Elastic Cloud Server

Getting Started

Issue 06

Date 2022-06-30





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1 Overview

This section describes the methods of purchasing ECSs, and how to register with Huawei Cloud and complete real-name authentication before purchasing ECSs.

Registering with HUAWEI CLOUD and Completing Real-Name Authentication

If you already have an account, skip this part. If you do not have an account, perform the following operations to create an account:

- Visit the HUAWEI CLOUD official website.
- 2. Click **Register** and complete the registration as instructed.

 After the registration, the system automatically redirects you to your personal information page.
- 3. Perform real-name authentication.
 - If your account is an individual account, see Individual Real-Name Authentication.
 - If your account is an enterprise account, see Enterprise Real-Name Authentication.

More information:

- For details about ECS pricing, see **Elastic Cloud Server Pricing Details**.
- Before purchasing ECS resources, ensure that your account balance is sufficient. For details, see Topping Up an Account (Prepaid Direct Customers).

2 Purchasing an ECS

2.1 Overview

Scenarios

ECSs are more cost-effective than physical servers. Within minutes, you can obtain ECS resources from the cloud service platform. ECS resources are flexible and ondemand. This section describes how to purchase an ECS on the management console.

Creation process:

- Step 1: Configure Basic Settings
- Step 2: Configure Network
- Step 3: Configure Advanced Settings
- Step 4: Confirm

Notes

Dedicated physical resources

To run an ECS on isolated physical hardware, apply for a Dedicated Computing Cluster (DCC) before creating the ECS.

For details about DCC, see **Dedicated Computing Cluster User Guide**.

2.2 Step 1: Configure Basic Settings

Basic Settings

- 1. Log in to the ECS console and buy an ECS.
- 2. Select a region.

ECSs in different regions cannot communicate with each other over an intranet. For low network latency and quick resource access, select the nearest region.

3. Select a billing mode, Yearly/Monthly, Pay-per-use, or Spot pricing.

 In Yearly/Monthly billing mode, you can select a required duration. Then, the system deducts the fees incurred at one time based on the service price.

Yearly/Monthly ECSs cannot be deleted. If such an ECS is no longer required, go to the **Elastic Cloud Server** page, click **More** in the **Operation** column of this ECS, and select **Unsubscribe** to unsubscribe it.

- In Pay-per-use billing mode, after configuring basic settings, you do not need to select a required duration. Then, the system deducts the fees incurred based on the service duration.
- In Spot pricing billing mode, your purchased ECS is billed based on the service duration at a lower price than that of a pay-per-use ECS with the same specifications. However, a spot ECS may be reclaimed at any time based on the market price or changes in supply and demand. For more information about spot ECSs, see Spot Pricing ECSs.

4. Select an AZ.

An AZ is a physical location that uses independent power supply and networks. AZs in the same region can communicate with each other over an intranet.

- To enhance application availability, create ECSs in different AZs.
- To shorten network latency, create ECSs in the same AZ.

∩ NOTE

Random AZ allocation is available on the console when you create an ECS. The system will use a hash algorithm to select an AZ as the default AZ based on your universally unique identifier (UUID).

The available ECS types and flavors vary depending on AZs. To view all supported ECS types and flavors on the cloud service platform, set **AZ** to **Random**. Then, the system automatically allocates an AZ according to your selected ECS flavor.

For example, S3 ECSs are available only in AZ 1; S2 ECSs are available in AZ 2 and AZ 3 and have been sold out in AZ 1. If you set **AZ** to **Random**, you can view both S3 and S2 ECSs. If you create an S3 ECS, the system automatically allocates it to AZ 1. If you create an S2 ECS, the system randomly allocates it to AZ 2 or AZ 3.

Set Spot Type.

This parameter is optional and is displayed only when **Billing Mode** is set to **Spot pricing**. You can select **Spot** or **Spot block**. For details, see **Spot Pricing ECSs**.

6. (Optional) Select a CPU architecture.

This configuration is displayed when you select **By Type** for **Instance Selection**.

x86

The x86 CPU architecture uses Complex Instruction Set Computing (CISC). Each instruction can be used to execute low-level hardware operations. There are a large number of instructions and the length of each instruction is different. Therefore, executing such an instruction is complex and time-consuming.

Kunpeng

The Kunpeng CPU architecture uses Reduced Instruction Set Computing (RISC). RISC is a microprocessor that executes fewer types of computer instructions but at a higher speed than CISC. RISC simplifies the computer architecture and improves the running speed. Compared with the x86 CPU architecture, the Kunpeng-based CPU architecture has a more balanced performance and power consumption ratio. Kunpeng features high density, low power consumption, high cost-effectiveness.

7. Set **Specifications**.

The cloud platform provides various ECS types for different application scenarios. You can choose from existing ECS types and flavors in the list. Alternatively, you can enter a flavor or specify vCPUs and memory size to search for the flavor suited to your needs.

□ NOTE

- Before selecting an ECS type, learn about the introduction and notes on each type of ECSs. For details, see ECS Types.
- When purchasing an ECS, sold-out vCPU and memory resources cannot be selected. You can select **Hide sold-out specifications** to hide specifications that have been sold out.

8. Select an image.

Public image

A public image is a standard, widely used image. It contains an OS and preinstalled public applications and is available to all users. You can configure the runtime environment or software in the public image as needed.

Private image

A private image is an image available only to the user who created it. It contains an OS, preinstalled public applications, and the user's private applications. Using a customized private image, you can create ECSs tailored to your needs in batches.

For instructions about how to create a private image, see **Creating a Private Image**.

You can also select an encrypted image. For more information about encrypted images, see **Encrypting Images**.

- If you use a full-ECS image to create an ECS, the EVS disks associated with the full-ECS image do not support the function of creating disks using a data disk image.
- If a full-ECS image is in **Normal** state and the system displays message "Available in AZx", the full-ECS image can be used to create ECSs in this AZ only, and the encryption attributes of the system and data disks of the created ECSs are the same as those of the system and data disks specified in the full-ECS image. Additionally, the SCSI, sharing attribute, and data encryption settings of the system and data disks cannot be modified during ECS creation.
- If a full-ECS image is in **Normal** state but the system does not display message "Available in AZx", the full-ECS image can be used to create ECSs in the entire region, and the encryption attributes of the system and data disks of the created ECSs are the same as those of the system and data disks specified in the full-ECS image. Additionally, the SCSI, sharing attribute, and data encryption settings of data disks can be modified during ECS creation.
- An ISO image created from an ISO file cannot be used to create ECSs. You
 need to install an OS and drivers on the ECS and use the ECS to create a
 system disk image first.
- ECSs created from ISO images cannot be directly used because some functions like disk attachment are restricted.
- To ensure that NIC multi-queue is enabled on an ECS created using a private image, configure NIC multi-queue when creating such a private image. NIC multi-queue routes NIC interrupt requests among multiple vCPUs for higher network packets per second (PPS) and bandwidth.

For details, see How Do I Enable NIC Multi-Queue for an Image?

Shared image

A shared image is a private image shared by another user.

Marketplace image

This parameter is available only when **Billing Mode** is set to **Yearly/Monthly** or **Pay-per-use**. Marketplace images are high-quality third-party images that have OSs, application environments, and software preinstalled. You can use the images to deploy websites and application development environments with a few clicks, and no additional configuration operation is required.

If you use a Marketplace image, after you click **Marketplace image**, the system displays Marketplace images for you to choose from. For example, if the image product is **name1 (test_001)**, **name1** is the image name, and **test_001** is the product name. You can search for your desired Marketplace image by image name or product name. Alternatively, you can click the image name to view more information about the image.

9. (Optional) Set **Protection**.

When using certain public images, you are advised to enable protection to improve the overall security for ECSs. HSS is designed to improve the overall security for ECSs. It reduces intrusion risks with asset management, vulnerability management, intrusion detection, and baseline inspection functions.

Select one of the following options:

 HSS basic edition (free): provides HSS basic edition (1-month free trial), account cracking protection, weak password detection, and malicious program detection.

After the free trial period expires, the HSS basic edition quotas will be automatically released, and HSS will not protect your servers.

If you want to retain or upgrade HSS security capabilities, you are advised to purchase HSS. For details, see **Editions and Features**.

This option is selected by default.

- Advanced HSS edition (paid): provides HSS enterprise edition, vulnerability patches, virus scan and removal, and graded protection.
- None: Do not use security protection.

After you select an HSS edition, the system automatically installs the HSS agent, enables account cracking prevention, and offers host security functions.

HSS provides basic, enterprise, premium, and WTP editions. Switch between these editions on the HSS management console. For details about the differences among editions, see **Editions Details**.

10. (Optional) Set License Type.

Specifies a license type for using an OS or software. This parameter is displayed only when the selected image is billed.

Bring your own license (BYOL)
 Allows you to use your existing OS license. In such a case, you do not need to apply for a license again.

For more information about license types, see License Types.

11. Set System Disk and Data Disk if required.

Disks are classified as EVS disks and DSS disks based on whether the storage resources used by the disks are dedicated. DSS disks allow you to use dedicated storage resources.

- If you have requested for a storage pool on the DSS page, click the DSS tab and create disks in the obtained storage pool.
- If you have not requested for a dedicated storage pool, click the **Disks** tab and create EVS disks that use public storage resources.

- When you use DSS resources to create a disk, the disk type must be the same as that of the requested storage pool. For example, both are of high I/O type.
- For more information about DSS, see *Dedicated Distributed Storage Service*.
- System disk

For details about the disk types supported by ECS, see **Disk Types and Performance**.

- If the image based on which an ECS is created is not encrypted, the system disk of the ECS is not encrypted. If the image based on which an ECS is created is encrypted, the system disk of the ECS is automatically encrypted. For details, see (Optional) Encryptionrelated parameters.
- Data disk

You can create multiple data disks for an ECS and enable required functions for each data disk. When creating an ECS, you can add up to 23

data disks with customized sizes to it. After the ECS is created, you can add up to 23 VBD disks or 59 SCSI disks to it.

Click **Show** → and set the following functions if required:

- SCSI: indicates that the device type of the data disk is SCSI if you select this option. For more information about SCSI disks and the ECSs that can be attached with SCSI disks, see Device Types and Usage Instructions.
- Share: indicates that the EVS disk is sharable if you select this option. Such an EVS disk can be attached to multiple ECSs.
- Encryption: indicates that the data disk is encrypted if you select this option. For details, see (Optional) Encryption-related parameters.
- (Optional) Encryption-related parameters

To enable encryption, click **Create Xrole** to assign KMS access permissions to EVS. If you have rights granting permission, assign the KMS access permissions to EVS. If you do not have the permission, contact the user having the security administrator rights to assign the KMS access permissions.

- **Encryption**: indicates that the EVS disk has been encrypted.
- Create Xrole: assigns KMS access permissions to EVS to obtain KMS keys. After the permissions are assigned, follow-up operations do not require assigning permissions again.
- Xrole Name: EVSAccessKMS: specifies that permissions have been assigned to EVS to obtain KMS keys for encrypting or decrypting EVS disks.
- KMS Key Name: specifies the name of the key used by the encrypted EVS disk. You can select an existing key, or click Create KMS Key and create a new one on the KMS console. The default value is evs/ default.
- KMS Key ID: specifies the ID of the key used by the encrypted data disk.

□ NOTE

If you detach the system disk purchased when you buy a yearly/monthly ECS and want to continue using it as a system disk, you can only attach it to the original ECS. If you want to use it as a data disk, you can attach it to any ECS.

If you detach the non-shared data disk purchased when you buy a yearly/monthly ECS and want to attach it again, you can only attach it to the original ECS as a data disk.

The data disk purchased when you buy a yearly/monthly ECS does not support separate renewal, unsubscription, automatic service renewal, conversion to pay-peruse payment, and release.

12. Click Next: Configure Network.

2.3 Step 2: Configure Network

Network Settings

1. Set **Network** by selecting an available VPC and subnet from the drop-down list and specifying a private IP address assignment mode.

VPC provides a dedicated network for your ECS. A VPC can contain subnets for further isolation. You can configure security groups per subnet to control access to cloud resources.

You can select an existing VPC or create a new one.

For more information about VPC, see Virtual Private Cloud.

- Ensure that DHCP is enabled in the VPC to which the ECS belongs.
- When you use VPC for the first time, the system automatically creates a VPC for you, including the security group and NIC.
- 2. (Optional) Add an extension NIC. You can add multiple extension NICs to an ECS and specify IP addresses for them (including primary NICs).

◯ NOTE

If you specify an IP address for a NIC when creating multiple ECSs in a batch:

- This IP address serves as the start IP address.
- Ensure that the IP addresses required by the NICs are within the subnet, consecutive, and available.
- The subnet with the specified IP address cannot overlap with other subnets.
- IPv6 not required/Automatically-assigned IPv6 address: This parameter is available only if the ECS is of specific flavors and in a VPC with IPv6 enabled. For details about how to enable IPv6 on a subnet, see IPv4 and IPv6 Dual-Stack Network. For details about how to check whether an ECS supports IPv4/IPv6 dual stack, see "Constraints" in Dynamically Assigning IPv6 Addresses.

By default, the system assigns IPv4 addresses. If you select **Automatically-assigned IPv6 address**, the system assigns IPv6 addresses. In a VPC, an ECS uses an IPv6 address to access the dual-stack intranet. To access the Internet, you must enable **IPv6 Bandwidth** and select a shared bandwidth. Then, the ECS accesses the IPv6 Internet through the IPv6 address.

After purchasing an ECS, enable IPv6 so that the ECS dynamically obtains an IPv6 address. For details, see **Dynamically Assigning IPv6 Addresses**.

□ NOTE

- IPv6 can be enabled only during ECS creation, and the configuration cannot be modified after the ECS is created. If **IPv6 Bandwidth** is not enabled when you create an ECS, you can enable it after the ECS is created.
- Dedicated bandwidth is not supported.
- 3. Set **Security Group** by selecting an available security group from the drop-down list or creating a new one.

A security group controls ECS access within or between security groups by defining access rules. This enhances ECS security.

When creating an ECS, you can select multiple (recommended not more than five) security groups. In such a case, the access rules of all the selected security groups apply on the ECS.

◯ NOTE

Before initializing an ECS, ensure that the security group rules for the outbound direction meet the following requirements:

Protocol: TCPPort Range: 80

• Remote End: 169.254.0.0/16

If you use the default security group rules for the outbound direction, the preceding requirements are met, and the ECS can be initialized. The default security group rules for the outbound direction are as follows:

Protocol: ANYPort Range: ANYRemote End: 0.0.0.0/16

Set EIP.

An EIP is a static public IP address bound to an ECS in a VPC. Using the EIP, the ECS provides services externally.

The following options are provided:

Auto assign

The system automatically assigns an EIP for the ECS. The EIP provides a dedicated bandwidth that is configurable.

Use existing

An existing EIP is assigned for the ECS. When using an existing EIP, you are not allowed to create ECSs in a batch.

Not required

Without an EIP, the ECS cannot access the Internet and is used in the private network or cluster only.

□ NOTE

For a yearly/monthly ECS, **Auto assign** is unavailable to **EIP**. If an EIP is required, bind an existing EIP to the ECS. Alternatively, purchase an EIP that is billed in pay-per-use payment and then bind the EIP to the ECS.

5. Set **EIP Type**.

- Dynamic BGP provides automatic failover and load balancing capabilities and makes better routing decisions based on optimal paths when a network connection fails.
- Static BGP offers routing control and protects against route flapping, but cannot choose an optimal path in real time when a network connection fails.

6. Set Billed By.

This parameter is mandatory when **EIP** is set to **Auto assign**. If you select **Bandwidth** or **Traffic**, the system will allocate a dedicated bandwidth for you, and the bandwidth is dedicated for one EIP.

- Bandwidth: The billing will be based on the duration for which the bandwidth is used.
- **Traffic**: The billing will be based on the total traffic irrespective of the duration for which the bandwidth is used.
- Shared bandwidth: The bandwidth can be used by multiple EIPs.

- A bandwidth can be shared among a limited number of EIPs. If the number of EIPs cannot meet service requirements, switch to a higher shared bandwidth or apply for expanding the EIP quota of the existing bandwidth.
- EIPs that are billed yearly/monthly do not support shared bandwidths.
- When a shared bandwidth that is billed yearly/monthly expires, the system automatically deletes the bandwidth configuration and creates a dedicated bandwidth billed by traffic for the EIPs sharing the deleted bandwidth configuration.
- 7. Set **Bandwidth Size**.
 - Select the bandwidth based on service requirements. The unit is Mbit/s.
- 8. Click Next: Configure Advanced Settings.

2.4 Step 3: Configure Advanced Settings

Advanced Settings

1. Set ECS Name.

The name can be customized but can contain only letters, digits, underscores (_), hyphens (-), and periods (.).

If you want to purchase multiple ECSs at a time, the system automatically sequences these ECSs.

If multiple ECSs are created at the same time, the system automatically adds a hyphen followed by a four-digit incremental number to the end of each ECS name. For example, if you enter ecs, the ECSs will be named ecs-0001, ecs-0002, If you create multiple ECSs again, the values in the new ECS names increase from the existing maximum value. For example, the existing ECS with the maximum number in name is ecs-0010. If you enter ecs, the names of the new ECSs will be ecs-0011, ecs-0012, When the value reaches 9999, it will start from 0001.

Allow duplicate name: allows ECS names to be duplicate. If you select **Allow duplicate name** and create multiple ECSs in a batch, the created ECSs will have the same name.

The name of a Windows ECS can contain a maximum of 15 characters and must be unique. Otherwise, some Windows applications cannot be used.

The **ECS Name** set in this step will be the initial host name in the ECS OS.

Consecutive periods (.) or hyphens (-) will be replaced with the first character to prevent unknown issues.

2. Set Login Mode.

Key pair authentication is more secure than password authentication. If you select **Password**, ensure that the password meets complexity requirements listed in **Table 2-1** to prevent malicious attacks.

Key pair

A key pair is used for ECS login authentication. You can select an existing key pair, or click **Create Key Pair** and create a desired one.

□ NOTE

If you use an existing key pair, make sure that you have saved the key file locally. Otherwise, logging in to the ECS will fail.

Password

A username and its initial password are used for ECS login authentication.

The initial password of user **root** is used for authenticating Linux ECSs, while that of user **Administrator** is used for authenticating Windows ECSs.

The passwords must meet the requirements described in Table 2-1.

Table 2-1 Password complexity requirements

Parameter	Requirement	Example Value
Password	 Consists of 8 to 26 characters. Contains at least three of the following character types: Uppercase letters Lowercase letters Digits Special characters for Windows: \$! @%=+[]:./,? Special characters for Linux: !@%=+[]:./^,{}? Cannot contain the username or the username spelled backwards. Cannot contain more than two consecutive characters in the same sequence as they appear in the username. (This requirement applies only to Windows ECSs.) Cannot start with a slash (/) for Windows ECSs. 	YNbUwp! dUc9MClnv NOTE The example password is generated randomly. Do not use it.

■ NOTE

The system does not periodically change the ECS password. It is recommended that you change your password regularly for security.

Set password later

The password for logging in to the ECS is not configured during the ECS creation. After the ECS is created, select **Reset Password** in the **Operation** column, set a password for the ECS as prompted, and log in to the ECS.

3. Set Cloud Backup and Recovery.

Cloud Backup and Recovery (CBR) provides backup protection for EVS disks and ECSs, and uses backups to restore the EVS disks and ECSs. After you set **Cloud Backup and Recovery**, the system binds the target ECS to the cloud backup vault and associates the ECS with the selected backup policy to periodically back up the ECS.

For CBR pricing details, see How Is CBR Billed?

The following options are provided:

- Create new
 - Set the name of the cloud backup vault, which consists of 1 to 64 characters, containing only letters, digits, underscores (_), and hyphens (-). For example, vault-f61e. The default naming rule is vault xxxx.
 - ii. Enter the vault capacity, which is required for backing up the ECS. The vault capacity cannot be smaller than that of the ECS to be backed up. Its value ranges from the total capacity of the ECS to 10,485,760 in the unit of GB.
 - iii. Select a backup policy from the drop-down list, or log in to the CBR console and configure a desired one.
- Use existing
 - i. Select an existing cloud backup vault from the drop-down list.
 - i. Select a backup policy from the drop-down list, or log in to the CBR console and configure a desired one.
- Not required

Skip this configuration if CBR is not required. If you need to enable CBR after creating an ECS, log in to the CBR console, locate the target vault, and bind the ECS to the vault.

4. Configure Cloud Eye.

If you select certain public images, it is a good practice to enable detailed monitoring to collect OS metrics. These metrics help you understand the resource utilization and locate a fault.

After you enable detailed monitoring, an agent will be automatically installed on the ECS to provide 1-minute fine-grained monitoring of ECS metrics, such as CPU, memory, network, disk, and process.

For details about the monitoring metrics after the agent is installed, see OS Monitoring Metrics Supported by ECSs with the Agent Installed.

5. Set ECS Group (Optional).

An ECS group applies the anti-affinity policy to the ECSs in it so that the ECSs are automatically allocated to different hosts. This configuration is optional. For instructions about how to create an ECS group, see **Managing ECS Groups**.

An existing ECS attached with a local disk cannot be added to an ECS group. To use ECS group functions, select an ECS group when creating an ECS.

- 6. To use functions listed in **Advanced Options**, select **Configure now**. Otherwise, do not select it.
 - User Data

You can specify the user data. The user data will be automatically passed to the ECS when the ECS starts for the first time. This configuration is optional.

- **As text**: allows you to enter the user data in the text box.
- As file: enables the text to automatically inject a script file or other files into a specified directory on an ECS when you create the ECS.

For example, if you activate user **root** permission by passing a script file to an ECS, you can log in to the ECS as user **root**.

For detailed operations, see Passing User Data to ECSs.

Tag

This configuration is optional. You can tag an ECS to facilitate identification and management. You can add up to 10 tags to an ECS.

Tags added during ECS creation will also be added to the created EIP and EVS disks (including the system disk and data disks) of the ECS. If the ECS uses an existing EIP, the tags will not be added to the EIP.

After creating the ECS, you can view the tags on the pages providing details about the ECS, EIP, and EVS disks.

For details, see **Tag Management**.

Agency

This configuration is optional. When your ECS resources need to be shared with other accounts, or your ECS is delegated to professional personnel or team for management, the tenant administrator creates an agency in IAM and grants the ECS management permissions to the personnel or team. The delegated account can log in to the cloud system and switch to your account to manage resources. You do not need to share security credentials (such as passwords) with other accounts, ensuring the security of your account.

If you have created an agency in IAM, you can select the agency from the drop-down list and obtain specified operation permissions. For more information about agencies, see **Account Delegation**.

7. Click **Next: Confirm**.

2.5 Step 4: Confirm

Confirming the Order

On the Confirm page, view details about the ECS configuration.
 To learn more about the price, click Pricing details.

- 2. Select the required duration and quantity for the ECS.
 - Required Duration: sets the service duration if you select the Yearly/ Monthly billing mode. The service duration ranges from one month to three years.

You can select **Auto-renew** to automatically renew yearly/monthly resources when they expire.

- Monthly: Your subscription will be automatically renewed each month.
- Yearly: Your subscription will be automatically renewed each year.

For details about auto-renewal, see Auto-Renewal Rules.

- **Quantity**: sets the number of ECSs to be created.

The remaining number of ECSs you are allowed to create is displayed. To ensure effective resource usage, an upper limit is set on the ECSs to be created. If the number of ECSs you need exceeds the maximum number of ECSs you are allowed to create, you can click **Increase Quota** to apply for a higher quota. You can purchase the ECSs you need after the request is approved.

- ECS Price: shows the ECS configuration fee.
 For details, click Pricing details.
- 3. Read the agreement and select the **Agreement** option.
- Confirm the configuration and click **Submit**.
 After the ECS is created, it will be started by default.

Follow-up Procedure

• If your ECS is created using a private image that is created using an external image file, and the ECS has no one-click password reset plug-in installed, it is a good practice to install the password reset plug-in after you log in to the ECS. If your login password is forgotten or expires, you can use the one-click password reset function to set a new password for the ECS.

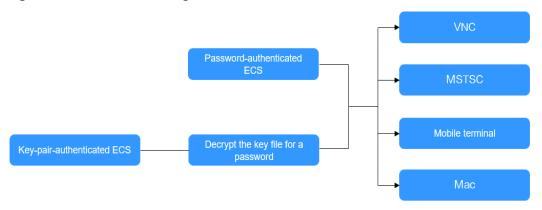
For details, see (Optional) Installing the One-Click Password Reset Plug-in on an ECS.

3 Logging In to an ECS

Logging In to a Windows ECS

Figure 3-1 shows the modes in which a Windows ECS can be logged in.

Figure 3-1 Windows ECS login modes



1. (Optional) Retrieve your password from the key file.

To log in to a key-pair-authenticated ECS, use the password obtaining function provided by the management console to decrypt the key file used during ECS creation to obtain a password.

For details, see Obtaining the Password for Logging In to a Windows ECS.

- 2. Select a login method and log in to the ECS.
 - Using VNC on the management console
 The login username is Administrator.
 For details, see Login Using VNC.
 - Using MSTSC

The login username is **Administrator**, and the ECS must have an EIP bound.

For details, see Login Using MSTSC.

From a mobile terminal

The login username is **Administrator**, and the ECS must have an EIP bound.

For details, see Logging In to a Windows ECS from a Mobile Terminal.

From a Mac

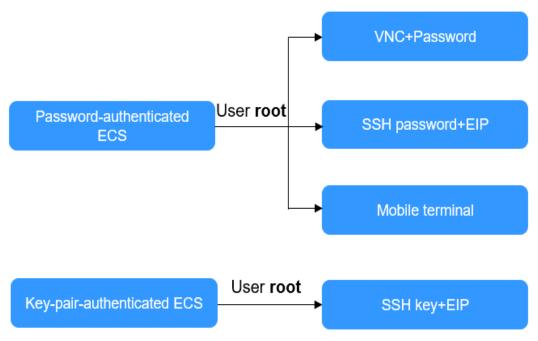
The login username is **Administrator**, and the ECS must have an EIP bound.

For details, see Logging In to a Windows ECS from a Mac.

Logging In to a Linux ECS

The method of logging in to an ECS varies depending on the login authentication configured during ECS creation.

Figure 3-2 Linux ECS login modes



- To log in to a password-authenticated ECS for the first time, use one of the following methods:
 - Using VNC on the management console with login username root
 For details, see Login Using VNC.
 - Using an SSH password
 The login username is root, and the ECS must have an EIP bound.
 For details, see Login Using an SSH Password.
 - From a mobile terminal
 The login username is root, and the ECS must have an EIP bound.
 For details, see Logging In to a Linux ECS from a Mobile Terminal.
- To log in to a key-pair-authenticated ECS for the first time, use a tool, such as PuTTY or XShell, and the desired SSH key as user **root**. Ensure that the ECS has an EIP bound.

For instructions about how to log in to a Linux ECS using an SSH key, see **Login Using an SSH Key**.

□ NOTE

If you want to log in to an ECS using VNC provided on the management console, log in to the ECS using an SSH key, configure the login password, and use the password for login.

Follow-up Procedure

- If you have added a data disk during ECS creation, you must initialize the data disk after logging in to the ECS.
 - For details, see **Scenarios and Disk Partitions**.
- Certain ECSs require the installation of a driver after you log in to them. For details about available ECS types as well as their functions and usage, see "Notes" in ECS Types.

4 Initializing EVS Data Disks

4.1 Scenarios and Disk Partitions

If you have added a data disk during ECS creation, you must initialize the data disk after logging in to the ECS.

Scenarios

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

System disk

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

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

In both cases, you must initialize the data disk before using it. Choose an appropriate partition style based on your service plan.

Partitioning Operation Guide

Table 4-1 lists the common disk partition styles. In Linux, different disk partition styles require different partitioning tools.

Table 4-1 Disk partition styles

Disk Partition Style	Maximum Disk Capacity Supported	Maximum Number of Partitions Supported	Linux Partitioning Tool
Master Boot Record (MBR)	2 TiB	 4 primary partitions 3 primary partitions and 1 extended partition With MBR, you can create several primary partitions and one extended partition. The extended partition must be divided into logical partitions before use. For example, if 6 partitions need to be created, you can create them in the following two ways: 3 primary partitions and 1 extended partition, with the extended partition divided into 3 logical partitions 1 primary partition and 1 extended partition, with the extended partition divided into 5 logical partitions 	• fdisk • parted
GUID Partition Table (GPT)	18 EiB 1 EiB = 1048576 TiB	Unlimited Disk partitions created using GPT are not categorized.	parted

4.2 Initializing Windows Data Disks Using Script

Scenarios

This section uses Windows Server 2008 R2 Enterprise 64bit to describe how to automatically initialize data disks attached to a server running Windows.

The formatting procedure varies depending on the server OS. This section is for reference only.

NOTICE

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

Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
 - For how to log in to an ECS, see Logging In to an ECS.
 - For how to log in to a BMS, see **Logging In to the BMS**.

Constraints

- This script uses the NTFS file system and MBR partition style by default.
- This script does not support the initialization of disks that form Windows logical volume groups.
- This script supports the initialization of up to 23 Windows data disks.
- Only data disks in Windows simplified Chinese and English can be initialized.

Manually Executing the Script to Initialize Windows Data Disks

- Step 1 Log in to the server, visit https://ecs-instance-driver.obs.cn-north-1.myhuaweicloud.com/datadisk/WinVMDataDiskAutoInitialize.ps1 to obtain the automatic disk initialization script, and save it to C:\Windows\System32.
- **Step 2** On the server desktop, click **Start**, right-click **Windows PowerShell**, and choose **Run as administrator** from the shortcut menu.

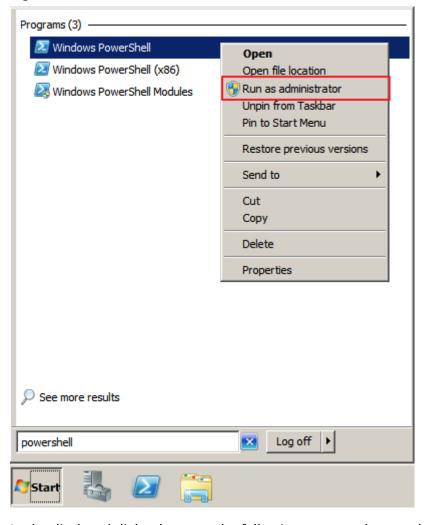


Figure 4-1 Run Windows PowerShell as administrator

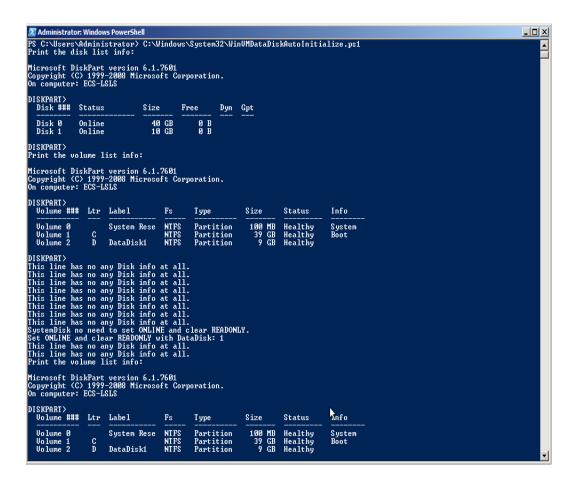
Step 3 In the displayed dialog box, run the following command to set the script execution policy:

Set-ExecutionPolicy - ExecutionPolicy Bypass - Force

Step 4 Run the following command in the dialog box to execute the initialization script:

C:\Windows\System32\WinVMDataDiskAutoInitialize.ps1

Information similar to the following is displayed:



MOTE

If the command output shows that PowerShell cannot load the file, the reason is that the Windows system policy does not allow the PowerShell script downloaded from the network to be executed when the script is not signed.

To solve this problem, run the **set-ExecutionPolicy RemoteSigned** command and restart PowerShell.

Step 5 (Optional) On the Disk Management page, view the initialization result.

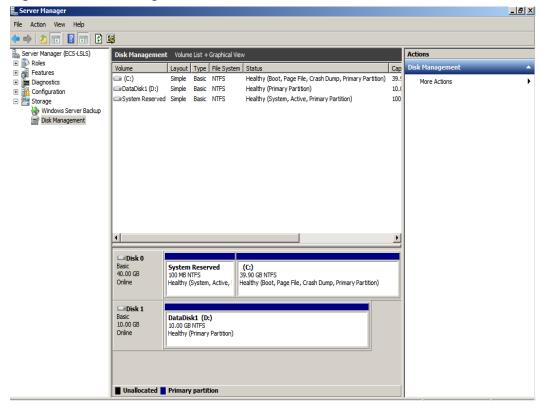


Figure 4-2 Disk Management

----End

Configuring Automatic Initialization of Windows Data Disks

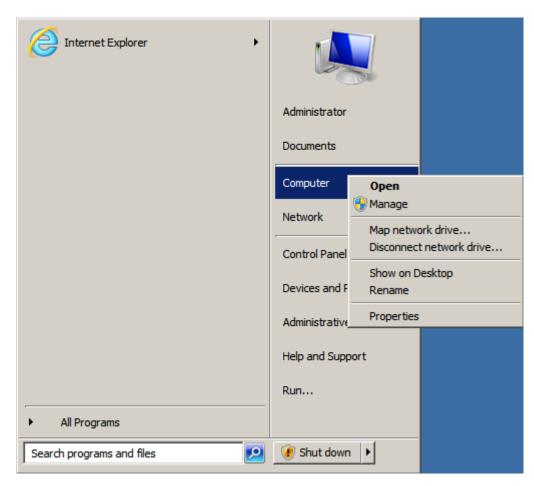
You can configure automatic initialization for Windows data disks. After the configuration is complete, new disks purchased and attached to this server will be automatically initialized after the server is logged in to again.

Ⅲ NOTE

To enable automatic initialization of Windows data disks on multiple servers, configure automatic initialization on one server, create a private image for this server, and use the image to batch create servers.

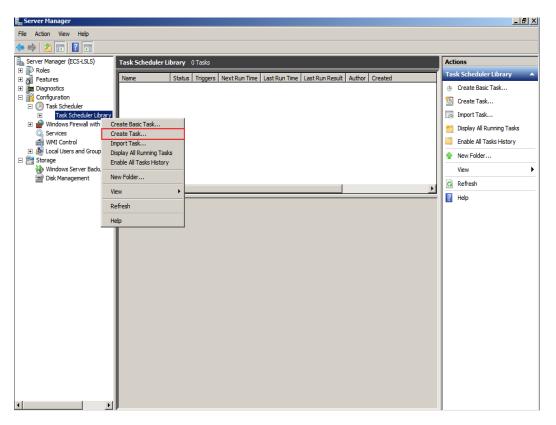
Step 1 On the server desktop, click **Start**, right-click **Computer** in the list, and choose **Manage** from the shortcut menu.

The **Server Manager** window is displayed.



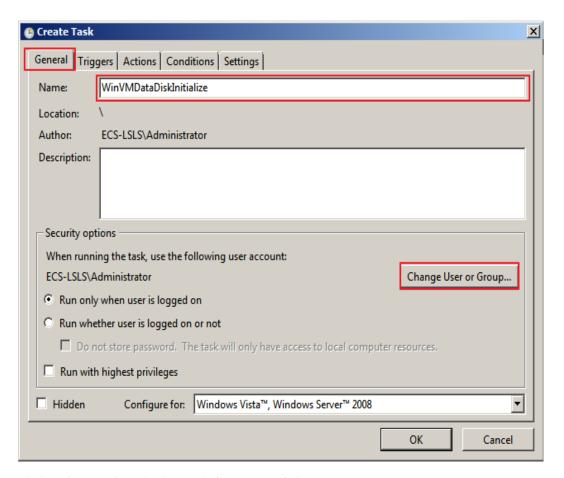
Step 2 In the navigation tree on the left, choose **Configuration** > **Task Scheduler** > **Task Scheduler** Library, then right-click and choose **Create Task** from the shortcut menu.

The Create Task page is displayed.



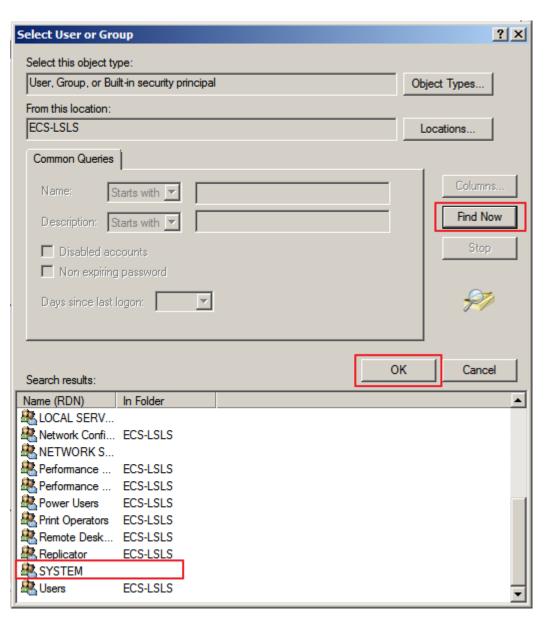
Step 3 On the displayed page, click the **General** tab, enter **WinVMDataDiskInitialize** in the **Name** text box, and click **Change User or Group**.

The **Select User or Group** page is displayed.

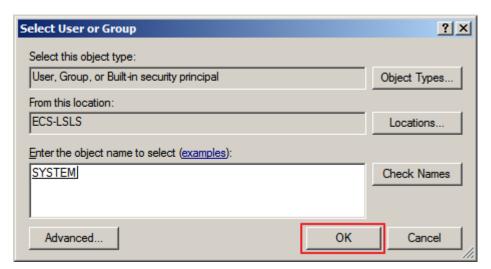


- **Step 4** Click **Advanced** in the lower left corner of the page.
- **Step 5** Click **Find Now** to the right of the page. In the search result list, select **SYSTEM** and click **OK**.

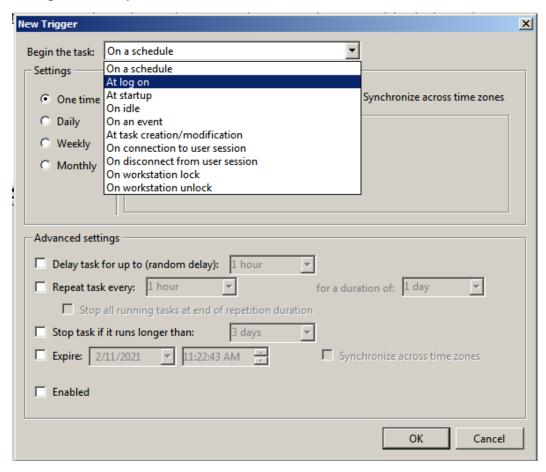
The **Select User or Group** page is displayed.



Step 6 Click OK.

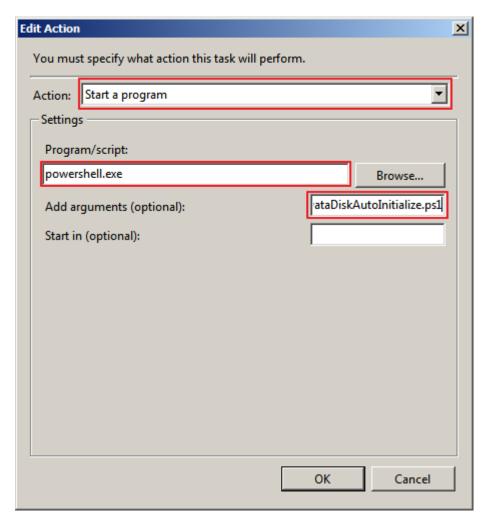


- **Step 7** Click the **Triggers** tab and click **Create** in the lower left corner of the page.
- **Step 8** On the **New Trigger** page, choose **At log on** for **Begin the task**, retain the default settings for other parameters, and click **OK**.



- **Step 9** Click the **Actions** tab and click **Create** in the lower left corner of the page.
- **Step 10** On the **Edit Action** page, set the following parameters:
 - Action: Choose Start a program.
 - Program/Script: Select powershell.exe.
 - Add arguments (optional): Enter -ExecutionPolicy Bypass C:\Windows \System32\WinVMDataDiskAutoInitialize.ps1.

Click OK.



Step 11 On the **Create Task** page, click **OK**.

----End

4.3 Initializing Linux Data Disks Using Script

Scenarios

This section uses CentOS 7.4 64bit to describe how to initialize data disks attached to a server running Linux using the initialization script.

The formatting procedure varies depending on the server OS. This section is for reference only.

NOTICE

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

Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
 - For how to log in to an ECS, see Logging In to an ECS.
 - For how to log in to a BMS, see Logging In to the BMS.

Constraints

- This script uses the EXT4 file system by default. It cannot be used for the disks using LVM or VG.
- This script can only be used to format CentOS.

Initializing New Disks

1. Log in to the server and run the following command to obtain the automatic disk initialization script:

wget https://ecs-instance-driver.obs.cn-north-1.myhuaweicloud.com/datadisk/LinuxVMDataDiskAutoInitialize.sh

™ NOTE

If an abnormal output is returned, check whether the server has an EIP bound. When you are in a region other than **CN North-Beijing1**, the script can be obtained only after an EIP is bound to the server.

2. Run the following command to change the permission of the script:

chmod +x LinuxVMDataDiskAutoInitialize.sh

3. Execute the following script to automatically detect the data disks to be initialized:

./LinuxVMDataDiskAutoInitialize.sh

The script automatically detects and displays the drive letters (for example, /dev/vdb) except the system disk on the server. Then, you need to enter the drive letter to be initialized, for example, /dev/vdb.

Figure 4-3 Automatic detecting disks

```
Step 1: Initializing script and check root privilege
Is running, please wait!
Success, the script is ready to be installed!
Step 2: Show all active disks:
Disk /dev/vdb
```

4. Enter the drive letter and press **Enter**. The script automatically creates the partition for the disk and formats it.

Figure 4-4 Entering the drive letter

```
Step 3: Please choose the disk(e.g.: /dev/vdb and q to quit):/dev/vdb

Step 4: The disk is partitioning and formatting
Is running, please wait!

Success, the disk has been partitioned and formatted!
```

5. Enter the directory on which you want to mount the partition, for example, / data-test.

Figure 4-5 Entering the mounting directory

```
Step 5: Make a directory and mount it
Please enter a location to mount (e.g.: /mnt/data):/data-test
Success, the mount is completed!
```

The initialization is complete until the script has mounted the partition and configured automatic mounting upon server start.

Figure 4-6 Disk initialization completed

```
tep 6: Write configuration to /etc/fstab and mount device
 Step 7: Show information about the file system on which each FILE resides
                    Size Used Avail Use% Mounted on
Filesystem
                    4.0M 0 4.0M 0% /dev
16G 0 16G 0% /dev/
16G 8.6M 16G 1% /run
devtmpfs
                                             0% /dev/shm
tmpfs
tmpfs
                               0 4.0M
                                             0% /sys/fs/cgroup
                    4.0M
                                             6% /
1% /tmp
/dev/vda1
                      40G 2.1G
                                     16G
                      16G
tmpfs
/dev/sdb1
                                             1% /data-test
 Step 8: Show the write configuration to /etc/fstab
# /etc/fstab
# Created by anaconda on Thu Jul 7 04:01:51 2022
# Accessible filesystems, by reference, are maintained under '/dev/disk/'.
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
# After editing this file, run 'systemctl daemon-reload' to update systemd
# units generated from this file.
UUID=257f1147-e890-4926-a897-4e9347cf1b97 / ext4
UUID=a0eeaf8f-bacd-4999-aaba-b6a5286be02c /data-test ext4 defaults 0 0
                                                                                                defaults
                                                                                                                     1 1
```

Initializing Existing Disks

 Log in to the server and run the following command to obtain the automatic disk initialization script:

wget https://ecs-instance-driver.obs.cn-north-1.myhuaweicloud.com/datadisk/LinuxVMDataDiskAutoInitialize.sh

2. Run the following command to change the permission of the script:

chmod -x LinuxVMDataDiskAutoInitialize.sh

3. Execute the following script to automatically detect the data disks to be initialized:

sh LinuxVMDataDiskAutoInitialize.sh

4. The script automatically detects that the disk partition has been mounted and displays the mounting directory. Determine whether to unmount the partition. Enter **y** to unmount the partition, or enter **n** to exit the script. In this example, enter **y** to continue the initialization.

Figure 4-7 Unmounting the disk partition

```
Your disk has been mounted:
/dev/vdbl on /data-test type ext4 (rw,relatime,data=ordered)

Force uninstalling? [y/n]:y
Is running, please wait!
Success, the disk is unloaded!
```

5. After the disk partition is unmounted, determine whether to format the disk. Enter **y** to format the disk, or enter **n** to exit the script.

Figure 4-8 Formatting the disk

```
Ready to begin to format the disk? [y/n]:y
Is running, please wait!
Success, the disk has been formatted!
Step 4: The disk is partitioning and formatting
Is running, please wait!
Success, the disk has been partitioned and formatted!
```

6. After the disk is formatted, the system automatically creates a partition and completes the formatting. Enter the directory on which you want to mount the partition, for example, /data-test.

Figure 4-9 Entering the mounting directory

```
Step 5: Make a directory and mount it
Please enter a location to mount (e.g.: /mnt/data):/data-test
Success, the mount is completed!
```

The initialization is complete until the script has mounted the partition and configured automatic mounting upon server start.

Figure 4-10 Disk formatting and partition mounting completed

```
tep 6: Write configuration to /etc/fstab and mount device
Step 7: Show information about the file system on which each FILE resides Filesystem Size Used Avail Use% Mounted on
devtmpfs
                      4.0M
16G
                                   0 4.0M
0 16G
                                                  0% /dev
0% /dev/shm
tmpfs
                                                  % /uev/sim
1% /run
0% /sys/fs/cgroup
6% /
1% /tmp
1% /data-test
                                  6M 16G
0 4.0M
1G 36G
                      16G
4.0M
 mpfs
                              8.6M
tmpfs
/dev/vda1
tmpfs
                        16G
                                32K
                                         16G
 dev/sdb1
 Step 8: Show the write configuration to /etc/fstab
# /etc/fstab
# Created by anaconda on Thu Jul 7 04:01:51 2022
  Accessible filesystems, by reference, are maintained under '/dev/disk/'. See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info.
  After editing this file, run 'systemctl daemon-reload' to update systemd units generated from this file.
UUID=257f1147-e890-4926-a897-4e9347cf1b97 /
                                                                                               ext4
                                                                                                          defaults
                                                                                                                                  1 1
```

4.4 Initializing a Windows Data Disk (Windows Server 2008)

Scenarios

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

The maximum disk capacity supported by MBR is 2 TiB, and that supported by GPT is 18 EiB. Therefore, use the GPT partition style if your disk capacity is larger than 2 TiB. For details, see Initializing a Windows Data Disk Larger Than 2 TiB (Windows Server 2008). To learn more about disk partition styles, see Scenarios and Disk Partitions.

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

NOTICE

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

Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
 - For how to log in to an ECS, see Logging In to an ECS.
 - For how to log in to a BMS, see Logging In to the BMS.

Procedure

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

The **Server Manager** window is displayed.

Step 2 In the navigation tree, choose **Storage** > **Disk Management**.

The **Disk Management** window is displayed.

- If Figure 4-11 is displayed, the new disk is offline. Go to Step 3.
- If Figure 4-14 is displayed, the Initialize Disk window is prompted. Go to Step 5.

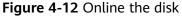
_ B × Action View Help 🗦 🖒 | 🚈 🔃 🔃 🕞 🗗 🗙 📽 😅 🔌 🐯 Server Manager (ECS-EN-FQY)

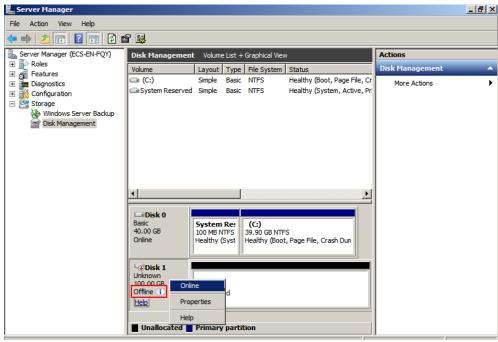
Roles Layout Type File System Status Features

| Diagnostics
| Configuration
| Storage Healthy (Boot, Page File, Cr More Actions System Reserved Simple Basic NTFS Healthy (System, Active, Pr Disk Management 4 □ Disk 0 System Res 100 MB NTFS (C:) 39.90 GB NTFS 40.00 GB Online Healthy (Boot, Page File, Crash Dur Healthy (Syst **ŪDisk 1** Unknown 100.00 GB Offline i 100.00 GB Help Unallocated Primary partition

Figure 4-11 Disk Management

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





□ NOTE

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

Step 4 After making the disk online, the disk status changes from **Offline** to **Not Initialized**. Right-click the disk status and choose **Initialize Disk** from the shortcut menu, as shown in **Figure 4-13**.

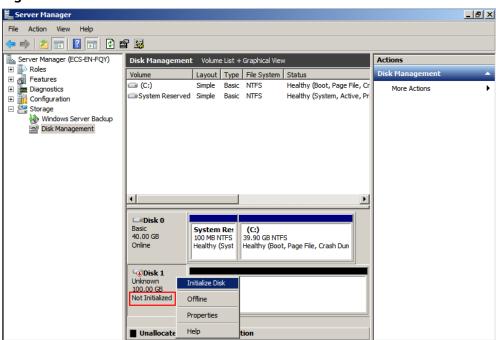
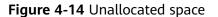
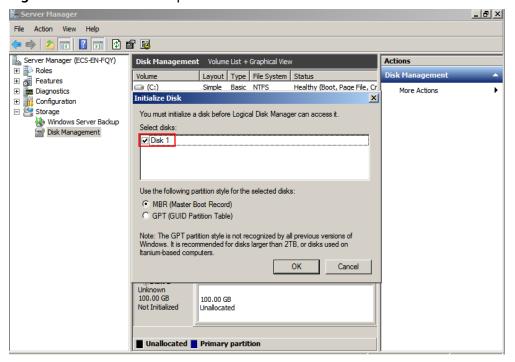


Figure 4-13 Initialize Disk

Step 5 In the Initialize Disk dialog box, select the target disk, click MBR (Master Boot Record) or GPT (GUID Partition Table), and click OK, as shown in Figure 4-14.





NOTICE

The maximum disk size supported by MBR is 2 TiB, and that supported by GPT is 18 EiB. Because an EVS data disk currently supports up to 32 TiB, use GPT if your disk size is larger than 2 TiB.

If the partition style is changed after the disk has been used, all data on the disk will be lost, so take care to select an appropriate partition style when initializing the disk. If you must change the partition style to GPT after a disk has been used, it is recommended that you back up the disk data before the change.

Step 6 Right-click at the unallocated space and choose **New Simple Volume** from the shortcut menu, as shown in **Figure 4-15**.

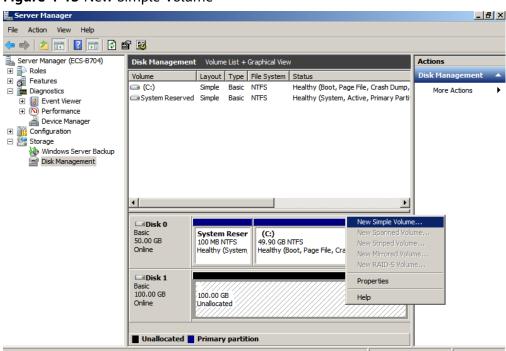


Figure 4-15 New Simple Volume

Step 7 On the displayed **New Simple Volume Wizard** window, click **Next**.

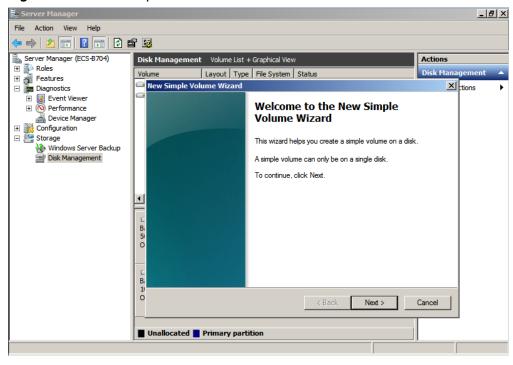
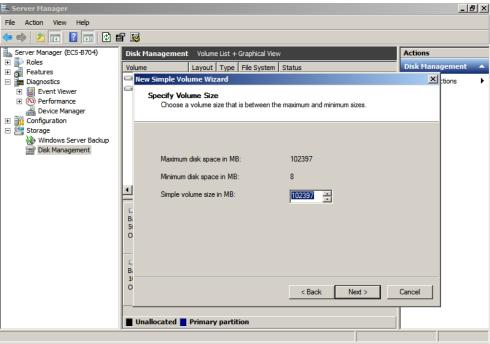


Figure 4-16 New Simple Volume Wizard

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





Step 9 Assign the drive letter and click **Next**.

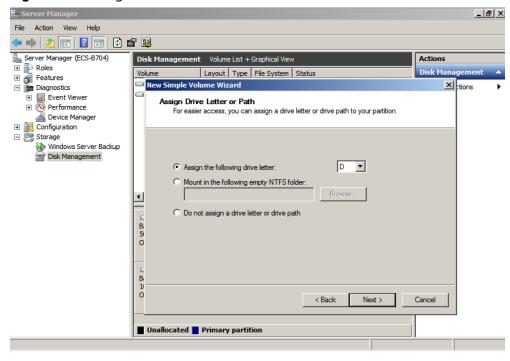
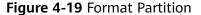
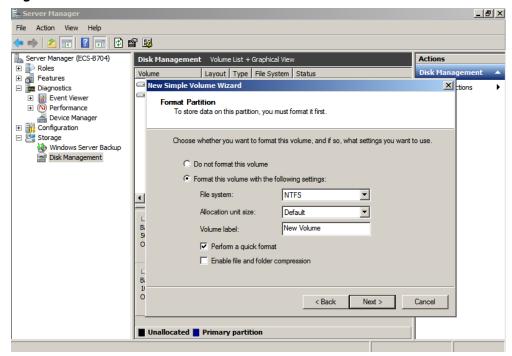


Figure 4-18 Assign Drive Letter or Path

Step 10 On the displayed **Format Partition** page, click **Format this volume with the following settings**, set parameters based on the requirements, and select **Perform a quick format**. Then, click **Next**.





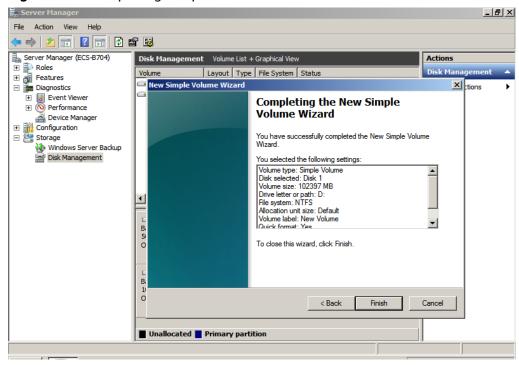


Figure 4-20 Completing the partition creation

NOTICE

The partition sizes supported by file systems vary. Choose an appropriate file system format based on your service requirements.

Step 11 Click **Finish**. Wait for the initialization to complete. When the volume status changes to **Healthy**, the initialization has finished successfully, as shown in **Figure 4-21**.

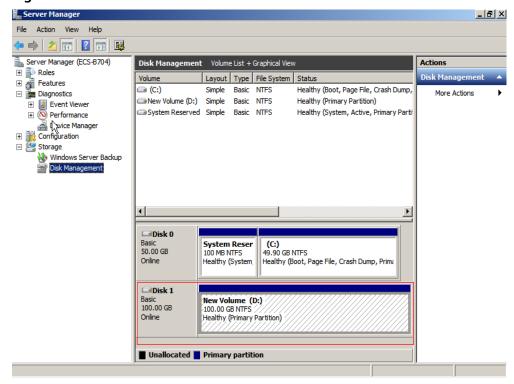


Figure 4-21 Disk initialization succeeded

----End

4.5 Initializing a Windows Data Disk (Windows Server 2019)

Scenarios

This section uses Windows Server 2019 Standard 64bit to describe how to initialize a data disk attached to a server running Windows.

The maximum disk capacity supported by MBR is 2 TiB, and that supported by GPT is 18 EiB. Therefore, use the GPT partition style if your disk capacity is larger than 2 TiB. For details, see Initializing a Windows Data Disk Larger Than 2 TiB (Windows Server 2008). To learn more about disk partition styles, see Scenarios and Disk Partitions.

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

NOTICE

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

Prerequisites

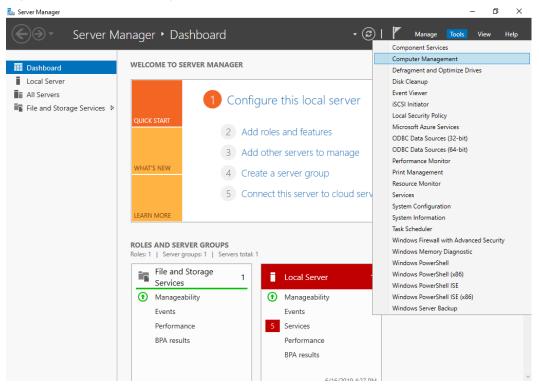
- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
 - For how to log in to an ECS, see Logging In to an ECS.
 - For how to log in to a BMS, see Logging In to the BMS.

Procedure

- **Step 1** On the desktop of the server, click the start icon in the lower left corner.
 - The Windows Server window is displayed.
- Step 2 Click Server Manager.

The **Server Manager** window is displayed.

Figure 4-22 Server Manager



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

The Computer Management window is displayed.

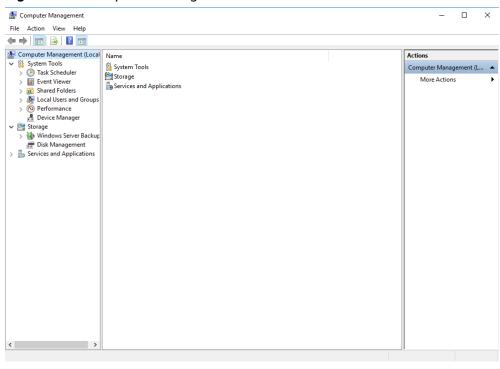


Figure 4-23 Computer Management

Step 4 Choose **Storage** > **Disk Management**.

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

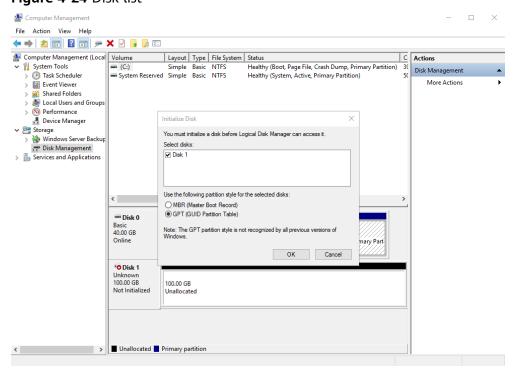
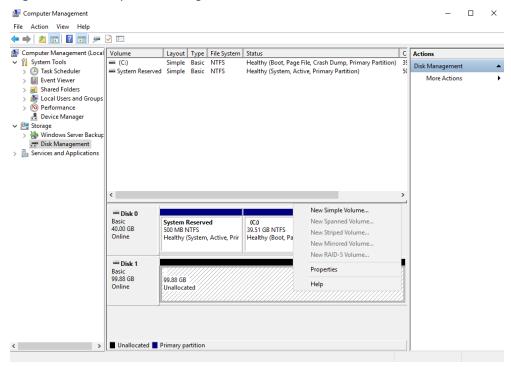


Figure 4-24 Disk list

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

The **Computer Management** window is displayed.

Figure 4-25 Computer Management



NOTICE

The maximum disk size supported by MBR is 2 TiB, and that supported by GPT is 18 EiB. Because an EVS data disk currently supports up to 32 TiB, use GPT if your disk size is larger than 2 TiB.

If the partition style is changed after the disk has been used, all data on the disk will be lost, so take care to select an appropriate partition style when initializing the disk. If you must change the partition style to GPT after a disk has been used, it is recommended that you back up the disk data before the change.

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

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

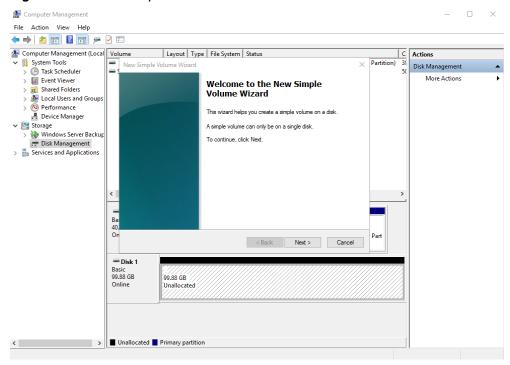
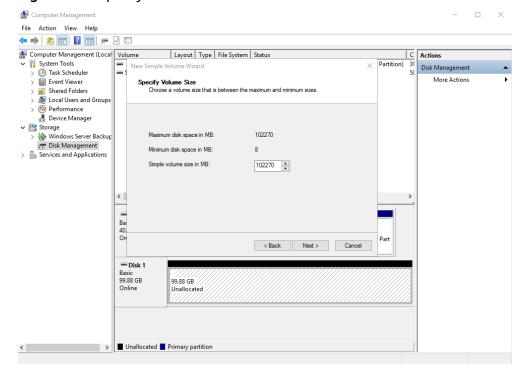


Figure 4-26 New Simple Volume Wizard

Step 7 Follow the prompts and click **Next**.

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

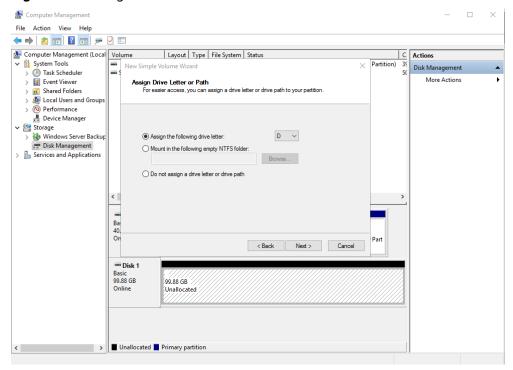




Step 8 Specify the volume size and click **Next**. The system selects the maximum volume size by default. You can specify the volume size as required. In this example, the default setting is used.

The Assign Drive Letter or Path page is displayed.

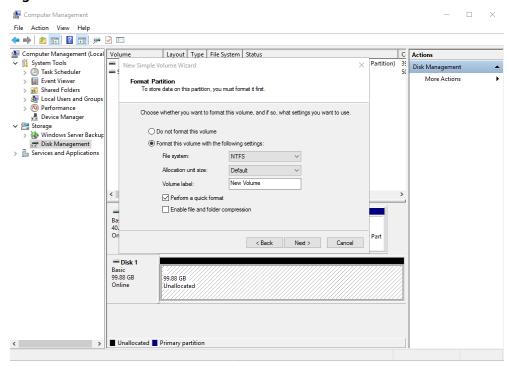
Figure 4-28 Assign Drive Letter or Path



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

The Format Partition page is displayed.

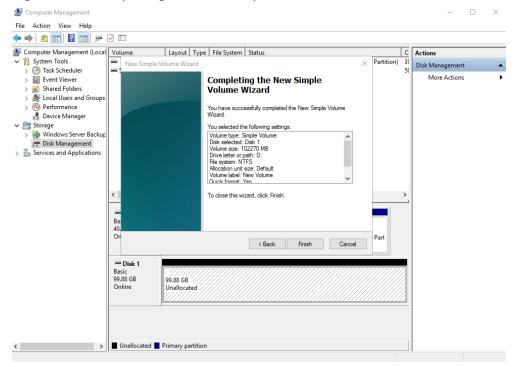
Figure 4-29 Format Partition



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

The Completing the New Simple Volume Wizard page is displayed.

Figure 4-30 Completing the New Simple Volume Wizard



NOTICE

The partition sizes supported by file systems vary. Choose an appropriate file system format based on your service requirements.

Step 11 Click Finish.

Wait for the initialization to complete. When the volume status changes to **Healthy**, the initialization has finished successfully, as shown in **Figure 4-31**.

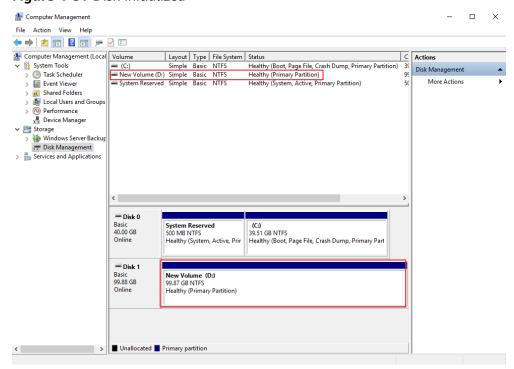
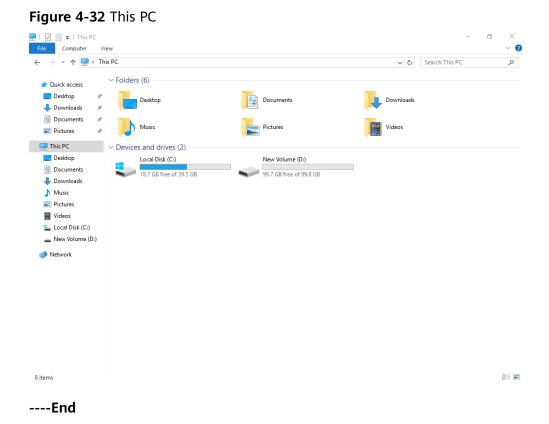


Figure 4-31 Disk initialized

Step 12 After the volume is created, click on the task bar and check whether a new volume appears in **This PC**. In this example, New Volume (D:) is the new volume.

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



4.6 Initializing a Linux Data Disk (fdisk)

Scenarios

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

The maximum partition size that MBR supports is 2 TiB and that GPT supports is 18 EiB. If the disk size you need to partition is greater than 2 TiB, partition the disk using GPT.

The fdisk partitioning tool is suitable only for MBR partitions, and the parted partitioning tool is suitable for both MBR and GPT partitions. For more information, see **Scenarios and Disk Partitions**.

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

NOTICE

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

Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
 - For how to log in to an ECS, see Logging In to an ECS.
 - For how to log in to a BMS, see Logging In to the BMS.

Creating and Mounting a Partition

The following example shows you how a new primary partition can be created on a new data disk that has been attached to a server. The primary partition will be created using fdisk, and MBR will be used. Furthermore, the partition will be formatted using the ext4 file system, mounted on /mnt/sdc, and configured to mount automatically at startup.

Step 1 Query what block devices are available on the server.

fdisk -l

Information similar to the following is displayed:

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

Disk /dev/vda: 42.9 GiB, 42949672960 bytes, 83886080 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos Disk identifier: 0x000bcb4e

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

Disk /dev/vdb: 107.4 GiB, 107374182400 bytes, 209715200 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes

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

Step 2 Launch fdisk to partition the new data disk.

fdisk New data disk

In this example, run the following command:

fdisk /dev/vdb

Information similar to the following is displayed:

[root@ecs-test-0001 ~]# fdisk /dev/vdb Welcome to fdisk (util-linux 2.23.2).

Changes will remain in memory only, until you decide to write them. Be careful before using the write command.

Device does not contain a recognized partition table Building a new DOS disklabel with disk identifier 0x38717fc1.

Command (m for help):

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

Information similar to the following is displayed:

Command (m for help): n
Partition type:
 p primary (0 primary, 0 extended, 4 free)
 e extended

There are two types of disk partitions:

- Choosing p creates a primary partition.
- Choosing **e** creates an extended partition.

■ NOTE

If MBR is used, a maximum of 4 primary partitions, or 3 primary partitions plus 1 extended partition can be created. The extended partition must be divided into logical partitions before use.

Disk partitions created using GPT are not categorized.

Step 4 Enter **p** and press **Enter** to create a primary partition in this example.

Information similar to the following is displayed:

Select (default p): p Partition number (1-4, default 1):

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

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

Information similar to the following is displayed:

Partition number (1-4, default 1): 1 First sector (2048-209715199, default 2048):

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

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

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

Information similar to the following is displayed:

First sector (2048-209715199, default 2048):
Using default value 2048
Last sector, +sectors or +size{K,M,G} (2048-209715199, default 209715199):

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

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

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

Information similar to the following is displayed:

Last sector, +sectors or +size{K,M,G} (2048-209715199, default 209715199): Using default value 209715199 Partition 1 of type Linux and of size 100 GiB is set

Command (m for help):

A primary partition has been created for the new data disk.

Step 8 Enter **p** and press **Enter** to print the partition details.

Information similar to the following is displayed:

Command (m for help): p

Disk /dev/vdb: 107.4 GiB, 107374182400 bytes, 209715200 sectors

Units = sectors of 1 * 512 = 512 bytes

Sector size (logical/physical): 512 bytes / 512 bytes I/O size (minimum/optimal): 512 bytes / 512 bytes

Disk label type: dos Disk identifier: 0x38717fc1

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

Command (m for help):

Details about the /dev/vdb1 partition are displayed.

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

Information similar to the following is displayed:

Command (m for help): w

The partition table has been altered!

Calling ioctl() to re-read partition table.

Syncing disks.

The partition is created.

□ NOTE

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

Step 10 Synchronize the new partition table to the OS.

partprobe

Step 11 Format the new partition with a desired file system format.

mkfs -t File system format /dev/vdb1

In this example, the **ext4** format is used for the new partition.

mkfs -t ext4 /dev/vdb1

Information similar to the following is displayed:

[root@ecs-test-0001 ~]# mkfs -t ext4 /dev/vdb1

mke2fs 1.42.9 (28-Dec-2013)

Filesystem label=

OS type: Linux

Block size=4096 (log=2)

Fragment size=4096 (log=2)

Stride=0 blocks, Stripe width=0 blocks 6553600 inodes, 26214144 blocks

1310707 blocks (5.00%) reserved for the super user

First data block=0

Maximum filesystem blocks=2174746624

800 block groups

32768 blocks per group, 32768 fragments per group

8192 inodes per group

Superblock backups stored on blocks:

32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,

4096000, 7962624, 11239424, 20480000, 23887872

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

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

NOTICE

The partition sizes supported by file systems vary. Choose an appropriate file system format based on your service requirements.

Step 12 Create a mount point.

mkdir Mount point

In this example, the /mnt/sdc mount point is created.

mkdir /mnt/sdc

□ NOTE

The /mnt directory exists on all Linux systems. If the mount point cannot be created, it may be that the /mnt directory has been accidentally deleted. You can run mkdir -p /mnt/sdc to create the mount point.

Step 13 Mount the new partition on the created mount point.

mount Disk partition Mount point

In this example, the /dev/vdb1 partition is mounted on /mnt/sdc.

mount /dev/vdb1 /mnt/sdc

Step 14 Check the mount result.

df -TH

Information similar to the following is displayed:

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

You should now see that partition /dev/vdb1 is mounted on /mnt/sdc.

□ NOTE

After the server is restarted, the disk will not be automatically mounted. To configure automount at startup, you will need to modify the /etc/fstab file. For details, see Configuring Automatic Mounting at System Start.

----End

Configuring Automatic Mounting at System Start

The **fstab** file controls what disks are automatically mounted at startup. You can use **fstab** to configure your data disks to mount automatically. This operation will not affect the existing data.

The example here uses UUIDs to identify disks in the **fstab** file. You are advised not to use device names to identify disks in the file because device names are assigned dynamically and may change (for example, from /dev/vdb1 to /dev/vdb2) after a reboot. This can even prevent your disk from booting up.

■ NOTE

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

Step 1 Query the partition UUID.

blkid Disk partition

In this example, the UUID of the /dev/vdb1 partition is queried.

blkid /dev/vdb1

Information similar to the following is displayed:

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

Carefully record the UUID, as you will need it for the following step.

Step 2 Open the **fstab** file using the vi editor.

vi /etc/fstab

- **Step 3** Press i to enter editing mode.
- **Step 4** Move the cursor to the end of the file and press **Enter**. Then, add the following information:

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

In this example, the line starting with "UUID" is the information added. Edit this line to match the following format:

- UUID: The UUID obtained in **Step 1**.
- Mount point: The directory on which the partition is mounted. You can query the mount point using df -TH.
- Filesystem: The file system format of the partition. You can query the file system format using **df -TH**.
- Mount option: The partition mount option. Usually, this parameter is set to defaults.
- Dump: The Linux dump backup option.
 - **0**: Linux dump backup is not used. Usually, dump backup is not used, and you can set this parameter to **0**.
 - 1: Linux dump backup is used.
- fsck: The fsck option, which means whether to use fsck to check the disk during startup.
 - 0: not use fsck.

If the mount point is the root partition (/), this parameter must be set to

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

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

The system saves the configurations and exits the vi editor.

Step 6 Verify that the disk is auto-mounted at startup.

1. Unmount the partition.

umount Disk partition

In this example, run the following command:

umount /dev/vdb1

2. Reload all the content in the /etc/fstab file.

mount -a

3. Query the file system mounting information.

mount | grep Mount point

In this example, run the following command:

mount | grep /mnt/sdc

If information similar to the following is displayed, automatic mounting has been configured:

root@ecs-test-0001 ~]# mount | grep /mnt/sdc /dev/vdb1 on /mnt/sdc type ext4 (rw,relatime,data=ordered)

----End

4.7 Initializing a Linux Data Disk (parted)

Scenarios

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

The maximum partition size that MBR supports is 2 TiB and that GPT supports is 18 EiB. If the disk size you need to partition is greater than 2 TiB, partition the disk using GPT.

The fdisk partitioning tool is suitable only for MBR partitions, and the parted partitioning tool is suitable for both MBR and GPT partitions. For more information, see **Scenarios and Disk Partitions**.

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

NOTICE

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

Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
 - For how to log in to an ECS, see Logging In to an ECS.
 - For how to log in to a BMS, see Logging In to the BMS.

Creating and Mounting a Partition

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

Step 1 Query information about the new data disk.

lsblk

Information similar to the following is displayed:

```
root@ecs-test-0001 ~]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
vda 253:0 0 40G 0 disk
__vda1 253:1 0 40G 0 part /
vdb 253:16 0 100G 0 disk
```

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

Step 2 Launch parted to partition the new data disk.

```
parted New data disk
```

In this example, run the following command:

parted /dev/vdb

Information similar to the following is displayed:

```
[root@ecs-test-0001 ~]# parted /dev/vdb
GNU Parted 3.1
Using /dev/vdb
Welcome to GNU Parted! Type 'help' to view a list of commands.
(parted)
```

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

Information similar to the following is displayed:

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

Disk Flags: (parted)

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

Step 4 Set the disk partition style.

mklabel Disk partition style

This command lets you control whether to use MBR or GPT for your partition table. In this example, GPT is used.

mklabel gpt

NOTICE

The maximum disk size supported by MBR is 2 TiB, and that supported by GPT is 18 EiB. Because an EVS data disk currently supports up to 32 TiB, use GPT if your disk size is larger than 2 TiB.

If the partition style is changed after the disk has been used, all data on the disk will be lost, so take care to select an appropriate partition style when initializing the disk. If you must change the partition style to GPT after a disk has been used, it is recommended that you back up the disk data before the change.

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

Information similar to the following is displayed:

(parted) mklabel gpt

(parted) p

Model: Virtio Block Device (virtblk)

Disk /dev/vdb: 107GiB

Sector size (logical/physical): 512B/512B

Partition Table: gpt

Disk Flags:

Number Start End Size File system Name Flags

(parted)

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

- **Step 6** Enter **unit s** and press **Enter** to set the measurement unit of the disk to sector.
- **Step 7** Create a new partition.

mkpart Partition name Start sector End sector

In this example, run the following command:

mkpart test 2048s 100%

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

Information similar to the following is displayed:

(parted) mkpart opt 2048s 100%

(parted)

Step 8 Enter **p** and press **Enter** to print the partition details.

Information similar to the following is displayed:

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

Number Start End Size File system Name Flags
1 2048s 209713151s 209711104s test

(parted)
```

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

Information similar to the following is displayed:

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

You can configure automatic mounting by updating the /etc/fstab file. Before doing so, format the partition with a desired file system and mount the partition on the mount point.

Step 10 View the disk partition information.

lsblk

Information similar to the following is displayed:

```
[root@ecs-test-0001 ~]# lsblk

NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT

vda 253:0 0 40G 0 disk

—vda1 253:1 0 40G 0 part /

vdb 253:16 0 100G 0 disk

—vdb1 253:17 0 100G 0 part
```

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

Step 11 Format the new partition with a desired file system format.

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

In this example, the **ext4** format is used for the new partition.

mkfs -t ext4 /dev/vdb1

Information similar to the following is displayed:

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

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

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

NOTICE

The partition sizes supported by file systems vary. Choose an appropriate file system format based on your service requirements.

Step 12 Create a mount point.

mkdir Mount point

In this example, the /mnt/sdc mount point is created.

mkdir /mnt/sdc

The /mnt directory exists on all Linux systems. If the mount point cannot be created, it may be that the /mnt directory has been accidentally deleted. You can run mkdir -p /mnt/sdc to create the mount point.

Step 13 Mount the new partition on the created mount point.

mount Disk partition Mount point

In this example, the /dev/vdb1 partition is mounted on /mnt/sdc.

mount /dev/vdb1 /mnt/sdc

Step 14 Check the mount result.

df -TH

Information similar to the following is displayed:

```
[root@ecs-test-0001 ~]# df -TH
Filesystem
           Type
                   Size Used Avail Use% Mounted on
                   43G 1.9G 39G 5%/
/dev/vda1
            ext4
devtmpfs
            devtmpfs 2.0G 0 2.0G 0% /dev
          tmpfs 2.0G 0 2.0G 0% /dev/shm
tmpfs 2.0G 9.0M 2.0G 1% /run
tmpfs
                   2.0G 9.0M 2.0G 1% /run
tmpfs
                   2.0G  0  2.0G  0% /sys/fs/cgroup
tmpfs
           tmpfs
                   398M 0 398M 0% /run/user/0
tmpfs
           tmpfs
/dev/vdb1 ext4 106G 63M 101G 1% /mnt/sdc
```

You should now see that partition /dev/vdb1 is mounted on /mnt/sdc.

After the server is restarted, the disk will not be automatically mounted. To configure automount at startup, you will need to modify the /etc/fstab file. For details, see Configuring Automatic Mounting at System Start.

----End

Configuring Automatic Mounting at System Start

The **fstab** file controls what disks are automatically mounted at startup. You can use **fstab** to configure your data disks to mount automatically. This operation will not affect the existing data.

The example here uses UUIDs to identify disks in the **fstab** file. You are advised not to use device names to identify disks in the file because device names are assigned dynamically and may change (for example, from /dev/vdb1 to /dev/vdb2) after a reboot. This can even prevent your disk from booting up.

■ NOTE

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

Step 1 Query the partition UUID.

blkid Disk partition

In this example, the UUID of the /dev/vdb1 partition is queried.

blkid /dev/vdb1

Information similar to the following is displayed:

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

Carefully record the UUID, as you will need it for the following step.

Step 2 Open the **fstab** file using the vi editor.

vi /etc/fstab

- **Step 3** Press i to enter editing mode.
- **Step 4** Move the cursor to the end of the file and press **Enter**. Then, add the following information:

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

In this example, the line starting with "UUID" is the information added. Edit this line to match the following format:

- UUID: The UUID obtained in **Step 1**.
- Mount point: The directory on which the partition is mounted. You can query the mount point using df -TH.
- Filesystem: The file system format of the partition. You can query the file system format using **df -TH**.
- Mount option: The partition mount option. Usually, this parameter is set to defaults.
- Dump: The Linux dump backup option.
 - **0**: Linux dump backup is not used. Usually, dump backup is not used, and you can set this parameter to **0**.
 - 1: Linux dump backup is used.
- fsck: The fsck option, which means whether to use fsck to check the disk during startup.
 - 0: not use fsck.

If the mount point is the root partition (/), this parameter must be set to

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

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

The system saves the configurations and exits the vi editor.

Step 6 Verify that the disk is auto-mounted at startup.

1. Unmount the partition.

umount Disk partition

In this example, run the following command:

umount /dev/vdb1

2. Reload all the content in the /etc/fstab file.

mount -a

3. Query the file system mounting information.

mount | grep Mount point

In this example, run the following command:

mount | grep /mnt/sdc

If information similar to the following is displayed, automatic mounting has been configured:

root@ecs-test-0001 ~]# mount | grep /mnt/sdc /dev/vdb1 on /mnt/sdc type ext4 (rw,relatime,data=ordered)

----End

4.8 Initializing a Windows Data Disk Larger Than 2 TiB (Windows Server 2008)

Scenarios

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

The maximum disk capacity supported by MBR is 2 TiB, and that supported by GPT is 18 EiB. Therefore, use the GPT partition style if your disk capacity is larger than 2 TiB. For details, see Initializing a Windows Data Disk Larger Than 2 TiB (Windows Server 2008). To learn more about disk partition styles, see Scenarios and Disk Partitions.

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

NOTICE

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

Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
 - For how to log in to an ECS, see Logging In to an ECS.
 - For how to log in to a BMS, see Logging In to the BMS.

Procedure

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

The **Start** window is displayed.

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

The **Server Manager** window is displayed.

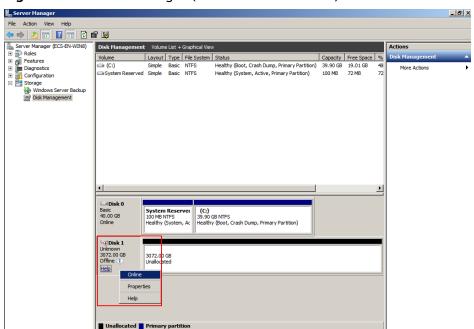


Figure 4-33 Server Manager (Windows Server 2008)

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

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

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

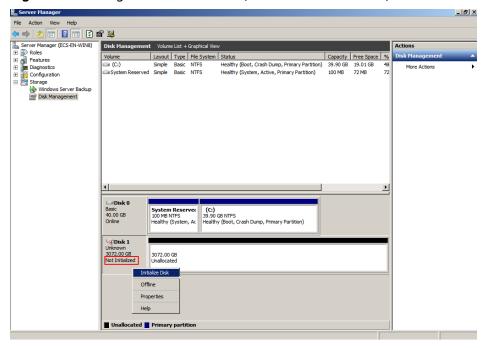


Figure 4-34 Bring online succeeded (Windows Server 2008)

Step 4 In the **Disk 1** area, right-click and choose **Initialize Disk** from the shortcut menu.

The **Initialize Disk** dialog box is displayed.

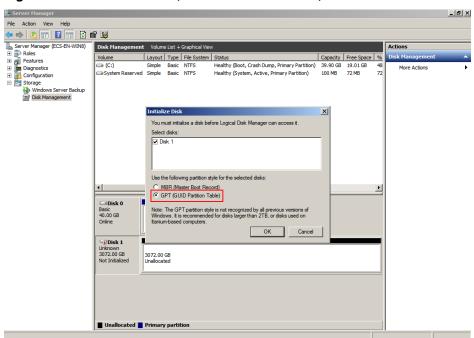


Figure 4-35 Initialize Disk (Windows Server 2008)

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

The **Server Manager** window is displayed.

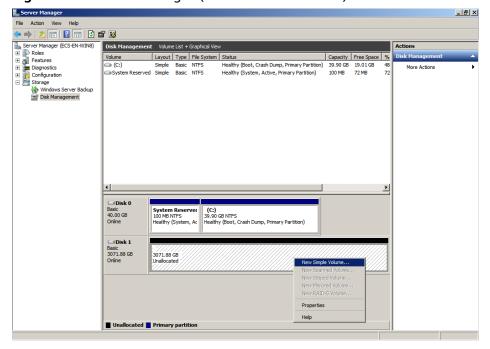


Figure 4-36 Server Manager (Windows Server 2008)

NOTICE

The maximum disk size supported by MBR is 2 TiB, and that supported by GPT is 18 EiB. Because an EVS data disk currently supports up to 32 TiB, use GPT if your disk size is larger than 2 TiB.

If the partition style is changed after the disk has been used, all data on the disk will be lost, so take care to select an appropriate partition style when initializing the disk. If you must change the partition style to GPT after a disk has been used, it is recommended that you back up the disk data before the change.

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

The New Simple Volume Wizard window is displayed.

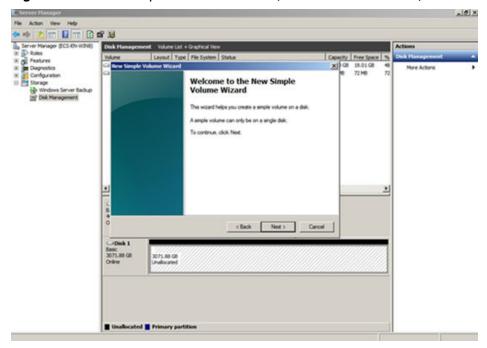


Figure 4-37 New Simple Volume Wizard (Windows Server 2008)

Step 7 Follow the prompts and click **Next**.

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

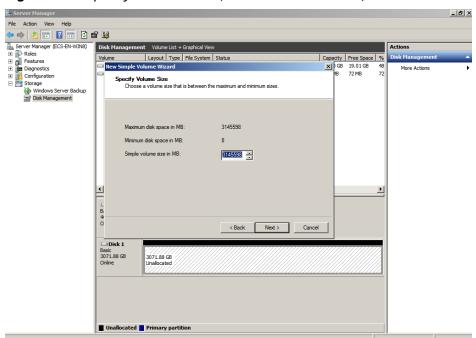


Figure 4-38 Specify Volume Size (Windows Server 2008)

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

The Assign Drive Letter or Path page is displayed.

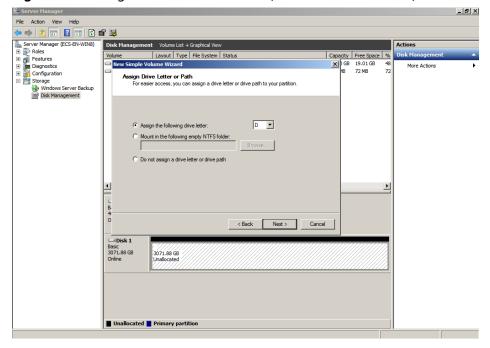
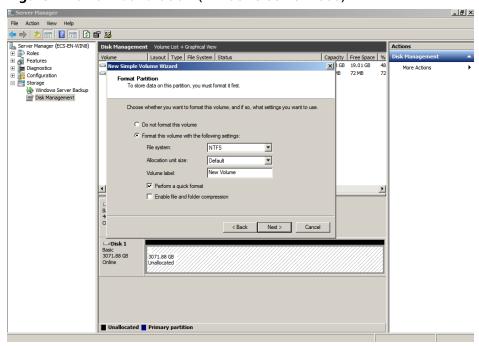


Figure 4-39 Assign Drive Letter or Path (Windows Server 2008)

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

The Format Partition page is displayed.





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

The Completing the New Simple Volume Wizard page is displayed.

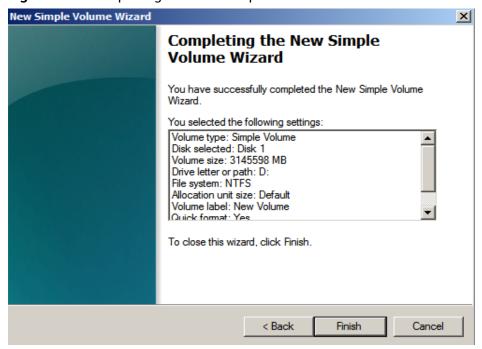


Figure 4-41 Completing the New Simple Volume Wizard

NOTICE

The partition sizes supported by file systems vary. Choose an appropriate file system format based on your service requirements.

Step 11 Click Finish.

Wait for the initialization to complete. When the volume status changes to **Healthy**, the initialization has finished successfully, as shown in **Figure 4-42**.

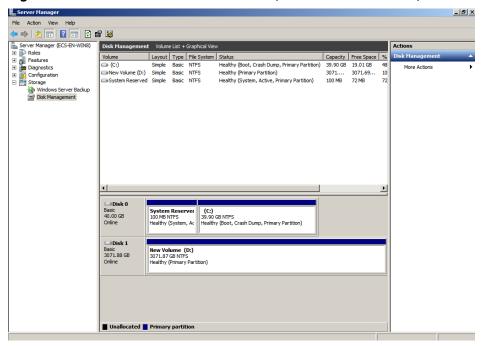


Figure 4-42 Disk initialization succeeded (Windows Server 2008)

Step 12 After the volume is created, click and check whether a new volume appears in **Computer**. In this example, New Volume (D:) is the new volume.

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

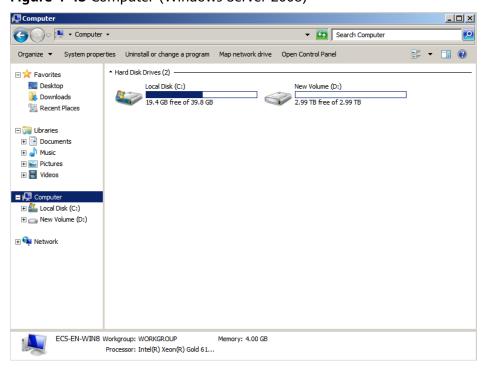


Figure 4-43 Computer (Windows Server 2008)

----End

4.9 Initializing a Windows Data Disk Larger Than 2 TiB (Windows Server 2012)

Scenarios

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

The maximum disk capacity supported by MBR is 2 TiB, and that supported by GPT is 18 EiB. Therefore, use the GPT partition style if your disk capacity is larger than 2 TiB. For details, see Initializing a Windows Data Disk Larger Than 2 TiB (Windows Server 2008). To learn more about disk partition styles, see Scenarios and Disk Partitions.

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

NOTICE

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

Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
 - For how to log in to an ECS, see Logging In to an ECS.
 - For how to log in to a BMS, see Logging In to the BMS.

Procedure

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

The **Server Manager** window is displayed.

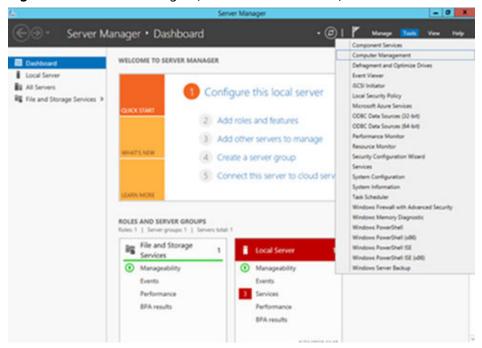
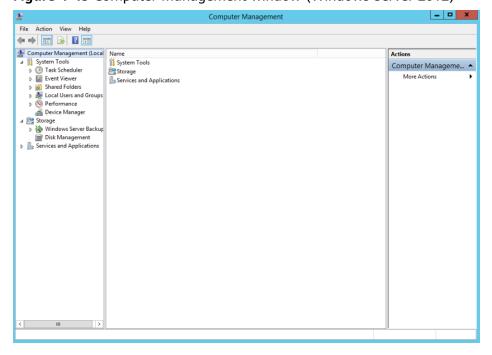


Figure 4-44 Server Manager (Windows Server 2012)

Step 2 In the upper right corner, choose **Tools** > **Computer Management**.

The **Computer Management** window is displayed.





Step 3 Choose Storage > Disk Management.

Disks are displayed in the right pane.

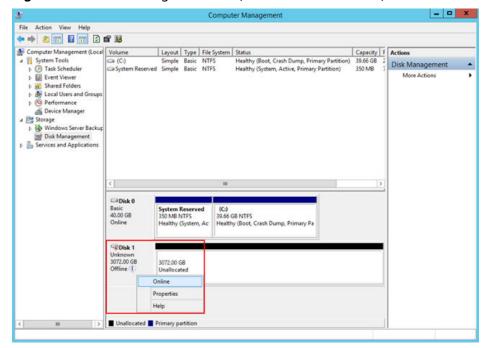


Figure 4-46 Disk Management list (Windows Server 2012)

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

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

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

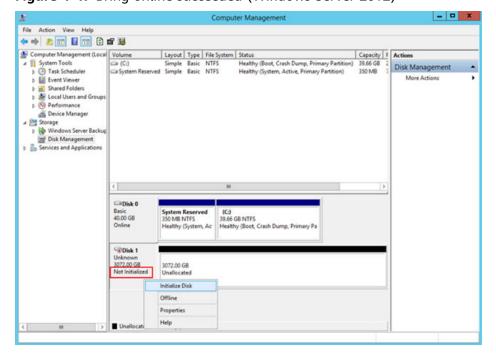
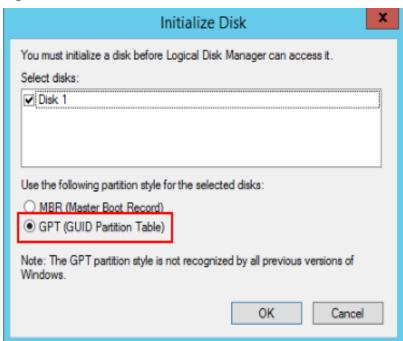


Figure 4-47 Bring online succeeded (Windows Server 2012)

Step 5 (Optional) In the **Disk 1** area, right-click and choose **Initialize Disk** from the shortcut menu.

The Initialize Disk dialog box is displayed.

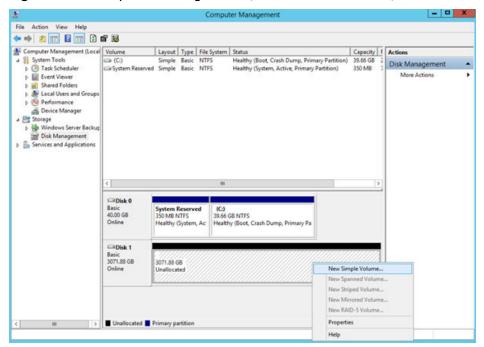
Figure 4-48 Initialize Disk (Windows Server 2012)



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

The **Computer Management** window is displayed.

Figure 4-49 Computer Management (Windows Server 2012)



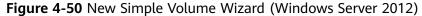
NOTICE

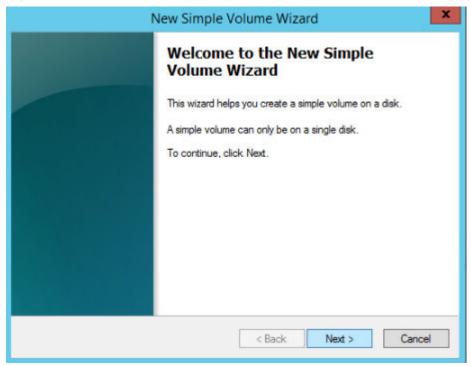
The maximum disk size supported by MBR is 2 TiB, and that supported by GPT is 18 EiB. Because an EVS data disk currently supports up to 32 TiB, use GPT if your disk size is larger than 2 TiB.

If the partition style is changed after the disk has been used, all data on the disk will be lost, so take care to select an appropriate partition style when initializing the disk. If you must change the partition style to GPT after a disk has been used, it is recommended that you back up the disk data before the change.

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

The New Simple Volume Wizard window is displayed.





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

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

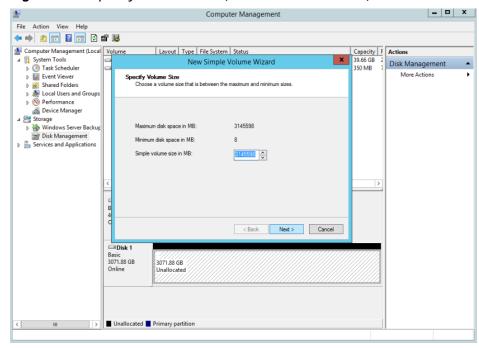


Figure 4-51 Specify Volume Size (Windows Server 2012)

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

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

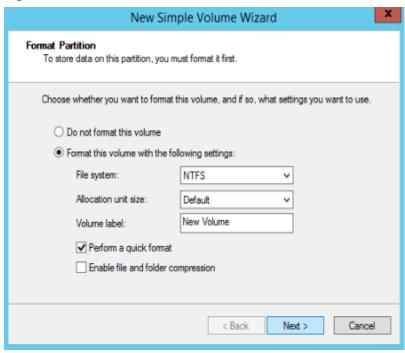




Step 10 Assign a drive letter or path to your partition and click **Next**. The system assigns drive letter D by default. In this example, the default setting is used.

The **Format Partition** page is displayed.

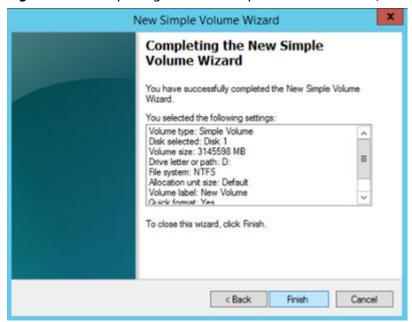
Figure 4-53 Format Partition (Windows Server 2012)



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

The Completing the New Simple Volume Wizard page is displayed.

Figure 4-54 Completing the New Simple Volume Wizard (Windows Server 2012)



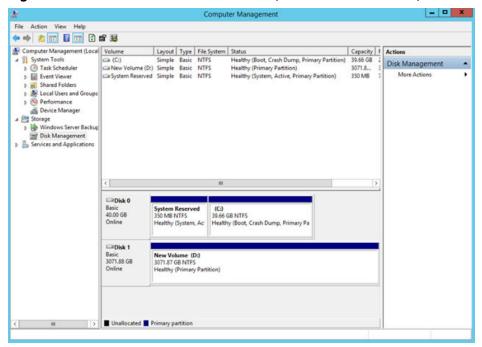
NOTICE

The partition sizes supported by file systems vary. Choose an appropriate file system format based on your service requirements.

Step 12 Click Finish.

Wait for the initialization to complete. When the volume status changes to **Healthy**, the initialization has finished successfully, as shown in **Figure 4-55**.

Figure 4-55 Disk initialization succeeded (Windows Server 2012)



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

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

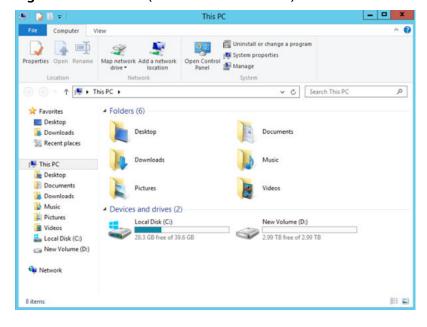


Figure 4-56 This PC (Windows Server 2012)

----End

4.10 Initializing a Linux Data Disk Larger Than 2 TiB (parted)

Scenarios

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

The maximum partition size that MBR supports is 2 TiB and that GPT supports is 18 EiB. If the disk size you need to partition is greater than 2 TiB, partition the disk using GPT.

The fdisk partitioning tool is suitable only for MBR partitions, and the parted partitioning tool is suitable for both MBR and GPT partitions. For more information, see **Scenarios and Disk Partitions**.

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

NOTICE

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

Prerequisites

- A data disk has been attached to a server and has not been initialized.
- You have logged in to the server.
 - For how to log in to an ECS, see Logging In to an ECS.
 - For how to log in to a BMS, see Logging In to the BMS.

Creating and Mounting a Partition

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

Step 1 Query information about the new data disk.

lsblk

Information similar to the following is displayed:

```
[root@ecs-centos74 ~]# lsblk

NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT

vda 253:0 0 40G 0 disk

—vda1 253:1 0 1G 0 part /boot

—vda2 253:2 0 39G 0 part /

vdb 253:16 0 3T 0 disk
```

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

Step 2 Launch parted to partition the new data disk.

```
parted New data disk
```

In this example, run the following command:

parted /dev/vdb

Information similar to the following is displayed:

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

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

Information similar to the following is displayed:

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

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

Step 4 Set the disk partition style.

mklabel Disk partition style

The disk partition style can be MBR or GPT. If the disk capacity is greater than 2 TiB, use GPT.

mklabel gpt

NOTICE

The maximum disk size supported by MBR is 2 TiB, and that supported by GPT is 18 EiB. Because an EVS data disk currently supports up to 32 TiB, use GPT if your disk size is larger than 2 TiB.

If the partition style is changed after the disk has been used, all data on the disk will be lost, so take care to select an appropriate partition style when initializing the disk. If you must change the partition style to GPT after a disk has been used, it is recommended that you back up the disk data before the change.

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

Information similar to the following is displayed:

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

Number Start End Size File system Name Flags

(parted)

- **Step 6** Enter **unit s** and press **Enter** to set the measurement unit of the disk to sector.
- **Step 7** Create a new partition.

mkpart Partition name Start sector End sector

In this example, run the following command:

mkpart opt 2048s 100%

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

Information similar to the following is displayed:

(parted) mkpart opt 2048s 100%

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

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

Step 8 Enter **p** and press **Enter** to print the partition details.

Information similar to the following is displayed:

```
(parted) p
Model: Virtio Block Device (virtblk)
Disk /dev/vdb: 6442450944s
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number Start End Size File system Name Flags
1 2048s 6442448895s 6442446848s opt
```

Details about the dev/vdb1 partition are displayed.

- **Step 9** Enter **q** and press **Enter** to exit parted.
- **Step 10** View the disk partition information.

lsblk

Information similar to the following is displayed:

```
[root@ecs-centos74 ~]# lsblk

NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT

vda 253:0 0 40G 0 disk

—vda1 253:1 0 1G 0 part /boot

—vda2 253:2 0 39G 0 part /

vdb 253:16 0 3T 0 disk

—vdb1 253:17 0 3T 0 part
```

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

Step 11 Format the new partition with a desired file system format.

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

In this example, the **ext4** format is used for the new partition.

mkfs -t ext4 /dev/vdb1

Information similar to the following is displayed:

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

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

NOTICE

The partition sizes supported by file systems vary. Choose an appropriate file system format based on your service requirements.

Step 12 Create a mount point.

mkdir Mount point

In this example, the /mnt/sdc mount point is created.

mkdir /mnt/sdc

The /mnt directory exists on all Linux systems. If the mount point cannot be created, it may be that the /mnt directory has been accidentally deleted. You can run mkdir -p /mnt/sdc to create the mount point.

Step 13 Mount the new partition on the created mount point.

mount Disk partition Mount point

In this example, the /dev/vdb1 partition is mounted on /mnt/sdc.

mount /dev/vdb1 /mnt/sdc

Step 14 Check the mount result.

df -TH

Information similar to the following is displayed:

```
[root@ecs-centos74 ~]# df -TH
            Type Size Used Avail Use% Mounted on
Filesystem
             ext4
                     42G 1.5G 38G 4% /
/dev/vda2
             devtmpfs 2.0G 0 2.0G 0% /dev
devtmpfs
            tmpfs 2.0G 0 2.0G 0% /dev/shm
tmpfs
           tmpfs 2.0G 8.9M 2.0G 1% /run
tmpfs 2.0G 0 2.0G 0% /sys/fs/cgro
ext4 1.1G 153M 801M 17% /boot
tmpfs
                    2.0G  0  2.0G  0% /sys/fs/cgroup
tmpfs
/dev/vda1
                    398M 0 398M 0% /run/user/0
tmpfs
            tmpfs
/dev/vdb1
           ext4 3.3T 93M 3.1T 1% /mnt/sdc
```

You should now see that partition /dev/vdb1 is mounted on /mnt/sdc.

----End

Configuring Automatic Mounting at System Start

The **fstab** file controls what disks are automatically mounted at startup. You can use **fstab** to configure your data disks to mount automatically. This operation will not affect the existing data.

The example here uses UUIDs to identify disks in the **fstab** file. You are advised not to use device names to identify disks in the file because device names are assigned dynamically and may change (for example, from /dev/vdb1 to /dev/vdb2) after a reboot. This can even prevent your disk from booting up.

Ⅲ NOTE

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

Step 1 Query the partition UUID.

blkid Disk partition

In this example, the UUID of the /dev/vdb1 partition is queried.

blkid /dev/vdb1

Information similar to the following is displayed:

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

Carefully record the UUID, as you will need it for the following step.

Step 2 Open the fstab file using the vi editor.

vi /etc/fstab

- **Step 3** Press **i** to enter editing mode.
- **Step 4** Move the cursor to the end of the file and press **Enter**. Then, add the following information:

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

In this example, the line starting with "UUID" is the information added. Edit this line to match the following format:

- UUID: The UUID obtained in Step 1.
- Mount point: The directory on which the partition is mounted. You can query the mount point using **df** -**TH**.
- Filesystem: The file system format of the partition. You can query the file system format using **df -TH**.
- Mount option: The partition mount option. Usually, this parameter is set to defaults.
- Dump: The Linux dump backup option.
 - **0**: Linux dump backup is not used. Usually, dump backup is not used, and you can set this parameter to **0**.
 - 1: Linux dump backup is used.
- fsck: The fsck option, which means whether to use fsck to check the disk during startup.
 - **0**: not use fsck.
 - If the mount point is the root partition (/), this parameter must be set to 1.

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

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

The system saves the configurations and exits the vi editor.

Step 6 Verify that the disk is auto-mounted at startup.

1. Unmount the partition.

umount Disk partition

In this example, run the following command:

umount /dev/vdb1

2. Reload all the content in the /etc/fstab file.

mount -a

3. Query the file system mounting information.

mount | grep Mount point

In this example, run the following command:

mount | grep /mnt/sdc

If information similar to the following is displayed, automatic mounting has been configured:

root@ecs-test-0001 ~]# mount | grep /mnt/sdc /dev/vdb1 on /mnt/sdc type ext4 (rw,relatime,data=ordered)

----End

5 Change History

Released On	Description
2022-06-30	This issue is the sixth official release. Added the following content: Initializing Windows Data Disks Using Script Initializing Linux Data Disks Using Script
2020-08-31	This issue is the fifth official release. Added the step of configuring server monitoring in Step 3: Configure Advanced Settings.
2020-04-28	This issue is the fourth official release. Added procedures for selecting a CPU architecture in Step 1: Configure Basic Settings.
2019-07-12	This issue is the third official release. Modified content in Overview.
2019-06-03	This issue is the second official release. Modified the procedure for creating an ECS in Purchasing an ECS.
2018-11-19	This issue is the first official release.