Linux User Guide



ThinkStation P5 Gen 2

Third Edition (August 2026)

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About this documentation

This documentation applies to the ThinkStation® product models listed below.

Model name	Machine types (MT)
ThinkStation P5 Gen 2	30KB, 30KC, 30KD, 30KE, 30KF, 30KG, 30KH, and 30KJ

Before operating your workstation for the first time, read the safety-related documents listed below to understand important safety and regulatory information:

- Safety and Warranty Guide
- Generic Safety and Compliance Notices
- Regulatory Notice

To access additional and the latest supporting documents, visit the Lenovo Documentation Center and search by the product name.

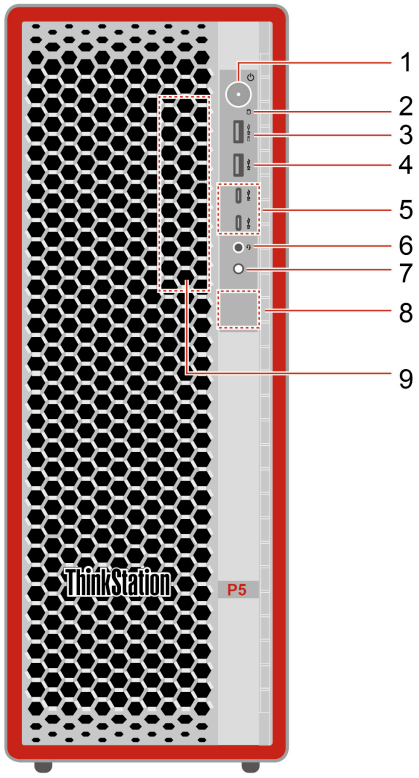
Notes:

- 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.
- Depending on the version of operating systems and programs, some user interface instructions might not be applicable to your computer.

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Chapter 1. Overview

Front view



Item	Description	Item	Description
1	Power button with indicator	2	Storage indicator
3	USB-A connector (USB 10Gbps, Always On)*	4	USB-A connector (USB 10Gbps)*
5	USB-C® connectors (USB 10Gbps)*	6	Combo audio jack
7	Diagnostic panel button	8	Diagnostic panel
9	Front-access storage bay (or flex bay)*		

* 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 in the connector name for each corresponding device.

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Power indicator

Shows 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.

Storage indicator

The storage indicator blinks when a storage drive is under reading or writing.

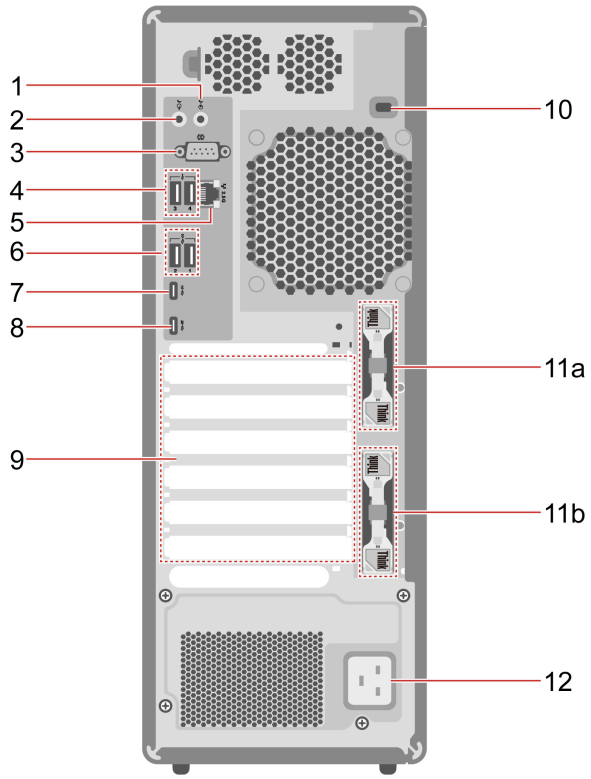
Always On USB feature

A USB connector with a battery icon supports the Always On USB feature. With the Always On USB feature enabled, the connector can charge a USB-compatible device when the computer is in sleep mode (S3), in hibernate mode (S4), or even off (S5).

To enable the Always On USB feature, do the following:

1. Turn on or restart the computer. When the logo screen is displayed, press F1 or Fn+F1 to enter the UEFI BIOS menu.
2. Click **Devices → USB Setup → USB Charging Port in S4/S5** to enable the Always On USB feature.

Rear view



Item	Description	Item	Description
1	Audio line-in connector	2	Audio line-out connector
3	Serial connector*	4	USB-A connectors (Hi-Speed USB)
5	2.5-Gbps Ethernet connector with indicators	6	USB-A connectors (USB 10Gbps)
7	USB-C connector (USB 10Gbps)	8	USB-C connector (USB 20Gbps)
9	PCIe card area	10	Security-lock slot
11a	Key-nest for the side cover*	11b	Key-nest for the M.2 solid-state drive (SSD) enclosures*
12	Power connector		

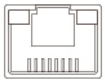
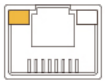
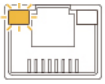
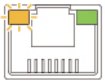
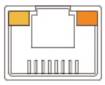
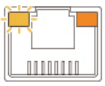
* for selected models

Serial connector

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

2.5-Gbps Ethernet connector indicators

There are two LED indicators on the Ethernet connector that display the following statuses.

LED status	Indication
	The Ethernet connection is not established yet.
	A 10-Mbps or 100-Mbps Ethernet connection is established and ready for data transfer.
	A 10-Mbps or 100-Mbps Ethernet connection is actively transferring data.
	A 1-Gbps Ethernet connection is established and ready for data transfer.
	A 1-Gbps Ethernet connection is actively transferring data.
	A 2.5-Gbps Ethernet connection is established and ready for data transfer.
	A 2.5-Gbps Ethernet connection is actively transferring data.

PCIe card area

Depending on the PCIe cards installed, connectors in this area might be Ethernet connectors, video output connectors, serial connectors, or other connectors.

If a graphics card is installed, the video output connectors can be one or more of the following:

- HDMI™ connector

- DisplayPort™ connector
- Mini DisplayPort™ connector
- USB-C connector (USB4 40Gbps)

Specifications

Dimensions & weight

Item	Description
Width	165 mm (6.5 inches)
Height	440 mm (17.3 inches) with feet
Depth	453.9 mm (17.9 inches)
Weight (without packaging)	Maximum configuration as shipped: 19 kg (41.89 lb)

Power supply

Item	Description
AC input voltage	100 V–240 V
Input frequency	50/60 Hz
Power supply	• 750-watt automatic voltage-sensing power supply • 1000-watt automatic voltage-sensing power supply

Memory

Item	Description
Slots	8 memory slots across 4 channels
Memory type	DDR5-6400 ECC RDIMM (16 GB, 32 GB, 64 GB, or 128 GB)
DIMM count	1, 2, 4, or 8
Maximum capacity	Up to 1 TB (8 × 128 GB)

Note: System memory speed may be reduced when multiple memory modules are installed per channel. The system provides eight memory slots over four CPU channels, with two slots per channel. When eight memory modules are installed, the 6400 MT/s memory speed will clock down to 5200 MT/s.

Storage

Item	Description
Drive type	• 3.5-inch SATA3 hard disk drive (HDD)* • M.2 PCIe Gen 5 solid-state drive (SSD)*
Capacity	Type `Disks` in the search box and use the Disks application to view the storage drive capacity of your computer. **Note:** The storage drive capacity indicated by the system is less than the nominal capacity.

* for selected models

Display

Item	Description
Display support	Up to 8 independent displays by two discrete graphics cards*
Maximum output resolution	Up to 7680 × 4320 pixels at 165 Hz, using DisplayPort with Display Stream Compression (DSC)

* for selected models

Note: The actual resolution of external displays may vary by the connected display device, the cable being used, and the number of displays connected.

Networking

Item	Description
Bluetooth®	Bluetooth 5.4*
Wi-Fi®	Wi-Fi 7*
Ethernet LAN	• Onboard Ethernet: 2.5 GbE • Optional Ethernet: Up to two additional Ethernet adapters with up to four additional 25 GbE connectors

* for selected models

View hardware configuration in Windows

Installed hardware varies by model and configuration. To view your hardware configuration:

1. Open the system menu from the top-right corner and click ⏻.
2. Click **System → About**.

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

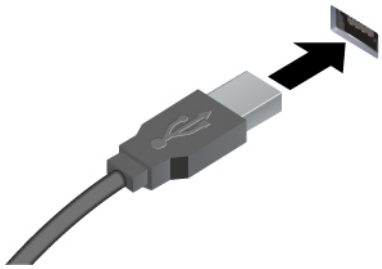
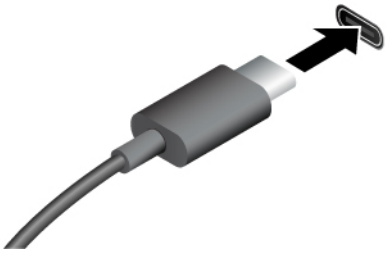
- Operating: From 10°C (50°F) to 35°C (95°F)
- Storage: From -40°C (-40°F) to 60°C (140°F)

Relative humidity

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

USB specifications

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

Connector name	Description
 • USB-A connector (Hi-Speed USB) • USB-A connector (USB 10Gbps)	• Connect USB-A compatible devices, such as a USB-A keyboard, USB-A mouse, USB-A storage device, or USB-A printer. • Charge USB-A compatible devices with a maximum output voltage and current of: – USB-A connector (Hi-Speed USB): 5 V, 0.9 A – USB-A connector (USB 10Gbps): 5 V, 3 A
 • USB-C connector (USB 10Gbps) • USB-C connector (USB 20Gbps) • USB-C connector (USB4 40Gbps)	• Charge USB-C compatible devices with a maximum output voltage and current of 5 V and 3 A. • Connect to USB-C accessories to help expand your computer functionality. To purchase USB-C accessories, go to https://www.lenovo.com/accessories. • The USB-C connector (USB4 40Gbps) can additionally connect to an 8K display and charge a compatible device when the computer is off, in sleep, or hibernation. **Note:** Maximum display resolution depends on the display, connected graphics card, and cable.

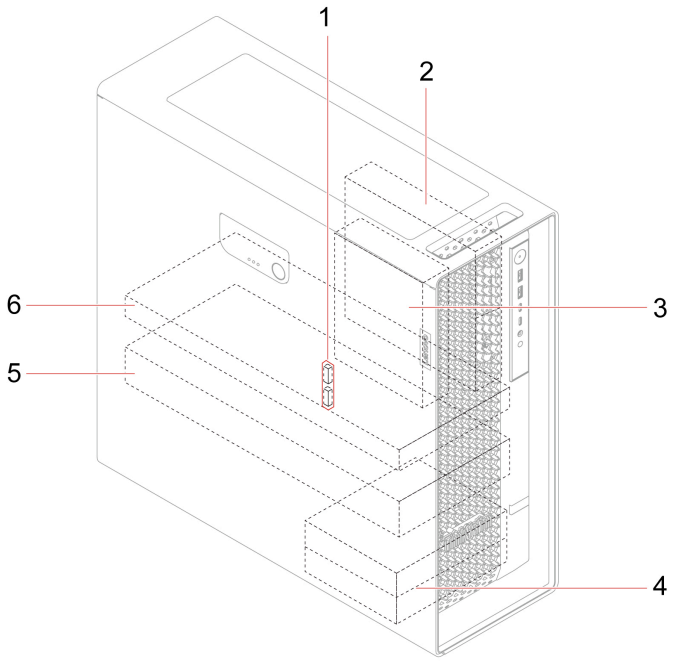
Note: Only the USB-C connectors (USB4 40Gbps) in the PCIe card area support display connection. Do not use any other USB-C connectors for displays.

Expansion modules

You can boost your computer's capabilities by adding devices to the expansion modules. This section outlines the available modules for this product.

Storage configuration

The system features multiple spaces for high-performance storage configuration, offering the flexibility to choose the best fit for your needs.



Location	Name	Drive support
1	Onboard M.2 slots	Up to 2 × 4TB M.2 Gen 5 SSDs (2280 or 22110)
2	Front-access storage bay*	Up to 2 × 4TB M.2 Gen 5 SSDs (2280)
3	3rd SATA drive bay*	Up to 1 × 12TB 3.5 SATA3 HDD
4	Internal SATA drive bays	Up to 2 × 12TB 3.5 SATA3 HDDs
5	ThinkStation Enterprise Dual Drive Internal Enclosure (EDDIE)*	Up to 2 × 12TB 3.5 SATA3 HDDs
6	M.2 SSD PCIe Gen 5 x16 adapter*	Up to 4 × 4TB M.2 Gen 5 SSDs (2242, 2260, 2280, 22110)

* for selected models

Note: Although multiple M.2 dimensions can be installed, the only drives qualified by Lenovo are 2280.

Configuration rules

- Systems equipped with CPUs rated at 350 W or higher do not support the front-access storage bay options, including M.2 SSD enclosures and a media card reader.
- Installing an NVIDIA RTX PRO Sync Board limits the number of supported internal HDDs to two.
- The EDDIE module and the 3rd SATA drive bay cannot be supported simultaneously.

Hardware requirements

The following mechanical or thermal parts are required for the storage configuration. Depending on the model, some parts may not be included and may need to be ordered separately.

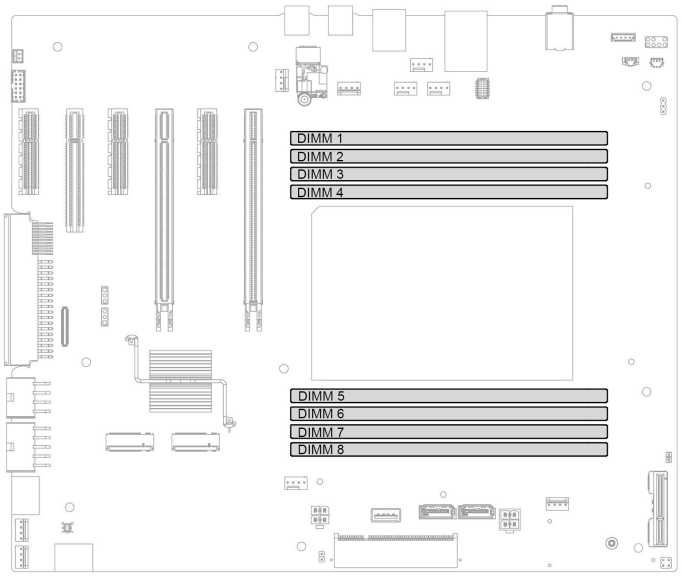
Name	Required parts for the drive installation
Onboard M.2 slots	• On-board SSD heat sink kit
Front-access storage bay*	• Flex bay fan • Flex bay cage • M.2 SSD enclosure tray • M.2 SSD enclosures • M.2 SSD enclosure cable • Flex bay cover • Key to the SSD enclosure lock
3rd SATA drive bay*	• Optional HDD cage • Optional HDD cage holder • Optional HDD bracket • SATA data cable • SATA power cable • Flex bay cage • Flex bay fan
Internal SATA drive bays	• HDD fan • HDD bracket • SATA data cable • SATA power cable
ThinkStation Enterprise Dual Drive Internal Enclosure (EDDIE)*	• HDD enclosure tray • EDDIE screw kit • EDDIE cable clip • EDDIE support bracket • SATA data cables • SATA power cable
M.2 SSD PCIe adapter*	• Available PCIe x16 slot • M.2 SSD PCIe adapter

* for selected models

Note: For EDDIE installation instructions, refer to the documentation included with the module. For other part details, refer to the hardware replacement section.

Memory configuration

The system provides eight onboard memory slots for installing supported memory modules.



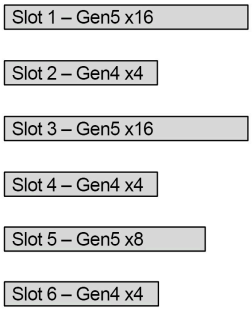
Item	Description
Slots	8 memory slots across 4 channels
Memory type	DDR5-6400 ECC RDIMM (16 GB, 32 GB, 64 GB, or 128 GB)
DIMM count	1, 2, 4, or 8
Maximum capacity	Up to 1 TB (8 × 128 GB)

Configuration rules

- Systems configured with Intel Xeon 638, 636, or 634 processors support a maximum of four 128 GB DDR5-6400 ECC RDIMM modules per system.
- Multiple modules in one system must be identical in type and capacity.
- Memory modules must be installed in the following order: DIMM 3, 8, 1, 6, 4, 5, 2, and 7.

PCIe configuration

The system provides six onboard PCIe slots for installing supported expansion cards, including graphics, storage, networking, management, and other PCIe devices.



Configuration rules

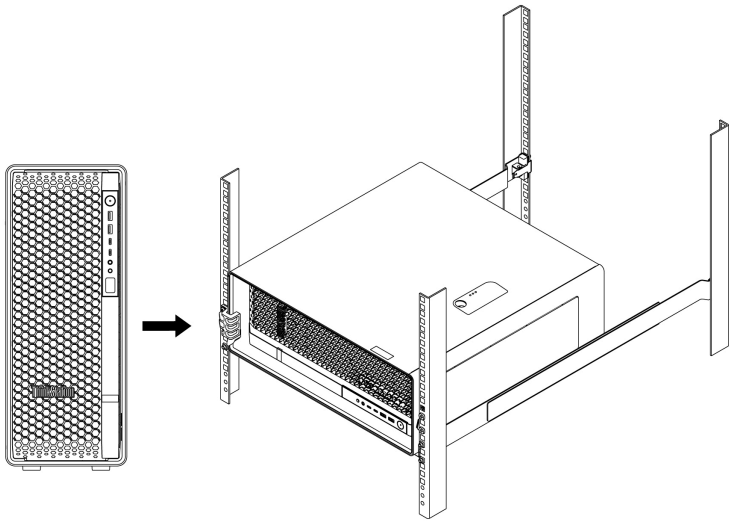
- Always ensure that the CPU power capability and PSU wattage are sufficient before planning the graphics card configuration. If unsure, contact Lenovo.
- Ensure at least one graphics card is installed. If multiple cards are installed, they must be identical.
- Install the following PCIe cards (if available) only in their designated slots.

PCIe card	Slot
NVIDIA GeForce graphics cards	Slot 1
– Intel E610-T4 Ethernet adapter – ThinkStation BMC card	Slot 5
ThinkStation USB4 PCIe card	Slot 6

- The ThinkStation Enterprise Dual Drive Internal Enclosure (EDDIE) occupies Slots 4 and 5. When an EDDIE module is installed, the following devices are not supported in Slot 3 due to thermal constraints.
  - Graphics cards
  - M.2 SSD PCIe Gen 5 x4 adapter
  - Intel E610/E810 Ethernet adapter
  - Broadcom RAID 940-8i adapter
- Populate the PCIe slots in the following priority order.
  - Without EDDIE
    1. PCIe Gen 5 x16 slot (Slot 3)
    2. PCIe Gen 5 x16 slot (Slot 1)
    3. PCIe Gen 5 x8 slot (Slot 5)
    4. PCIe Gen 4 x4 slot (Slot 2)
    5. PCIe Gen 4 x4 slot (Slot 4)
    6. PCIe Gen 4 x4 slot (Slot 6)
  - With EDDIE
    1. PCIe Gen 5 x16 slot (Slot 1)
    2. PCIe Gen 5 x16 slot (Slot 3)
    3. PCIe Gen 4 x4 slot (Slot 2)
    4. PCIe Gen 4 x4 slot (Slot 6)

Rack-mounted chassis

Your computer offers flexibility for both desktop and data center environments. With an easy-to-attach sliding rail kit, you can install the computer into a rack. You can buy the rail kit from Lenovo. It will come with a guide to help you install your computer into a rack.



Chapter 2. Get started

Connect to an external display

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

Connect to a wired display

1. Check the available video output connectors on your computer and display and prepare a compatible display cable or adapter.
2. Connect your display to your computer and plug it into a power source.
3. Turn on the display.

Note: If more than one graphics card is installed, PCIe slot 3 provides the primary video output.

Change display settings

1. Right-click a blank area on the desktop and select display settings.
2. Select the display that you want to configure and change display settings of your preference.

Get started with Ubuntu Desktop (24.04 LTS)

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/.

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 Apps** 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 ⚙.

Access networks

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

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.

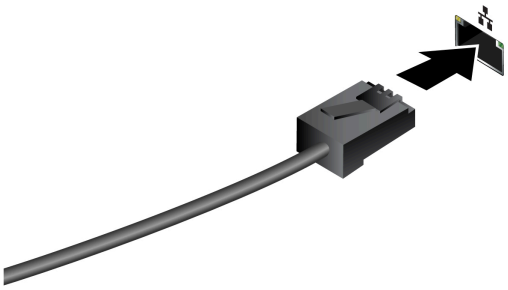
1. Open the system menu from the top-right corner and turn on the Wi-Fi by clicking **Wi-Fi** button.
2. Click **>** to expand the Wi-Fi section of the menu. A list of available wireless networks is displayed. Click **All Networks** to see extra options.
3. Select an available network for connection. Provide required information if needed.

Note: The wireless LAN module on your computer may support different standards. For some countries or regions, the use of 802.11ax and 802.11be may be disabled according to local regulations.

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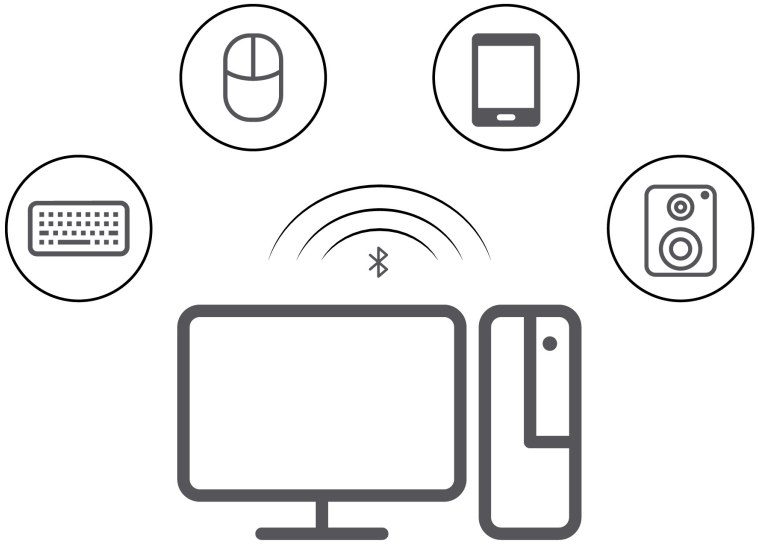
Connect to the wired Ethernet

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



Connect to a Bluetooth-enabled device (24.04 LTS) (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.



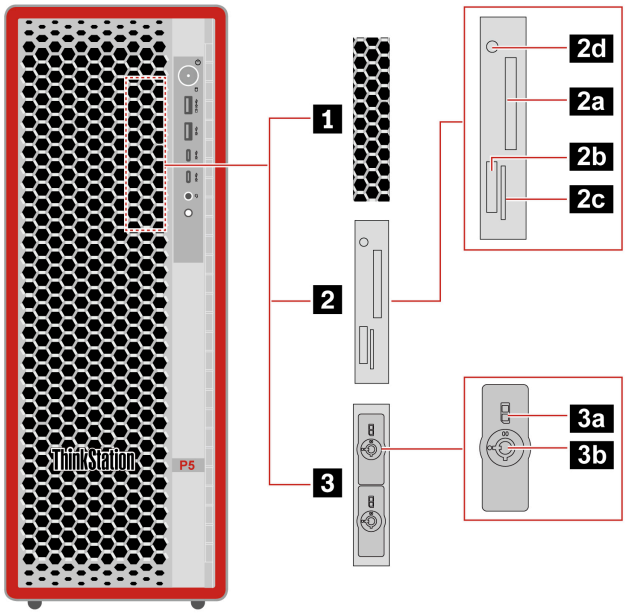
1. Open the system menu from the top-right corner and turn on the Bluetooth by clicking **Bluetooth** button.
2. Click **>** to expand the Bluetooth section of the menu. A list of discoverable devices is displayed.
3. Select a Bluetooth device, and then follow the on-screen instructions.

Your Bluetooth-enabled device and computer will automatically connect the next time if the two devices are in range of each other with Bluetooth turned on. You can use Bluetooth for data transfer or remote control and communication.

Front-access storage bay

Overview

The front-access storage bay (or flex bay) can be configured with one of the following devices.



Device type	Feature description
1 Dummy cover	A decorative placeholder panel.
2 Media card reader (MCR)	• 2a CompactFlash (CF) card slot • 2b Memory Stick (MS) card slot • 2c Secure Digital (SD) card slot • 2d Media card reader indicator
3 Front-access M.2 SSD enclosures	• 3a Front-access SSD indicators • 3b Front-access SSD enclosure lock

Supported media cards

Slot	Supported cards
2a CompactFlash (CF) card slot	• CompactFlash™ Type I • CompactFlash™ Type II • Microdrive
2b Memory Stick (MS) card slot	• Memory Stick™ • Memory Stick Duo™ • Memory Stick PRO™ • Memory Stick PRO Duo™ • Memory Stick PRO-HG Duo™ • Memory Stick XC Duo • Memory Stick XC-HG Duo
2c Secure Digital (SD) card slot	• SD™ • SDHC™ • SDXC™ • SD UHS-II • MultiMediaCard™

Note: Some models equipped with a media card reader may not support Memory Stick PRO-HG Duo or Memory Stick XC-HG cards.

Media card reader indicator

When the computer is powered on, the indicator behaves as follows.

- **Solid on**: A supported card is inserted into a media card reader slot.
- **Blinking**: The card is being read from or written to.
- **Off**: No card is inserted in the media card reader.

Use a media card

If your computer has a media card slot, read the following information.

Install a media card

1. Locate the media card slot.
2. Hold the media card with the correct orientation and gently insert it into the slot.
3. Push the card into the slot until it is firmly seated and recognized by the operating system.

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.

Front-access SSD indicators

Each M.2 SSD enclosure is equipped with two indicators that show the drive status and activity.

LED	Status and indication
 Status LED	• **Solid on:** The storage drive status is failure. • **4 Hz blinking (four times per second):** Locating the storage drive • **1 Hz blinking (once a second):** Rebuilding RAID • **Off (when the computer is powered on):** The storage drive status is normal.
 Activity LED	• **Solid on:** The storage drive is online, installed, or powered on (no activity). • **Variable blinking:** Accessing the storage drive • **Off (when the computer is powered on):** The storage drive is not installed or powered.

Front-access SSD enclosure lock

- To unlock, turn the key clockwise to the position with a circle mark on the lock.
- Keys are attached to the rear of the machine. Store keys in a safe place when not in use.
- Keys carved with xx, such as **00**, **01**, **02**, or **03**, can unlock the locks carved with the same numbers.

Set up SSD hot-plug feature

The M.2 SSD enclosures installed in the front-access storage bay support hot-plug operation, allowing you to insert or remove drives without powering off the system.

Important: Before removing a hot-plug drive, download and install the Intel® Rapid Storage Technology (RST) app from the Lenovo Support website. Use the app to safely eject the drive.

To enable or disable hot-plug feature

Step 1. Turn on or restart the computer. When the Lenovo logo screen is displayed, press F1 or Fn+F1 to enter the UEFI BIOS menu.

Step 2. Navigate to **Devices → Storage Setup → Intel(R) VMD Technology → MCIO Hot Plug**.

Note: The **MCIO Hot Plug** is available only when the **MCIO Slot** options are configured in VMD mode. It is hidden when the slots are configured in PCIe mode.

Step 3. Enable or disable the feature as needed.

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

Chapter 3. Explore your computer

Power and performance solutions

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 set the power plan:

1. Go to **Settings → Power**.
2. Choose or customize a power plan of your preference.

Change the fan speed level

You can change the fan speed level, from level 1 to level 7, to adjust the thermal performance of your computer. A higher fan speed level indicates better thermal performance with more noise.

To change the fan speed level:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Power → Fan Control Stepping** and press Enter.
3. Set the fan speed level as desired.
4. Press F10 or Fn+F10 to save the changes and 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.

Security solutions

Lenovo values your information security. Your computer can be secured by physical locks, software solutions, and BIOS solutions. They can protect your computer from harm, theft, or unauthorized use.

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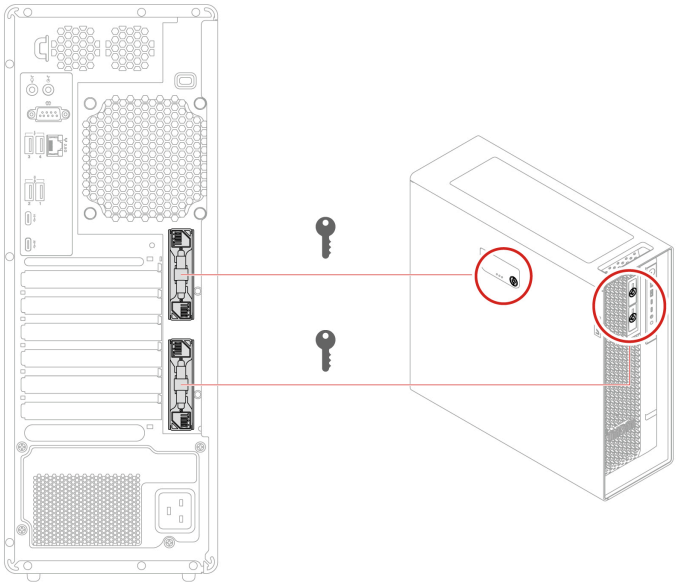
Use physical locks

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 locks (for selected models)

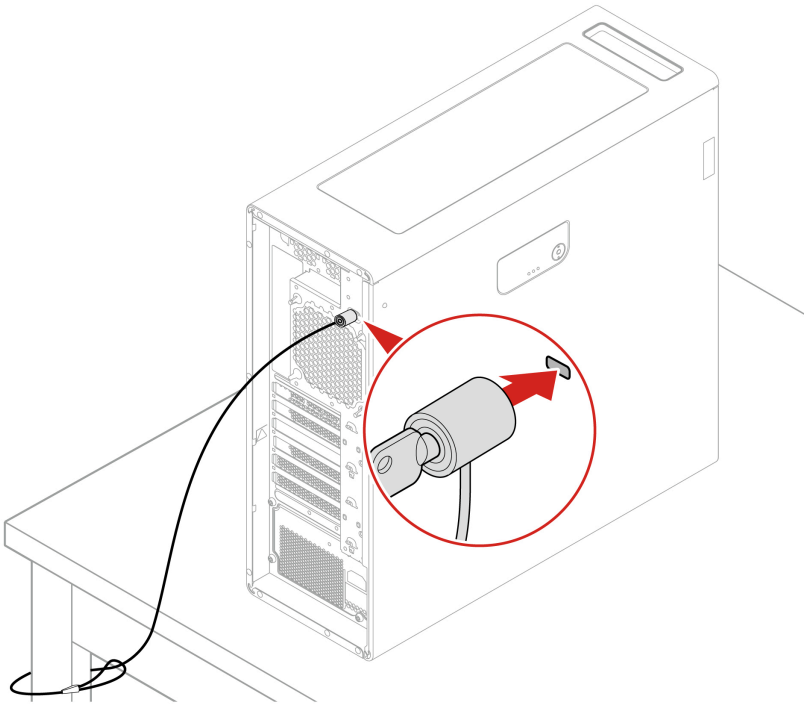
Locking the side cover or front M.2 SSD enclosure with a key lock helps prevent unauthorized access to the inside of your computer or the storage drives.

- Keys are attached to the rear of the machine. Store keys in a safe place when not in use.
- Keys carved with xx, such as **00**, **01**, **02**, or **03**, can unlock the locks carved with the same numbers.
- To unlock, turn the key clockwise to the position with a circle mark on the lock.



Security lock

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



Use BIOS security solutions

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

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 or disable the cover presence switch 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** or **Disabled** 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.

Wipe user data before disposal or reuse

Before you recycle, dispose of, or reuse the computer, it is recommended that all user data stored on the system be removed. For detailed instructions, see https://support.lenovo.com/documentation/FS10189.

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 one or more of the following types of passwords 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 (for selected models)

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 or change a password

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Security**.
3. Select the password type. Then, follow the on-screen instructions to set, change, or remove a password.
4. 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.

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

Chapter 4. UEFI BIOS

What is UEFI BIOS

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.

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

Enter the UEFI BIOS menu

Turn on or restart the computer. When the logo screen is displayed, press F1 or Fn+F1 to enter the UEFI BIOS menu.

Note: If you have set UEFI BIOS passwords, enter the correct passwords when prompted.

Navigate the UEFI BIOS menu

Follow the on-screen instructions to navigate in the UEFI BIOS menu.

The table below introduces the available settings of the UEFI BIOS menu. You can follow the on-screen instruction to navigate in the UEFI BIOS menu.

Note: The UEFI BIOS menu might vary depending on system configurations.

Menu	Introduction
Main	This category provides the general product-related and firmware information including system summary, machine type, product serial number, UUID number, etc.
Devices	This category introduces how to configure various devices such as USB ports and audio controllers.
Advanced	This category provides advanced information about the computer such as the CPU features.
Power	This category introduces power and thermal management solutions.
Security	This category introduces various passwords, locks, and software to protect your computer.
Startup	This category introduces how to set the boot priority order.
Exit	This category introduces how to exit as you prefer.

You can go to Lenovo BIOS Simulator Center https://download.lenovo.com/bsco/index.html to explore the detailed settings by your product name.

Note: The Lenovo BIOS Simulator Center makes periodic updates of the settings. The UEFI BIOS simulator interface and description of settings might be different from that on your actual user interface.

Update the UEFI BIOS

When you install a new program, device driver, or hardware component, you might need to update the UEFI BIOS.

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

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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

Follow the instructions to update the UEFI BIOS from the Lenovo Support Web site.

For computers purchased in mainland China

1. Go to https://newsupport.lenovo.com.cn.
2. Click **Download drivers and software**, and select or search product.
3. Follow the on-screen instructions to download and install the latest UEFI BIOS update package.

For computers purchased outside mainland China

1. Go to https://pcsupport.lenovo.com and select the entry for your computer.
2. Click **Drivers & Software → Manual Update → BIOS/UEFI**.
3. Follow the on-screen instructions to download and install the latest UEFI BIOS update package.

Common BIOS settings

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** 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 **Boot Menu** and press Enter.
4. 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.

Configure Secure Boot before installing a new operating system

Different operating systems have different Secure Boot requirements. Before installation, enable or disable the Secure Boot in UEFI BIOS accordingly.

To enable or disable the Secure Boot

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 an operating system that supports secure boot, select **Enabled** for **Secure Boot**.
   - To install an operating system that does not support secure boot, such as some Linux operating systems, select **Disabled** for **Secure Boot**.
4. Press F10 or Fn+F10 to save the changes and exit.

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 5. Hardware replacement

Before hardware replacement

Before replacing the hardware of your computer, read this section first. You will get to know what CRU is, the CRU list, system board connectors, and prerequisites for CRU replacement.

What is CRU

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

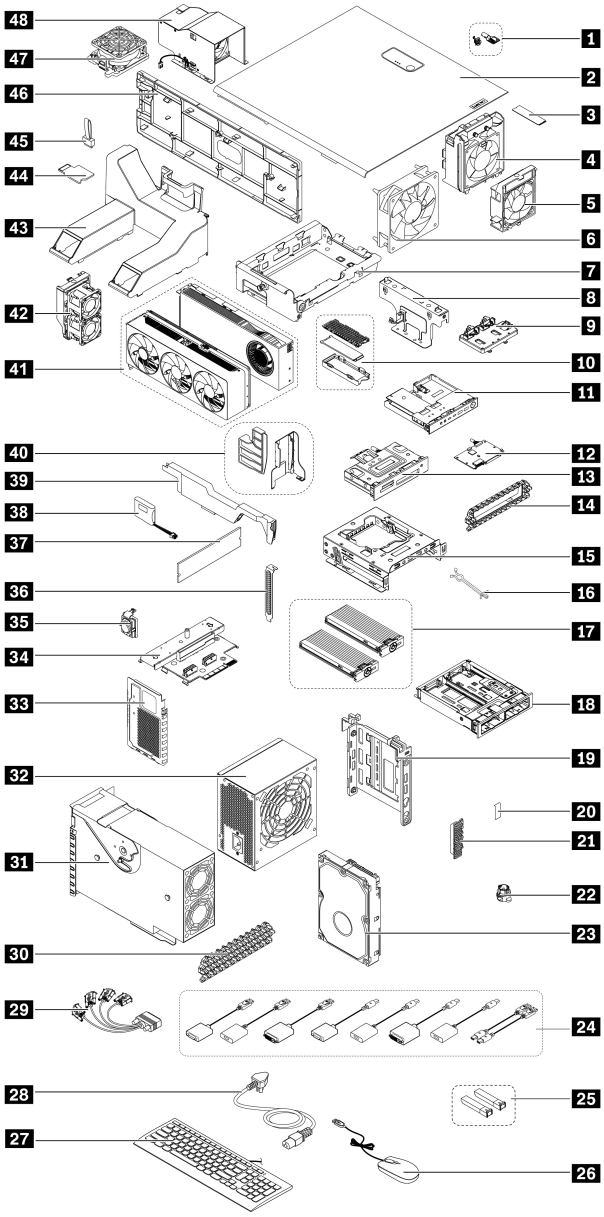
- **Self-service CRUs:** Refer to parts that can be replaced easily by customers themselves or by trained service technicians at an additional cost.
- **Optional-service CRUs:** Refer to parts that can be replaced by customers with a greater skill level. Trained service technicians can also provide service 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

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CRU list

Exploded view



Part list

Self-service CRUs:

- 1 Lock and key kit for the side cover
- 2 Side cover
- 3 M.2 SSD*
- 4 Front fan
- 5 HDD fan*
- 6 Rear fan
- 7 Optional HDD cage*
- 8 Optional HDD cage holder*
- 9 On-board SSD holder
- 10 On-board SSD heat sink kit
- 14 Flex bay cover*
- 15 Flex bay cage*
- 16 USB4 PCIe card cable clip*
- 17 M.2 SSD enclosures*
- 18 M.2 SSD enclosure tray*
- 19 HDD bracket
- 20 ID badge
- 21 ThinkStation logo badge
- 22 Think LED holder
- 23 HDD*
- 24 Display adapters*
- 26 Mouse*
- 27 Keyboard*
- 28 Power cord
- 29 External 1-to-4 serial cable*
- 30 Flex bay dummy cover*
- 31 1000-watt power supply unit (PSU) assembly*
- 32 750-watt PSU assembly*
- 33 1000-watt PSU cover*
- 34 1000-watt power distribution board and bracket*
- 36 PCIe bracket
- 37 Memory module
- 38 Supercapacitor module*
- 39 PCIe top retention holder*
- 40 Customized PCIe extenders*
- 42 Memory fans
- 43 Memory fan duct
- 46 Top cover
- 47 Flex bay fan*
- 48 CPU fan duct module*

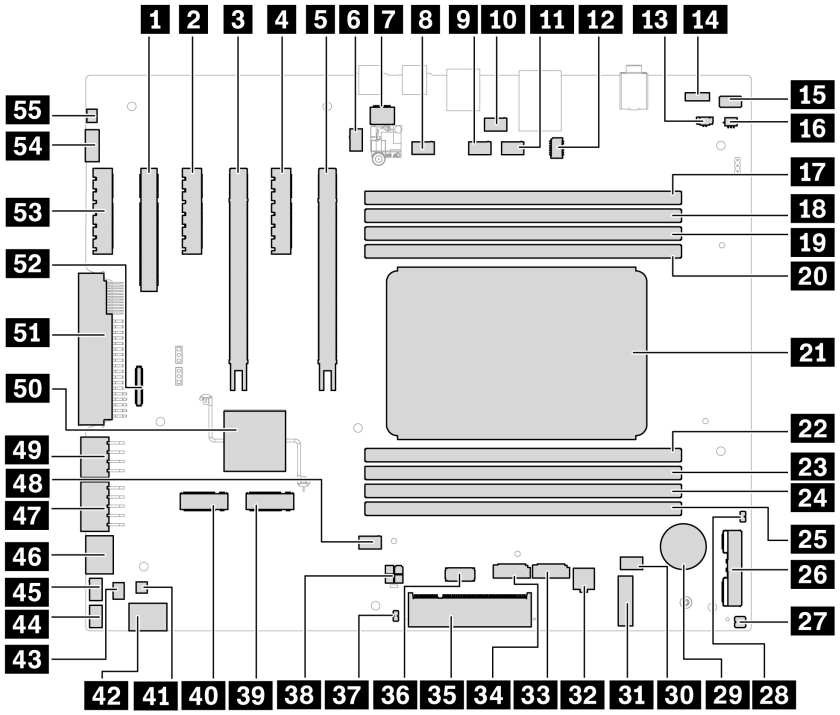
Optional-service CRUs:

- 11 Front panel I/O assembly (with/without USB)
- 12 Media card reader with cable*
- 13 Media card reader box*
- 25 Fiber modules of some Ethernet adapter cards*
- 35 Internal speaker
- 41 PCIe cards (graphics cards only)*
- 44 Trusted Cryptography Module (TCM) card*
- 45 VROC key*

* for selected models

Note: The PCIe cards mentioned above refers only to the graphics cards, as they are the only Customer Replaceable Units (CRUs); other PCIe cards are not classified as CRUs.

System board illustration



Item	Description	Item	Description
1	PCIe Gen 5 x8 slot (Slot 5)	2	PCIe Gen 4 x4 slot (Slot 4)
3	PCIe Gen 5 x16 slot (Slot 3)	4	PCIe Gen 4 x4 slot (Slot 2)
5	PCIe Gen 5 x16 slot (Slot 1)	6	CPU fan connector
7	Alternate TPM connector	8	Rear fan connector
9	Memory duct fan connector 2	10	Auxiliary fan connector 1
11	Memory duct fan connector 1	12	Internal COM connector
13	Speaker connector	14	VROC connector
15	Flex I2C connector	16	Cover presence switch connector
17	Memory slot (DIMM1)	18	Memory slot (DIMM2)
19	Memory slot (DIMM3)	20	Memory slot (DIMM4)
21	CPU socket	22	Memory slot (DIMM5)
23	Memory slot (DIMM6)	24	Memory slot (DIMM7)
25	Memory slot (DIMM8)	26	M.2 SSD enclosure cable connector
27	Thermal sensor connector	28	Power button connector
29	Coin-cell battery	30	Flex bay fan connector
31	M.2 Wi-Fi slot	32	Secondary SATA power connector
33	SATA data connector 4	34	SATA data connector 3

Item	Description	Item	Description
35	Front I/O panel slot	36	Internal USB 3.2 connector (for media card reader)
37	Drive-activity connector (for RAID card)	38	Primary SATA power connector
39	M.2 Gen 5 SSD slot 1	40	M.2 Gen 5 SSD slot 2
41	Think LED connector	42	SATA data connector 2
43	Clear CMOS jumper	44	Front fan connector
45	HDD fan connector	46	SATA data connector 1
47	10-pin MB power connector (for 750-watt PSU)	48	Auxiliary fan connector 2
49	8-pin CPU power connector (for 750-watt PSU)	50	PCH
51	Power distribution board slot (for 1000-watt PSU)	52	BMC connector
53	PCIe Gen 4 x4 slot (Slot 6)	54	I/O control connector (for USB4 PCIe card)
55	I/O power connector (for USB4 PCIe card)		

Prerequisites for hardware replacement

General prerequisites

Before replacing any parts, make sure you have:

- Read *Generic Safety and Compliance Notices* and any safety requirements for hardware maintenance in this manual.
- Installed any necessary software fixes, drivers, and UEFI BIOS downloads. To access these, go to Lenovo Support Web site and select the entry for your product.

Prerequisites for opening computer covers



During operation, some components become hot enough to burn the skin. Before you open the computer cover, remove any media from the drives, turn off the computer and connected devices, disconnect power, remove all cables and locking devices, and wait approximately 10 minutes until the computer is cool.

Prerequisites for replacing parts with cables

Before reaching parts with cables, record the cable routing for future reference and then disconnect the cables from the system board.

Prerequisites for replacing internal storage drives

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

- Replace internal storage drives only for repair. The internal storage drives are not designed for frequent changes or replacement.
- Before replacing an internal storage drive, make a backup copy of all the data that you want to keep, then perform a low-level format to erase all data.

- Be extremely careful during write operations such as copying, saving, or formatting. The drives in the computer you are servicing might have been rearranged or the drive startup sequence changed. If you select an incorrect drive, data or programs might be overwritten.
- Do not touch the contact edge of the internal storage drive. Otherwise, the internal storage drive might get damaged.
- Do not apply pressure or expose the drive to physical shocks or vibration. Place it on a soft surface, such as a cloth, for protection.

Prerequisites for replacing the power supply assembly (if supported)

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.



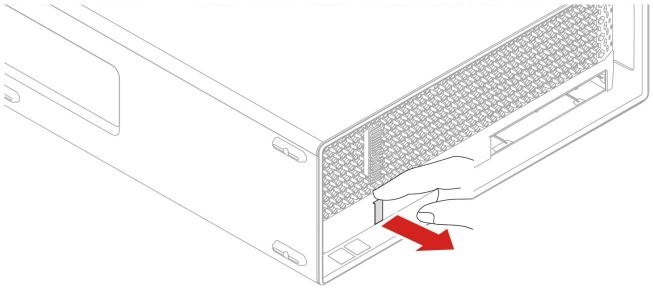
Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

ID badge

Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Pry up and remove the ID badge.



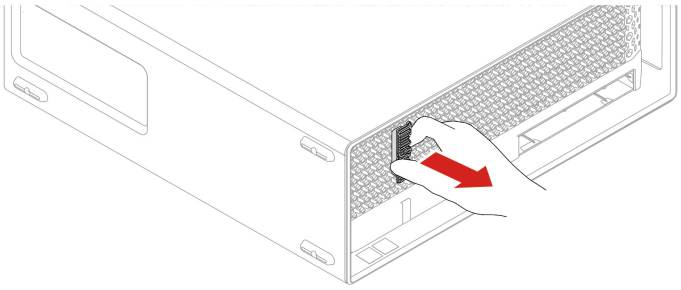
Step 2. Install the removed parts and cables in reverse order.

ThinkStation logo badge

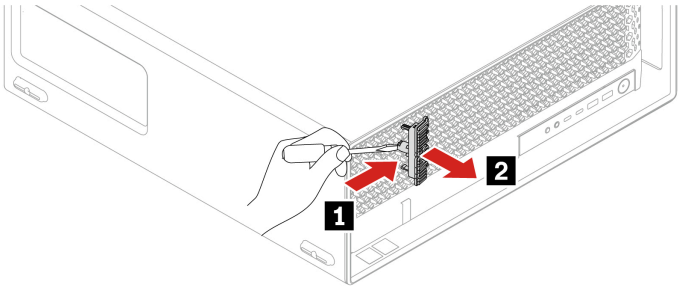
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Pull the ThinkStation logo forward to partially remove it from the slot.



Step 2. Gently press the tab to fully release and remove the logo badge.



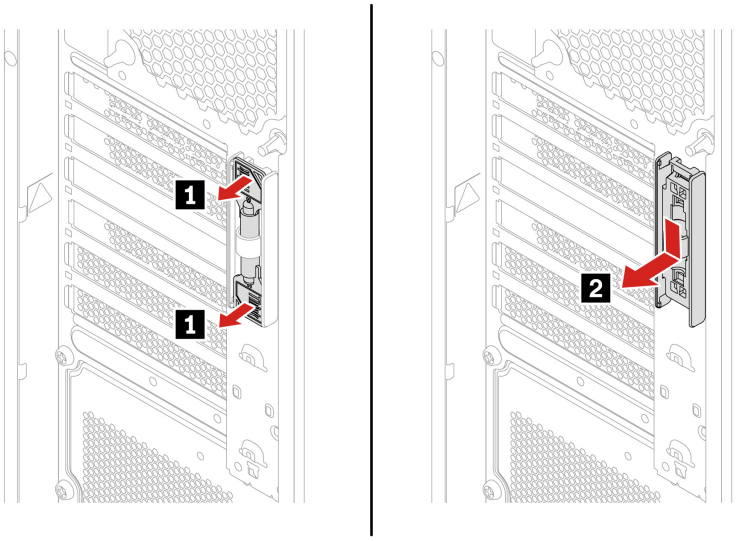
Step 3. Install the removed parts and cables in reverse order.

Keys and key bracket

Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Pull the keys out of the key slots. Slide the key bracket off the chassis, if needed.



Step 2. Install the removed parts in reverse order.

Side cover

Before you start, read “Prerequisites for hardware replacement” on page 30.

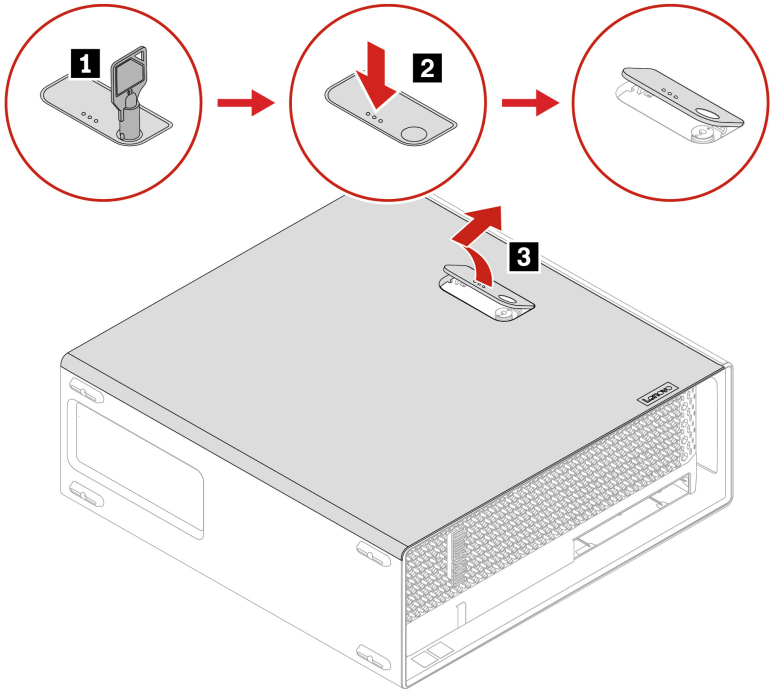
Replacement steps

Step 1. Turn off the computer and remove all connected devices and cables.

Step 2. Place a soft, clean towel or cloth on the desk or surface. Hold the computer sides and gently lay it down so that the computer cover is facing up.

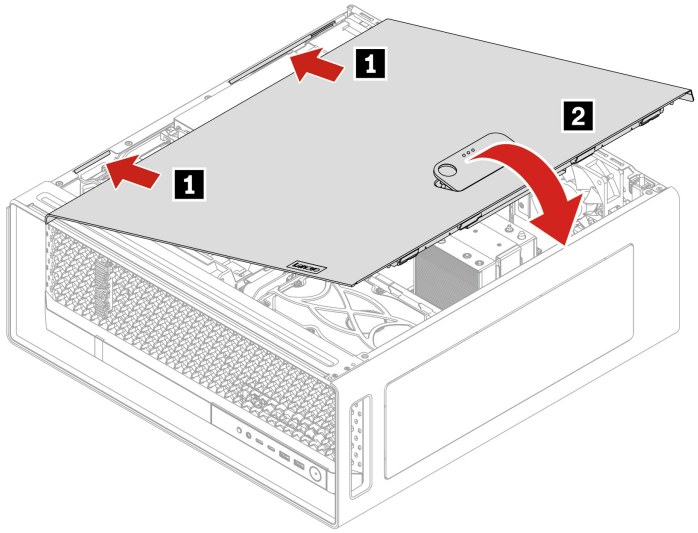
Step 3. Remove the side cover.

1. Unlock the side cover lock, if available.
2. Press to open the side cover handle and lift the handle to release the cover.
3. Remove the side cover from the system.

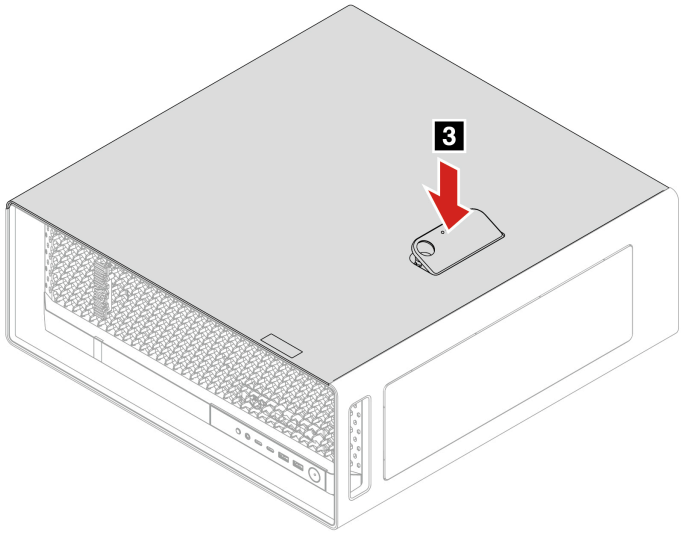


Step 4. Install the side cover.

1. Align the side cover with the system. Press the side cover until the latch secures it in place.



2. Press to close the side cover handle.



Step 5. Install other removed devices and cables in reverse order.

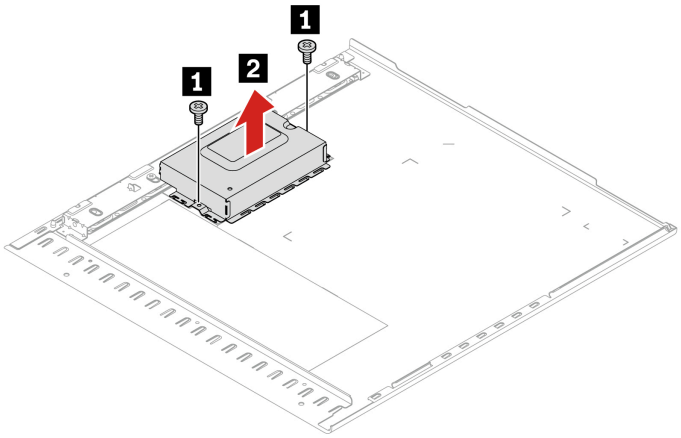
Lock for the side cover

Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

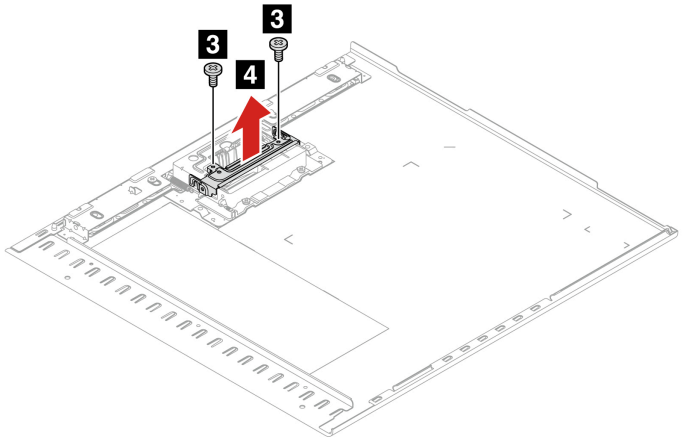
Step 1. Remove the “Side cover” on page 33.

Step 2. Remove two screws and remove the lock cover.



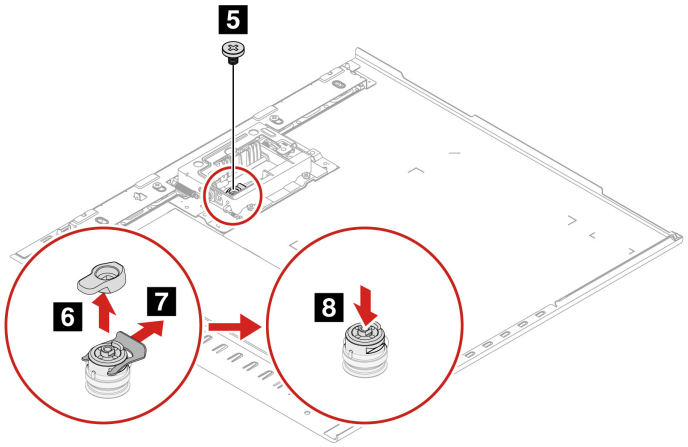
Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
1	M3	L3	5.0 ± 0.5	Silver	2

Step 3. Remove two screws and remove the bracket.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
3	M3	L3	5.0 ± 0.5	Silver	2

Step 4. Remove the screw securing the lock, take out the two support holders, and then detach the lock from the outside of the side cover.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
5	M2	L3.6	1.5 ± 0.2	Silver	1

Note: For models without a side cover lock, you need to remove the dummy lock before installing a lock.

Step 5. Install the removed parts and cables in reverse order.

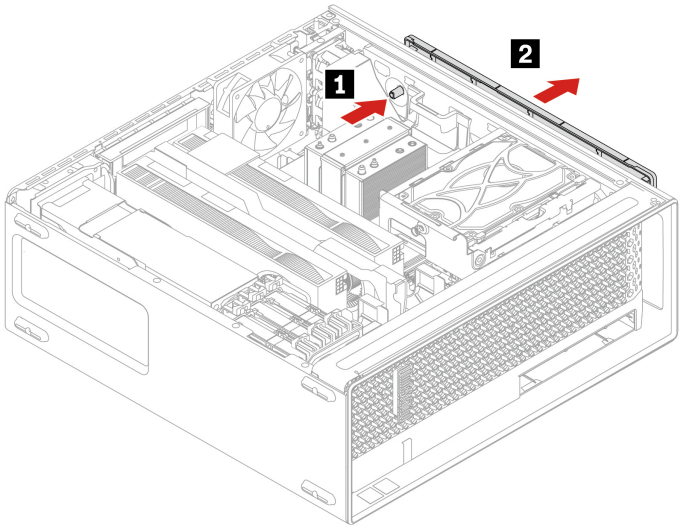
Top cover

Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Remove the “Side cover” on page 33.

Step 2. Press the tab inside the system to release the top cover and remove the cover from the system.



Step 3. Install the removed parts and cables in reverse order.

PCIe components

This section describes how to replace PCIe cards and their related components.

Note: Illustrations are provided as a reference for replacement steps. PCIe cards and related components may vary in appearance from those in your system.

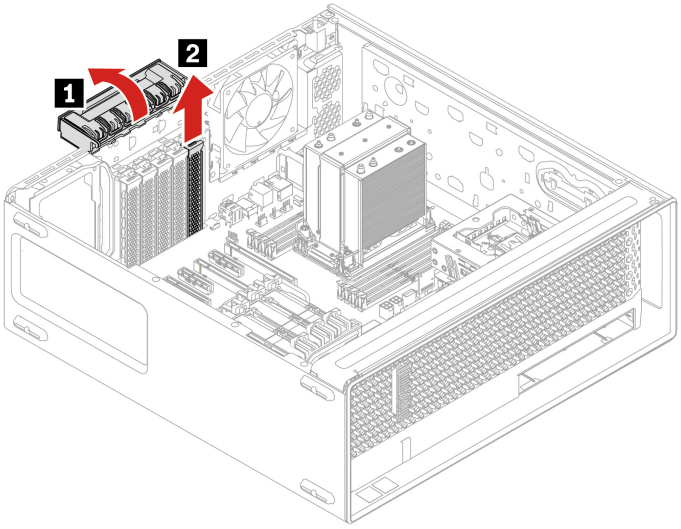
PCIe bracket

Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Remove the “Side cover” on page 33.

Step 2. Open the PCIe retaining latch and remove the PCIe bracket from the slot.



Step 3. Install the removed parts and cables in reverse order.

PCIe top retention holder and supercapacitor module

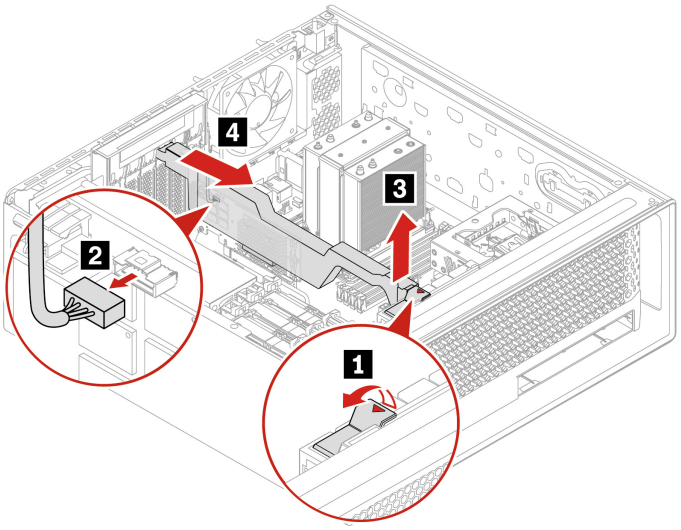
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Remove the “Side cover” on page 33.

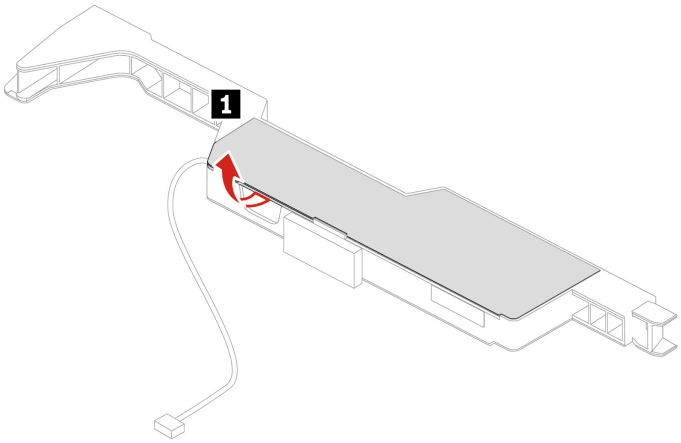
Step 2. Remove the PCIe top retention holder.

1. Open the latch to release the PCIe top retention holder.
2. Disconnect the supercapacitor cable from the **J14 connector** on the RAID card, if any.
3. Pivot the holder upward and lift it out of the system.

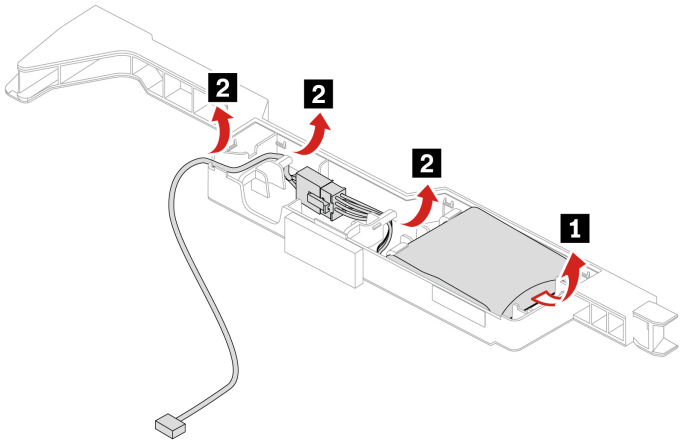


Step 3. Remove the supercapacitor module and cable.

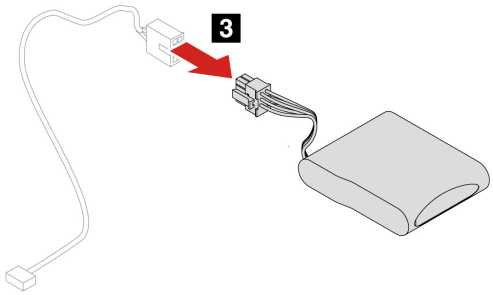
1. Pry open the PCIe top retention holder cover.



2. Remove the supercapacitor module and cable.



3. Disconnect the cable from the supercapacitor module.



Step 4. Install the removed parts and cables in reverse order.

Half-length PCIe cards

Before you start, read the following.

- “Prerequisites for hardware replacement” on page 30
- “PCIe configuration” on page 9
- “PCIe cable connection” on page 43

Replacement steps

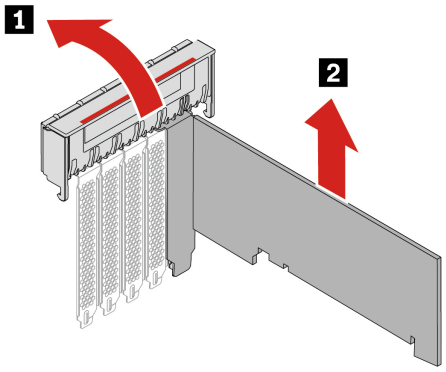
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “PCIe top retention holder and supercapacitor module” on page 38

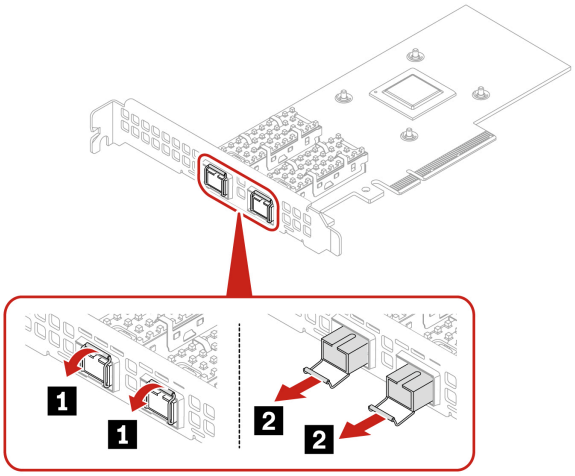
Step 2. Disconnect any cables connected to the PCIe card, if applicable.

Step 3. Pull open the PCIe retaining latch. Pull the PCIe card from the slot and lift it from the system.

Note: The 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.



Step 4. For some Ethernet adapters, the following fiber modules can be removed.



Step 5. Install the removed parts and cables in reverse order.

Full-length PCIe card and extender

Before you start, read the following.

- “Prerequisites for hardware replacement” on page 30
- “PCIe configuration” on page 9
- “PCIe cable connection” on page 43

Replacement steps

Step 1. Remove the following parts, if any, in order.

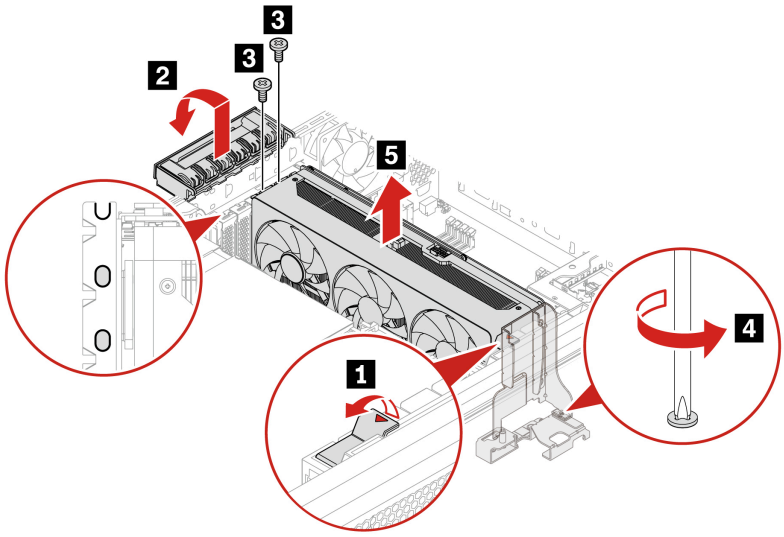
- “Side cover” on page 33
- “PCIe top retention holder and supercapacitor module” on page 38

Step 2. Disconnect any cables connected to the PCIe card (if available).

Step 3. Remove the PCIe card.

1. Pull open the PCIe retaining latches on both sides.
2. Remove or loosen any screws securing the PCIe card to the chassis (if available).
3. Pull the PCIe card from the slot and lift it from the system.

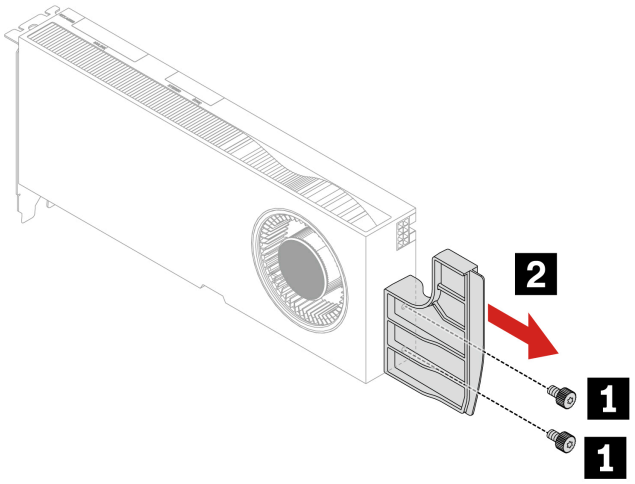
Note: The card might fit tightly into the slot. If necessary, alternately move each side of the card a small amount until the card is removed from the slot.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
3	M3.5	L5	5.0 ± 0.5	Black	2
4 (captive screw)	M3	L5	3.0 ± 0.5	Black	1

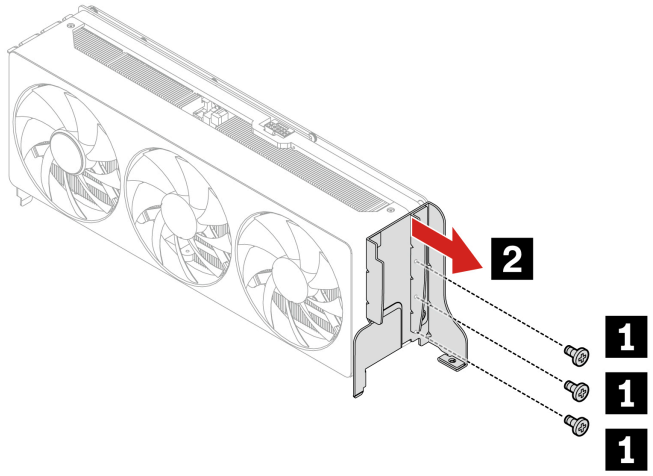
Step 4. Remove the customized PCIe extender (if available).

- For computer models with RTX Pro 4000 Blackwell, the graphics card and the PCIe card extender work as a CRU assembly. Do not try to remove the extender.
- For computer models with other graphics cards, the PCIe card extender is a customized CRU. You can remove it according to the following information.
  - Type-1



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
1	M3	L5.5	3.0 ± 0.25	Black	2

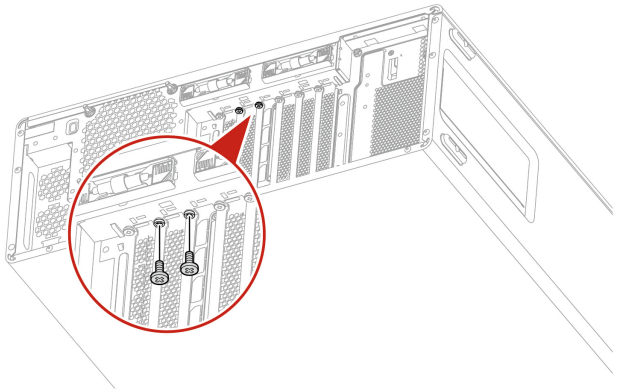
– Type-2



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
1	M3	L5	3.0 ± 0.5	Black	3

Step 5. Install the removed parts and cables in reverse order.

Note: For compatible models without a pre-installed GeForce 5080 PCIe card, you may need a PH2 screwdriver to access two screws above the second and third PCIe brackets on the rear panel, as the card doesn't include chassis mounting screws.



PCIe cable connection

Some PCIe cards require cabling to the system board. For connector locations, see “System board illustration” on page 29.

Some PCIe cards also require cabling to other system components. Follow the cable connection shown in the illustrations below.

Graphics card to 750-watt PSU

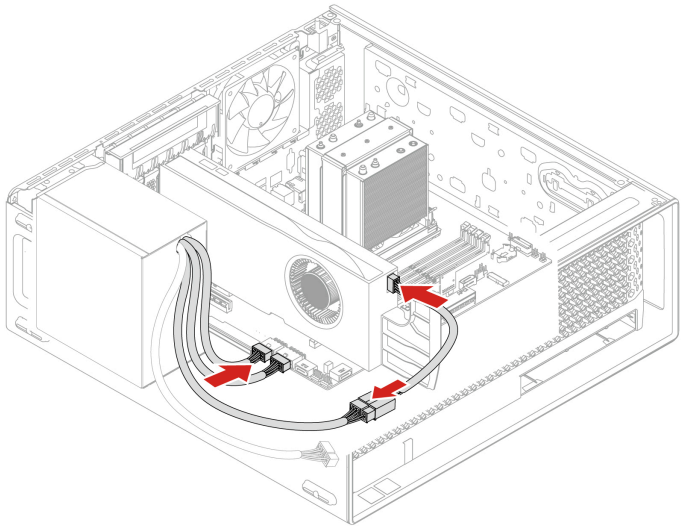


Figure 1. Cable connection for single graphics card and 750-watt PSU

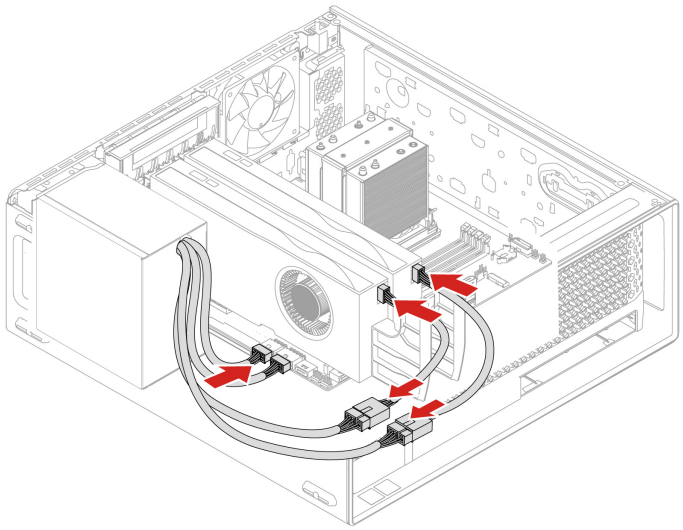
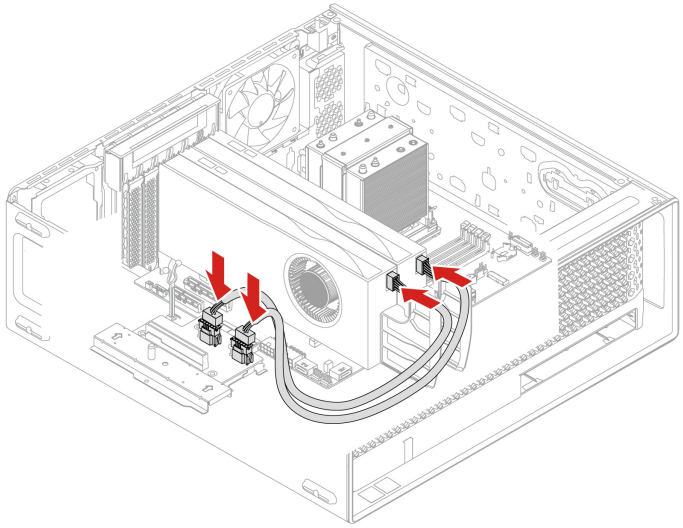
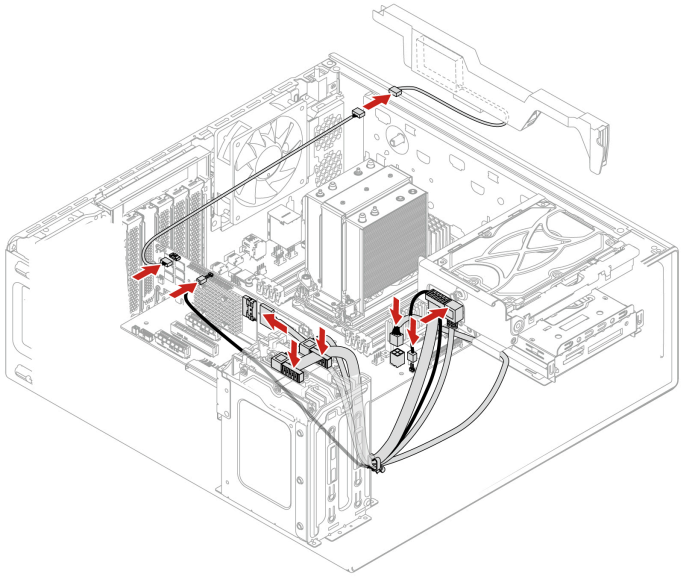


Figure 2. Cable connection for dual graphics cards and 750-watt PSU

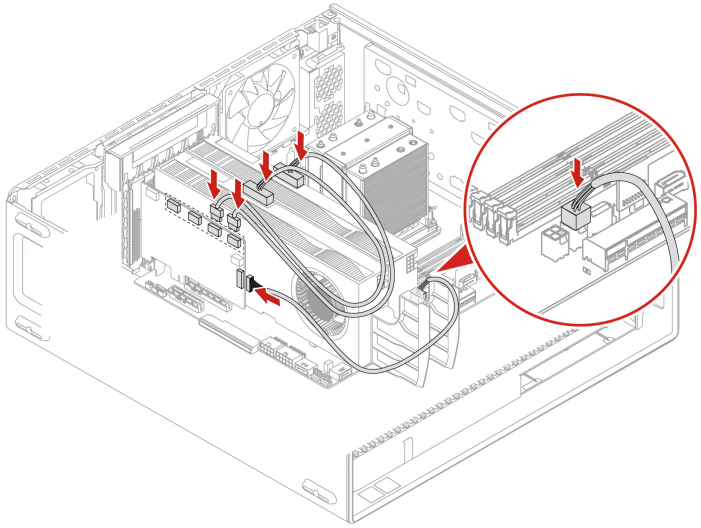
Graphics cards to the power distribution board of 1000-watt PSU



RAID card to HDDs, supercapacitor module, and system board



Sync card to graphics cards



CPU fan duct module

Before you start, read “Prerequisites for hardware replacement” on page 30.

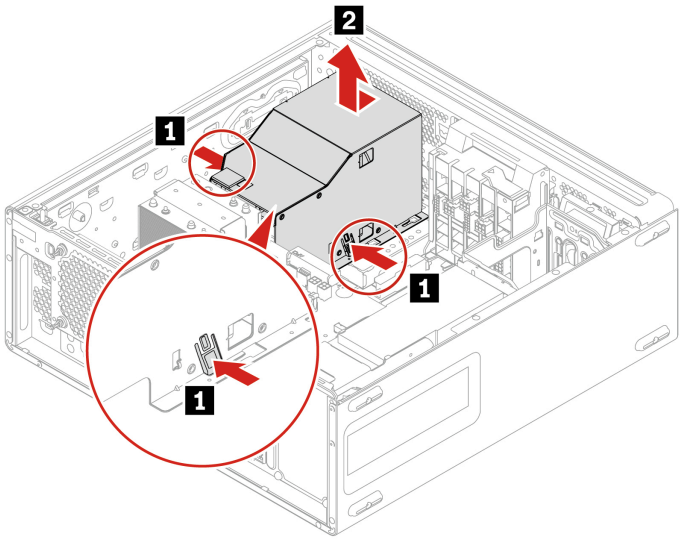
Replacement steps

Step 1. Remove the “Side cover” on page 33.

Step 2. Disconnect the fan cable from the auxiliary fan connector 2 on the system board.

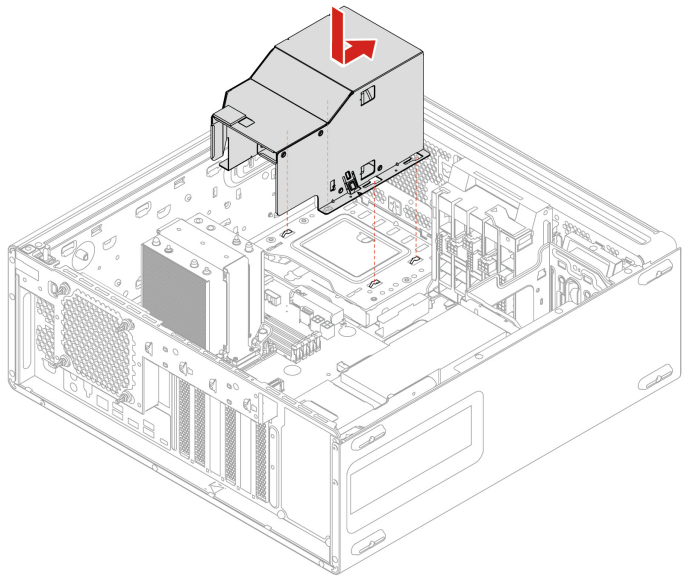
Step 3. Remove the CPU fan duct module.

1. Press the latches on both sides of the CPU fan duct module, and then slide the module to release the four retaining hooks from the chassis.
2. Lift the CPU fan duct module out of the computer.



Step 4. Install the CPU fan duct module.

1. Align the four retaining hooks on the CPU fan duct module with the corresponding slots in the chassis.
2. Lower the module into position and slide it until it clicks into place.



Step 5. Install other removed parts and cables in reverse order.

Storage components

This section describes how to replace storage drives and their related components.

HDD and its bracket

Before you start, read “Prerequisites for hardware replacement” on page 30.

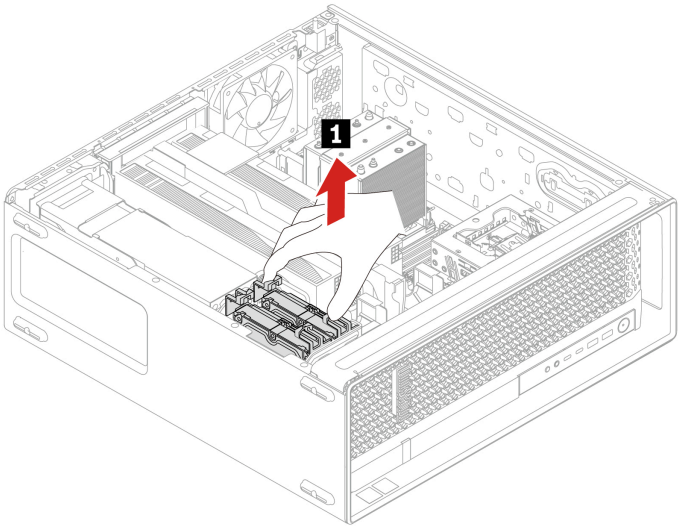
Replacement steps

Step 1. Remove the “Side cover” on page 33.

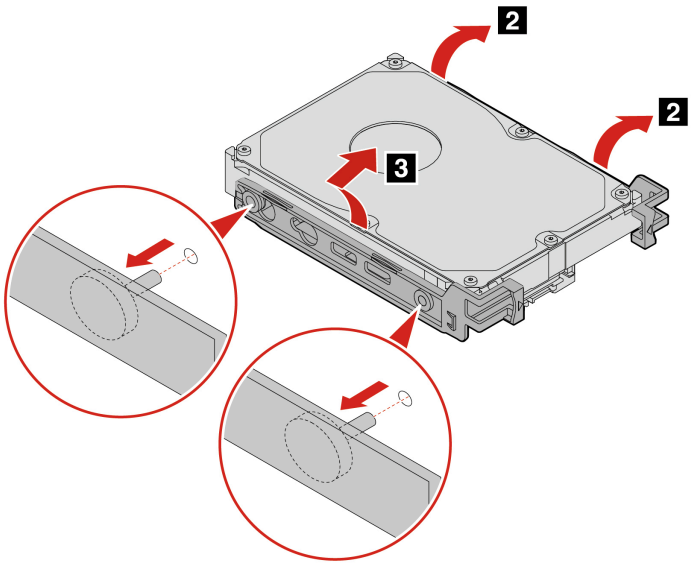
Step 2. Disconnect the SATA power and data cables from the HDD and the system board.

Note: If you need to replace the SATA power or data cable, you should also remove the “Full-length PCIe card and extender” on page 41 and “Front fan” on page 77 to gain full access.

Step 3. Squeeze the tabs on the HDD bracket and pull it from the bay.



Step 4. Remove the drive from the bracket by pulling the pins out of the holes in the side of the drive.



Step 5. Install the removed parts and cables in reverse order.

HDD fan

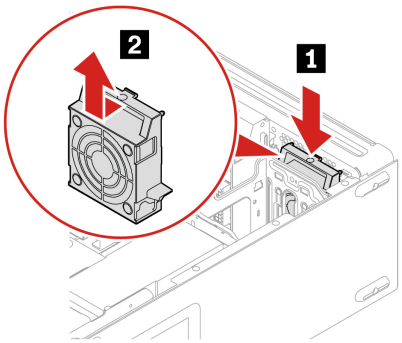
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Remove the “Side cover” on page 33.

Step 2. Disconnect the HDD fan cable from the system board. For connector locations, see “System board illustration” on page 29.

Step 3. Tilt the fan to release it and lift the fan from the system.



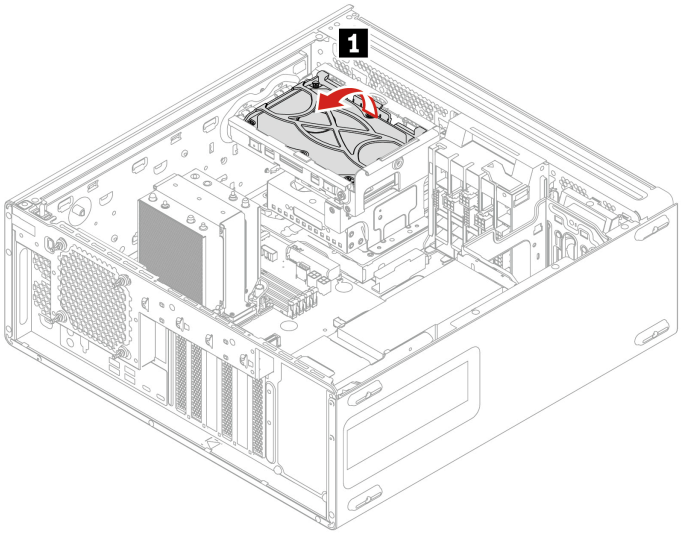
Step 4. Install the removed parts and cables in reverse order.

Optional HDD and its bracket

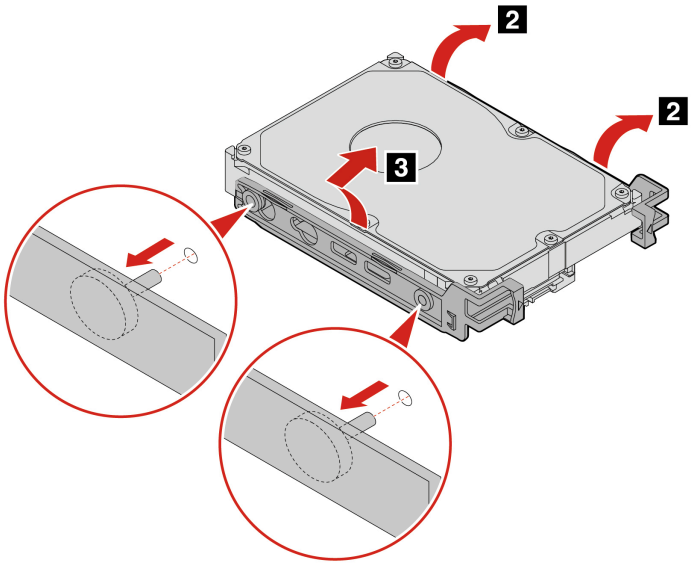
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Remove the “Side cover” on page 33.
Step 2. Disconnect the SATA power and data cables from the HDD and the system board.
Step 3. Remove the optional HDD and bracket.



Step 4. Remove the drive from the bracket by pulling the pins out of the holes in the side of the drive.



Step 5. Install the removed parts and cables in reverse order.

Optional HDD cage

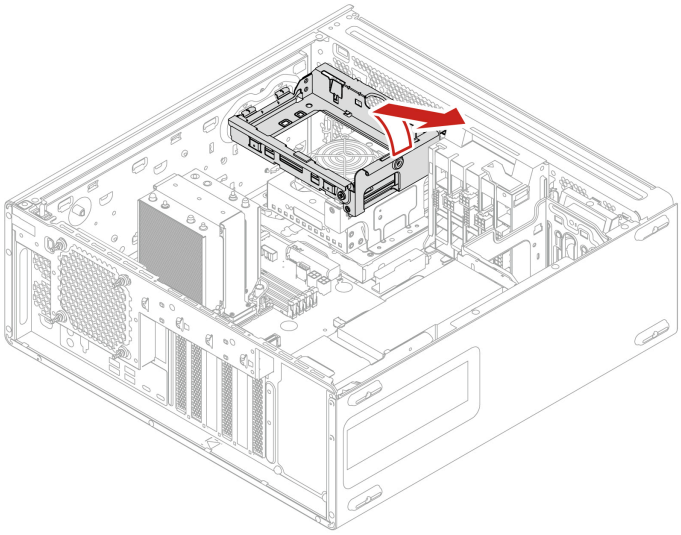
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

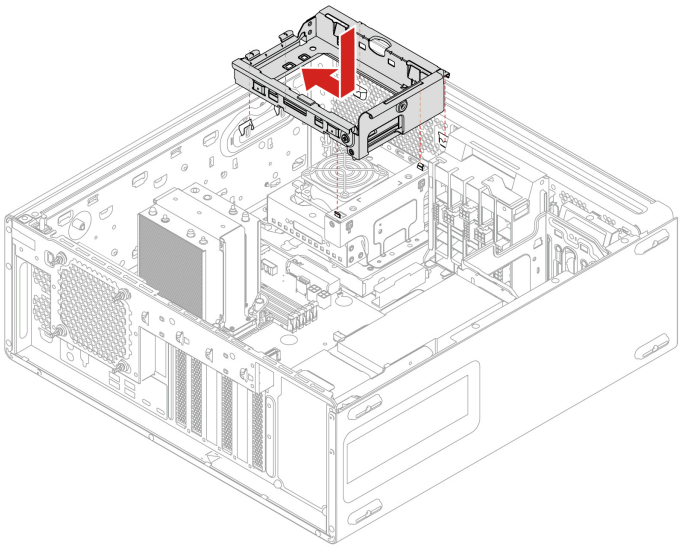
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Optional HDD and its bracket” on page 49

Step 2. Grab the handle with a red line and lift the optional HDD cage from the system.



Step 3. Align the optional HDD cage with the holes on the system and lower it into place.



Step 4. Install other removed parts and cables in reverse order.

Optional HDD cage holder

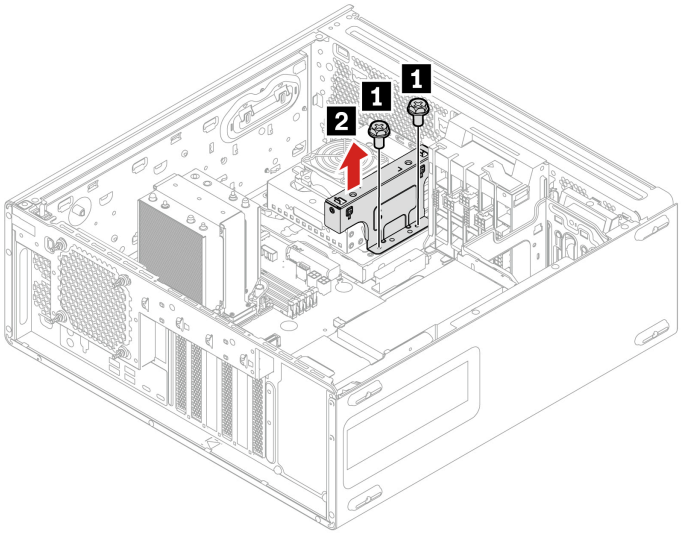
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Optional HDD and its bracket” on page 49
- “Optional HDD cage” on page 50

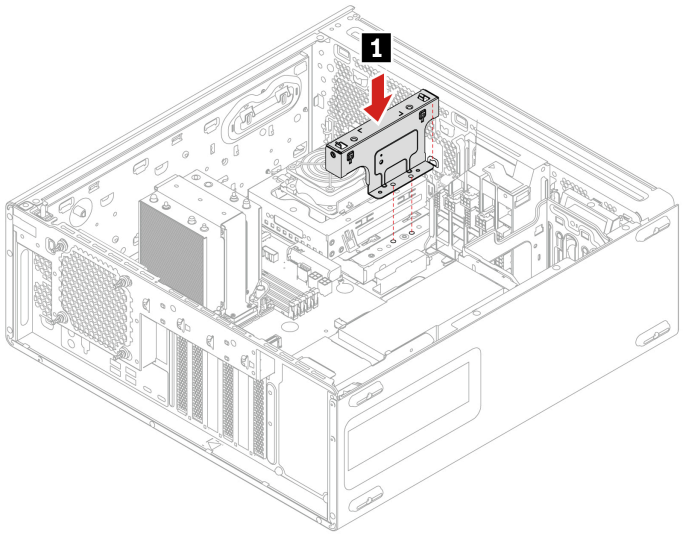
Step 2. Remove two screws and lift the optional HDD cage holder out of the system.



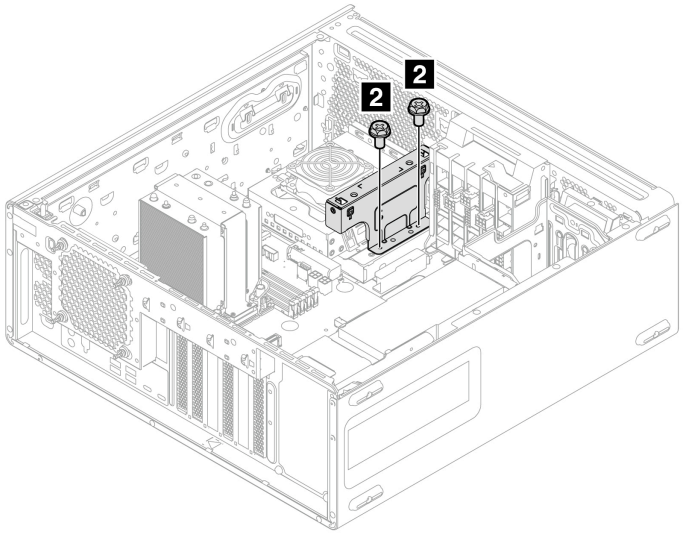
Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
1	M3	L5	5.0 ± 0.5	Black	2

Step 3. Install the optional HDD cage holder.

1. Align the holder with the two holes on the system and lower it into place.



2. Secure the holder with two screws.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
2	M3	L5	5.0 ± 0.5	Black	2

Step 4. Install other removed parts and cables in reverse order.

Flex bay fan

Before you start, read “Prerequisites for hardware replacement” on page 30.

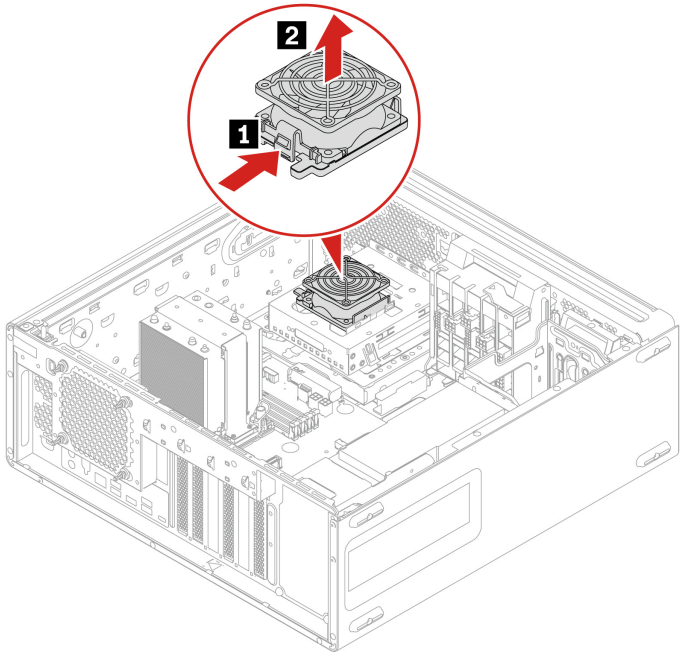
Replacement steps

Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Optional HDD and its bracket” on page 49
- “Optional HDD cage” on page 50
- “Optional HDD cage holder” on page 51

Step 2. Disconnect the fan cable from the system board. For connector locations, see “System board illustration” on page 29.

Step 3. Press the latch to release the flex bay fan and remove it.



Step 4. Install the removed parts and cables in reverse order.

Media card reader module

Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

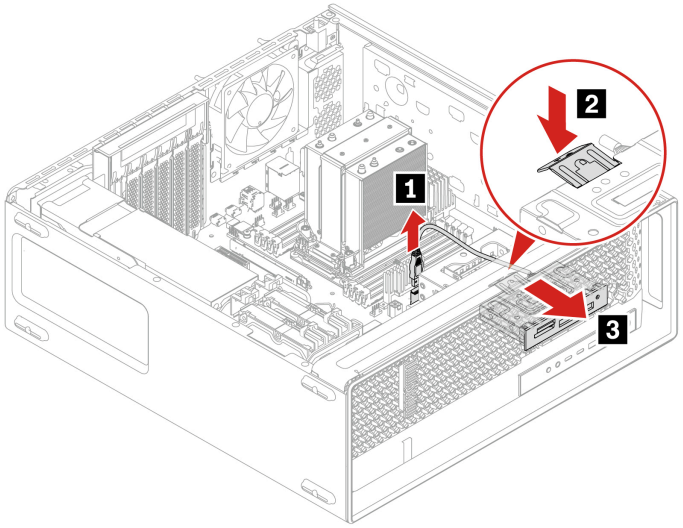
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Optional HDD and its bracket” on page 49
- “Optional HDD cage” on page 50
- “Optional HDD cage holder” on page 51

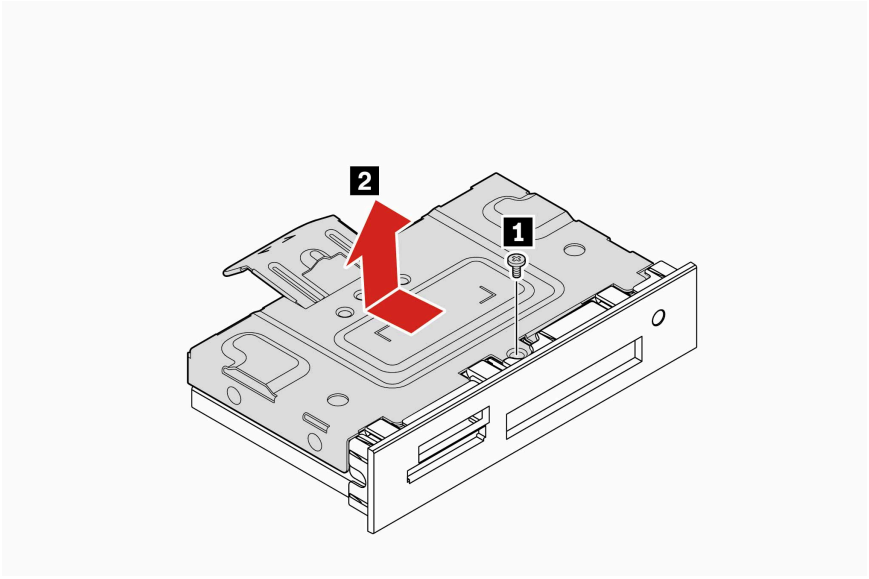
- “Flex bay fan” on page 53

Step 2. Disconnect the media card reader (MCR) cable from the internal USB 3.2 connector on the system board. For connector locations, see “System board illustration” on page 29.

Step 3. Press the clip to release the module and push it with the cable through the front of the system to remove it.

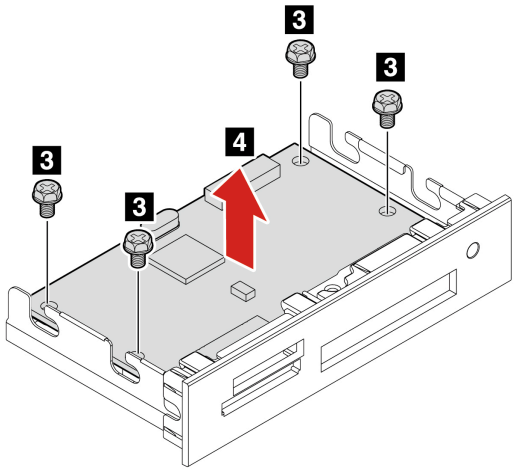


Step 4. Remove one screw and then slide off the MCR box cover.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
1	M3	L4	3.0 ± 0.5	Silver	1

Step 5. Remove four screws and remove the MCR with cable from the box.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
3	M3	L5	5.0 ± 0.5	Black	4

Step 6. Install the removed parts and cables in reverse order.

M.2 SSD enclosure and SSD

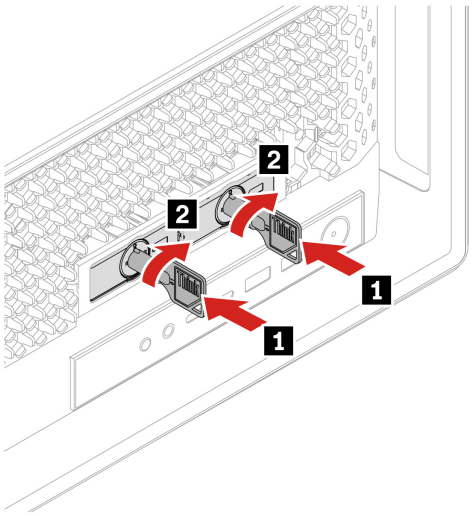
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

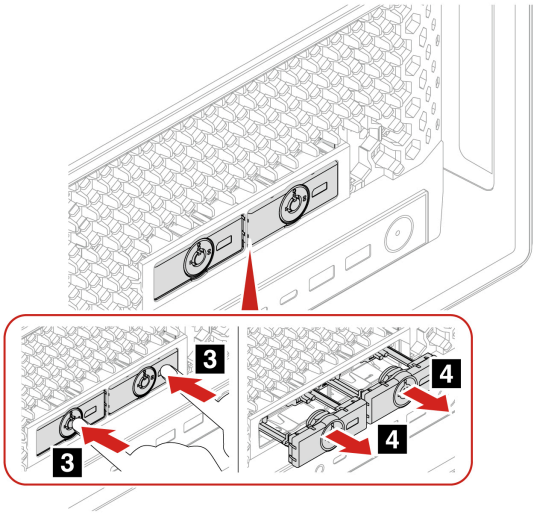
Step 1. Turn off the computer and back up all important data if necessary.

Step 2. Remove the M.2 SSD enclosure.

1. Unlock the M.2 SSD enclosure.

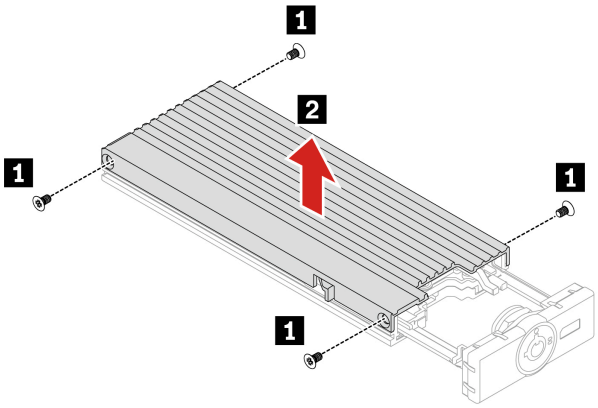


2. Press and eject the M.2 SSD enclosure.



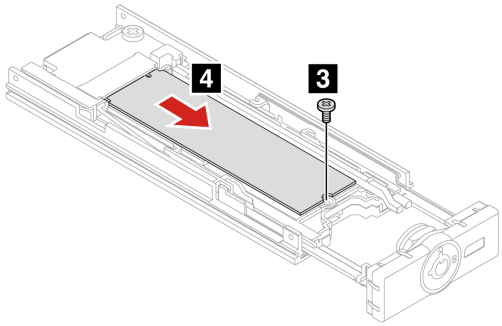
Step 3. Remove the SSD from the M.2 SSD enclosure.

1. Remove four screws and remove the enclosure cover.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
1	M2	L3.6	1.5 ± 0.2	Silver	4

2. Remove one screw and pull the SSD out of the enclosure.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
3	M2	L4.5	1.5 ± 0.2	Black	1

Step 4. Install the removed parts and cables in reverse order.

M.2 SSD enclosure tray and cable

Before you start, read “Prerequisites for hardware replacement” on page 30.

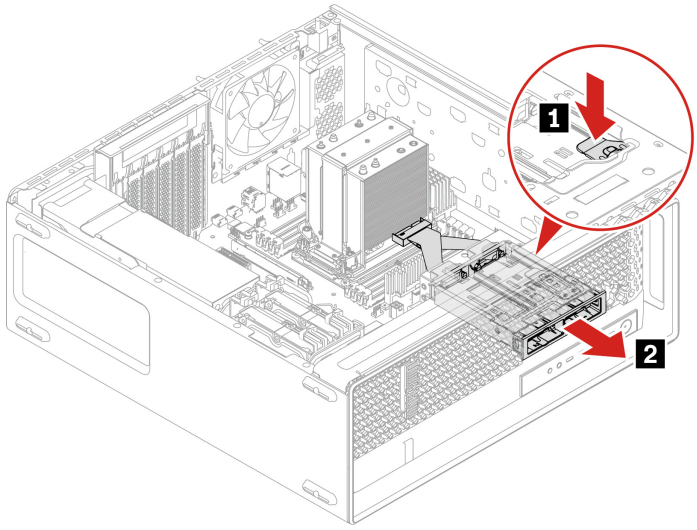
Replacement steps

Step 1. Remove the following parts, if any, in order.

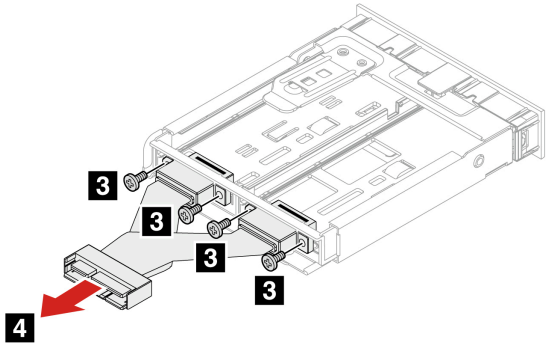
- “Side cover” on page 33
- “Optional HDD and its bracket” on page 49
- “Optional HDD cage” on page 50
- “Optional HDD cage holder” on page 51
- “Flex bay fan” on page 53
- “M.2 SSD enclosure and SSD” on page 55

Step 2. Disconnect the M.2 SSD enclosure cable from the system board. For connector locations, see “System board illustration” on page 29.

Step 3. Press the clip to release the module and push it with the cable through the front of the system to remove it.



Step 4. Remove four screws and remove the cable from the tray.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
3	M2	L6.5	1.5 ± 0.5	Black	4

Step 5. Install the removed parts and cables in reverse order.

Flex bay cage

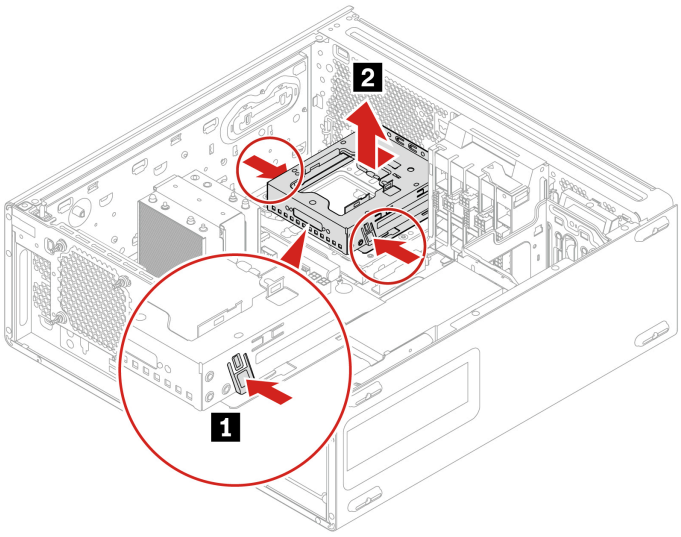
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

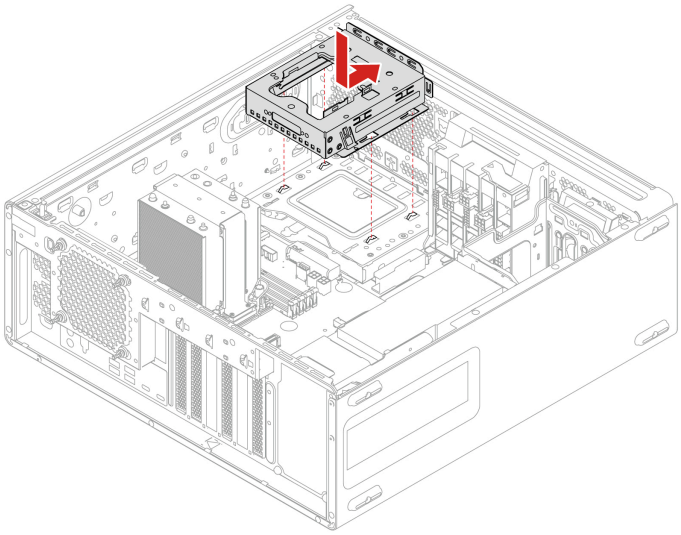
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Optional HDD and its bracket” on page 49
- “Optional HDD cage” on page 50
- “Optional HDD cage holder” on page 51
- “Flex bay fan” on page 53
- “Media card reader module” on page 53
- “M.2 SSD enclosure tray and cable” on page 57
- “M.2 SSD enclosure and SSD” on page 55

Step 2. Press the two clips on both sides to release the flex bay cage. Then, remove the cage from the system.



Step 3. Align the cage with the four holes on the system, then slide it in until it locks into place.



Step 4. Install other removed parts and cables in reverse order.

Flex bay cover

Before you start, read “Prerequisites for hardware replacement” on page 30.

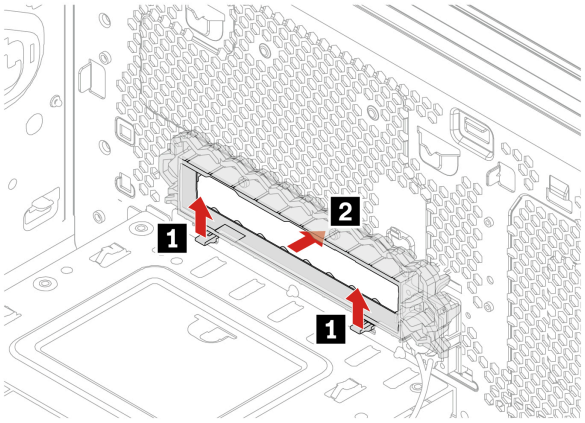
Replacement steps

Step 1. Remove the following parts, if any, in order.

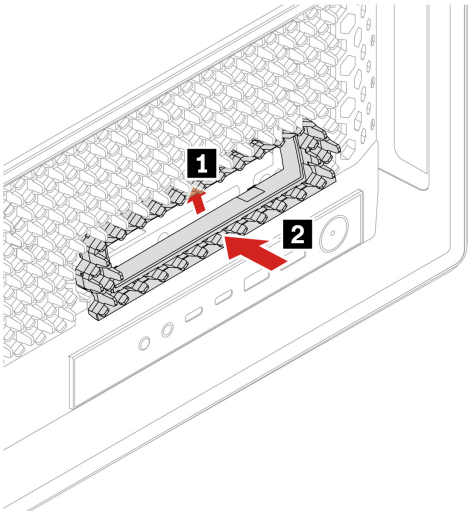
- “Side cover” on page 33
- “Optional HDD and its bracket” on page 49
- “Optional HDD cage” on page 50
- “Optional HDD cage holder” on page 51
- “Flex bay fan” on page 53

- “Media card reader module” on page 53
- “M.2 SSD enclosure tray and cable” on page 57
- “M.2 SSD enclosure and SSD” on page 55

Step 2. From inside the system, lift the two tabs to release the cover and push it out of the system.



Step 3. Align the upper edge of the cover to the system, then push the bottom of the cover until it clicks into place.



Step 4. Install other removed parts and cables in reverse order.

Flex bay dummy cover

Before you start, read “Prerequisites for hardware replacement” on page 30.

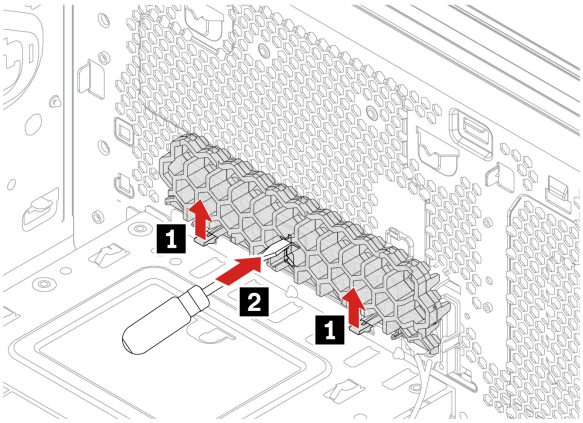
Replacement steps

Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Optional HDD and its bracket” on page 49

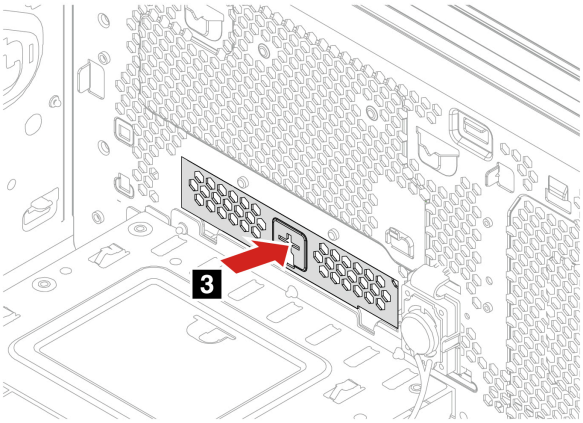
- “Optional HDD cage” on page 50
- “Optional HDD cage holder” on page 51
- “Flex bay fan” on page 53
- “Media card reader module” on page 53
- “M.2 SSD enclosure tray and cable” on page 57
- “M.2 SSD enclosure and SSD” on page 55

Step 2. From inside the system, lift the two tabs to release the cover and push it out of the system.

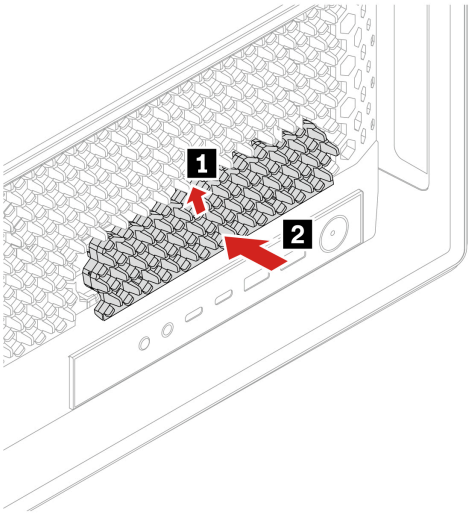


Step 3. Carefully press the metal insert out of the chassis, if needed.

Note: After removal, handle the new openings with care, as the edges may be sharp.



Step 4. Align the upper edge of the cover to the system, then push the bottom of the cover until it clicks into place.



Step 5. Install other removed parts and cables in reverse order.

SSD in M.2 SSD PCIe adapter

Before you start, read “Prerequisites for hardware replacement” on page 30.

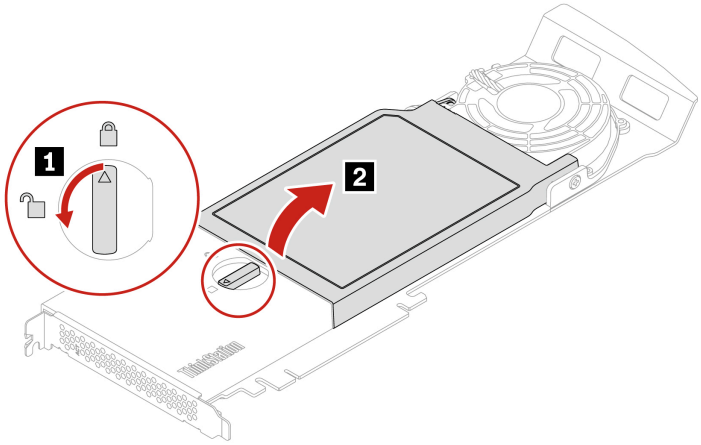
Replacement steps

Step 1. Remove the “Side cover” on page 33.

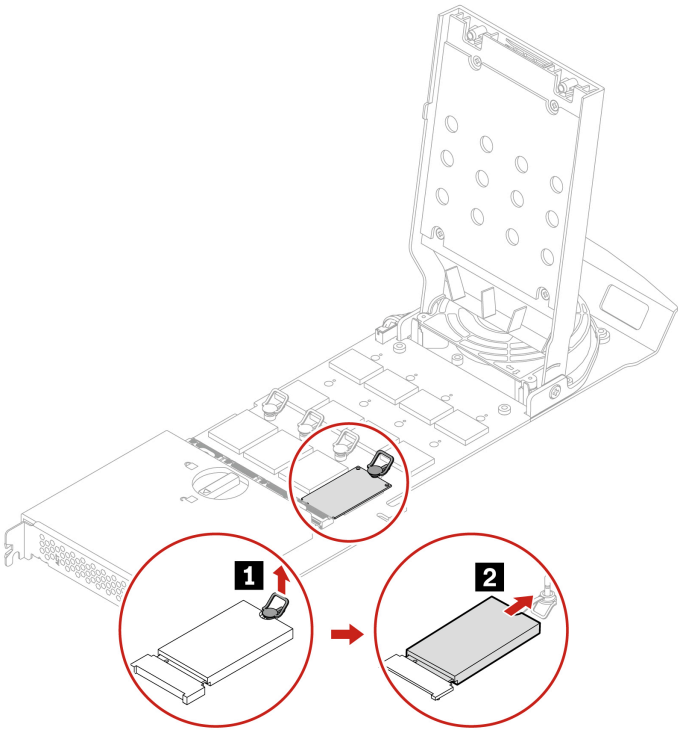
Step 2. Remove the M.2 SSD PCIe adapter from the PCIe slot following the steps in “Full-length PCIe card and extender” on page 41.

Step 3. Remove the SSD from the M.2 SSD PCIe adapter.

1. Rotate the lock to the open position to open the cover.

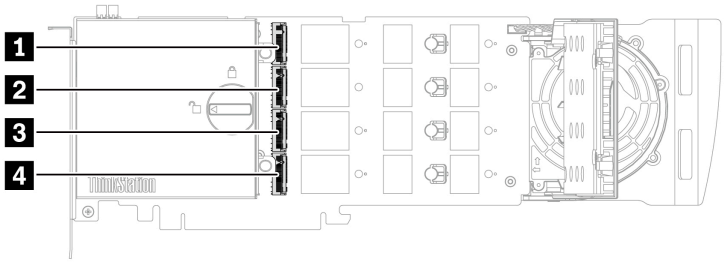


2. Pull the handle of the retention latch outward to release the M.2 SSD. Then, remove the M.2 SSD from the PCIe adapter.

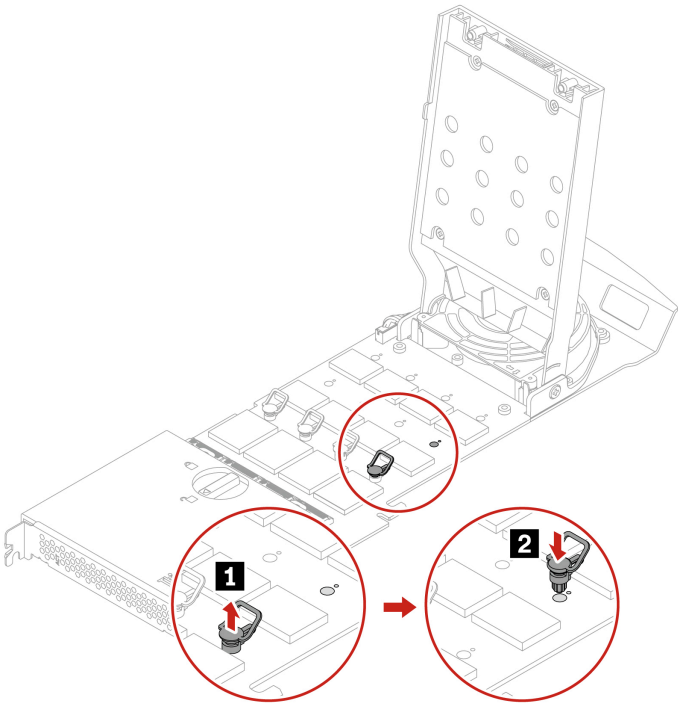


Step 4. Install the SSD into the M.2 SSD PCIe adapter.

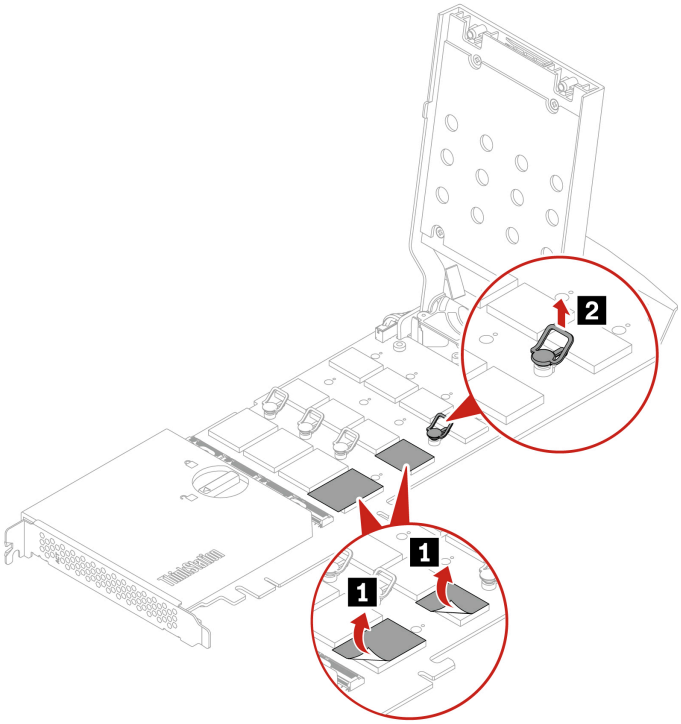
Note: Install M.2 SSDs in the following order as shown:



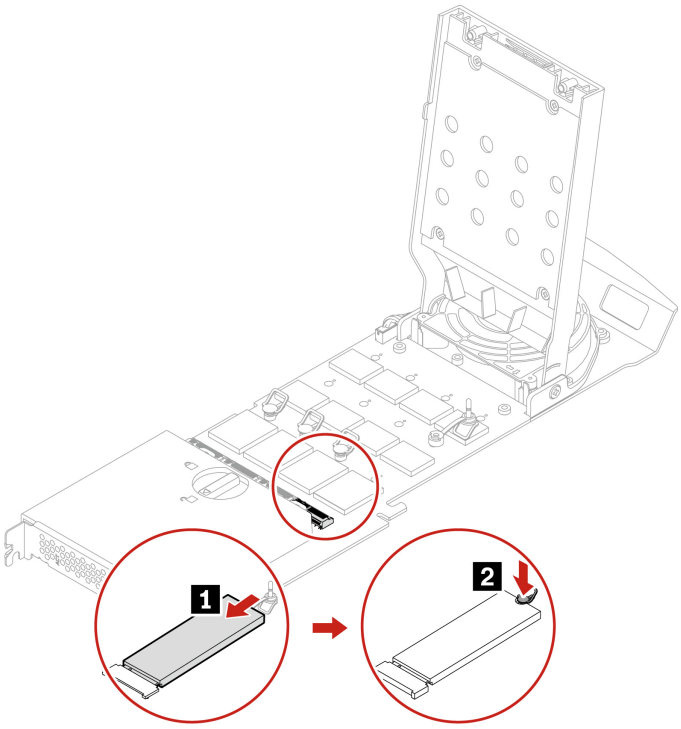
1. Adjust the location of the retention latch on the PCIe adapter to suit the length of the new M.2 SSD, if necessary.



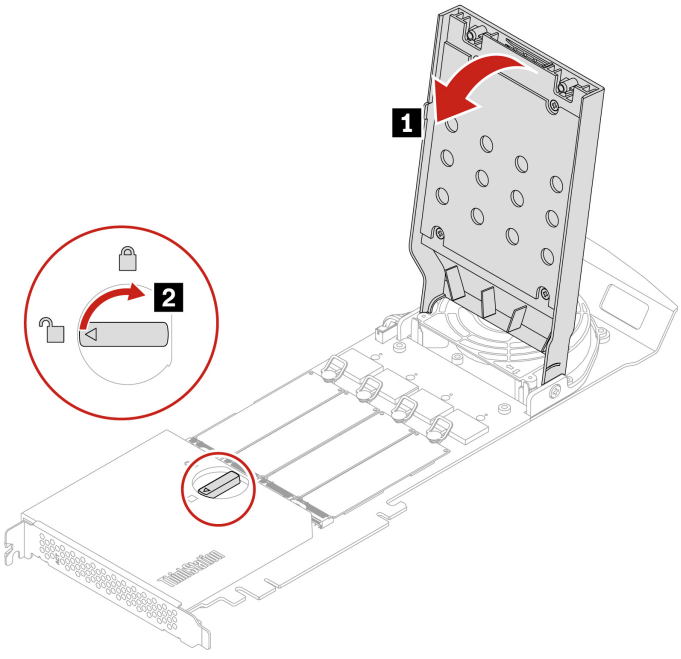
2. Remove the film from the thermal pad on which you want to install the M.2 SSD. Pull the handle of the retention latch outward to the open position.



3. Install a new M.2 SSD. Then, insert the plug of the retention latch into the hole to secure the new drive. Do not touch the circuit board of the M.2 SSD.



4. Rotate the lock to the closed position to close the cover.



Step 5. Install other removed parts and cables in reverse order.

On-board SSD and its heat sink kit

Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

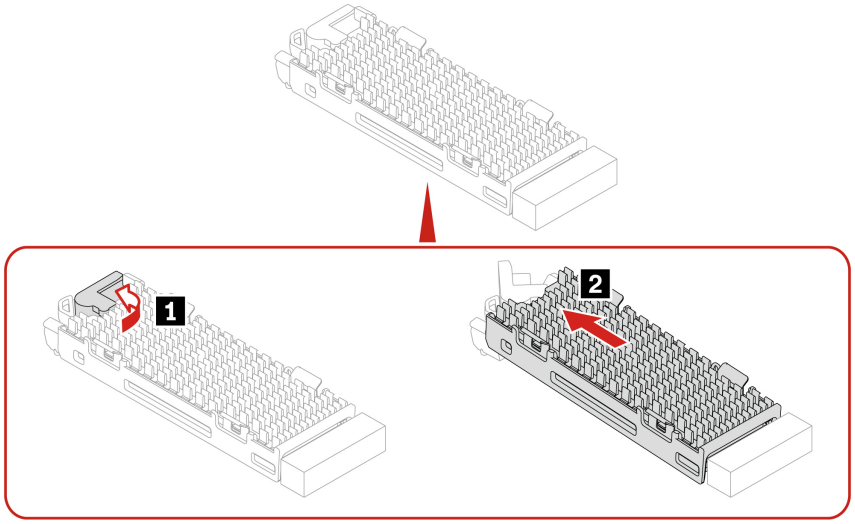
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “PCIe top retention holder and supercapacitor module” on page 38
- “Half-length PCIe cards” on page 40
- “Full-length PCIe card and extender” on page 41

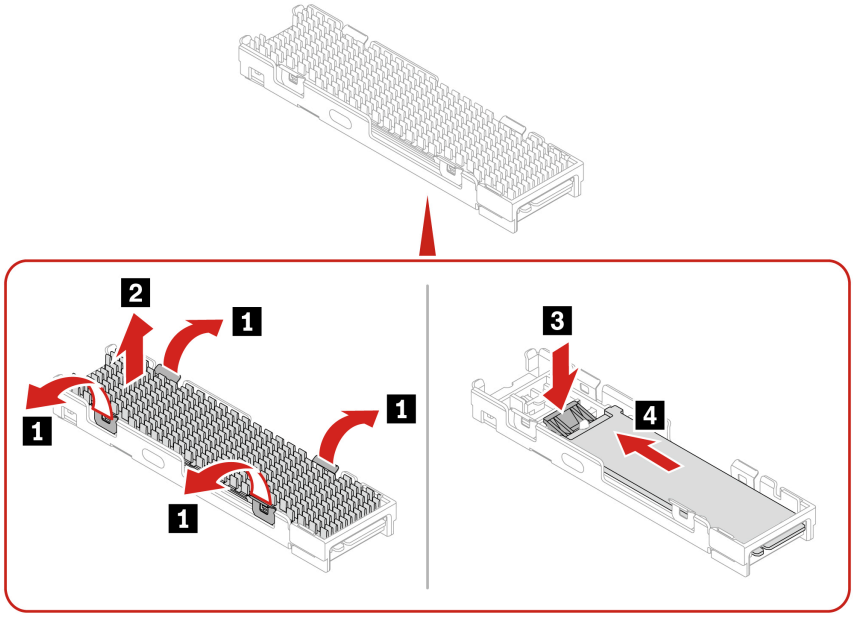
Step 2. Remove the on-board SSD and its heat sink kit.

CAUTION:
Before you touch the heat sink, wait several minutes until the component is cool.

1. Rotate the tab to release the drive and pull it from the on-board M.2 SSD slot.

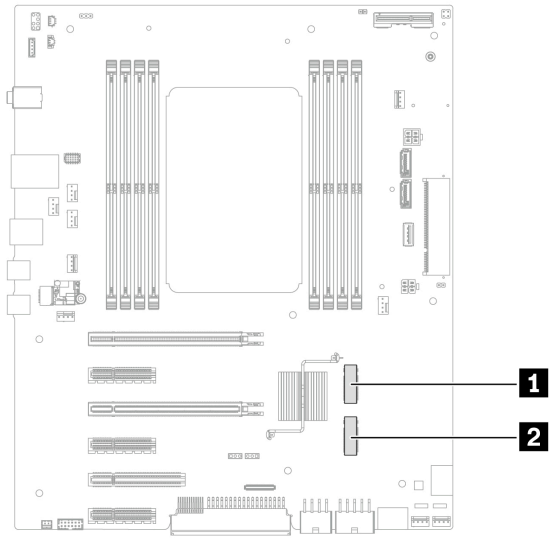


2. Pull open the tabs to remove the heat sink cover. Press the tab to release and remove the drive from the heat sink.

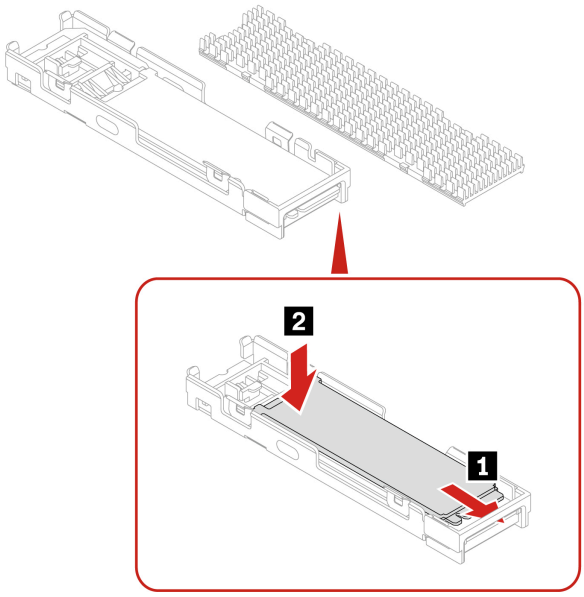


Step 3. Install the on-board SSD and its heat sink kit.

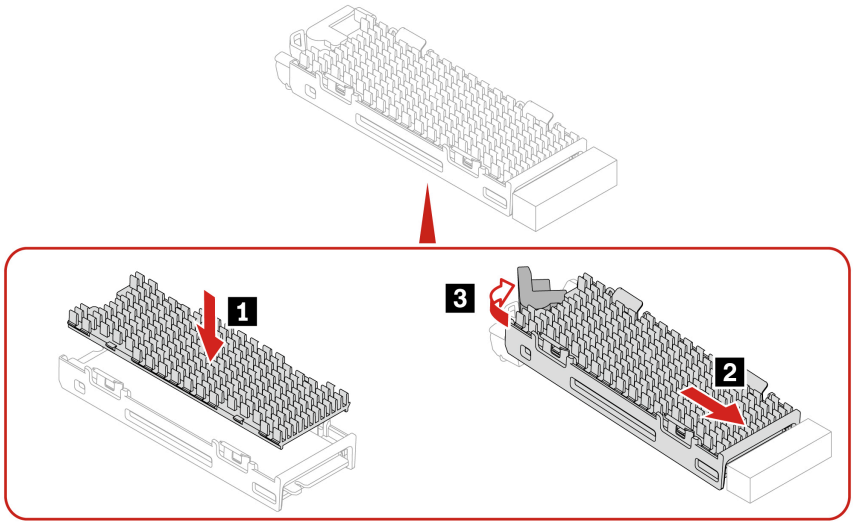
Note: Ensure to install the on-board M.2 SSDs in the following order.



1. Remove the protective film on the heat sink and thermal pad (if available).
2. Insert the SSD into the heat sink by aligning the drive edge with the slot.



3. Install the heat sink cover. Insert the drive into the on-board M.2 slot. Rotate the tab to secure it in place.



Step 4. Install other removed parts and cables in reverse order.

On-board SSD holder

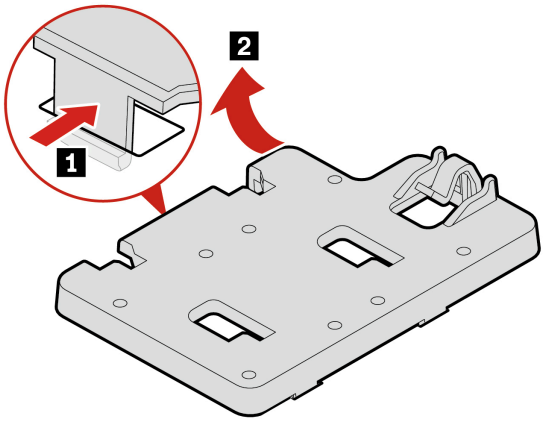
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

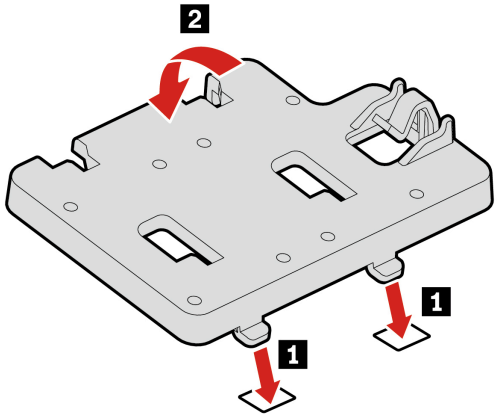
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “PCIe top retention holder and supercapacitor module” on page 38
- “Half-length PCIe cards” on page 40
- “Full-length PCIe card and extender” on page 41
- “On-board SSD and its heat sink kit” on page 65

Step 2. Press the clip to release the SSD holder, then lift and remove it.



Step 3. Insert the SSD holder into the slot and press down until the clip locks it in place.



Step 4. Install other removed parts and cables in reverse order.

Memory components

This section describes how to replace memory modules and their related components.

Memory fan duct

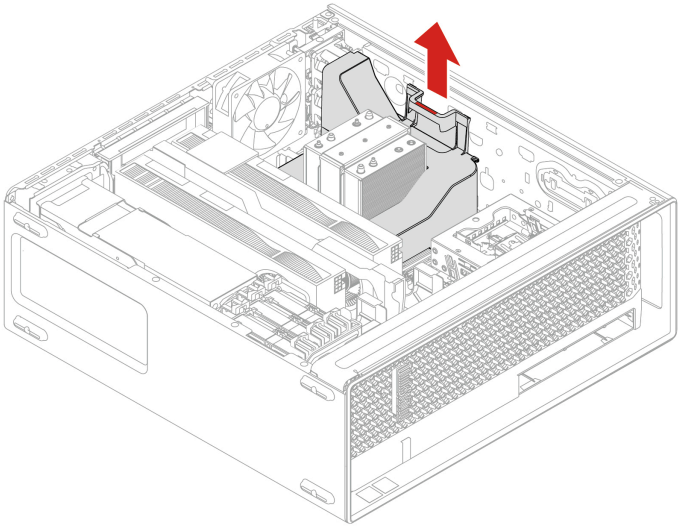
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Remove the “Side cover” on page 33.

CAUTION:
Before you touch the memory fan duct, wait several minutes until the component is cool.

Step 2. Release the fan duct using the handle with a red line. Lift the duct from the system.



Step 3. Install the removed parts and cables in reverse order.

Memory fans

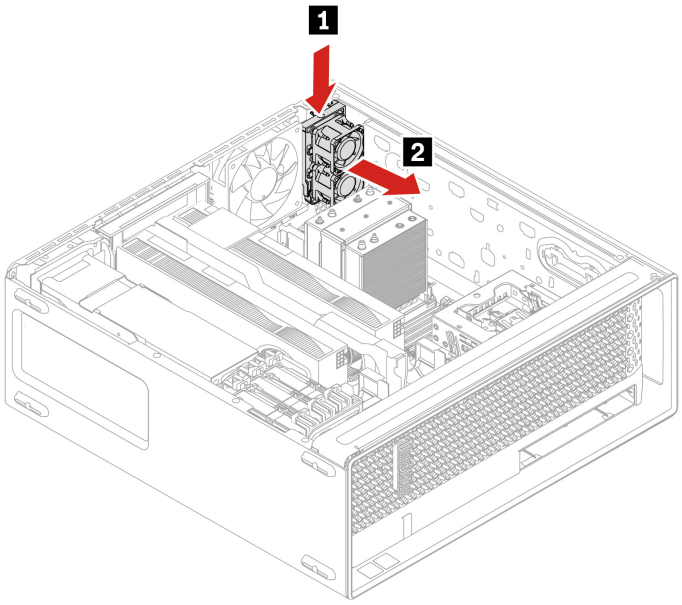
Before you start, read “Prerequisites for hardware replacement” on page 30.

Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Memory fan duct” on page 69

Step 2. Disconnect the two memory fan cables from the system board. For connector locations, see “System board illustration” on page 29.

Step 3. Tilt the memory fan module to release it and lift it from the system.



Step 4. Install the removed parts and cables in reverse order.

Memory module

Before you start, read the following.

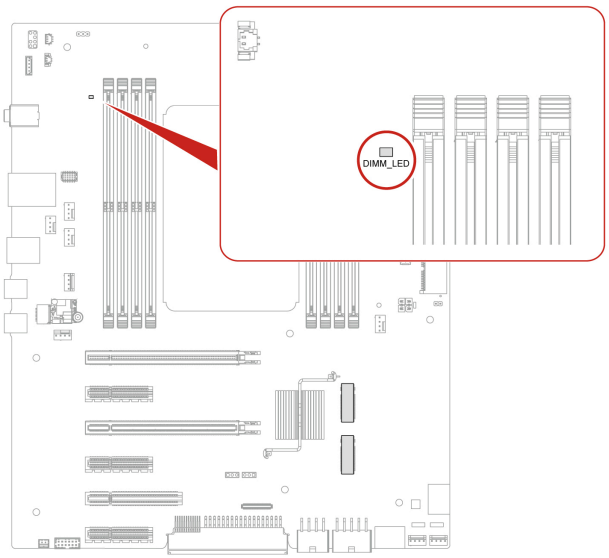
- “Prerequisites for hardware replacement” on page 30
- “Memory configuration” on page 8

Replacement steps

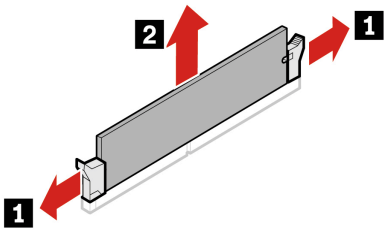
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Memory fan duct” on page 69

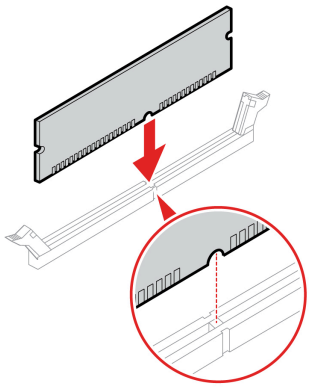
Step 2. Verify that the DIMM LED on the system board is off, and then wait at least one minute before removing or installing a module. It allows the system to be completely discharged of electricity.



Step 3. Press outward on the clips to release the memory module and remove it from the slot.



Step 4. Align the notch in the memory module with the tab in the slot. Press down on the module until the clips lock into place.



Step 5. Install other removed parts and cables in reverse order.

Power components

This section describes how to replace the power supply and its related components.

Power supply unit assembly

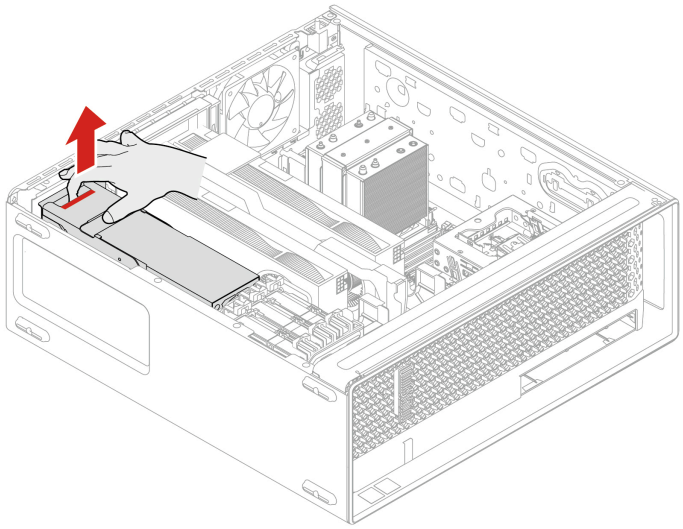
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

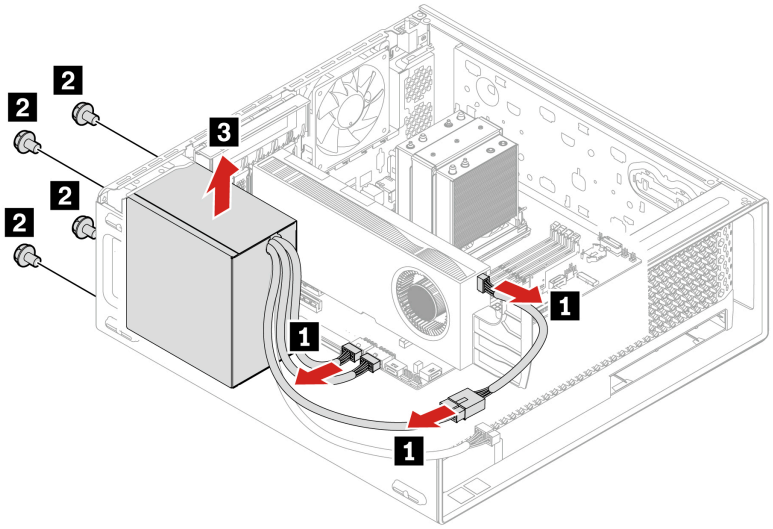
Step 1. Remove the “Side cover” on page 33.

Step 2. Remove the power supply unit (PSU) assembly.

- For the 1000-watt PSU, lift the lever and pull the power supply from the system.



- For the 750-watt PSU, disconnect the PSU cables from the system board and graphics cards (if any), remove four screws, and then remove the PSU with cable from the system.



Location	Thread	Length	Torque (lbf·in)	Color	Quantity
2	#6–32	5 mm	5.0 ± 0.5	Black	4

Step 3. Install the removed parts and cables in reverse order.

1000-watt PSU cover

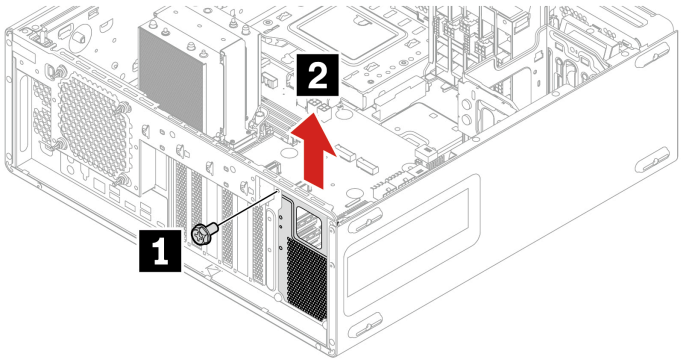
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Power supply unit assembly” on page 73

Step 2. Remove one screw from the PSU cover and lift it from the system.



Location	Thread	Length	Torque (lbf·in)	Color	Quantity
1	#6–32	5 mm	5.0 ± 0.5	Black	1

Step 3. Install the removed parts and cables in reverse order.

1000-watt power distribution board and bracket

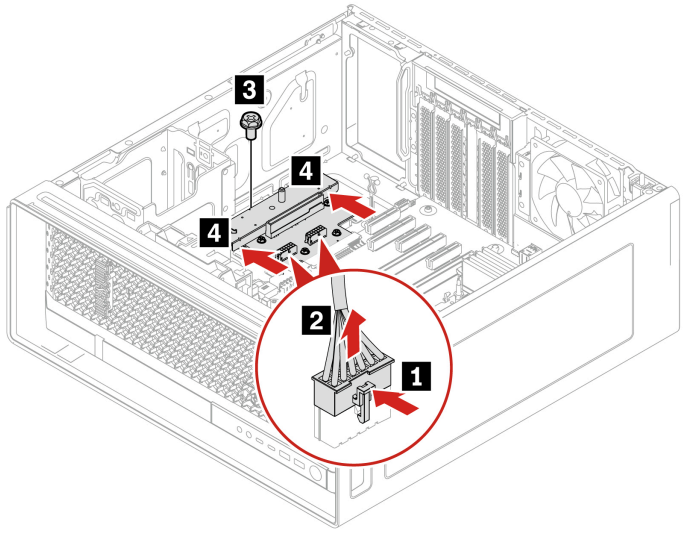
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Remove the following parts, if any, in order.

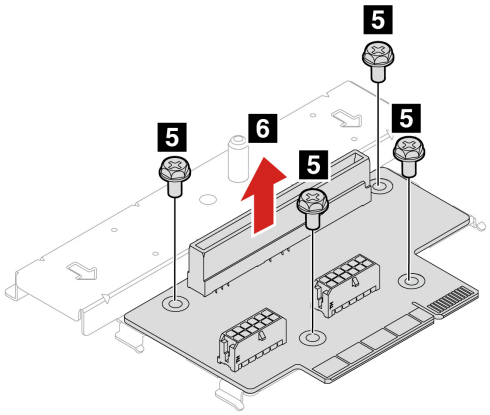
- “Side cover” on page 33
- “Power supply unit assembly” on page 73

Step 2. Disconnect any cables from the power distribution board. Remove one screw and slide the power distribution board away from the system board and remove it.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
3	M3	L5	5.0 ± 0.5	Black	1

Step 3. Remove four screws and remove the power distribution board from the bracket.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
5	M3	L5	5.0 ± 0.5	Black	4

Step 4. Install the removed parts and cables in reverse order.

Front panel I/O assembly

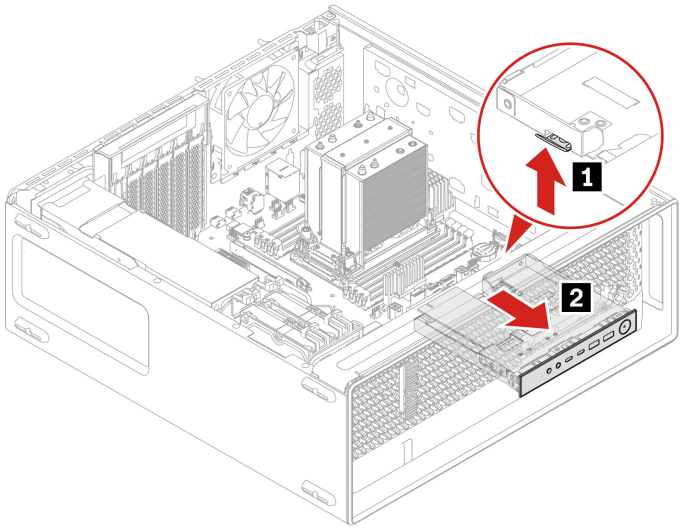
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

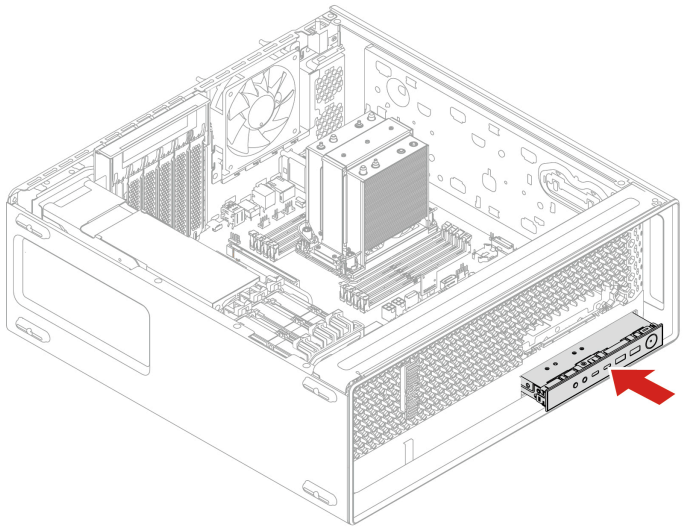
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Optional HDD and its bracket” on page 49
- “Optional HDD cage” on page 50
- “Optional HDD cage holder” on page 51
- “Flex bay fan” on page 53
- “Media card reader module” on page 53
- “M.2 SSD enclosure tray and cable” on page 57
- “M.2 SSD enclosure and SSD” on page 55
- “Flex bay cage” on page 58
- “CPU fan duct module” on page 46

Step 2. Lift the release latch, push the front panel I/O assembly forward, and remove it from the system.



Step 3. Insert the assembly until it connects to the system board.



Step 4. Install other removed parts and cables in reverse order.

Front fan

Before you start, read “Prerequisites for hardware replacement” on page 30.

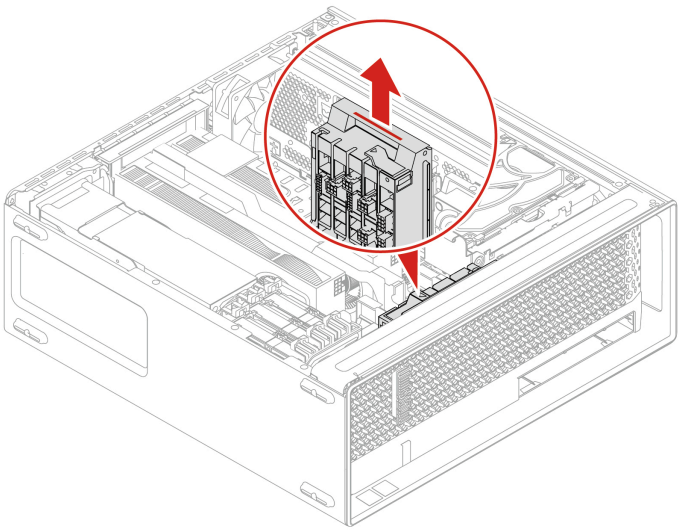
Replacement steps

Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “PCIe top retention holder and supercapacitor module” on page 38
- “Half-length PCIe cards” on page 40
- “Full-length PCIe card and extender” on page 41

Step 2. Disconnect the fan cable from the system board and remove the cable from the guide. For connector locations, see “System board illustration” on page 29.

Step 3. Lift the fan from the system using the handle with a red line.



Step 4. Install the removed parts and cables in reverse order.

Rear fan

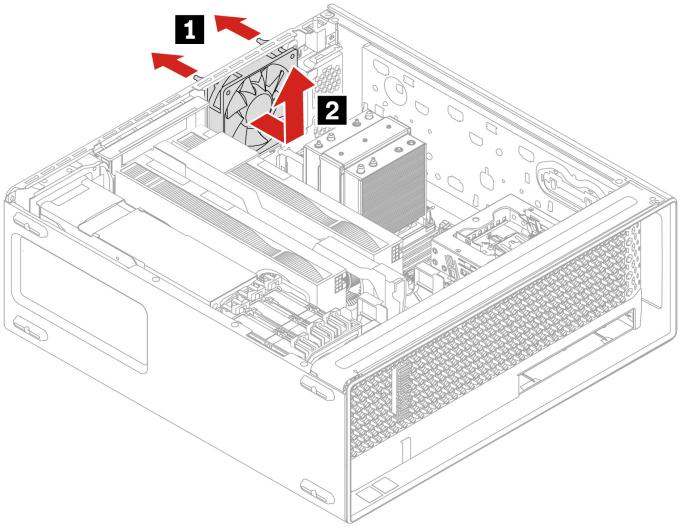
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

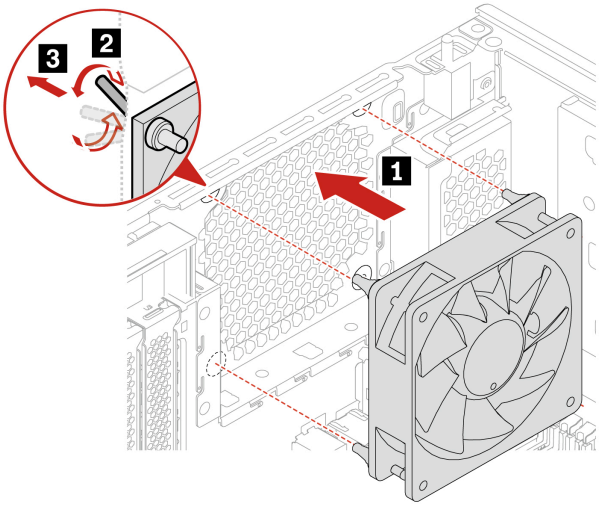
Step 1. Remove the “Side cover” on page 33.

Step 2. Disconnect the fan cable from the system board. For connector locations, see “System board illustration” on page 29.

Step 3. Stretch the four rubber pins from the rear panel to release the fan. Then, remove the fan from the system.



Step 4. Lower the fan into the chassis, using the holes in the rear of the system for alignment. Pull the four rubber pins through the holes to secure the fan in place. Connect the fan cable to the system board.



Step 5. Install other removed parts and cables in reverse order.

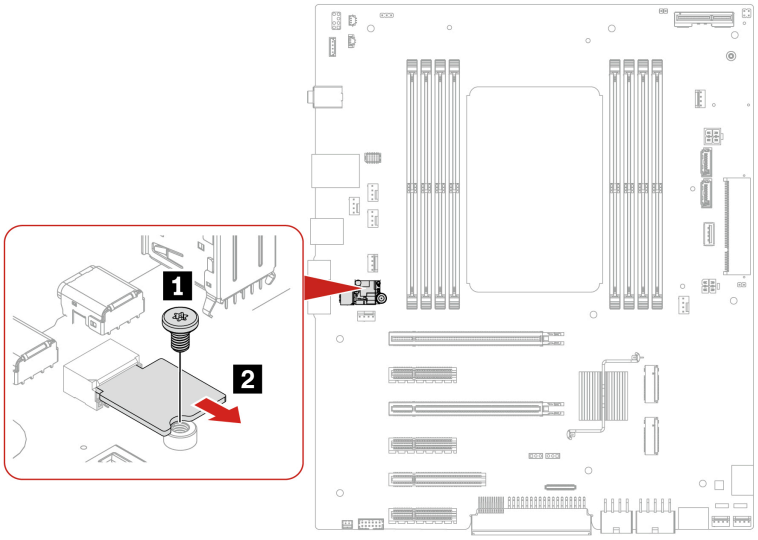
TCM card

Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Remove the “Side cover” on page 33.

Step 2. Use a T15 screwdriver to remove the screw and pull the TCM card out of the system.



Location	Thread (mm)	Length (mm)	Torque (lbf·in)	Color	Quantity
1	M3	L3	3 ± 0.5	Black	1

Step 3. Install the removed parts and cables in reverse order.

VROC key

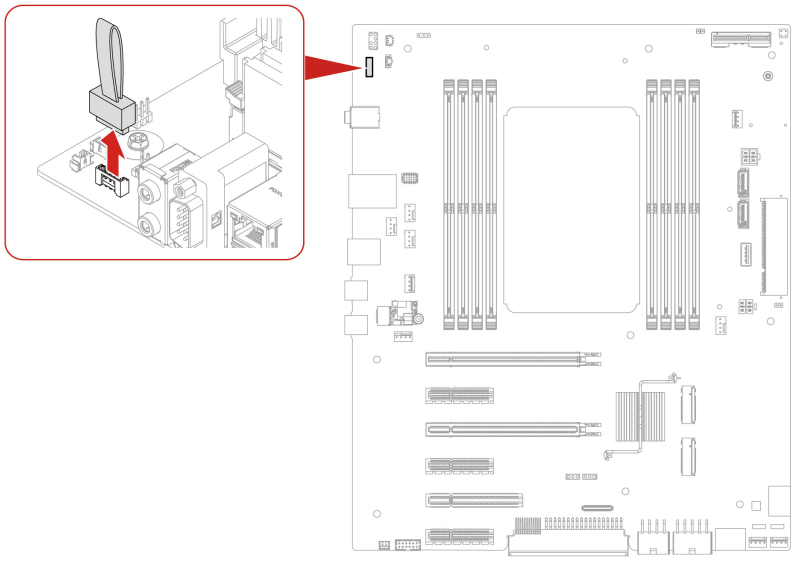
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Memory fan duct” on page 69
- “Memory fans” on page 70

Step 2. Remove the VROC key from the system.



Step 3. Install the removed parts and cables in reverse order.

Think LED cable and holder

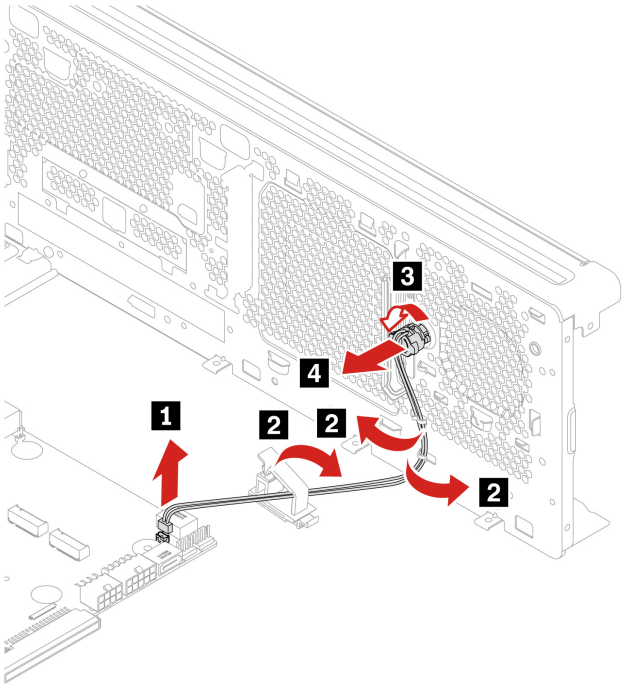
Before you start, read “Prerequisites for hardware replacement” on page 30.

Replacement steps

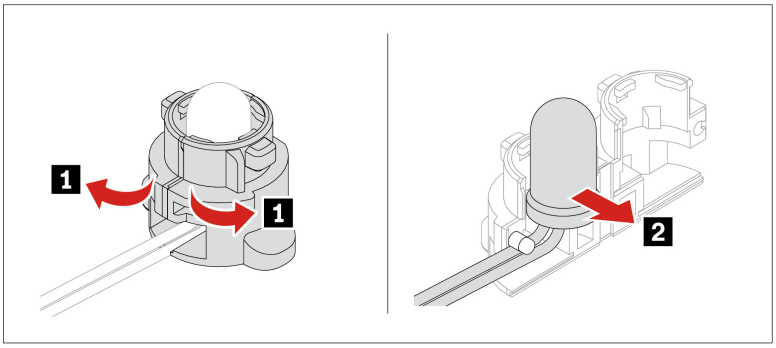
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “PCIe top retention holder and supercapacitor module” on page 38
- “Half-length PCIe cards” on page 40
- “Full-length PCIe card and extender” on page 41
- “Front fan” on page 77

Step 2. Disconnect the Think LED cable from the system board. Remove the cable from the guides. Rotate the Think LED holder and remove it from the chassis.



Step 3. Open the Think LED holder and remove the Think LED.



Step 4. Install the removed parts and cables in reverse order.

Internal speaker

Before you start, read “Prerequisites for hardware replacement” on page 30.

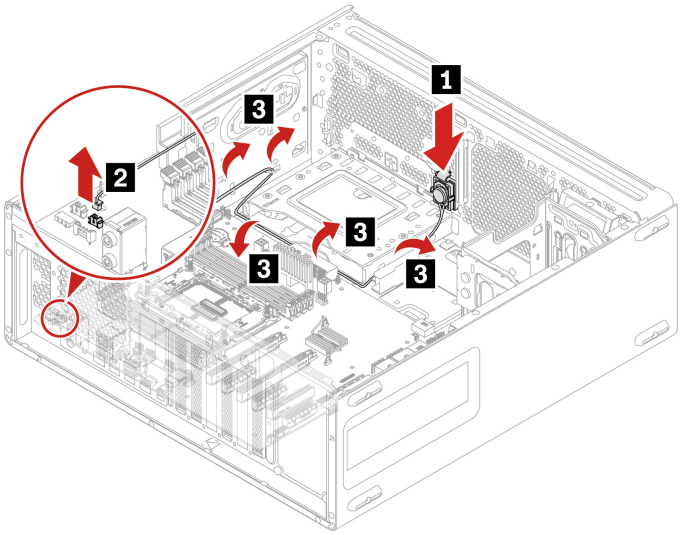
Replacement steps

Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 33
- “Optional HDD and its bracket” on page 49
- “Optional HDD cage” on page 50
- “Optional HDD cage holder” on page 51

- “Flex bay fan” on page 53
- “Media card reader module” on page 53
- “M.2 SSD enclosure tray and cable” on page 57
- “M.2 SSD enclosure and SSD” on page 55
- “Flex bay cage” on page 58
- “Front panel I/O assembly” on page 75
- “CPU fan duct module” on page 46

Step 2. Press and release the speaker from the system. Disconnect the speaker cable from the system board. Remove the cable from the guides and remove the speaker.



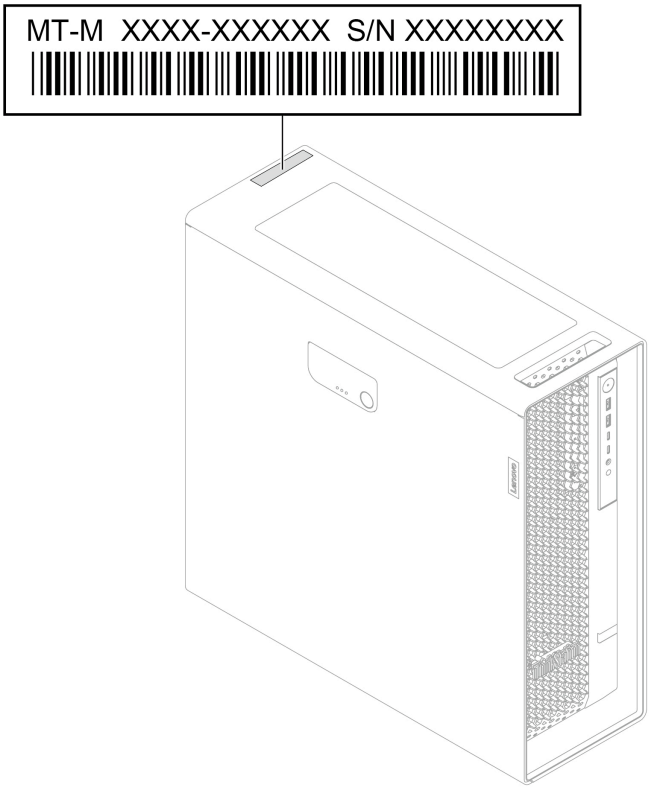
Step 3. Install the removed parts and cables in reverse order.

Chapter 6. Help and support

Find your serial number

You can find the serial number via one of the following.

- Open the Terminal and run `sudo dmidecode -t system | grep Serial`.
- Check the machine-type model and serial-number label of your computer (see illustration below).



Troubleshoot and diagnose at Lenovo Support Web site

Lenovo provides two different diagnosing solutions to help you identify and resolve problems on your computer.

For computers purchased in mainland China

1. Go to https://newsupport.lenovo.com.cn/.
2. Enter the troubleshooting section and find the question you are encountering.

For computers purchased outside mainland China

1. Go to https://www.pcsupport.lenovo.com/ and enter your product name in the search box.
2. Click **Troubleshoot & Diagnose** and select the option that fits your need.

Notes:

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- Before launching any automatic diagnosing process, a pop-up window will be prompted to install Lenovo Service Bridge. Lenovo Service Bridge helps to connect your computer with Lenovo diagnosing tools.
- Lenovo Support Web site makes periodic updates of the sections to keep improving your experience with your computer. The Web site interface and descriptions of sections might be different from that on your actual interface.
- If you are unaware of what problem your computer goes with, it is recommended that you select **Easy** and follow on-screen instructions to get your firmware updated and obtain the hardware status.
- If you have identified the problem on your computer, you can select **Custom** and follow on-screen instructions to resolve the problem.

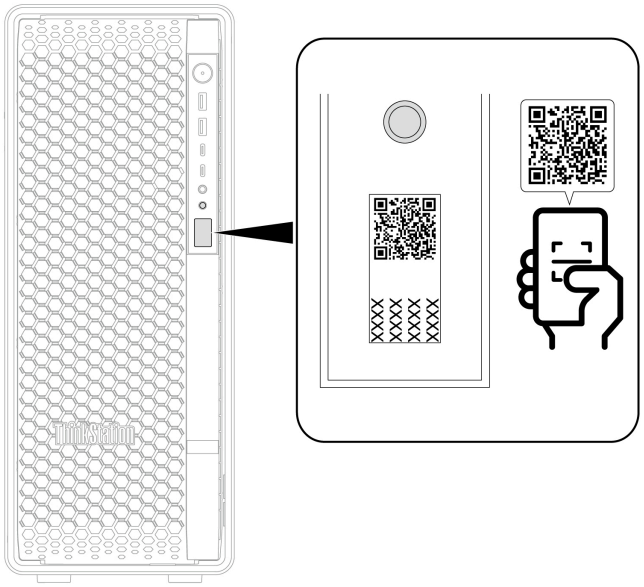
If solutions can not resolve problems on your computer, you can follow on-screen instructions to submit an e-ticket or contact Lenovo for professional assistance.

ThinkStation Diagnostics

The ThinkStation Diagnostics solution provides built-in hardware monitoring to track system components and alert you to hardware events in real time.

Diagnostic panel and button

The diagnostic panel automatically reports events even when the Windows or display is unavailable. Use the adjacent button to navigate the panel and manage reported events.



Computer status	Panel and button behavior
No event	**Short press:** Turn the diagnostic panel on or off. • When on, the panel shows the date and time. • The panel turns off automatically after three minutes of inactivity.
Error events occur	The diagnostic panel turns on automatically. • **Short press:** Switch between multiple errors and show the QR code for the selected event. • **Long press (about 3 seconds):** Clear the selected event.

The diagnostic panel behavior can be changed in the UEFI BIOS as follows.

1. Turn on or restart the computer. When the logo screen is displayed, press F1 or Fn+F1 to enter the UEFI BIOS menu.
2. Go to **Advanced → Diagnostics**. Choose to show only the diagnostic error code or both it and the BIOS POST Code. Adjust other settings if needed.

Steps to decode an error

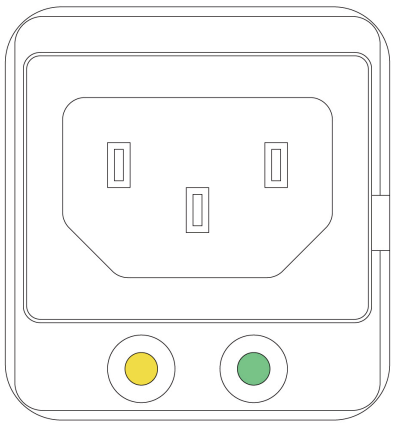
- Method 1: Scan the QR code on the diagnostic panel with your smartphone.
- Method 2: Manually access https://www.thinkworkstationsoftware.com/?view=codes. Record the four-digit error code on the panel and decode it on the website above.

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

LED indicators for troubleshooting

The following LED indicators help you troubleshoot some power-related issues.

1000-watt power connector indicator

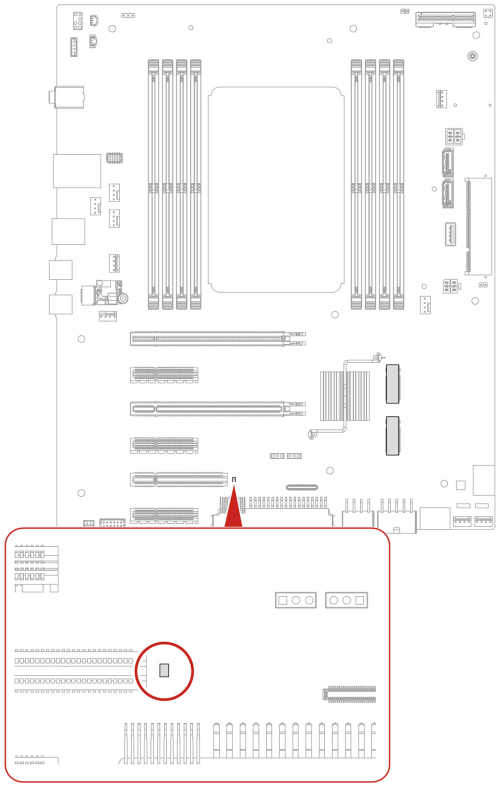


The power connector indicator on the rear panel shows the power status of your computer.

- **Off:** Power is unplugged.
- **Green indicator on:** Power is properly connected and functioning.

- **Yellow indicator on:** Power is improperly connected or not functioning. Check the power connection, power cord, power supply unit (PSU) assembly, or other power-related components.

PSU indicator



When power is connected, open the computer cover and use this indicator to verify PSU status.

- **On:** PSU is functioning.
- **Off:** PSU is not functioning. Follow the provided instructions to replace the PSU assembly or contact Lenovo for support.

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 needed information 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” on page 84.

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.

Self-help resources

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

Resources	How to access?
Lenovo Support Web Site	https://pcsupport.lenovo.com
Tips	https://www.lenovo.com/tips
Lenovo Community	https://forums.lenovo.com
Accessibility information	https://www.lenovo.com/accessibility
Ubuntu help information	https://help.ubuntu.com/lts/ubuntu-help/index.html

Purchase accessories or additional services

This topic provides instructions on how to purchase accessories or additional services.

Accessories

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

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

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 names might vary by country or region.

Accessibility features

Lenovo is committed to making information technology accessible to everyone, including individuals with hearing, vision, mobility, cognitive, or speech disabilities. To get the most up-to-date and detailed accessibility features information for the product, go to https://support.lenovo.com/docs/product_accessibility_features.

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

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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 A. Important notice for Quebec consumers

In regard to section 79.18 of Quebec's Regulation respecting the application of the Consumer Protection Act, Lenovo in no way guarantees the availability of (a) replacement parts; (b) repair services; and (c) information necessary to maintain or repair the goods. For up-to-date information on the technical support and parts available for your purchase, please consult **https://support.lenovo.com/ca/en**.

En ce qui concerne l'article 79.18 du Règlement d'application de la Loi sur la protection du consommateur du Québec, Lenovo ne garantit en aucune façon la disponibilité des éléments suivants :(a) les pièces de rechange; (b) les services de réparation; et (c) les renseignements nécessaires à l'entretien à la réparation du bien. Pour obtenir des renseignements à jour sur le soutien technique et les pièces disponibles pour votre achat, veuillez consulter **https://support.lenovo.com/ca/fr**.

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Appendix B. Notice for USB connector name update

The USB Implementers Forum published a revision of the guideline for USB connector names in September, 2022. Lenovo follows the revised guideline and updates USB connector names accordingly. You can refer to the table below for naming update details.

Current name	Previous name
USB-A connector (Hi-Speed USB)	USB-A 2.0 connector
USB-A connector (USB 5Gbps)	USB-A 3.2 Gen 1 connector
USB-A connector (USB 10Gbps)	USB-A 3.2 Gen 2 connector
USB-A connector (USB 5Gbps, Always On USB)	Always on USB-A 3.2 Gen 1 connector
USB-A connector (USB 10Gbps, Always On USB)	Always on USB-A 3.2 Gen 2 connector
USB-C connector (USB 5Gbps)	USB-C (3.2 Gen 1) connector
USB-C connector (USB 10Gbps)	USB-C (3.2 Gen 2) connector
USB-C connector (USB 20Gbps)	USB 3.2 Gen 2x2
USB-C connector (USB4 20Gbps)	USB 4 Gen 2x2
USB-C connector (USB4 40Gbps)	USB-C (USB 4) connector
USB-C connector (Thunderbolt 3)	USB-C (Thunderbolt 3) connector
USB-C connector (Thunderbolt 4)	USB-C (Thunderbolt 4) connector

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Appendix C. Notices and trademarks

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https://pcsupport.lenovo.com

New Mexico PFAS notice



HEVC standard

This product may support digital video coding under certain versions of HEVC (High Efficiency Video Coding) standard and, if so, may be covered by patents at https://accessadvance.com/advance-patent-lists/.



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