ThinkStation P7 (Intel) Linux User Guide

Read this first

Before using this documentation and the product it supports, ensure that you read and understand the following:

- *Safety and Warranty Guide*
- *Generic Safety and Compliance Notices*
- *Setup Guide*

Second Edition (July 2023)

Contents

Discover your Lenovo computer

Thank you for choosing a Lenovo computer! We are dedicated to delivering the best solution to you.

Before starting your tour, please read the following information:

- Illustrations in this documentation might look different from your product.
- Depending on the model, some optional accessories, features, software programs, and user interface instructions might not be applicable to your computer.
- Documentation content is subject to change without notice. To get the latest documentation, go to https://pcsupport.lenovo.com.

Chapter 1. Meet your computer

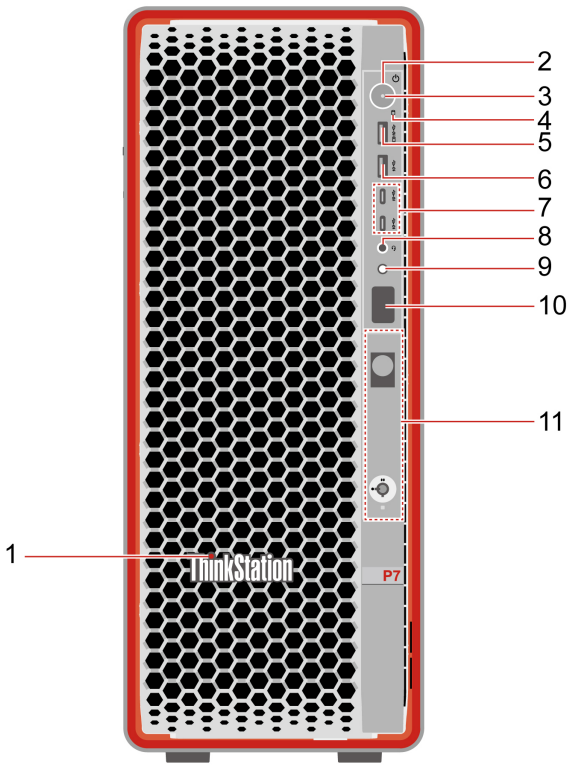
Side ventilation notice

Side ventilation design is available on some models. Pay attention to the ventilation distance requirements for models with different configurations:

- Systems configured with rear-exhausting graphics cards (such as NVIDIA RTX 6000 Ada) do not require side ventilation.
- Systems configured with internal-exhausting graphics cards (such as GeForce RTX 4070 and GeForce RTX 4080) require side ventilation. Do not block air vents on the left side cover. To ensure heat dissipation, do not place any objects within 4.5 cm (1.8 inches) or 1 rack unit from the left side cover.
- For rack-mounted systems, a rack spacer is recommended in the gap above the system.

Note: Do not install internal-exhausting graphics cards (such as GeForce RTX 4070 and GeForce RTX 4080) on systems without side ventilation on the left side cover.

Front



Item	Description	Item	Description
1	ThinkStation® LED	2	Power button
3	Power indicator	4	Storage indicator
5	Always On USB-A 3.2 Gen 2 connector*	6	USB-A 3.2 Gen 2 connectors*
7	USB-C® (3.2 Gen 2) connectors*	8	Headset connector

Item	Description	Item	Description
9	Diagnostic LCD switch	10	Diagnostic LCD
11	Flex module*		

* for selected models

Statement on USB transfer rate

Depending on many factors such as the processing capability of the host and peripheral devices, file attributes, and other factors related to system configuration and operating environments, the actual transfer rate using the various USB connectors on this device will vary and will be slower than the data rate listed below for each corresponding device.

USB device	Data rate (Gbit/s)
3.2 Gen 1	5
3.2 Gen 2	10
3.2 Gen 2 × 2	20
Thunderbolt 3	40
Thunderbolt 4	40

Power indicator

Show the system status of your computer.

- **On:** The computer is starting up or working.
- **Off:** The computer is off or in hibernation mode.
- **Blinking slowly:** The computer is in sleep mode.

Always On USB-A 3.2 Gen 2 connector

With the Always On USB feature enabled, the Always On USB-A 3.2 Gen 2 connector can charge a USB-A compatible device when the computer is on, off, in sleep mode, or in hibernation mode.

Diagnostic LCD switch

Use the diagnostic LCD switch to turn on or turn off the diagnostic LCD, and handle occurred events.

Status	Behavior and function
No event	**Short press:** Turn on or turn off the diagnostic LCD. Date and time will be displayed on the LCD when it is turned on. The LCD will turn off automatically if idle for three minutes.
Error events occur	The diagnostic LCD will turn on automatically when an error event occurs. • **Short press (when multiple events occur):** Switch among error events and display the corresponding QR code of the selected event. • **Long press (about 3 seconds):** Clear the selected event.

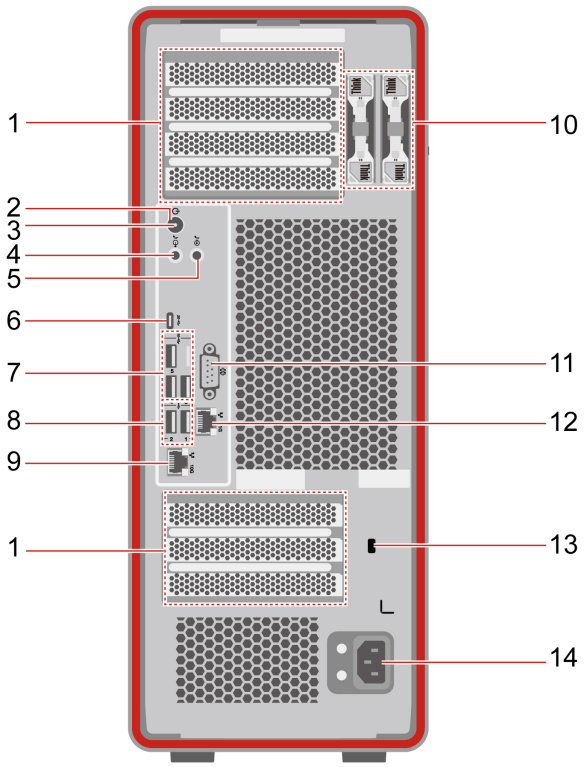
Diagnostic LCD

Display the diagnostic information when an issue or error is detected. You can decode the error code at https://www.thinkworkstationsoftware.com/codes.

Related topics

- “USB specifications” on page 8.

Rear



Item	Description	Item	Description
1.	PCI-Express card areas	2.	Power button
3.	Power indicator	4.	Audio line-out connector
5.	Audio line-in connector	6.	USB-C® (3.2 Gen 2×2) connector
7.	USB-A 3.2 Gen 2 connectors	8.	USB-A 2.0 connectors
9.	Ethernet connector (10G)	10.	Lock kits
11.	Serial connector*	12.	Ethernet connector (1G)
13.	Security-lock slot	14.	Power cord connector

* for selected models

Serial connector

Connect an external modem, a serial printer, or other devices that use a serial connector.

PCI-Express card areas

Install PCI-Express cards into these areas to improve the operating performance of the computer. Depending on the computer model, the video output connectors in these areas might be HDMI™ connectors, DisplayPort™ connectors or Mini DisplayPort™ connectors.

Related topics

- “Lock the computer” on page 13.
- “USB specifications” on page 8.

Specifications

Specifications	Description
Dimensions	• Width: 175mm (6.9 inches) • Height: 440 mm (17.3 inches, with feet) • Depth: 508 mm (20 inches)
Weight (without packaging)	Maximum configuration as shipped: 24.5kg (54 lb)
Hardware configuration	1. Open the system menu from the top-right corner and click **Settings**. 2. Click **About**.
Power supply	• 1000-watt 92% power supply • 1400-watt 92% power supply
Electrical input	• Input voltage: From 100 V ac to 240 V ac • Input frequency: 50/60 Hz
Microprocessor	To view the microprocessor information of your computer, enter **Settings** and click **About**.
Memory	Up to eight double data rate 5 (DDR5) error correction code (ECC) registered dual inline memory modules (RDIMMs) Maximum memory capacity: Up to 2 TB (8 x 256 GB if available)
Storage device	• 3.5-inch hard disk drive* • M.2 solid-state drive* **Notes:** • The M.2 solid-state drive in the flex module is hot-swappable. • Type `Disks` in the search box and use the **Disks** application to view the storage drive capacity of your computer. • The storage drive capacity indicated by the system is less than the nominal capacity.
Video features	• PCIe x16 card slots on the system board for a discrete graphics card • Video connectors on a discrete graphics card: – DisplayPort connector* – Mini DisplayPort connector* – HDMI out connector*
Expansion	• Flex bay* • Memory slots • M.2 solid-state drive slots • Storage drive bay • PCI-Express slots
Network features	• Bluetooth* • Ethernet LAN • Wireless LAN*

* for selected models

Operating environment

Maximum altitude (without pressurization)

- Operating: From 0 m (0 ft) to 3048 m (10 000 ft)
- Storage: From 0 m (0 ft) to 12192 m (40 000 ft)

Temperature

- Operating: From 10°C (50°F) to 35°C (95°F)
- Storage: From -40°C (-40°F) to 60°C (140°F)

Relative humidity

- Operating: 20%-80% (non-condensing)
- Storage: 10%–90% (non-condensing)

System memory speed

The Intel Xeon® or Intel Core™ microprocessor families compatible with this ThinkStation computer feature an integrated memory controller. The memory controller provides the microprocessor with direct access to the system memory. Therefore, the system memory speed will be determined by the memory module type, frequency, size (capacity), the number of memory modules installed, and the microprocessor model.

Notes:

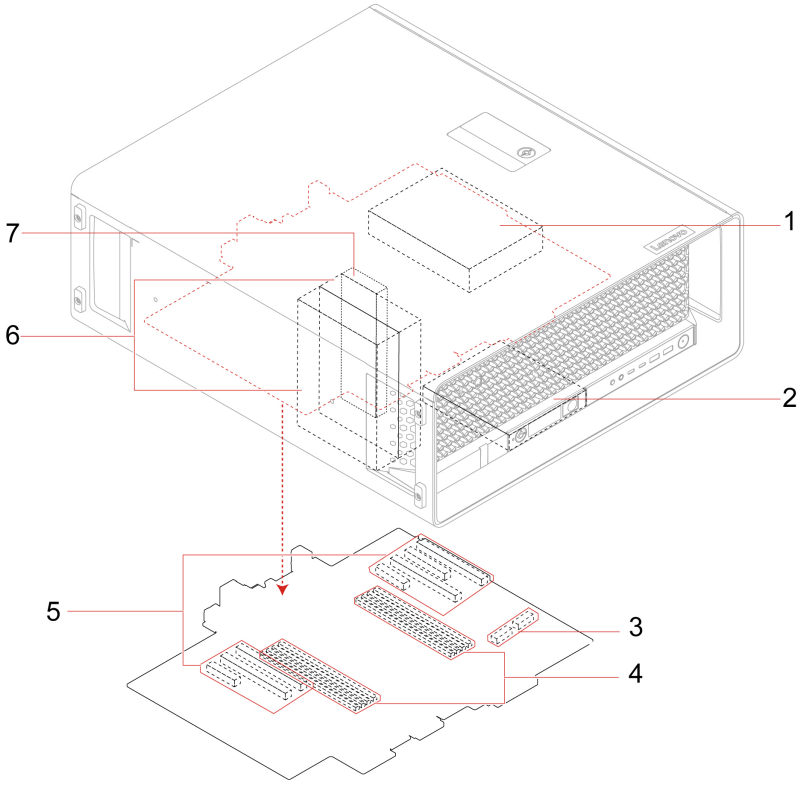
- The actual system memory speed of the memory modules varies depending on the microprocessor model. For example, your computer comes with 2666 MT/s memory modules, but the microprocessor only supports up to 2400 MT/s memory modules. Then the system memory speed will be no faster than 2400 MT/s.
- The microprocessor models supported in your computer might vary. For a list of supported microprocessor models, contact the Lenovo Customer Support Center.

Refer to the following information about the system memory speed:

- **Memory module types:** DDR5 ECC RDIMMs
- **Memory module speed**: 4800 MT/s

Expand your computer

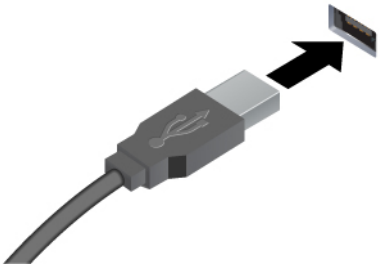
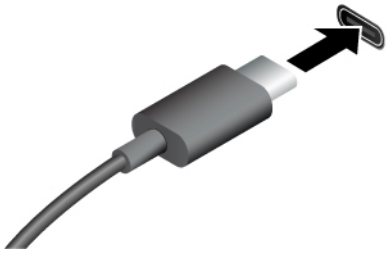
You can enhance your computer capacity and performance by adding various devices according to the following rules:



Item	Description
1. Optional hard disk drive bay*	You can install a 3.5-inch hard disk drive in the optional storage drive bay in selected modules.
2. Flex bay*	Depending on your computer model, one of the following devices might be installed in the flex bay: • Flex module* • 15-in-1 media card reader* In flex module, you can install an M.2 solid-state drive* (hot-swappable) with a storage box.
3. On-board horizontal M.2 solid-state drive slots	Up to two horizontal M.2 solid-state drives are installed in selected models.
4. Memory slots	Up to eight memory modules are installed in selected models.
5. PCIe slots	You can install compatible PCIe cards in the PCIe card slots.
6. Internal storage drive bay	You can install hard disk drives and solid-state drives in the internal storage drive bay.
7. On-board vertical Solid-state drive slot*	You can install one vertical M.2 solid-state drive in selected models.

USB specifications

Note: Depending on the model, some USB connectors might not be available on your computer.

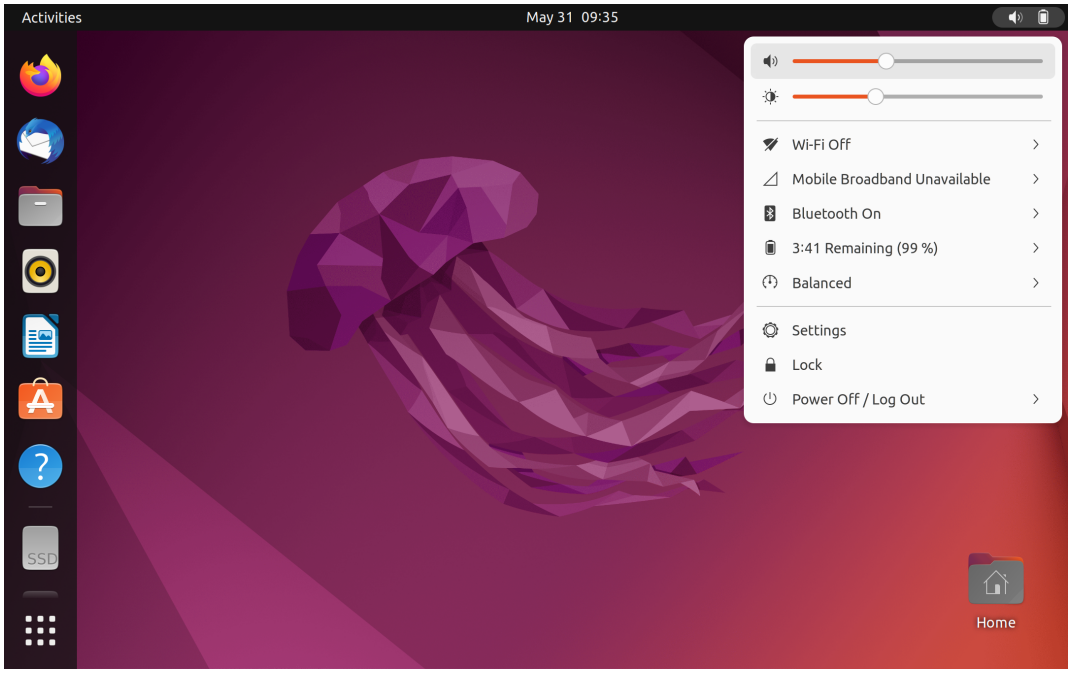
Connector name	Description
 • USB-A 2.0 connector • SS USB-A 3.2 Gen 1 connector • 10 USB-A 3.2 Gen 2 connector	Connect USB-A compatible devices, such as a USB-A keyboard, USB-A mouse, USB-A storage device, or USB-A printer.
 • SS USB-C (3.2 Gen 1) connector • 10 USB-C (3.2 Gen 2) connector • 20 USB-C (3.2 Gen 2x2)connector • USB-C (Thunderbolt 3) connector • USB-C (Thunderbolt 4) connector	• Charge USB-C compatible devices with the output voltage and current of 5 V and 3 A. • Connect to an external display: – USB-C to VGA: 1920 x 1200 pixels, 60 Hz – USB-C to DP: 3840 x 2160 pixels, 60 Hz • Connect to USB-C accessories to help expand your computer functionality. To purchase USB-C accessories, go to https://www.lenovo.com/accessories.

Chapter 2. Get started with your computer

Get started with Ubuntu Desktop

Learn the basics of Ubuntu and start working with it right away. For more information about Ubuntu, see the Ubuntu documentation site at: https://help.ubuntu.com/lts/ubuntu-help/index.html.

The Gnome desktop is installed by default and is designed to be simple and easy to use. Details on using Gnome are available by launching the Help application or online at https://help.gnome.org/users/.



Launch an app

- Press the Super key (with the Windows logo) or open the Activities menu on the top left and type in the name of the application you want to launch.
- Click the **Show Applications** button on the lower left, and select the application you want to launch.

Launch settings

Open the system menu from the top-right corner and click **Settings**.

Access networks

This section helps you access networks through connecting to a wired or wireless network.

Connect to the wired Ethernet

Connect your computer to a local network through the Ethernet connector on your computer with an Ethernet cable.

Connect to Wi-Fi networks (for selected models)

If your computer includes a wireless LAN module, you can connect your computer to Wi-Fi®networks.

1. Open the system menu from the top-right corner and expand the Wi-Fi section of the menu.
2. Click **Select Network**. A list of available wireless networks is displayed.
3. Select a network available for connection. Provide required information, if needed.

Connect an external display

Connect a projector or a monitor to your computer to give presentations or expand your workspace.

Change display settings

Right-click a blank area on the desktop and select **Display settings**. Then, you can change display settings as you prefer.

Chapter 3. Explore your computer

Set the power plan

For ENERGY STAR® compliant computers, the following power plan takes effect when your computers have been idle for a specified duration:

- Turn off the display: After 5 minutes
- Put the computer to sleep: After 20 minutes

To awaken the computer from Sleep mode, press any key on your keyboard.

To reset the power plan to achieve the best balance between performance and power saving:

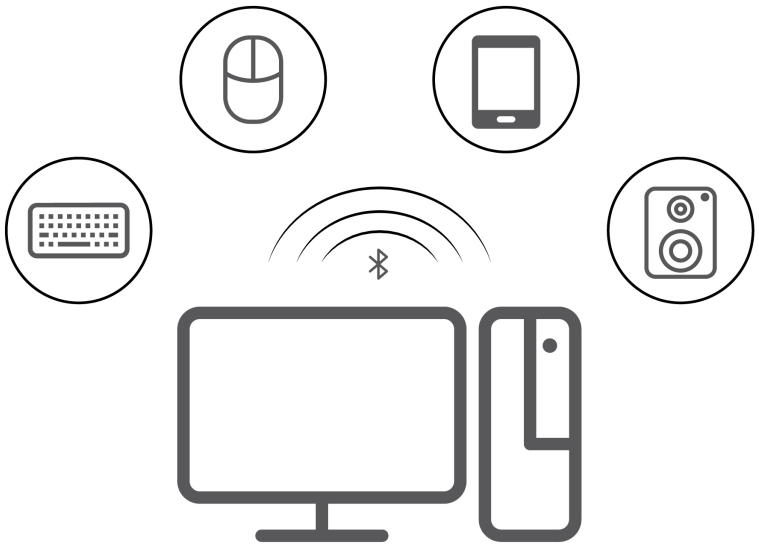
1. Open the system menu from the top-right corner and click **Settings**.
2. Click **Power**.
3. Choose or customize a power plan of your preference.

Transfer data

Quickly share your files using the built-in Bluetooth technology among devices with the same features. You also can install a disc or media card to transfer data.

Connect to a Bluetooth-enabled device (for selected models)

You can connect all types of Bluetooth-enabled devices to your computer, such as a keyboard, a mouse, a smartphone, or speakers. Place the device that you are attempting to connect to less than 10 meters (33 feet) from the computer.



1. Turn on Bluetooth on the computer.
   a. Open the system menu from the top-right corner and then click **Settings → Bluetooth**.
   b. In the Bluetooth section enable Bluetooth with the toggle button at the top.

2. Any discoverable devices will be shown in the **Devices** list.
3. Select a Bluetooth device, and then follow the on-screen instructions.

Use a media card (for selected models)

If your computer has an SD-card slot, read the following information.

Install a media card

1. Locate the SD-card slot.
2. Ensure that the metal contacts on the card are facing the ones in the SD-card slot. Insert the card firmly into the SD-card slot until it is secured in place.

Remove a media card

Attention: Before removing a media card, unmount the card from the operating system first. Otherwise, data on the card might get corrupted or lost.

1. Launch the **Files** application.
2. Select the unmount icon next to the card and unmount the card from the operating system.
3. Press the card and remove it from your computer. Store the card safely for future use.

Purchase accessories

Lenovo has a number of hardware accessories and upgrades to help expand the capabilities of your computer. Options include memory modules, storage devices, network cards, power adapters, keyboards, mice, and more.

To shop at Lenovo, go to https://www.lenovo.com/accessories.

Chapter 4. Secure your computer and information

Lock the computer

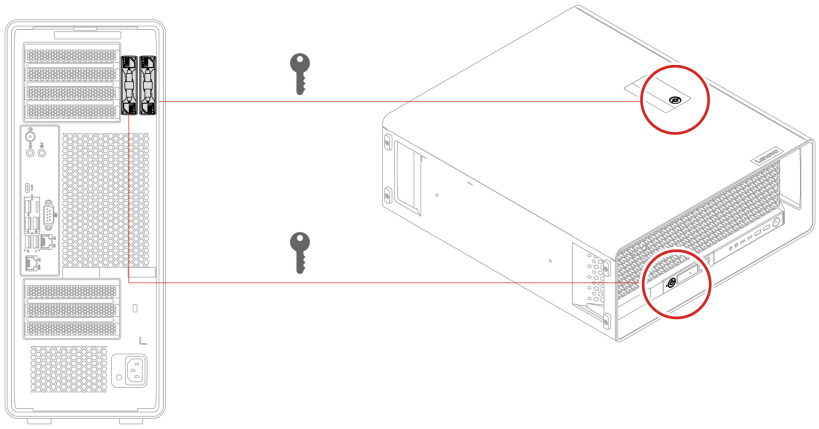
Note: Lenovo makes no comments, judgments, or warranties about the function, quality, or performance of the locking device and security feature. You can purchase computer locks from Lenovo.

Key lock

Locking the side panel and flex module through a key lock prevents unauthorized access to the inside of your computer or storage drives. The keys for the key lock are attached to the rear of the machine and flex module bracket. For security, store the keys in a secure place when you are not using them.

Notes:

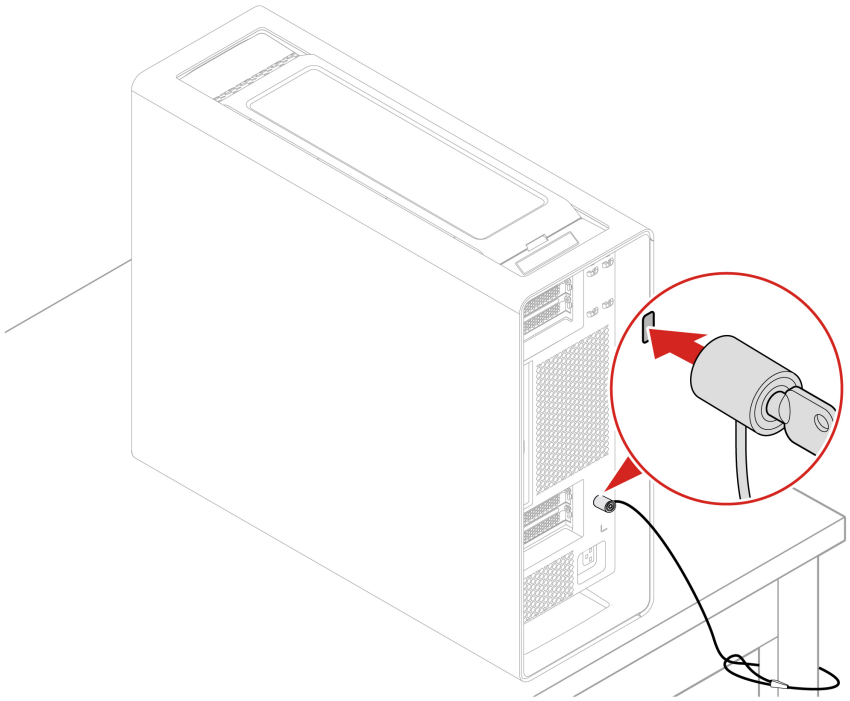
- You can install or replace storage drive in the flex module. Lock the flex module to prevent the unexpected removal. The storage drive also can be hot-swappable, which means that you can install or replace the drive without even turning off your computer. Therefore, lock the flex module to prevent the unexpected removal.
- The key can be common or random, that is, use one key for multiple locks or one key for one lock. For details, see the table below:



Lock location	Key description
Side panel	The key for the side panel might be one of the following: • Common key carved with `00`: The same key can open locks for side panel and flex module on the same computer or on different computers. • Random key carved with `R` and `xx`, for example, `01`, `02`, and `03`: The same key can open locks for side panel and flex module on the same computer, but cannot open locks for side panel and flex module on other P7 computers.
Flex module	The key for the flex module might be one of the following: • Common key carved with `00`: The same key can open locks for side panel and flex module on the same computer or on different computers. • Random key carved with `R` and `xx`, for example, `01`, `02`, and `03`: The same key can open locks for the side panel and the flex module on the same computer, but cannot open locks for the side panel and the flex module on other P7 computers.

Security lock

Lock your computer to a desk, table, or other fixtures through a security lock.



UEFI BIOS passwords

You can set passwords in UEFI (Unified Extensible Firmware Interface) BIOS (Basic Input/Output System) to strengthen the security of your computer.

Password types

You can set a power-on password, supervisor password, system management password, or hard disk password in UEFI BIOS to prevent unauthorized access to your computer. However, you are not prompted to enter any UEFI BIOS password when your computer resumes from sleep mode.

- Power-on password

  When a power-on password is set, you are prompted to enter a valid password each time the computer is turned on.

- Supervisor password

  Setting a supervisor password deters unauthorized users from changing configuration settings. If you are responsible for maintaining the configuration settings of several computers, you might want to set a supervisor password.

  When a supervisor password is set, you are prompted to enter a valid password each time you try to enter the BIOS menu.

  If both the power-on password and supervisor password are set, you can enter either password. However, you must use your supervisor password to change any configuration settings.

- Hard disk password

Setting a hard disk password prevents unauthorized access to the data on the storage drive. When a hard disk password is set, you are prompted to enter a valid password each time you try to access the storage drive.

Note: After you set a hard disk password, your data on the storage drive is protected even if the storage drive is removed from one computer and installed in another.

- System management password (for selected models)

  You can enable the system management password to have the same authority as the supervisor password to control security related features. To customize the authority of the system management password through the UEFI BIOS menu:

  1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
  2. Select **Security → System Management Password Access Control**.
  3. Follow the on-screen instructions.

  If you have set both the supervisor password and the system management password, the supervisor password overrides the system management password.

Set, change, and remove a password

Before you start, print these instructions.

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Security**.
3. Depending on the password type, select **Set Supervisor Password**, **Set Power-On Password**, **Set System Management Password**, or **Hard Disk Password** and press Enter.
4. Follow the on-screen instructions to set, change, or remove a password.
5. Press F10 or Fn+F10 to save the changes and exit.

You should record your passwords and store them in a safe place. If you forget the passwords, contact a Lenovo-authorized service provider to have the passwords removed.

Note: If the hard disk password is forgotten, Lenovo cannot remove the password or recover data from the storage drive.

Use BIOS security solutions

This section provides BIOS solutions to secure your computer and information.

Wipe the storage drive data

It is recommended that you wipe the storage drive data before recycling the storage drive or the computer.

To wipe the storage drive data:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Security → secure wipe → Enabled**.
3. Press F10 or Fn+F10 to save the changes and exit.
4. Restart the computer. When the logo screen is displayed, press F12 or Fn+F12.
5. Select **App Menu → secure wipe** and press Enter.
6. Select the storage drive you will wipe and click **NEXT**.
7. Select the entire storage drive or partition to wipe as desired.
8. Select the method as desired and click **NEXT**.

9. Click **Yes** to confirm your option when the prompting window is displayed.
10. If you have set a hard disk password for the storage drive, enter the password. Otherwise, set a temporary password following the on-screen instructions. Then, click **NEXT**. The wiping process begins.

    Note: Duration of the wiping process varies depending on the storage drive capacity.
11. Click **Reboot** when you are prompted to reset the system, and then one of the following will happen:
    - If the system storage drive data is wiped, you will be prompted that no operating system is found.
    - If the non-system storage drive data is wiped, the computer restarts automatically.

Cover presence switch

The cover presence switch prevents the computer from logging in to the operating system when the computer cover is not properly installed or closed.

To enable the cover presence switch connector on the system board:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Security → Cover Tamper Detected** and press Enter.
3. Select **Enabled** and press Enter.
4. Press F10 or Fn+F10 to save the changes and exit.

If the cover presence switch is enabled and the computer cover is not correctly installed or closed, an error message will be displayed when you turn on the computer. To bypass the error message and log in to the operating system:

1. Properly install or close the computer cover.
2. Enter the BIOS menu, save and then exit.

Intel BIOS guard

The Intel BIOS Guard module cryptographically verifies all BIOS updates. This hardware-based security helps prevent software and malware attacks on the computers BIOS.

Smart USB Protection

The Smart USB Protection function is a security function that helps prevent data from being copied from the computer to USB storage devices connected to the computer. You can set the Smart USB Protection function to one of the following modes:

- **Disabled** (default setting): You can use the USB storage devices without limitation.
- **Read Only**: You cannot copy data from the computer to the USB storage devices. However, you can access data on the USB storage devices.
- **No Access**: You cannot access the USB storage devices from the computer.

To configure the Smart USB Protection function:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Security → Smart USB Protection** and press Enter.
3. Select the desired setting and press Enter.
4. Press F10 or Fn+F10 to save the changes and exit.

Chapter 5. Advanced configurations

What is UEFI BIOS

Note: The operating system settings might override any similar settings in UEFI BIOS.

UEFI BIOS is the first program that the computer runs when the computer is turned on. UEFI BIOS initializes the hardware components and loads the operating system and other programs. Your computer comes with a setup program with which you can change UEFI BIOS settings.

Enter the BIOS menu

Restart the computer. When the logo screen is displayed, press F1 or Fn+F1 to enter the BIOS menu.

Note: If you have set BIOS passwords, enter the correct passwords when prompted. You also can select **No** or press Esc to skip the password prompt and enter the BIOS menu. However, you cannot change the system configurations that are protected by passwords.

Navigate in the BIOS interface

Attention: The default configurations are already optimized for you in **boldface**. Improper change of the configurations might cause unexpected results.

Depending on your keyboard, you can navigate in the BIOS interface by pressing the following keys, or combinations of Fn and the following keys:

Key	Function
F1 or Fn+F1	General Help
Esc or Fn+Esc	Exit the submenu
↑ ↓ or Fn+↑ ↓	Locate an item
← → or Fn+← →	Move keyboard focus
+/– or Fn++/–	Change value
Enter	Enter the submenu
F9 or Fn+F9	Setup Defaults
F10 or Fn+F10	Save and exit

Change the display language of UEFI BIOS

UEFI BIOS supports three or four display languages: English, French, simplified Chinese, and Russian (for selected models).

To change the display language of UEFI BIOS:

1. Select **Main → Language** and press Enter.
2. Set the display language as desired.

Change the display mode of UEFI BIOS (for selected models)

You can use UEFI BIOS in the graphic mode or the text mode according to your needs.

The keys on the keyboard used to perform various tasks are displayed at the bottom of the screen. In addition to the keyboard, you also can use the mouse to make selections.

To change the display mode of UEFI BIOS:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Main → Setup Mode Select** and press Enter.
3. Set the display mode as desired.

Set the system date and time

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Main → System Time & Date** and press Enter.
3. Set the system date and time as desired.
4. Press F10 or Fn+F10 to save the changes and exit.

Change the priority boot order

If the computer does not boot from a device as expected, you can change the boot priority order permanently or select a temporary boot device.

Change the priority boot order permanently

1. Depending on the type of the storage device, do one of the following:
   - If the storage device is internal, go to step 2.
   - If the storage device is a disc, ensure that the computer is on or turn on the computer. Then, insert the disc into the optical drive.
   - If the storage device is an external device other than a disc, connect the storage device to the computer.
2. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
3. Select **Startup → Priority Boot Order**, and then follow the on-screen instructions to change the boot priority order.
4. You can also select the first priority device group by selecting **Startup → First Boot Device**, and then follow the on-screen instructions to select the first boot device within this group. Your computer will boot from the first boot device before trying the boot priority order you set in the previous step.
5. Press F10 or Fn+F10 to save the changes and exit.

Select a temporary boot device

Note: Not all discs and storage drives are bootable.

1. Depending on the type of the storage device, do one of the following:
   - If the storage device is internal, go to step 2.
   - If the storage device is a disc, ensure that the computer is on or turn on the computer. Then, insert the disc into the optical drive.
   - If the storage device is an external device other than a disc, connect the storage device to the computer.

2. Restart the computer. When the logo screen is displayed, press F12 or Fn+F12.
3. Select the storage device as desired and press Enter.

If you want to change the boot priority order permanently, select **Enter Setup** on Startup Device Menu and press Enter to enter the BIOS menu.

Enable or disable the configuration change detection feature

If you enable configuration change detection, when the POST detects configuration changes of some hardware devices (such as storage drives or memory modules), an error message will be displayed when you turn on the computer.

To enable or disable the configuration change detection feature:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Security → Configuration Change Detection** and press Enter.
3. Enable or disable the feature as desired.
4. Press F10 or Fn+F10 to save the changes and exit.

To bypass the error message and log in to the operating system, press F2 or Fn+F2. To clear the error message, enter the BIOS menu, save and then exit.

Enable or disable the automatic power-on feature

The Automatic Power On item in UEFI BIOS provides various options for you to make your computer start up automatically.

To enable or disable the automatic power-on feature:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Power → Automatic Power On** and press Enter.
3. Select the feature as desired and press Enter.
4. Enable or disable the feature as desired.
5. Press F10 or Fn+F10 to save the changes and exit.

Enable or disable the ErP LPS compliance mode

Lenovo computers meet the eco-design requirements of the ErP Lot 3 regulation. For more information, go to:
https://www.lenovo.com/us/en/compliance/eco-declaration

You can enable the ErP LPS compliance mode to reduce the consumption of electricity when the computer is off or in sleep mode.

To enable or disable the ErP LPS compliance mode:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Power → Enhanced Power Saving Mode** and press Enter.
3. Depending on whether you select **Enabled** or **Disabled**, do one of the following:
   - If you select **Enabled**, press Enter. Then, select **Power → Automatic Power On** and press Enter. Check whether the Wake on LAN feature is disabled automatically. If no, disable it.
   - If you select **Disabled**, press Enter. Then, go to the next step.

4. Press F10 or Fn+F10 to save the changes and exit.

When the ErP LPS compliance mode is enabled, you can wake up the computer by doing one of the following:

- Press the power button.
- Enable the Wake Up on Alarm feature to make the computer wake up at a set time.

Change BIOS settings before installing a new operating system

BIOS settings vary by operating system. Change the BIOS settings before installing a new operating system.

To change the BIOS settings:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. From the main interface, select **Security → Secure Boot** and press Enter.
3. Depending on the operating system to be installed, do one of the following:
   - To install the Windows 10 (64-bit) and most of Linux operating system, select **Enabled** for **Secure Boot**.
   - To install an operating system that does not support secure boot, select **Disabled** for **Secure Boot**.
4. Press F10 or Fn+F10 to save the changes and exit.

Update UEFI BIOS

When you install a new program, device driver, or hardware component, you might need to update UEFI BIOS. You can update the BIOS from your operating system or a flash update disc (supported only on selected models).

Download and install the latest UEFI BIOS update package by one of the following methods:

- Using the built-in software update service:

  Ubuntu software update will check the LVFS site for any firmware updates and notify you when updates are available.
- From the Lenovo Support Web site:
  1. Go to https://pcsupport.lenovo.com.
  2. Download the flash BIOS update driver for the operating system version or the ISO image version (used to create a flash update disc). Then, download the installation instructions for the flash BIOS update driver you have downloaded.
  3. Print the installation instructions and follow the instructions to update the BIOS.

Reset system to factory default

This feature allows you to reset the UEFI BIOS to the factory default settings, including all UEFI BIOS settings and internal data. It helps you wipe user data in case that you want to dispose of or reuse your computer.

1. Restart the computer. When the logo screen is displayed, press F1 to enter the UEFI BIOS menu.
2. Select **Security → Reset system to Factory Default** and press Enter.
3. Several warning windows might be displayed. Do the following before resetting the system to the factory default settings:
   a. Deactivate the Absolute Persistence Module.
   b. Remove the NVMe password if your have set one.

4. For computer models with RAID settings, a window is displayed to remind you of data damage. Select **Yes** to proceed.
5. A window is displayed to confirm all UEFI BIOS settings will be reset. Select **Yes** to proceed.

   Note: If the **Intel AMT control** and **Absolute Persistence(R) Module** are permanently disabled, these settings cannot be reset successfully.
6. Enter the supervisor password, system management password or power-on password in the window prompted.

Your computer will restart immediately. It takes a few minutes to complete the initialization process. Your computer screen might be blank during this process. This is normal and you should not interrupt it.

View UEFI BIOS Event logs

The UEFI BIOS Event log viewer provides the brief information about UEFI BIOS events. Do the following to view the logs:

1. Restart the computer. When the logo screen is displayed, press F1.
2. Select **Main → BIOS Event log**. Then, press Enter. The UEFI BIOS Event log interface is displayed.
3. Navigate the interface by pressing the following keys, and then check details by selecting each item.
   - ↑ ↓: Move keyboard focus
   - PgUp / PgDn: Scroll page
   - Enter: Select
   - F3: Exit

The following UEFI BIOS event logs might be listed on your screen depending on UEFI BIOS activities. Each log consists of a date, a time, and a description of the event.

- **Power On** event: This log shows the Power On Self Test (POST) routine has started with the power-on process. It includes the power-on reason, the boot mode, and the shutdown reason.
- **Subcomponent Code Measurement** event: This log shows the subcomponent code measurement has worked. It includes the validation result of each component.
- **System Preboot Authentication** event: This log shows what credential is provided to gain preboot authentication. It includes the installed password, the password type, the input device, and the authentication result.
- **BIOS Password Change** event: This log shows the change history of the UEFI BIOS passwords. It includes the password type, the type and result of the event.
- **Subcomponent Self-healing** event: This log shows the information about the subcomponent where the recovery event occurred. It includes the cause and result of the event, and the recovered firmware version.
- **BIOS Setup Configuration Change** event: This log shows the change history of the UEFI BIOS Setup configuration. It includes the item name and value.
- **Device Change** event: This log shows the change history of devices. It includes the cause and type of the event.
- **System Boot** event: This log shows which device was utilized to boot the system. It includes the boot option, the description, and the file path list.
- **System Tamper** event: This log shows the occurrence of system tamper events. It includes the cause and type of the event.
- **POST Error** event: This log shows the occurrence of errors during the POST routine. It includes the error code.

- **Flash Update** event: This log shows the occurrence of flash update. It includes the cause and result of the event, and the updated firmware version.
- **Capsule Update** event: This log shows the occurrence of UEFI capsule firmware update. It includes the cause and result of the event, and the updated firmware version.
- **Log Cleared** event: This log shows UEFI BIOS event logs are cleared. It includes the cause and result of the event.
- **Shutdown / Reboot** event: This log shows the UEFI BIOS is successfully shut down or the system is rebooted. It includes the cause and type of the event.

Chapter 6. CRU replacement

Customer Replaceable Units (CRUs) are parts that can be replaced by the customer. Lenovo computers contain the following types of CRUs:

- **Self-service CRUs:** Refer to parts that can be replaced easily by customer themselves or by trained service technicians at an additional cost.
- **Optional-service CRUs:** Refer to parts that can be replaced by customers with a greater skill level. Trained service technicians can also provide service to replace the parts under the type of warranty designated for the customer's machine.

If you intend on installing the CRU, Lenovo will ship the CRU to you. CRU information and replacement instructions are shipped with your product and are available from Lenovo at any time upon request. You might be required to return the defective part that is replaced by the CRU. When return is required: (1) return instructions, a prepaid shipping label, and a container will be included with the replacement CRU; and (2) you might be charged for the replacement CRU if Lenovo does not receive the defective CRU within thirty (30) days of your receipt of the replacement CRU. For full details, see the Lenovo Limited Warranty documentation at:
https://www.lenovo.com/warranty/llw_02

CRU list

The following is the CRU list of your computer.

Self-service CRUs

- Blank bezel*
- CPU duct*
- Fan grommet*
- Flex module tray*
- Flex module fan*
- Front CPU fan*
- Hard disk drive*
- Hard disk drive and lower PCI-Express fan*
- Hard disk drive bracket*
- ID badge
- Keyboard*
- M.2 solid-state drive*
- M.2 solid-state drive holder
- M.2 solid-state drive tray and thermal kit
- Mouse*
- Memory module
- Memory fan duct
- NVLINK retainer*
- NVMe BCB*
- Optional hard disk drive cage*

- PCI-Express card*
- PCI-Express card bracket*
- PCI-Express card extender*
- Power cord
- Power supply assembly
- Rear CPU fan
- Side panel
- Solid-state drive bracket*
- Storage box in flex module*
- Super capacitor module*
- Think LED holder
- ThinkStation logo badge
- ThinkStation LED cable
- Top cover
- Upper PCI-Express card fan
- Vertical solid state drive tray*
- Wi-Fi antenna cover*

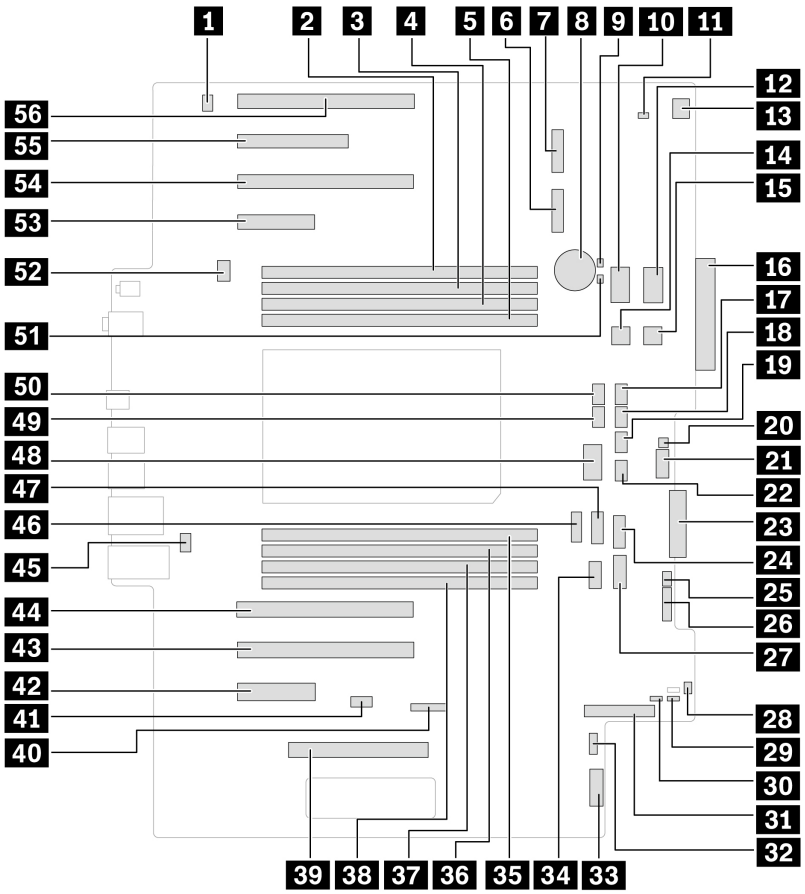
Optional-service CRUs

- 15-in-1 Media card reader*
- Front panel I/O assembly
- Lock kit with random key*
- NVLINK bridge*
- Speaker cable

* for selected models

System board

Note: The system board might look slightly different from the illustration.



Item	Item
1 Internal speaker connector	2 Memory slot 8
3 Memory slot 7	4 Memory slot 6
5 Memory slot 5	6 M.2 solid-state drive slot 1
7 M.2 solid-state drive slot 2	8 Coin-cell battery
9 RST_FIO	10 Graphics card power connector 1
11 Cover presence switch connector (intrusion switch connector)	12 Graphics card power connector 3
13 PCIe card slot 1 to 4 fan connector	14 Power connector of Internal bay 1
15 Power connector of Internal bay 2	16 Front panel connector
17 Flex bay fan connector	18 Memory fan 2 connector
19 Memory fan 1 connector	20 Thunderbolt power connector
21 Thunderbolt connector	22 PCIe card slot 5 to 7 fan connector
23 Media card IO connector	24 SATA 3 connector
25 Flex-I2C	26 APS
27 SATA 1 connector	28 Logo LED connector
29 Clear CMOS	30 CLR_RTC

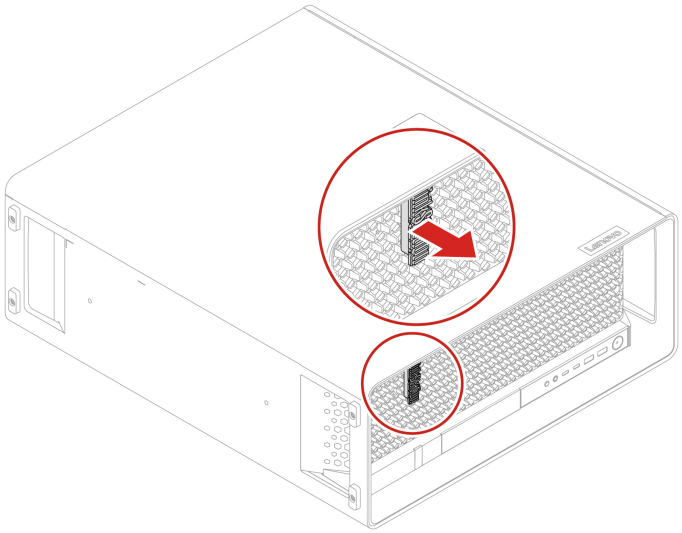
Item	Item
31 M.2 solid-state drive slot 3	32 VROC
33 ALT_TPM	34 Internal USB 3.2 connector
35 Memory slot 4	36 Memory slot 3
37 Memory slot 2	38 Memory slot 1
39 Auxiliary power connector	40 BMC
41 BMC USB connector	42 PCIe 5.0 x4 card slot 7
43 PCIe 4.0 x16 card slot 6	44 PCIe 5.0 x 16 card slot 5
45 Serial port connector	46 Internal USB 2.0 connector
47 SATA 2 connector	48 Graphics card power connector 2
49 Internal storage fan connector	50 CPU fan connector
51 Power button header	52 Rear-fan-assembly connector
53 PCIe 4.0 x 4 card slot 4	54 PCIe 5.0 x 16 card slot 3
55 PCIe 4.0 x 8 card slot 2	56 PCIe 5.0 x 16 card slot 1

ThinkStation logo badge

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Removal steps

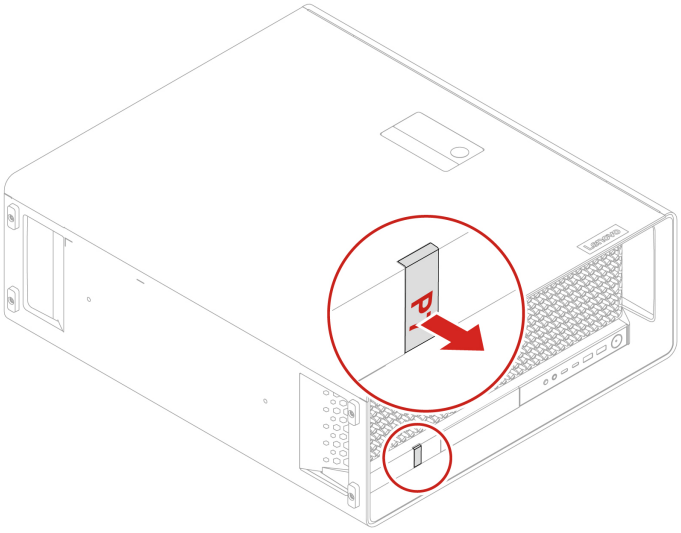


ID badge

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Removal steps



Top cover

Prerequisite

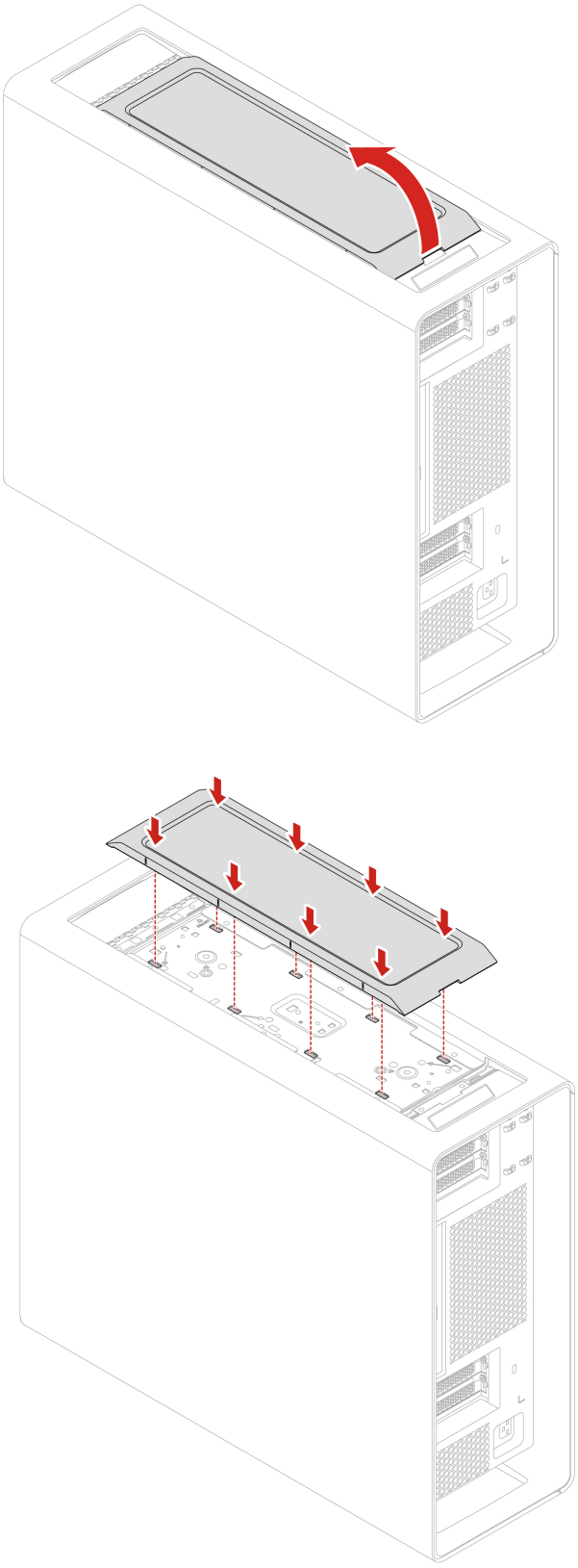
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Before you open the computer cover, turn off the computer and wait several minutes until the computer is cool.

For access, do the following:

1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.

Replacement procedures



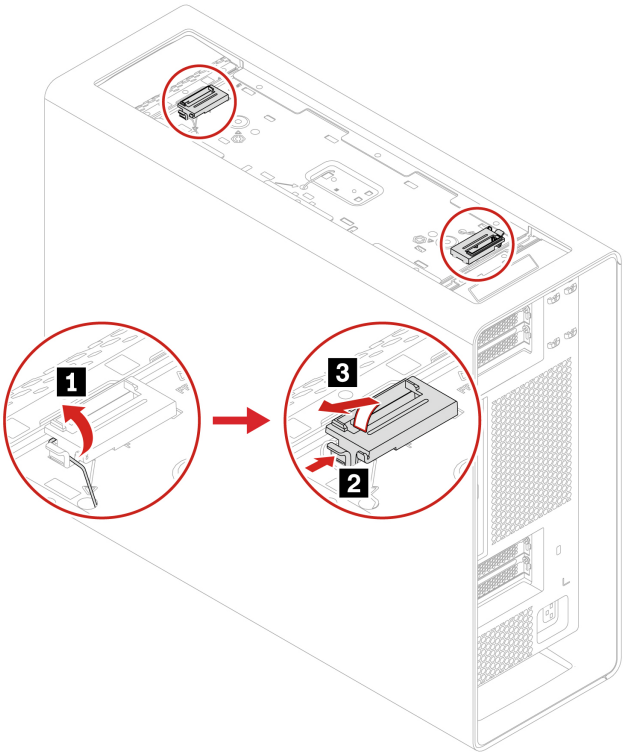
Wi-Fi antenna cover

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, remove the top cover. See “Top cover” on page 27.

Removal steps



Side panel

Prerequisite

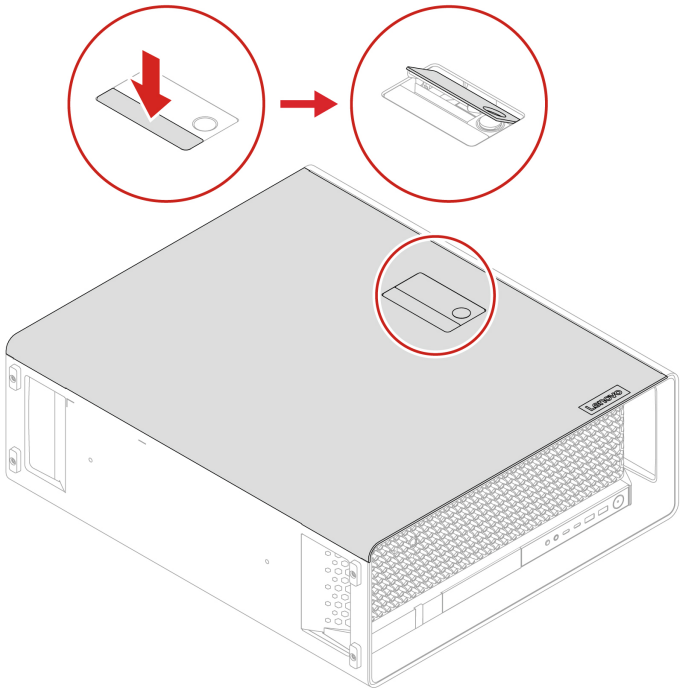
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

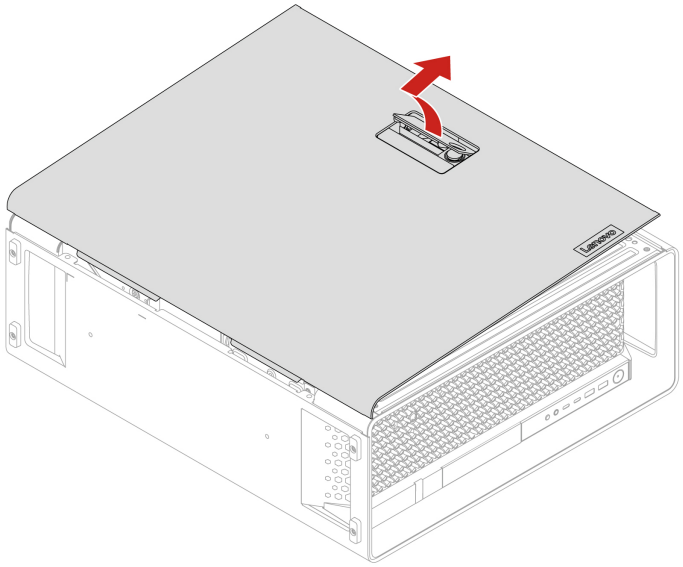
Before you open the side panel, turn off the computer and wait several minutes until the computer is cool.

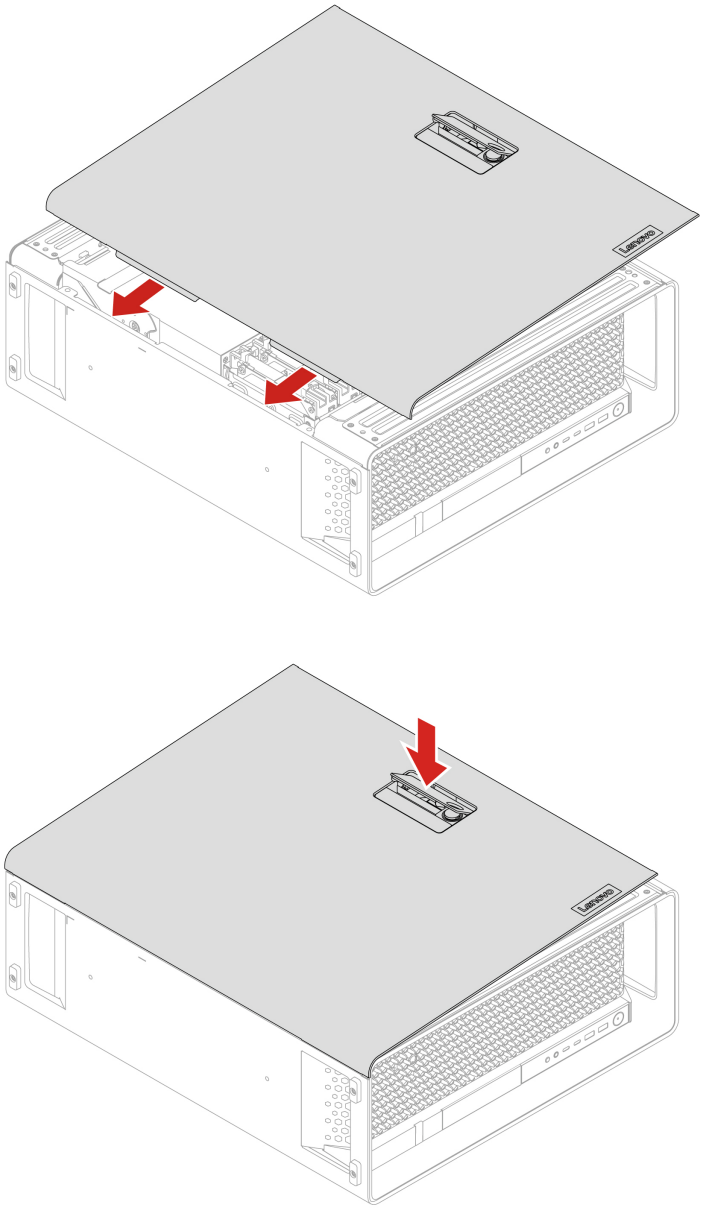
For access, do the following:

1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Unlock any locking device that secures the side panel.
4. Lay the computer on its side for easier access to the side panel.

Replacement procedures







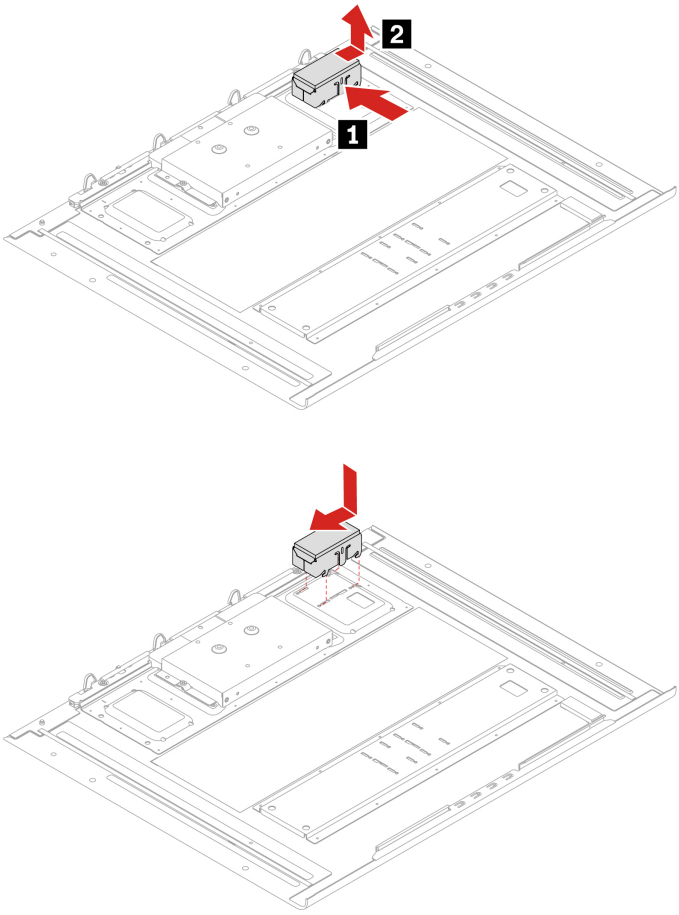
NVLINK retainer

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, remove the side panel. See “Side panel” on page 29.

Replacement procedure



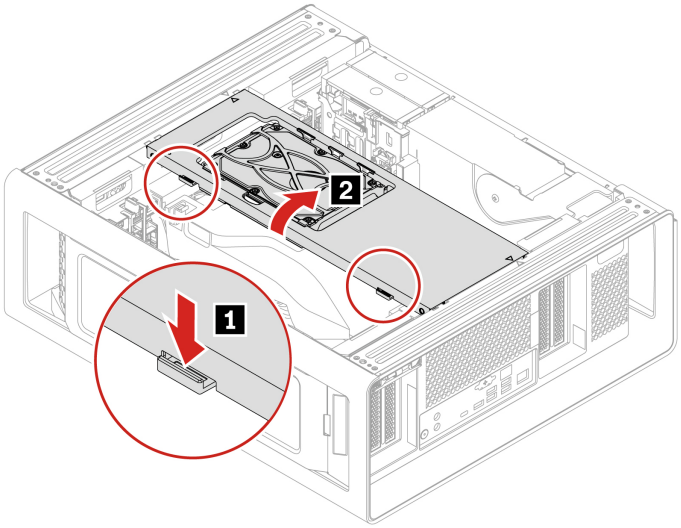
Optional hard disk drive

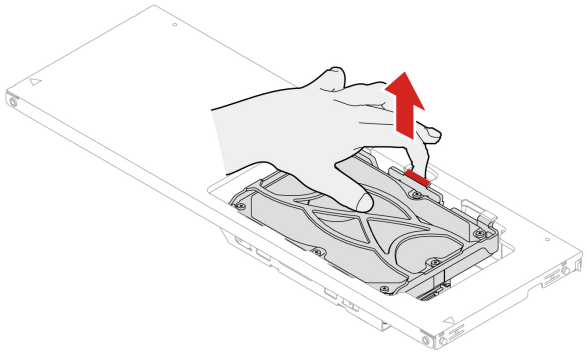
Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

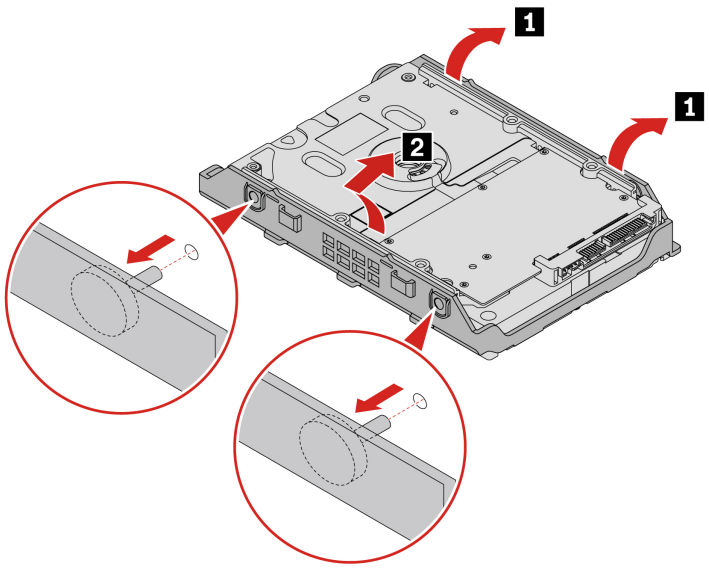
For access, remove the side panel. See “Side panel” on page 29.

Removal steps





Disconnect the cable from the hard disk drive after detaching the storage drive bracket from the optional hard disk drive bracket. Then, remove the bracket.



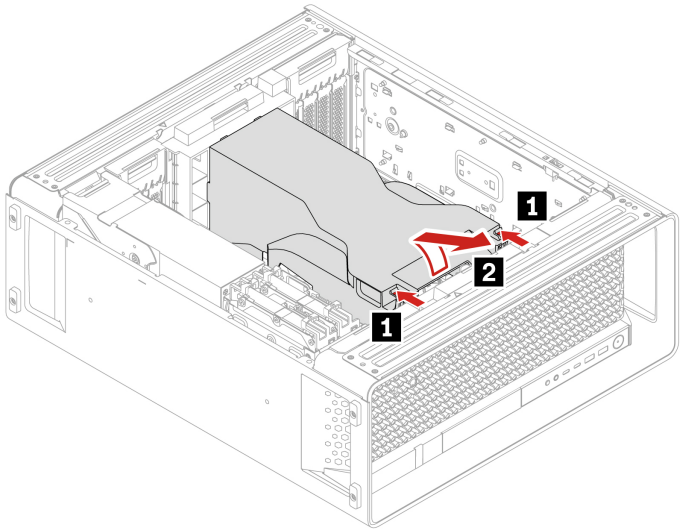
CPU duct

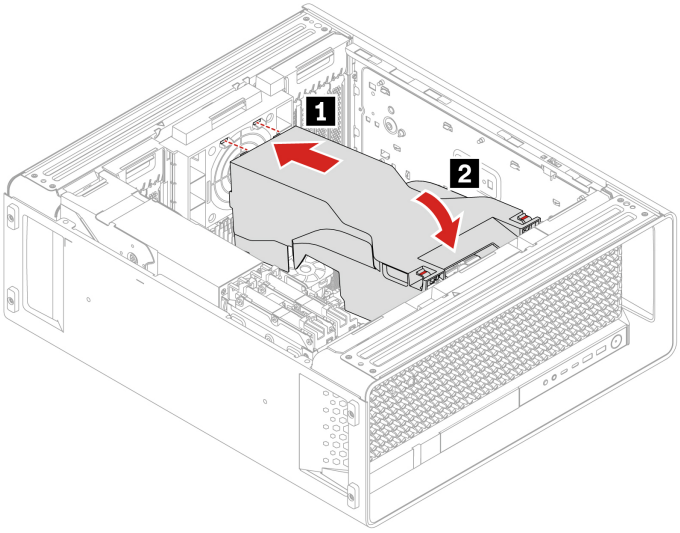
Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, remove the side panel. See “Side panel” on page 29.

Replacement procedures





Hard disk drive in the internal storage drive bay

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

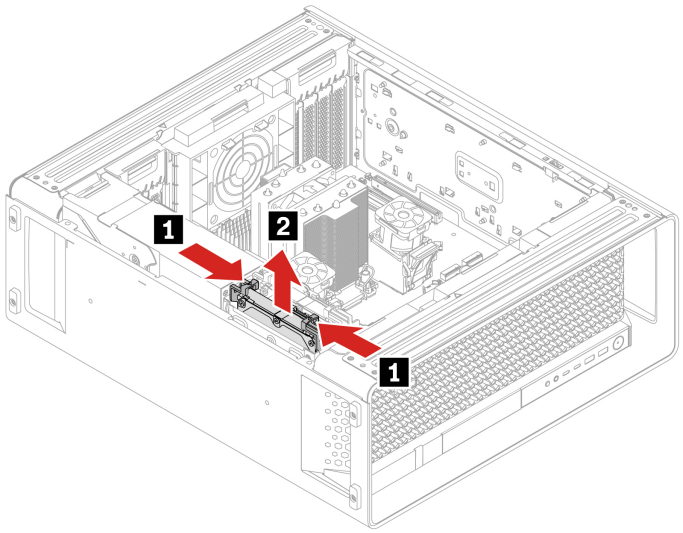
Attention: The internal storage drive is sensitive. Inappropriate handling might cause damage and permanent loss of data. When handling the internal storage drive, observe the following guidelines:

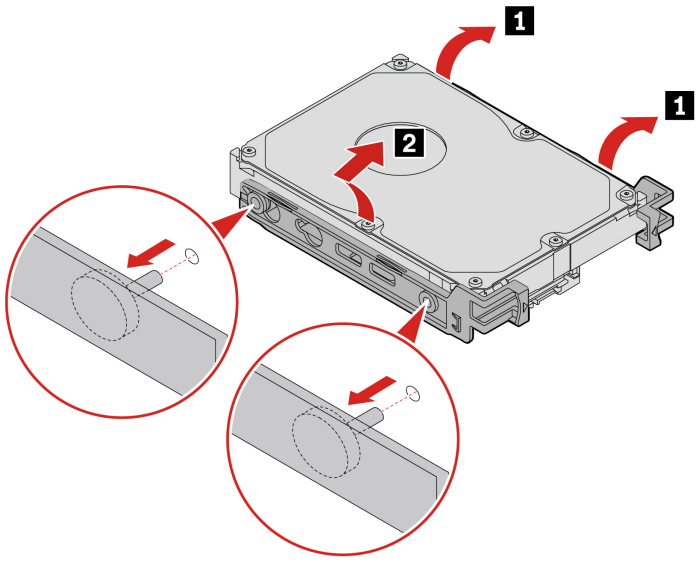
- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive. Otherwise, the internal storage drive might get damaged.
- Do not apply pressure to the internal storage drive.
- Do not make the internal storage drive subject to physical shocks or vibration. Put the internal storage drive on soft material, such as a cloth, to absorb physical shocks.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Disconnect the cable from the hard disk drive.

Removal steps





Solid-state drive bracket in internal storage drive bay

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

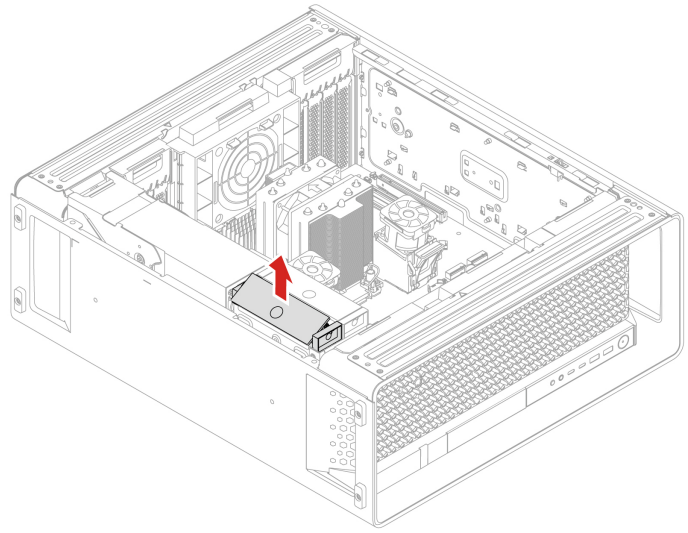
Attention: The internal storage drive is sensitive. Inappropriate handling might cause damage and permanent loss of data. When handling the internal storage drive, observe the following guidelines:

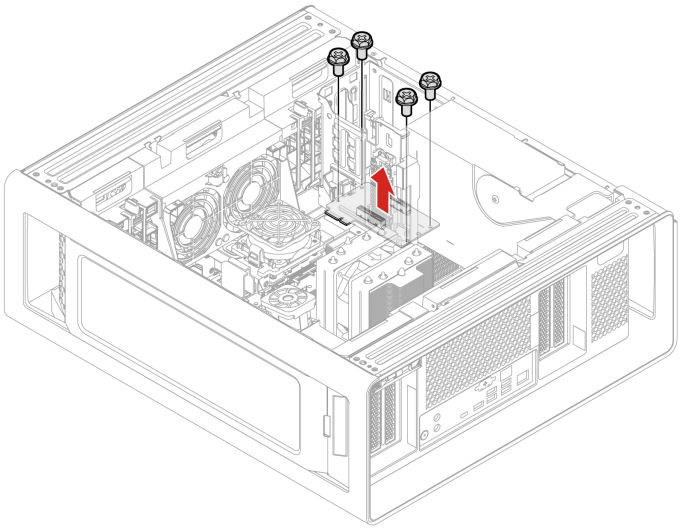
- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive. Otherwise, the internal storage drive might get damaged.

- Do not apply pressure to the internal storage drive.
- Do not make the internal storage drive subject to physical shocks or vibration. Put the internal storage drive on a soft material, such as cloth, to absorb physical shocks.

For access, please remove the side panel. See “Side panel” on page 29.

Removal steps





Screw (quantity)	Color	Torque
M3 x 5 mm, Nl coated (4)	Black	5.0 ± 0.5 lb/in

Vertical M.2 solid-state drive module

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

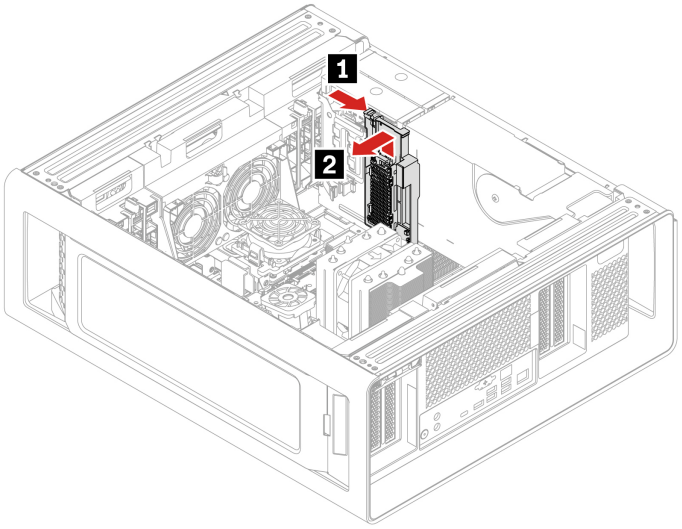
Before you open the computer cover, turn off the computer and wait several minutes until the computer is cool.

Attention: The internal storage drive is sensitive. Inappropriate handling might cause damage and permanent loss of data. When handling the internal storage drive, observe the following guidelines:

- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive. Otherwise, the internal storage drive might get damaged.
- Do not apply pressure to the internal storage drive.
- Do not make the internal storage drive subject to physical shocks or vibration. Put the internal storage drive on a soft material, such as cloth, to absorb physical shocks.

For access, please remove the side panel. See “Side panel” on page 29.

Removal steps



M.2 solid-state drive

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Attention: The internal storage drive is sensitive. Inappropriate handling might cause damage and permanent loss of data. When handling the internal storage drive, observe the following guidelines:

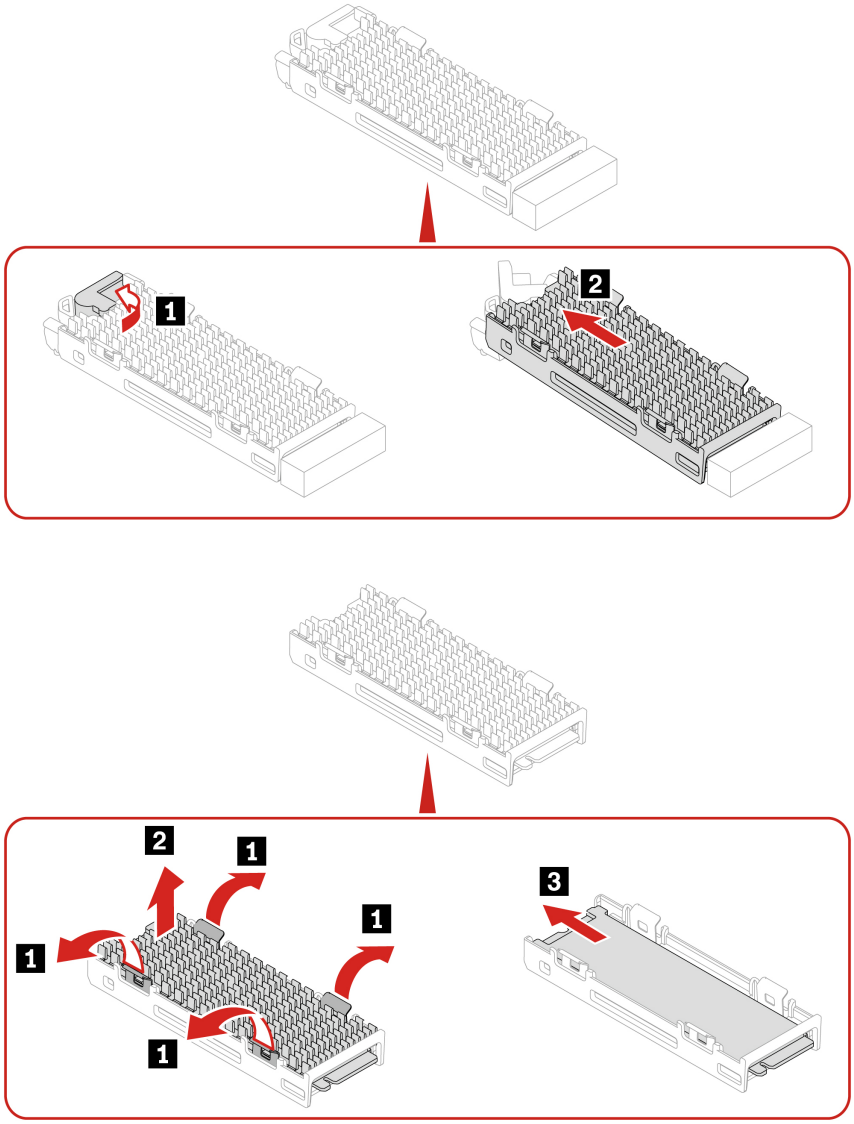
- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive. Otherwise, the internal storage drive might get damaged.

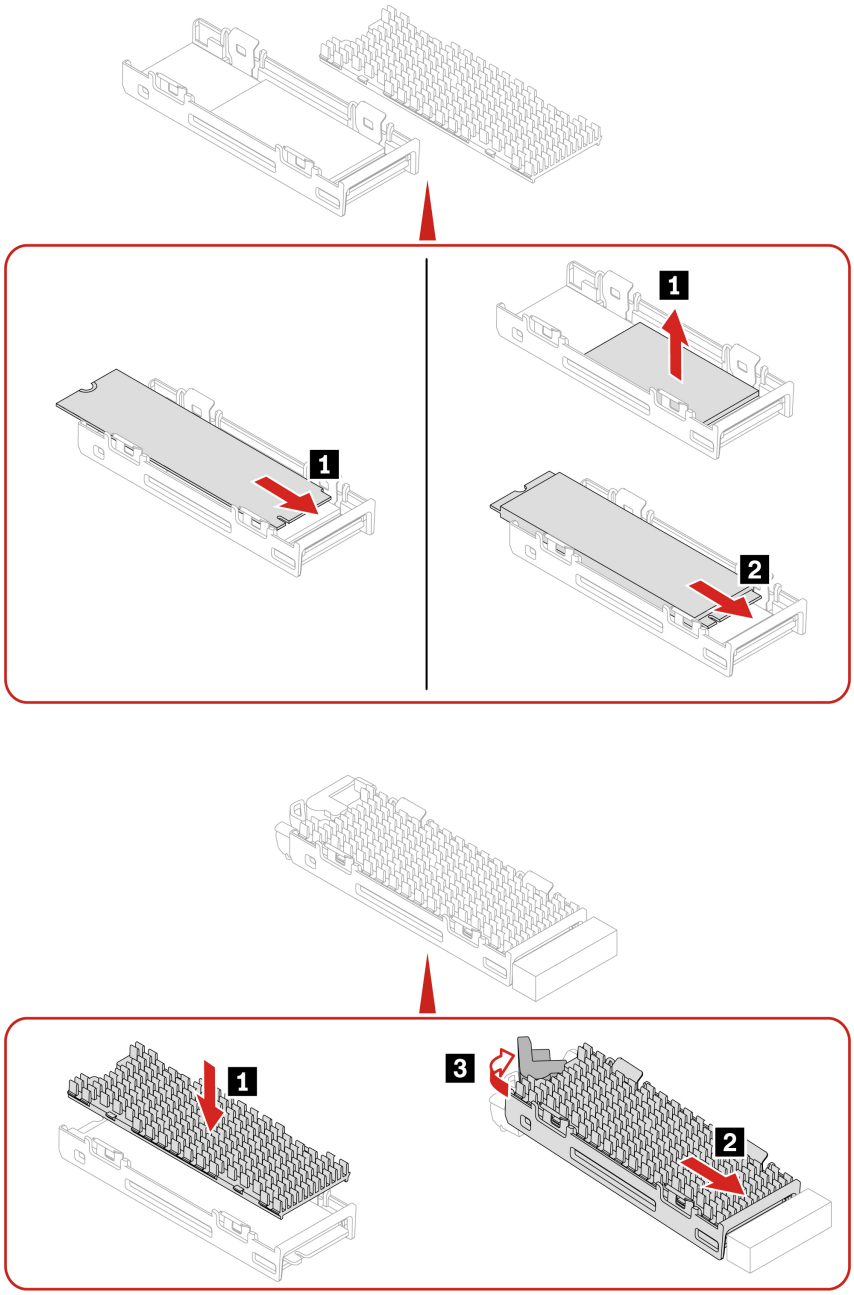
- Do not apply pressure to the internal storage drive.
- Do not make the internal storage drive subject to physical shocks or vibration. Put the internal storage drive on a soft material, such as cloth, to absorb physical shocks.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the following solid-state drive module if any:
   - “Solid-state drive bracket in internal storage drive bay” on page 36
   - “Vertical M.2 solid-state drive module” on page 37.

Replacement procedures





Front CPU fan

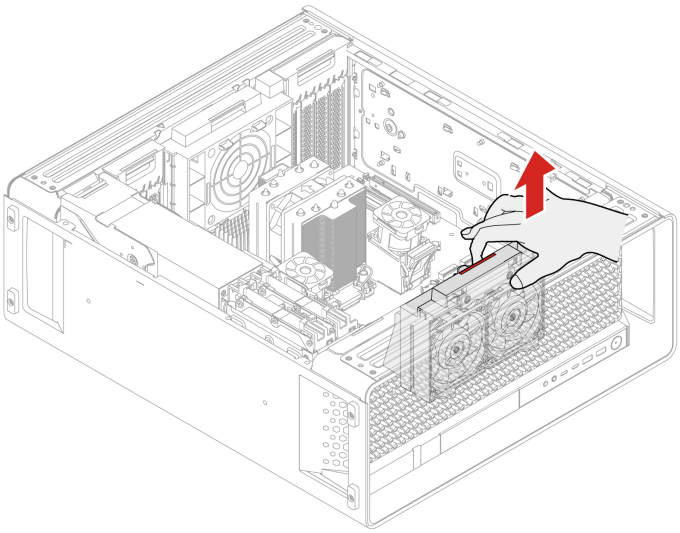
Prerequisite

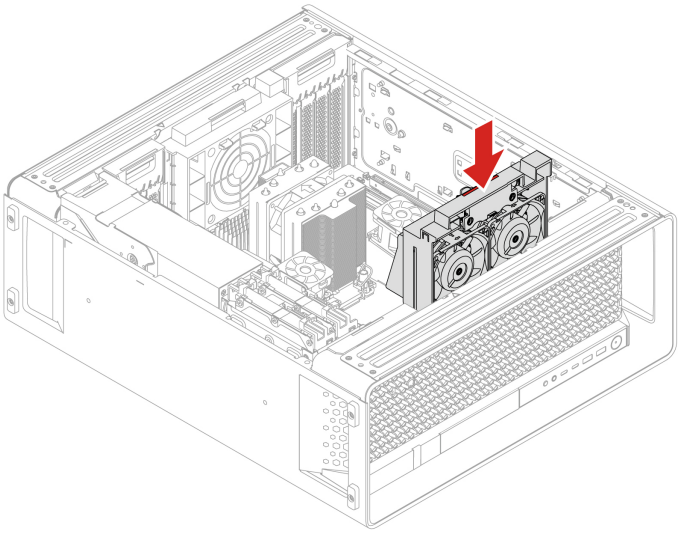
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.
3. Disconnect the cable from the CPU front fan.

Replacement procedure





Rear CPU fan

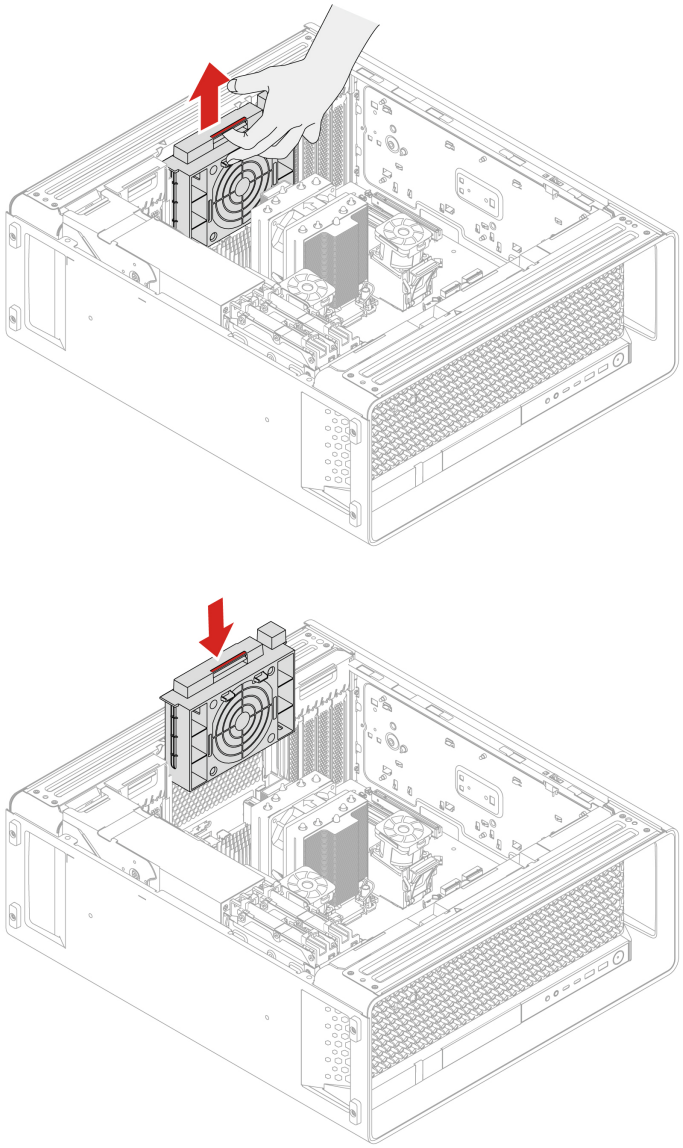
Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.
3. Disconnect the cable from the CPU rear fan.

Replacement procedure



Upper PCI-Express fan

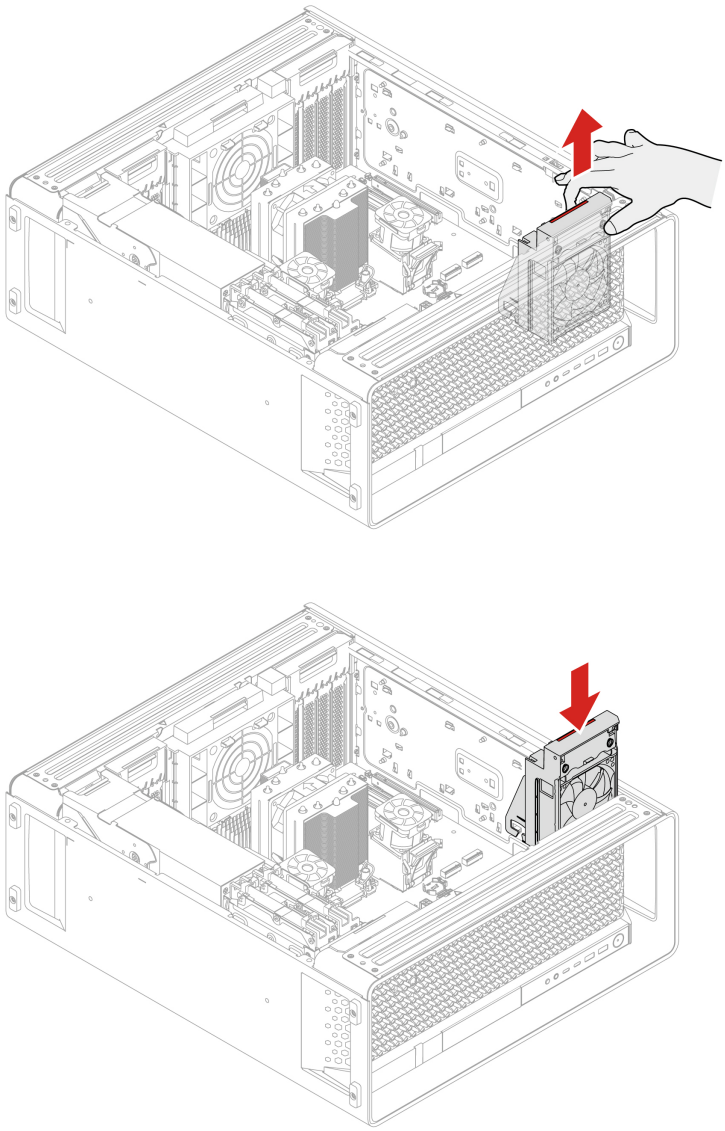
Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.
3. Disconnect the cable from the upper PCI-Express fan.
4. Detach cables from the cable clip on the fan bracket.

Replacement procedure



Hard disk drive and lower PCI-Express fan

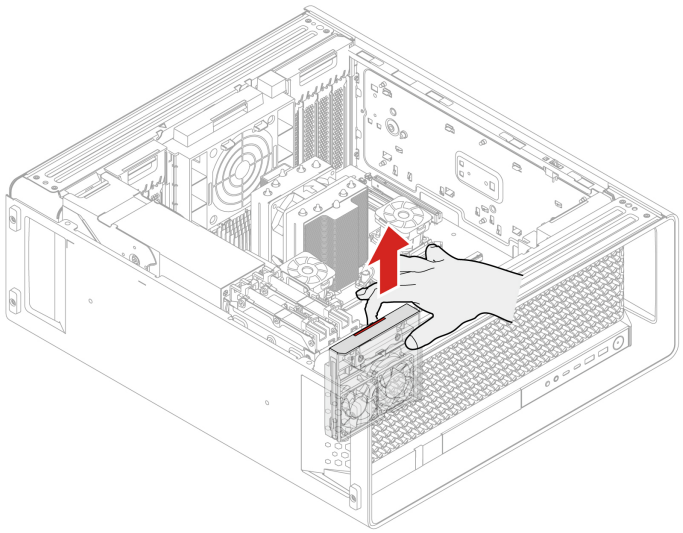
Prerequisite

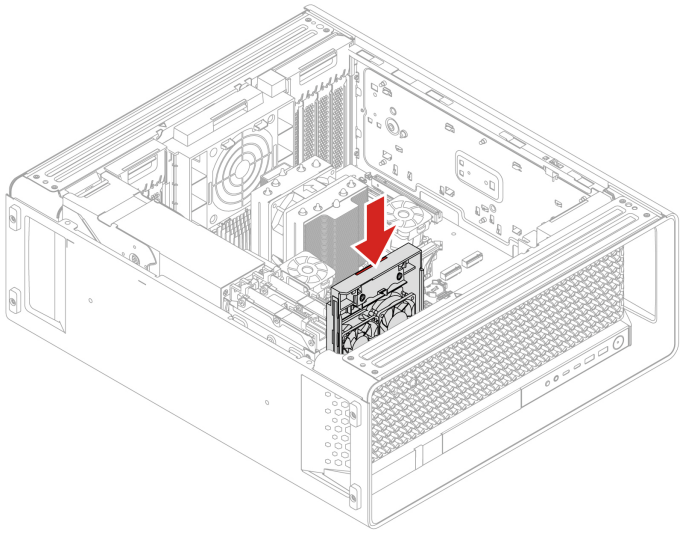
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.
3. Disconnect the cable from the hard disk drive and lower PCI-Express fan.

Replacement procedure





Memory module and fan duct

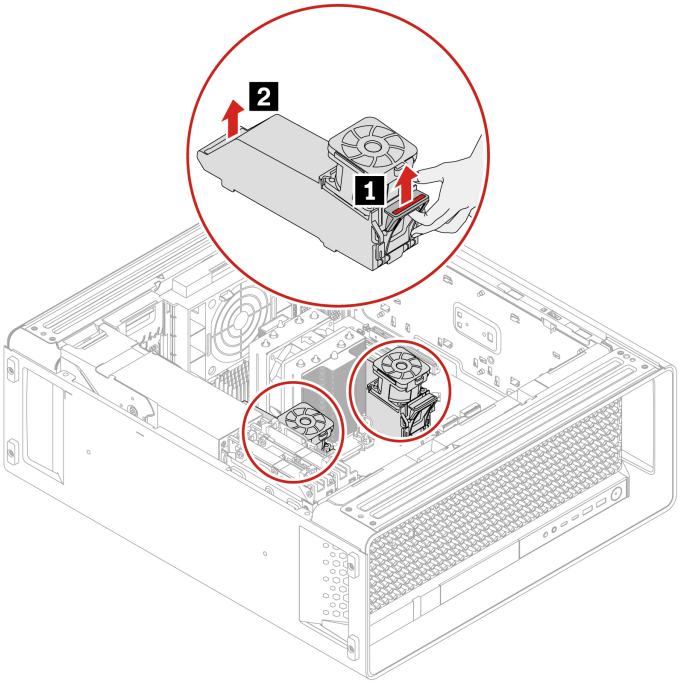
Prerequisite

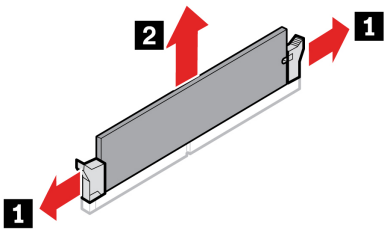
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, remove the following parts in order:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.
3. Disconnect the cable from the memory heat sink.

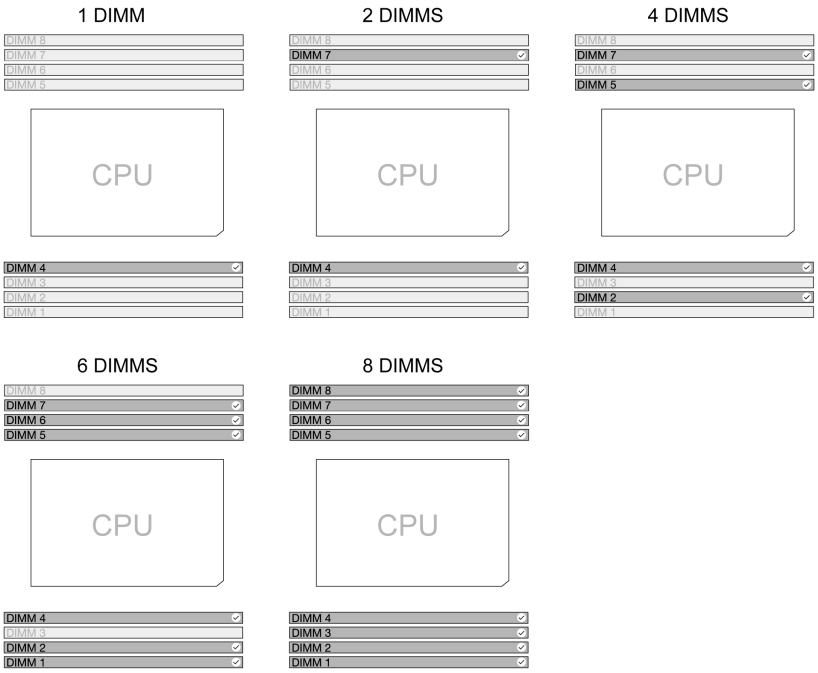
Removal steps

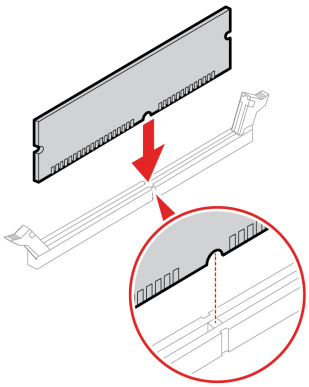


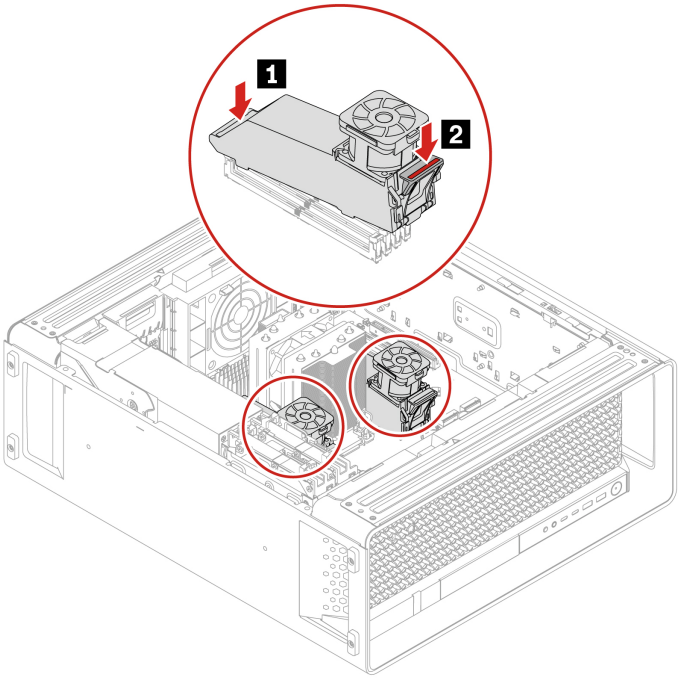


Installation steps

Ensure that you follow the installation order for memory modules shown in the following illustration.


1 DIMM
DIMM 8
DIMM 7
DIMM 6
DIMM 5
CPU
DIMM 4
DIMM 3
DIMM 2
DIMM 1
2 DIMMS
DIMM 8
DIMM 7
DIMM 6
DIMM 5
CPU
DIMM 4
DIMM 3
DIMM 2
DIMM 1
4 DIMMS
DIMM 8
DIMM 7
DIMM 6
DIMM 5
CPU
DIMM 4
DIMM 3
DIMM 2
DIMM 1
6 DIMMS
DIMM 8
DIMM 7
DIMM 6
DIMM 5
CPU
DIMM 4
DIMM 3
DIMM 2
DIMM 1
8 DIMMS
DIMM 8
DIMM 7
DIMM 6
DIMM 5
CPU
DIMM 4
DIMM 3
DIMM 2
DIMM 1





Front panel I/O assembly

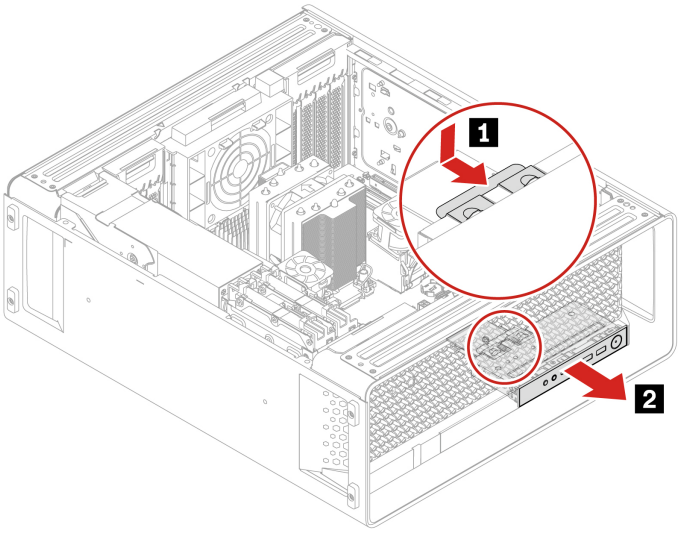
Prerequisite

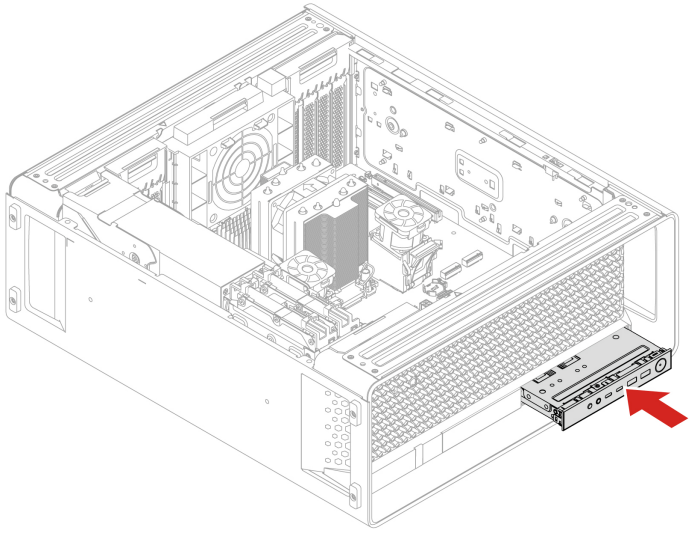
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.
3. Remove the upper PCI-Express fan. See “Upper PCI-Express fan” on page 42.

Replacement procedure





ThinkStation LED cable and holder

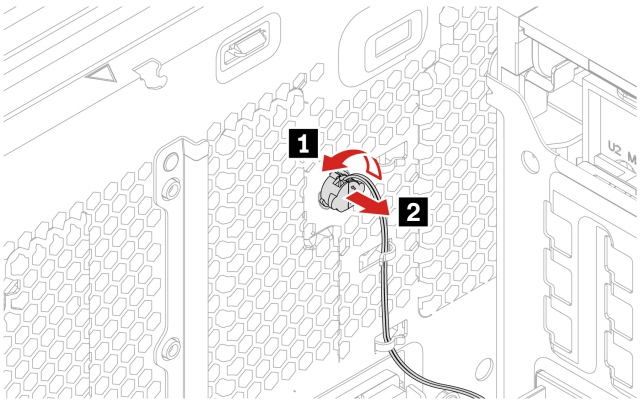
Prerequisite

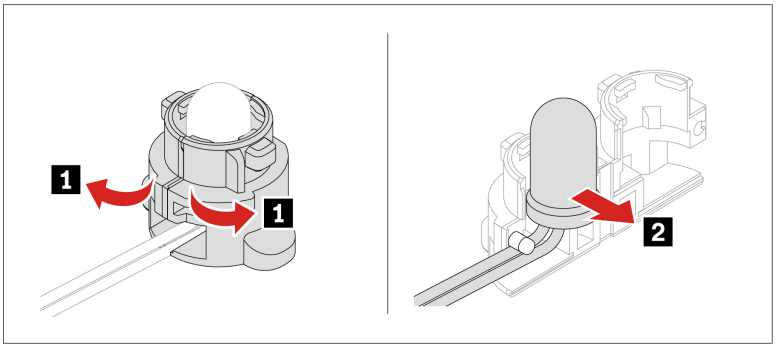
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.
3. Remove the front CPU fan. See “Front CPU fan” on page 40.
4. Remove the hard disk driver and lower PCI-Express fan. See “Hard disk drive and lower PCI-Express fan” on page 43.

Removal steps





NVLINK bridge

Prerequisite

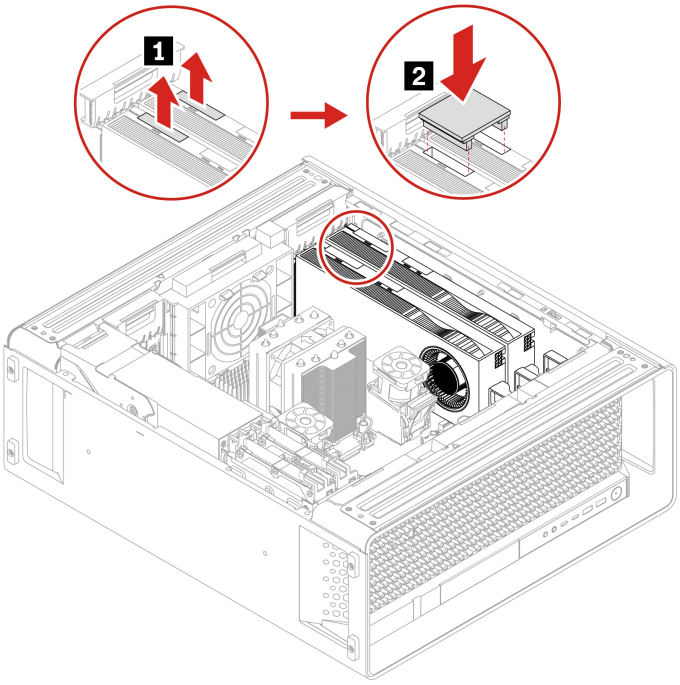
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Note: The NVLINK bridge is shipped in an accessary box within the computer carton box. You need to take it out from the packaging and install it by yourself.

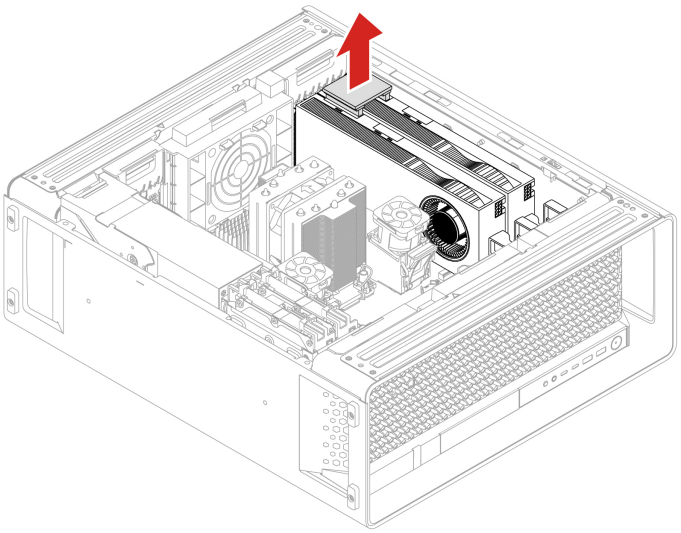
For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.

Installation steps



Removal steps



PCI-Express card and extender

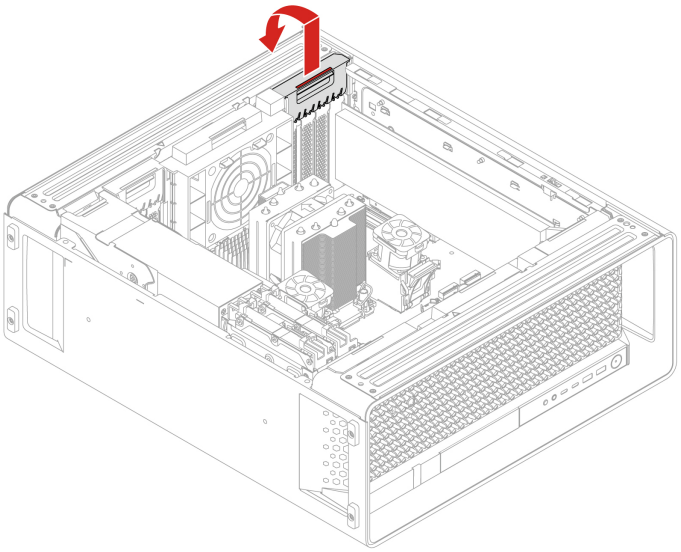
Prerequisite

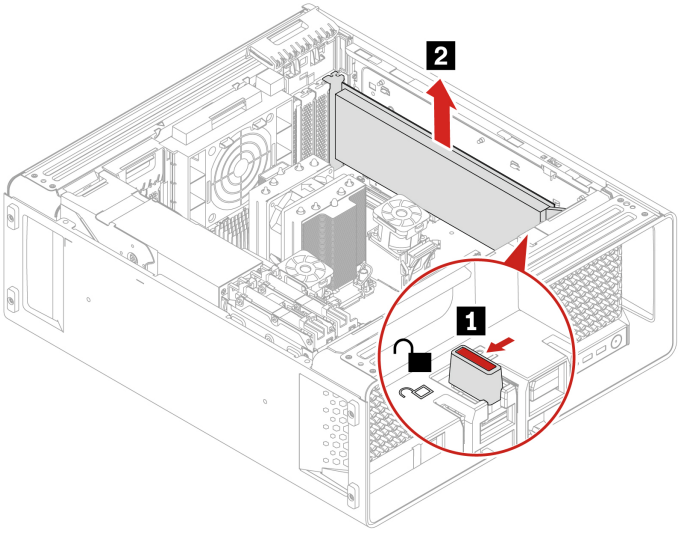
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

1. Remove the side panel. See “Side panel” on page 29.
2. Disconnect the cable from the PCI-Express card if any.

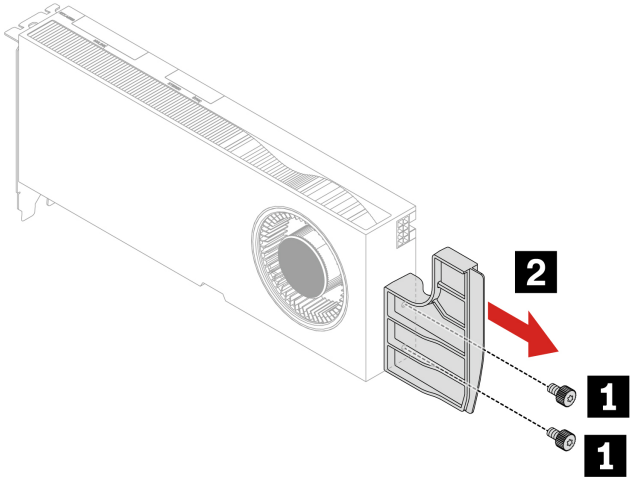
Removal steps

Note: The full-length card might fit tightly into the slot. If necessary, alternately move each side of the card a small amount until the card is removed from the slot.



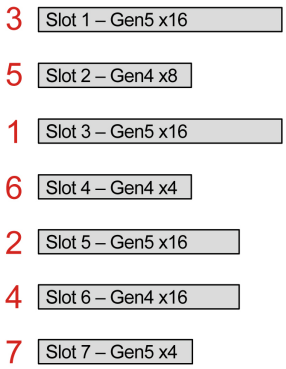


Note: The PCIe card retainer is only available on some Graphics cards.



Screw (quantity)	Color	Torque
M3 x 5.5 mm, Nl coated (2)	Black	3–3.5 lb/in

Install PCIe cards according to the corresponding slot types and the following illustrated installation order:



Note: Do not change the graphics card slot installation location if you replace a GeforceRTX 4080 graphics card.

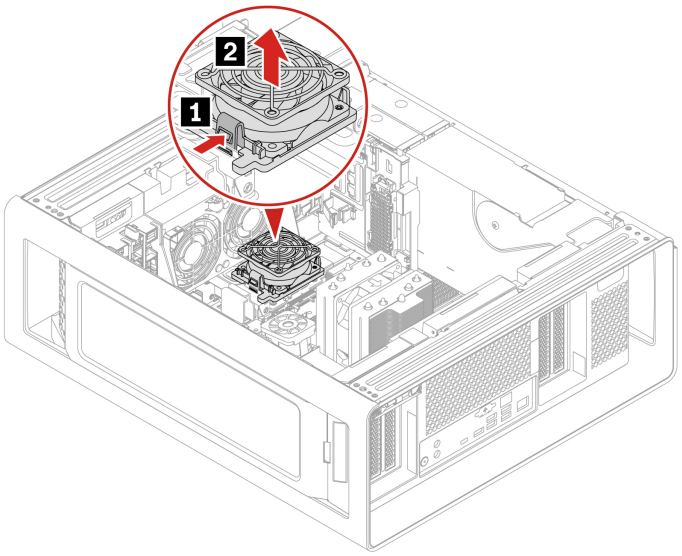
Flex module fan

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

1. Remove the side panel. See “Side panel” on page 29.
2. Disconnect the cable from the fan.

Removal steps



Storage box in flex module

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Attention: The internal storage drive is sensitive. Inappropriate handling might cause damage and permanent loss of data. When handling the internal storage drive, observe the following guidelines:

- Replace the internal storage drive only for repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage drive. Otherwise, the internal storage drive might get damaged.
- Do not apply pressure to the internal storage drive.
- Do not make the internal storage drive subject to physical shocks or vibration. Put the internal storage drive on a soft material, such as cloth, to absorb physical shocks.

You can install or replace a storage drive with a storage box in the flex module. The storage drive can be hot-swappable, which means that you can install or replace the drive without even turning off your computer. Therefore, lock the storage drive to prevent the unexpected removal. The keys are attached to the rear of the computer. Store the keys in a secure place.

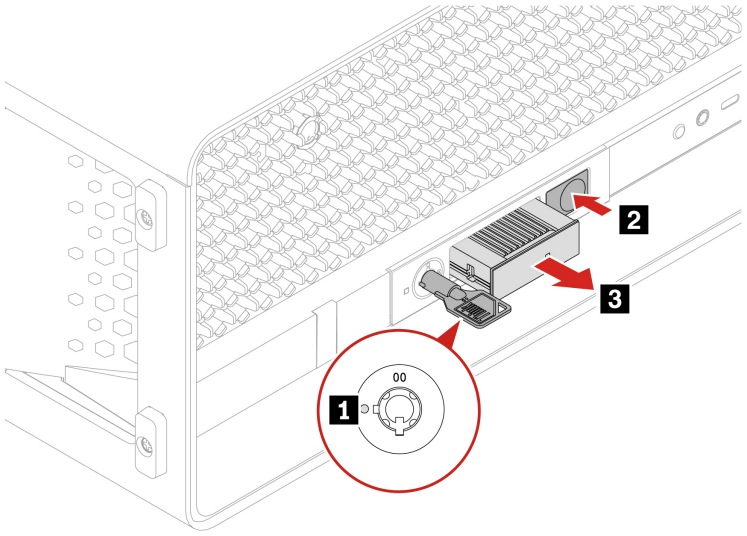
Attention: The storage drive in the flex module is hot-swappable only when the operating system of your computer does not reside on the storage drive installed in the flex module. If the requirement is not met, do not remove or install the storage drive when the computer is turned on. Otherwise, data on the storage drive might get damaged.

For access, do the following:

1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.

Removal steps

You might need to use the key attached at the rear of the computer to unlock the flex module.



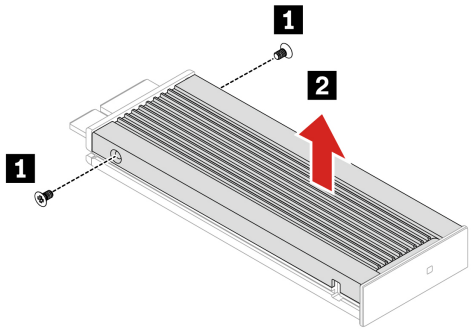
M.2 solid-state drive in storage box

Prerequisite

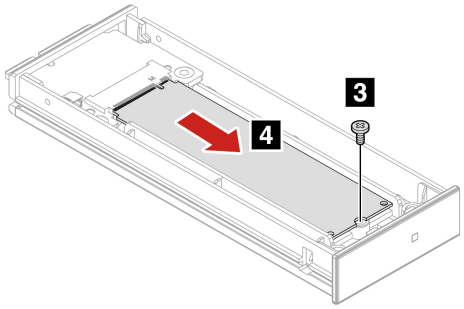
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, please remove the flex module. See “Storage box in flex module” on page 52.

Removal steps



Screw (quantity)	Color	Torque
M2 x 3.6 mm, Zn coated (2)	Blue	1.5± 0.2 lb/in



Screw (quantity)	Color	Torque
M2 x 4.5 mm, Zn coated (1)	Black	1.5± 0.2 lb/in

Flex module

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Attention: The storage drive is sensitive. Inappropriate handling might cause damage and permanent loss of data. When handling the storage drive, observe the following guidelines:

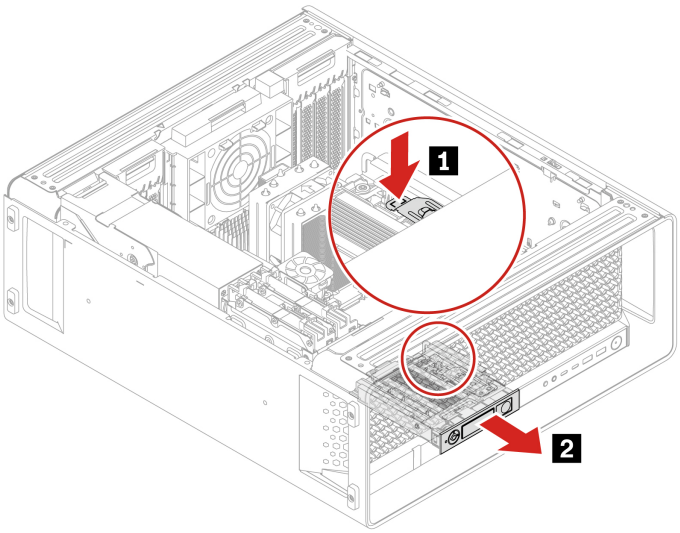
- Replace the storage drive only for repair. The storage drive is not designed for frequent changes or replacement.

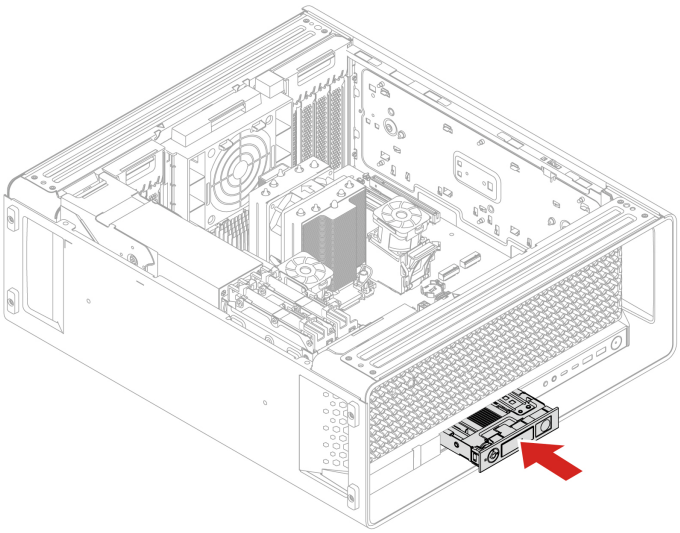
- Before replacing the storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the storage drive. Otherwise, the storage drive might get damaged.
- Do not apply pressure to the storage drive.
- Do not make the storage drive subject to physical shocks or vibration. Put the storage drive on a soft material, such as cloth, to absorb physical shocks.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.
3. Remove the front CPU fan. See “Front CPU fan” on page 40.

Replacement procedure





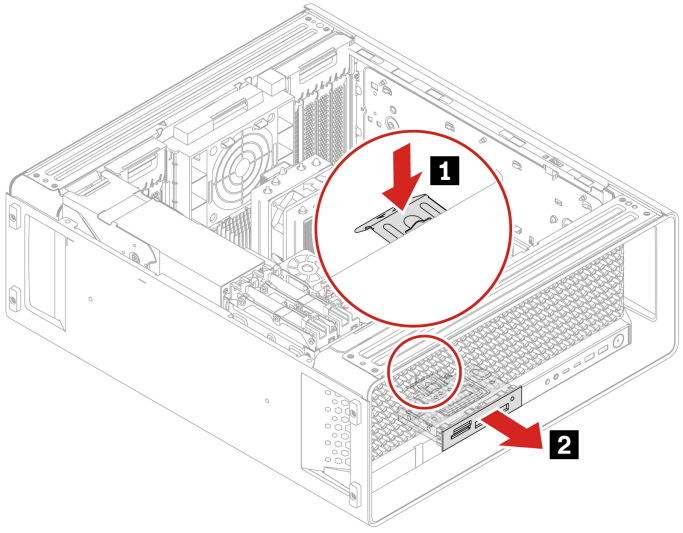
Media card reader

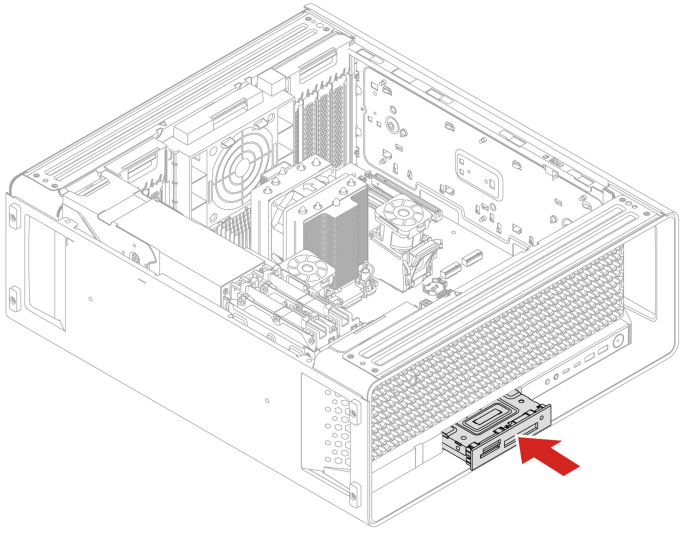
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.
3. Remove the front CPU fan. See “Front CPU fan” on page 40.
4. Disconnect the cable from the media card reader.

Replacement procedure





Speaker cable

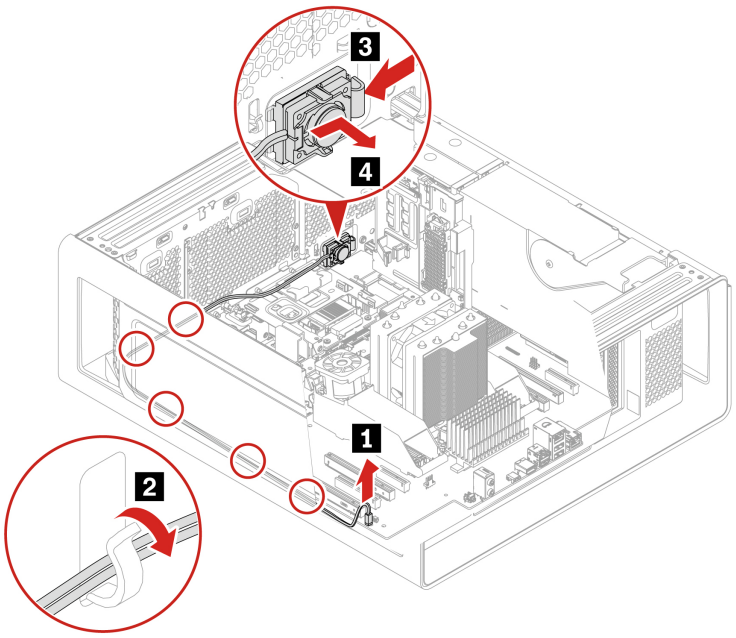
Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.
3. Remove the CPU front fan. See “Front CPU fan” on page 40.
4. Remove the CPU rear fan. See “Rear CPU fan” on page 41.
5. Remove the upper PCI-Express fan. See “Upper PCI-Express fan” on page 42.
6. Remove the hard disk and lower PCI-Express fan. See “Hard disk drive and lower PCI-Express fan” on page 43.

Removal steps



Super capacity module

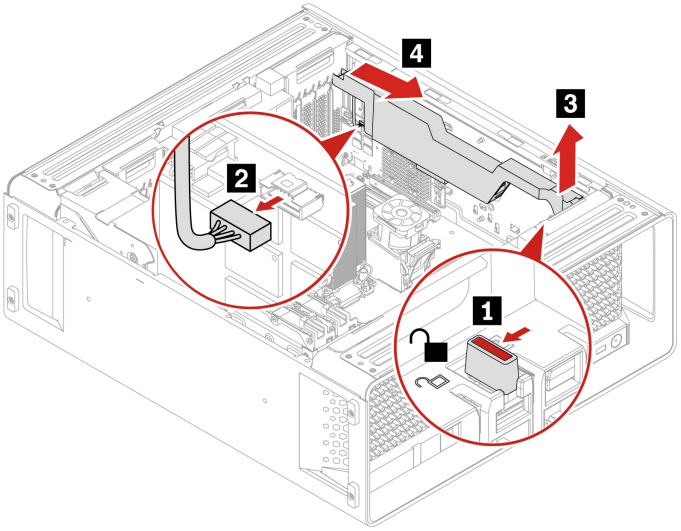
Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

For access, do the following:

1. Remove the side panel. See “Side panel” on page 29.
2. Remove the CPU duct. See “CPU duct” on page 34.

Removal steps



Note: When installing a new super capacitor module, connect the super capacitor module cable to the super capacitor module connector (J14) on the RAID card.

Power supply assembly

Prerequisite

Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

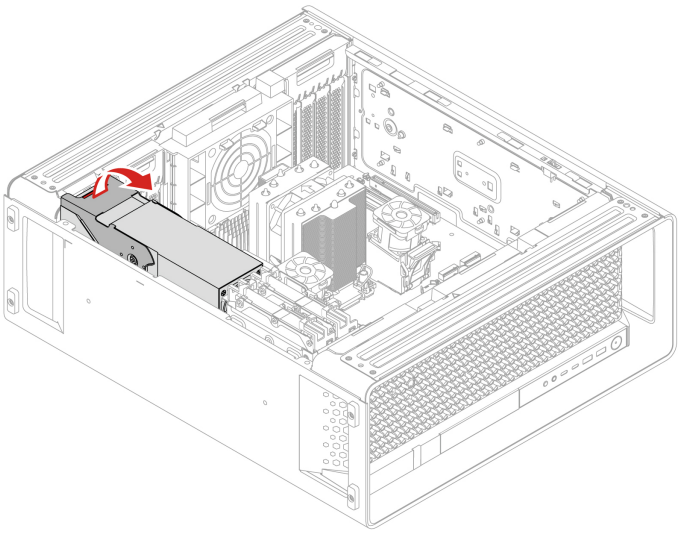
Although there are no moving parts in the computer after the power cord has been disconnected, the following warnings are required for your safety.

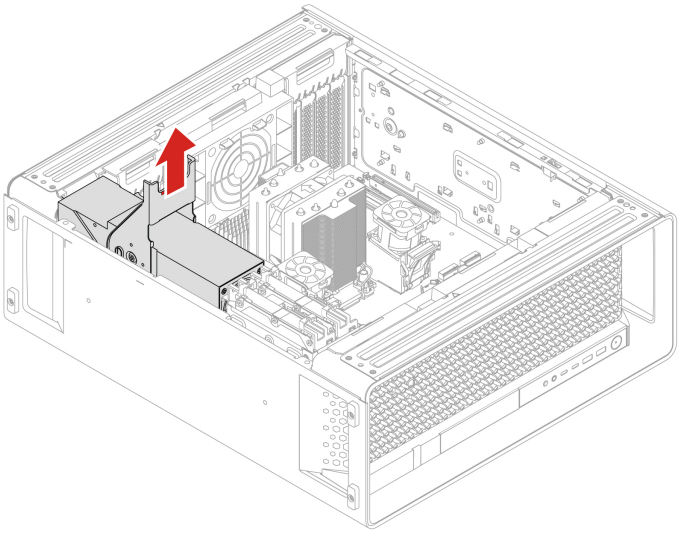
Keep fingers and other parts of your body away from hazardous, moving parts. If you suffer an injury, seek medical care immediately. Never remove the cover on a power supply or any part that has the following label attached.

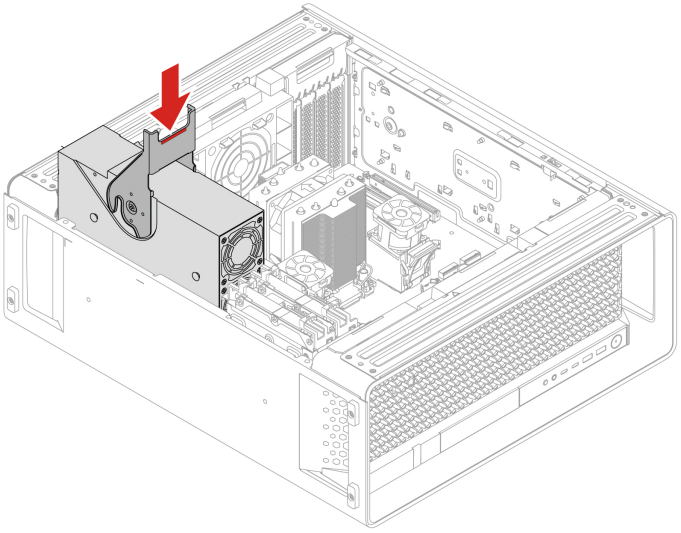
Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

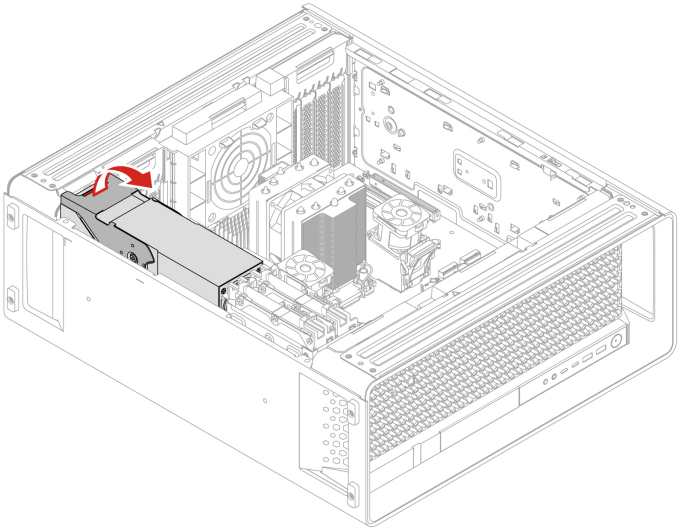
For access, please remove the side panel. See “Side panel” on page 29.

Replacement procedure









Chapter 7. Help and support

Self-help resources

Use the following self-help resources to learn more about the computer and troubleshoot problems.

Resources	How to access?
Product documentation: • *Safety and Warranty Guide* • *Generic Safety and Compliance Notices* • *Setup Guide* • This *User Guide* • *Regulatory Notice*	Go to https://pcsupport.lenovo.com. Then, follow the on-screen instructions to filter out the documentation you want.
Lenovo Support Web site with the latest support information of the following: • Drivers and software • Diagnostic solutions • Product and service warranty • Product and parts details • Knowledge base and frequently asked questions	https://pcsupport.lenovo.com
Ubuntu help information	https://help.ubuntu.com/lts/ubuntu-help/index.html

Lenovo diagnostic tools

Use diagnostic solutions to test hardware components and report operating-system-controlled settings that interfere with the correct operation of your computer.If a four-digit error code is displayed on the diagnostic LCD (for selected models) on the front panel or the diagnostic indicator on the front panel turns on:

1. Use your smartphone to scan the QR code displayed on the diagnostic LCD to open https://www.thinkworkstationsoftware.com/codes.
2. Decode the error according to the four-digit error code displayed on the diagnostic LCD.

For more information, go to https://www.thinkworkstationsoftware.com/diags.

Call Lenovo

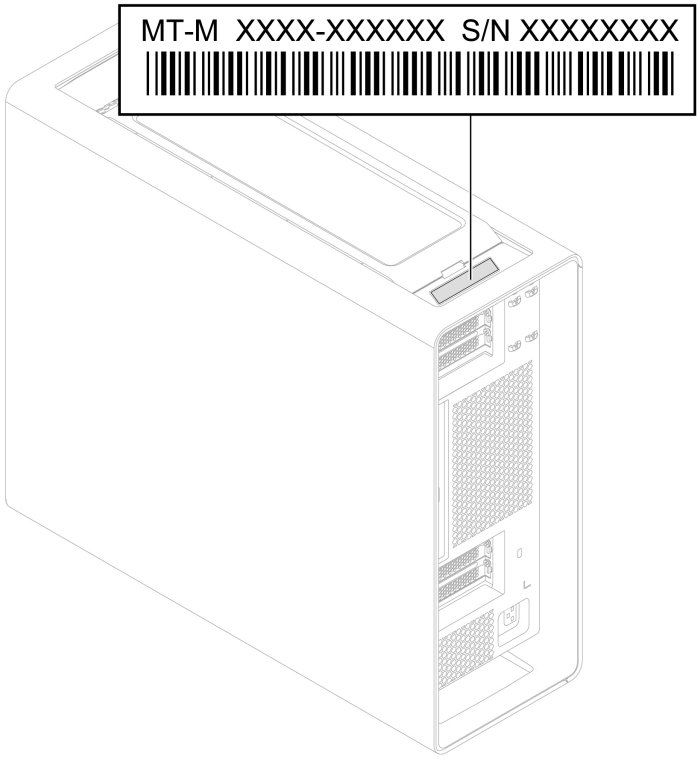
If you have tried to correct the problem yourself and still need help, you can call Lenovo Customer Support Center.

Before you contact Lenovo

Prepare the following before you contact Lenovo:

1. Record the problem symptoms and details:
   - What is the problem? Is it continuous or intermittent?
   - Any error message or error code?
   - What operating system are you using? Which version?
   - Which software applications were running at the time of the problem?
   - Can the problem be reproduced? If so, how?
2. Record the system information:
   - Product name
   - Machine type and serial number

     The following illustration shows where to find the machine type and serial number of your computer.



Lenovo Customer Support Center

During the warranty period, you can call Lenovo Customer Support Center for help.

Telephone numbers

For a list of the Lenovo Support phone numbers for your country or region, go to: https://pcsupport.lenovo.com/supportphonelist

Note: Phone numbers are subject to change without notice. If the number for your country or region is not provided, contact your Lenovo reseller or Lenovo marketing representative.

Services available during the warranty period

- Problem determination - Trained personnel are available to assist you with determining if you have a hardware problem and deciding what action is necessary to fix the problem.
- Lenovo hardware repair - If the problem is determined to be caused by Lenovo hardware under warranty, trained service personnel are available to provide the applicable level of service.
- Engineering change management - Occasionally, there might be changes that are required after a product has been sold. Lenovo or your reseller, if authorized by Lenovo, will make selected Engineering Changes (ECs) that apply to your hardware available.

Services not covered

- Replacement or use of parts not manufactured for or by Lenovo or nonwarranted parts
- Identification of software problem sources
- Configuration of UEFI BIOS as part of an installation or upgrade
- Changes, modifications, or upgrades to device drivers
- Installation and maintenance of network operating systems (NOS)
- Installation and maintenance of programs

For the terms and conditions of the Lenovo Limited Warranty that apply to your Lenovo hardware product, see *Safety and Warranty Guide* that comes with your computer.

Purchase additional services

During and after the warranty period, you can purchase additional services from Lenovo at: https://pcsupport.lenovo.com/warrantyupgrade

Service availability and service name might vary by country or region.

Appendix A. Supplemental information about the Ubuntu operating system

In limited countries or regions, Lenovo offers customers an option to order computers with the preinstalled Ubuntu® operating system.

If the Ubuntu operating system is available on your computer, read the following information before you use the computer. Ignore any information related to Windows-based programs, utilities, and Lenovo preinstalled applications in this documentation.

Access the Lenovo Limited Warranty

This product is covered by the terms of the Lenovo Limited Warranty (LLW), version L505-0010-02 08/2011. You can view the LLW in a number of languages from the following Web site. Read the Lenovo Limited Warranty at:
https://www.lenovo.com/warranty/llw_02

The LLW also is preinstalled on the computer. To access the LLW, go to the following directory:

```
/opt/Lenovo
```

If you cannot view the LLW either from the Web site or from your computer, contact your local Lenovo office or reseller to obtain a printed version of the LLW.

Access the Ubuntu help system

The Ubuntu help system provides information about how to use the Ubuntu operating system. To access the help system from Home Screen, move your pointer to the Launch bar, and then click the **Help** icon. If you cannot find the **Help** icon from the Launch bar, click the **Search** icon on the bottom left, and type Help to search it.

To learn more about the Ubuntu operating system, go to:
https://www.ubuntu.com

Get support information

If you need help, service, technical assistance, or more information about the Ubuntu operating system or other applications, contact the provider of the Ubuntu operating system or the provider of the application. If you need the service and support for hardware components shipped with your computer, contact Lenovo. For more information about how to contact Lenovo, refer to the *User Guide* and *Safety and Warranty Guide*.

To access the latest *User Guide* and *Safety and Warranty Guide*, go to:
https://pcsupport.lenovo.com

Access open-source information

This device includes software made publicly available by Lenovo, including software licensed under the General Public License and/or the Lesser General Public License (the open source software).

You may obtain a copy of the corresponding source code for any such open source software licensed under the General Public License and/or the Lesser General Public License (or any other license requiring us to make a written offer to provide corresponding source code to you) from Lenovo for a period of three years without charge except for the cost of media, shipping, and handling, upon written request to Lenovo. This offer is valid to anyone in receipt of this device.

You may send your request in writing to the address below accompanied by a check or money order for $15 to:

Lenovo Legal Department
Attn: Open Source Team / Source Code Requests
8001 Development Dr.
Morrisville, NC 27560

Please include the version of the OS and the version of the Linux Kernel pre-shipped on this Device as part of your request. Be sure to provide a return address.

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Appendix B. Compliance information

Note: For more compliance information, refer to *Generic Safety and Compliance Notices* at https://pcsupport.lenovo.com.

Certification-related information

Product name: ThinkStation P7

Machine types: 30F2，30F3，30F4，30F5，30F6，and 30F7

Further compliance information related to your product is available at https://www.lenovo.com/compliance.

Operating environment

Maximum altitude (without pressurization)

- Operating: From 0 m (0 ft) to 3048 m (10 000 ft)
- Storage: From 0 m (0 ft) to 12192 m (40 000 ft)

Temperature

- Operating: From 10°C (50°F) to 35°C (95°F)
- Storage: From -40°C (-40°F) to 60°C (140°F)

Relative humidity

- Operating: 20%-80% (non-condensing)
- Storage: 10%–90% (non-condensing)

Appendix C. Notices and trademarks

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