161     log_action_end_msg $?
162     else
163     log_action_end_msg $?
164     fi
165     ;;
166
167 force-reload|restart)
168     if init_is_upstart; then
169     exit 1
170     fi
171     process_options
172
173     log_warning_msg "Running $0 $1 is deprecated because it may not re-enable some interfaces"
174     log_action_begin_msg "Reconfiguring network interfaces"
175     [ /usr/bin/timeout 30 ifdown -a --exclude=lo $verbose || true
176     set +f
177     exclusions=$(process_exclusions)
178     if /usr/bin/timeout 30 ifup -a --exclude=lo $exclusions $verbose && ifup_hotplug $exclusions $verbose
179     then
180     log_action_end_msg $?
181     else
182     log_action_end_msg $?
```

- Debian 8.2.0/8.8.0
 - a. Run the following command to edit the **network-pre.conf** file:
vi /lib/systemd/system/networking.service.d/network-pre.conf
 - b. Press **/** to enter editing mode and add the timeout attribute to the file.
[Service]
TimeoutStartSec=30
- Debian 9.0
 - a. Run the following command to edit the **networking.service** file:
vi /etc/systemd/system/network-online.target.wants/networking.service
 - b. Press **i** to enter editing mode and change **TimeoutStartSec=5min** to **TimeoutStartSec=30**.

8.11 How Do I Make a System Disk Image Support Fast ECS Creation?

Scenarios

Fast Create greatly reduces the time required to create ECSs from a system disk image. Currently, this feature is supported for all newly created system disk images by default, but some existing system disk images may not support this feature. You can make them support it through image replication.

For example, if image A does not support fast ECS creation, you can replicate it to generate image copy_A that supports fast ECS creation.

Constraints

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

Check Whether an Image Supports Fast ECS Creation

1. Access the IMS console.
 - a. Log in to the management console.

- b. Under **Compute**, click **Image Management Service**.
The IMS console is displayed.
2. Click the **Private Images** tab to display the image list.
3. Click the name of the target image.
4. On the displayed image details page, check the value of **Fast ECS Creation**.

Figure 8-38 Image details

Name	newCloudinit-Image	ID	e587771f-9920-456f-a987-b00792c4d326
Image Type	System disk image	Disk Capacity (GB)	40
OS	Windows Server 2016 Datacenter 64bit	Status	✔ Normal
Minimum Memory	Unlimited	Image Size	7.21 GB
Maximum Memory	Unlimited	Released ?	No
Created	2023/01/28 17:30:38 GMT+08:00	Completed	2023/01/28 17:38:58 GMT+08:00
Source	ECS --	Description	--
Encrypted	No	OS Type	Windows
NIC Multi-Queue	Supported	Enterprise Project	default
Fast ECS Creation ?	Supported		

Configure an Image to Make It Support Fast ECS Creation

1. Locate the 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. Wait for the replication to complete. Then, the new image can be used to quickly create ECSs.

8.12 Why Did I Fail to Install Guest OS Drivers on a Windows ECS?

Possible causes:

- Your image file was exported from a VMware VM, and VMware Tools was not uninstalled or not completely uninstalled.
- You have downloaded Guest OS drivers of an incorrect version for your Windows ECS.
- The disk space available for installing Guest OS drivers is insufficient. Ensure that the disk where Guest OS drivers are installed has at least 300 MB space available.

8.13 How Do I Install Native Xen and KVM Drivers?

Scenarios

When optimizing a Linux private image with Xen virtualization, you need to install native Xen and KVM drivers on the source ECS of the image.

This section describes how to install native Xen and KVM drivers.

⚠ CAUTION

If an ECS has no Xen drivers installed, the network performance of the ECS will be poor, and the security groups and firewall configured for the ECS will not take effect.

If an ECS has no KVM drivers installed, the NICs of the ECS may not be detected and the ECS will be unable to communicate with other resources.

Prerequisites

- The virtualization type of the ECS is Xen. For details, see [Viewing the Virtualization Type of a Linux ECS](#).
- The kernel version must be later than 2.6.24.
- Disable your antivirus and intrusion detection software. You can enable them after the driver installation is complete.

Procedure

Modify the configuration file depending on the OS.

- CentOS, EulerOS
Take CentOS 7.0 as an example. Modify the `/etc/dracut.conf` file. Add the Xen PV and VirtIO drivers to `add_drivers`. Xen PV drivers include `xen-blkfront` and `xen-netfront`. VirtIO drivers include `virtio_blk`, `virtio_scsi`, `virtio_net`, `virtio_pci`, `virtio_ring`, and `virtio`. Separate driver names with spaces. Save and exit the `/etc/dracut.conf` file. Run the `dracut -f` command to regenerate `initrd`.
For details, see [CentOS and EulerOS](#).
- Ubuntu and Debian
Modify the `/etc/initramfs-tools/modules` file. Add the Xen PV and VirtIO drivers. Xen PV drivers include `xen-blkfront` and `xen-netfront`. VirtIO drivers include `virtio_blk`, `virtio_scsi`, `virtio_net`, `virtio_pci`, `virtio_ring`, and `virtio`. Separate driver names with spaces. Save and exit the `/etc/initramfs-tools/modules` file. Run the `update-initramfs -u` command to regenerate `initrd`.
For details, see [Ubuntu and Debian](#).
- SUSE and openSUSE
 - If the OS version is earlier than SUSE 12 SP1 or openSUSE 13, modify the `/etc/sysconfig/kernel` file and add Xen PV and VirtIO drivers to `INITRD_MODULES=""`. Xen PV drivers include `xen_vnif`, `xen_vbd`, and

xen_platform_pci. VirtIO drivers include virtio_blk, virtio_scsi, virtio_net, virtio_pci, virtio_ring, and virtio. Separate driver names with spaces. Run the **mkinitrd** command to regenerate initrd.

- If the OS version is SUSE 12 SP1, modify the **/etc/dracut.conf** file and add Xen PV and VirtIO drivers to **add_drivers**. Xen PV drivers include xen_vnif, xen_vbd, and xen_platform_pci. VirtIO drivers include virtio_blk, virtio_scsi, virtio_net, virtio_pci, virtio_ring, and virtio. Separate driver names with spaces. Run the **dracut -f** command to regenerate initrd.
- If the OS version is later than SUSE 12 SP1 or openSUSE 13, modify the **/etc/dracut.conf** file and add Xen PV and VirtIO drivers to **add_drivers**. Xen PV drivers include xen-blkfront and xen-netfront. VirtIO drivers include virtio_blk, virtio_scsi, virtio_net, virtio_pci, virtio_ring, and virtio. Separate driver names with spaces. Save and exit the **/etc/dracut.conf** file. Run the **dracut -f** command to regenerate initrd.

For details, see [SUSE and openSUSE](#).

NOTE

For SUSE, run the following command to check whether xen-kmp (driver package for Xen PV) is installed:

```
rpm -qa |grep xen-kmp
```

If information similar to the following is displayed, xen-kmp is installed in the OS:

```
xen-kmp-default-4.2.2_04_3.0.76_0.11-0.7.5
```

If xen-kmp is not installed, obtain it from the ISO file and install it.

If you add built-in drivers to the initrd or initramfs file by mistake, the ECS will not be affected.

CentOS and EulerOS

1. Run the following command to open the **/etc/dracut.conf** file:

```
vi /etc/dracut.conf
```

2. Press **i** to enter editing mode and add Xen PV and VirtIO drivers to **add_drivers** (the format varies depending on the OS).

```
[root@CTU10000xxxx ~]# vi /etc/dracut.conf
# additional kernel modules to the default
add_drivers+="xen-blkfront xen-netfront virtio_blk virtio_scsi virtio_net virtio_pci virtio_ring virtio"
.....
```

3. Press **Esc**, enter **:wq**, and press **Enter**. The system saves the change and exits the **/etc/dracut.conf** file.
4. Run the following command to regenerate initrd:

```
dracut -f /boot/initramfs-2.6.32-573.8.1.el6.x86_64.img
```

If the virtual file system is not the default initramfs, run **dracut -f *Name of the initramfs or initrd file actually used***. You can obtain the actual initramfs or initrd file name from the **grub.cfg** file, which can be **/boot/grub/grub.cfg**, **/boot/grub2/grub.cfg**, or **/boot/grub/grub.conf** depending on the OS.

5. Check whether native Xen and KVM drivers have been installed. If the virtual file system is initramfs, run the following commands:

```
lsinitrd /boot/initramfs-`uname -r`.img | grep xen
```

```
lsinitrd /boot/initramfs-`uname -r`.img | grep virtio
```

If the virtual file system is initrd, run the following commands:

lsinitrd /boot/initrd-`uname -r` | grep xen

lsinitrd /boot/initrd-`uname -r` | grep virtio

Assume that the virtual file system is initramfs. The command output will be:

```
[root@CTU10000xxxxx home]# lsinitrd /boot/initramfs-`uname -r`.img | grep xen
-rwxr--r-- 1 root root 54888 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
block/xen-blkfront.ko
-rwxr--r-- 1 root root 45664 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/
drivers/net/xen-netfront.ko

[root@CTU10000xxxxx home]# lsinitrd /boot/initramfs-`uname -r`.img | grep virtio
-rwxr--r-- 1 root root 23448 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
block/virtio_blk.ko
-rwxr--r-- 1 root root 50704 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/
drivers/net/virtio_net.ko
-rwxr--r-- 1 root root 28424 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
scsi/virtio_scsi.ko
drwxr-xr-x 2 root root 0 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
virtio
-rwxr--r-- 1 root root 14544 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
virtio/virtio.ko
-rwxr--r-- 1 root root 21040 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
virtio/virtio_pci.ko
-rwxr--r-- 1 root root 18016 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
virtio/virtio_ring.ko
```

NOTE

If you add built-in drivers to the `initrd` or `initramfs` file by mistake, the ECS will not be affected. The drivers cannot be found by running the `lsinitrd` command. You can run the following commands to check whether built-in drivers are in the kernel:

```
cat /boot/config-`uname -r` | grep CONFIG_VIRTIO | grep y
```

```
cat /boot/config-`uname -r` | grep CONFIG_XEN | grep y
```

Ubuntu and Debian

1. Run the following command to open the **modules** file:

```
vi /etc/initramfs-tools/modules
```

2. Press **i** to enter editing mode and add Xen PV and VirtIO drivers to the **/etc/initramfs-tools/modules** file (the format varies depending on the OS).

```
[root@CTU10000xxxxx ~]# vi /etc/initramfs-tools/modules
```

```
.....
# Examples:
#
# raid1
# sd_mOd
xen-blkfront
xen-netfront
virtio_blk
virtio_scsi
virtio_net
virtio_pci
virtio_ring
virtio
```

3. Press **Esc**, enter **:wq**, and press **Enter**. The system saves the change and exits the **/etc/initramfs-tools/modules** file.
4. Run the following command to regenerate `initrd`:
update-initramfs -u
5. Run the following commands to check whether native Xen and KVM drivers have been installed:

```
lsinitramfs /boot/initrd.img-`uname -r` |grep xen
```

```
lsinitramfs /boot/initrd.img-`uname -r` |grep virtio
```

```
[root@ CTU10000xxxxx home]# lsinitramfs /boot/initrd.img-`uname -r` |grep xen
lib/modules/3.5.0-23-generic/kernel/drivers/net/ethernet/qlogic/netxen
lib/modules/3.5.0-23-generic/kernel/drivers/net/ethernet/qlogic/netxen/netxen_nic.ko
lib/modules/3.5.0-23-generic/kernel/drivers/net/xen-netback
lib/modules/3.5.0-23-generic/kernel/drivers/net/xen-netback/xen-netback.ko
lib/modules/3.5.0-23-generic/kernel/drivers/block/xen-blkback
lib/modules/3.5.0-23-generic/kernel/drivers/block/xen-blkback/xen-blkback.ko
```

```
[root@ CTU10000xxxxx home]# lsinitramfs /boot/initrd.img-`uname -r` |grep virtio
lib/modules/3.5.0-23-generic/kernel/drivers/scsi/virtio_scsi.ko
```

NOTE

If you add built-in drivers to the `initrd` or `initramfs` file by mistake, the ECS will not be affected. The drivers cannot be found by running the `lsinitrd` command. You can run the following commands to check whether built-in drivers are in the kernel:

```
[root@ CTU10000xxxxx home]# cat /boot/config-`uname -r` | grep CONFIG_VIRTIO | grep y
CONFIG_VIRTIO_BLK=y
CONFIG_VIRTIO_NET=y
CONFIG_VIRTIO=y
CONFIG_VIRTIO_RING=y
CONFIG_VIRTIO_PCI=y
CONFIG_VIRTIO_MMIO_CMDLINE_DEVICES=y
[root@ CTU10000xxxxx home]# cat /boot/config-`uname -r` | grep CONFIG_XEN | grep y
CONFIG_XEN_BLKDEV_FRONTEND=y
CONFIG_XEN_NETDEV_FRONTEND=y
```

SUSE and openSUSE

If the OS version is earlier than SUSE 12 SP1 or openSUSE 13, modify the `/etc/sysconfig/kernel` file to install the drivers. For details, see [scenario 1](#).

If the OS version is SUSE 12 SP1, modify the `/etc/dracut.conf` file to install the drivers. For details, see [scenario 2](#).

If the OS version is later than SUSE 12 SP1 or openSUSE 13, modify the `/etc/dracut.conf` file to install the drivers. For details, see [scenario 3](#).

- Earlier than SUSE 12 SP1 or openSUSE 13:

NOTE

Before installing the drivers, run the following command to check whether `xen-kmp` (driver package for Xen PV) is installed:

```
rpm -qa |grep xen-kmp
```

If information similar to the following is displayed, `xen-kmp` is installed:

```
xen-kmp-default-4.2.2_04_3.0.76_0.11-0.7.5
```

If `xen-kmp` is not installed, obtain it from the ISO package and install it first.

- a. Run the following command to open the `/etc/sysconfig/kernel` file:

```
vi /etc/sysconfig/kernel
```

- b. Add Xen PV and VirtIO drivers after `INITRD_MODULES=` (the format varies depending on the OS).

```
SIA10000xxxxx:~ # vi /etc/sysconfig/kernel
# (like drivers for scsi-controllers, for lvm or reiserfs)
#
INITRD_MODULES="ata_piix ata_generic xen_vnif xen_vbd xen_platform_pci virtio_blk
virtio_scsi virtio_net virtio_pci virtio_ring virtio"
```

- c. Run the **dracut -f** command to regenerate initrd.

 NOTE

If the virtual file system is not the default `initramfs` or `initrd`, run **dracut -f *Name of the initramfs or initrd file actually used.*** The actual `initramfs` or `initrd` file name can be obtained from the `menu.lst` or `grub.cfg` file (`/boot/grub/menu.lst`, `/boot/grub/grub.cfg`, or `/boot/grub2/grub.cfg`).

The following is an example `initrd` file of SUSE 11 SP4:

```
default 0
timeout 10
gfxmenu (hd0,0)/boot/message
title sles11sp4_001_[_VMX_]
root (hd0,0)
kernel /boot/linux.vmx vga=0x314 splash=silent console=ttyS0,115200n8 console=tty0
net.ifnames=0 NON_PERSISTENT_DEVICE_NAMES=1 showopts
initrd /boot/initrd.vmx
title Failsafe_sles11sp4_001_[_VMX_]
root (hd0,0)
kernel /boot/linux.vmx vga=0x314 splash=silent ide=nodma apm=off noresume edd=off
powersaved=off nohz=off highres=off processor.max+cstate=1 nomodeset x11failsafe
console=ttyS0,115200n8 console=tty0 net.ifnames=0 NON_PERSISTENT_DEVICE_NAMES=1
showopts
initrd /boot/initrd.vmx
```

/boot/initrd.vmx is the `initrd` file actually used. If **/boot** is missing in the `initrd` file path, you need to add it when you run the **dracut -f** command. In this case, the command should be **dracut -f /boot/initramfs-xxx**.

- d. Run the following commands to check whether Xen PVOPS and KVM VirtIO drivers have been installed:

```
lsinitrd /boot/initrd-`uname -r` | grep xen
```

```
lsinitrd /boot/initrd-`uname -r` | grep virtio
```

```
SIA10000xxxx:~ # lsinitrd /boot/initrd-`uname -r` | grep xen
-rwxr--r-- 1 root root 42400 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/block/
xen-blkfront.ko
-rwxr--r-- 1 root root 44200 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/net/
xen-netfront.ko
```

```
SIA10000xxxx:~ # lsinitrd /boot/initrd-`uname -r` | grep virtio
-rwxr--r-- 1 root root 19248 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/scsi/
virtio_scsi.ko
-rwxr--r-- 1 root root 23856 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/block/
virtio_blk.ko
drwxr-xr-x 2 root root 0 Jul 12 14:53 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio
-rwxr--r-- 1 root root 15848 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio_ring.ko
-rwxr--r-- 1 root root 20008 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio_pci.ko
-rwxr--r-- 1 root root 12272 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio.ko
-rwxr--r-- 1 root root 38208 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/net/
virtio_net.ko
```

- e. Restart the ECS.
- f. Modify the `/boot/grub/menu.lst` file to add **xen_platform_pci.dev_unplug=all** and change the root settings.

Before the modification:

```
###Don't change this comment -YaST2 identifier: Original name: linux###
title SUSE Linux Enterprise Server 11SP4 - 3.0.76-0.11 (default)
root (hd0,0)
kernel /boot/vmlinuz-3.0.76-0.11-default root=UUID=4eb40294-4c6f-4384-bbb6-
b8795bbb1130 splash=silentcrashkernel=256M-:128M showopts vga=0x314
initrd /boot/initrd-3.0.76-0.11-default
```

After the modification:

```
###Don't change this comment -YaST2 identifier: Original name: linux###
title SUSE Linux Enterprise Server 11SP4 - 3.0.76-0.11 (default)
root (hd0,0)
kernel /boot/vmlinuz-3.0.76-0.11-default root=UUID=4eb40294-4c6f-4384-bbb6-
b8795bbb1130 splash=silentcrashkernel=256M-:128M showopts vga=0x314
xen_platform_pci.dev_unplug=all
initrd /boot/initrd-3.0.76-0.11-default
```

NOTE

- Ensure that the root partition is in UUID format.
 - **xen_platform_pci.dev_unplug=all** is used to shield QEMU devices.
 - For SUSE 11 SP1 64bit to SUSE 11 SP4 64bit, add **xen_platform_pci.dev_unplug=all** to the **menu.lst** file. For SUSE 12 or later, QEMU device shield is enabled by default, and you do not need to configure it.
- g. Run the following commands to check whether Xen drivers exist in **initrd**:

```
lsinitrd /boot/initrd-`uname -r` | grep xen
```

```
lsinitrd /boot/initrd-`uname -r` | grep virtio
```

```
SIA10000xxxx:~ # lsinitrd /boot/initrd-`uname -r` | grep xen
-rwxr--r-- 1 root root 42400 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/block/
xen-blkfront.ko
-rwxr--r-- 1 root root 44200 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/net/
xen-netfront.ko
```

```
SIA10000xxxx:~ # lsinitrd /boot/initrd-`uname -r` | grep virtio
-rwxr--r-- 1 root root 19248 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/scsi/
virtio_scsi.ko
-rwxr--r-- 1 root root 23856 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/block/
virtio_blk.ko
drwxr-xr-x 2 root root 0 Jul 12 14:53 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio
-rwxr--r-- 1 root root 15848 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio_ring.ko
-rwxr--r-- 1 root root 20008 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio_pci.ko
-rwxr--r-- 1 root root 12272 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio.ko
-rwxr--r-- 1 root root 38208 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/net/
virtio_net.ko
```

NOTE

If you add built-in drivers to the **initrd** or **initramfs** file by mistake, the ECS will not be affected. The drivers cannot be found by running the **lsinitrd** command. You can run the following commands to check whether built-in drivers are in the kernel:

```
cat /boot/config-`uname -r` | grep CONFIG_VIRTIO | grep y
```

```
cat /boot/config-`uname -r` | grep CONFIG_XEN | grep y
```

- SUSE 12 SP1:
 - Run the following command to open the **/etc/dracut.conf** file:


```
vi /etc/dracut.conf
```
 - Press **i** to enter editing mode and add Xen PV and VirtIO drivers to **add-drivers** (the format varies depending on the OS).


```
[root@CTU10000xxxx ~]# vi /etc/dracut.conf
# additional kernel modules to the default
add_drivers+="ata_piix ata_generic xen_vnif xen_vbd xen_platform_pci virtio_blk virtio_scsi
virtio_net virtio_pci virtio_ring virtio"
```
 - Press **Esc**, enter **:wq**, and press **Enter**. The system saves the change and exits the **/etc/dracut.conf** file.

- d. Run the following command to regenerate initrd:
dracut -f /boot/initramfs-File name
If the virtual file system is not the default initramfs, run the **dracut -f Name of the initramfs or initrd file actually used** command. The actual initramfs or initrd file name can be obtained from the **grub.cfg** file, which can be **/boot/grub/grub.cfg**, **/boot/grub2/grub.cfg**, or **/boot/grub/grub.conf** depending on the OS.
- e. Check whether native Xen and KVM drivers have been installed. If the virtual file system is initramfs, run the following commands:
lsinitrd /boot/initramfs-`uname -r`.img | grep xen
lsinitrd /boot/initramfs-`uname -r`.img | grep virtio
If the virtual file system is initrd, run the following commands:
lsinitrd /boot/initrd-`uname -r` | grep xen
lsinitrd /boot/initrd-`uname -r` | grep virtio
- Later than SUSE 12 SP1 or openSUSE 13:
Take SUSE Linux Enterprise Server 12 SP2 (x86_64) as an example.
 - a. Run the following command to open the **/etc/dracut.conf** file:
vi /etc/dracut.conf
 - b. Press **i** to enter editing mode and add Xen PV and VirtIO drivers to **add_drivers** (the format varies depending on the OS).

```
[root@CTU10000xxxx ~]# vi /etc/dracut.conf
# additional kernel modules to the default
add_drivers+="ata_piix ata_generic xen-blkfront xen-netfront virtio_blk virtio_scsi
virtio_net virtio_pci virtio_ring virtio"
```
 - c. Press **Esc**, enter **:wq**, and press **Enter**. The system saves the change and exits the **/etc/dracut.conf** file.
 - d. Run the following command to regenerate initrd:
dracut -f /boot/initramfs-File name
If the virtual file system is not the default initramfs, run the **dracut -f Name of the initramfs or initrd file actually used** command. The actual initramfs or initrd file name can be obtained from the **grub.cfg** file, which can be **/boot/grub/grub.cfg**, **/boot/grub2/grub.cfg**, or **/boot/grub/grub.conf** depending on the OS.
 - e. Check whether native Xen and KVM drivers have been installed. If the virtual file system is initramfs, run the following commands:
lsinitrd /boot/initramfs-`uname -r`.img | grep xen
lsinitrd /boot/initramfs-`uname -r`.img | grep virtio
If the virtual file system is initrd, run the following commands:
lsinitrd /boot/initrd-`uname -r` | grep xen
lsinitrd /boot/initrd-`uname -r` | grep virtio
Assume that the virtual file system is initrd. The command output will be:

```
sluo-ecs-30dc:~ # lsinitrd /boot/initrd-`uname -r` | grep xen
-rw-r--r-- 1 root root 69575 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/block/xen-
blkfront.ko
-rw-r--r-- 1 root root 53415 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/net/xen-
netfront.ko
drwxr-xr-x 2 root root 0 Sep 28 10:21 lib/modules/4.4.21-69-default/updates/pvdriver/xen-hcall
-rwxr-xr-x 1 root root 8320 Sep 28 10:21 lib/modules/4.4.21-69-default/updates/pvdriver/xen-
```

hcall/xen-hcall.ko

```
sluo-ecs-30dc:~ # lsinitrd /boot/initrd-`uname -r` | grep virtio
-rw-r--r-- 1 root root 29335 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/block/
virtio_blk.ko
-rw-r--r-- 1 root root 57007 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/net/
virtio_net.ko
-rw-r--r-- 1 root root 32415 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/scsi/
virtio_scsi.ko
drwxr-xr-x 2 root root 0 Sep 28 10:21 lib/modules/4.4.21-69-default/kernel/drivers/virtio
-rw-r--r-- 1 root root 19623 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/virtio/
virtio.ko
-rw-r--r-- 1 root root 38943 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/virtio/
virtio_pci.ko
-rw-r--r-- 1 root root 24431 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/virtio/
virtio_ring.ko
```

 **NOTE**

If you add built-in drivers to the `initrd` or `initramfs` file by mistake, the ECS will not be affected. The drivers cannot be found by running the `lsinitrd` command. You can run the following commands to check whether built-in drivers are in the kernel:

```
cat /boot/config-`uname -r` | grep CONFIG_VIRTIO | grep y
```

```
cat /boot/config-`uname -r` | grep CONFIG_XEN | grep y
```

9 Image Replication

When Do I Need to Replicate an Image?

You can replicate an image within a region or across regions.

- In-region replication

This is used for conversion between encrypted and unencrypted images or for enabling advanced features (such as fast ECS creation). For details, see [Replicating Images Within a Region](#).

- Cross-region replication

This is used for replicating a private image in the current region to the same account in another region. You can use this private image to deploy the same application environment in the two regions. For details, see [Replicating Images Across Regions](#).

What Images Can I Replicate?

Only private images can be replicated. The restrictions on image replication are as follows:

- In-region replication

Private images created from ISO files or full-ECS images cannot be replicated within a region.

- Cross-region replication

Encrypted images cannot be replicated across regions.

Can I Replicate Images Across Regions Between the Chinese Mainland, International, and European Websites?

The Chinese Mainland, International, and European websites are accessed by using different accounts. You cannot replicate images between these websites through cross-region replication. However, there is a way to do the replication.

For example, if you want to replicate a system disk image from the CN-Hong Kong region of the International website to the CN East-Shanghai1 region of the Chinese Mainland website, perform the following operations:

1. Log in to the console of the International website, export the image from the CN-Hong Kong region to an OBS bucket in that region, and download the image to a local directory. Assume that the image file is exported as **Windows Server 2012.qcow2**.
For details, see [Exporting an Image](#).
2. Log in to the console of the Chinese Mainland website, switch to the CN East-Shanghai1 region, and upload the **Windows Server 2012.qcow2** image file to an OBS bucket in that region.
For details, see [Uploading an External Image File](#).
3. Register the image file as a private image
For details, see [Registering an External Image File as a Private Image](#).

How Long Does It Take to Replicate an Image?

The time required for replicating an image depends on the network transmission speed and the number of tasks in the queue. Generally, it takes 10 to 20 minutes to replicate data of 1 GB across regions.

How Will I Be Billed for Replicating Images?

- In-region replication

The replicas of system disk and data disk images are stored in OBS buckets for free.

NOTE

Full-ECS images cannot be replicated within the same region.

- Cross-region replication

System disk and data disk images: You are billed for the OBS traffic for replicating images cross regions.

Full-ECS images: You are billed for the CSBS or CBR traffic generated by replicating the images cross regions and for the space used to store the CSBS or CBR backups associated with the replicas.

NOTE

The process of cross-region full-ECS image replication is as follows:

1. The system replicates the backup of a full-ECS image to the destination region.
2. In the destination region, the system automatically generates a full-ECS image from the backup.

Is There a Limit on the Image Size During Cross-Region Replication?

Yes. An image to be replicated cannot be larger than 128 GB.

To replicate an image larger than 128 GB across regions, you can export the image to an OBS bucket, import the image to an OBS bucket in the target region, and register it as a private image.

How Many Cross-Region Image Replication Tasks Can I Run Concurrently?

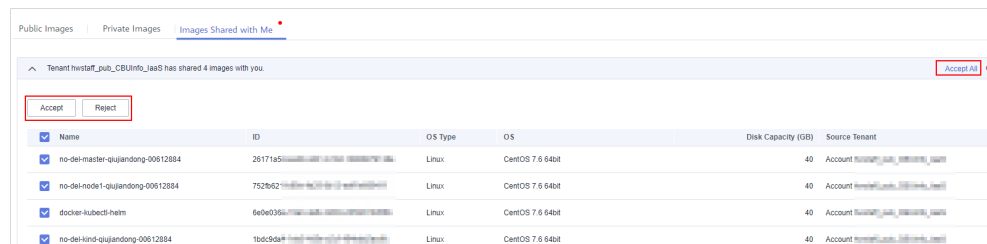
Five.

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

You can use image sharing to replicate images between projects in the same region.

In the **Share Image** dialog box, enter target project IDs, and click **OK**, as instructed in [Sharing Specified Images](#). After the image is shared, switch to the target projects. On the **Image Management Service > Images Shared with Me** page, you can view the shared image to be accepted.

Figure 9-1 Accepting or rejecting shared images



What Are the Regions That Support Cross-Region Replication of System and Data Disk Images?

Figure 9-2 Regions that support cross-region replication of system and data disk images

Source Region \ Destination Region	CN North-Beijing1	CN North-Beijing2	CN North-Beijing4	CN North-Ulanqab1	CN East-Shanghai1	CN East-Shanghai2	CN South-Guangzhou	CN Southwest-Guiyang1	CH-Hong Kong	AP-Bangkok	AP-Singapore	AF-Johannesburg	LA-Mexico City1	LA-Sao Paulo1
CN North-Beijing1	-	√	√	√	√	√	√	√	x	x	x	√	x	x
CN North-Beijing2	√	-	√	√	√	√	√	√	x	x	x	x	x	x
CN North-Beijing4	√	√	-	√	√	√	√	√	x	x	x	x	x	x
CN North-Ulanqab1	√	√	√	-	√	√	√	√	x	x	x	x	x	x
CN East-Shanghai1	√	√	√	√	-	√	√	√	x	x	x	x	x	x
CN East-Shanghai2	√	√	√	√	√	-	√	√	x	x	x	x	x	x
CN South-Guangzhou	√	√	√	√	√	√	-	√	x	x	x	x	x	x
CN Southwest-Guiyang1	√	√	√	√	√	√	√	-	x	x	x	x	x	x
CH-Hong Kong	x	x	x	x	x	x	x	x	-	x	x	x	x	x
AP-Bangkok	x	x	x	x	x	x	x	x	x	-	x	x	x	x
AP-Singapore	x	x	x	x	x	x	x	x	x	x	-	x	x	x
AF-Johannesburg	√	x	x	x	x	x	x	x	x	x	x	-	x	x
LA-Mexico City1	x	x	x	x	x	x	x	x	x	x	x	x	-	x
LA-Sao Paulo1	x	x	x	x	x	x	x	x	x	x	x	x	x	-

 **NOTE**

- ✓ indicates that cross-region replication of system and data disk images is supported.
- × indicates that cross-region replication of system and data disk images is not supported. In this case, export the desired image and then import it to the target region.
- - indicates that the source and destination regions are the same.
- Region adjustment may affect cross-region image replication of users that are registered after the adjustment. The users that were registered before the adjustment are not affected. You can see on the console if cross-region can be performed for a given region.
- Regions not listed in the figure above do not support cross-region replication of system or data disk images.

What Are the Regions That Support Cross-Region Full-ECS Image Replication?

Cross-region replication of full-ECS images is only available for certain regions. You can see on the console if it is available for a given region.

If a full-ECS image cannot be replicated to a different region, you can use it to create an ECS, use the ECS to create a system disk image and a data disk image, and replicate the images to the destination region.

A full-ECS image created using an ECS backup can be replicated from the region where they reside to another region, but the replicated full-ECS image cannot be replicated across regions again.

10 Image Deletion

Will a Private Image Be Automatically Deleted If I Delete or Unsubscribe from the ECS Used to Create the Image?

No. Private images created using ECSs are stored in OBS buckets. Deleting or unsubscribing from the ECSs does not affect the images.

Can I Delete an Image I Shared with Others?

- If an image is shared with a project, you can delete the image without requiring any participation from the image recipients. After you delete the image, the image recipients cannot use it any longer. Inform the recipients to back up their data before you delete the image.
- If an image is shared with an account or organization, you need first to remove the account or organization from the image recipients before you delete the image.

How Do I Delete a Shared Image? Does the Deletion Affect Any ECS or EVS Disk Created from It?

Reject this image on the **Images Shared with Me** tab page. This does not affect any ECS or EVS disk created from it.

11 Image Encryption

How Can I Share an Encrypted Image or Publish It in KooGallery?

You are not allowed to share an encrypted image or publish it in KooGallery directly. If you want to do so, you can replicate the image to generate an unencrypted version, and then share or publish the unencrypted image in KooGallery.

How Can I Change an Unencrypted Image to an Encrypted One?

You can select an encryption key when you replicate the image. Then, the system will generate an encrypted version of the unencrypted image.

What Are the Restrictions on Using an Encrypted Image?

- An encrypted image cannot be shared with others, published in KooGallery, or replicated across regions.
- The key used for encrypting an image cannot be changed.

12 KooGallery Images

What Is a KooGallery Image?

KooGallery is an online store where you can purchase third-party images that have the OS, application environments, and software preinstalled. You can use these images to deploy websites and application development environments in just a few clicks. No additional configuration is required.

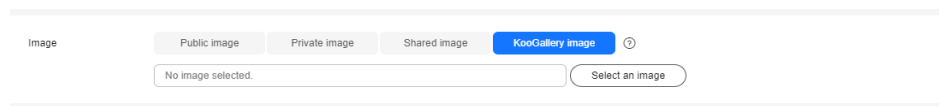
KooGallery images have been strictly tested by Huawei Cloud and service providers to ensure the image content security.

How Do I Use a KooGallery Image?

You can use a KooGallery image to:

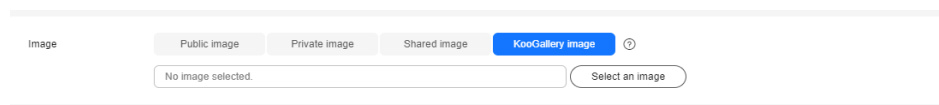
- Create an ECS
On the ECS creation page, select **KooGallery image** for **Image** and click **Select Image**. Search for the required KooGallery image, select the image, and click **OK**.

Figure 12-1 Selecting a KooGallery image



- Change the OS of an ECS
Locate the row that contains the target ECS, choose **More > Change OS** in the **Operation** column. Select **KooGallery image**. Search for the required KooGallery image, select the image, and click **OK**.

Figure 12-2 Changing the OS



 NOTE

The ECS must be in the **Stopped** state and its **Billing Mode** cannot be **Yearly/ Monthly**.

What Do I Do If No KooGallery Image Is Available When I Change the OS of an ECS?

There are some restrictions on using a KooGallery image to change the OS of an ECS.

For example:

- If an ECS is created from a private image in KooGallery and is billed on a yearly/monthly basis, the OS cannot be changed.

How Do I Publish an Image in KooGallery?

An image can be published in KooGallery based on certain specifications. Huawei Cloud KooGallery is a trusted platform for delivering software and service transactions. It is dedicated to providing users with high-quality and easy-to-use software, services, and solutions based on cloud computing and big data, meeting the requirements of Huawei Cloud users for fast cloud migration and service development.

The prerequisites for publishing an image in KooGallery are as follows:

- A system disk image has been created.

 NOTE

Data disk images and full-ECS images cannot be published in KooGallery.

- The account has passed the enterprise real-name authentication.
- Use an account instead of an IAM user to log in to the console.

For details, see [Image Release Guide](#).

13 Accounts and Permissions

13.1 How Do I Authorize a Key?

Scenarios

To share an encrypted image, you need to authorize the key used for encrypting the image. This section describes how to authorize a key.

NOTE

The key can only be a custom key. The default key cannot be authorized.

Prerequisites

You have confirmed the key to be authorized. (You can view **KMS Key Name** on the image details page).

Procedure

1. Log in to the management console and choose **Security & Compliance > Data Encryption Workshop**.
2. On the **Custom Keys** tab, click the alias of the target key to go to the key details page.
3. On the **Grants** tab, click **Create Grant**, and set the following parameters.
 - **User or Account:** Select **Account** and enter the account ID. You can obtain the account ID from **My Credentials**.
 - **Granted Operations:** **Decrypt Data Key** and **Describe Key** are mandatory. Others are optional.
4. Click **OK**.

13.2 How Do I Create an IAM Agency?

Scenarios

During cross-region image replication, an agency is required to verify cloud service permissions in the destination region. So, create a cloud service agency before the replication.

Background

An agency is a trusted 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 this trusted relationship with a 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_admin_agency**.

Figure 13-1 Creating an agency

The screenshot shows a form for creating an agency. It contains the following fields and options:

- Agency Name:** A text input field containing "ims_admin_agency".
- Agency Type:** Two radio button options: "Account" (unselected) and "Cloud service" (selected). Below "Cloud service" is a sub-description: "Delegate a cloud service to access your resources in other cloud services."
- Cloud Service:** A dropdown menu showing "Image Management Service (IMS)".
- Validity Period:** A dropdown menu showing "Unlimited".
- Description:** A text area containing "Agency with IMS Administrator privileges". A character count "40/255" is visible at the bottom right of the text area.
- Buttons:** A red "Next" button and a white "Cancel" button.

- **Agency Type:** Select **Cloud service**.
 - **Cloud Service:** This parameter is available only if you select **Cloud service** for **Agency Type**. Select **Image Management Service (IMS)** from the drop-down list.
 - **Validity Period:** Select **Unlimited**.
 - **Description:** This parameter is optional. You can enter **Agency with IMS Administrator privileges**.
6. Click **Next**.
- Select **Region-specific projects** for **Scope** and select one or more projects from the drop-down list.

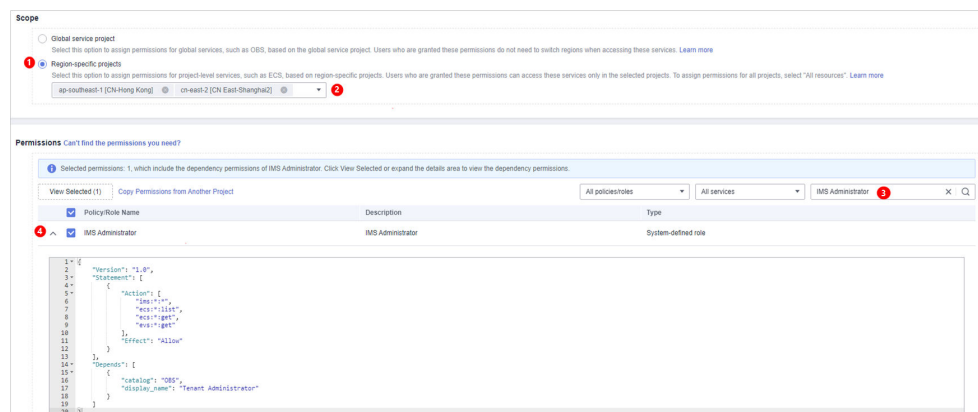
In cross-region image replication, the agency must have the IMS Administrator permissions for the destination region. For example, if you want to replicate an image from CN-Hong Kong to CN East-Shanghai2, the agency must have the IMS Administrator permissions for CN East-Shanghai2.

 **CAUTION**

Do not select **All projects**, or the created agency will be invalid.

- Select **IMS Administrator** for **Permissions**.

Figure 13-2 Granting permissions to an agency



7. Click **OK**.

Figure 13-3 New agency

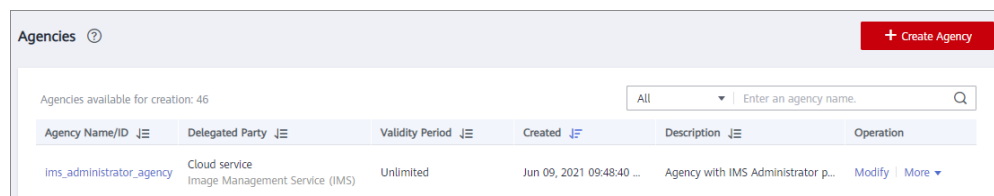
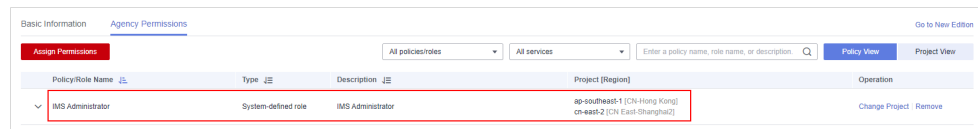


Figure 13-4 Permissions of the new agency



13.3 What Do I Do If I Enabled EPS But Now I Cannot Find Private Images in My Enterprise Project?

Scenarios

If you cannot find the private images on the **Enterprise Project Management Service** page, add the private images to their associated enterprise project.

Procedure

1. Log in to the management console.
2. Under **Compute**, click **Image Management Service**.
3. Click the **Private Images** tab.
4. Locate the row that contains the image, click **More** in the **Operation** column, and select **Allocate to Enterprise Project**.
5. In the displayed dialog box, select the target enterprise project.

13.4 What Do I Do If I Cannot Create an Image from a CSBS Backup or BMS Using a Subaccount with the Allow_all Permission After EPS Is Enabled?

When an enterprise project subaccount is used to create an image, the system displays a message indicating that CSBS or BMS is not supported by EPS.

This is because CSBS and BMS are not interconnected with EPS regionally or globally. The global resource viewing permission must be granted to the subaccount in IAM. For example, you can view resources of other cloud services if you have the Tenant Guest permission.

For details, see [Assigning Permissions to an IAM User](#).

14 Cloud-Init

14.1 Cloud-Init Installation FAQ

You are advised to install Cloud-Init on the ECS that will be used to create a private image so that new ECSs created from the private image support custom configurations (for example, changing the ECS login password).

For details about how to install Cloud-Init, see [Installing Cloud-Init](#).

For details about how to configure Cloud-Init, see [Configuring Cloud-Init](#).

The following describes common problems you may encounter when installing Cloud-Init and their solutions.

Ubuntu 16.04/CentOS 7: Failed to Set Cloud-Init Automatic Start

- Symptom

After Cloud-Init is installed, you run the following command to configure Cloud-Init automatic start:

```
systemctl enable cloud-init-local.service cloud-init.service cloud-  
config.service cloud-final.service
```

Information similar to the following is displayed:

Figure 14-1 Failed to enable Cloud-Init to start automatically

```
root@ecs-wjq-ubuntu14:~# systemctl enable cloud-init-local.service cloud-init.se  
rvice cloud-config.service cloud-final.service  
Failed to execute operation: Unit file is masked  
root@ecs-wjq-ubuntu14:~#
```

- Solution

a. Run the following command to roll back the configuration:

```
systemctl unmask cloud-init-local.service cloud-init.service cloud-  
config.service cloud-final.service
```

b. Run the following command to configure automatic start again:

```
systemctl enable cloud-init-local.service cloud-init.service cloud-  
config.service cloud-final.service
```

- c. Run the following command to check the Cloud-Init status:
systemctl status cloud-init-local.service cloud-init.service cloud-config.service cloud-final.service

As shown in the following figures, **failed** is displayed and all services are in the **inactive** state.

Figure 14-2 Checking Cloud-Init status (1)

```
root@ecs-wjq-ubuntu14:~# systemctl status cloud-init-local.service
● cloud-init-local.service - Initial cloud-init job (pre-networking)
   Loaded: loaded (/lib/systemd/system/cloud-init-local.service; enabled; vendor preset: enabled)
   Active: failed (Result: exit-code) since Fri 2018-08-17 07:12:20 UTC; 1min 25s ago
     Process: 4418 ExecStart=/usr/bin/cloud-init init --local (code=exited, status=203/EXEC)
    Main PID: 4418 (code=exited, status=203/EXEC)

Aug 17 07:12:20 ecs-wjq-ubuntu14 systemd[1]: Starting Initial cloud-init job (pre-networking)...
Aug 17 07:12:20 ecs-wjq-ubuntu14 systemd[1]: cloud-init-local.service: Main process exited, code=exited, status=203/EXEC
Aug 17 07:12:20 ecs-wjq-ubuntu14 systemd[1]: Failed to start Initial cloud-init job (pre-networking).
Aug 17 07:12:20 ecs-wjq-ubuntu14 systemd[1]: cloud-init-local.service: Unit entered failed state.
Aug 17 07:12:20 ecs-wjq-ubuntu14 systemd[1]: cloud-init-local.service: Failed with result 'exit-code'.
lines 1-11/11 (END)
```

Figure 14-3 Checking Cloud-Init status (2)

```
● cloud-init-local.service - Initial cloud-init job (pre-networking)
   Loaded: loaded (/lib/systemd/system/cloud-init-local.service; enabled; vendor preset: enabled)
   Active: failed (Result: exit-code) since Fri 2018-08-17 07:12:20 UTC; 59s ago
     Process: 4418 ExecStart=/usr/bin/cloud-init init --local (code=exited, status=203/EXEC)
    Main PID: 4418 (code=exited, status=203/EXEC)

Aug 17 07:12:20 ecs-wjq-ubuntu14 systemd[1]: Starting Initial cloud-init job (pre-networking)...
Aug 17 07:12:20 ecs-wjq-ubuntu14 systemd[1]: cloud-init-local.service: Main process exited, code=exited, status=203/EXEC
Aug 17 07:12:20 ecs-wjq-ubuntu14 systemd[1]: Failed to start Initial cloud-init job (pre-networking).
Aug 17 07:12:20 ecs-wjq-ubuntu14 systemd[1]: cloud-init-local.service: Unit entered failed state.
Aug 17 07:12:20 ecs-wjq-ubuntu14 systemd[1]: cloud-init-local.service: Failed with result 'exit-code'.
```

This is because the address that the system uses to access Cloud-Init is redirected to **/usr/bin/**, but the actual installation path is **/usr/local/bin**.

- d. Run the following command to copy Cloud-Init to the **usr/bin** directory:
cp /usr/local/cloud-init /usr/bin/
- e. Run the following command to restart Cloud-Init:
systemctl restart cloud-init-local.service cloud-init.service cloud-config.service cloud-final.service

Figure 14-4 Restarting Cloud-Init

```
root@ecs-wjq-ubuntu14:~# systemctl start cloud-init-local.service; systemctl status cloud-init-local.service
● cloud-init-local.service - Initial cloud-init job (pre-networking)
   Loaded: loaded (/lib/systemd/system/cloud-init-local.service; enabled; vendor preset: enabled)
   Active: active (exited) since Fri 2018-08-17 07:18:01 UTC; 4ms ago
     Process: 4491 ExecStart=/usr/bin/cloud-init init --local (code=exited, status=0/SUCCESS)
    Main PID: 4491 (code=exited, status=0/SUCCESS)

Aug 17 07:18:01 ecs-wjq-ubuntu14 cloud-init[4491]: [CLOUDINIT] util.py[DEBUG]: R
Aug 17 07:18:01 ecs-wjq-ubuntu14 cloud-init[4491]: [CLOUDINIT] util.py[DEBUG]: R
Aug 17 07:18:01 ecs-wjq-ubuntu14 cloud-init[4491]: [CLOUDINIT] __init__.py[DEBUG]: R
Aug 17 07:18:01 ecs-wjq-ubuntu14 cloud-init[4491]: [CLOUDINIT] util.py[DEBUG]: R
Aug 17 07:18:01 ecs-wjq-ubuntu14 cloud-init[4491]: [CLOUDINIT] util.py[DEBUG]: R
Aug 17 07:18:01 ecs-wjq-ubuntu14 cloud-init[4491]: [CLOUDINIT] cloud-init[DEBUG]: R
Aug 17 07:18:01 ecs-wjq-ubuntu14 cloud-init[4491]: [CLOUDINIT] util.py[DEBUG]: R
Aug 17 07:18:01 ecs-wjq-ubuntu14 cloud-init[4491]: [CLOUDINIT] util.py[DEBUG]: R
Aug 17 07:18:01 ecs-wjq-ubuntu14 cloud-init[4491]: [CLOUDINIT] util.py[DEBUG]: c
lines 1-16/16 (END)
```

- f. Run the following command to check the Cloud-Init status:

```
systemctl status cloud-init-local.service cloud-init.service cloud-  
config.service cloud-final.service
```

Ubuntu 14.04: chkconfig and systemctl Not Installed

- Symptom
chkconfig is not installed.
- Solution
Run the following commands to install chkconfig:
apt-get update
apt-get install sysv-rc-conf
cp /usr/sbin/sysv-rc-conf /usr/sbin/chkconfig
Run the following command to query the Cloud-Init version:
cloud-init -v
Information similar to the following is displayed:
-bash:/usr/bin/cloud-init: not found this command
Run the following command to copy Cloud-Init to the **usr/bin** directory:
cp /usr/local/bin/cloud-init /usr/bin/

Debian 9.5: Failed to Query the Cloud-Init Version and Configure Automatic Start

1. Run the following command to query the Cloud-Init version:
cloud-init -v
Information similar to the following is displayed:
-bash:/usr/bin/cloud-init: not found this command
Run the **cp /usr/local/bin/cloud-init /usr/bin/** command to copy Cloud-Init to the **usr/bin** directory.
2. Run the **cloud-init init --local** command.
Information similar to the following is displayed:

Figure 14-5 Information returned when Cloud-Init automatic start successfully set

```
root@ecs-debian-9:/tmp/CLOUD-INIT# cloud-init# cloud-init init --local  
/usr/local/lib/python2.7/dist-packages/Cheetah-2.4.4-py2.7.egg/Cheetah/Compiler.py:1509: UserWarning:  
You don't have the C version of NameMapper installed! I'm disabling Cheetah's useStackFrames option as it is painfully slow with  
the Python version of NameMapper. You should get a copy of Cheetah with the compiled C version of NameMapper.  
"You don't have the C version of NameMapper installed!"  
Cloud-Init v. 0.7.6 running 'init-local' at Mon, 20 Aug 2018 02:31:45 +0000. Up 704.40 seconds.  
root@ecs-debian-9:/tmp/CLOUD-INIT# cloud-init#
```

The compilation fails because GCC is not installed.

To solve this issue:

Run the following command to install GCC. Then, install Cloud-Init again.

```
yum -y install gcc
```

3. After Cloud-Init is installed, run the following command to configure Cloud-Init automatic start:

```
systemctl enable cloud-init-local.service cloud-init.service cloud-  
config.service cloud-final.service
```

Information similar to the following is displayed.

Figure 14-6 Prompt indicating the failure to configure Cloud-Init automatic start

```
Failed to enable unit: Unit file /etc/systemd/system/cloud-init-local.service is masked.
```

To solve this issue:

- Run the following command to roll back the configuration:
systemctl unmask cloud-init-local.service cloud-init.service cloud-config.service cloud-final.service
- Run the following command to set automatic start again:
systemctl enable cloud-init-local.service cloud-init.service cloud-config.service cloud-final.service
- Run the following command to restart Cloud-Init:
systemctl restart cloud-init-local.service cloud-init.service cloud-config.service cloud-final.service

Run the **systemctl status** command to check the Cloud-Init status. Information similar to the following is displayed:

Figure 14-7 Verifying the service status

```
cloud-init-local.service - Initial cloud-init job (pre-networking)
Loaded: loaded (/lib/systemd/system/cloud-init-local.service; enabled; vendor preset: enabled)
Active: active (exited) since Mon 2018-08-20 02:48:37 UTC; 6s ago
Process: 1082 ExecStart=/usr/bin/cloud-init init --local (code=exited, status=0/SUCCESS)
Main PID: 1082 (code=exited, status=0/SUCCESS)
Tasks: 0 (limit=4915)
CGroup: /system.slice/cloud-init-local.service

Aug 20 02:48:37 ecs-debian-9 cloud-init[1082]: [CLOUDINIT] util.py[DEBUG]: Running command ['blkid', '-tLABEL=config-2', '--device']
Aug 20 02:48:37 ecs-debian-9 cloud-init[1082]: [CLOUDINIT] __init__.py[DEBUG]: Seeing if we can get any data from <class 'cloudinit.config.C'>
Aug 20 02:48:37 ecs-debian-9 cloud-init[1082]: [CLOUDINIT] util.py[DEBUG]: Reading from /proc/mounts (quiet=False)
Aug 20 02:48:37 ecs-debian-9 cloud-init[1082]: [CLOUDINIT] util.py[DEBUG]: Read 1947 bytes from /proc/mounts
Aug 20 02:48:37 ecs-debian-9 cloud-init[1082]: [CLOUDINIT] util.py[DEBUG]: Fetched 'devpts': {'mountpoint': '/dev/pts', 'opts': 'noexec, nosuid, noatime, noexec, nosuid, noatime'}
Aug 20 02:48:37 ecs-debian-9 cloud-init[1082]: [CLOUDINIT] cloud-init[DEBUG]: No local datasource found
Aug 20 02:48:37 ecs-debian-9 cloud-init[1082]: [CLOUDINIT] util.py[DEBUG]: Reading from /proc/uptime (quiet=False)
Aug 20 02:48:37 ecs-debian-9 cloud-init[1082]: [CLOUDINIT] util.py[DEBUG]: Read 14 bytes from /proc/uptime
Aug 20 02:48:37 ecs-debian-9 cloud-init[1082]: [CLOUDINIT] util.py[DEBUG]: cloud-init node 'init' took 0.104 seconds (0.10)
Aug 20 02:48:37 ecs-debian-9 systemd[1]: Started Initial cloud-init job (pre-networking).

cloud-init.service - Initial cloud-init job (metadata service crawler)
Loaded: loaded (/lib/systemd/system/cloud-init.service; enabled; vendor preset: enabled)
Active: active (exited) since Mon 2018-08-20 02:48:40 UTC; 3s ago
Process: 1096 ExecStart=/usr/bin/cloud-init init (code=exited, status=0/SUCCESS)
Main PID: 1096 (code=exited, status=0/SUCCESS)
Tasks: 0 (limit=4915)
CGroup: /system.slice/cloud-init.service

Aug 20 02:48:40 ecs-debian-9 cloud-init[1096]: [CLOUDINIT] helpers.py[DEBUG]: config-ca-certs already ran (freq=once-per-instance)
Aug 20 02:48:40 ecs-debian-9 cloud-init[1096]: [CLOUDINIT] stages.py[DEBUG]: Running module rsyslog (<module 'cloudinit.config.C'>)
Aug 20 02:48:40 ecs-debian-9 cloud-init[1096]: [CLOUDINIT] helpers.py[DEBUG]: config-rsyslog already ran (freq=once-per-instance)
Aug 20 02:48:40 ecs-debian-9 cloud-init[1096]: [CLOUDINIT] stages.py[DEBUG]: Running module users-groups (<module 'cloudinit.config.C'>)
Aug 20 02:48:40 ecs-debian-9 cloud-init[1096]: [CLOUDINIT] helpers.py[DEBUG]: config-users-groups already ran (freq=once-per-instance)
Aug 20 02:48:40 ecs-debian-9 cloud-init[1096]: [CLOUDINIT] cloud-init[DEBUG]: Ran 13 modules with 0 failures
Aug 20 02:48:40 ecs-debian-9 cloud-init[1096]: [CLOUDINIT] util.py[DEBUG]: Reading from /proc/uptime (quiet=False)
Aug 20 02:48:40 ecs-debian-9 cloud-init[1096]: [CLOUDINIT] util.py[DEBUG]: Read 14 bytes from /proc/uptime
Aug 20 02:48:40 ecs-debian-9 cloud-init[1096]: [CLOUDINIT] util.py[DEBUG]: cloud-init node 'init' took 2.657 seconds (2.66)
Aug 20 02:48:40 ecs-debian-9 systemd[1]: Started Initial cloud-init job (metadata service crawler).

cloud-config.service - Apply the settings specified in cloud-config
Loaded: loaded (/lib/systemd/system/cloud-config.service; enabled; vendor preset: enabled)
Active: active (exited) since Mon 2018-08-20 02:48:41 UTC; 2s ago
Process: 1140 ExecStart=/usr/bin/cloud-init modules --mode=config (code=exited, status=0/SUCCESS)
Main PID: 1140 (code=exited, status=0/SUCCESS)
Tasks: 0 (limit=4915)
CGroup: /system.slice/cloud-config.service
```

CentOS 7/Fedora 28: Required C Compiler Not Installed

- Symptom

After Cloud-Init is successfully installed, you run the following command:

```
cloud-init init --local
```

The following information is displayed:

```
/usr/lib/python2.5/site-packages/Cheetah/Compiler.py:1532: UserWarning:
You don't have the C version of NameMapper installed! I'm disabling Cheetah's useStackFrames
option as it is painfully slow with the Python version of NameMapper. You should get a copy of
Cheetah with the compiled C version of NameMapper.
```

```
"\nYou don't have the C version of NameMapper installed!
```

- Cause analysis
This alarm is generated because C version of NameMapper needs to be compiled when Cloud-Init is installed. However, GCC is not installed in the system, and the compilation cannot be performed. As a result, NameMapper is missing.
- Solution
Run the following command to install GCC:
yum -y install gcc
Reinstall Cloud-Init.

CentOS 7/Fedora: Failed to Use the New Password to Log In to an ECS Created from an Image

- Symptom
You cannot use a new password to log in to an ECS created from an image with Cloud-Init installed. After logging in to the ECS using the old password, you find that NICs of the ECS are not started.

Figure 14-8 NIC not started

```
[root@ecs-fedora28-wjq-test ~]# ifconfig
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

- Solution
Log in to the ECS used to create that image, open the DHCP configuration file `/etc/sysconfig/network-scripts/ifcfg-ethX`, and comment out **HWADDR**.

14.2 What Can I Do with a Cloud-Init ECS?

Introduction to Cloud-Init

Cloud-Init is an open-source tool for cloud instance initialization. When creating ECSs from an image with Cloud-Init, you can use user data injection to customize initialization details (for example, an ECS login password) to the ECSs. You can also configure and manage a running ECS by querying and using metadata. If Cloud-Init is not installed, you cannot apply these custom configurations to your ECSs, and you will have to use the original password in the image file to log in to the ECSs.

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 this private image can be customized.

- For Windows, download and install Cloudbase-Init.
For details, see [Installing and Configuring Cloudbase-Init](#).
- For Linux, 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](#).

14.3 What Do I Do If Installed NetworkManager and Now I Can't Inject the Key or Password Using Cloud-Init?

Cause

One likely possibility 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](#).

14.4 How Do I Install growpart for SUSE 11 SP4?

Scenarios

For SUSE and openSUSE, growpart is an independent tool and is not included in a **cloud-*** package. You need to install it separately.

Procedure

1. Check whether Cloud-Init and growpart are installed.

rpm -qa | grep cloud-init

If cloud-init is installed, the command output should be similar to the following:

```
cloud-init-0.7.8-39.2
```

rpm -qa | grep growpart

If growpart is installed, the command output should be similar to the following:

```
growpart-0.29-8.1
```

2. If they are installed, uninstall them.
zypper remove cloud-init growpart
3. Delete residual files.
rm -fr /etc/cloud/*

```
rm -fr /var/lib/cloud/*
```

4. Install growpart.

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

5. Install python-oauth.

```
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. Install Cloud-Init.

```
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. Check whether growpart, python-oauth, and Cloud-Init are installed successfully.

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

If growpart is installed, the command output should be similar to the following:

```
growpart-0.27-1.1
```

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

If python-oauth is installed, the command output should be similar to the following:

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

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

If Cloud-Init is installed, the command output should be similar to the following:

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

8. Check the configurations.

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

15 ECS Creation

15.1 Can I Change the Image of a Purchased ECS?

Yes.

If you have selected the wrong image or your service requirements have changed, you can change the image of your ECS.

You can change the image type (public, private, KooGallery, and shared images) and OS. For details, see [Changing the OS](#).

15.2 Can I Change the Specifications Defined by a Private Image When I Use the Image to Create an ECS?

Yes. You can specify the CPU, memory, bandwidth, system and data disks of the ECS you are creating. The system disk must be smaller than 1,024 GB but no less than the system disk capacity in the image.

When you use a full-ECS image to create an ECS, the system and data disk information defaulted by the image will be automatically displayed. You can increase the capacity of a system disk or data disks, but cannot decrease it.

For details, see [Creating an ECS from an Image](#).

15.3 Can I Specify the System Disk Capacity When I Create an ECS Using an Image?

When you use a system disk image to create an ECS, you can set the ECS specifications and system disk type without considering those in the image, but the system disk capacity can only be larger than that in the image.

When you use a full-ECS image to create an ECS, the system and data disk information defaulted by the image will be automatically displayed. You can increase the capacity of a system disk or data disks, but cannot decrease it.

For details, see [Creating an ECS from an Image](#).

15.4 What Do I Do If a Partition Is Not Found During the Startup of an ECS Created from an Imported Private Image?

Cause

Disk partition IDs are changed after the cross-platform image import. As a result, no partition can be found at startup. In this case, you need to change disk partition IDs in the image to UUID.

Solution

openSUSE 13.2 is used as an example.

1. Check disk partition IDs.

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

An output similar to the following should be seen:

```
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 12 Jul 22 01:35 ata-QEMU_HARDDISK_QM00001-part10 -> ../../xvda10
lrwxrwxrwx 1 root root 11 Jul 22 01:35 ata-QEMU_HARDDISK_QM00001-part2 -> ../../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
lrwxrwxrwx 1 root root 11 Jul 22 01:35 ata-QEMU_HARDDISK_QM00001-part9 -> ../../xvda9
lrwxrwxrwx 1 root root 10 Jul 22 01:35 ata-QEMU_HARDDISK_QM00005 -> ../../xvde
lrwxrwxrwx 1 root root 10 Jul 22 01:35 scsi-SATA_QEMU_HARDDISK_QM00001 -> ../../xvda
lrwxrwxrwx 1 root root 11 Jul 22 01:35 scsi-SATA_QEMU_HARDDISK_QM00001-part1 -> ../../xvda1
lrwxrwxrwx 1 root root 12 Jul 22 01:35 scsi-SATA_QEMU_HARDDISK_QM00001-part10 -> ../../xvda10
lrwxrwxrwx 1 root root 11 Jul 22 01:35 scsi-SATA_QEMU_HARDDISK_QM00001-part2 -> ../../xvda2
lrwxrwxrwx 1 root root 11 Jul 22 01:35 scsi-SATA_QEMU_HARDDISK_QM00001-part5 -> ../../xvda5
lrwxrwxrwx 1 root root 11 Jul 22 01:35 scsi-SATA_QEMU_HARDDISK_QM00001-part6 -> ../../xvda6
lrwxrwxrwx 1 root root 11 Jul 22 01:35 scsi-SATA_QEMU_HARDDISK_QM00001-part7 -> ../../xvda7
lrwxrwxrwx 1 root root 11 Jul 22 01:35 scsi-SATA_QEMU_HARDDISK_QM00001-part8 -> ../../xvda8
lrwxrwxrwx 1 root root 11 Jul 22 01:35 scsi-SATA_QEMU_HARDDISK_QM00001-part9 -> ../../xvda9
lrwxrwxrwx 1 root root 10 Jul 22 01:35 scsi-SATA_QEMU_HARDDISK_QM00005 -> ../../xvde
```

ata-QEMU_HARDDISK_xxx and **scsi-SATA_QEMU_HARDDISK_xxx** indicate that the ECS disks are simulated using Quick EMUlator (QEMU). The content on the left of -> are disk partition IDs, and that on the right of -> are partition names.

2. Check disk partition UUIDs.

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

An output similar to the following should be seen:

```
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 -> ../../xvda9
lrwxrwxrwx 1 root root 11 Jul 22 01:35 55f36660-9bac-478c-a701-7ecc5347f789 -> ../../xvda8
lrwxrwxrwx 1 root root 11 Jul 22 01:35 780f36bc-0ada-4c98-9a8d-44570d65333d -> ../../xvda1
lrwxrwxrwx 1 root root 11 Jul 22 01:35 b3b7c47f-6a91-45ef-80d6-275b1cc16e19 -> ../../xvda6
lrwxrwxrwx 1 root root 11 Jul 22 01:35 ea63b55d-3b6e-4dcd-8986-956b72bac3e9 -> ../../xvda7
lrwxrwxrwx 1 root root 12 Jul 22 01:35 eb3cc645-925e-4bc5-bedf-c2a6f3b65809 -> ../../xvda10
```

The content on the left of -> are disk partition UUIDs, and that on the right of -> are partition names. Based on the outputs in 1 and this step, you can obtain the mappings between the partition names, IDs, and UUIDs.

3. Open the `/etc/fstab` file to check partition names.

vi /etc/fstab

An 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
/dev/disk/by-id/scsi-SATA_QEMU_HARDDISK_QM00001-part6 /home ext3 nosuid,errors=panic 1 2
/dev/disk/by-id/scsi-SATA_QEMU_HARDDISK_QM00001-part10 /opt ext3 defaults,errors=panic 1 2
/dev/disk/by-id/scsi-SATA_QEMU_HARDDISK_QM00001-part7 /tmp ext3 nodev,nosuid,errors=panic 1 2
/dev/disk/by-id/scsi-SATA_QEMU_HARDDISK_QM00001-part9 /usr ext3 defaults,errors=panic 1 2
/dev/disk/by-id/scsi-SATA_QEMU_HARDDISK_QM00001-part8 /var ext3 nodev,nosuid,errors=panic 1 2
sysfs /sys sysfs noauto 0 0
proc /proc proc defaults 0 0
usbfs /proc/bus/usb usbfs noauto 0 0
devpts /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
```

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

4. Press **i** to enter editing mode. Change each disk partition ID to a UUID based on the outputs in 1 and 2.

The modified content is as follows.

```
UUID=45ecd7a0-29da-4402-a017-4564a62308b8 / ext3 defaults,errors=panic 1 1
UUID=780f36bc-0ada-4c98-9a8d-44570d65333d /boot ext3 defaults,errors=panic 1 2
UUID=b3b7c47f-6a91-45ef-80d6-275b1cc16e19 /home ext3 nosuid,errors=panic 1 2
UUID=eb3cc645-925e-4bc5-bedf-c2a6f3b65809 /opt ext3 defaults,errors=panic 1 2
UUID=ea63b55d-3b6e-4dcd-8986-956b72bac3e9 /tmp ext3 nodev,nosuid,errors=panic 1 2
UUID=55386c6a-9e32-41d4-af7a-e79596221f51 /usr ext3 defaults,errors=panic 1 2
UUID=55f36660-9bac-478c-a701-7ecc5347f789 /var ext3 nodev,nosuid,errors=panic 1 2
sysfs /sys sysfs noauto 0 0
proc /proc proc defaults 0 0
usbfs /proc/bus/usb usbfs noauto 0 0
devpts /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 correct, or the ECS will be unable to start up normally.

5. Press **Esc**, enter `:wq`, and press **Enter**. The system saves the configuration and exits the editor.
6. Check the partition names in the system boot configuration file.

The system boot configuration file varies depending on the OS. Confirm the boot configuration file of the current OS.

- GRUB 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=tty0 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 each 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
console=ttyS0,115200 console=tty0 xen_emul_unplug=all
initrd /boot/initrd-3.0.101-0.47.52-default
```

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

15.5 What Do I Do If the Disks of a CentOS ECS Created from an Image Cannot Be Found?

Symptom

When you started a CentOS ECS, the system cannot find disks. Generally, this is because the `xen-blkfront.ko` module was not loaded during the startup. You need to modify OS kernel startup parameters.

Figure 15-1 Startup screen

```
OK ] Started Show Plymouth Boot Screen.
OK ] Reached target Paths.
OK ] Reached target Basic System.
dracut-initqueue[465]: Warning: Could not boot.
dracut-initqueue[465]: Warning: /dev/disk/by-uuid/545e232a-f59b-4576-af34-eccb829ea3d2 does not exist
Starting Dracut Emergency Shell...
Warning: /dev/disk/by-uuid/545e232a-f59b-4576-af34-eccb829ea3d2 does not exist
Generating "/run/initramfs/rdsosreport.txt"

Entering emergency mode. Exit the shell to continue.
Type "journalctl" to view system logs.
You might want to save "/run/initramfs/rdsosreport.txt" to a USB stick or /boot
after mounting them and attach it to a bug report.

dracut:/# _
```

Solution

Modify OS kernel boot parameters.

NOTE

These operations can only be performed after a normal OS startup. So, perform them in the source ECS of the image instead of the current ECS.

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 file.

- 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 file (CentOS 7 as an example).

```
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, and then use the image to create a new ECS.

15.6 What Do I Do If I Enabled Automatic Configuration During Image Registration for an ECS Created from a Windows Image and Now It Won't Start?

Cause

This may be caused by an issue with offline VirtIO driver injection.

Solution

When you inject VirtIO drivers into the image for a Windows ECS, note that:

- If the boot mode in the image file is UEFI, the VirtIO drivers cannot be injected offline.
- Disable Group Policy Object (GPO) because some policies may cause offline VirtIO driver injection to fail.
- Stop any installed antivirus software. They may cause offline VirtIO driver injection to fail.

To install VirtIO drivers, see [Optimizing a Windows Private Image](#).

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

Symptom

An ECS created from a private image booting to UEFI cannot start.

Possible Causes

The image is configured for UEFI boot, but the uefi attribute was not added to the image.

Solution

1. Delete the ECS that failed 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.

16 Driver Installation

16.1 Must I Install Guest OS Drivers on an ECS?

Installing Guest OS drivers on an ECS improves your experience in using the ECS. In addition, it also ensures high reliability and stability of ECSs.

- Windows ECSs: Install PV and VirtIO drivers on ECSs.
- Linux ECSs: Install Xen PV and VirtIO drivers and add them to initrd.

16.2 Why Do I Need to Install and Update VirtIO Drivers for Windows?

Why Do I Need to Install VirtIO Drivers?

VirtIO drivers are paravirtualized drivers that provide high-performance disks and NICs for ECSs.

- Windows does not have VirtIO drivers installed by default.
- Public images have VirtIO drivers by default.
- You need to install VirtIO drivers for private images. For details, see [Installing VirtIO Drivers](#).

Why Do I Need to Update VirtIO Drivers?

This ensures that known issues identified by the community can be eliminated from drivers as soon as possible.

What Do I Need to Do?

- Upgrade VirtIO drivers in Windows private images or running Windows ECSs.
- If you have any technical issues or questions, contact the customer service.

16.3 Why Did I Fail to Install Guest OS Drivers on a Windows ECS?

Possible causes:

- Your image file was exported from a VMware VM, and VMware Tools was not uninstalled or not completely uninstalled.
- You have downloaded Guest OS drivers of an incorrect version for your Windows ECS.
- The disk space available for installing Guest OS drivers is insufficient. Ensure that the disk where Guest OS drivers are installed has at least 300 MB space available.

16.4 How Do I Install PV Drivers in Windows?

This only applies to Xen ECSs.

Xen ECSs have been discontinued and no longer been available for new users. For details, see [Discontinued ECS Specifications](#). If you are a new user or you are an existing user that will use this image to create a non-Xen ECS, this answer does not apply to you.

For details, see [Installing PV Drivers](#).

16.5 How Do I Install VirtIO Drivers in Windows?

The installation only applies to KVM ECSs.

Before using an ECS or external image file to create a private image, ensure that VirtIO drivers have been installed in the OS so that ECSs created from this image can support KVM virtualization and the network performance can be improved.

For details, see [Installing VirtIO Drivers](#).

16.6 How Do I Install Native KVM Drivers in Linux?

When optimizing a Linux private image, you need to install native KVM drivers on the ECS from which the image will be created. If you ECS already has native KVM drivers installed, you do not need to install the drivers again.

For details, see [Installing Native KVM Drivers](#).

16.7 How Do I Install Native Xen and KVM Drivers?

Scenarios

When optimizing a Linux private image with Xen virtualization, you need to install native Xen and KVM drivers on the source ECS of the image.

This section describes how to install native Xen and KVM drivers.

CAUTION

If an ECS has no Xen drivers installed, the network performance of the ECS will be poor, and the security groups and firewall configured for the ECS will not take effect.

If an ECS has no KVM drivers installed, the NICs of the ECS may not be detected and the ECS will be unable to communicate with other resources.

Prerequisites

- The virtualization type of the ECS is Xen. For details, see [Viewing the Virtualization Type of a Linux ECS](#).
- The kernel version must be later than 2.6.24.
- Disable your antivirus and intrusion detection software. You can enable them after the driver installation is complete.

Procedure

Modify the configuration file depending on the OS.

- CentOS, EulerOS

Take CentOS 7.0 as an example. Modify the `/etc/dracut.conf` file. Add the Xen PV and VirtIO drivers to **add_drivers**. Xen PV drivers include `xen-blkfront` and `xen-netfront`. VirtIO drivers include `virtio_blk`, `virtio_scsi`, `virtio_net`, `virtio_pci`, `virtio_ring`, and `virtio`. Separate driver names with spaces. Save and exit the `/etc/dracut.conf` file. Run the **dracut -f** command to regenerate `initrd`.

For details, see [CentOS and EulerOS](#).

- Ubuntu and Debian

Modify the `/etc/initramfs-tools/modules` file. Add the Xen PV and VirtIO drivers. Xen PV drivers include `xen-blkfront` and `xen-netfront`. VirtIO drivers include `virtio_blk`, `virtio_scsi`, `virtio_net`, `virtio_pci`, `virtio_ring`, and `virtio`. Separate driver names with spaces. Save and exit the `/etc/initramfs-tools/modules` file. Run the **update-initramfs -u** command to regenerate `initrd`.

For details, see [Ubuntu and Debian](#).

- SUSE and openSUSE

- If the OS version is earlier than SUSE 12 SP1 or openSUSE 13, modify the `/etc/sysconfig/kernel` file and add Xen PV and VirtIO drivers to **INITRD_MODULES=""**. Xen PV drivers include `xen_vnif`, `xen_vbd`, and `xen_platform_pci`. VirtIO drivers include `virtio_blk`, `virtio_scsi`, `virtio_net`, `virtio_pci`, `virtio_ring`, and `virtio`. Separate driver names with spaces. Run the **mkinitrd** command to regenerate `initrd`.

- If the OS version is SUSE 12 SP1, modify the `/etc/dracut.conf` file and add Xen PV and VirtIO drivers to **add_drivers**. Xen PV drivers include `xen_vnif`, `xen_vbd`, and `xen_platform_pci`. VirtIO drivers include `virtio_blk`, `virtio_scsi`, `virtio_net`, `virtio_pci`, `virtio_ring`, and `virtio`. Separate driver names with spaces. Run the **dracut -f** command to regenerate `initrd`.

- If the OS version is later than SUSE 12 SP1 or openSUSE 13, modify the `/etc/dracut.conf` file and add Xen PV and VirtIO drivers to **add_drivers**. Xen PV drivers include `xen-blkfront` and `xen-netfront`. VirtIO drivers include `virtio_blk`, `virtio_scsi`, `virtio_net`, `virtio_pci`, `virtio_ring`, and `virtio`. Separate driver names with spaces. Save and exit the `/etc/dracut.conf` file. Run the **dracut -f** command to regenerate `initrd`.

For details, see [SUSE and openSUSE](#).

NOTE

For SUSE, run the following command to check whether `xen-kmp` (driver package for Xen PV) is installed:

```
rpm -qa |grep xen-kmp
```

If information similar to the following is displayed, `xen-kmp` is installed in the OS:

```
xen-kmp-default-4.2.2_04_3.0.76_0.11-0.7.5
```

If `xen-kmp` is not installed, obtain it from the ISO file and install it.

If you add built-in drivers to the `initrd` or `initramfs` file by mistake, the ECS will not be affected.

CentOS and EulerOS

1. Run the following command to open the `/etc/dracut.conf` file:
vi /etc/dracut.conf
2. Press **i** to enter editing mode and add Xen PV and VirtIO drivers to **add_drivers** (the format varies depending on the OS).

```
[root@CTU10000xxxx ~]# vi /etc/dracut.conf
# additional kernel modules to the default
add_drivers+="xen-blkfront xen-netfront virtio_blk virtio_scsi virtio_net virtio_pci virtio_ring virtio"
.....
```
3. Press **Esc**, enter **:wq**, and press **Enter**. The system saves the change and exits the `/etc/dracut.conf` file.
4. Run the following command to regenerate `initrd`:
dracut -f /boot/initramfs-2.6.32-573.8.1.el6.x86_64.img
If the virtual file system is not the default `initramfs`, run **dracut -f *Name of the initramfs or initrd file actually used***. You can obtain the actual `initramfs` or `initrd` file name from the `grub.cfg` file, which can be `/boot/grub/grub.cfg`, `/boot/grub2/grub.cfg`, or `/boot/grub/grub.conf` depending on the OS.
5. Check whether native Xen and KVM drivers have been installed. If the virtual file system is `initramfs`, run the following commands:
lsinitrd /boot/initramfs-`uname -r`.img | grep xen
lsinitrd /boot/initramfs-`uname -r`.img | grep virtio
If the virtual file system is `initrd`, run the following commands:
lsinitrd /boot/initrd-`uname -r` | grep xen
lsinitrd /boot/initrd-`uname -r` | grep virtio
Assume that the virtual file system is `initramfs`. The command output will be:

```
[root@CTU10000xxxx home]# lsinitrd /boot/initramfs-`uname -r`.img | grep xen
-rwxr--r-- 1 root root 54888 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/block/xen-blkfront.ko
-rwxr--r-- 1 root root 45664 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/net/xen-netfront.ko
```

```
[root@CTU10000xxxxx home]# lsinitrd /boot/initramfs-`uname -r`.img | grep virtio
-rwxr--r-- 1 root root 23448 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
block/virtio_blk.ko
-rwxr--r-- 1 root root 50704 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/
drivers/net/virtio_net.ko
-rwxr--r-- 1 root root 28424 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
scsi/virtio_scsi.ko
drwxr-xr-x 2 root root 0 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
virtio
-rwxr--r-- 1 root root 14544 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
virtio/virtio.ko
-rwxr--r-- 1 root root 21040 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
virtio/virtio_pci.ko
-rwxr--r-- 1 root root 18016 Jul 16 17:53 lib/modules/2.6.32-573.8.1.el6.x86_64/kernel/drivers/
virtio/virtio_ring.ko
```

NOTE

If you add built-in drivers to the `initrd` or `initramfs` file by mistake, the ECS will not be affected. The drivers cannot be found by running the `lsinitrd` command. You can run the following commands to check whether built-in drivers are in the kernel:

```
cat /boot/config-`uname -r` | grep CONFIG_VIRTIO | grep y
cat /boot/config-`uname -r` | grep CONFIG_XEN | grep y
```

Ubuntu and Debian

1. Run the following command to open the `modules` file:
vi /etc/initramfs-tools/modules
2. Press **i** to enter editing mode and add Xen PV and VirtIO drivers to the `/etc/initramfs-tools/modules` file (the format varies depending on the OS).

```
[root@CTU10000xxxxx ~]# vi /etc/initramfs-tools/modules
.....
# Examples:
#
# raid1
# sd_m0d
xen-blkfront
xen-netfront
virtio_blk
virtio_scsi
virtio_net
virtio_pci
virtio_ring
virtio
```

3. Press **Esc**, enter `:wq`, and press **Enter**. The system saves the change and exits the `/etc/initramfs-tools/modules` file.
4. Run the following command to regenerate `initrd`:
update-initramfs -u
5. Run the following commands to check whether native Xen and KVM drivers have been installed:

```
lsinitramfs /boot/initrd.img-`uname -r` | grep xen
lsinitramfs /boot/initrd.img-`uname -r` | grep virtio
```

```
[root@CTU10000xxxxx home]# lsinitramfs /boot/initrd.img-`uname -r` | grep xen
lib/modules/3.5.0-23-generic/kernel/drivers/net/ethernet/qlogic/netxen
lib/modules/3.5.0-23-generic/kernel/drivers/net/ethernet/qlogic/netxen/netxen_nic.ko
lib/modules/3.5.0-23-generic/kernel/drivers/net/xen-netback
lib/modules/3.5.0-23-generic/kernel/drivers/net/xen-netback/xen-netback.ko
lib/modules/3.5.0-23-generic/kernel/drivers/block/xen-blkback
lib/modules/3.5.0-23-generic/kernel/drivers/block/xen-blkback/xen-blkback.ko
```

```
[root@ CTU10000xxxxx home]# lsinitramfs /boot/initrd.img-`uname -r` |grep virtio
lib/modules/3.5.0-23-generic/kernel/drivers/scsi/virtio_scsi.ko
```

NOTE

If you add built-in drivers to the `initrd` or `initramfs` file by mistake, the ECS will not be affected. The drivers cannot be found by running the `lsinitrd` command. You can run the following commands to check whether built-in drivers are in the kernel:

```
[root@ CTU10000xxxxx home]# cat /boot/config-`uname -r` | grep CONFIG_VIRTIO | grep y
CONFIG_VIRTIO_BLK=y
CONFIG_VIRTIO_NET=y
CONFIG_VIRTIO=y
CONFIG_VIRTIO_RING=y
CONFIG_VIRTIO_PCI=y
CONFIG_VIRTIO_MMIO_CMDLINE_DEVICES=y
[root@ CTU10000xxxxx home]# cat /boot/config-`uname -r` | grep CONFIG_XEN | grep y
CONFIG_XEN_BLKDEV_FRONTEND=y
CONFIG_XEN_NETDEV_FRONTEND=y
```

SUSE and openSUSE

If the OS version is earlier than SUSE 12 SP1 or openSUSE 13, modify the `/etc/sysconfig/kernel` file to install the drivers. For details, see [scenario 1](#).

If the OS version is SUSE 12 SP1, modify the `/etc/dracut.conf` file to install the drivers. For details, see [scenario 2](#).

If the OS version is later than SUSE 12 SP1 or openSUSE 13, modify the `/etc/dracut.conf` file to install the drivers. For details, see [scenario 3](#).

- Earlier than SUSE 12 SP1 or openSUSE 13:

NOTE

Before installing the drivers, run the following command to check whether `xen-kmp` (driver package for Xen PV) is installed:

```
rpm -qa |grep xen-kmp
```

If information similar to the following is displayed, `xen-kmp` is installed:

```
xen-kmp-default-4.2.2_04_3.0.76_0.11-0.7.5
```

If `xen-kmp` is not installed, obtain it from the ISO package and install it first.

- Run the following command to open the `/etc/sysconfig/kernel` file:
vi /etc/sysconfig/kernel
- Add Xen PV and VirtIO drivers after `INITRD_MODULES=` (the format varies depending on the OS).

```
SIA10000xxxxx:~ # vi /etc/sysconfig/kernel
# (like drivers for scsi-controllers, for lvm or reiserfs)
#
INITRD_MODULES="ata_piix ata_generic xen_vnif xen_vbd xen_platform_pci virtio_blk
virtio_scsi virtio_net virtio_pci virtio_ring virtio"
```
- Run the `dracut -f` command to regenerate `initrd`.

NOTE

If the virtual file system is not the default `initramfs` or `initrd`, run `dracut -f Name of the initramfs or initrd file actually used`. The actual `initramfs` or `initrd` file name can be obtained from the `menu.lst` or `grub.cfg` file (`/boot/grub/menu.lst`, `/boot/grub/grub.cfg`, or `/boot/grub2/grub.cfg`).

The following is an example `initrd` file of SUSE 11 SP4:

```

default 0
timeout 10
gfxmenu (hd0,0)/boot/message
title sles11sp4_001_[_VMX_]
root (hd0,0)
kernel /boot/linux.vmx vga=0x314 splash=silent console=ttyS0,115200n8 console=tty0
net.ifnames=0 NON_PERSISTENT_DEVICE_NAMES=1 showopts
initrd /boot/initrd.vmx
title Failsafe_sles11sp4_001_[_VMX_]
root (hd0,0)
kernel /boot/linux.vmx vga=0x314 splash=silent ide=nodma apm=off noresume edd=off
powersaved=off nohz=off highres=off processor.max+cstate=1 nomodeset x11failsafe
console=ttyS0,115200n8 console=tty0 net.ifnames=0 NON_PERSISTENT_DEVICE_NAMES=1
showopts
initrd /boot/initrd.vmx

```

/boot/initrd.vmx is the **initrd** file actually used. If **/boot** is missing in the **initrd** file path, you need to add it when you run the **dracut -f** command. In this case, the command should be **dracut -f /boot/initramfs-xxx**.

- d. Run the following commands to check whether Xen PVOPS and KVM VirtIO drivers have been installed:

```
lsinitrd /boot/initrd-`uname -r` | grep xen
```

```
lsinitrd /boot/initrd-`uname -r` | grep virtio
```

```

SIA10000xxxx:~ # lsinitrd /boot/initrd-`uname -r` | grep xen
-rwxr--r-- 1 root root 42400 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/block/
xen-blkfront.ko
-rwxr--r-- 1 root root 44200 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/net/
xen-netfront.ko

```

```

SIA10000xxxx:~ # lsinitrd /boot/initrd-`uname -r` | grep virtio
-rwxr--r-- 1 root root 19248 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/scsi/
virtio_scsi.ko
-rwxr--r-- 1 root root 23856 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/block/
virtio_blk.ko
drwxr-xr-x 2 root root 0 Jul 12 14:53 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio
-rwxr--r-- 1 root root 15848 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio_ring.ko
-rwxr--r-- 1 root root 20008 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio_pci.ko
-rwxr--r-- 1 root root 12272 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio.ko
-rwxr--r-- 1 root root 38208 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/net/
virtio_net.ko

```

- e. Restart the ECS.
- f. Modify the **/boot/grub/menu.lst** file to add **xen_platform_pci.dev_unplug=all** and change the root settings.

Before the modification:

```

###Don't change this comment -YaST2 identifier: Original name: linux###
title SUSE Linux Enterprise Server 11SP4 - 3.0.76-0.11 (default)
root (hd0,0)
kernel /boot/vmlinuz-3.0.76-0.11-default root=UUID=4eb40294-4c6f-4384-bbb6-
b8795bbb1130 splash=silentcrashkernel=256M-:128M showopts vga=0x314
initrd /boot/initrd-3.0.76-0.11-default

```

After the modification:

```

###Don't change this comment -YaST2 identifier: Original name: linux###
title SUSE Linux Enterprise Server 11SP4 - 3.0.76-0.11 (default)
root (hd0,0)
kernel /boot/vmlinuz-3.0.76-0.11-default root=UUID=4eb40294-4c6f-4384-bbb6-
b8795bbb1130 splash=silentcrashkernel=256M-:128M showopts vga=0x314
xen_platform_pci.dev_unplug=all
initrd /boot/initrd-3.0.76-0.11-default

```


 NOTE

- Ensure that the root partition is in UUID format.
- **xen_platform_pci.dev_unplug=all** is used to shield QEMU devices.
- For SUSE 11 SP1 64bit to SUSE 11 SP4 64bit, add **xen_platform_pci.dev_unplug=all** to the **menu.lst** file. For SUSE 12 or later, QEMU device shield is enabled by default, and you do not need to configure it.

- g. Run the following commands to check whether Xen drivers exist in initrd:

```
lsinitrd /boot/initrd-`uname -r` | grep xen
```

```
lsinitrd /boot/initrd-`uname -r` | grep virtio
```

```
SIA10000xxxx:~ # lsinitrd /boot/initrd-`uname -r` | grep xen
-rwxr--r-- 1 root root 42400 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/block/
xen-blkfront.ko
-rwxr--r-- 1 root root 44200 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/net/
xen-netfront.ko

SIA10000xxxx:~ # lsinitrd /boot/initrd-`uname -r` | grep virtio
-rwxr--r-- 1 root root 19248 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/scsi/
virtio_scsi.ko
-rwxr--r-- 1 root root 23856 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/block/
virtio_blk.ko
drwxr-xr-x 2 root root 0 Jul 12 14:53 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio
-rwxr--r-- 1 root root 15848 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio_ring.ko
-rwxr--r-- 1 root root 20008 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio_pci.ko
-rwxr--r-- 1 root root 12272 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/virtio/
virtio.ko
-rwxr--r-- 1 root root 38208 Jun 22 2012 lib/modules/2.6.32-279.el6.x86_64/kernel/drivers/net/
virtio_net.ko
```

 NOTE

If you add built-in drivers to the `initrd` or `initramfs` file by mistake, the ECS will not be affected. The drivers cannot be found by running the `lsinitrd` command. You can run the following commands to check whether built-in drivers are in the kernel:

```
cat /boot/config-`uname -r` | grep CONFIG_VIRTIO | grep y
```

```
cat /boot/config-`uname -r` | grep CONFIG_XEN | grep y
```

- SUSE 12 SP1:

- a. Run the following command to open the `/etc/dracut.conf` file:

```
vi /etc/dracut.conf
```

- b. Press **i** to enter editing mode and add Xen PV and VirtIO drivers to **add-drivers** (the format varies depending on the OS).

```
[root@CTU10000xxxx ~]# vi /etc/dracut.conf
# additional kernel modules to the default
add_drivers+="ata_piix ata_generic xen_vnif xen_vbd xen_platform_pci virtio_blk virtio_scsi
virtio_net virtio_pci virtio_ring virtio"
```

- c. Press **Esc**, enter **:wq**, and press **Enter**. The system saves the change and exits the `/etc/dracut.conf` file.

- d. Run the following command to regenerate `initrd`:

```
dracut -f /boot/initramfs-File name
```

If the virtual file system is not the default `initramfs`, run the **dracut -f *Name of the initramfs or initrd file actually used*** command. The actual `initramfs` or `initrd` file name can be obtained from the **grub.cfg** file, which

can be `/boot/grub/grub.cfg`, `/boot/grub2/grub.cfg`, or `/boot/grub/grub.conf` depending on the OS.

- e. Check whether native Xen and KVM drivers have been installed. If the virtual file system is `initramfs`, run the following commands:

```
lsinitrd /boot/initramfs-`uname -r`.img | grep xen
```

```
lsinitrd /boot/initramfs-`uname -r`.img | grep virtio
```

If the virtual file system is `initrd`, run the following commands:

```
lsinitrd /boot/initrd-`uname -r` | grep xen
```

```
lsinitrd /boot/initrd-`uname -r` | grep virtio
```

- Later than SUSE 12 SP1 or openSUSE 13:

Take SUSE Linux Enterprise Server 12 SP2 (x86_64) as an example.

- a. Run the following command to open the `/etc/dracut.conf` file:

```
vi /etc/dracut.conf
```

- b. Press **i** to enter editing mode and add Xen PV and VirtIO drivers to **add_drivers** (the format varies depending on the OS).

```
[root@CTU10000xxxx ~]# vi /etc/dracut.conf
# additional kernel modules to the default
add_drivers+="ata_piix ata_generic xen-blkfront xen-netfront virtio_blk virtio_scsi
virtio_net virtio_pci virtio_ring virtio"
```

- c. Press **Esc**, enter `:wq`, and press **Enter**. The system saves the change and exits the `/etc/dracut.conf` file.

- d. Run the following command to regenerate `initrd`:

```
dracut -f /boot/initramfs-File name
```

If the virtual file system is not the default `initramfs`, run the **dracut -f *Name of the initramfs or initrd file actually used*** command. The actual `initramfs` or `initrd` file name can be obtained from the `grub.cfg` file, which can be `/boot/grub/grub.cfg`, `/boot/grub2/grub.cfg`, or `/boot/grub/grub.conf` depending on the OS.

- e. Check whether native Xen and KVM drivers have been installed. If the virtual file system is `initramfs`, run the following commands:

```
lsinitrd /boot/initramfs-`uname -r`.img | grep xen
```

```
lsinitrd /boot/initramfs-`uname -r`.img | grep virtio
```

If the virtual file system is `initrd`, run the following commands:

```
lsinitrd /boot/initrd-`uname -r` | grep xen
```

```
lsinitrd /boot/initrd-`uname -r` | grep virtio
```

Assume that the virtual file system is `initrd`. The command output will be:

```
sluo-ecs-30dc:~ # lsinitrd /boot/initrd-`uname -r` | grep xen
-rw-r--r-- 1 root root 69575 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/block/xen-
blkfront.ko
-rw-r--r-- 1 root root 53415 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/net/xen-
netfront.ko
drwxr-xr-x 2 root root 0 Sep 28 10:21 lib/modules/4.4.21-69-default/updates/pvdriver/xen-hcall
-rwxr-xr-x 1 root root 8320 Sep 28 10:21 lib/modules/4.4.21-69-default/updates/pvdriver/xen-
hcall/xen-hcall.ko

sluo-ecs-30dc:~ # lsinitrd /boot/initrd-`uname -r` | grep virtio
-rw-r--r-- 1 root root 29335 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/block/
virtio_blk.ko
-rw-r--r-- 1 root root 57007 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/net/
virtio_net.ko
```

```
-rw-r--r-- 1 root root 32415 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/scsi/  
virtio_scsi.ko  
drwxr-xr-x 2 root root 0 Sep 28 10:21 lib/modules/4.4.21-69-default/kernel/drivers/virtio  
-rw-r--r-- 1 root root 19623 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/virtio/  
virtio.ko  
-rw-r--r-- 1 root root 38943 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/virtio/  
virtio_pci.ko  
-rw-r--r-- 1 root root 24431 Oct 26 2016 lib/modules/4.4.21-69-default/kernel/drivers/virtio/  
virtio_ring.ko
```

NOTE

If you add built-in drivers to the `initrd` or `initramfs` file by mistake, the ECS will not be affected. The drivers cannot be found by running the `lsinitrd` command. You can run the following commands to check whether built-in drivers are in the kernel:

```
cat /boot/config-`uname -r` | grep CONFIG_VIRTIO | grep y  
cat /boot/config-`uname -r` | grep CONFIG_XEN | grep y
```

17 Image Tags

17.1 How Many Tags Can I Add to an Image?

An image can have a maximum of 10 tags.

Each tag consists of a key and a value. The key contains a maximum of 36 characters, and the value contains a maximum of 43 characters. The key cannot be left blank or an empty string. The value cannot be left blank but can be an empty string.

For details, see [Tagging an Image](#).

17.2 How Do I Add, Delete, and Modify Image Tags?

NOTE

- When adding predefined tags to an image or searching for an image using predefined tags, you must have permission to access the Tag Management Service (TMS).
- If your organization has pre-configured tag policies for images, you need to add tags to your images based on the policies. If you do not comply with the tag policies, images may fail to be created. Contact the organization administrator to learn more about the tag policies.
 - Each tag consists of a key and a value. A key contains a maximum of 36 characters, and a value contains a maximum of 43 characters. A key cannot be left blank or be an empty string. A value cannot be left blank but can be an empty string.
 - An image can have a maximum of 10 tags.

1. Access the IMS console.
 - a. Log in to the management console.
 - b. Under **Compute**, click **Image Management Service**.
The IMS console is displayed.
2. Click the **Private Images** tab and click the image name to display the image details.
 - To modify an image tag, go to [3](#).

- To delete an image tag, go to [4](#).
 - To add an image tag, go to [5](#).
3. Click the **Tags** tab, locate the target tag, and click **Edit** in the **Operation** column. In the displayed dialog box, modify the tag.
 4. Click the **Tags** tab, locate the target tag, and click **Delete** in the **Operation** column. In the displayed dialog box, click **Yes**.
 5. Click the **Tags** tab and then **Add Tag**. In the displayed dialog box, add a tag.

17.3 How Do I Search for Private Images by Tag?

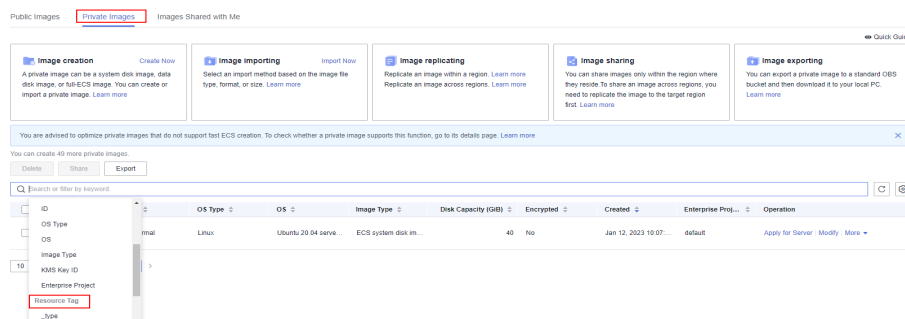
NOTE

- When adding predefined tags to an image or searching for an image using predefined tags, you must have permission to access the Tag Management Service (TMS).
- If your organization has pre-configured tag policies for images, you need to add tags to your images based on the policies. If you do not comply with the tag policies, images may fail to be created. Contact the organization administrator to learn more about the tag policies.
 - Each tag consists of a key and a value. A key contains a maximum of 36 characters, and a value contains a maximum of 43 characters. A key cannot be left blank or be an empty string. A value cannot be left blank but can be an empty string.
 - An image can have a maximum of 10 tags.

Search for Private Images by Tag

1. Access the IMS console.
 - a. Log in to the management console.
 - b. Under **Compute**, click **Image Management Service**.
The IMS console is displayed.
2. Click the **Private Images** tab and click the search box above the private image list. Under **Resource Tag**, specify the tag key and value to search for images.

Figure 17-1 Searching for images by tag



 **NOTE**

- Neither the tag key nor tag value can be empty. When the tag key and tag value are matched, the system automatically shows your desired private images.
- You can add multiple tags to search for shared images. The system will display private images that match all tags.

18 Billing

18.1 What Are the Billing Standards for IMS?

Billing of Different Image Types

Image Type	Billing
Public	Free
Private	<ul style="list-style-type: none"> System disk image, ISO image, or data disk image: free Full-ECS image: charged for the storage on CSBS or CBR <p>If the image is created from a CSBS or CBR backup, you will be billed for the space used to store the CSBS or CBR backup.</p>
Shared	<ul style="list-style-type: none"> If it is a system or data disk image, the OBS storage is free. If it is a full-ECS image, you will be billed for the space used to store the CBR backup. <p>NOTE Full-ECS images created from a CBR backup can be shared but those created from a CSBS backup cannot.</p>
KooGallery	Determined by the image provider.

Billing of Private Image Operations

Operation	Billing Item
Uploading an external image file to an OBS bucket	OBS storage (You are advised to delete unneeded image files.)

Operation	Billing Item
Creating an ECS from a system disk image or full-ECS image	EVS disks attached to the created ECS (The system disk image and full-ECS image are free of charge.) For example, when you use a full-ECS image (with a 40 GB system disk and 100 GB data disk) to create an ECS, you will be charged based on the total capacity of the system disk and data disk. NOTE If a private image is created using an ECS created from a KooGallery image, you will be billed for the private image based on the KooGallery price.
Replication of a system or data disk image within a region	None. OBS buckets are available for free to store the image copies.
Cross-region replication of a system or data disk image	Traffic generated by OBS cross-region replication
Cross-region replication of a full-ECS image	<ul style="list-style-type: none">• Traffic of CSBS or CBR cross-region replication• Space used for storing the CSBS or CBR backup associated with the newly replicated image
Exporting images	OBS space for storing the exported images

Reference

- For OBS pricing details, see [OBS Pricing Details](#).
- For CSBS pricing details, see [CSBS Pricing Details](#).
- For CBR pricing details, see [CBR Pricing Details](#).
- For EVS pricing details, see [EVS Pricing Details](#).

18.2 How Will I Be Billed for Full-ECS Images?

- For a full-ECS image created from a CSBS or CBR backup, you will be billed for the space used to store the CSBS or CBR backup.
- For a full-ECS image shared by others, you will be billed for the space used to store the CBR backup.
- When you use a full-ECS image to create an ECS, the full-ECS image is free of charge, but you will be billed for EVS disks attached to the ECS.
For example, when you use a full-ECS image (with a 40 GB system disk and 100 GB data disk) to create an ECS, you will be charged based on the total capacity of the system disk and data disk.
- When you replicate a full-ECS image across regions, you will be billed for:
 - Traffic of CSBS or CBR cross-region replication

- Space for storing the CSBS or CBR backup associated with the newly replicated image