

Image Management Service

FAQs

Issue 01
Date 2023-08-10



Copyright © Huawei Technologies Co., Ltd. 2024. All rights reserved.

No part of this document may be reproduced or transmitted in any form or by any means without prior written consent of Huawei Technologies Co., Ltd.

Trademarks and Permissions



HUAWEI and other Huawei trademarks are trademarks of Huawei Technologies Co., Ltd.

All other trademarks and trade names mentioned in this document are the property of their respective holders.

Notice

The purchased products, services and features are stipulated by the contract made between Huawei and the customer. All or part of the products, services and features described in this document may not be within the purchase scope or the usage scope. Unless otherwise specified in the contract, all statements, information, and recommendations in this document are provided "AS IS" without warranties, guarantees or representations of any kind, either express or implied.

The information in this document is subject to change without notice. Every effort has been made in the preparation of this document to ensure accuracy of the contents, but all statements, information, and recommendations in this document do not constitute a warranty of any kind, express or implied.

Security Declaration

Vulnerability

Huawei's regulations on product vulnerability management are subject to the *Vul. Response Process*. For details about this process, visit the following web page:

<https://www.huawei.com/en/psirt/vul-response-process>

For vulnerability information, enterprise customers can visit the following web page:

<https://securitybulletin.huawei.com/enterprise/en/security-advisory>

Contents

1 Image Consulting.....	1
1.1 Basic Concepts.....	1
1.2 How Do I Select an Image?.....	3
1.3 Are There Any Public Images Already Containing Certain Applications, Such as OpenVPN or PyTorch?	5
1.4 How Do I Increase the Image Quota?.....	5
1.5 What Are the Differences Between Images and Backups?.....	6
1.6 Can I Tailor an Image?.....	8
1.7 How Can I Back Up the Current Status of an ECS for Restoration in the Case of a System Fault?.....	8
1.8 How Can I Apply a Private Image to an Existing ECS?.....	8
1.9 Can I Import Data from a Data Disk Image to a Data Disk?.....	8
1.10 Can I Use Private Images of Other Accounts?.....	9
2 Image Creation.....	10
2.1 General Creation FAQs.....	10
2.2 Full-ECS Image FAQs.....	11
2.3 How Can I Use a Backup to Create an EVS Disk or ECS?.....	12
2.4 Is There Any Difference Between the Image Created from a CSBS/CBR Backup and That Created from an ECS?.....	13
2.5 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?	13
2.6 How Do I Create a Full-ECS Image Using an ECS That Has a Spanned Volume?.....	13
2.7 Why Is Sysprep Required for Creating a Private Image from a Windows ECS?.....	14
2.8 How Do I Handle the Startup Failure of a Windows ECS Created from a Windows Image Generalized by Sysprep?.....	14
2.9 What Do I Do If I Cannot Create an Image in ZVHD2 Format Using an API?.....	16
3 Image Sharing.....	17
3.1 General Sharing FAQs.....	17
3.2 How Will I Be Billed for Sharing an Image?.....	19
3.3 What Are the Differences Between Sharing Images and Replicating Images?.....	20
4 OS.....	21
4.1 How Do I Select an OS?.....	21
4.2 How Is BIOS Different from UEFI?.....	21
4.3 How Do I Delete Redundant Network Connections from a Windows ECS?.....	22

4.4 What Do I Do If an ECS Starts Slowly?.....	23
4.5 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?.....	24
5 Image Import.....	25
5.1 Can I Use Images in Formats not Described in This Document?.....	25
5.2 What Are the Impacts If I Do Not Pre-configure an ECS Used to Create a Private Image?.....	25
5.3 How Do I Import an OVF or OVA File to the Cloud Platform?.....	26
5.4 What Do I Do If I Chose the Wrong OS or System Disk Capacity When Registering a Private Image?.....	27
5.5 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?.....	27
6 Image Export.....	28
6.1 Can I Download My Private Images to a Local PC?.....	28
6.2 Can I Use the System Disk Image of an ECS on a BMS After I Export It from the Cloud Platform?.....	28
6.3 Why Is the Image Size in an OBS Bucket Different from That Displayed in IMS?.....	28
6.4 Can I Download a Public Image to My PC?.....	28
6.5 What Are the Differences Between Import/Export and Fast Import/Export?.....	29
6.6 Why the Export Option Is Unavailable for My Image?.....	30
7 Image Optimization.....	31
7.1 Must I Install Guest OS Drivers on an ECS?.....	31
7.2 Why Do I Need to Install and Update VirtIO Drivers for Windows?.....	31
7.3 What Will the System Do to an Image File When I Use the File to Register a Private Image?.....	32
7.4 How Do I Configure an ECS, a BMS, or an Image File Before I Use It to Create an Image?.....	33
7.5 What Do I Do If a Windows Image File Is Not Pre-Configured When I Use It to Register a Private Image?.....	36
7.6 What Do I Do If a Linux Image File Is Not Pre-Configured When I Use It to Register a Private Image?.....	39
7.7 How Do I Enable NIC Multi-Queue for an Image?.....	42
7.8 How Do I Configure an ECS to Use DHCPv6?.....	46
7.9 How Do I Clean Up the Disk Space of a Windows ECS?.....	56
7.10 How Do I Make a System Disk Image Support Fast ECS Creation?.....	66
7.11 Why Did I Fail to Install Guest OS Drivers on a Windows ECS?.....	67
7.12 How Do I Install Native Xen and KVM Drivers?.....	67
8 Image Replication.....	76
9 Image Deletion.....	80
10 Image Encryption.....	81
11 Accounts and Permissions.....	82
11.1 What Do I Do If I Enabled EPS But Now I Cannot Find Private Images in My Enterprise Project?.....	82
11.2 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?.....	82
12 Cloud-Init.....	83

12.1 Cloud-Init Installation FAQ.....	83
12.2 What Can I Do with a Cloud-Init ECS?.....	87
12.3 What Do I Do If Installed NetworkManager and Now I Can't Inject the Key or Password Using Cloud-Init?.....	88
12.4 How Do I Install growpart for SUSE 11 SP4?.....	88
13 ECS Creation.....	90
13.1 Can I Change the Image of a Purchased ECS?.....	90
13.2 Can I Change the Specifications Defined by a Private Image When I Use the Image to Create an ECS?.....	90
13.3 Can I Specify the System Disk Capacity When I Create an ECS Using an Image?.....	90
13.4 What Do I Do If a Partition Is Not Found During the Startup of an ECS Created from an Imported Private Image?.....	91
13.5 What Do I Do If the Disks of a CentOS ECS Created from an Image Cannot Be Found?.....	93
13.6 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?.....	95
13.7 What Do I Do If an Exception Occurs When I Start an ECS Created from an Image Using UEFI Boot?.....	95
14 Billing.....	97
14.1 What Are the Billing Standards for IMS?.....	97

1 Image Consulting

1.1 Basic Concepts

Images are classified as public, private, and shared.

Image Type	Description
Public	<p>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. If a public image does not contain the environments or software you need, you can use a public image to create an ECS and then deploy the required environments or software on it.</p> <p>Public images include the following OSs to choose from: Ubuntu and CentOS</p> <p>For more information, see Managing Public Images.</p>

Image Type	Description
Private	<p>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.</p> <p>A private image can be a system disk image, data disk image, ISO image, or full-ECS image.</p> <ul style="list-style-type: none">• A system disk image contains an OS and preinstalled software for various services. You can use a system disk image to create ECSs and migrate your services to the cloud.• A data disk image contains only service data. You can use a data disk image to create EVS disks and use them to migrate your service data to the cloud.• An ISO image is created from an external ISO image file. It is a special image that is not available on the ECS console.• A full-ECS image contains an OS, preinstalled software, and service data. A full-ECS image is created using differential backups and the creation takes less time than creating a system or data disk image that has the same disk capacity.
Shared	<p>A shared image is a private image another user has shared with you.</p> <p>For more information, see Sharing Images.</p>

You can modify an image, share images, export images, encrypt images, replicate images, export an image list, and delete images.

Table 1-1 Managing private images

Feature	Description	Helpful Link
Modifying an image	You can modify the following attributes of an image: name, description, minimum memory, maximum memory, and advanced functions such as NIC multi-queue and SR-IOV driver.	Modifying an Image
Sharing images	You can share an image with other Huawei Cloud accounts. These accounts can use your shared private image to quickly create ECSs or EVS disks.	<ul style="list-style-type: none">• Sharing Images• Image Sharing FAQs
Exporting images	You can export private images to your OBS bucket and download them to your local PC for backup.	Exporting an Image

Feature	Description	Helpful Link
Encrypting images	You can create encrypted images to improve data security. KMS envelope encryption is used. Encrypted images can be created from external image files or encrypted ECSs.	<ul style="list-style-type: none">• Encryption Method• Creating Encrypted Images
Replicating images within a region	By replicating images within a region, you can convert encrypted and unencrypted images into each other or enable some advanced features, for example, quick instance provisioning.	Replicating Images Within a Region
Tagging an image	You can tag your private images for easy management and search.	Tagging an Image
Exporting image list	You can export the public or private image list in a given region as a CSV file for local maintenance and query.	Exporting Image List
Deleting images	You can delete images that will be no longer used. Deleting an image does not affect the ECSs created from that image.	Deleting Images

1.2 How Do I Select an Image?

When creating an ECS or a BMS, you can select an image based on the following factors:

- [Image Type](#)
- [Image Fee](#)
- [OS](#)

Image Type

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

Table 1-2 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
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 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.

System Architecture	Applicable Memory	Constraints
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
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.

1.3 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 set up the environment or search for eligible images in KooGallery.


1.4 How Do I Increase the Image Quota?

What Is Quota?

Quotas can limit the number or amount of resources available to users, such as the maximum number of ECSs or EVS disks that can be created.

If the existing resource quota cannot meet your service requirements, you can apply for a higher quota.

How Do I View My Quotas?

1. Log in to the management console.
2. Click  in the upper left corner and select the desired region and project.
3. In the upper right corner of the page, choose **Resources > My Quotas**. The **Service Quota** page is displayed.
4. View the used and total quota of each type of resources on the displayed page.

If a quota cannot meet service requirements, apply for a higher quota.

How Do I Apply for a Higher Quota?

1. Log in to the management console.
2. In the upper right corner of the page, choose **Resources > My Quotas**. The **Service Quota** page is displayed.
3. Click **Increase Quota** in the upper right corner of the page.
4. On the **Create Service Ticket** page, configure parameters as required. In the **Problem Description** area, fill in the content and reason for adjustment.
5. After all necessary parameters are configured, select **I have read and agree to the Ticket Service Protocol and Privacy Statement** and click **Submit**.

1.5 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 1-3](#) lists the differences between them.

Table 1-3 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.

Item	CBR	IMS
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
Advantages	<p>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.</p>	<p>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.</p>

 **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.

1.6 Can I Tailor an Image?

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.

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 backups 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. When you change the OS, select that image. For details about how to change the OS, see [Changing the OS](#).

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:

1. Use the data disk image to create a temporary disk.
2. Attach the temporary disk to the ECS where the target disk is located.
3. 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 about image sharing, see [Sharing Specified Images](#).

2 Image Creation

2.1 General Creation FAQs

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 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 [How Do I Increase the Image Quota?](#)

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.

2.2 Full-ECS Image FAQs

What Is a Full-ECS Image?

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

- Sharing an ECS with other 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 2-1 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 2-2 Disk backup

Details <u>Disk Backup</u> Share List Replication History				
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 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.

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

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

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

For details about how to create a private image from a CSBS backup, see [Creating a Full-ECS Image from a CSBS Backup](#). For details about how to 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](#).

2.4 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.

2.5 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 Linux System Disk Image from an ISO File](#)

2.6 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.

2.7 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 join a domain, Sysprep is not required.

⚠ CAUTION

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

Restrictions on Running Sysprep

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
```

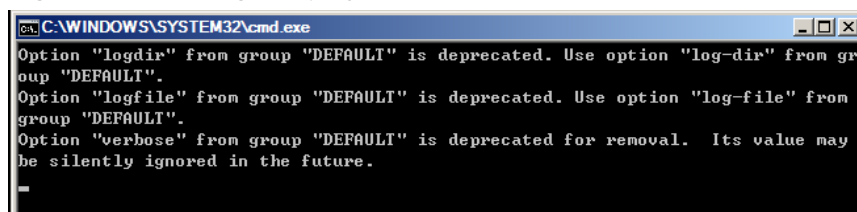
In the displayed **Windows Script Host** dialog box, if the value of **Remaining Windows rearm count** is **0**, you cannot run Sysprep.

2.8 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 2-3 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 2-4 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 (0x = 0x00000001) 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 2-5 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.

2.9 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_llid** role (**op_gated_llid** 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.

3 Image Sharing

3.1 General Sharing FAQs

How Many Tenants 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?

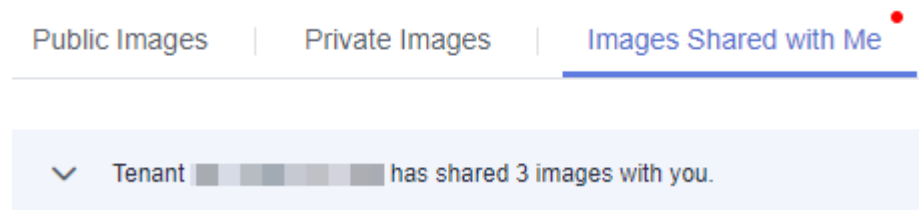
Switch to the region where the shared image is, choose **Service List > Compute > Image Management Service > Images Shared with Me**.

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 3-1](#)) 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 3-1 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?

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.

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](#).

3.2 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.

3.3 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.

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

4 OS

4.1 How Do I Select an OS?

- 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.

4.2 How Is BIOS Different from UEFI?

Table 4-1 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.
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.

4.3 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.

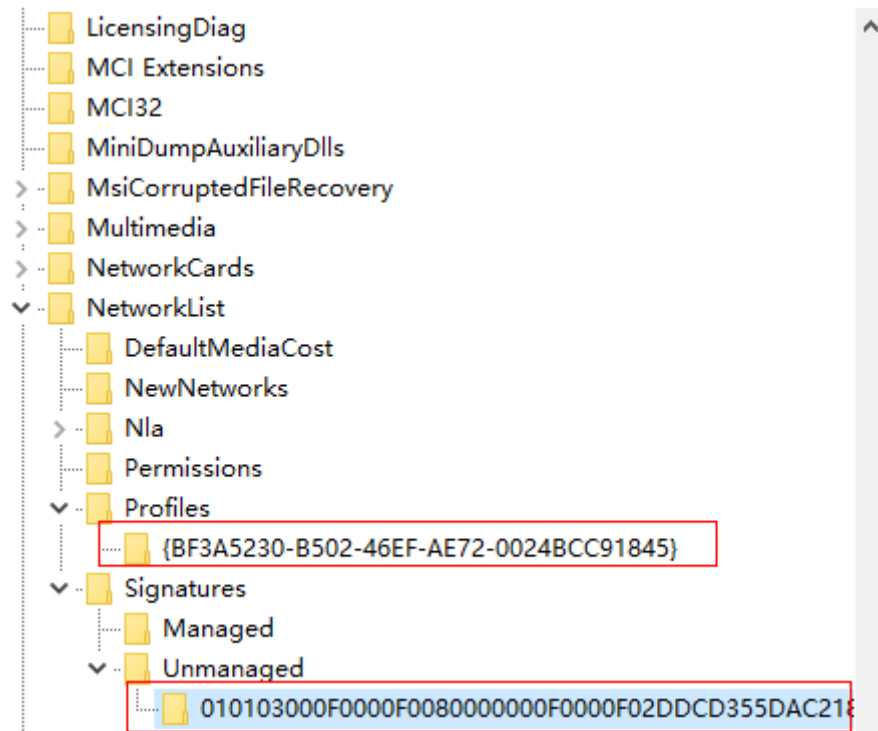
Method 2

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 4-1 Registry directory

4.4 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 4-2 Querying the GRUB file version

```
[root@...centos...]# 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 4-3 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-e0
19-4ba5-8ce0-8fe12b6efc24 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
uiet
```

4.5 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.

5 Image Import

5.1 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](#).

5.2 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.

5.3 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 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](#).

5.4 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.

5.5 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 Image Export

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

Yes. You can download private images in VMDK, VHD, QCOW2, or ZVHD format as instructed in [Exporting an Image](#).

6.2 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.

6.3 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.

Cause Analysis

The size of an image in an OBS bucket varies depending on the file's storage format in the bucket.

6.4 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 Linux ECS](#)
- [Exporting an Image](#)

 NOTE

- Ubuntu public images and the private images created from these public images cannot be exported.
- However, if an Ubuntu private image is created from an external image file, this private image can be exported.

6.5 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 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. The import is fast because the system does not perform any operations like driver injection. 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

Item	Description	Helpful Link
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
Fast export	<p>On the Export Image page, select Enable following Fast Export. 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

6.6 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

7 Image Optimization

7.1 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.

7.2 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.

7.3 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 UUIDs.
- Change disk partition names in the **/etc/fstab** file to UUIDs.
- 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

7.4 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 7-1 ECS configurations

OS	Configuration	Reference
Linux	<ul style="list-style-type: none">• Set the NIC to DHCP.• Install the one-click password reset plug-in.• (Optional) Install Cloud-Init.• Delete files from the network rule directory.• Change the disk identifier in the GRUB configuration file to UUID.• Change the disk identifier 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 7-2 Image file configurations

OS	Configuration	Reference
Linux	<ul style="list-style-type: none">• Delete files from the network rule directory.• Set the NIC to DHCP.• Install native Xen and KVM drivers.• Change the disk identifier in the GRUB configuration file to UUID.• Change the disk identifier 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 7-3 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

OS	Configuration	Reference
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 7-4 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

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

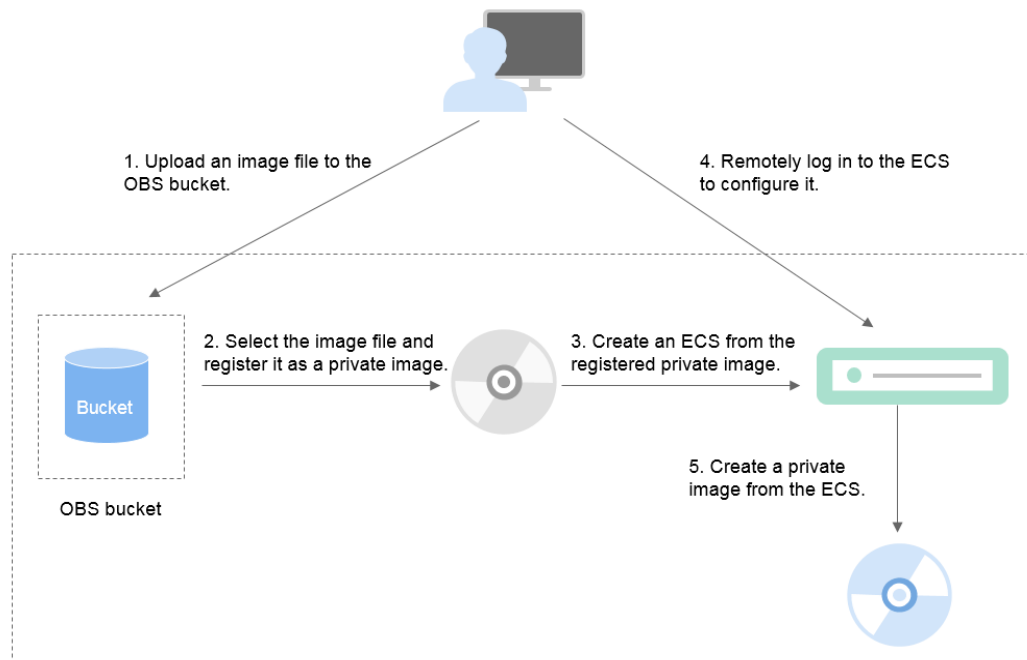
If an image file is not configured as instructed in [Preparing an Image File \(Windows\)](#) before it is exported from the original platform, you can use it to create an ECS, configure the ECS, and use the ECS to create a private image. [Figure 7-1](#) shows the process.

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 7-1 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 \(Windows\)](#).

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 an 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 NICs are set to DHCP by referring to [2](#) in [Step 4: Configure the ECS](#).
 - d. Use MSTSC to log in to the ECS. If the login 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 NICs are set to DHCP. If the ECS is configured with a static IP address, change its IP address assignment mode to DHCP as instructed in [Setting the NIC to DHCP](#).
3. Enable remote desktop connection for the ECS as needed. For details about how to enable this function, see [Enabling Remote Desktop Connection](#).
4. (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.

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

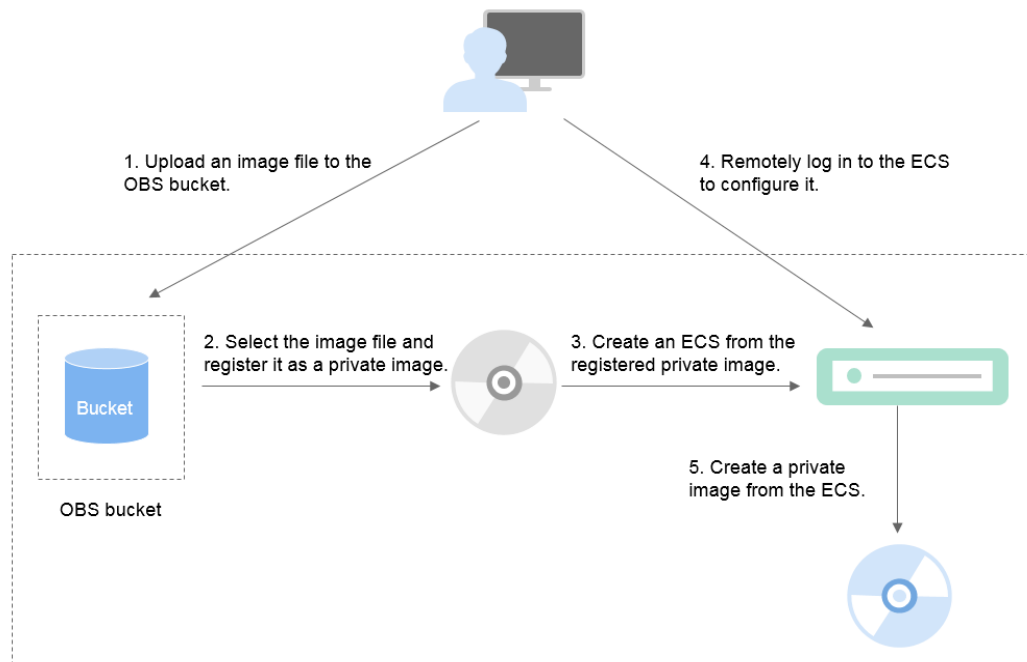
If an image file is not configured as instructed in [Preparing an Image File \(Linux\)](#) before it is exported from the original platform, you can use it to create an ECS, configure the ECS, and use the ECS to create a private image. [Figure 7-2](#) shows the process.

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 7-2 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 an 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 NICs are set to DHCP. If the ECS is configured with a static IP address, change its IP address assignment mode to DHCP as instructed in [Setting the NIC to DHCP](#).
 - Run the **service sshd status** command to check whether 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 the disk identifier in the GRUB configuration file to UUID. For details, see [Changing the Disk Identifier in the GRUB Configuration File to UUID](#).
 - Change the disk identifier in the fstab file to UUID. For details, see [Changing the Disk Identifier 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.

7.7 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, virtualization type, and image 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.
- The Linux public images listed in [Table 7-5](#) support NIC multi-queue.

NOTE

- For Linux ECSs, you are advised to upgrade the kernel to 2.6.35 or later. Otherwise, NIC multi-queue is not supported.

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

Table 7-5 Linux ECSs that support NIC multi-queue

OS	Image	Support for NIC Multi-Queue	Multi-Queue Enabled for Public Images by Default
Linux	Ubuntu 14.04/16.04 Server 64bit	Yes	Yes
	openSUSE 42.2 64bit	Yes	Yes
	SUSE Enterprise 12 SP1/SP2 64bit	Yes	Yes
	CentOS 6.8/6.9/7.0/7.1/7.2/7.3/7.4/7.5/7.6 64bit	Yes	Yes
	Debian 8.0.0/8.8.0/8.9.0/9.0.0 64bit	Yes	Yes
	Fedora 24/25 64bit	Yes	Yes
	EulerOS 2.2 64bit	Yes	Yes

Operation Instructions

Assume that an ECS has the required specifications and virtualization type.

- If the ECS was created from a public image listed in [ECSs Supporting NIC Multi-Queue](#), NIC multi-queue is enabled on the ECS by default. You do not need to enable NIC multi-queue manually.
- If the ECS was created from an external image file with an OS listed in [ECSs Supporting NIC Multi-Queue](#), you may need to perform the following operations to enable NIC multi-queue:

NOTE

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

- a. [Register the External Image File as a Private Image.](#)
- b. [Enable NIC Multi-Queue for the Image.](#)
- c. [Create an ECS from the Private Image.](#)
- d. [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 page providing details about the image.

- 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

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:

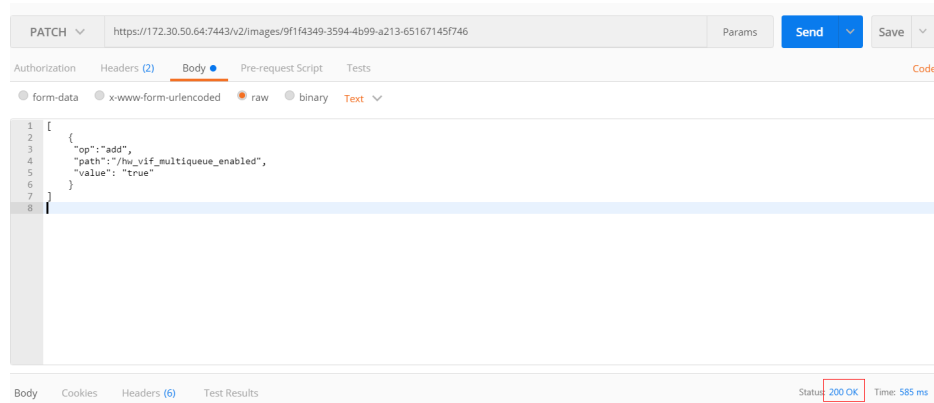
```
PATCH /v2/images/{image_id}
```

The request body is as follows:

```
[
  {
    "op": "add",
    "path": "/hw_vif_multiqueue_enabled",
    "value": "true"
  }
]
```

Figure 7-3 shows an example request body for setting NIC multi-queue.

Figure 7-3 Example request body



Create an ECS from the Private Image

Use the registered private image to create an ECS. For details, see [Purchasing an ECS](#). Note the following when setting the parameters:

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

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

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

7.8 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:

- 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.
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.
- 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.

Procedure

- 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 7-6 Enabling dynamic assignment of IPv6 addresses for different OSs

OS	Automatically/ Manually Enabling	Reference
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.

1. Log in to the management console.
2. Click  in the upper left corner and select the desired region and project.
3. Click . Under **Compute**, click **Elastic Cloud Server**.
4. Click the target ECS to go to the detail page.
5. In the **ECS Information** area, click the VPC name.

6. Click the number in the **Subnets** column.
The **Subnets** page is displayed.
7. In the subnet list, locate the target subnet and click its name.
The subnet details page is displayed.
8. In the **Subnet Information** area, click **Enable** for **IPv6 CIDR Block**.
9. Click **Yes**.

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 7-4 IPv6 disabled

```
eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP qlen 1000
link/ether fa:16:3e: b8:00:00:00:00:00 brd ff:ff:ff:ff:ff:ff
inet 10.0.0.1 brd 10.0.0.255 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 7-5 IPv6 enabled

```
eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
link/ether fa:16:3e: b8:00:00:00:00:00 brd ff:ff:ff:ff:ff:ff
inet 10.0.0.1 brd 10.0.0.255 scope global noprefixroute dynamic eth0
    valid_lft 76391sec preferred_lft 76391sec
inet6 fe80::f816:3e:b8:00:00:00:00:00 /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 7-6 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 7-5](#).

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 7-7](#) lists the download paths of **ipv6-setup-rhel** and **ipv6-setup-debian**.

Table 7-7 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 7-7 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 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 7-8 IPv6 enabled

```
eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
link/ether fa:16:3e: brd ff:ff:ff:ff:ff:ff
inet b d 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 7-9 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
    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 7-8](#).

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 7-10 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 7-11 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 7-12 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 7-13 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 7-14 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 7-15 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/ip6tablef 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 7-16 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

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 7-17 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 7-18 Modification 2

```
154 reload)
155     process_options
156
157     log_action_begin_msg "Reloading network interfaces configuration"
158     state=$(cat /run/network/ifstate)
159     [ -x /usr/bin/timeout 30 ] && ifdown -a --exclude=lo $verbose || true
160     if [ -x /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     [ -x /usr/bin/timeout 30 ] && ifdown -a --exclude=lo $verbose || true
176     set --
177     exclusions=$(onprocess_exclusions)
178     if [ -x /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**.

7.9 How Do I Clean Up the Disk Space of a Windows ECS?

Scenarios

To clean up the disk space of a Windows ECS, you need to perform the following operations.

Disable Virtual Memory

Some disk space of an ECS serves as virtual memory which can be used when the ECS memory is exhausted. However, when the memory usage is high, frequent switching between the memory and virtual memory causes a large number of extra I/Os, which deteriorates the I/O performance. Therefore, you can disable virtual memory to free up disk space on Windows.

An ECS running Windows Server 2008 R2 Standard 64-bit is used as an example to describe how to disable virtual memory.

1. Right-click the **Computer** icon and choose **Properties**. In the displayed window, click **Advanced System Settings**.

2. In the **System Properties** dialog box, click the **Advanced** tab.
3. Click **Settings** in the **Performance** area.
4. In the displayed **Performance Options** dialog box, click the **Advanced** tab and then **Change**. The **Virtual Memory** dialog box is displayed.
5. Delete virtual memory.

In the **Virtual Memory** dialog box, deselect **Automatically manage paging file size for all drives**, select the paging file of the disk whose virtual memory is to be deleted, select **No paging file**, and click **Set**.

CAUTION

If the warning "If you disable the paging file or set the initial size to less than xxx megabytes and a system error occurs, Windows might not record details that could help identify the problem. Do you want to continue?" is displayed, set the initial size to xxx shown in the warning. The partition for storing paging files must have sufficient space. If the disk resources are insufficient, virtual memory will be insufficient. You only need to set virtual memory in one partition of the ECS.

6. Choose **Start > Control Panel > Appearance and Personalization > Show hidden files and folders**. The **Folder Options** dialog box is displayed. Click the **View** tab, deselect **Hide protected operating system files (Recommended)**, and select **Show hidden files, folders, and drives**. When you deselect **Hide protected operating system files (Recommended)**, a warning is displayed, as shown in [Figure 7-19](#). Click **Yes** and then click **Apply**.

Figure 7-19 Warning

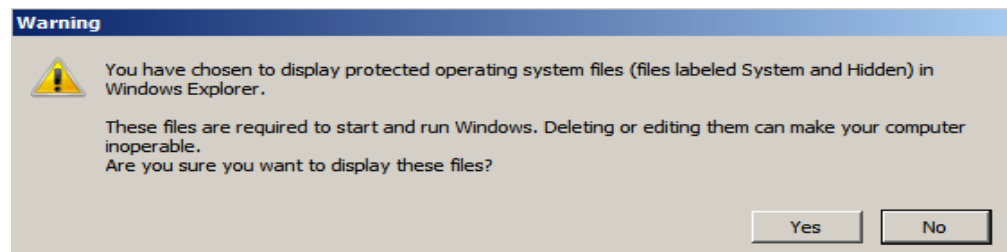
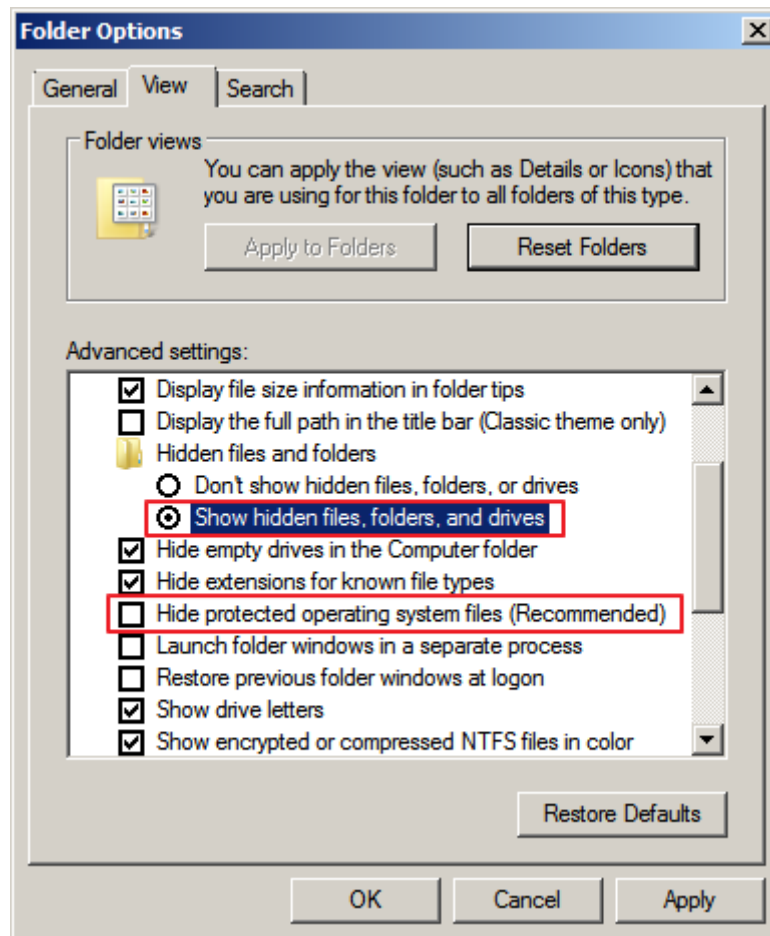


Figure 7-20 Showing hidden files



7. After file hiding is disabled, delete the hidden file **pagefile.sys** from disk C. After the OS is restarted, the available space increases.

Disable Hibernation

An ECS running Windows Server 2008 R2 Standard 64-bit is used as an example to describe how to disable hibernation.

Method 1: Delete the **Hiberfil.sys** file.

The **Hiberfil.sys** file is generated by Windows hibernation and occupies large system disk space. It saves memory data and sessions to disks so that the memory image file required by sessions can be quickly restored after the computer is restarted. Perform the following steps to delete the **Hiberfil.sys** file to free up some disk space:

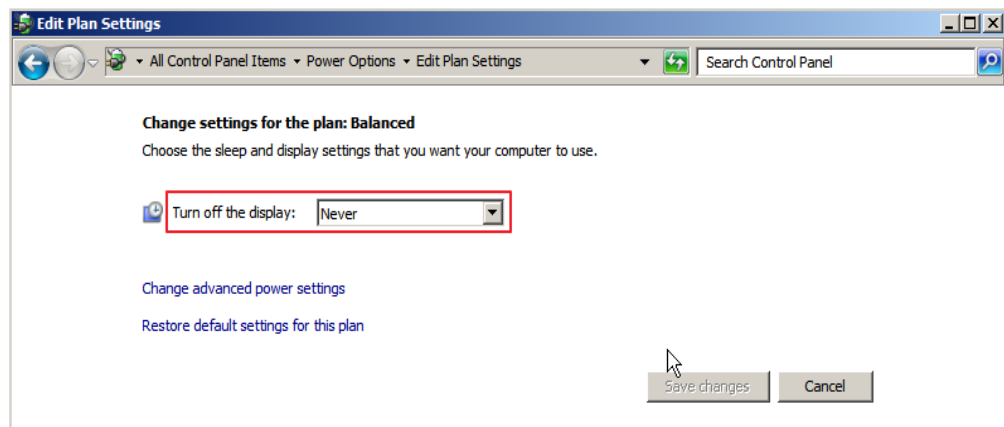
1. Run **cmd.exe** as an administrator to open the command line interface (CLI).
2. Run the following command to disable hibernation (**Hiberfil.sys** file will be automatically deleted):

powercfg -h off

Method 2: Disable hibernation.

1. Choose **Start > Control Panel > Appearance and Personalization > Personalization > Change screen saver** and click **Change plan settings**.

2. In the **Power Options** window, click **Change plan settings** on the right of **Balanced (recommended)**.
3. Set **Turn off the display** to **Never**.

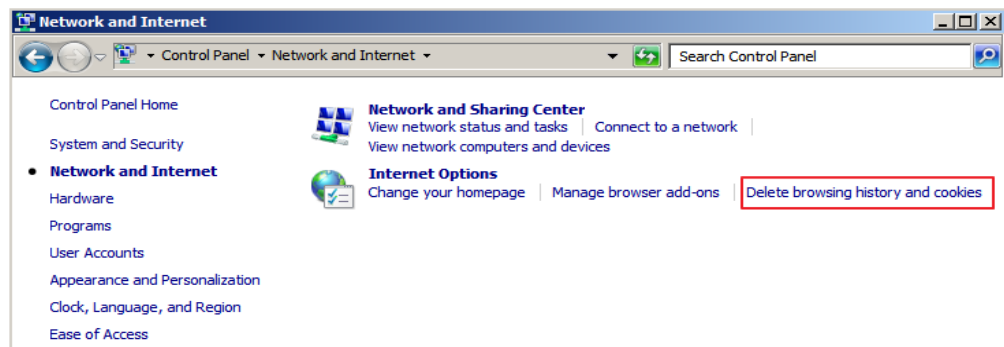


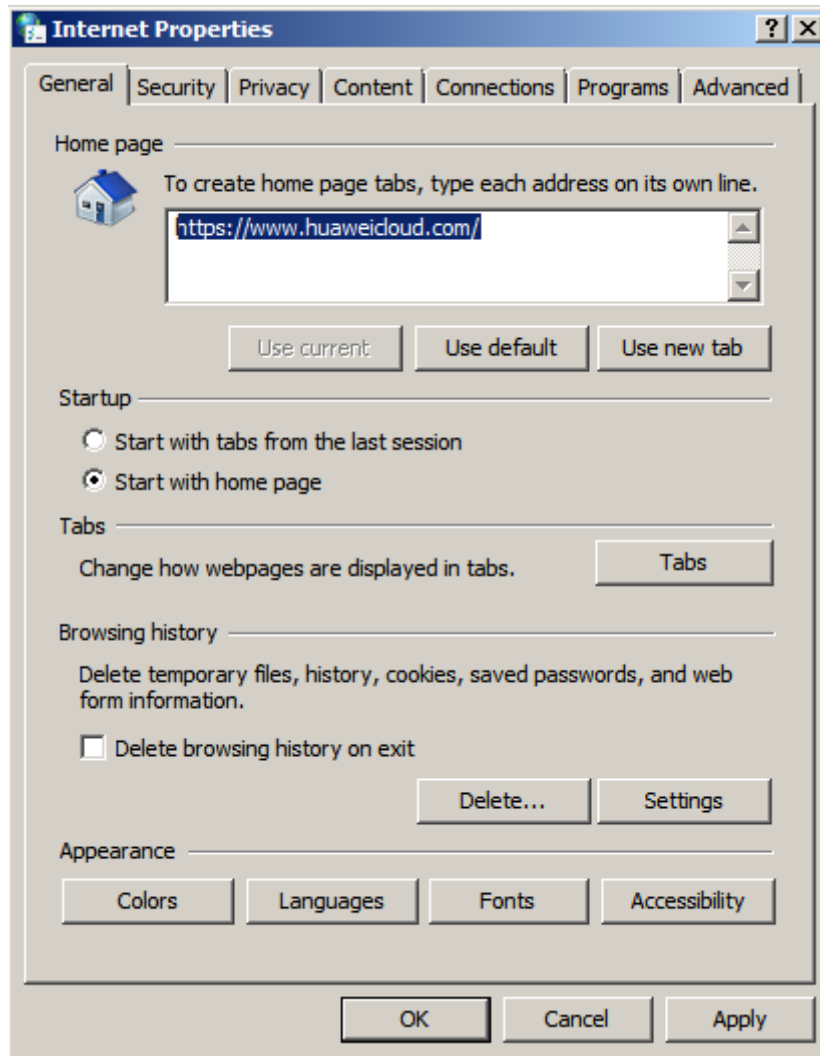
Delete Internet Explorer Temporary Files

An ECS running Windows Server 2008 R2 Standard 64bit is used as an example to describe how to delete temporary files generated by Internet Explorer.

Internet Explorer stores all information about Internet access in a specified folder, including Internet Explorer cache files, cookies files, browsing history, visited websites, URLs in the address bar, and Internet Explorer forms/passwords. Perform the following steps to delete temporary files generated by Internet Explorer:


1. Choose **Start > Control Panel > Network and Internet > Internet Options**. Click **Delete browsing history and cookies** to delete cookies and temporary files of Internet Explorer.





2. After the preceding step is performed, there may be residual files or records left. Open the **C:\Windows\temp** and **C:\Users\Username\AppData\Local\Temp** folders and delete all files in them. (The folders store visited websites and other temporary information.)

 C:\Windows\Temp

 C:\Users\Administrator\AppData\Local\Temp

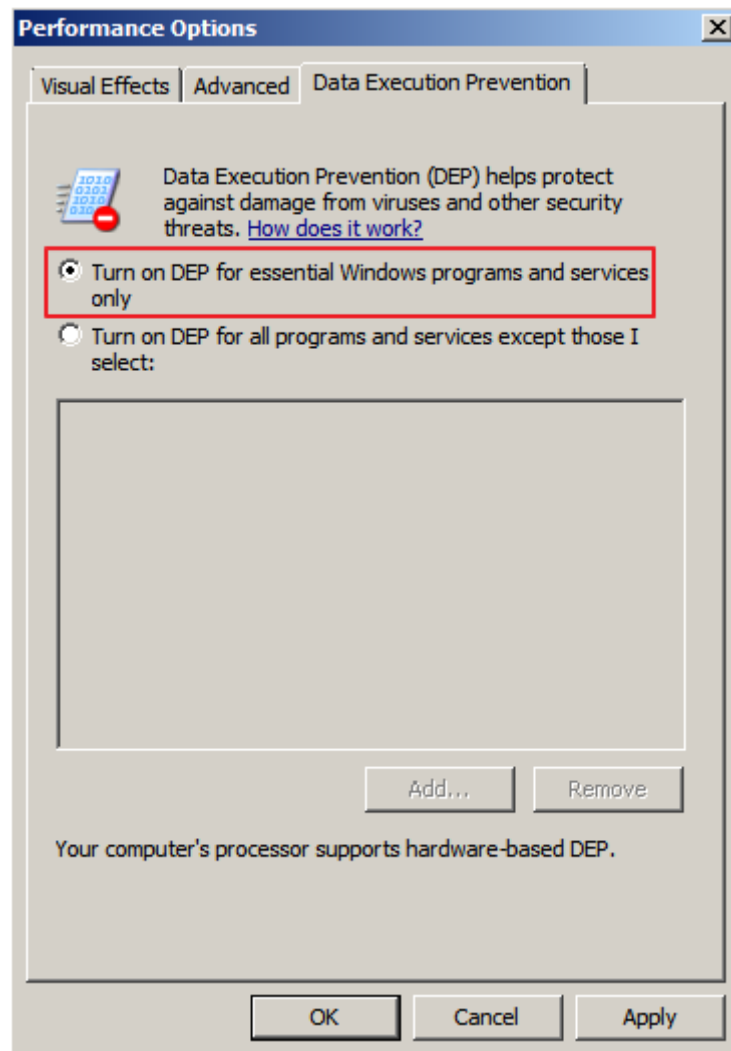
Disable Data Execution Prevention (DEP)

DEP reserves a part of ECS memory for temporarily storing application data and another part of memory for temporarily storing application instructions. This protects ECSs from viruses and other security threats.

An ECS running Windows Server 2008 R2 Standard 64-bit is used as an example to describe how to disable DEP.

1. Right-click the **Computer** icon and choose **Properties**. In the displayed window, click **Advanced System Settings**.
2. In the **System Properties** dialog box, click the **Advanced** tab.

3. Click **Settings** in the **Performance** area.
4. In the **Performance Options** dialog box, click the **Data Execution Prevention** tab, select **Turn on DEP for essential Windows programs and services only**, and click **Apply**.



Delete Redundant Application Files

The **C:\Windows\prefetch** folder stores the index files generated by applications. The files are used to improve system performance and speed up system startup and file reading. However, the number of files increases with time. Deleting redundant files can free up disk space on Windows.

Delete all files in the **C:\Windows\prefetch** folder to delete redundant application files.

Clean Up Disks

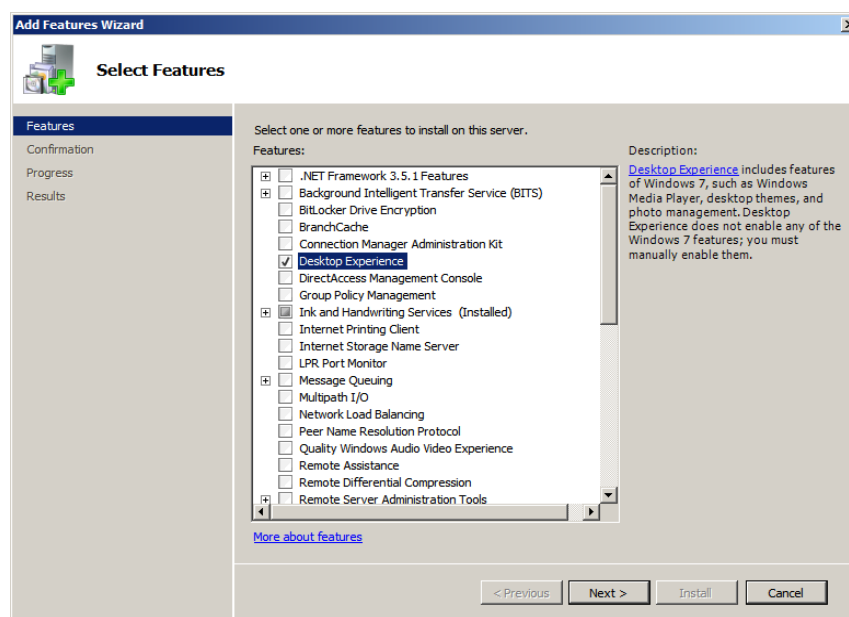
You can use **Disk Cleanup** of ECSs to delete temporary files, empty the recycle bin, and delete redundant system files and other files.

On the ECS, click **Start**. In the search box, enter **Disk Cleanup**. Click the displayed **Disk Cleanup** to scan for the space that can be freed up. After the scan is complete, confirm the files to be deleted and click **OK** to start disk cleanup.

If **Disk Cleanup** is unavailable, you need to install Desktop Experience first. An ECS running Windows Server 2008 R2 Standard 64bit is used as an example to describe how to install Desktop Experience.

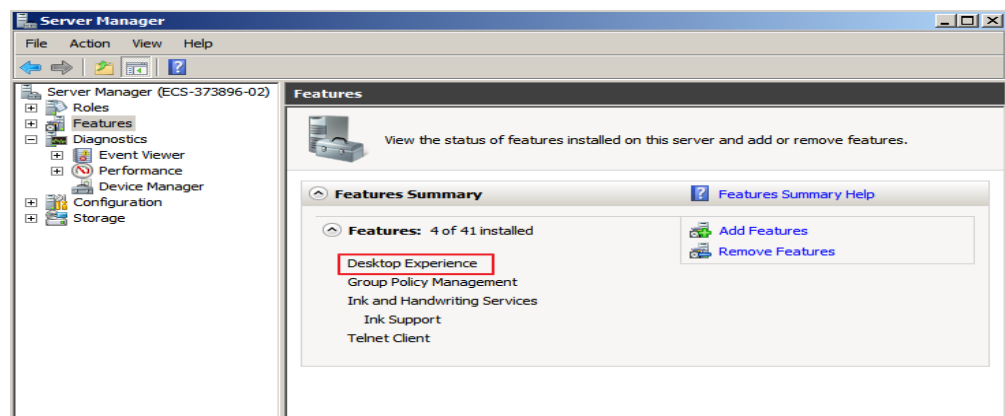
1. Choose **Start > All Programs > Administrative Tools > Server Manager**. In the navigation pane, click **Features**.
2. Click **Add Features**.
3. In the **Select Features** dialog box, select **Desktop Experience** and click **Next**.

Figure 7-21 Installing Desktop Experience



4. In the **Confirm Installation Selections** dialog box, confirm the installation of Desktop Experience, and click **Install**.
5. When the installation progress reaches 100% in the **Results** dialog box, the system prompts you to restart the server. Click **Close**, and then click **Yes** to restart the server.
6. After the server is restarted, start the server manager. In the **Function Summary** area, check whether Desktop Experience is installed.

Figure 7-22 Successful installation of Desktop Experience



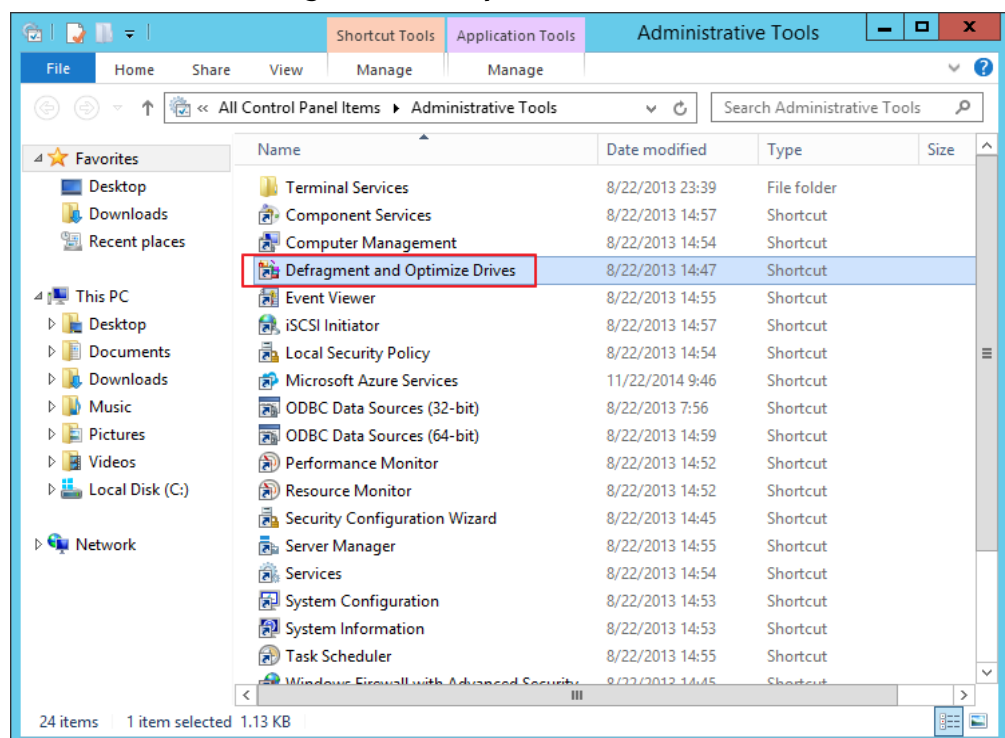
7. Choose **Start > All Programs > Accessories > System Tools > Disk Cleanup** to start the disk cleanup tool.

Defragment and Optimize Drives

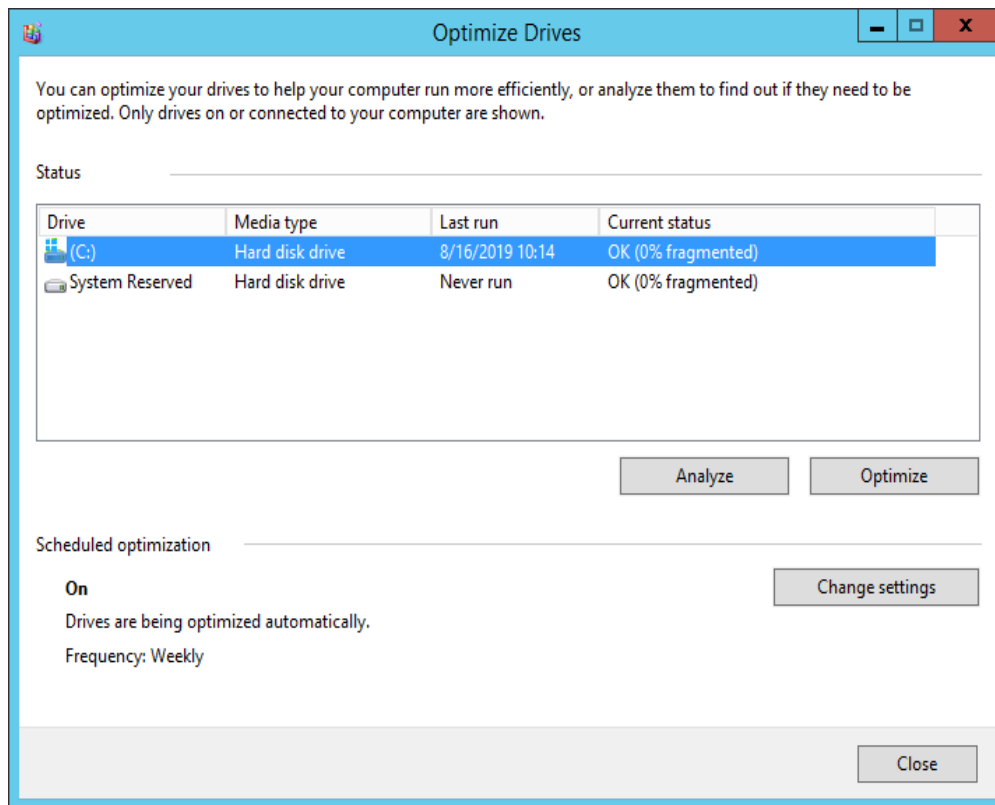
Disk defragmentation is a process in which system software or professional disk defragmentation software is used to organize the fragments generated during the long-term use of disks into the smallest number of contiguous fragments, improving the performance and running speed of the server.

An ECS running Windows Server 2012 R2 Datacenter 64bit is used as an example to describe how to defragment and optimize drives.

1. Choose **Control Panel > All Control Panel Items > Administrative Tools**, and double-click **Defragment and Optimize Drives**.



2. Select the disk partition to be optimized, and then click **Analyze** to analyze whether the disk partition needs to be optimized. If the analysis result indicates that optimization is necessary, click **Optimize**.



Delete .dmp Files

When a blue screen of death (BSOD) occurs on a Windows ECS, the system automatically generates a BSOD error file with the suffix .dmp. A .dmp file is a system error file in Windows, such as **memory.dmp** and **minixxx.dmp**.

You can manually delete .dmp files from disk C to free up system disk space.

CAUTION

After the .dmp file is deleted, the BSOD cause on the ECS cannot be queried.

Clean Up Component Store

Windows Component Store stores all the files required for installing Windows. Updated installation files are also stored in Component Store, which causes the size of Component Store to increase as the update increases.

An ECS running Windows Server 2012 R2 Datacenter 64-bit is used as an example to describe how to clean up Component Store.

1. In Windows PowerShell, run the following command to delete the backup files generated during the Service Pack installation:

dism /online /cleanup-image /spsuperseded

```
PS C:\Users\Administrator> dism /online /cleanup-image /spsuperseded
Deployment Image Servicing and Management tool
Version: 6.3.9600.19408
Image Version: 6.3.9600.19397
Service Pack Cleanup cannot proceed: No Service Pack backup files were found.
The operation completed successfully.
```

2. Run the following command to check the size of Component Store:

Dism.exe /Online /Cleanup-Image /AnalyzeComponentStore

```
PS C:\Users\Administrator> Dism.exe /Online /Cleanup-Image /AnalyzeComponentStore
Deployment Image Servicing and Management tool
Version: 6.3.9600.19408
Image Version: 6.3.9600.19397
[=====99.9%===== ]
Component Store (WinSxS) information:
Windows Explorer Reported Size of Component Store : 7.90 GB
Actual Size of Component Store : 7.75 GB
    Shared with Windows : 4.12 GB
    Backups and Disabled Features : 3.33 GB
    Cache and Temporary Data : 297.92 MB
Date of Last Cleanup : 2019-08-16 11:00:48
Number of Reclaimable Packages : 3
Component Store Cleanup Recommended : Yes
The operation completed successfully.
```

3. Run the following command to clean up Component Store:

Dism.exe /online /Cleanup-Image /StartComponentCleanup

```
PS C:\Users\Administrator> Dism.exe /online /Cleanup-Image /StartComponentCleanup
Deployment Image Servicing and Management tool
Version: 6.3.9600.19408
Image Version: 6.3.9600.19397
[=====100.0%=====]
The operation completed successfully.
PS C:\Users\Administrator> _
```

Delete System Logs

System logs record hardware and software information, system problems, and system events. You can use the logs to locate error causes or track attacker actions. System logs include application logs, security logs, startup logs, and event forwarding logs. The **System32 > LogFiles** folder on disk C of Windows stores the operation logs and event logs of Windows. Deleting the folder can free up the space of disk C.

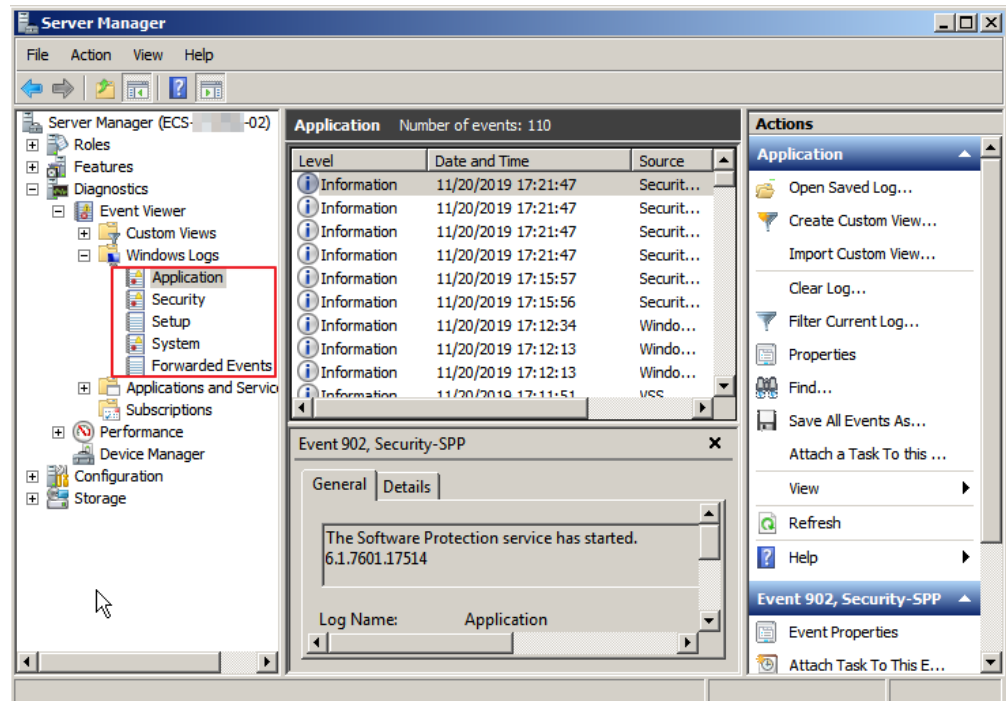
An ECS running Windows Server 2008 R2 Standard 64-bit is used as an example to describe how to delete system logs.

1. Open the **C:\Windows\System32\LogFiles** folder, and delete all the files and folders in it.



C:\Windows\System32\LogFiles

1. Choose **Start**, right-click **Computer**, and choose **Manage** in the shortcut menu.
2. In the displayed window, choose **Diagnostics > Event Viewer > Windows Logs** and delete logs of **Application**, **Security**, **Setup**, **System**, and **Forwarded Events**.



7.10 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 7-23 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.

7.11 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.

7.12 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.
- 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@CTU10000xxxx 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@CTU10000xxxx ~]#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@ CTU10000xxxx 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@ CTU10000xxxx 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:
 - 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
```

8 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.

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?

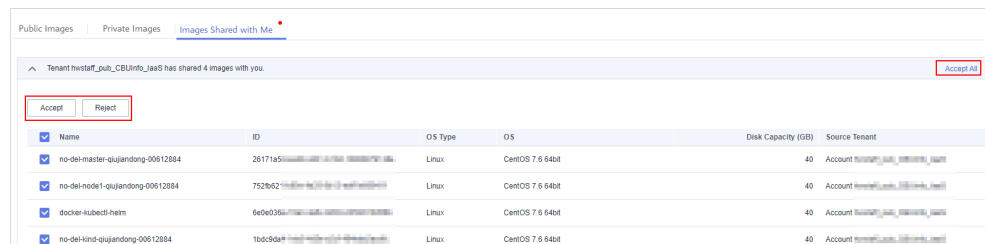
Five.

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 8-1 Accepting or rejecting shared images



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

Figure 8-2 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	CN-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
CN South-Guangzhou	√	√	√	√	√	√	-	√	x	x	x	x	x	x
CN Southwest-Guiyang1	√	√	√	√	√	√	√	-	x	x	x	x	x	x
CN-Hong Kong	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
LA-Mexico City1	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	-

 **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. In this case, whether the replication can be performed is subject to the management console display. The users that were registered before the adjustment are not affected.
- 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?

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.

9 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.

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.

10 Image Encryption

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.
- The key used for encrypting an image cannot be changed.

11 Accounts and Permissions

11.1 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.

11.2 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.

12 Cloud-Init

12.1 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 12-1 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 12-2 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 12-3 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 12-4 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]: F
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 12-5 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 12-6 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 12-7 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': 'rw,relatime,defaults'}
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 mode '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 mode '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 12-8 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**.

12.2 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 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](#).

12.3 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](#).

12.4 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
```

13 ECS Creation

13.1 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, and shared images) and OS. For details, see [Changing the OS](#).

13.2 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.

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

Yes, but you cannot create a system disk smaller than the original and the maximum allowed is 1,024 GB.

13.4 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 UUIDs.

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 configuration file
 - `/boot/grub/grub.conf`
 - `/boot/grub/menu.lst`
 - `/boot/grub/grub.cfg`
 - `/boot/grub2/grub.cfg`
- Syslinux configuration file
 - `/extlinux.conf`

- /boot/syslinux/extlinux.conf
- /boot/extlinux/extlinux.conf
- /boot/syslinux/syslinux.cfg
- /syslinux/syslinux.cfg
- /syslinux.cfg

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

vi /boot/grub/menu.lst

```
default 0
timeout 3
title xxx Server OS - xxxxxx
kernel /boot/vmlinuz-3.0.101-0.47.52-default root=/dev/disk/by-id/scsi-
SATA_QEMU_HARDDISK_QM00001-part5 resume= memmap=0x2000000$0x3E000000
nmi_watchdog=2 crashkernel=512M-:256M console=ttyS0,115200 console=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.

13.5 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 13-1 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 configuration 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 configuration 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.

13.6 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](#).

13.7 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.

14 Billing

14.1 What Are the Billing Standards for IMS?

Billing of Different Image Types

Image Type	Billing
Private	<ul style="list-style-type: none"> System disk image, ISO image, or data disk image: free OBS buckets are used in the background for free image storage. Full-ECS image: charged for the storage on CSBS or CBR. 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.
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>

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.
Replication of a system or data disk image within a region	None. OBS buckets are available for free to store the image copies.
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](#).