



**openEuler
1.0**

Installation Guide

Date **2020-01-22**

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Preface

Overview



This guide describes how to install Huawei openEuler 1.0 in graphical mode or text mode.

Intended Audience

This guide is intended for openEuler 1.0 users with a basic understanding of Linux system management, and is also recommended for administrators, system engineers, and maintenance personnel. This guide assumes that you have a basic understanding of Linux system management.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

1 Installation Preparations

This section describes the compatibility of the hardware and software and the related configurations and preparations required for the installation.

- 1.1 [Obtaining the Installation Source](#)
- 1.2 [Release Package Integrity Check](#)
- 1.3 [Hardware Compatibility](#)
- 1.4 [Minimal Hardware Specifications](#)

1.1 Obtaining the Installation Source

Obtain the openEuler release package and verification file before the installation.

Perform the following operations to obtain the openEuler release package:

1. Log in to the [openEuler Community](#) website.
2. Click **Download**. The download list is displayed.
3. Click **Get openEuler-1.0-aarch64-dvd.iso** to download the **openEuler-1.0-aarch64-dvd.iso** release package to the local PC.
4. Click the **openEuler-1.0-aarch64-dvd.iso.sha256sum** link under the **please download the checksum file:** area to download the **openEuler-1.0-aarch64-dvd.iso.sha256sum** verification file to the local PC.

1.2 Release Package Integrity Check

Introduction

To prevent the software package from being incompletely downloaded due to network or storage device faults during transmission, you need to verify the integrity of the software package after obtaining it. Only the software packages that pass the verification can be installed.

Compare the verification value recorded in the verification file with the .iso file verification value calculated manually to check whether the software package passes the verification. If the verification values are consistent, the integrity of the .iso file is not damaged. If they are

inconsistent, you can confirm that the file integrity is damaged and you need to obtain the file again.

Prerequisites

Before verifying the integrity of the release package, you need to prepare the following files:

.iso file: **openEuler-1.0-aarch64-dvd.iso**

Verification file: **openEuler-1.0-aarch64-dvd.iso.sha256sum**

Procedure

To verify the file integrity, perform the following operations:

Step 1 Run the following command to obtain the verification value in the verification file:

```
#cat openEuler-1.0-aarch64-dvd.iso.sha256sum
```

Step 2 Run the following command to calculate the SHA256 verification value of the file:

```
#sha256sum openEuler-1.0-aarch64-dvd.iso
```

After the command is run, the verification value is displayed.

Step 3 Check whether the values calculated in step 1 and step 2 are consistent.

If the verification values are consistent, the integrity of the .iso file is not damaged. If they are inconsistent, you can confirm that the file integrity is damaged and you need to obtain the file again.

----End

1.3 Hardware Compatibility

You need to take hardware compatibility into account during openEuler installation. Table 1-1 lists the types of supported servers.

NOTE

- TaiShan 200 servers are backed by Huawei Kunpeng 920 processors.
- Currently, only Huawei TaiShan servers are supported. More servers from other vendors will be supported in the future.

Table 1-1 Supported servers

Server Type	Server Name	Server Model
Rack server	TaiShan 200 servers	2280 balanced model
Rack server		5280 storage model
High-density server		X6000 high-density model

1.4 Minimal Hardware Specifications

Table 1-2 lists the minimal hardware specifications supported by openEuler.

Table 1-2 Minimal hardware specifications

Component	Minimal Hardware Specifications	Description
Architecture	AArch64	Only the 64-bit ARM architecture is supported.
CPU	Huawei Kunpeng 920 series	It is strongly recommended that the physical servers used as compute nodes in one cluster use the same series of CPUs.
Memory	≥ 8 GB (You are advised to configure 16 GB memory or higher for better user experience.)	-
Hard disk	≥ 10 GB (You are advised to configure 120 GB memory or higher for better user experience.)	The hard disk supports IDE, SATA, SAS interfaces.

2 Installation Mode

NOTICE

The operating system can only be deployed on TaiShan 200 servers. For details about the types of supported servers, see **Installation Preparations > Hardware Compatibility**. Moreover, it can only be installed using the CD/DVD-ROM.

[2.1 Installation Through the CD/DVD-ROM](#)

2.1 Installation Through the CD/DVD-ROM

This section describes how to create or use a CD/DVD-ROM to install the operating system.

Preparing the Installation Source

If you have obtained a CD/DVD-ROM, install the operating system using the CD/DVD-ROM. If you have obtained an ISO file, record the ISO file to a DVD and install the operating system using the obtained DVD.

Starting the Installation

Perform the following operations to start the installation:

NOTE

Set the system to preferentially boot from the CD/DVD-ROM. Take the BIOS as an example. You need to move the **CD/DVD-ROM Drive** option under **Boot Type Order** to the top.

1. Disconnect all drives that are not required, such as USB drives.
2. Start your computer system.
3. Insert the installation CD/DVD-ROM into the CD/DVD-ROM drive.
4. Restart the computer system.

After a short delay, a graphical wizard page is displayed, which contains different boot options. If you do not perform any operation within one minute, the installation starts automatically with the default options.

3 Installation Guideline

This section describes how to install openEuler 1.0 by using the CD/DVD-ROM.

- 3.1 [Starting the Installation](#)
- 3.2 [Using GUI Mode for Installation](#)
- 3.3 [Using Text Mode for Installation](#)

3.1 Starting the Installation

Mount the ISO image of openEuler 1.0 to the server from the CD/DVD-ROM and restart the server. The procedure is as follows:

NOTE

Before the installation, ensure that the server boots from the CD/DVD-ROM drive preferentially. The following steps describe how to install the operating system using the virtual CD/DVD-ROM drive on the baseboard management controller (BMC). Installing the operating system from a physical drive is simple. After the installation starts, the procedure for the physical drive is the same as that for the virtual drive.

1. On the toolbar, click the icon shown in the following figure.

Figure 3-1 Drive icon



An image dialog box is displayed, as shown in the following figure.

Figure 3-2 Image dialog box



2. Select **Image File** and then click **Browse**. The **Open** dialog box is displayed.

3. Select the image file and click **Open**. In the image dialog box, click **Connect**. If **Connect** changes to **Disconnect**, the virtual CD/DVD-ROM drive is connected to the server.
4. On the toolbar, click the restart icon shown in the following figure to restart the device.

Figure 3-3 Restart icon



5. A boot menu is displayed after the system is booted using the boot medium. In addition to options for starting the installation program, some other options are available on the boot menu. The **Install openEuler 1.0 with text mode** installation mode is used by default. Press the arrow keys on the keyboard to change the selection, and press **Enter** when the desired option is highlighted.

 **NOTE**


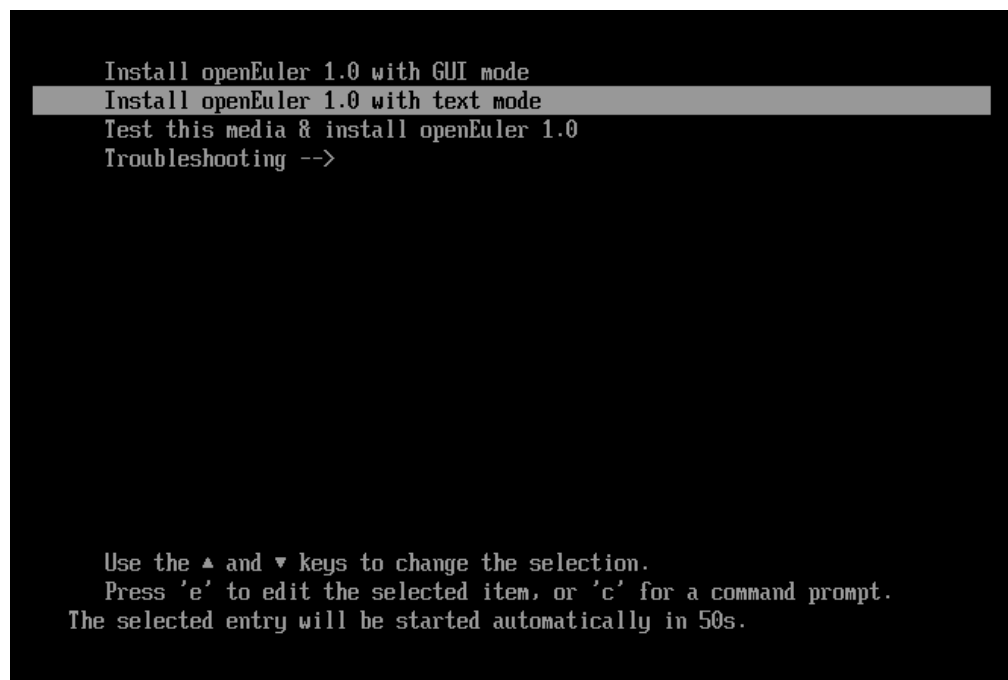
- If you do not perform any operations within 1 minute, the system automatically selects the default option **Install openEuler 1.0 with text mode** and enters the installation interface.
- During physical machine installation, if you cannot use the arrow keys to select boot options and the system does not respond after you press **Enter**, click  on the BMC page and configure **Key & Mouse Reset**.

Figure 3-4 Installation wizard



Installation wizard options are described as follows:

- **Install openEuler 1.0 with GUI mode:** Install openEuler in GUI mode on your server. For details, see **Installation Guide > Using GUI Mode for Installation**.

- **Install openEuler 1.0 with text mode:** Default option. Install openEuler in text mode on your server. The installation is completed in **tty0** of the system. For details, see **Installation Guide > Using Text Mode for Installation**.
- **Test this media & install openEuler 1.0:** Default option. Install openEuler on your server using the graphical installation program. The integrity of the installation medium is checked before the installation program is started.
- **Troubleshooting:** Problem locating mode, which is used when the system cannot be installed properly. In the fault locating mode, the following options are available:
 - **Install openEuler 1.0 in basic graphics mode:** Basic graphics installation mode. In this mode, the video driver is not started before the system starts and runs.
 - **Rescue an openEuler system:** Rescue mode, which is used to restore the system. In rescue mode, the operating system installation process is printed in the VNC or BMC, and the serial port is unavailable.

3.2 Using GUI Mode for Installation

On the installation wizard page, select **Install openEuler 1.0 with GUI mode** to enter the GUI mode.

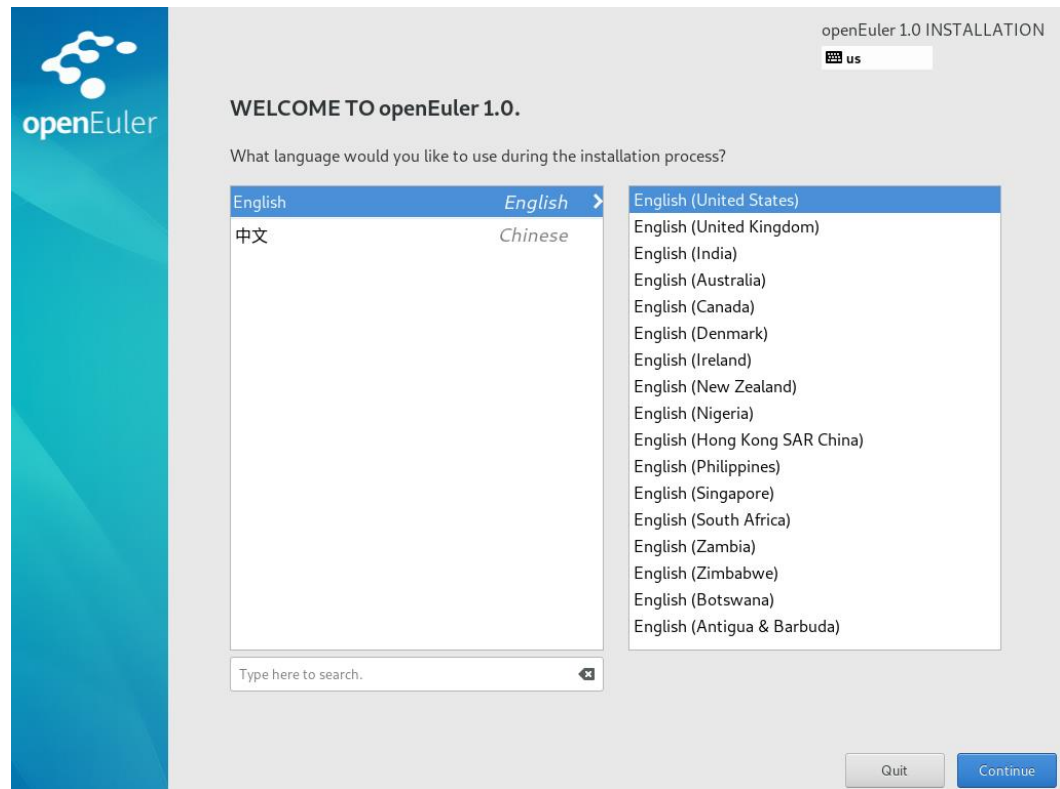
Perform graphical installation operations using a keyboard.

- Press **Tab** or **Shift+Tab** to move between GUI controls (such as buttons, area boxes, and check boxes).
- Press the up or down arrow key to move a target in the list.
- Press the left or right arrow key to move between the horizontal toolbar and watch bar.
- Press the spacebar or **Enter** to select or delete highlighted options, expand or collapse a drop-down list.
- Press **Alt**+a shortcut key (the shortcut key varies for different pages) to select the control where the shortcut key is located. The shortcut key can be highlighted (underlined) by holding down Alt.

3.2.1 Configuring an Installation Program Language

After the installation starts, the system will prompt the language that is used during the configuration installation process. English is configured by default. Configure another language as required, such as "English" in Figure 3-5.

Figure 3-5 Selecting a language



After configurations, click **Continue**. The main installation configuration interface is displayed.

If you want to exit the installation, click **Exit**. The message "Are you sure you want to exit the installation program?" is displayed. Click **Yes** in the dialog box to go back to the installation wizard page.

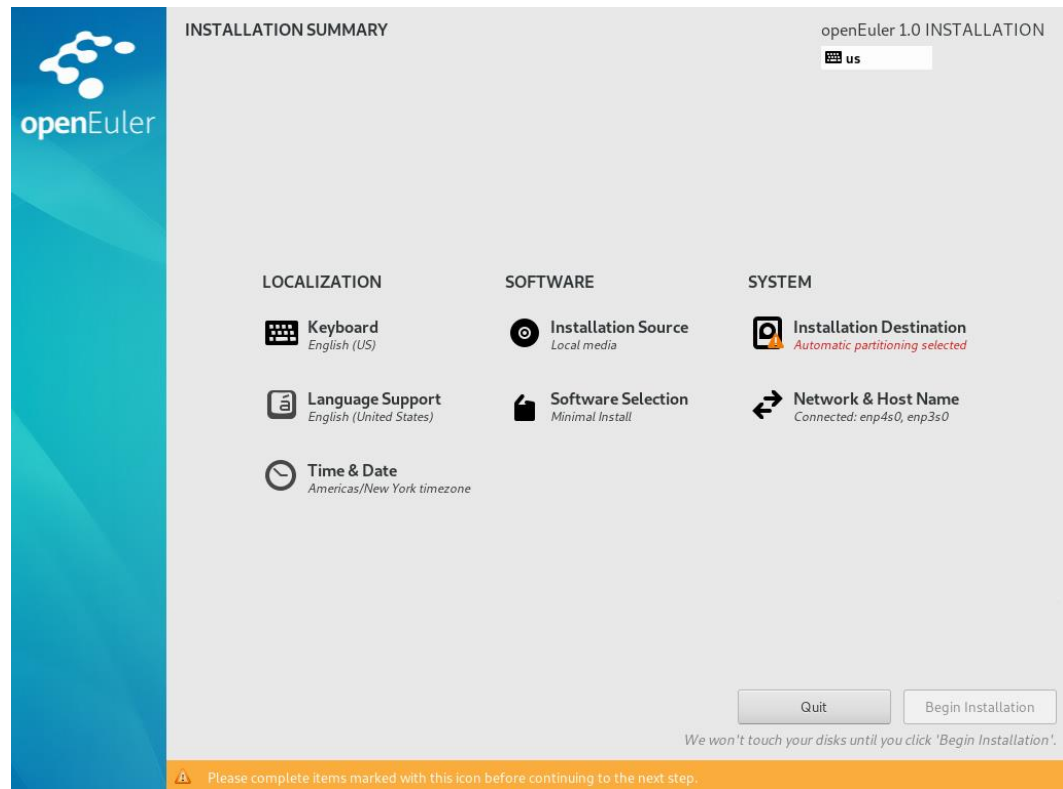
3.2.2 Entering the Installation Interface

After the installation program starts, the main installation configuration interface is displayed, as shown in Figure 3-6. On the interface, you can configure the time, language, installation source, network, and storage device.

Some configuration items are matched with safety symbols. A safety symbol will disappear after the item is configured. Start the installation only when all the safety symbols disappear from the interface.

If you want to exit the installation, click **Exit**. The message "Are you sure you want to exit the installation program?" is displayed. Click **Yes** in the dialog box to go back to the installation wizard page.

Figure 3-6 Installation summary



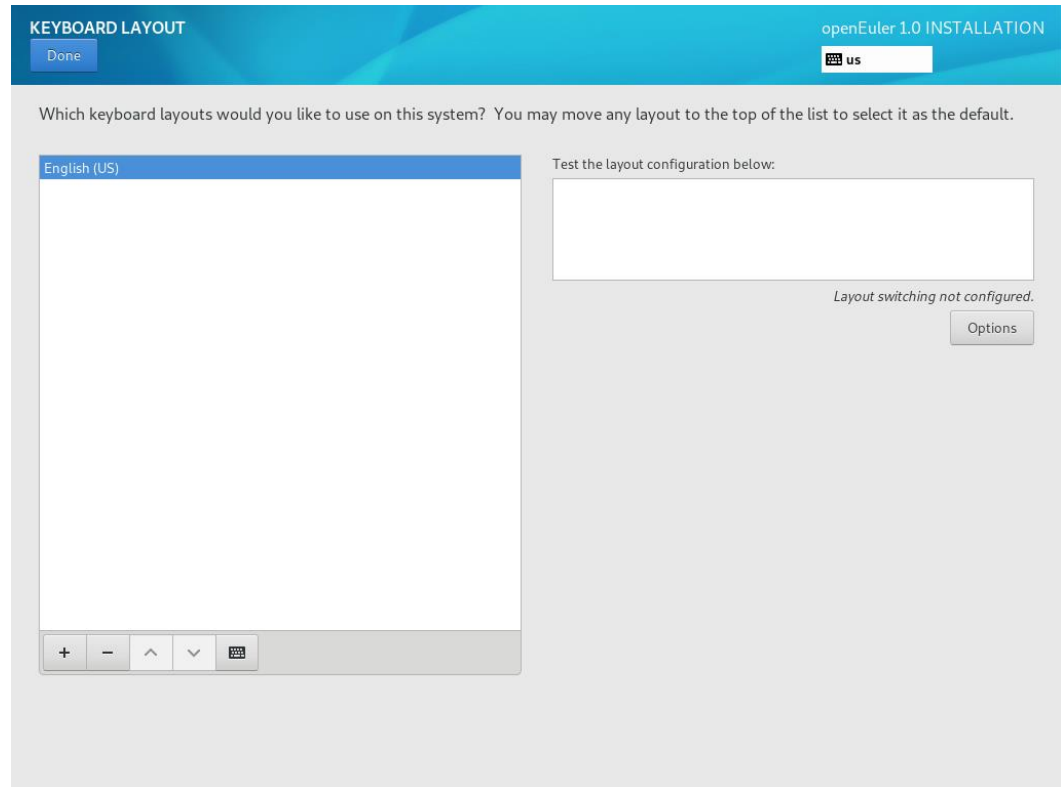
3.2.3 Setting Installation Parameters

3.2.3.1 Setting the Keyboard Layout

On the **INSTALLATION SUMMARY** page, click **KEYBOARD**. You can add or delete multiple keyboard layouts in the system.

- On the left white box, click to select the keyboard layout and click the keyboard under the box.
- To test the keyboard layout: On the left white box, click to select the keyboard layout, click the inside of the right text box, and enter the text to ensure that the keyboard layout can work properly.

Figure 3-7 Setting the keyboard layout



After the setting is complete, click **Done** in the upper left corner to go back to the **INSTALLATION SUMMARY** page.

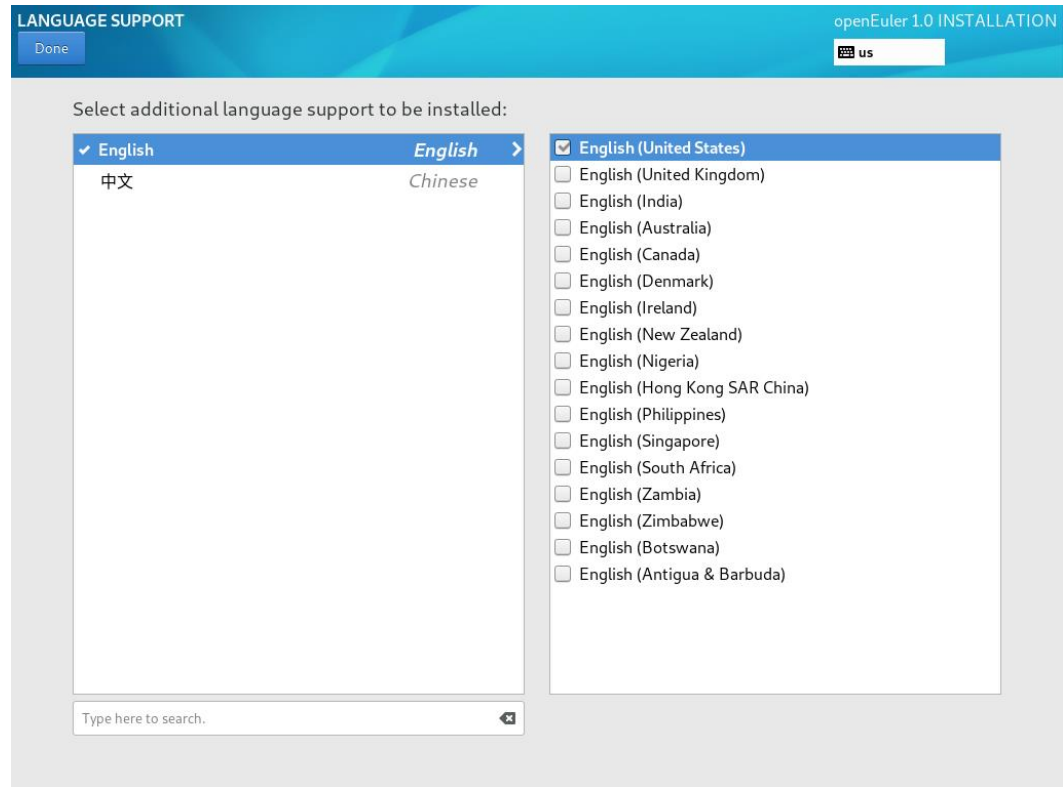
3.2.3.2 Setting a System Language

On the **INSTALLATION SUMMARY** page, click **LANGUAGE SUPPORT** to set the system language. Set another language as required, such as Chinese, as shown in Figure 3-8.

NOTE

- If you select Chinese, the system does not display Chinese characters after you log in to the system using VNC, because VNC does not support Chinese characters. If you log in to the system in SSH mode, Chinese characters will be displayed.
- If you select English, there will be no impact.

Figure 3-8 Setting a system language



After the setting is complete, click **Done** in the upper left corner to go back to the **INSTALLATION SUMMARY** page.

3.2.3.3 Setting Date and Time

On the **INSTALLATION SUMMARY** page, click **TIME & DATE**. On the **TIME & DATE** page, set the system time zone, date, and time.

When setting the time zone, you can click a specific city on the map with the mouse, or select a region from the drop-down list of **Region** or a city from the drop-down list of **City** at the top of the page, as shown in Figure 3-9.

If your city is not displayed on the map or in the drop-down list, select the nearest city in the same time zone.

Figure 3-9 Setting date and time



After the setting is complete, click **Done** in the upper left corner to go back to the **INSTALLATION SUMMARY** page.

3.2.3.4 Setting the Installation Source

On the **INSTALLATION SUMMARY** page, click **INSTALLATION SOURCE** to locate the installation source.

If you use the CD/DVD-ROM driver for the installation, the installation program automatically detects and displays the installation source information. You can use the default settings. Figure 3-10 shows an example.

Figure 3-10 Setting the installation source

The screenshot shows the 'INSTALLATION SOURCE' configuration window. The header includes 'INSTALLATION SOURCE' and 'openEuler 1.0 INSTALLATION'. A 'Done' button is in the top left. The main section asks 'Which installation source would you like to use?'. The 'Auto-detected installation media:' option is selected, showing 'Device: sr0' and 'Label: openEuler-1.0-aarch64' with a 'Verify' button. The 'On the network:' option is unselected, showing a 'Closest mirror' dropdown, a text input, and a 'Proxy setup...' button. Below is a 'URL type:' dropdown. The 'Additional repositories' section has a table with 'Enabled' and 'Name' columns. To the right are fields for 'Name:', 'URL type:' (set to 'http://'), 'Proxy URL:', 'User name:', and 'Password:'.

After the setting is complete, click **Done** in the upper left corner to go back to the **INSTALLATION SUMMARY** page.

NOTE

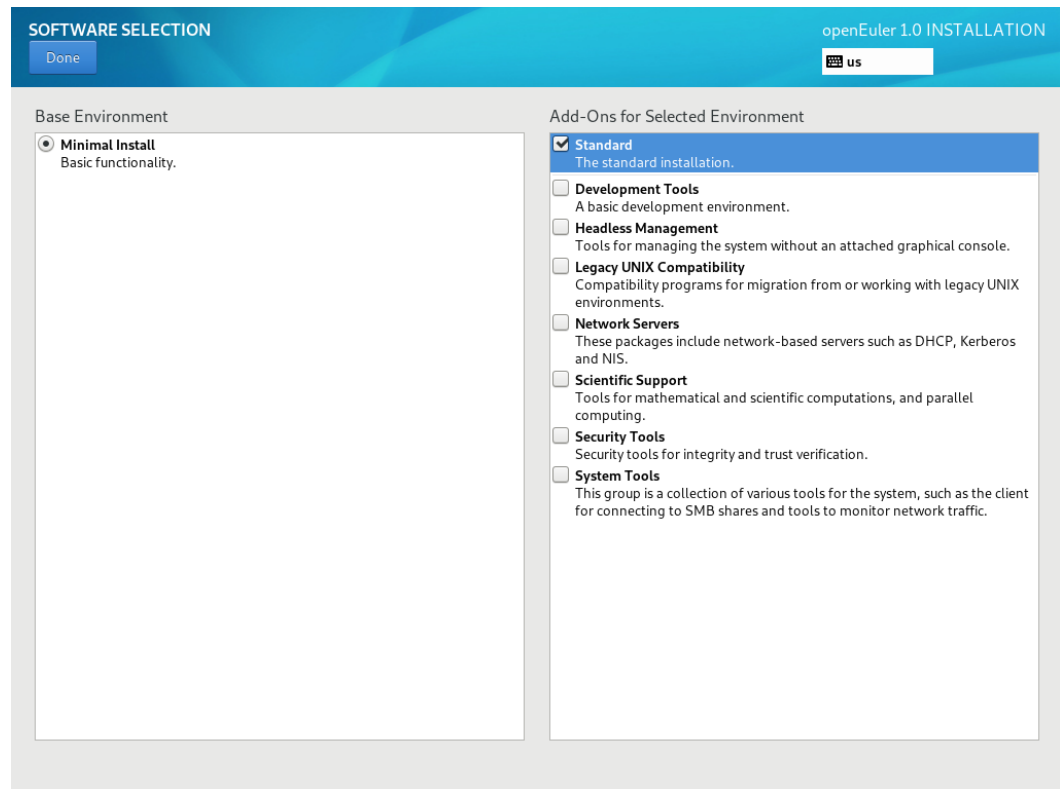
During the installation, if you have any questions about configuring the installation source, see **FAQs > An Exception Occurs During the Selection of the Installation Source**.

3.2.3.5 Selecting Installation Software

On the **INSTALLATION SUMMARY** page, click **SOFTWARE SELECTION** to specify the software package to be installed.

Based on the site requirements, select **Minimal Install** on the left box and select the additional option under the **Add-Ons for Selected Environment** area on the right, as shown in Figure 3-11.

Figure 3-11 Selecting installation software



NOTE

In Minimal Install mode, not all packages in the installation source will be installed. If the required package is not installed, you can mount the installation source to the local PC and configure a repository source, and use DNF to install the package.

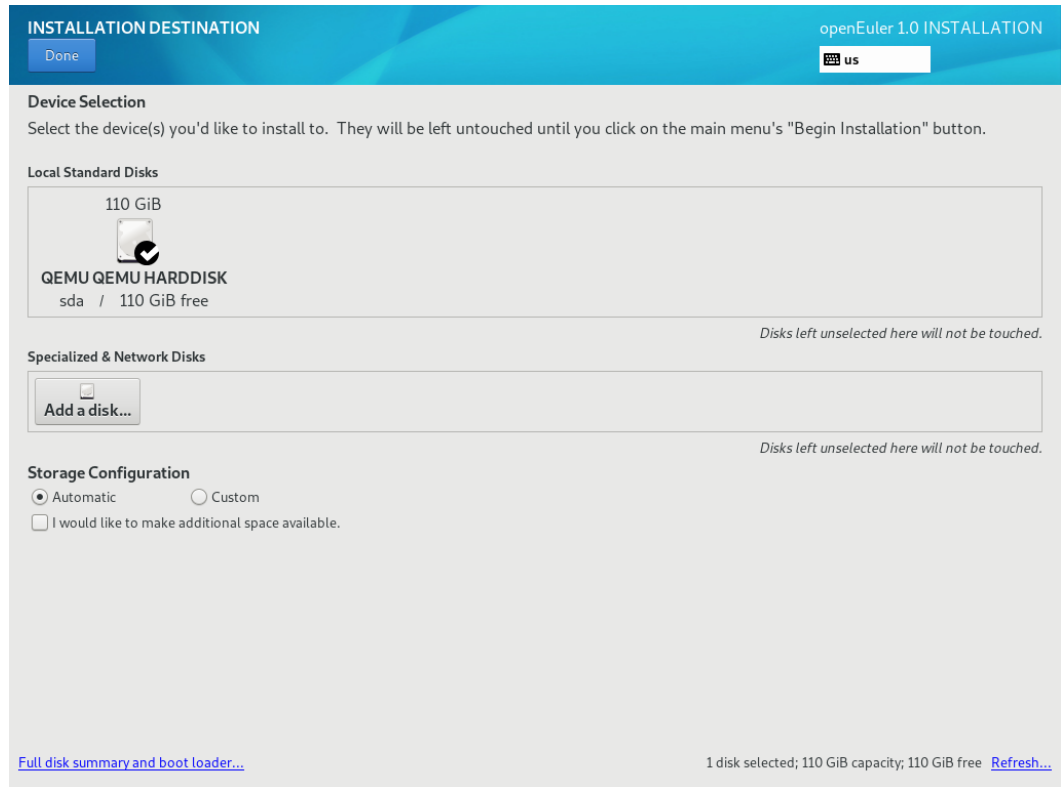
After the setting is complete, click **Done** in the upper left corner to go back to the **INSTALLATION SUMMARY** page.

3.2.3.6 Setting the Installation Destination

On the **INSTALLATION SUMMARY** page, click **INSTALLATION DESTINATION** to select the operating system installation disk and partition.

You can view available local storage devices in Figure 3-12. You can also add an attached device or a network disk specified by clicking **Add a disk**.

Figure 3-12 Setting the installation destination



Storage Configuration

On the **INSTALLATION DESTINATION** page, set storage configurations for system partition. You can either manually configure partitions or select **Automatic** to automatically configure partitioning.

NOTE

- During partitioning, to ensure system security and performance, you are advised to divide the device into the following partitions: **/boot**, **/var**, **/var/log**, **/var/log/audit**, **/home**, **/tmp**.
- If the system is configured with the swap partition, the swap partition is used when the physical memory of the system is insufficient. Although the swap partition can be used to expand the physical memory, if the swap partition is used due to insufficient memory, the system response time increases and the system performance deteriorates. Therefore, you are not advised to configure the swap partition in the system with sufficient physical memory or the performance sensitive system.
- If you need to split a logical volume group, select **Custom** to manually partition the logical volume group. On the **MANUAL PARTITIONING** page, click **Modify** in the **Volume Group** area to reconfigure the logical volume group.

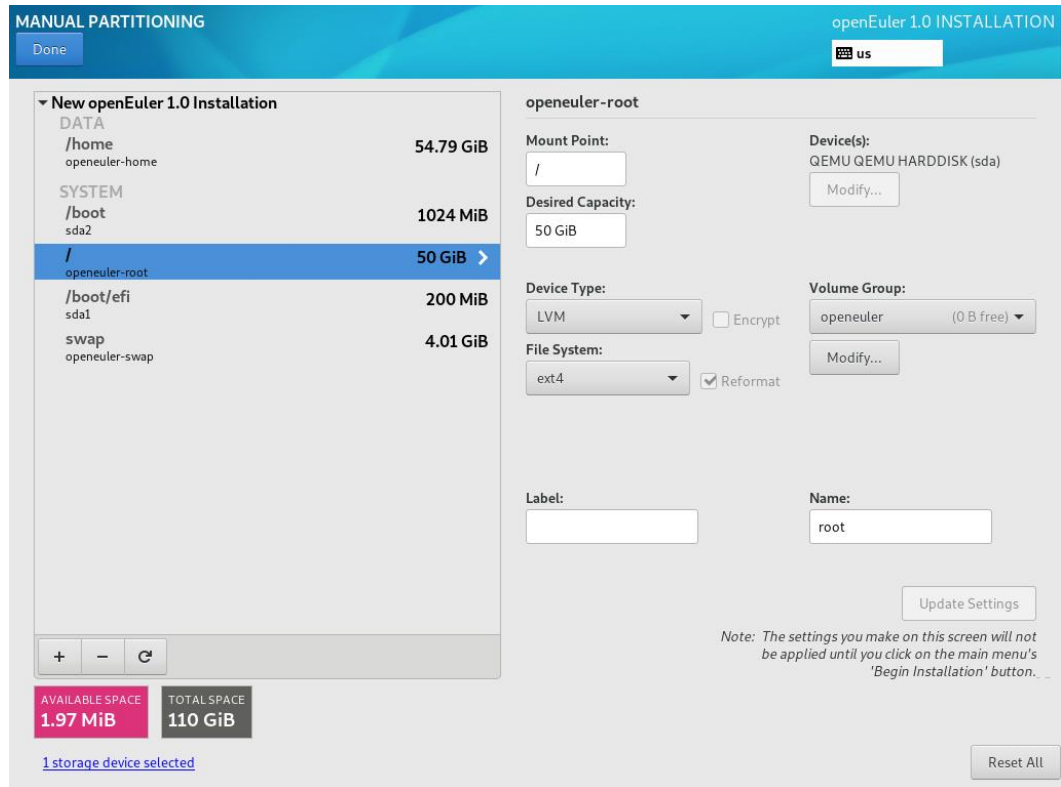
Automatic

Select **Automatic** if the software is installed in a new storage device or the data in the storage device is not required.

Customize

If you need to manually partition the disk, click **Customize** and click **Done** in the upper left corner. The following page is displayed.

Figure 3-13 MANUAL PARTITIONING page



On the **MANUAL PARTITIONING** page, you can partition the disk in either of the following ways:

- Automatic creation: Click **Click here to create them automatically**. The system automatically assigns four mount points according to the available storage space: **/boot**, **/boot/efi**, and **swap**.
- Manual creation: Click **+** to add a mount point. It is recommended that the expected capacity of each mount point not exceed the available space.

NOTE

If the expected capacity of the mount point exceeds the available space, the system allocates the remaining available space to the mount point.

After the setting is complete, click **Done** in the upper left corner to go back to the **INSTALLATION SUMMARY** page.

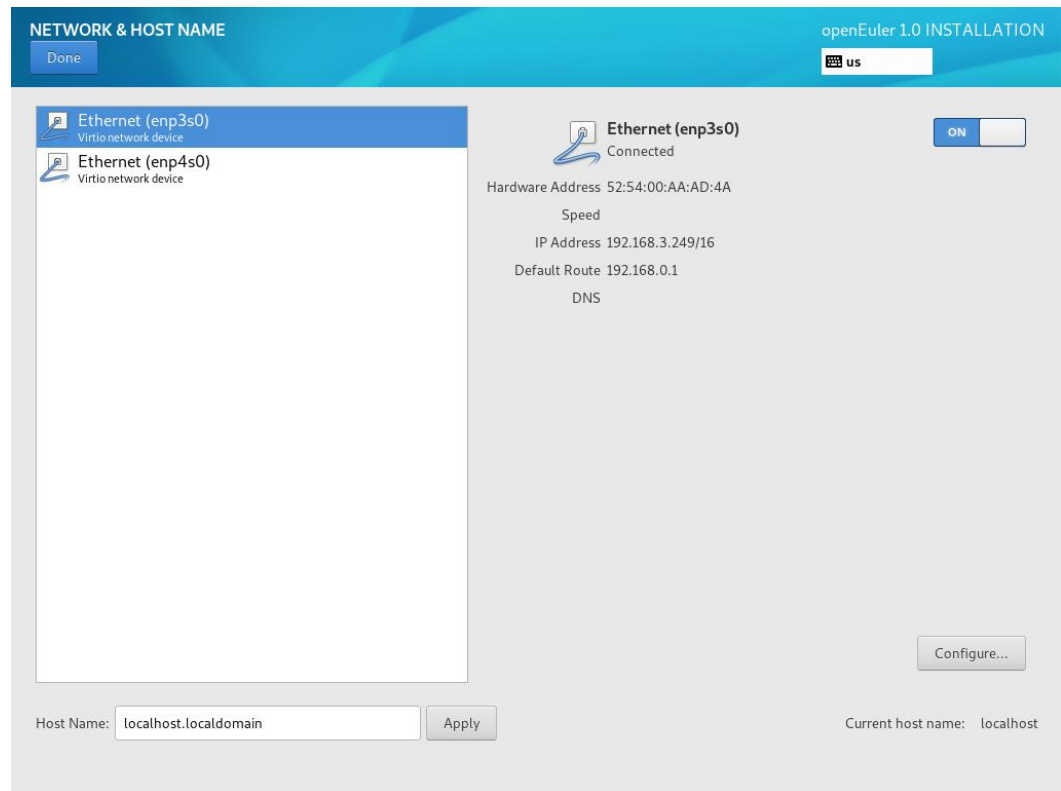
3.2.3.7 Setting the Network and Host Name

On the **INSTALLATION SUMMARY** page, select **NETWORK & HOST NAME** to configure the system network functions.

The installation program automatically detects a local access interface. The detected interface is listed in the left box, and the interface details are displayed in the right-hand area, as shown in Figure 3-14. In the upper right corner, click the switchover button to enable or disable the network interface. You can also click **Configure** to configure the selected interface.

In the lower left box, enter the host name. The host name can be the fully quantified domain name (format: `hostname.domainname`) or the brief host name (format: `hostname`).

Figure 3-14 Setting the network and host name

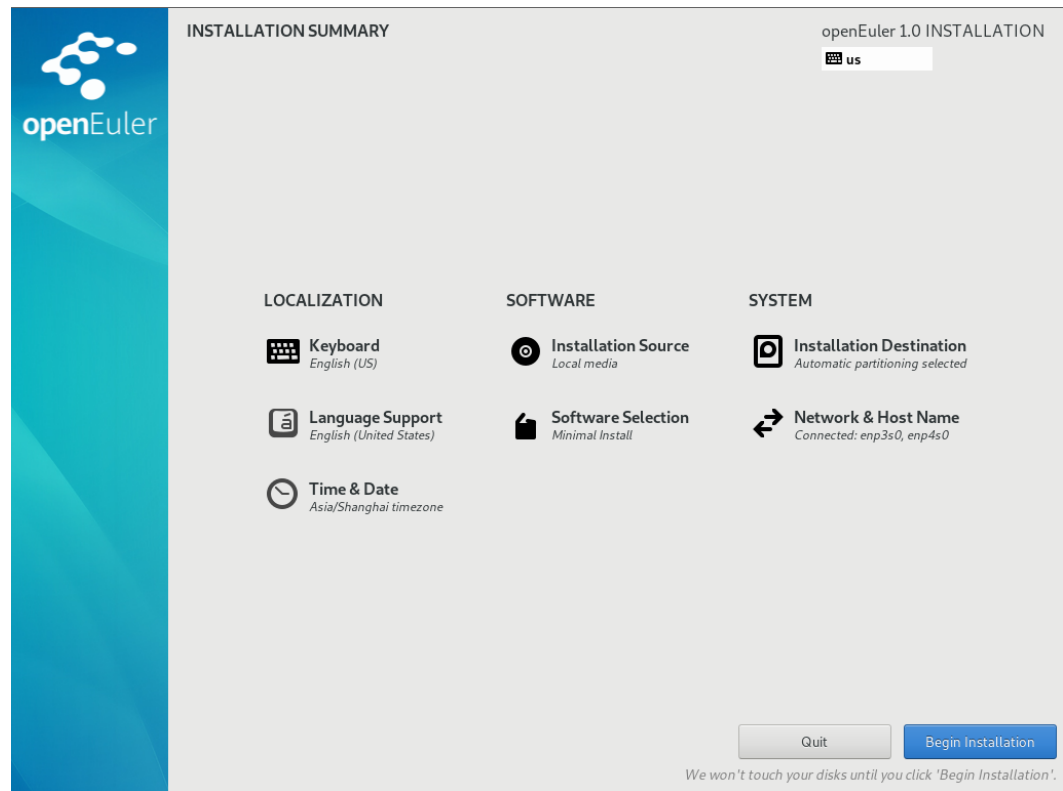


After the setting is complete, click **Done** in the upper left corner to go back to the **INSTALLATION SUMMARY** page.

3.2.4 Starting Installation

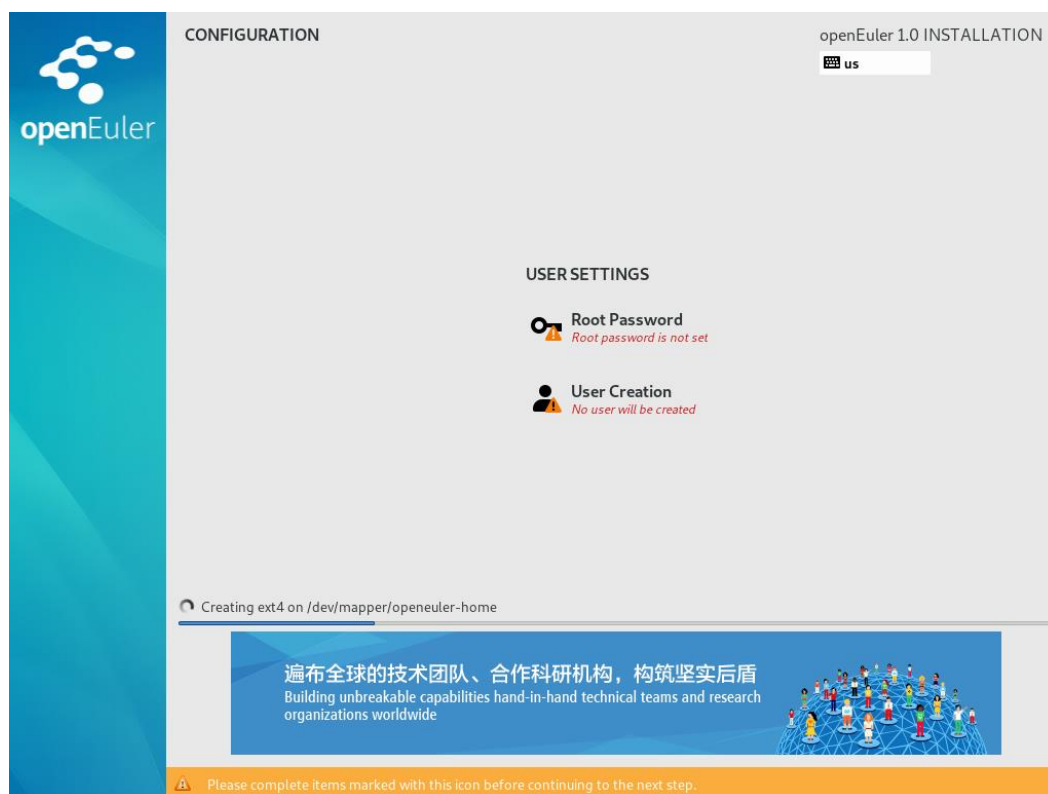
On the installation interface, after all the mandatory items are configured, the safety symbols will disappear. Then, you can click **Begin Installation** to install the system.

Figure 3-15 Starting installation



3.2.5 Configurations During Installation

After the installation starts, the overall installation progress and the progress of writing the software package to the system are displayed.

Figure 3-16 Installation process

During the process of installing software packages, you need to configure the root password and create users.

Password Complexity

The password of the root user or the password of the new user must meet the password complexity requirements. Otherwise, the password configuration or user creation will fail. The password complexity requirements are as follows:

1. A password must contain at least eight characters.
2. A password must contain at least three of the following types: uppercase letters, lowercase letters, digits, and special characters.
3. A password must be different from the account name.
4. A password cannot contain words in the dictionary.

- Querying a dictionary

In the installed openEuler environment, you can run the following command to export the dictionary library file **dictionary.txt**, and then check whether the password is in the dictionary.

```
cracklib-unpacker /usr/share/cracklib/pw_dict > dictionary.txt
```

- Modifying a dictionary

- i. Modify the exported dictionary library file, and then run the following command to update the dictionary library:

```
# create-cracklib-dict dictionary.txt
```


- ii. Run the following command to add another dictionary file **custom.txt** to the original dictionary library.

```
# create-cracklib-dict dictionary.txt custom.txt
```

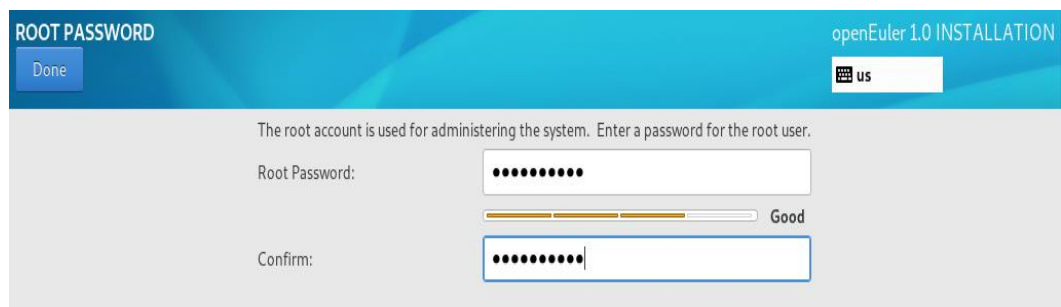
Setting the root User Password

Click **Root Password**. In the displayed dialog box, as shown in Figure 3-17, enter a password and re-enter to confirm.

NOTE

The password of root is required to configure at the same time of installing software packages. Otherwise, the installation will fail. A root account is used for performing critical system administrative tasks. It is not recommended to use this account for daily work or system access.

Figure 3-17 root password



After configuration, click **Done** in the left-upper corner to switch back to the installation process interface.

Creating a User

Click **User Creation**. Figure 3-18 shows the interface for creating a user. Enter a user name and set a password. By clicking **Advanced**, you can also configure a home directory and a user group, as shown in Figure 3-19.

Figure 3-18 Creating a user

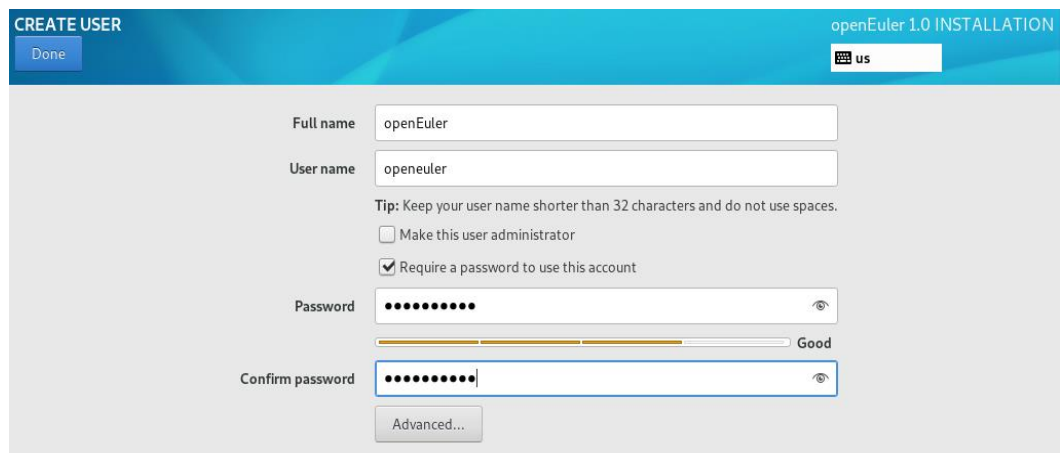


Figure 3-19 Advanced user configuration

ADVANCED USER CONFIGURATION

Home directory:

User and Group IDs

Specify a user ID manually:

Specify a group ID manually:

Group Membership

Add user to the following groups:

Example: wheel, my-team (1245), project-x (29935)

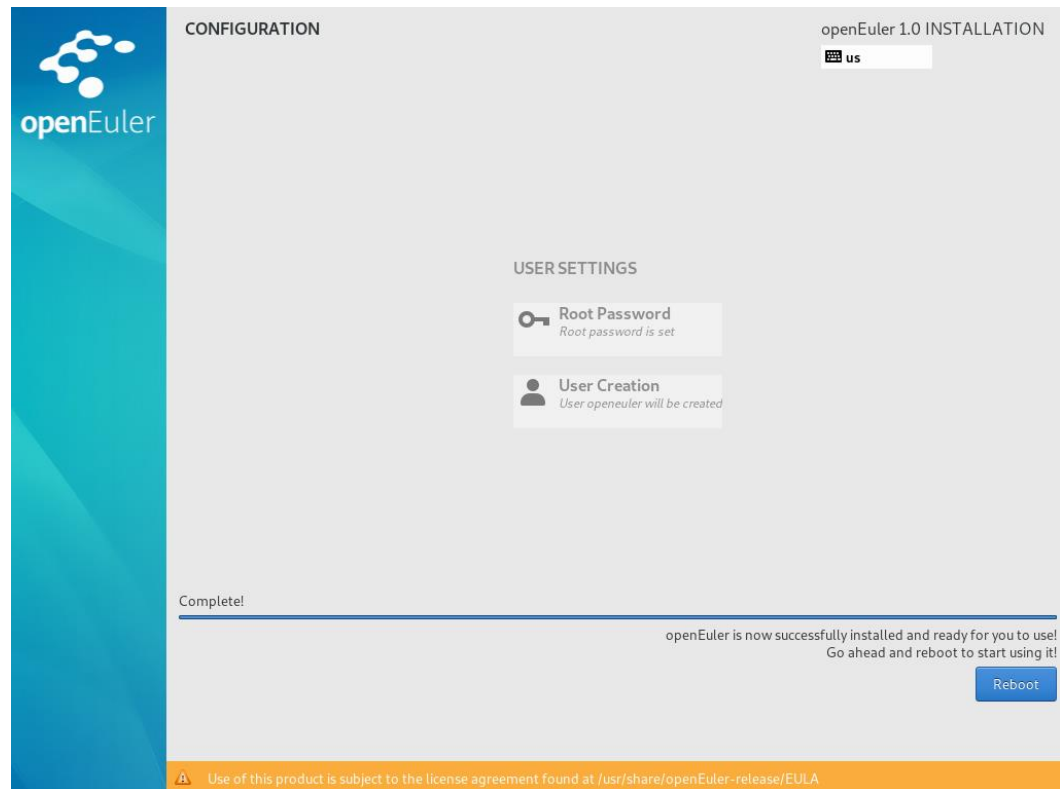
Tip: You may input a comma-separated list of group names and group IDs here. Groups that do not already exist will be created; specify their GID in parentheses.

After configuration, click **Done** in the left-upper corner to switch back to the installation process interface.

3.2.6 Completing the Installation

openEuler has been installed, as shown in Figure 3-20. Click **Reboot** to restart the system.

Figure 3-20 Completing the installation



NOTE

Remove the CD-ROM manually if it does not eject automatically during rebooting.

After the restart is complete, log in to openEuler through the CLI.

3.3 Using Text Mode for Installation

3.3.1 Entering the Installation Interface

On the installation wizard page, select **Install openEuler 1.0 with text mode** to enter the text mode.

After the installation program starts, the main interface of installation configuration is displayed when you enter **2**, as shown in Figure 3-21. You can set the time, language, installation source, network, and storage on the interface.

NOTE

[x] indicates that the items are configured (or configured by default). You can set these items as required.
[!] Indicates that the items are not configured. You must configure them before starting the installation.

Figure 3-21 Installation overview

```
Starting installer, one moment...
anaconda 29.24.7-2.ky4 for openEuler 1.0 started.
* installation log files are stored in /tmp during the installation
* shell is available on TTY2
* if the graphical installation interface fails to start, try again with the
  inst.text bootoption to start text installation
* when reporting a bug add logs from /tmp as separate text/plain attachments
=====
=====
1) Start UNC
2) Use text mode

Please make a selection from the above ['c' to continue, 'q' to quit, 'r' to
refresh]: 2
=====
=====
Installation

1) [x] Language settings                2) [x] Time settings
   (English (United States))           (America/New_York timezone)
3) [!] Installation source             4) [!] Software selection
   (Processing...)                     (Processing...)
5) [!] Installation Destination        6) [x] Network configuration
   (No disks selected)                 (Wired (ens2) connected)
7) [!] Root password                   8) [!] User creation
   (Password is not set.)              (No user will be created)

Please make a selection from the above ['b' to begin installation, 'h' to help,
'q' to quit, 'r' to refresh]:
```

3.3.2 Setting Installation Parameters

3.3.2.1 Configuring the System Language

Enter **1** on the installation overview page and press **Enter** to configure the system language. You can change the language as shown in the following figure.

Figure 3-22 Configuring a system language

```
Installation
1) [x] Language settings                2) [x] Time settings
   (English (United States))           (America/New_York timezone)
3) [!] Installation source             4) [!] Software selection
   (Processing...)                     (Processing...)
5) [!] Installation Destination        6) [x] Network configuration
   (No disks selected)                 (Wired (ens2) connected)
7) [!] Root password                   8) [!] User creation
   (Password is not set.)              (No user will be created)

Please make a selection from the above ['b' to begin installation, 'h' to help,
'q' to quit, 'r' to refresh]: 1
=====
Language settings

Available languages
1) English                2) Chinese

Please select language support to install ['b' to return to language list, 'c'
to continue, 'h' to help, 'q' to quit, 'r' to refresh]: 2
=====
Language settings

Available locales
1) Simplified Chinese
   (China)

Please select language support to install ['b' to return to language list, 'c'
to continue, 'h' to help, 'q' to quit, 'r' to refresh]: c
```

After the configuration is complete, enter **c** to return to the installation overview page.

3.3.2.2 Configuring the Time Zone and NTP Service

This section describes how to configure the system time zone (time/date) and configure the NTP service.

Configuring Time Zone

Enter **2** on the installation overview page and press **Enter**. The interface for configuring the time zone and NTP service is displayed.

Enter **1** and press **Enter** to configure the system time zone, as shown in Figure 3-23. You can configure and change the time zone and city of the system as required.

Figure 3-23 Configuring the time zone

```
Installation
1) [x] Language settings                2) [x] Time settings
   (English (United States))           (America/New_York timezone)
3) [x] Installation source             4) [x] Software selection
   (Local media)                       (Minimal Install)
5) [!] Installation Destination        6) [x] Network configuration
   (No disks selected)                 (Wired (ens2) connected)
7) [!] Root password                  8) [!] User creation
   (Password is not set.)              (No user will be created)

Please make a selection from the above ['b' to begin installation, 'h' to help,
'q' to quit, 'r' to refresh]: 2
=====
Time settings
Timezone: America/New_York
NTP servers: not configured

1) Change timezone
2) Configure NTP servers

Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]: 1
=====
Timezone settings
Available regions
1) Europe                5) Antarctica          9) Indian
2) Asia                  6) Pacific             10) Arctic
3) America               7) Australia           11) US
4) Africa                8) Atlantic            12) Etc

Please select the timezone. Use numbers or type names directly ['b' back to
region list, 'c' to continue, 'q' to quit, 'r' to refresh]:
```

When you select a city, the cities will be displayed in the paging mode if a large number of cities exist in the system. When the message **Press ENTER to continue** is displayed, press **Enter** to display all cities.

Figure 3-24 Cities

```
Please select the timezone. Use numbers or type names directly ['b' back to
region list, 'c' to continue, 'q' to quit, 'r' to refresh]: 2
=====
=====
Timezone settings

Available timezones in region Asia
1) Aden                29) Ho_Chi_Minh       57) Pontianak
2) Almaty              30) Hong_Kong        58) Pyongyang
3) Amman               31) Hovd             59) Qatar
4) Anadyr              32) Irkutsk          60) Qostanay
5) Aqtay               33) Jakarta          61) Qyzylorda
6) Aqtobe              34) Jayapura         62) Riyadh
7) Ashgabat            35) Jerusalem        63) Sakhalin
8) Atyrau              36) Kabul            64) Samarkand
9) Baghdad             37) Kamchatka        65) Seoul
10) Bahrain            38) Karachi          66) Shanghai
11) Baku                39) Kathmandu        67) Singapore
12) Bangkok            40) Khandyga         68) Srednekolymsk
13) Barnaul            41) Kolkata          69) Taipei
14) Beijing            42) Krasnoyarsk     70) Tashkent
15) Beirut             43) Kuala_Lumpur    71) Tbilisi
16) Bishkek            44) Kuching          72) Tehran
17) Brunei              45) Kuwait           73) Thimphu
18) Chita               46) Macau            74) Tokyo
19) Choibalsan         47) Magadan          75) Tomsk
20) Colombo            48) Makassar         76) Ulaanbaatar
21) Damascus           49) Manila           77) Urumqi
22) Dhaka               50) Muscat           78) Ust-Nera
23) Dili                51) Nicosia          79) Vientiane
24) Dubai              52) Novokuznetsk   80) Vladivostok
25) Dushanbe           53) Novosibirsk     81) Yakutsk

Press ENTER to continue:
26) Famagusta          54) Omsk              82) Yangon
27) Gaza               55) Oral              83) Yekaterinburg
28) Hebron             56) Phnom_Penh       84) Yerevan

Please select the timezone. Use numbers or type names directly ['b' back to
region list, 'c' to continue, 'q' to quit, 'r' to refresh]: 66
```

Setting the NTP Service

After the time zone is configured, return to the main installation interface (as shown in the **Installation** overview), enter **2**, and press **Enter**. The interface for configuring the time zone and NTP service is displayed.

Enter **2** and press **Enter** to configure the NTP service.

Figure 3-25 Configuring the NTP server

```
Time settings
Timezone: Asia/Shanghai
NTP servers: not configured
1) Change timezone
2) Configure NTP servers
Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]: 2
=====
NTP configuration
NTP servers: no NTP servers have been configured
1) Add NTP server
Please make a selection from the above ['c' to continue, 'q' to quit, 'r' to
refresh]: 1
=====
Add NTP server address
Enter an NTP server address and press ENTER:
```

After the configuration is complete, enter **c** to return to the installation overview page.

3.3.2.3 Configuring the Installation Source

Enter **3** on the installation overview page and press **Enter** to specify the location of the installation source.

You can select **local ISO file** or **Network**, as shown in the following figure. Currently, the CD/DVD is used for installation. The installation program automatically detects the installation source information. Retain the default settings.

- CD/DVD: Obtain the installation source from the mounted CD-ROM drive.
- local ISO file: Obtain the ISO file from the local disk.
- Network: Obtain the installation source on the network server through HTTP, HTTPS, FTP, or NFS.

Figure 3-26 Configuring an installation source

```
Installation
1) [x] Language settings                2) [x] Time settings
   (English (United States))           (Asia/Shanghai timezone)
3) [x] Installation source              4) [x] Software selection
   (Local media)                       (Minimal Install)
5) [!] Installation Destination         6) [x] Network configuration
   (No disks selected)                 (Wired (ens2) connected)
7) [!] Root password                   8) [!] User creation
   (Password is not set.)              (No user will be created)

Please make a selection from the above ['b' to begin installation, 'h' to help,
'q' to quit, 'r' to refresh]: 3
=====
Installation source

Choose an installation source type.
1) CD/DVD
2) local ISO file
3) Network

Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]: c
```

After the configuration is complete, enter **c** to return to the installation overview page.

NOTE

During the installation, if you have any questions about configuring the installation source, see [FAQs > An Exception Occurs During the Selection of the Installation Source](#).

3.3.2.4 Selecting Installation Software

Enter **4** on the installation overview page, and then press **Enter** to specify the software package to be installed.

- **Minimal Install:** Minimum environment. Provide basic functions of openEuler. By default, openEuler is installed in the minimum environment mode.

You need to select an appropriate installation environment based on service requirements. After entering **c** on the installation environment interface, you can select the software packages to be installed by selecting **Add-ons**, as shown in the following figure.

Figure 3-27 Installing software

```
Software selection
Base environment
1) [ ] Minimal Install

Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]: 1
=====
Software selection
Base environment
1) [x] Minimal Install

Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]: c
=====
Software selection
Add-ons for selected environment
1) [ ] Standard                5) [ ] Network Servers
2) [ ] Development Tools     6) [ ] Scientific Support
3) [ ] Headless Management    7) [ ] Security Tools
4) [ ] Legacy UNIX Compatibility 8) [ ] System Tools

Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]: 1
=====
Software selection
Add-ons for selected environment
1) [x] Standard                5) [ ] Network Servers
2) [ ] Development Tools     6) [ ] Scientific Support
3) [ ] Headless Management    7) [ ] Security Tools
4) [ ] Legacy UNIX Compatibility 8) [ ] System Tools

Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]: c
```

The optional **Add-ons** packages vary depending on the installation environment.

- **Standard:** standard installation. openEuler standard installation.
- **Development Tools:** Development tools. Basic development environment.
- **Headless Management:** Non graphical terminal system management tool. This tool is used to manage a non-image terminal system.
- **Legacy UNIX Compatibility:** Traditional UNIX compatibility. This compatibility program is used for the migration from an inherited UNIX environment or used in the environment.
- **Network Servers:** Network server. These packages include network-based servers such as DHCP, Kerberos, and NIS.
- **Scientific Support:** Scientific notation support. This tool is used for mathematical and scientific computing and parallel computing.

- Security Tools: Security tool. This tool is used for integrity and trustworthiness verification.
- System Tools: System tool. This set of software packages is a collection of various system tools, for example, the tool used for connecting to customers shared by SMB and the tool used for monitoring network traffic.

After the configuration is complete, enter **c** to return to the installation overview page.

3.3.2.5 Configuring the Installation Location

Enter **5** on the installation overview page and press **Enter** to configure the installation location of the OS. The installation program automatically detects and displays information about available installation locations. Generally, you can retain the default settings.

Figure 3-28 Installation destination

```
Installation Destination
1) [] QEMU HARDDISK: 60 GiB (sda)
1 disk selected; 60 GiB capacity; 60 GiB free ...
Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]: c
=====
Partitioning Options
1) [] Replace Existing Linux system(s)
2) [] Use All Space
3) [] Use Free Space
4) [] Manually assign mount points (EXPERIMENTAL)
Installation requires partitioning of your hard drive. Select what space to use
for the install target or manually assign mount points.
Please make a selection from the above ['c' to continue, 'q' to quit, 'r' to
refresh]: 2
=====
Partitioning Options
1) [] Replace Existing Linux system(s)
2) [] Use All Space
3) [] Use Free Space
4) [] Manually assign mount points (EXPERIMENTAL)
Installation requires partitioning of your hard drive. Select what space to use
for the install target or manually assign mount points.
Please make a selection from the above ['c' to continue, 'q' to quit, 'r' to
refresh]:
```

- **Partitioning options**
 - a. Replace existing Linux system(s): Replace the existing system. Only the space occupied by the existing system is used. The existing system data will be overwritten.
 - b. Use All Space: Use all space. Clear all data in the system disk. All system disk space is used for the installation of the system.

- c. Use Free Space: Use the remaining space. Only the remaining space of the system disk is used for the installation of the system, and the existing system data is not cleared.
- d. Manually assign mount points (EXPERIMENTAL): Manually assign mount points (experiment). You can manually allocate mount points. However, this function is only in the experiment phase and cannot be used actually.
- Partitioning scheme
 - a. Standard Partition: Standard partition. A standard partition can contain file systems or swap space, and can also provide containers for software RAID or LVM physical volumes.
 - b. LVM: Logical volume. Logical volume management (LVM) displays a simple bare-metal view of basic physical storage space, such as a hard disk or an LUN. Partitions that are regarded as physical volumes in physical storage can be grouped into volume groups. Each volume group can be divided into multiple logical volumes, and each logical volume simulates a standard disk partition. Therefore, an LVM logical volume can be used as a partition that contains multiple physical disks.
 - c. LVM Thin Provisioning: Thin provisioning of logical volumes. Thin provisioning allows you to manage storage pools with available space, also called thin pools, which can be allocated to any number of devices as required. The thin pools can be dynamically expanded as required to allocate storage space.

After the configuration is complete, enter **c** to return to the installation overview page.

3.3.2.6 Configuring the Network

Enter **6** on the installation overview page and press **Enter** to configure the system network function. You can set the host name and configure network devices. The configuration is not necessary during the installation. You can perform the configuration after the system is started.

Figure 3-29 Network configuration

```
Installation

1) [x] Language settings                2) [x] Time settings
   (Simplified Chinese (China))        (Asia/Shanghai timezone)
3) [x] Installation source             4) [x] Software selection
   (Local media)                       (Minimal Install)
5) [x] Installation Destination        6) [ ] Network configuration
   (Automatic partitioning             (No network devices available)
   selected)
7) [!] Root password                  8) [!] User creation
   (Password is not set.)              (No user will be created)

Please make a selection from the above ['b' to begin installation, 'h' to help,
'q' to quit, 'r' to refresh]: 6
=====
Network configuration

Host Name: localhost.localdomain

Current host name: localhost

1) Set host name

Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]:
```

- Setting the host name

Select 1) **Set host name**, enter the host name openEuler, and press **Enter**.

- Configuring the NIC

Select a NIC configuration item shown in the following figure and configure it. By default, the value of IPv4 address is dhcp, and the value of IPv6 address is auto.

```
Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]: 2
=====
Device configuration

1) IPv4 address or "dhcp" for DHCP
   dhcp
2) IPv4 netmask
3) IPv4 gateway
4) IPv6 address[/prefix] or "auto" for automatic, "dhcp" for DHCP, "ignore" to
   turn off
   auto
5) IPv6 default gateway
6) Nameservers (comma separated)
7) [x] Connect automatically after reboot
8) [ ] Apply configuration in installer

Configuring device ens2.

Please make a selection from the above ['c' to continue, 'q' to quit, 'r' to
refresh]:
```

NIC configuration description

1. IPv4 address or "dhcp" for DHCP: Configure the IPv4 address. The default value is dhcp, indicating that the DHCP server assigns an IP address.
2. IPv4 netmask: Configure the IPv4 mask.
3. IPv4 gateway: Configure the IPv4 gateway.
4. IPv6 address or "auto" for automatic, "dhcp" for DHCP, "ignore" to turn off: Configure IPv6 address. The default value is auto.
5. IPv6 default gateway: Configure the default IPv6 gateway.
6. Nameservers: DNS server.
7. Connect automatically after reboot: Automatically connect to the network after the reboot.
8. Apply configuration in installer: Apply the configuration in the installation program.

After the configuration is complete, enter **c** to return to the installation overview page.

3.3.2.7 Setting the root User Password

Enter **7** on the installation overview page and press **Enter** to set the root password.

NOTE

- The root password must be set during the installation. Otherwise, the installation fails.
- A root account is used for performing critical system administrative tasks. It is not recommended to use this account for daily work or system access
- When setting the password of user **root** or that of a new user, you are strongly advised to set the password according to the password complexity requirements. When you set a weak password (the password does not meet the complexity requirements), the system generates an alarm and asks you whether to use the weak password. If you enter **yes**, the weak password is forcibly set. However, the weak password poses security risks. Exercise caution when selecting a weak password. For details about the recommended password complexity, see the "Password Complexity" part in **Installation Guide > Installation in GUI Mode > Configurations During Installation**.

Figure 3-30 root password

```
Installation
1) [x] Language settings          2) [x] Time settings
   (Simplified Chinese (China))   (Asia/Shanghai timezone)
3) [x] Installation source        4) [x] Software selection
   (Local media)                  (Minimal Install)
5) [x] Installation Destination    6) [ ] Network configuration
   (Automatic partitioning        (No network devices available)
   selected)
7) [!] Root password              8) [!] User creation
   (Password is not set.)         (No user will be created)

Please make a selection from the above ['b' to begin installation, 'h' to help,
'q' to quit, 'r' to refresh]: 7
=====
=====
Root password
Please select new root password. You will have to type it twice.
Password:
Password (confirm):
```

After the configuration is complete, enter **c** to return to the installation overview page.

3.3.2.8 Creating a User

Enter **8** on the installation overview page and press **Enter**. Then, create a user and configure the full name or user name, user password, administrator or not, and owner group of the user as prompted.

NOTE

The password of the new user must meet the password complexity requirements to avoid configuration failure. For details about the recommended password complexity, see the "Password Complexity" part in **Installation Guide > Installation in GUI Mode > Configurations During Installation**.

Figure 3-31 Creating a user

```
Installation
1) [x] Language settings                2) [x] Time settings
   (Simplified Chinese (China))         (Asia/Shanghai timezone)
3) [x] Installation source             4) [x] Software selection
   (Local media)                       (Minimal Install)
5) [x] Installation Destination        6) [ ] Network configuration
   (Automatic partitioning             (No network devices available)
   selected)
7) [x] Root password                  8) [ ] User creation
   (Password is set.)                 (No user will be created)

Please make a selection from the above ['b' to begin installation, 'h' to help,
'q' to quit, 'r' to refresh]: 8
=====
User creation
1) [ ] Create user

Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]: 1
=====
User creation
1) [x] Create user
2) Full name
3) User name
4) [ ] Use password
5) [ ] Administrator
6) Groups

Please make a selection from the above ['c' to continue, 'h' to help, 'q' to
quit, 'r' to refresh]: c
```

After the configuration is complete, enter **c** to return to the installation overview page.

3.3.3 Completing the Installation

After all mandatory items are configured on the installation overview page, the alarm symbols [!] will disappear. In this case, enter **b** to install the system.

Figure 3-32 Starting installation

```
Installation

1) [x] Language settings                2) [x] Time settings
   (Simplified Chinese (China))        (Asia/Shanghai timezone)
3) [x] Installation source            4) [x] Software selection
   (Local media)                       (Minimal Install)
5) [x] Installation Destination       6) [ ] Network configuration
   (Automatic partitioning             (No network devices available)
   selected)
7) [x] Root password                  8) [x] User creation
   (Password is set.)                  (User openEuler will be created)

Please make a selection from the above ['b' to begin installation, 'h' to help,
'q' to quit, 'r' to refresh]:
```

Figure 3-33 Pressing **Enter** to restart the system after the installation is complete

```
Configuring installed system
.....
Writing network configuration
.
Creating users
....
Configuring addons
Executing com_redhat_kdump addon
.
Generating initramfs
.
Running post-installation scripts
.
Storing configuration files and kickstarts
..
Installation complete

Use of this product is subject to the license agreement found at:
/usr/share/openeuler-release/EULA

Installation complete. Press ENTER to quit:
```

Figure 3-34 Entering the login page after the installation is complete

```
Authorized users only. All activities may be monitored and reported.
Activate the web console with: systemctl enable --now cockpit.socket

localhost login: _
```

 **NOTE**

- Because the BIOS reserves memory, the total memory (indicated by **MemTotal**) is slightly different before and after the system restart.

- After the system is installed, the kdump function is disabled by default. To use the kdump function, manually enable it. For details, see [FAQs > How Do I Manually Enable the kdump Service?](#)

4 FAQs

- [4.1 Why Does openEuler Fail to Start After I Install It to the Second Disk?](#)
- [4.2 What Are the Constraints on Network Configurations?](#)
- [4.3 Why Does openEuler Enter Emergency Mode After It Is Powered On?](#)
- [4.4 Failed to Reinstall openEuler When a Logical Volume Group That Cannot Be Activated Has Existed in openEuler](#)
- [4.5 An Exception Occurs During the Selection of the Installation Source](#)
- [4.6 How Do I Manually Enable the kdump Service?](#)

4.1 Why Does openEuler Fail to Start After I Install It to the Second Disk?

Symptom

The operating system is installed on the second disk **sdb** during the installation. After the operating system is restarted, the operating system fails to be started.

Possible Cause

When openEuler is installed to the second disk, MBR and GRUB are installed to the second disk **sdb** by default. The following two conditions may occur:

1. openEuler installed on the first disk is loaded and started if it is complete.
2. openEuler installed on the first disk fails to be started from hard disks if it is incomplete.

The preceding two conditions occur because the boot loader is loaded from the first disk **sda** by default to start openEuler on the BIOS window. If openEuler is not installed on the **sda** disk, system restart fails.

Solution

This problem can be solved using either of the following two methods:

- During the installation of openEuler, select the first disk or both disks, and install the boot loader on the first disk **sda**.
- After installing openEuler, restart it by modifying the disk startup sequence on the BIOS window.

4.2 What Are the Constraints on Network Configurations?

The NetworkManager and network services are network service management tools. Some functions of the two services overlap.

- If the NetworkManager management service is used, run the **nmcli** command or modify the configuration file to configure the network (such as the IP address and route). Do not run the **ip**, **ifconfig**, or **route** command to configure the network.

NOTE

When the NetworkManager service is enabled and you run commands such as **ip**, **ifconfig**, and **route** to configure the network, the configurations will be overwritten by NetworkManager later.

To check whether NetworkManager is enabled, run the following command:

```
systemctl status NetworkManager
```

NOTE

For details about the use of the **nmcli** command, see the execution result of the **nmcli --help** or **man nmcli** command.

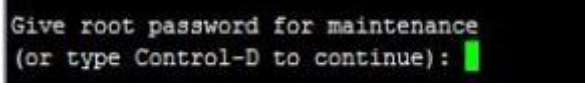
- If you want to run commands such as **ip**, **ifconfig**, and **route** commands to manage network information, run the following command to disable the NetworkManager service:

```
systemctl stop NetworkManager
```

4.3 Why Does openEuler Enter Emergency Mode After It Is Powered On?

Symptom

openEuler enters emergency mode after it is powered on.



```
Give root password for maintenance  
(or type Control-D to continue):
```

Possible Causes

Damaged OS files result in disk mounting failure, or over pressured I/O results in disk mounting timeout (threshold: 90s).

An abnormal and power-off system, and low performance of disk I/O may cause the problem.

Solution

1. Enter the password of root account to log in to openEuler.
2. Check and restore files by using the **fsck** tool, and restart openEuler.

NOTE

The fsck tool checks and maintains inconsistent file systems. If the system is powered off or a disk is faulty, run the **fsck** command to check file systems. Run the **fsck.ext3 -h** and **fsck.ext4 -h** commands to view the usage method of the fsck tool.

If you want to disable the timeout mechanism of disk mounting, add **x-systemd.device-timeout=0** to the **etc/fstab** file. For example:

```
#
# /etc/fstab
# Created by anaconda on Mon Sep 14 17:25:48 2015
#
# 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
#
/dev/mapper/openEuler-root / ext4 defaults,x-systemd.device-timeout=0 0 0
UUID=afcc811f-4b20-42fc-9d31-7307a8cfe0df /boot ext4
defaults,x-systemd.device-timeout=0 0 0
/dev/mapper/openEuler-home /home ext4 defaults 0 0
/dev/mapper/openEuler-swap swap swap defaults 0 0
```

4.4 Failed to Reinstall openEuler When a Logical Volume Group That Cannot Be Activated Has Existed in openEuler

Symptom

After a disk fails, openEuler fails to be reinstalled because a logical volume group that cannot be activated has existed in openEuler.

Possible Cause

During the installation of openEuler, a logical volume group cannot be activated.

Solution

Before reinstalling openEuler, restore the abnormal logical volume group to the normal status or clear it. The following uses an example:

- Restore the abnormal logical volume group to the normal status.
 - a. Run the following command to clear the activation status of the abnormal logical volume group to ensure that the error message "Can't open /dev/sdc exclusively mounted filesystem" is not displayed:

```
vgchange -a n testvg32947
```
 - b. Run the following command to recreate a physical volume based on the backup file:

```
pvcreeate --uuid JT7z1L-K5G4-izjB-3i5L-e94f-7yuX-rhkLjL --restorefile /etc/lvm/backup/testvg32947 /dev/sdc
```
 - c. Run the following command to restore the logical volume group information:

```
vgcfgrestore testvg32947
```
 - d. Run the following command to reactivate the logical volume group:

```
vgchange -ay testvg32947
```

- Run the following commands to clear the abnormal logical volume group:

```
vgchange -a n testvg32947  
vgremove -y testvg32947
```

4.5 An Exception Occurs During the Selection of the Installation Source

4.5.1 Software Dependency

Symptom

After the selection of the installation source, the message "Error checking software selection" is displayed.

Possible Cause

This is because the software package dependency in the installation source is abnormal.

Solution

Check whether the installation source is abnormal. Use the new installation source.

4.6 How Do I Manually Enable the kdump Service?

Symptom

Run the `systemctl status kdump` command. The following information is displayed, indicating that no memory is reserved.

```
[root@localhost ~]# systemctl status kdump  
● kdump.service - Crash recovery kernel arming  
   Loaded: loaded (/usr/lib/systemd/system/kdump.service; enabled; vendor preset: enabled)  
   Active: failed (Result: exit-code) since Mon 2019-09-16 05:36:56 EDT; 3min 14s ago  
     Process: 2202 ExecStart=/usr/bin/kdumpctl start (code=exited, status=1/FAILURE)  
    Main PID: 2202 (code=exited, status=1/FAILURE)  
  
Sep 16 05:36:55 localhost.localdomain systemd[1]: Starting Crash recovery kernel arming...  
Sep 16 05:36:56 localhost.localdomain kdumpctl[2202]: No memory reserved for crash kernel  
Sep 16 05:36:56 localhost.localdomain kdumpctl[2202]: Starting kdump: [FAILED]  
Sep 16 05:36:56 localhost.localdomain systemd[1]: kdump.service: Main process exited, code=exited, status=1/FAILURE  
Sep 16 05:36:56 localhost.localdomain systemd[1]: kdump.service: Failed with result 'exit-code'.  
Sep 16 05:36:56 localhost.localdomain systemd[1]: Failed to start Crash recovery kernel arming.
```

Possible Cause

The kdump service requires the system to reserve memory for running the kdump kernel. However, the system does not reserve memory for the kdump service. As a result, the kdump service cannot be started.

Solution

For the scenario where the OS has been installed

1. Add `crashkernel=1024M,high` to `/boot/efi/EFI/openEuler/grub.cfg`.

2. Restart the system for configuration to take effect.
3. Run the following command to check the kdump status:

```
systemctl status kdump
```

If the following information is displayed, the kdump status is **active**, indicating that the kdump service is enabled. No further action is required.

```
[root@localhost ~]# systemctl status kdump
● kdump.service - Crash recovery kernel arming
   Loaded: loaded (/usr/lib/systemd/system/kdump.service; enabled; vendor preset: enabled)
   Active: active (exited) since Sun 2019-09-29 11:16:03 CST; 2h 57min ago
     Process: 3664 ExecStart=/usr/bin/kdumpctl start (code=exited, status=0/SUCCESS)
    Main PID: 3664 (code=exited, status=0/SUCCESS)

Sep 29 11:15:58 localhost.localdomain systemd[1]: Starting Crash recovery kernel arming...
Sep 29 11:16:00 localhost.localdomain kdumpctl[3664]: Kbox memory 0xef000000-0x1000000: [OK]
Sep 29 11:16:03 localhost.localdomain kdumpctl[3664]: kexec: loaded kdump kernel
Sep 29 11:16:03 localhost.localdomain kdumpctl[3664]: Starting kdump: [OK]
Sep 29 11:16:03 localhost.localdomain systemd[1]: Started Crash recovery kernel arming.
[root@localhost ~]#
```

Parameter Description

The following table describes the parameters of the memory reserved for the kdump kernel.

Table 4-1 crashkernel parameters

Kernel Boot Parameter	Description	Default Value	Remarks
crashkernel=X	Reserve X of the physical memory for kdump when the physical memory is less than 4 GB.	None. You can adjust the value as required.	This configuration method is used only when the memory is less than 4 GB. Ensure that the continuous available memory is sufficient.
crashkernel=X@Y	Reserve X of the memory at the start address Y for kdump.	None. You can adjust the value as required.	Ensure that the X of the memory at the start address Y is not reserved for other modules.
crashkernel=X,high	Reserve 256 MB of the physical memory for kdump when the physical memory is less than 4 GB, and X of the physical memory for kdump when the physical memory is greater than or equal to 4 GB.	None. You can adjust the value based as required. The recommended value is 1024M,high .	Ensure that 256 MB of the memory is reserved for continuous use when the physical memory is less than 4 GB and X of the memory is reserved when the physical memory is greater than or equal to 4 GB. The actual reserved memory size equals 256 MB plus X.

Kernel Boot Parameter	Description	Default Value	Remarks
crashkernel=X,low crashkernel=Y,high	Reserve X of the physical memory for kdump when the physical memory is less than 4 GB and Y of the physical memory for kdump when the physical memory is greater than or equal to 4 GB.	None. You can adjust the value as required.	Ensure that X of the memory is reserved for continuous use when the physical memory is less than 4 GB and Y of the memory is reserved when the physical memory is greater than or equal to 4 GB. The actual reserved memory size equals X plus Y.