

User Guide

Lenovo
ThinkStation



Lenovo

ThinkStation P5 Gen 2

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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 using this documentation and the product it supports, please read the following information.

- Read these accompanying manuals, which include setup or safety information, if provided.
 - *Setup Guide* or *Setup, Safety, and Warranty Guide* (printed)
 - *Safety and Warranty Guide* (printed)
 - [Generic Safety and Compliance Notices](#)
- 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.
- Microsoft® makes periodic feature changes to the Windows® operating system through Windows Update. As a result, some information in this documentation might become outdated. Refer to Microsoft resources for the latest information.
- Documentation content is subject to change without notice. Lenovo makes constant improvements to the documentation of your computer, including this *User Guide*. To get the latest documentation, go to:
 - For computers purchased in mainland China: <https://iknow.lenovo.com.cn>
 - For computers purchased outside mainland China: <https://support.lenovo.com/documentation>

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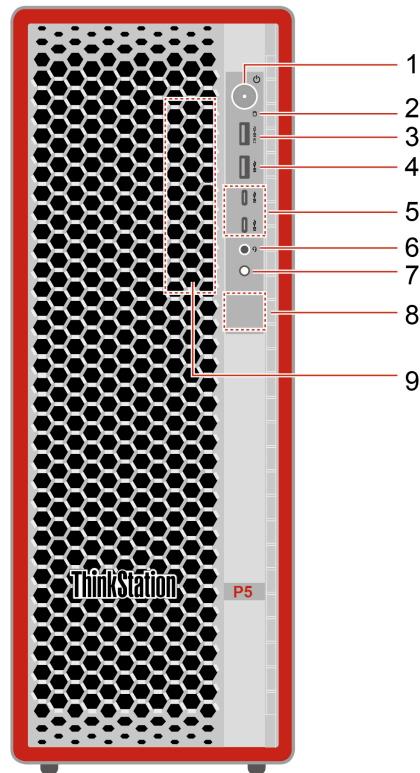
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Chapter 1. Overview

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*		

* 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.

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.

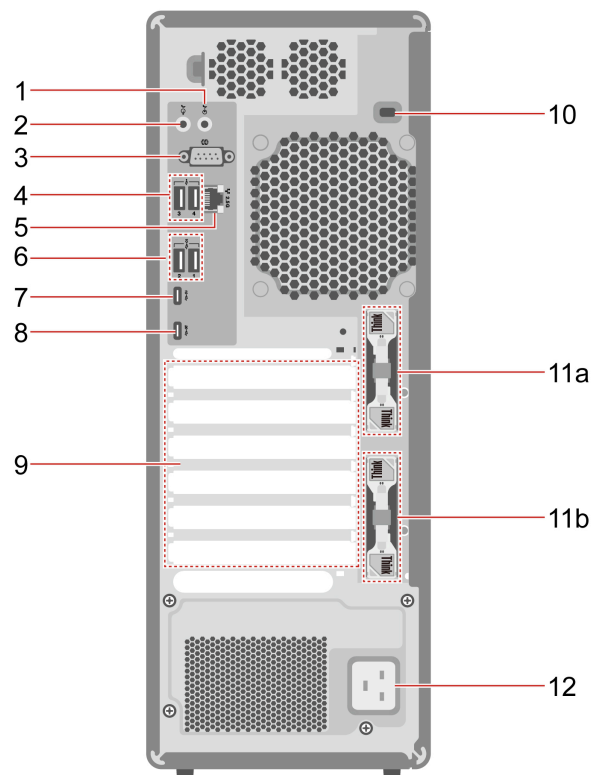
Always On USB feature

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		

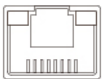
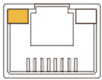
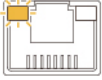
* for selected models

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 model, the video output connectors in the PCIe card area might be HDMI™ connectors, DisplayPort™ connectors, Mini DisplayPort™ connectors, or USB-C connectors (USB4 40Gbps). The maximum output resolution is 7680 × 4320 pixels at 165 Hz.

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

Specifications

Specification	Description
Dimensions	• 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)
Hardware configuration	• Type Device Manager in the Windows search box and then press Enter. Type the administrator password or provide confirmation, if prompted.
Power supply	• 750-watt automatic voltage-sensing power supply • 1000-watt automatic voltage-sensing power supply
Electrical input	• Input voltage: From 100 V ac to 240 V ac • Input frequency: 50/60 Hz
Memory	• Type: DDR5 ECC RDIMM (Double data rate 5, error correction code, registered dual in-line memory module) • Maximum capacity: 1 TB Note: See “System memory speed” on page 5 for more details.
Storage device	• Type: – 3.5-inch hard disk drive (HDD)* – M.2 solid-state drive (SSD)* • Capacity: To view the storage drive capacity of your computer, type Disk Management in the Windows search box and then press Enter. Note: The storage drive capacity indicated by the system is less than the nominal capacity.
Expansion	• SATA drive bays • 3rd SATA drive bay* • Onboard M.2 SSD slots • Front-access storage bay* • PCIe slots • Memory slots
Network features	• Bluetooth* • Ethernet LAN • Wireless LAN*

* for selected models

System memory speed

The system provides eight DIMM slots over four CPU channels, with two slots per channel. Maximum memory speed depends on whether channels are populated with one or two memory modules.

Quantity	Slot	Speed
1	DIMM 3	Up to 6400 MT/s
2	DIMM 3, 8	Up to 6400 MT/s
4	DIMM 3, 6, 1, 8	Up to 6400 MT/s
8	DIMM 3, 6, 1, 8, 4, 5, 2, 7	Up to 5200 MT/s

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

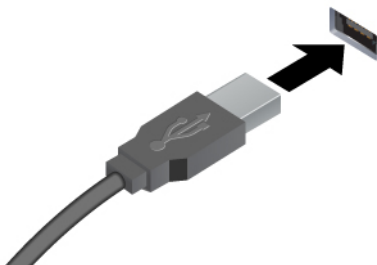
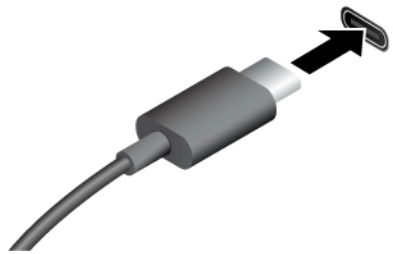
- Operating: From 10°C (50°F) to 35°C (95°F)
- Storage: From -40°C (-40°F) to 60°C (140°F)

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.

Chapter 2. Get started

Connect external displays

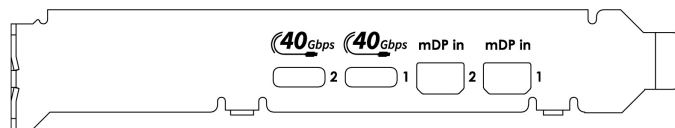
This section guides you through different ways to connect external displays.

Connect wired displays

Your computer supports up to two four-port discrete graphics cards, enabling you to connect a maximum of eight wired displays. You can connect an external display using a compatible adapter plugged into the HDMI, Mini DisplayPort, DisplayPort, or other video output connectors on your device.

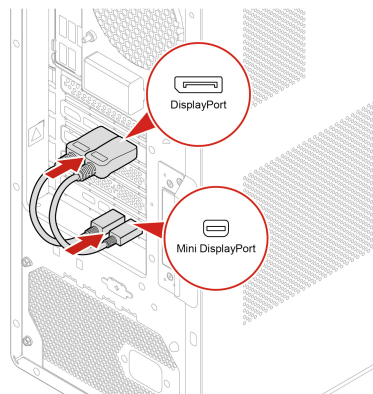
Connect a wired display with a USB4 PCIe card (for selected models)

The USB4 PCIe card has four connectors on the rear panel, as shown below.

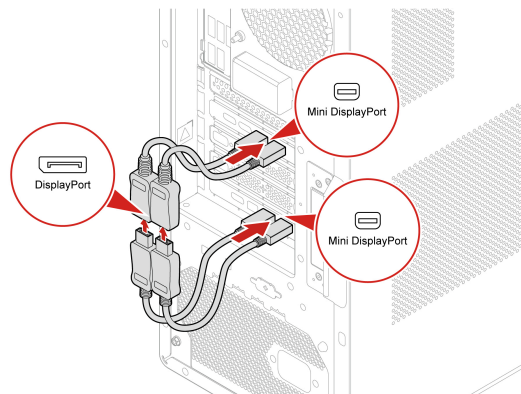


1. Connect DisplayPort (DP) connectors or Mini DisplayPort (mDP) connectors on the graphics card to Mini DisplayPort input (mDP in) connectors on the USB4 PCIe card.

For the graphics card with DisplayPort connectors



For the graphics card with Mini DisplayPort connectors



Notes:

- The mDP-to-DP adapters in the illustrations above are included with either the USB4 PCIe card or the graphics card featuring Mini DisplayPort connectors.
 - Illustrations are for cable connection reference only and may look slightly different from your actual device.
2. Connect your display to the USB-C connectors (USB4 40Gbps) on the USB4 PCIe card.

Connect a wireless display

Ensure that both your computer and the wireless display support Miracast®.

1. Press Windows logo key + K.
2. Select the display you want to connect to, and then follow the on-screen instructions.

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.

Access networks

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

Connect to Wi-Fi networks (for selected models)

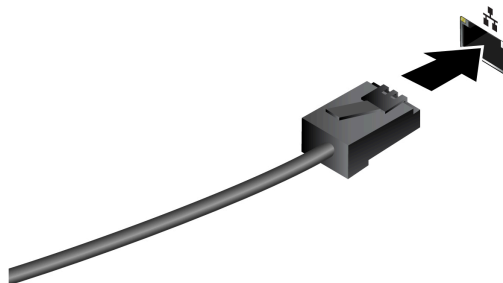
If your computer includes a wireless LAN module, you can connect your computer to Wi-Fi® networks.

1. Click the network icon  on the bottom right of your display to connect to an available network.
2. 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.

Connect to the wired Ethernet

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



Transfer data

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

Connect to a Bluetooth device

You can connect all types of Bluetooth-enabled devices to your computer, such as a keyboard, a mouse, a smartphone, or speakers. To ensure successful connection, place the devices at most 10 meters (33 feet) from the computer.

Conventional pair

This topic helps you connect to a Bluetooth device by conventional pair.

Step 1. Type **Bluetooth** in the Windows search box and then press Enter.

- Step 2. Turn on both the Bluetooth on your computer and the Bluetooth device. Make sure the device is discoverable.
- Step 3. Select the device when it is displayed on the **Add a device** list, and then follow the on-screen instructions.

Notes: If the Bluetooth connection failed, do the following:

1. Type **Device Manager** in the Windows search box and then press Enter.
2. Locate the Bluetooth adapter. Right-click and select **Update driver**.
3. Select **Search automatically for drivers**, and then follow the on-screen instructions.

Swift pair

This topic helps you connect to a Bluetooth device by swift pair.

If your Bluetooth device supports swift pair, do the following:

- Step 1. Enable swift pair notification on Bluetooth settings page.
- Step 2. Turn on both the Bluetooth on your computer and the Bluetooth device. Make sure the device is discoverable.
- Step 3. Click **Connect** when a swift pair notification appears on your computer.

Notes: If the Bluetooth connection failed, do the following:

1. Type **Device Manager** in the Windows search box and then press Enter.
2. Locate the Bluetooth adapter. Right-click and select **Update driver**.
3. Select **Search automatically for drivers**, and then follow the on-screen instructions.

Use a media card

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

Install a media card

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

Remove a media card

Attention: Before removing the card:

1. Click the triangular icon in the Windows notification area to show hidden icons. Right-click the icon prompting you to safely remove hardware and eject media.
2. Select the corresponding item to eject the card from the Windows operating system.
3. Press the card and remove it from your computer. Store the card safely for future use.

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 10 minutes
- Put the computer to sleep: After 25 minutes

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

To set the power plan:

1. Type Power Option in the Windows search box and then press Enter.
2. Choose or customize a power plan of your preference.

The Vantage app (for selected models)

The preinstalled Vantage app is a customized one-stop solution to help you maintain your computer with automated updates and fixes, configure hardware settings, and get personalized support.

To access the Vantage app, type Vantage in the Windows search box.

Key features

The Vantage app enables you to:

- Know the device status easily and customize device settings.
- Download and install UEFI BIOS, firmware and driver updates to keep your computer up-to-date.
- Monitor your computer health, and secure your computer against outside threats.
- Scan your computer hardware and diagnose hardware problems.
- Look up warranty status (online).
- Access *User Guide* and helpful articles.

Notes:

- The available features vary depending on the computer model.
- The Vantage app makes periodic updates of the features to keep improving your experience with your computer. The description of features might be different from that on your actual user interface.

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.

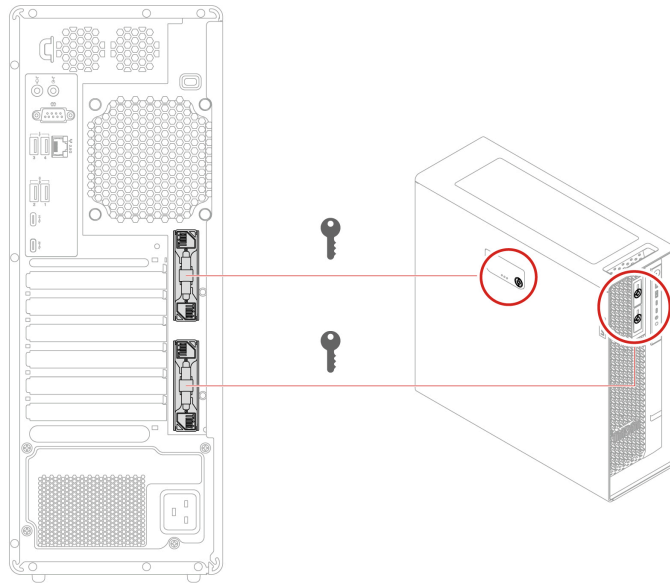
Use physical locks

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)

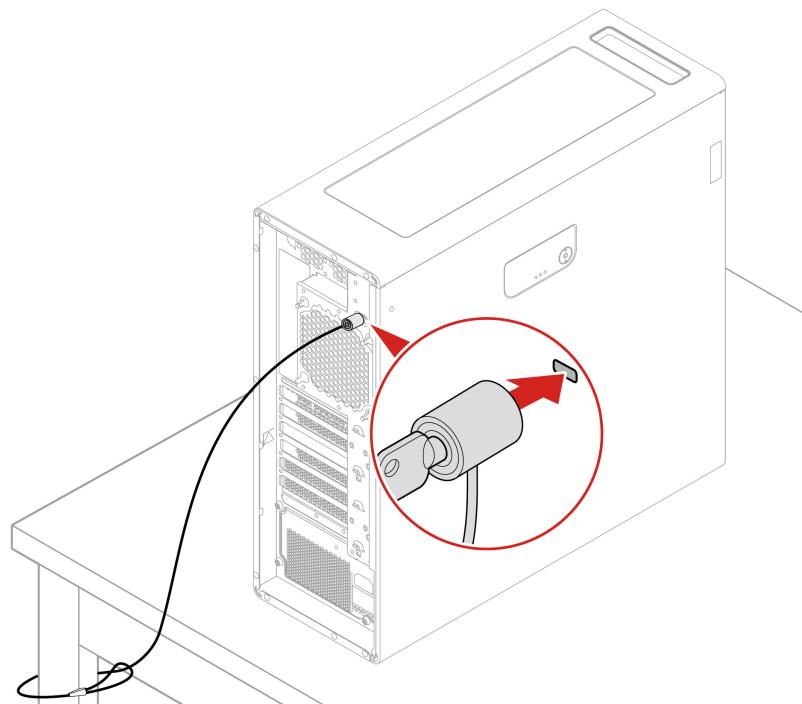
Locking the side cover or front M.2 SSD enclosure with a key lock helps prevent unauthorized access to the inside of your computer or the storage drives.

- 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 software security solutions

The following software solutions help secure your computer and information.

- **Windows Security**

Windows Security is a software built-in to the operating system. It continually scans for malicious software, viruses, and other security threats. Besides, Windows updates are downloaded automatically to help keep your computer safe. Windows Security also enables you to manage tools including firewall, account protection, application and browser control, and so on.

- **Antivirus programs (for selected models)**

Lenovo preinstalls a full-version antivirus software on selected models of computer. It helps defend the computer against viruses, safeguard your identity, and keep your personal information secured.

Note: For more information about how to use these software solutions, refer to their help systems respectively.

Use BIOS security solutions

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

Wipe the storage drive data

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

To wipe the storage drive data:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Security** → **secure wipe** → **Enabled**.
3. Press F10 or Fn+F10 to save the changes and exit.
4. Restart the computer. When the logo screen is displayed, press F12 or Fn+F12.
5. Select **App Menu** → **secure wipe** and press Enter.
6. Select the storage drive you will wipe and click **NEXT**.
7. Select the entire storage drive or partition to wipe as desired.
8. Select the method as desired and click **NEXT**.
9. Click **Yes** to confirm your option when the prompting window is displayed.
10. If you have set a hard disk password for the storage drive, enter the password. Otherwise, set a temporary password following the on-screen instructions. Then, click **NEXT**. The wiping process begins.

Note: Duration of the wiping process varies depending on the storage drive capacity.

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

Cover presence switch

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

To enable 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.

Absolute Persistence (for computers with Windows operating system and purchased outside mainland China)

Absolute Persistence technology is embedded in BIOS. It detects changes that happen on the hardware, software, or the call-in location. It keeps you always knowing what condition the computer is in. To activate the technology, you have to purchase a subscription to Absolute.

UEFI BIOS passwords

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

Password types

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

- Power-on password

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

- Supervisor password

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

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

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

- **Hard disk password (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, change, and remove a password

Before you start, print these instructions.

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

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

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

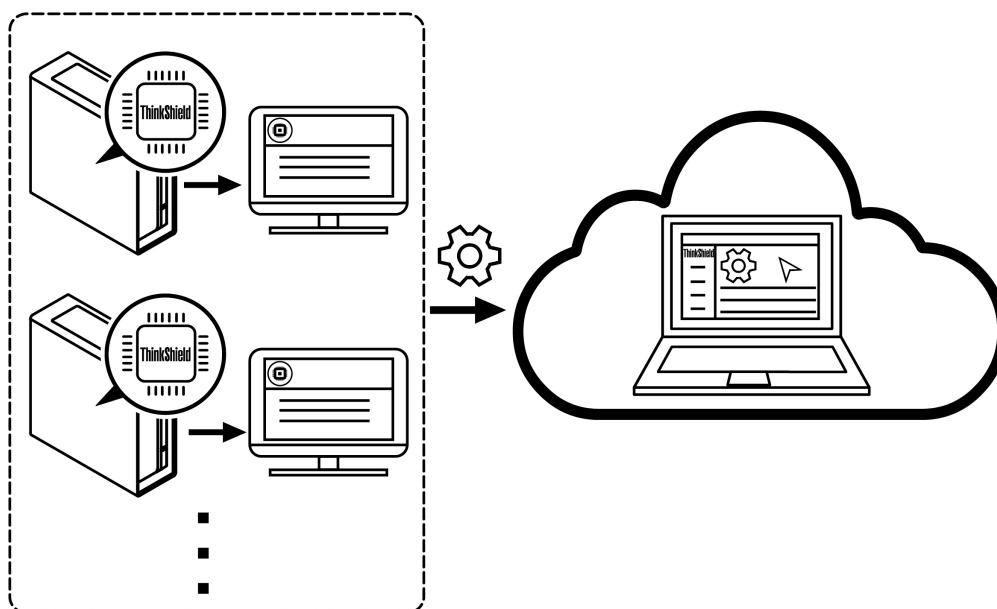
ThinkShield Firmware Assurance

This section introduces ThinkShield Firmware Assurance and shows you how to get started with this security solution.

What is ThinkShield Firmware Assurance

The ThinkShield Firmware Assurance solution provides administrators with below-OS visibility for efficient device protection. It secures system firmware across three integrated layers.

Security area	Feature
ThinkShield security chip	Hardware root of trust that verifies firmware integrity from start, blocks malicious or outdated updates, restores corrupted firmware, and logs changes for quick issue detection and recovery.
FirmwareShield agent	A middleware linking the security chip and cloud securely, enabling seamless communication and offering user-level BIOS event logs visibility.
Cloud console	A centralized platform for administrators to view and manage device fleet security, enabling unified security policy control, real-time firmware checks, and detailed logs access for faster troubleshooting, risk prevention, and streamlined operations.



Get started with the cloud console

After purchasing a license from Lenovo, the administrator of your organization will receive an email with access to the cloud console. Follow the instructions to create an administrator account and log in. Once set up, administrators can onboard devices to the cloud console as follows.

Step 1. Add users to your organization

1. From the navigation menu, select **Configuration and Settings**.
2. Go to **User Management → Users → + Invite a User**.
3. Choose **Manual Invite** or **Bulk Invite**, then follow the on-screen instructions to add one or multiple users.

Step 2. Assign licenses to devices

1. Click your user profile in the top-right corner of the portal.
2. Select **Organization Account**.
3. Open the Licenses tab to view subscription details.
4. Click **Assignments** and follow the instructions to assign licenses to devices.

Step 3. Onboard devices

1. Navigate to **Device Management → Device**.
2. Click **+ Onboard Device**.
3. Follow the on-screen steps to select OS type, onboarding method, installer expiration, and maximum devices. Then click **Download Installer**.
4. UDCSetup.exe (the FirmwareShield Agent installer) will be downloaded. Run it as an Administrator on the target device, either via deployment tools or using a USB drive for offline installation.

After installation is complete, the device will appear in **Device Management → Device** within the console with the status shown as **Active**. This means the device is fully onboarded, provisioned, and actively reporting data to the cloud console for centralized security management.

For more information, refer to <https://thinkshield.lenovocloudsoftware.com/portal/en/kb/thinkshield/firmware-assurance>.

Chapter 3. Explore your computer

AI features

This system combines AI-optimized hardware and intelligent software features to deliver powerful performance across computing, creative, and data-driven tasks.

AI-driven processors

The system is equipped with specialized processors optimized for AI workloads on selected models. These include:

- **Intel Granite Rapids CPU (Central Processing Unit):** Powers everyday computing and accelerates AI workloads with built-in AI instructions for faster machine learning and data processing.
- **NVIDIA Blackwell GPU (Graphics Processing Unit):** Delivers exceptional parallel computing performance, enabling quicker results for creative, scientific, and data-intensive projects.

AI-powered assistants

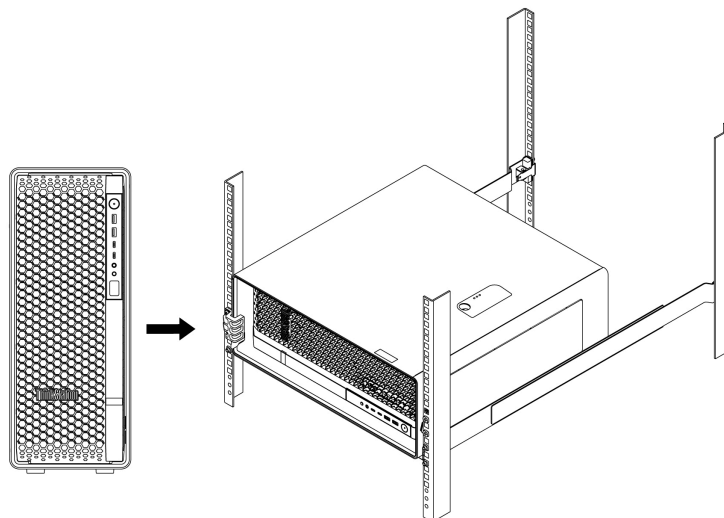
The system comes preinstalled with one or both of the following AI assistant applications to help you work smarter and faster on selected models.

-  **Lenovo AI Now:** Helps you organize files, summarize documents, generate content, and adjust system settings—all while keeping your data secure. For detailed instructions, see the User Guide in the apps' Help Center.
-  **Copilot:** Understands natural language and turns ideas into action—whether you're writing, analyzing data, or creating presentations. For more information, visit the official Microsoft website.

Note: Software features may vary by computer model and be subject to change. Explore the apps based on your actual user interface.

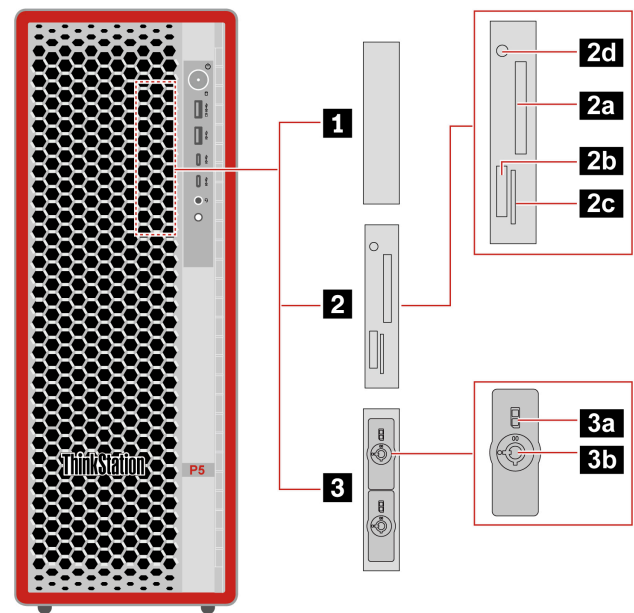
Rack-mounted chassis

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.



Front-access storage bay

The front-access storage bay (also referred to as the flex bay) is designed for versatility. Depending on your computer model, it can accommodate one of the following modules.



Name	Description
1 Dummy cover	A decorative placeholder panel.
2 15-in-1 media card reader module	Features one media card reader LED indicator (2d) and three card slots supporting the following 15 card types: 2a: CompactFlash™ Type I, CompactFlash™ Type II, Microdrive 2b: 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: SD™, SDHC™, SDXC™, SD UHS-II, MultiMediaCard™
3 M.2 SSD enclosure module	Contains two front-access M.2 SSD enclosures, each equipped with the following features. 3a: SSD LED indicators 3b: SSD enclosure lock Note: Always back up important data and power off the system before accessing the enclosures.

Media card reader LED indicator behavior

When the computer is powered on, the LED 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.

SSD LED indicator behavior

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.

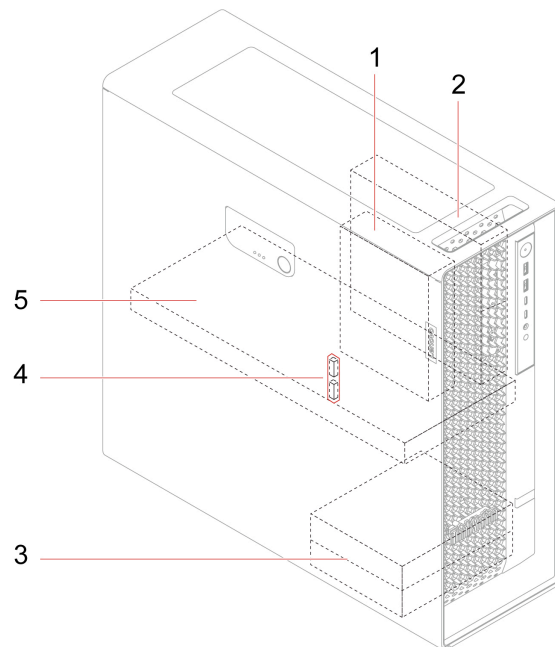
Expansion modules

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.

Supported type



Location	Name	Drive support
4	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)
5	M.2 SSD PCIe adapter*	Up to 4 × 4TB M.2 Gen 5 SSDs (2242, 2260, 2280, 22110)

Location	Name	Drive support
3	Internal SATA drive bays	Up to 2 × 12TB 3.5 SATA3 HDDs
1	3rd SATA drive bay*	Up to 1 × 12TB 3.5 SATA3 HDD

* for selected models

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

Hardware requirements

The following mechanical or thermal parts are required for the storage configuration.

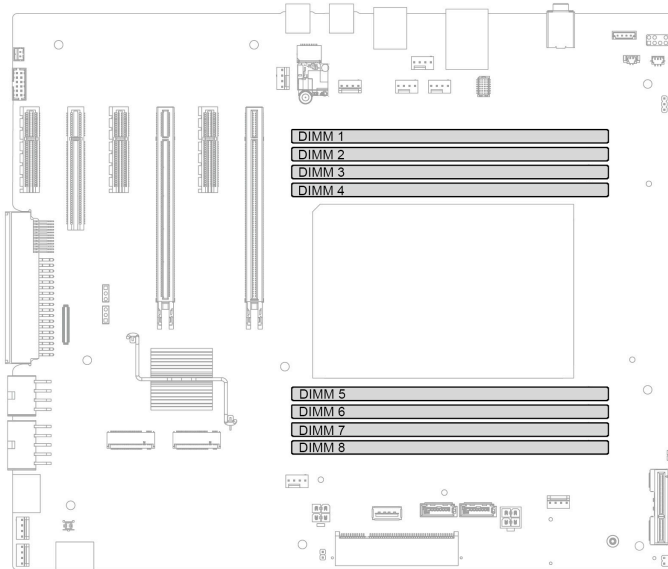
Name	Required parts for the drive installation
Onboard M.2 slots	On-board SSD heat sink kit
Front-access storage bay*	- Flex bay fan - Flex bay cage - M.2 SSD enclosure tray - M.2 SSD enclosures - M.2 SSD enclosure cable - Flex bay cover - Key to the SSD enclosure lock
M.2 SSD PCIe adapter*	- Available PCIe x16 slot - M.2 SSD PCIe adapter
Internal SATA drive bays	- HDD fan - HDD bracket - SATA data cable - SATA power cable
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

Notes:

- Some parts may be included in the system for selected models.
- For part information and installation instructions, refer to the hardware replacement section.

Memory configuration

The system board features eight memory slots across four channels, supporting high-capacity modules to handle demanding workloads.



Supported type

- Type: DDR5 ECC RDIMM (Double data rate 5, error correction code, registered dual in-line memory module)
- Capacity: 16 GB, 32 GB, 64 GB, or 128 GB per module
- Quantity: 1, 2, 4, or 8

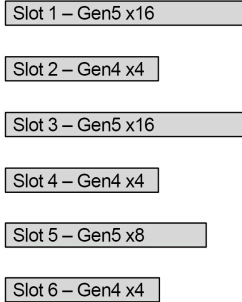
Configuration rules

- Multiple modules in one system must be identical in type and capacity.
- Modules must be installed only in the quantities, slots, and sequence specified below.

Quantity	Slot and order
1	DIMM 3
2	DIMM 3, 8
4	DIMM 3, 6, 1, 8
8	DIMM 3, 6, 1, 8, 4, 5, 2, 7

PCIe configuration

The system provides six onboard PCIe slots, supporting a wide range of high-performance expansion cards.



Supported type

- Graphics card such as NVIDIA RTX Pro or NVIDIA GeForce graphics card
- Storage adapter such as ThinkStation M.2 SSD PCIe adapter
- RAID adapter such as Broadcom 940-8i RAID card
- Ethernet adapter such as Intel E610-T4 Ethernet Adapter
- ThinkStation BMC card
- Additional PCIe devices such as NVIDIA RTX Pro Sync board, 4-port serial adapter, and dual PS/2 PCIe adapter

Note: PCIe options can vary by system power, thermal capacity, and mechanical layout.

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.
- Populate the PCIe slots in the following priority order.
 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)
- Install the following PCIe cards (if present) only in their designated slots.

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

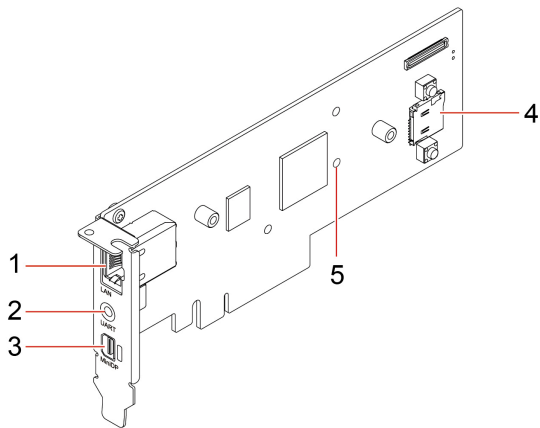
BMC card (for selected models)

This section provides information of the Baseboard Management Controller (BMC) card, including its functions, overview, setup, password management, and firmware update.

What is BMC

The Baseboard Management Controller (BMC) is a dedicated hardware component that enables out-of-band remote management of a system. Through a web-based interface, it allows administrators to monitor, configure, and troubleshoot systems remotely, even when the OS is offline or the machine is powered off.

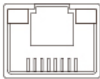
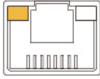
BMC card overview

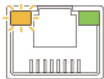
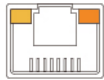


Item	Name	Description
1	Ethernet connector with indicators	The Ethernet connector provides remote access to the host system’s interface and supports data transfer speeds of 10, 100, or 1000 Mbps.
2	UART connector	The UART connector is disabled and reserved for future use.
3	Mini DisplayPort out connector	Serving as the BMC’s video output connector, it supports a maximum output resolution of 1920 × 1200 pixels at 60 Hz.
4	MicroSD slot	You can install a microSD card (capacity up to 2 TB) in the microSD slot as local media of BMC.
5	Firmware LED indicator	It shows whether the firmware is functional (see details below).

Ethernet connector indicators

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

LED status	Indication
	The Ethernet is not connected yet.
	The 10-Mbps Ethernet is connected, ready for transferring data.
	The 10-Mbps Ethernet is transferring data.
	The 100-Mbps Ethernet is connected, ready for transferring data.

LED status	Indication
	The 100-Mbps Ethernet is transferring data.
	The 1000-Mbps Ethernet is connected, ready for transferring data.
	The 1000-Mbps Ethernet is transferring data.

Firmware LED behavior

When the LED status indicates , it means the firmware works well.

When the LED is off, it means the firmware does not work. To solve the problem, do the following:

1. Ensure that the cable is correctly connected to the BMC card and to the system board.
2. Ensure that the BMC card is correctly installed.
3. If the LED is still off, replace the BMC card with a new one.

Get started with BMC

This section describes how to set up and access the BMC.

- Step 1. Connect your computer to a local network with an Ethernet cable through the Ethernet connector on the BMC card.
- Note:** Ensure that the host computer and client computers are in the same local area network.
- Step 2. Connect the power cables and turn on your computer. Wait around three minutes for initial startup. The initial startup takes approximately three to four minutes, and subsequent startups take about one minute. Wait patiently while the power indicator blinks during startup.
- Step 3. Obtain the dynamic IP address (for example: 10.176.7.xxx) from either the client BIOS or router port management interface.
- Step 4. On the host computer, open a web browser and navigate to the IP address using the HTTPS protocol (for example: <https://10.176.7.xxx/#login>).
- Step 5. For initial access, input the username (default: admin) and password (default: admin or PASSWORD!@), then change your password when prompted.
- Step 6. Log in with your username and new password.
The BMC remote management console will appear, where you can access all settings, sensors, and features of the BMC.

BMC remote management console

The ThinkStation BMC remote management console offers various functions, including but not limited to the following. For details, refer to https://support.lenovo.com/docs/bmc_web_guide.

- View and monitor the following information:
 - Overall status
 - Relevant information of sensors
 - System inventory
- Access the following basic configurations:

- Logs and reports
- Configuration settings
- Access the following advanced configurations:
 - Video recording
 - Remote control
 - Virtual media configuration
 - Maintenance tasks, including backing up configuration items, restoring configuration files, updating firmware, and so on.

Manage the BMC password

You can manage BMC passwords in the following methods to prevent unauthorized access to your computer.

- UEFI BIOS
- The BMC remote management console
- IPMI command

Update the BMC firmware

You can update the BMC firmware to the latest depending on your needs.

- Step 1. Go to https://support.lenovo.com/docs/bmc_fw_ts_x576 and follow the on-screen instructions to select and download the corresponding firmware installation package.
- Step 2. Log in to the BMC remote management console on the host computer.
- Step 3. Click **Maintenance → Firmware Update** and select the latest firmware installation package you prepared.
The firmware will be updated automatically. Your BMC card will automatically restart when the firmware update is completed.

RAID

RAID overview

RAID (Redundant Array of Independent Disks) technology combines multiple storage drives into a single logical unit to improve performance, reliability, or both. Depending on your model, your system could support one or more of the following RAID technologies.

- **Rapid Storage Technology Enterprise (RSTe):** Chipset-based SATA RAID with enterprise features for reliable general storage.
- **Virtual RAID on CPU (VROC):** CPU-direct NVMe RAID for low-latency, high-throughput workloads.
- **Discrete RAID card:** Dedicated RAID processor improves performance. Optional CacheVault protects cached data during power loss.

The table below outlines the supported drive types, RAID levels, and strip sizes for each technology.

Technology	Drive type	RAID level	Strip size
RSTe	SATA HDDs	RAID 0, 1, 5	- RAID 1: 4 KB, 8 KB, 16 KB, 32 KB, 64 KB, or 128 KB - RAID 5: 16 KB, 32 KB, 64 KB, or 128 KB
VROC	NVMe SSDs	- Basic key: RAID 0, 1, 10 - Premium key: RAID 0, 1, 5, 10	- RAID 0: 4 KB, 8 KB, 16 KB, 32 KB, 64 KB, or 128 KB - RAID 5: 16 KB, 32 KB, 64 KB, or 128 KB - RAID 10: 4 KB, 8 KB, 16 KB, 32 KB, or 64 KB
RAID card	SATA HDDs	RAID 0, 1, 5	- RAID 0: 64 KB, 128 KB, 256 KB, 512 KB, or 1 MB - RAID 5: 64 KB, 128 KB, 256 KB, 512 KB, or 1 MB

RAID levels

- **RAID 0 (Striping):** Maximizes capacity and performance without data redundancy.
- **RAID 1 (Mirroring):** Provides data redundancy by duplicating data across drives with full fault tolerance.
- **RAID 5 (Parity):** Balances performance with redundancy using distributed parity; requires at least 3 drives.
- **RAID 10 (Striped mirrors):** Combines mirroring and striping for high performance and strong redundancy; requires at least 4 drives.

Important notes before configuring RAID

- Back up all important data before configuring RAID.
- Do not mix drives of different types or capacities within the same RAID array.
- RAID 0 does not support any data redundancy. Use RAID 0 with caution. If a drive in the RAID 0 array fails, the data will be lost, and there is no way to recover it.
- Microsoft Windows 11 does not support booting from traditional magnetic hard disk drives (HDDs).

Configure RAID with RSTe

Enable RAID

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Devices → Storage Setup** and press Enter.
3. Select **Configure SATA as** and press Enter. Then, select **RAID** and press Enter.
4. Press F10 or Fn+F10 to save the changes and exit.

Create a RAID volume

Attention: All the existing data stored on the selected drives will be erased while the RAID volume is being created.

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Advanced → Intel(R) VROC SATA Controller** and press Enter.
3. Select **Create RAID Volume** and press Enter. The Create RAID Volume window is displayed.
4. Select and configure the options one by one.
 - a. **Name:** You can use the default name **Volume0** or type a preferred name for the RAID volume.
 - b. **RAID Level:** You can set the RAID level to one of the following:
 - **RAID0**

- **RAID1**
- **RAID5**

Note: Some of the RAID levels might not be displayed because the number of installed SATA storage drives varies.

- Select Disks:** Select a storage drive and press Enter. Then, select **X** and press Enter to add it to a group.
 - Strip Size** (if applicable): Select a strip size and press Enter.
 - Capacity:** Customize the capacity of the RAID volume. The default RAID volume is the largest value.
- Select **Create Volume** and press Enter to create a RAID volume.
 - Exit the BIOS menu.

View the information about a RAID volume

- Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
- Select **Advanced → Intel(R) VROC SATA Controller** and press Enter.
- Under **RAID Volumes**, select a RAID volume and press Enter to view the detailed information.
- Press F10 or Fn+F10 to save the changes and exit.

Delete a RAID volume

Attention: All the existing data stored on the selected drives will be erased after you delete RAID volumes.

- Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
- Select **Advanced → Intel(R) VROC SATA Controller** and press Enter.
- Under **RAID Volumes**, select the RAID volume that you want to delete and press Enter. The RAID VOLUME INFO window is displayed.
- Select **Delete** under **Volume Actions** and press Enter. When prompted, select **Yes** and press Enter to confirm the deletion of the selected RAID volume.
- Press F10 or Fn+F10 to save the changes and exit.

Configure RAID with VROC

Hardware requirements

A VROC key module is installed on the dedicated VROC header on the system board.

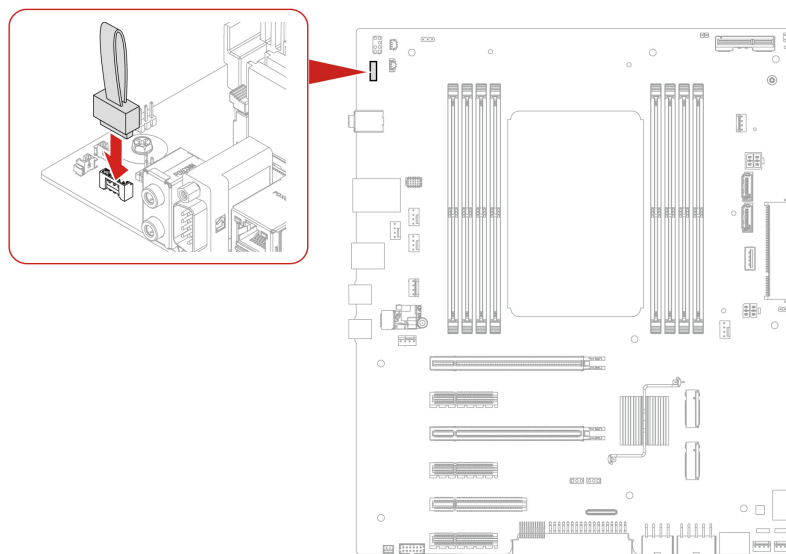


Figure 1. Install a VROC key to the system board

Enable RAID

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Devices** → **Storage Setup** → **Intel(R) VMD technology** and press Enter.
3. Select each menu item and press Enter. Then, select **Enabled** and press Enter.
4. Select an occupied M.2 solid-state drive slot as you need and press Enter. Then, select **VMD** and press Enter.
5. Press F10 or Fn+F10 to save the changes and exit.

Create a RAID volume

Attention: All the existing data stored on the selected drives will be erased while the RAID volume is being created.

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Advanced** → **Intel Virtual RAID on CPU** and press Enter.
3. Select **All Intel VMD Controllers** and press Enter.
4. Select **Create Volumes** and press Enter.
5. Select and configure the options one by one.
 - a. **Name:** You can use the default name **Volume0** or type a preferred name for the RAID volume.
 - b. **RAID Level:** You can set the RAID level to one of the following:
 - RAID0
 - RAID1
 - RAID10
 - RAID5

Note: Some of the RAID levels might not be displayed because the number of installed M.2 solid-state drives and the model of the upgrade key module vary.

- c. **Select Disks:** Select an M.2 solid-state drive and press Enter. Then, select **X** and press Enter to add it to a group.
 - d. **Stripe Size** (if applicable): Select a stripe size and press Enter.
 - e. **Capacity:** Customize the capacity of the RAID volume. The default RAID volume is the largest value.
6. Select **Create Volume** and press Enter to create a RAID volume.
 7. Exit the BIOS menu.

View the information about a RAID volume

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Advanced → Intel Virtual RAID on CPU** and press Enter.
3. Under **RAID Volumes**, select a RAID volume and press Enter to view the detailed information.
4. Press F10 or Fn+F10 to save the changes and exit.

Delete a RAID volume

Attention: All the existing data stored on the selected drives will be erased after you delete RAID volumes.

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Advanced → Intel Virtual RAID on CPU** and press Enter.
3. Select **Intel VROC Managed Volumes** and press Enter.
4. Under **Volume Actions**, select **Delete** and press Enter.
5. When prompted, select **Yes** and press Enter to confirm the deletion of the selected RAID volume.
6. Press F10 or Fn+F10 to save the changes and exit.

Configure RAID with the RAID card

Hardware requirements

- A compatible discrete RAID card is installed in your computer.
- Supercapacitor module is installed for cache protection.
- HDDs used for RAID configuration are installed and connected to the RAID card.

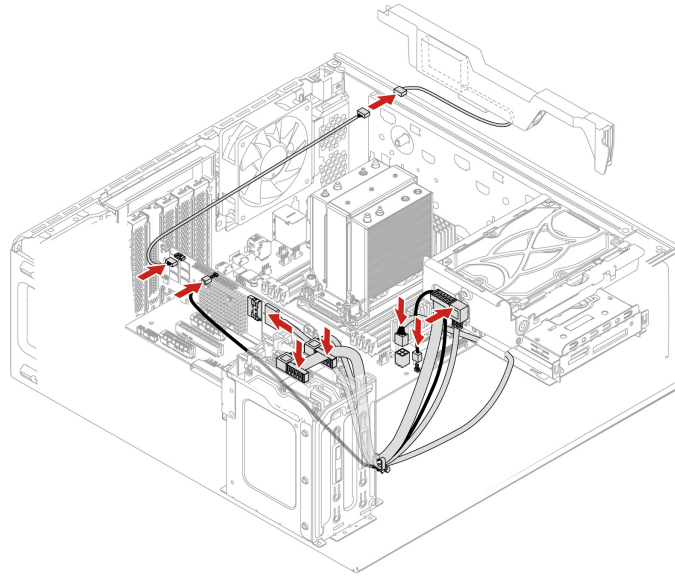


Figure 2. Cable routing for Broadcom 940-8i RAID card

Create a RAID volume

Attention: All the existing data stored on the selected drives will be erased while the RAID volume is being created.

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Advanced** → **MegaRAID Configuration Utility** and press Enter.
3. Select **Main Menu** and press Enter.
4. Select **Configuration Management** and press Enter.
5. Select **Create Virtual Drive** and press Enter.
6. Select and configure the options one by one.
 - a. **Select RAID Level:** You can set the RAID level to one of the following:
 - **RAID0**
 - **RAID1**
 - **RAID5**
 - Note:** Some of the RAID levels might not be displayed because the number of installed storage drives and the model of the MegaRAID adapter vary.
 - b. **Select Drives From:** Select **Unconfigured capacity** or **Free capacity** depending on your needs and press Enter.
 - c. **Select Drives:** Select a storage drive and press Enter. After selecting all storage drives for creating the RAID volume, select **Apply Changes** and press Enter. When promoted, select **Confirm** and press Enter. Then, select **Yes** and press Enter to save the storage drive selection. Finally, select **OK** and press Enter.
 - d. **Virtual Drive Name:** You can type a preferred name for the volume name.
 - e. **Strip Size** (if applicable): Select a strip size and press Enter.
7. Select **Save Configuration** and press Enter. When promoted, select **Confirm** and press Enter. Then, select **Yes** and press Enter to confirm the creation of the RAID volume.
8. Press F10 or Fn+F10 to save the changes and exit.

View the information about a RAID volume

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Advanced → MegaRAID Configuration Utility** and press Enter.
3. Select **Main Menu** and press Enter.
4. Select **Virtual Drive Management** and press Enter.
5. Select a RAID volume and press Enter to view the detailed information.
6. Press F10 or Fn+F10 to save the changes and exit.

Virtual drive state

Virtual drive can be in one of the following states:

State	Display in the output of StorCLI commands	Virtual drive status
Optimal	optl	All members of the virtual drive are online.
Partially Degraded	Pdgd	The virtual drive is capable of sustaining more than one member drive's failure. Currently, only a RAID 6 or RAID 60 virtual drive can be partially degraded.
Degraded	dgrd	One or more member drives have failed. The virtual drive can no longer sustain a subsequent drive failure.
Offline	OfLn	One or more member drives have failed. Virtual drive data has lost.

CAUTION:

Continuously monitor the RAID volume status to save drives from undesired data loss. If there is any drive failure, remove the failing drive and install a new one.

Delete a RAID volume

Attention: All the existing data stored on the selected drives will be erased after you delete RAID volumes.

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Advanced → MegaRAID Configuration Utility**.
3. Select **Main Menu** and press Enter.
4. Select **Virtual Drive Management** and press Enter.
5. Select the RAID volume that is not needed and press Enter.
6. Under **Operation**, select **Delete Virtual Drive** and press Enter.
7. Select **Go** and press Enter. When prompted, select **Confirm** and press Enter. Then, select **Yes** and press Enter to delete the RAID volume.
8. Press F10 or Fn+F10 to save the changes and exit.

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.

To explore the detailed settings:

- For computers purchased in mainland China
You can contact Lenovo Customer Support Center as shown at <https://newsupport.lenovo.com.cn/contacts.html>.
- For computers purchased outside mainland China
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:

From the Vantage app

Follow the instructions to update the UEFI BIOS from the Vantage app.

- Step 1. Open the Vantage app, and then click **Device → System Update**.
- Step 2. If the latest UEFI BIOS update package is available, follow the on-screen instructions to download and install the package.

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.

From the Windows Update

Follow the instructions to update the UEFI BIOS from the Windows Update.

- Step 1. Type **Settings** in the Windows search box and press Enter.
- Step 2. Click **Windows Update → Check for Updates**.
- Step 3. If a BIOS update package appears in your update list, click **Download or Install** to initiate the update.

Remote update via Windows Remote Desktop

- Step 1. Establish a Remote Desktop Protocol (RDP) connection to the target computer.
- Step 2. Through the RDP interface, remotely update the UEFI BIOS using one of the following methods:
 - “From the Vantage app” on page 33
 - “From the Lenovo Support Web site” on page 33
 - “From the Windows Update” on page 33
- Step 3. After installation, the system will automatically reboot multiple times (around 20 minutes). The remote connection will terminate during reboots — reconnect after the final reboot to verify successful update.

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.

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.

Change BIOS settings before installing a new operating system

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

Microsoft constantly makes updates to the Windows operating system. Before installing a particular Windows version, check the compatibility list for the Windows version. For details, go to:

To change the BIOS settings:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. From the main interface, select **Security** → **Secure Boot** and press Enter.
3. Depending on the operating system to be installed, do one of the following:
 - To install a Windows 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.

Reset system to factory default

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

1. Restart the computer. When the logo screen is displayed, press F1 to enter the UEFI BIOS menu.
2. Select **Security** → **Reset system to Factory Default** and press Enter.
3. Several warning windows might be displayed. Do the following before resetting the system to the factory default settings:
 - a. Deactivate the Absolute Persistence Module.
 - b. Remove the NVMe password if you have set one.
4. For computer models with RAID settings, a window is displayed to remind you of data damage. Select **Yes** to proceed.
5. A window is displayed to confirm all UEFI BIOS settings will be reset. Select **Yes** to proceed.

Note: If the **Intel AMT control** and **Absolute Persistence(R) Module** are permanently disabled, these settings cannot be reset successfully.

6. Enter the supervisor password, system management password or power-on password in the window prompted.

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

View UEFI BIOS Event logs

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

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

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

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

Chapter 5. CRU replacement

Before CRU 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:

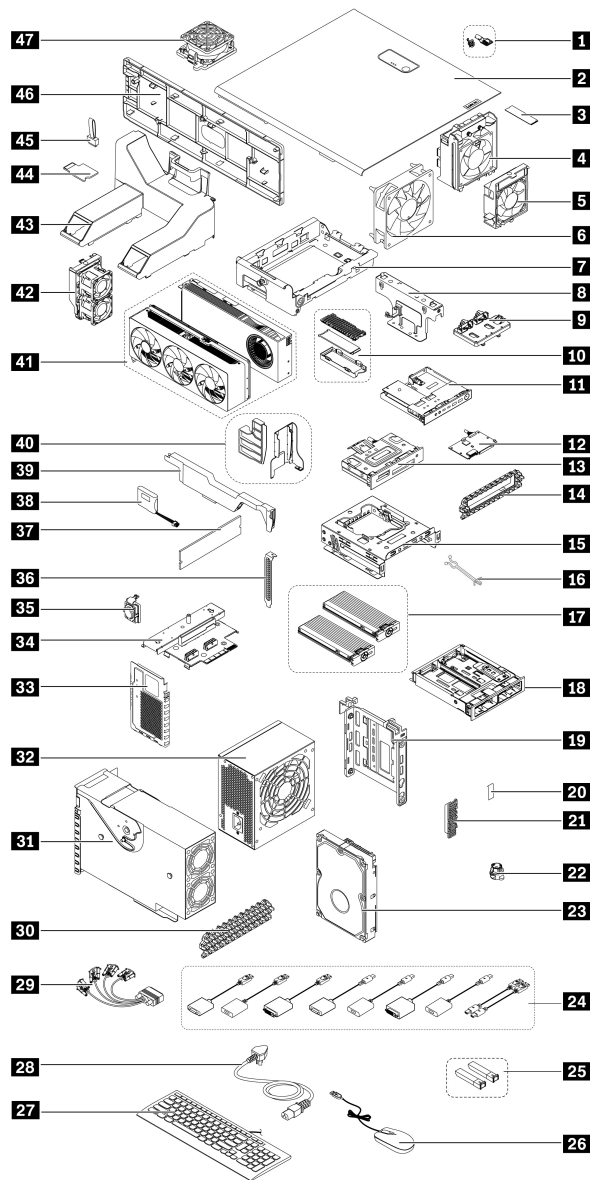
- **Self-service CRUs:** Refer to parts that can be replaced easily by customers themselves or by trained service technicians at an additional cost.
- **Optional-service CRUs:** Refer to parts that can be replaced by customers with a greater skill level. Trained service technicians can also provide service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

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*

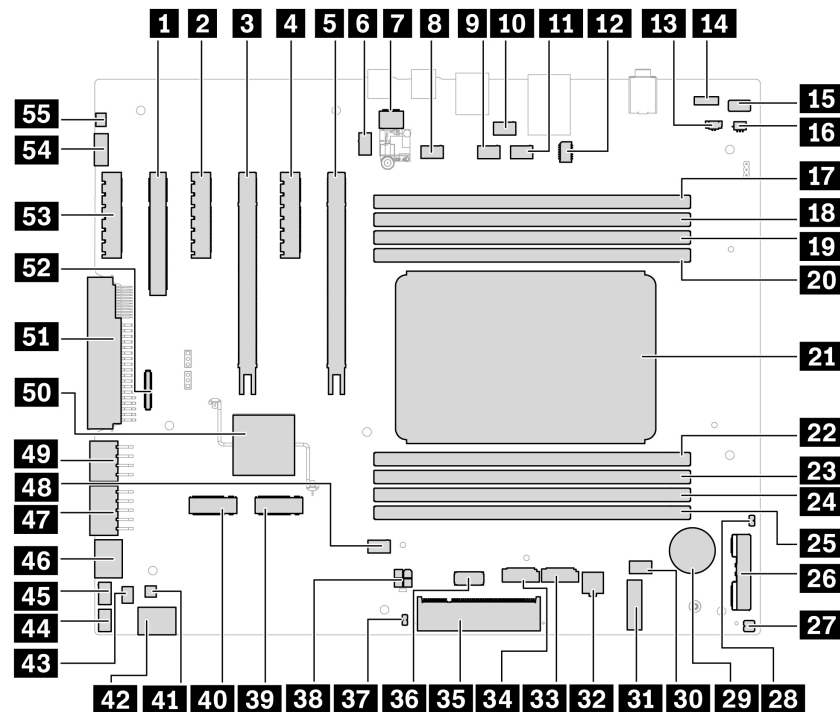
Optional-service CRUs:

- 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.



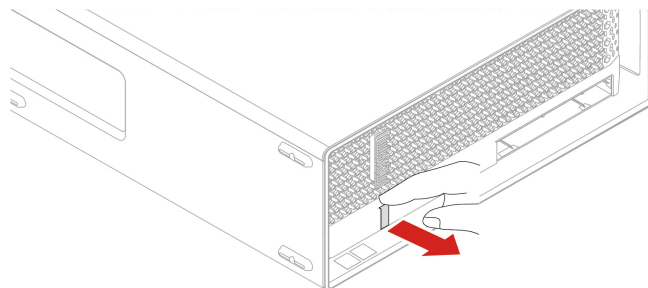
Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

ID badge

Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

Step 1. Pry up and remove the ID badge.



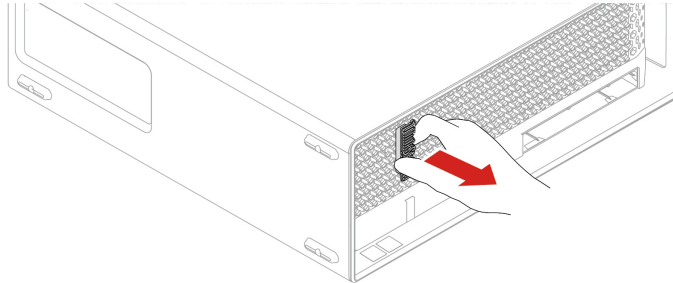
Step 2. Install the removed parts and cables in reverse order.

ThinkStation logo badge

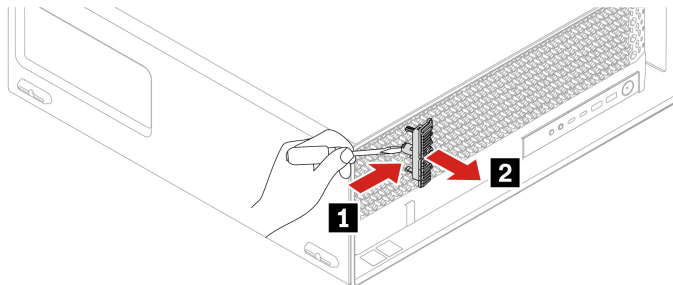
Before you start, read “Prerequisites for hardware replacement” on page 41.

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.



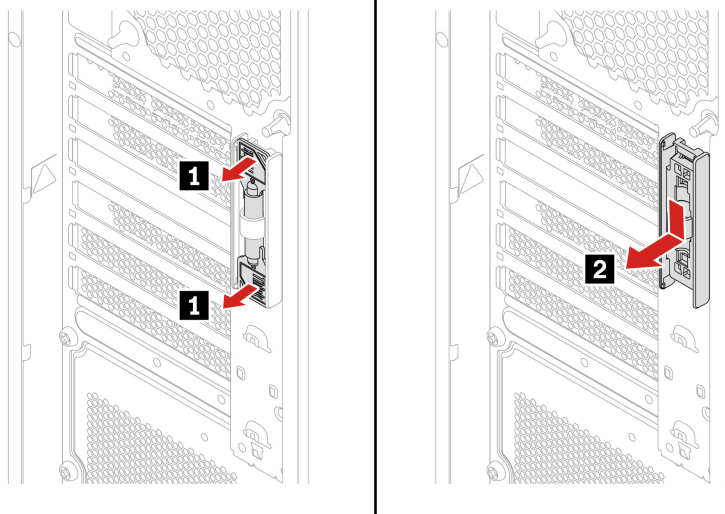
Step 3. Install the removed parts and cables in reverse order.

Keys and key bracket

Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

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



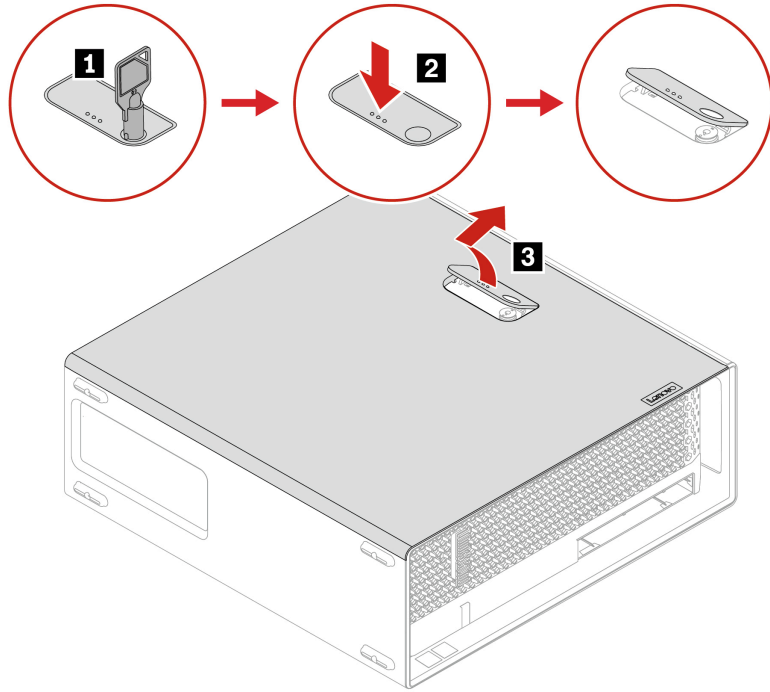
Step 2. Install the removed parts in reverse order.

Side cover

Before you start, read “Prerequisites for hardware replacement” on page 41.

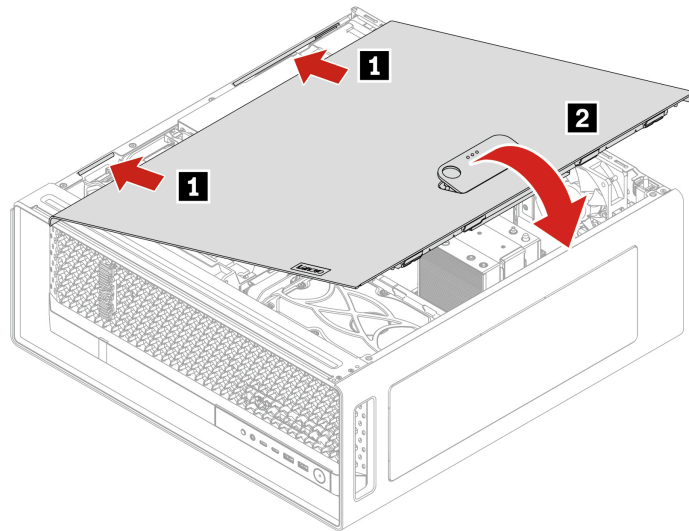
Replacement steps

- 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.

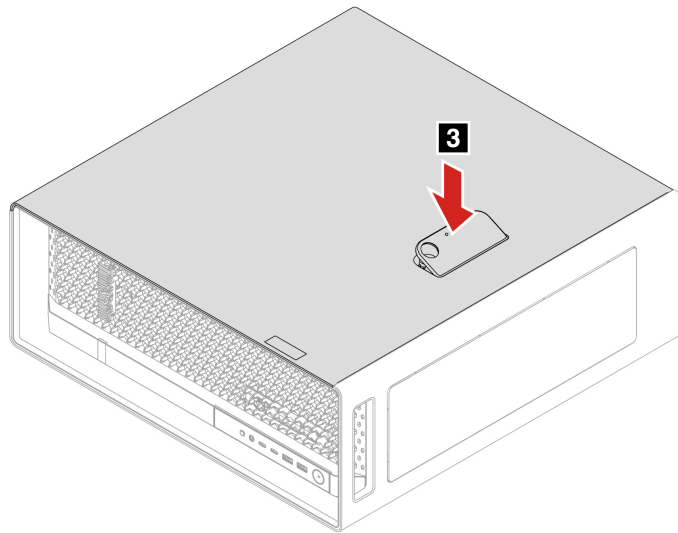


Step 4. Install the side cover.

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.

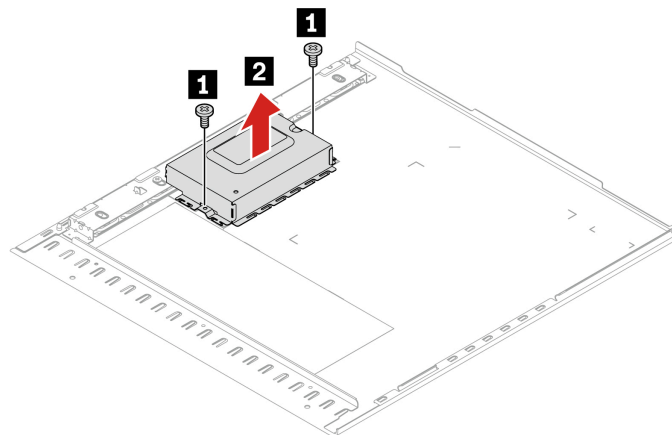
Lock for the side cover

Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

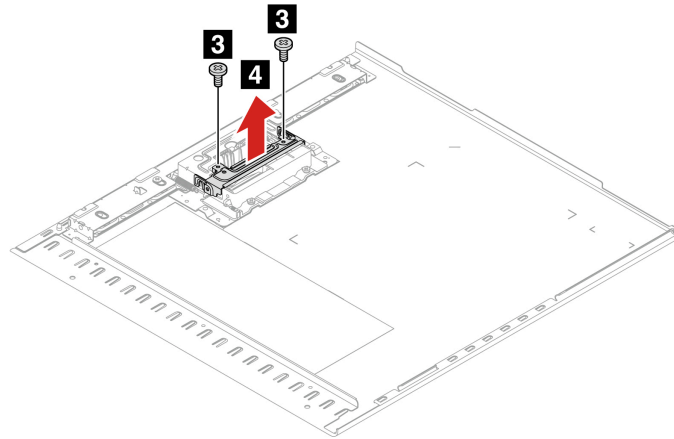
Step 1. Remove the “Side cover” on page 44.

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



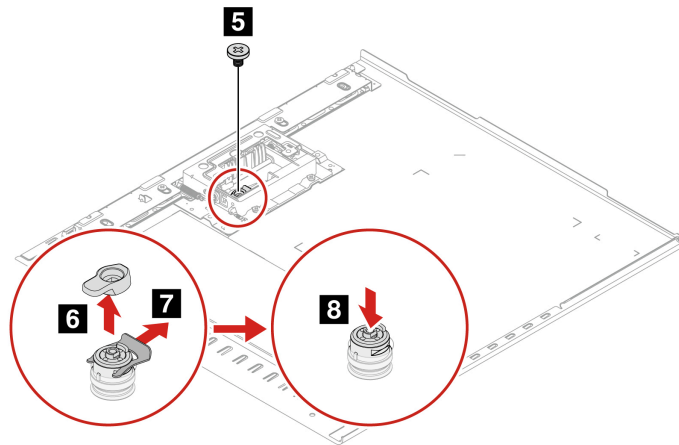
Location	Thread (mm)	Length (mm)	Torque (lbf-in)	Color	Quantity
1	M3	L3	5.0 ± 0.5	Silver	2

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.

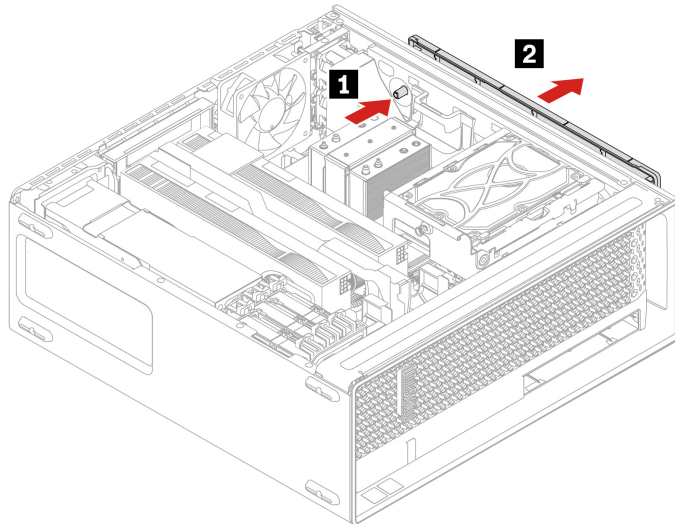
Top cover

Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

Step 1. Remove the “Side cover” on page 44.

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.

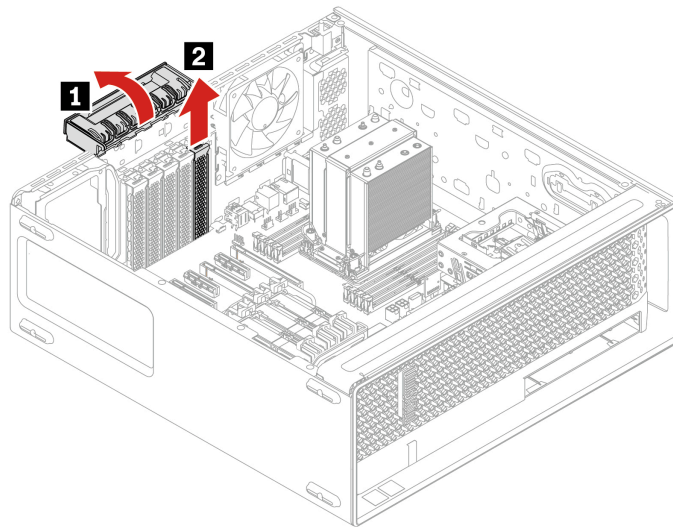
PCIe bracket

Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

Step 1. Remove the “Side cover” on page 44.

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

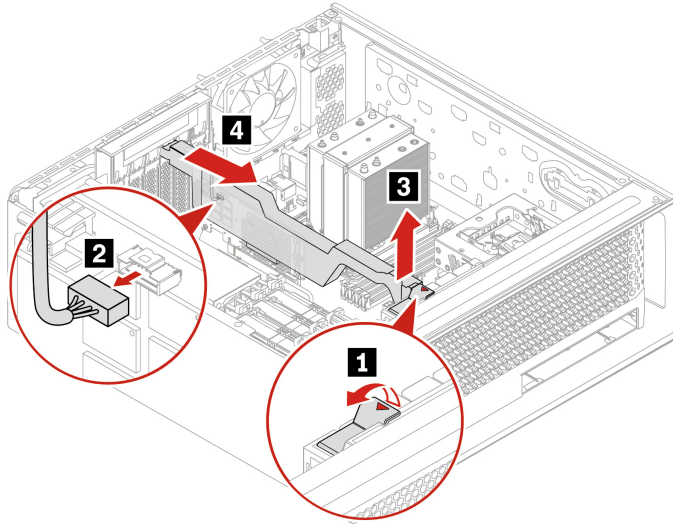
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

Step 1. Remove the “Side cover” on page 44.

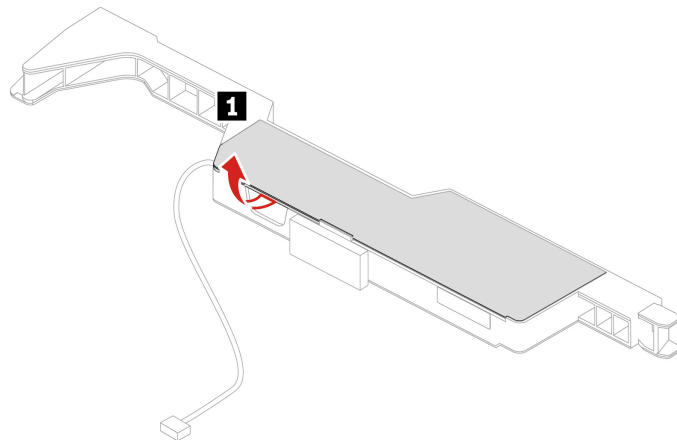
Step 2. Remove the PCIe top retention holder.

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.

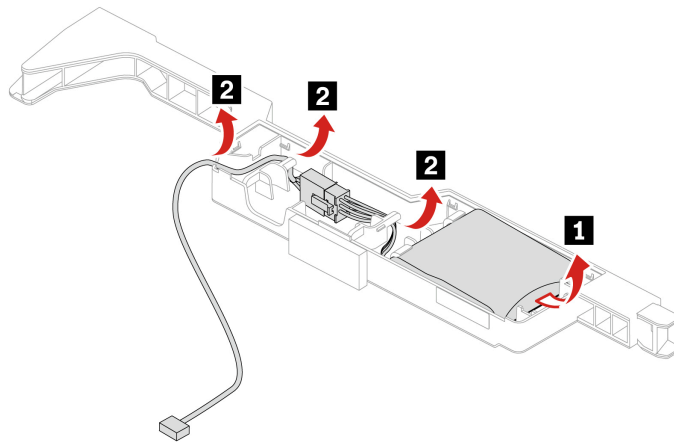


Step 3. Remove the supercapacitor module and cable.

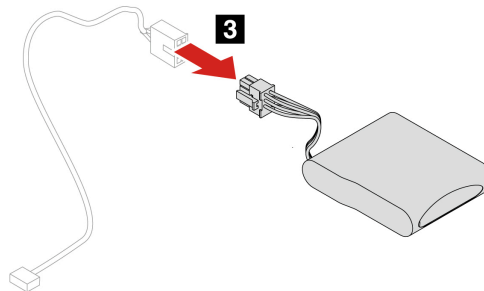
1. Pry open the PCIe top retention holder cover.



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 41
- “PCIe configuration” on page 21
- “PCIe cable connection” on page 54

Replacement steps

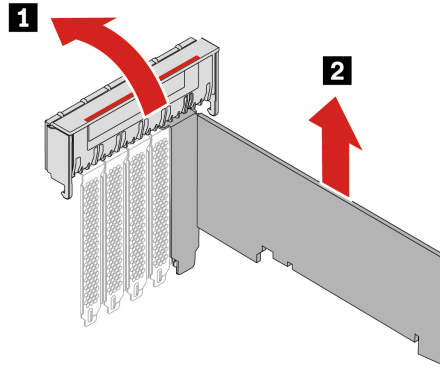
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 44
- “PCIe top retention holder and supercapacitor module” on page 49

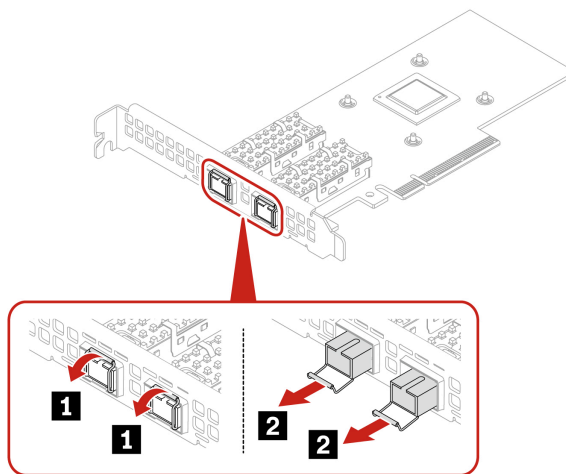
Step 2. Disconnect any cables connected to the PCIe card, if applicable.

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 41
- “PCIe configuration” on page 21
- “PCIe cable connection” on page 54

Replacement steps

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

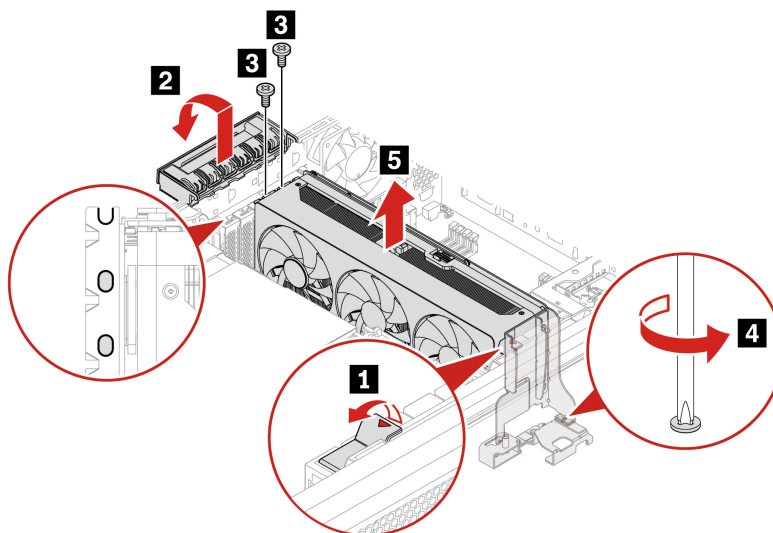
- “Side cover” on page 44
- “PCIe top retention holder and supercapacitor module” on page 49

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.

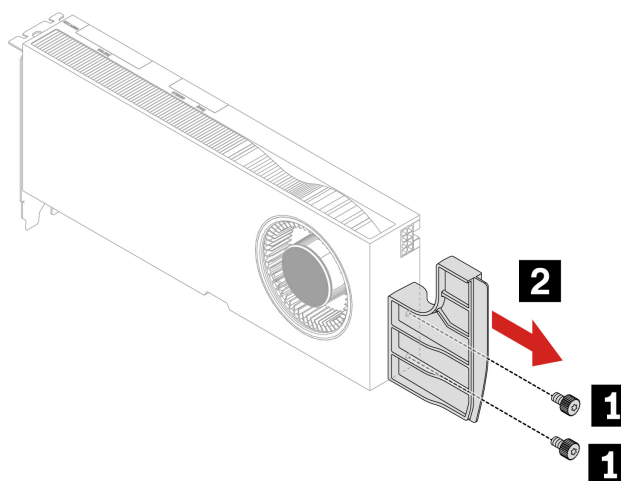
Note: The card might fit tightly into the slot. If necessary, alternately move each side of the card a small amount until the card is removed from the slot.



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

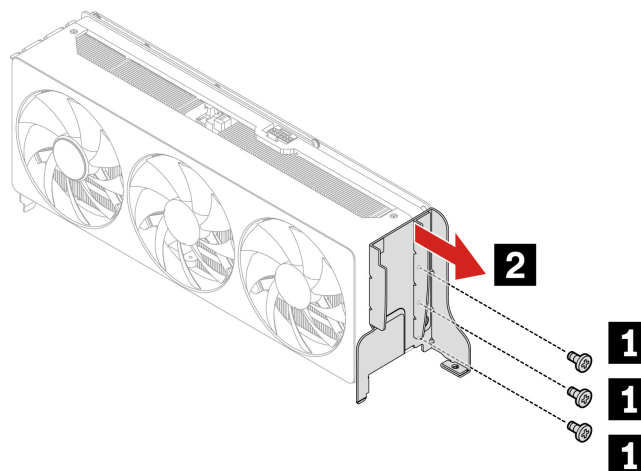
Step 4. Remove the customized PCIe extender (if available).

- 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

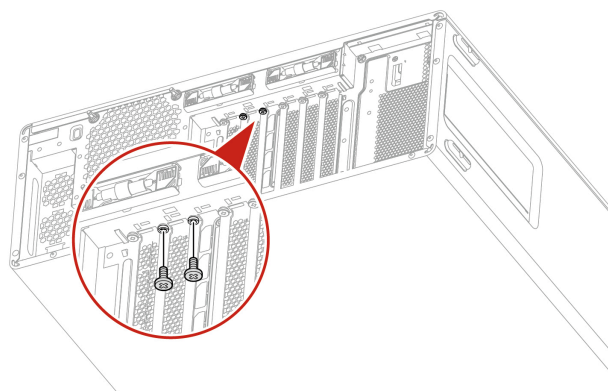
– Type-2



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 40.

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

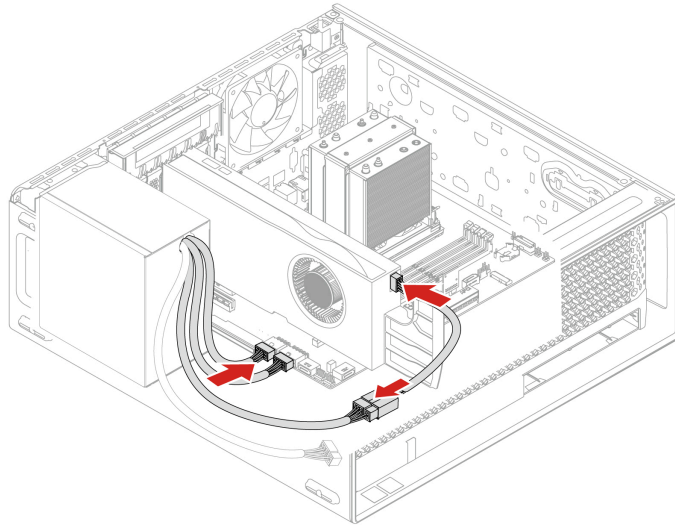


Figure 3. Cable connection for single graphics card and 750-watt PSU

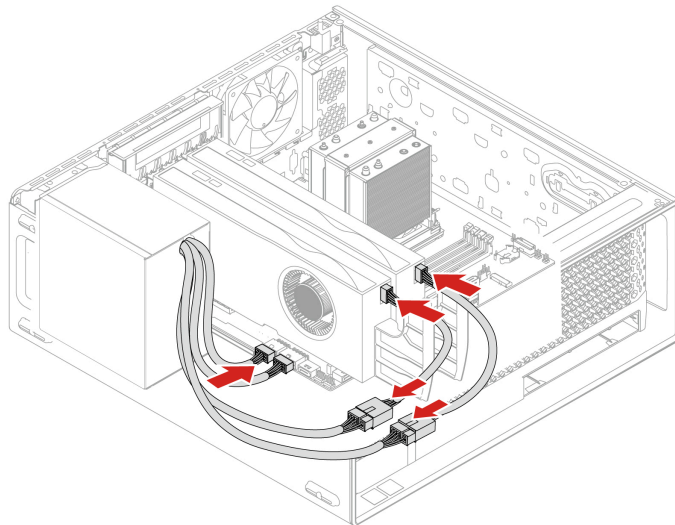
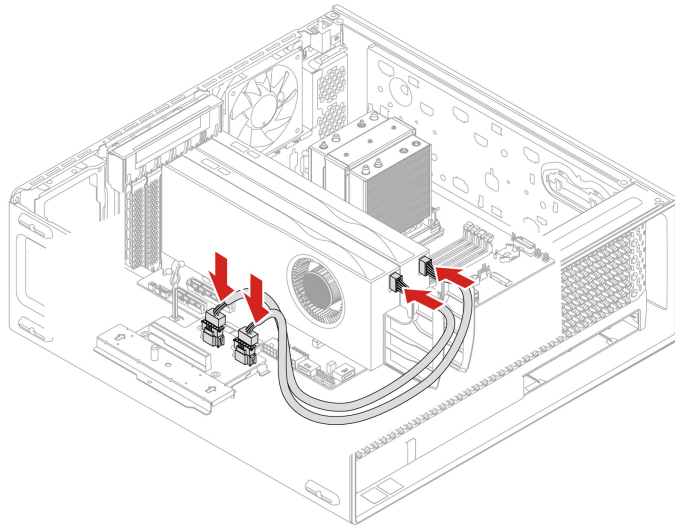
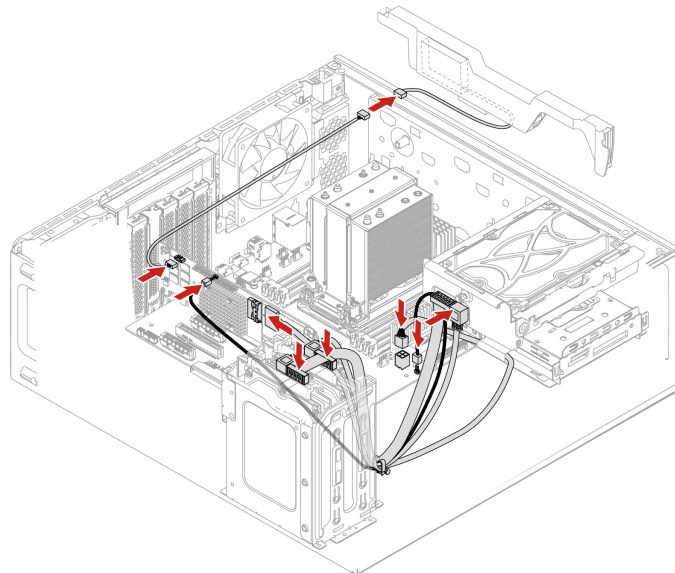


Figure 4. Cable connection for dual graphics cards and 750-watt PSU

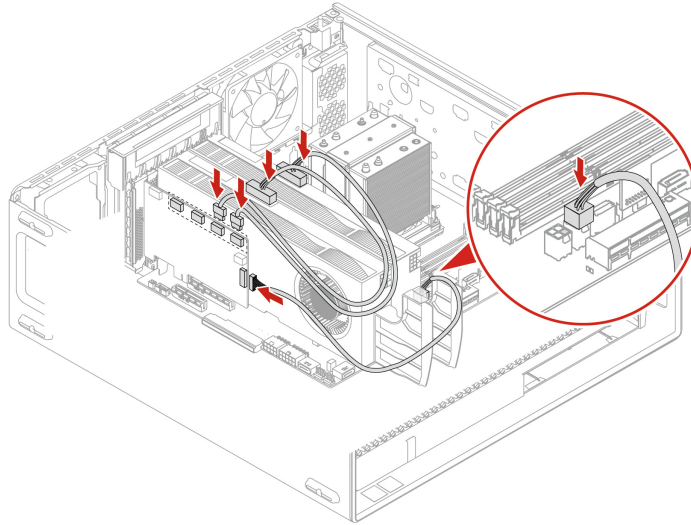
Graphics cards to the power distribution board of 1000-watt PSU



RAID card to HDDs, supercapacitor module, and system board



Sync card to graphics cards



Storage components

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

HDD and its bracket

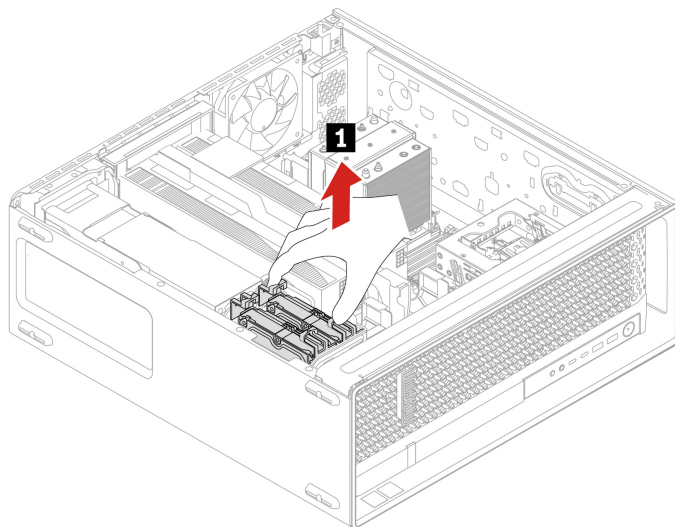
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

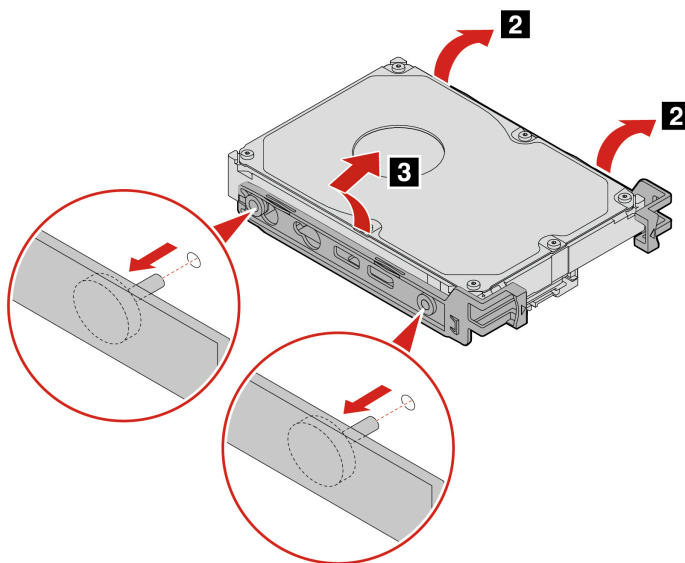
- Step 1. Remove the “Side cover” on page 44.
- Step 2. Disconnect the SATA power and data cables from the HDD and the system board.

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 52 and “Front fan” on page 87 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

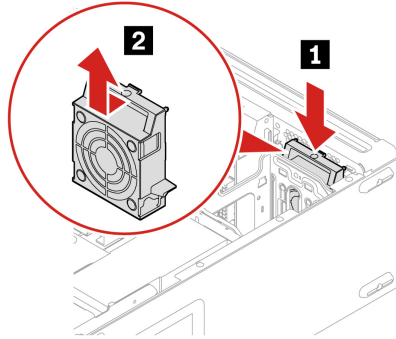
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

Step 1. Remove the “Side cover” on page 44.

Step 2. Disconnect the HDD fan cable from the system board. For connector locations, see “System board illustration” on page 40.

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

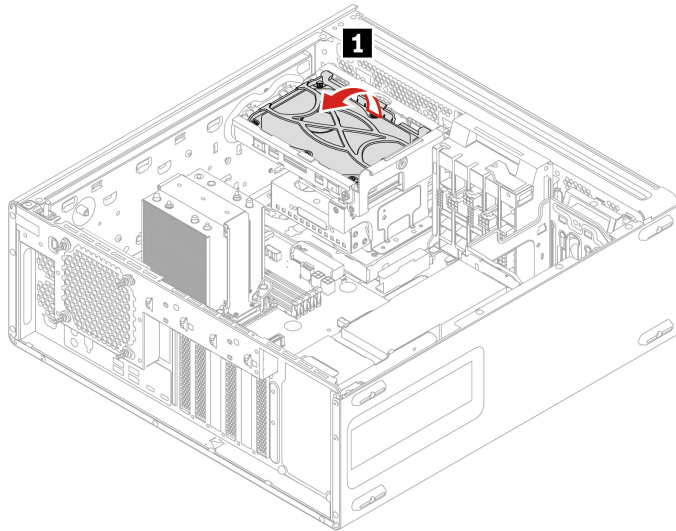
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

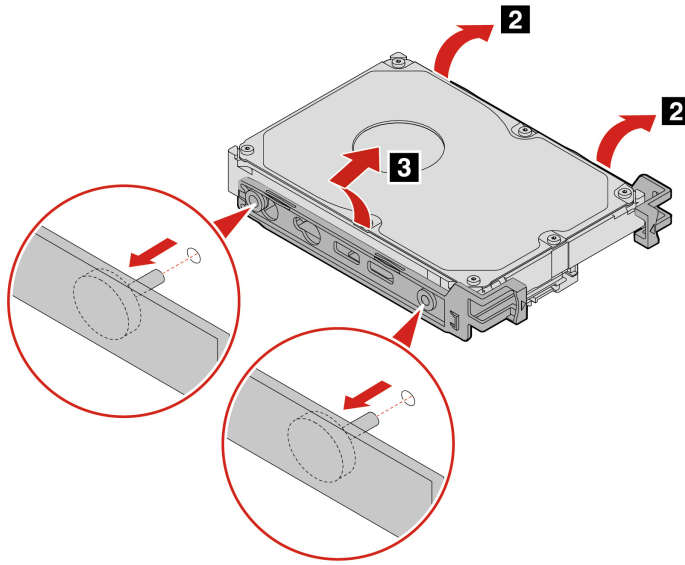
Step 1. Remove the “Side cover” on page 44.

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

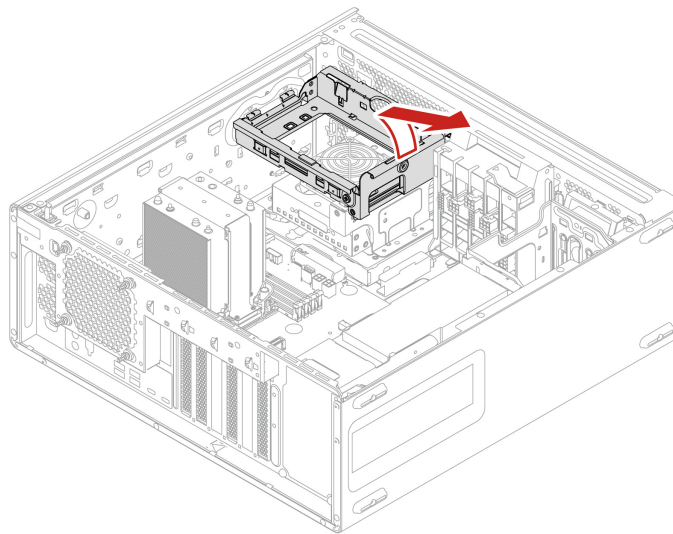
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

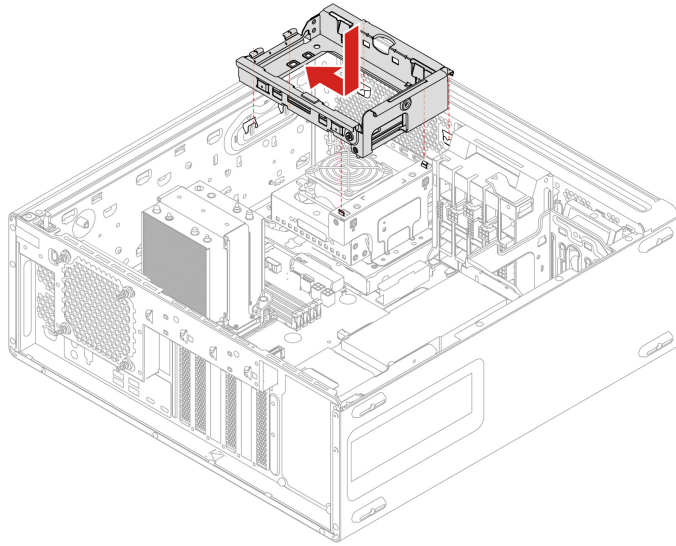
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 44
- “Optional HDD and its bracket” on page 59

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

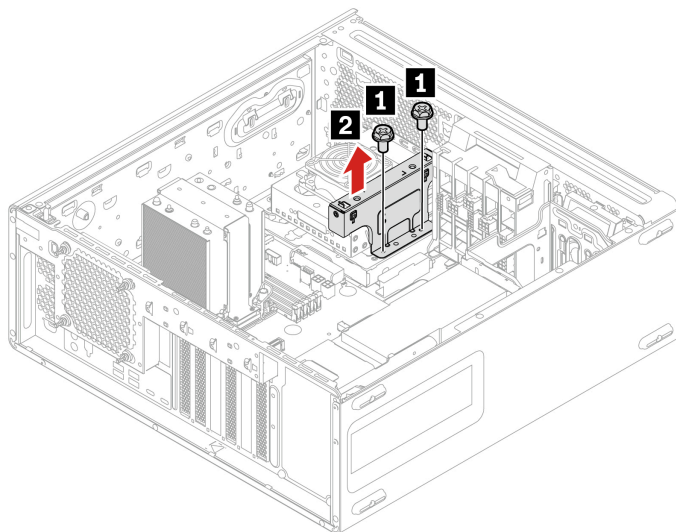
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

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

- “Side cover” on page 44
- “Optional HDD and its bracket” on page 59
- “Optional HDD cage” on page 60

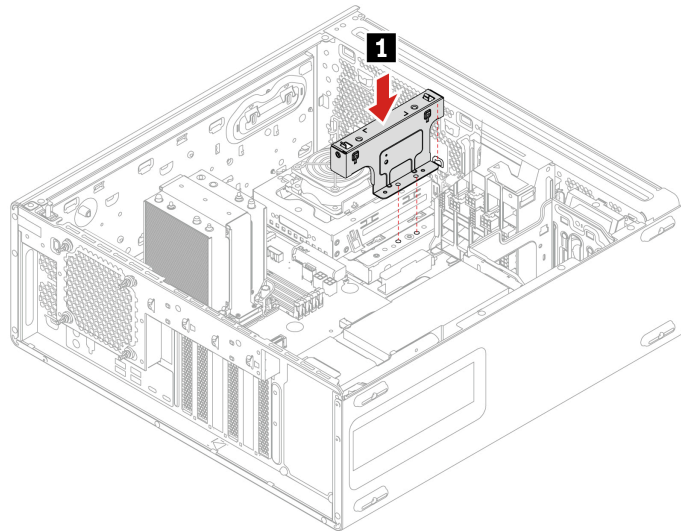
Step 2. Remove two screws and lift the optional HDD cage holder out of the system.



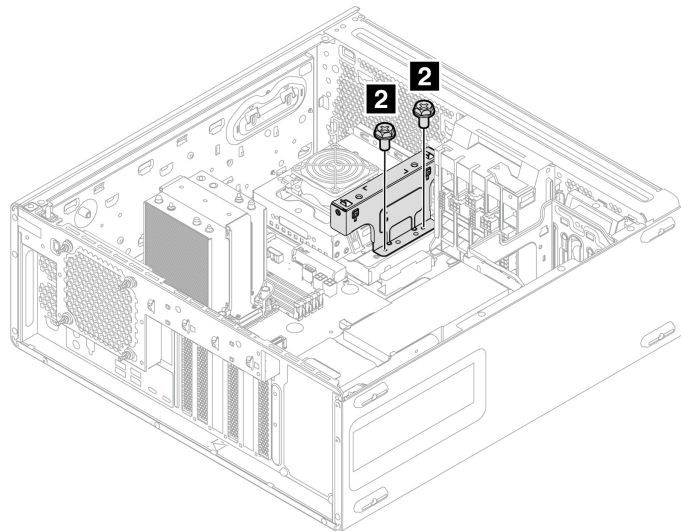
Location	Thread (mm)	Length (mm)	Torque (lbf-in)	Color	Quantity
1	M3	L5	5.0 ± 0.5	Black	2

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

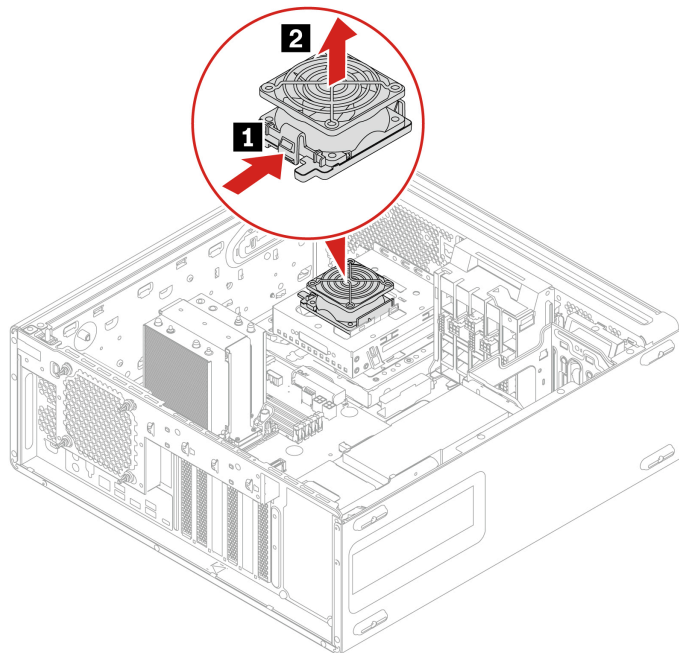
Step 4. Install other removed parts and cables in reverse order.

Flex bay fan

Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

- Step 1. Remove the following parts, if any, in order.
- “Side cover” on page 44
 - “Optional HDD and its bracket” on page 59
 - “Optional HDD cage” on page 60
 - “Optional HDD cage holder” on page 61
- Step 2. Disconnect the fan cable from the system board. For connector locations, see “System board illustration” on page 40.
- 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.

15-in-1 media card reader module

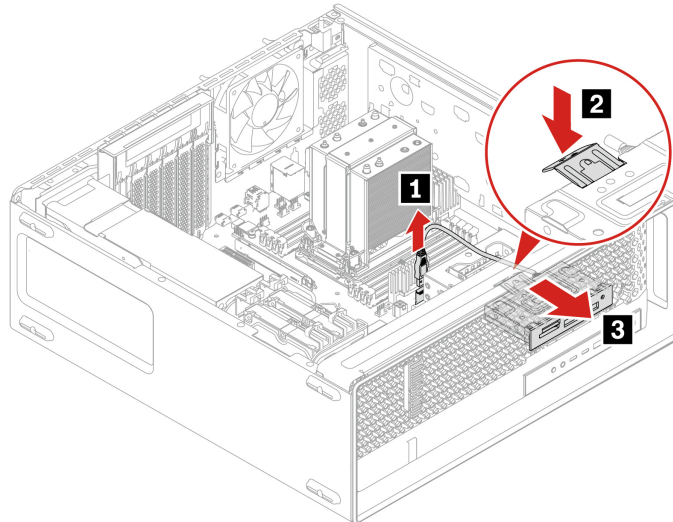
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

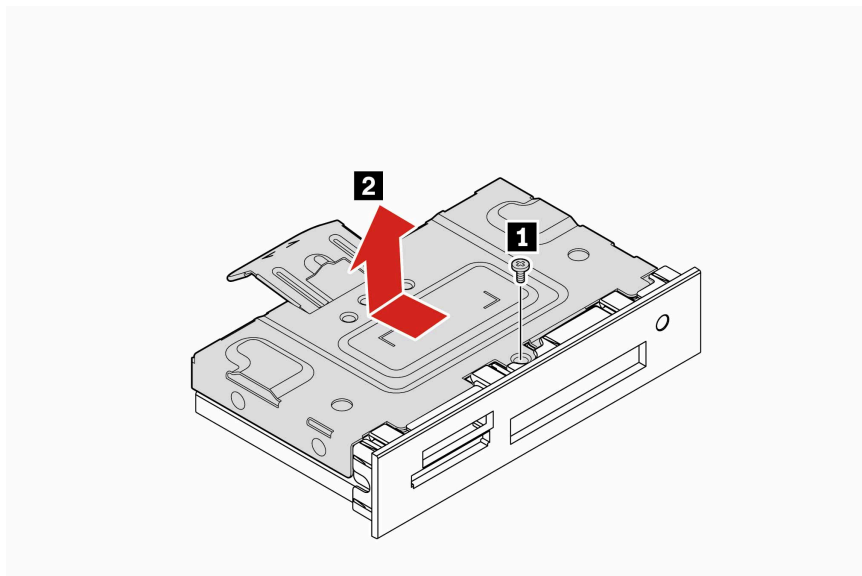
- Step 1. Remove the following parts, if any, in order.
- “Side cover” on page 44
 - “Optional HDD and its bracket” on page 59
 - “Optional HDD cage” on page 60
 - “Optional HDD cage holder” on page 61

- “Flex bay fan” on page 63

- 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 40.
- Step 3. Press the clip to release the module and push it with the cable through the front of the system to remove it.

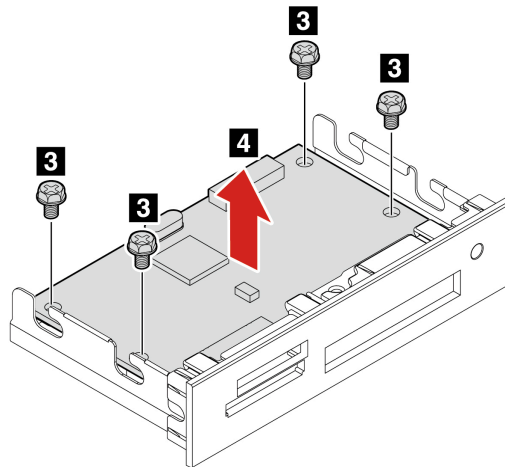


- Step 4. Remove one screw and then slide off the MCR box cover.



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

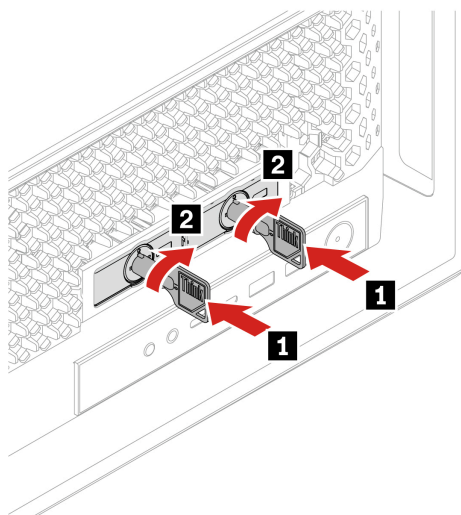
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

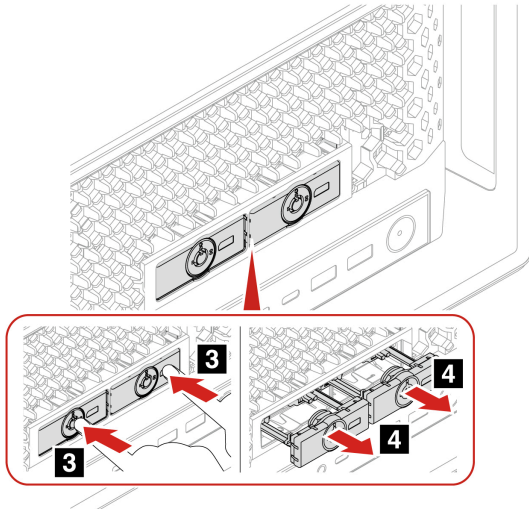
Step 1. Turn off the computer and back up all important data if necessary.

Step 2. Remove the M.2 SSD enclosure.

1. Unlock the M.2 SSD enclosure.

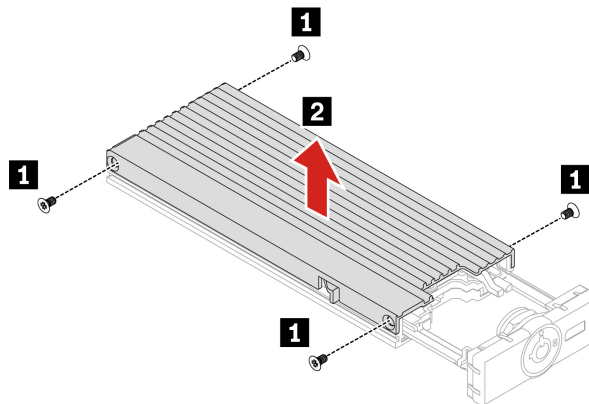


2. Press and eject the M.2 SSD enclosure.



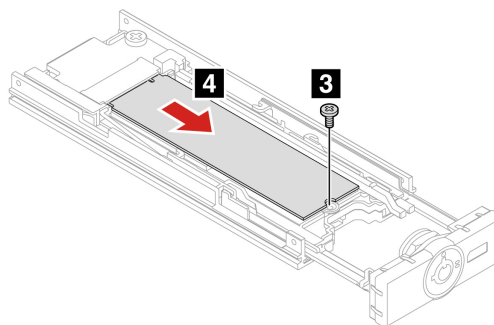
Step 3. Remove the SSD from the M.2 SSD enclosure.

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 41.

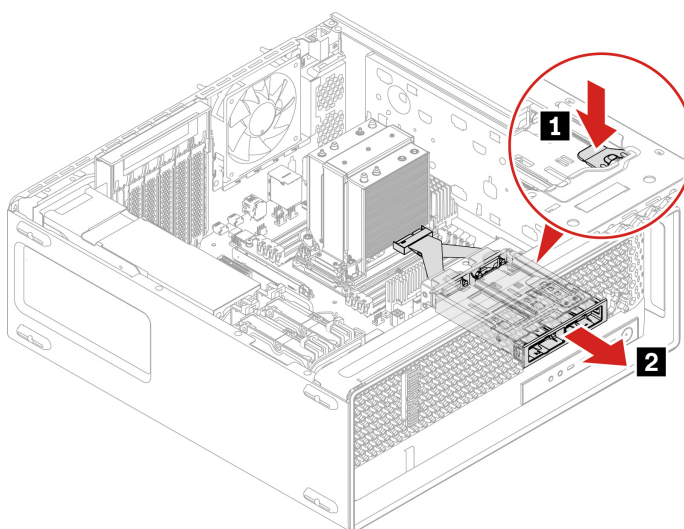
Replacement steps

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

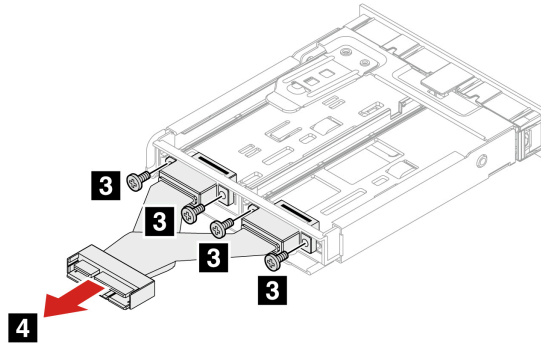
- “Side cover” on page 44
- “Optional HDD and its bracket” on page 59
- “Optional HDD cage” on page 60
- “Optional HDD cage holder” on page 61
- “Flex bay fan” on page 63
- “M.2 SSD enclosure and SSD” on page 65

Step 2. Disconnect the M.2 SSD enclosure cable from the system board. For connector locations, see “System board illustration” on page 40.

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

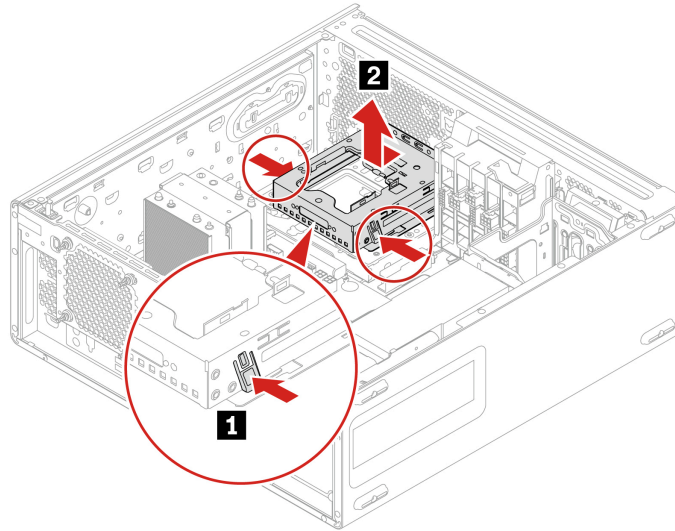
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

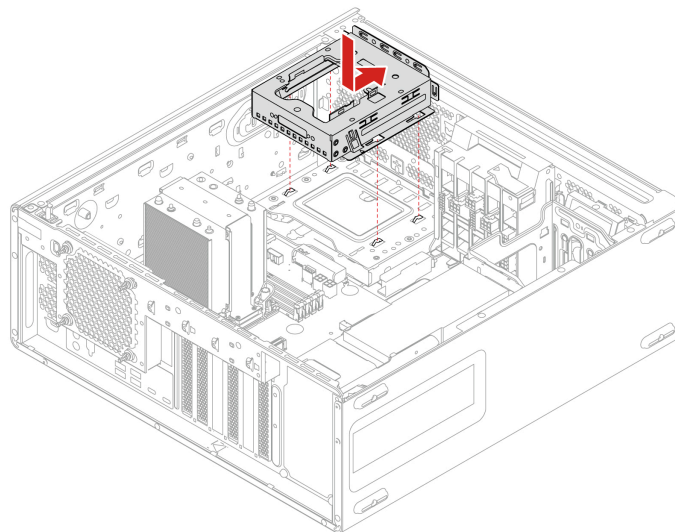
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 44
- “Optional HDD and its bracket” on page 59
- “Optional HDD cage” on page 60
- “Optional HDD cage holder” on page 61
- “Flex bay fan” on page 63
- “15-in-1 media card reader module” on page 63
- “M.2 SSD enclosure tray and cable” on page 67
- “M.2 SSD enclosure and SSD” on page 65

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 41.

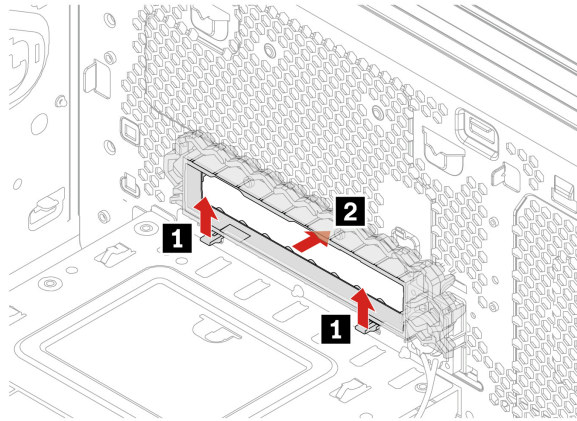
Replacement steps

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

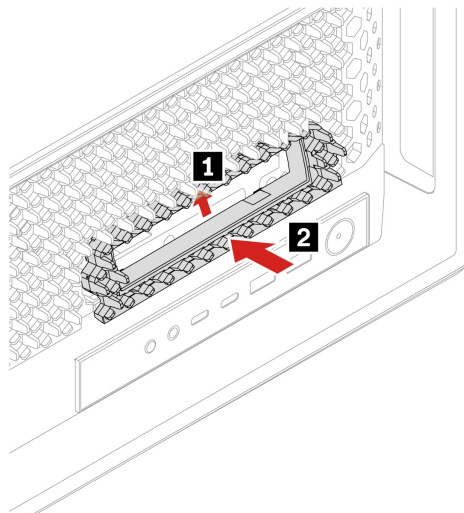
- “Side cover” on page 44
- “Optional HDD and its bracket” on page 59
- “Optional HDD cage” on page 60
- “Optional HDD cage holder” on page 61
- “Flex bay fan” on page 63

- “15-in-1 media card reader module” on page 63
- “M.2 SSD enclosure tray and cable” on page 67
- “M.2 SSD enclosure and SSD” on page 65

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 41.

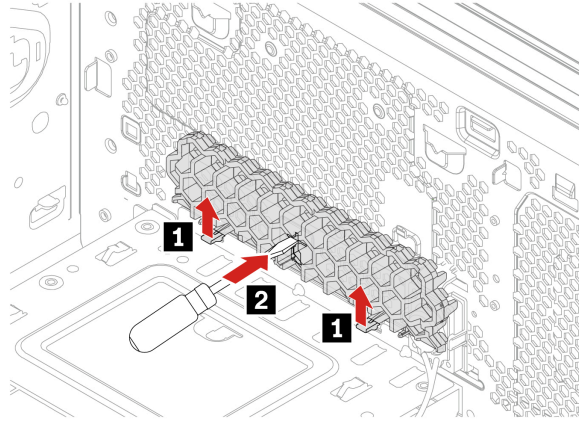
Replacement steps

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

- “Side cover” on page 44
- “Optional HDD and its bracket” on page 59

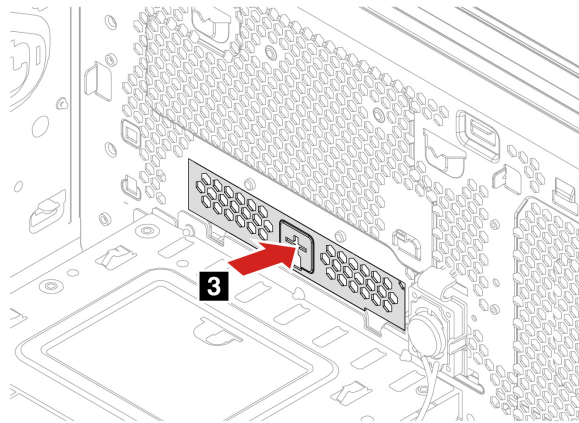
- “Optional HDD cage” on page 60
- “Optional HDD cage holder” on page 61
- “Flex bay fan” on page 63
- “15-in-1 media card reader module” on page 63
- “M.2 SSD enclosure tray and cable” on page 67
- “M.2 SSD enclosure and SSD” on page 65

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

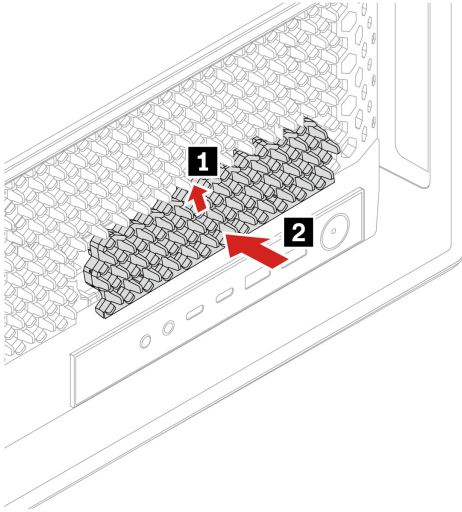


Step 3. Carefully press the metal insert out of the chassis, if needed.

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.



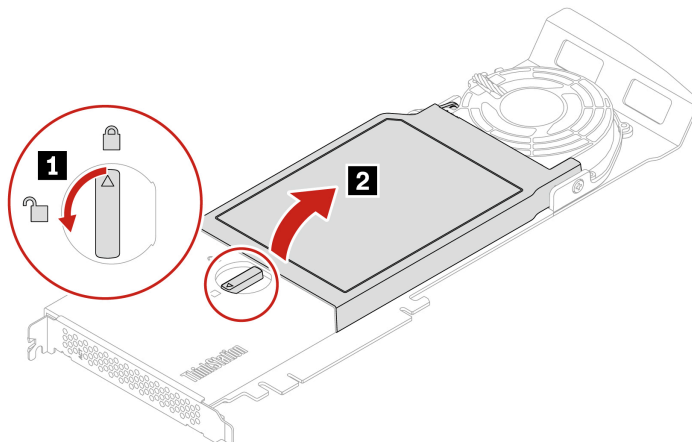
Step 5. Install other removed parts and cables in reverse order.

SSD in M.2 SSD PCIe adapter

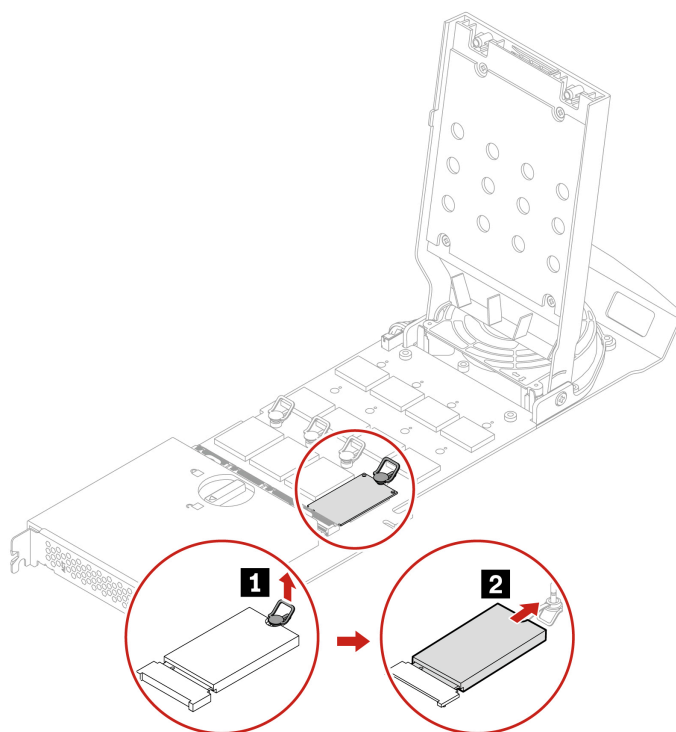
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

- Step 1. Remove the “Side cover” on page 44.
- 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 52.
- Step 3. Remove the SSD from the M.2 SSD PCIe adapter.
 - 1. Rotate the lock to the open position to open the cover.

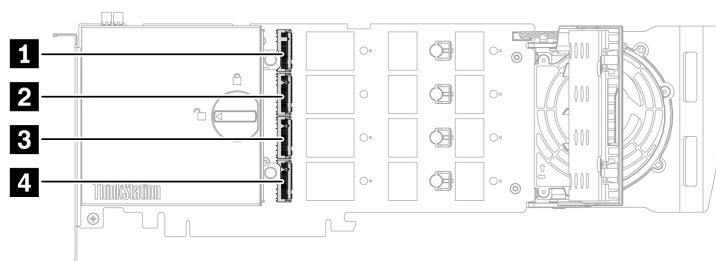


- 2. Pull the handle of the retention latch outward to release the M.2 SSD. Then, remove the M.2 SSD from the PCIe adapter.

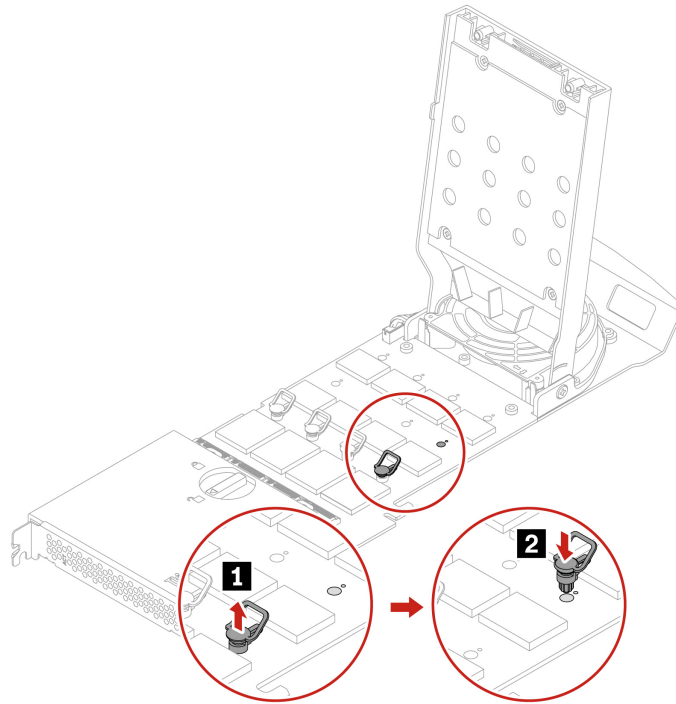


Step 4. Install the SSD into the M.2 SSD PCIe adapter.

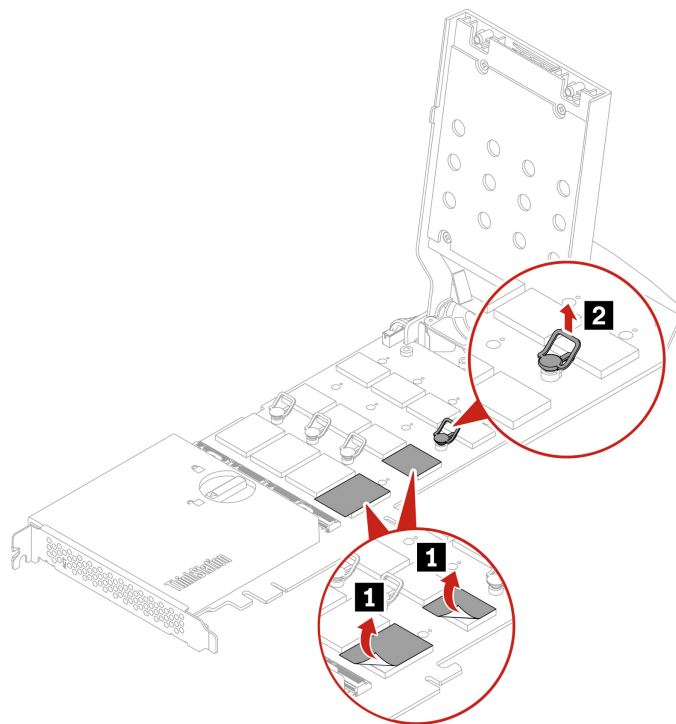
Note: Install M.2 SSDs in the following order as shown:



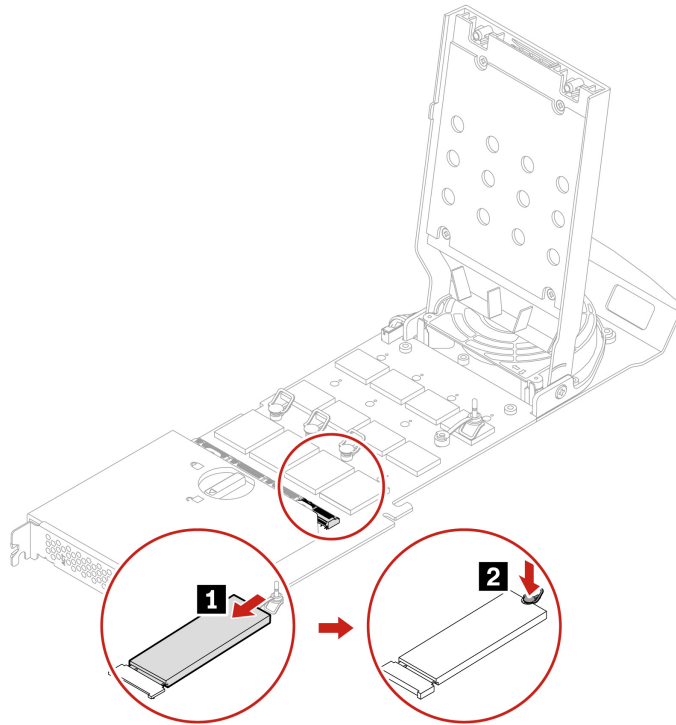
1. Adjust the location of the retention latch on the PCIe adapter to suit the length of the new M.2 SSD, if necessary.



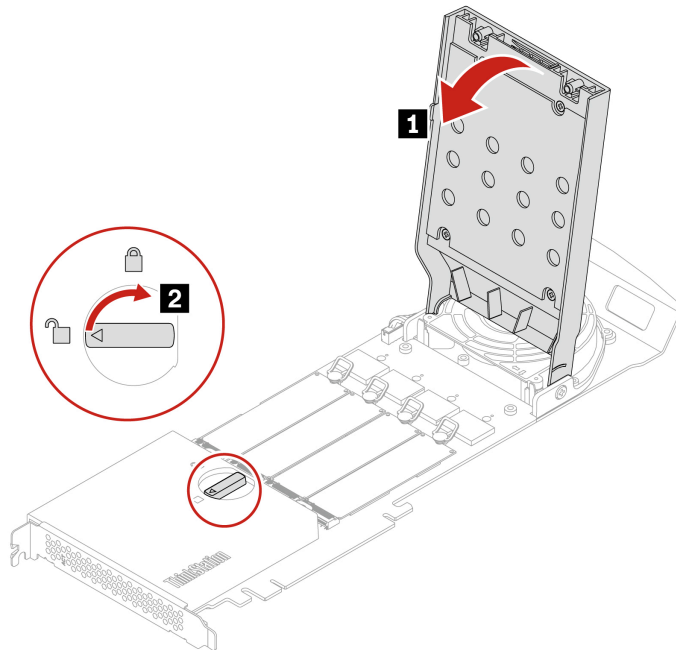
2. Remove the film from the thermal pad on which you want to install the M.2 SSD. Pull the handle of the retention latch outward to the open position.



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 41.

Replacement steps

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

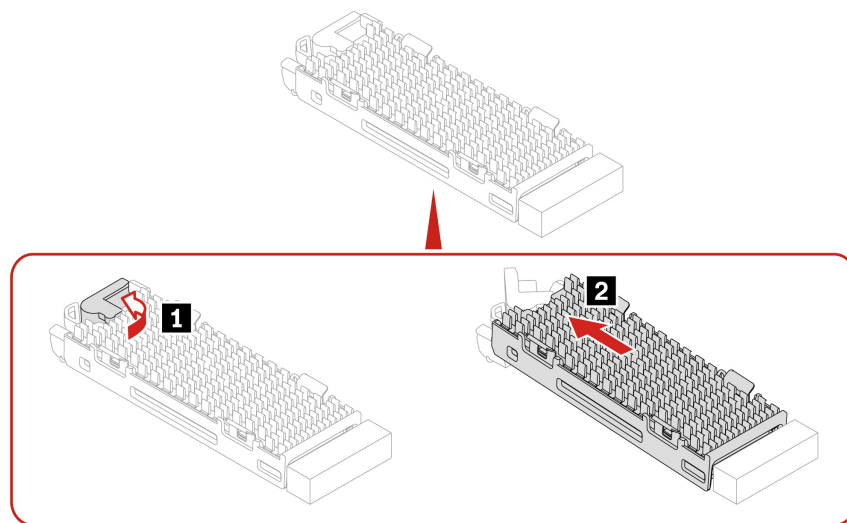
- “Side cover” on page 44
- “PCIe top retention holder and supercapacitor module” on page 49
- “Half-length PCIe cards” on page 51
- “Full-length PCIe card and extender” on page 52

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

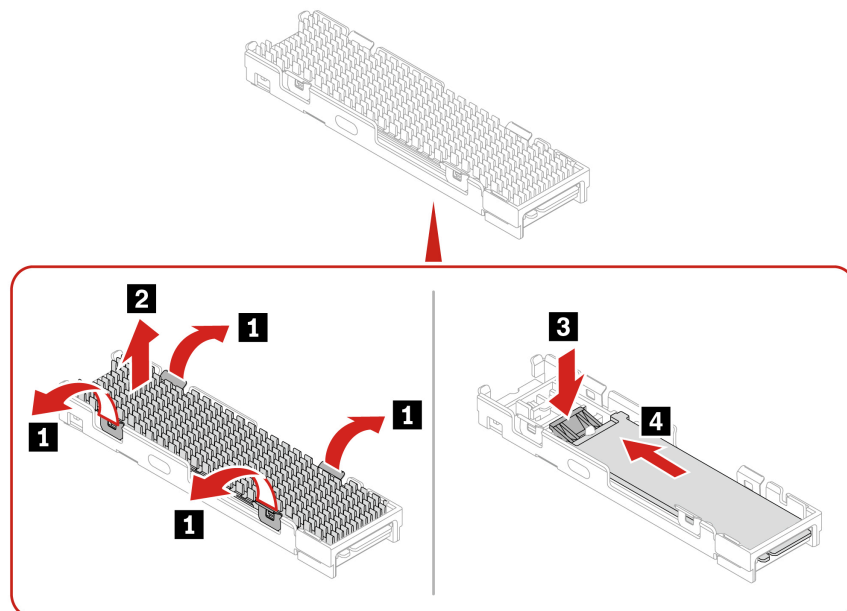
CAUTION:

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.

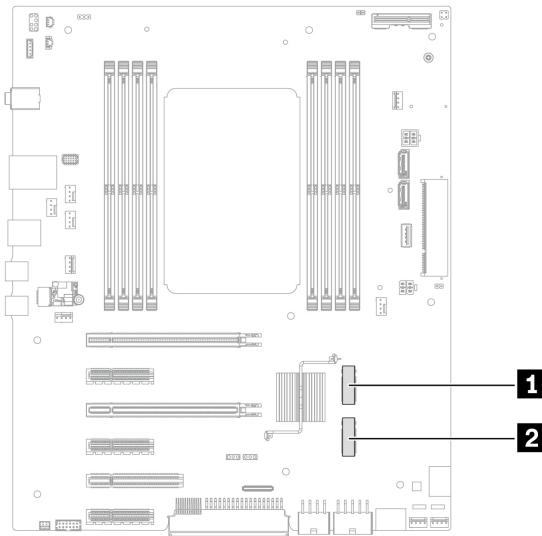


2. Pull open the tabs to remove the heat sink cover. Press the tab to release and remove the drive from the heat sink.

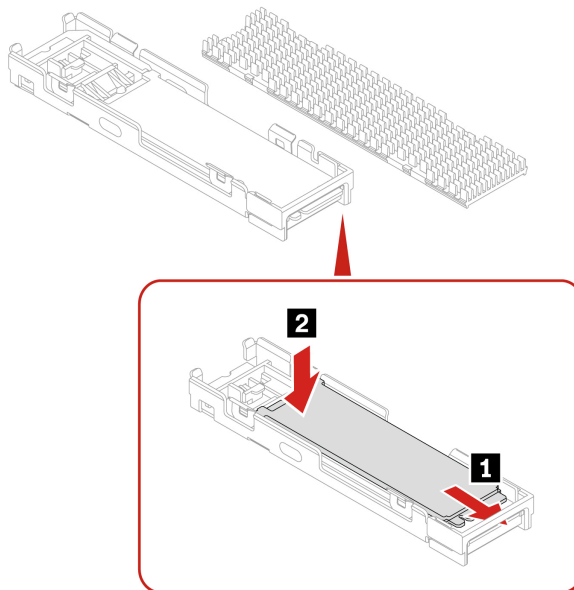


Step 3. Install the on-board SSD and its heat sink kit.

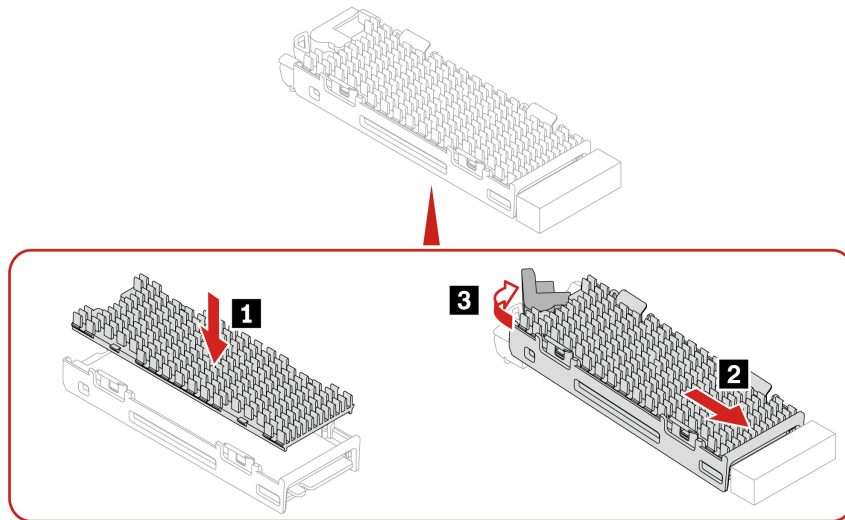
Note: Ensure to install the on-board M.2 SSDs in the following order.



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

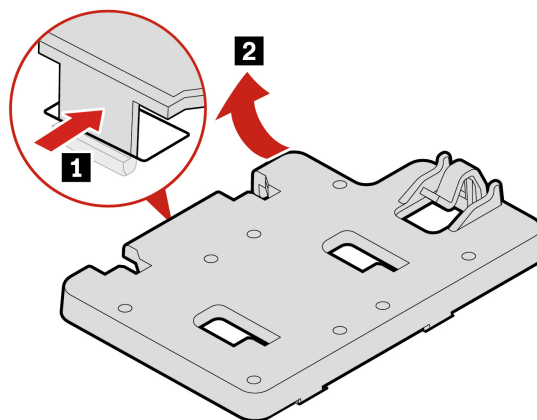
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

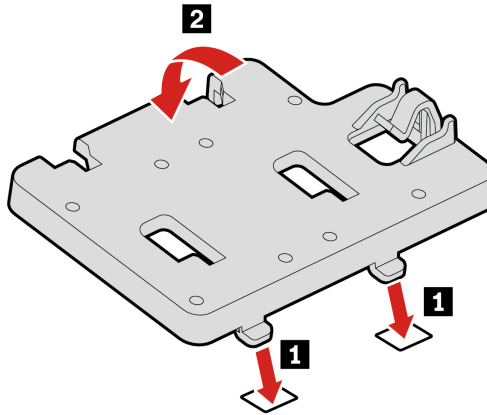
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 44
- “PCIe top retention holder and supercapacitor module” on page 49
- “Half-length PCIe cards” on page 51
- “Full-length PCIe card and extender” on page 52
- “On-board SSD and its heat sink kit” on page 75

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 41.

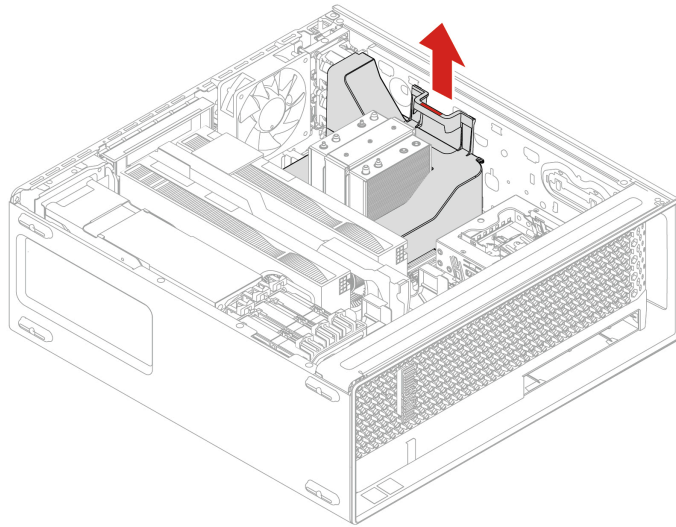
Replacement steps

Step 1. Remove the “Side cover” on page 44.

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

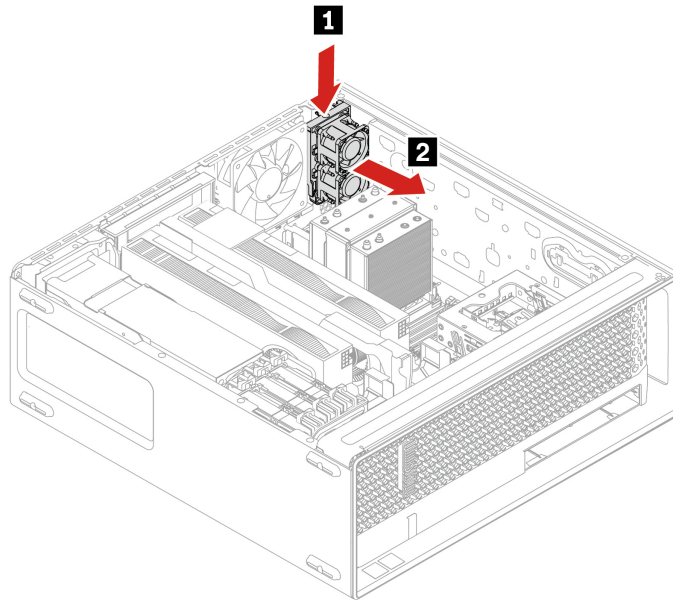
Before you start, read “Prerequisites for hardware replacement” on page 41.

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

- “Side cover” on page 44
- “Memory fan duct” on page 79

Step 2. Disconnect the two memory fan cables from the system board. For connector locations, see “System board illustration” on page 40.

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.

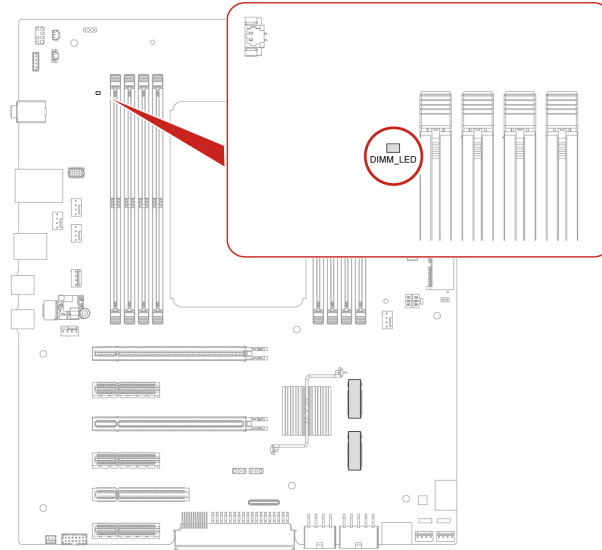
- “Prerequisites for hardware replacement” on page 41
- “Memory configuration” on page 20

Replacement steps

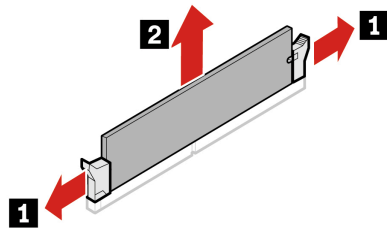
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 44
- “Memory fan duct” on page 79

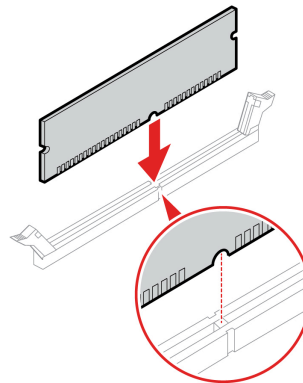
Step 2. Verify that the DIMM LED on the system board is off, and then wait at least one minute before removing or installing a module. It allows the system to be completely discharged of electricity.



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

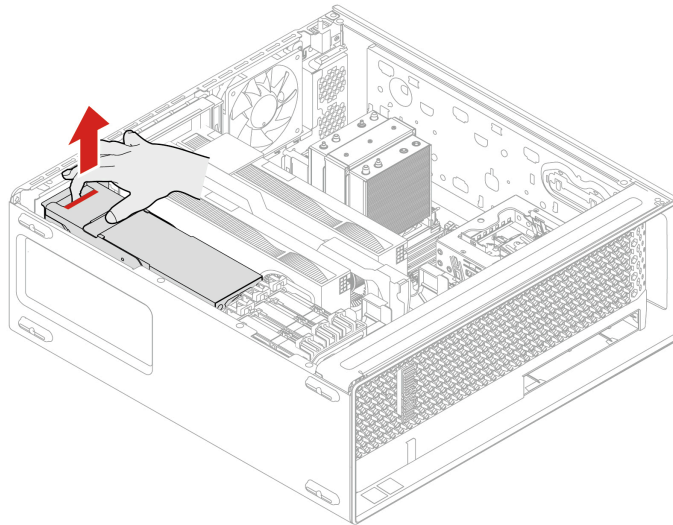
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

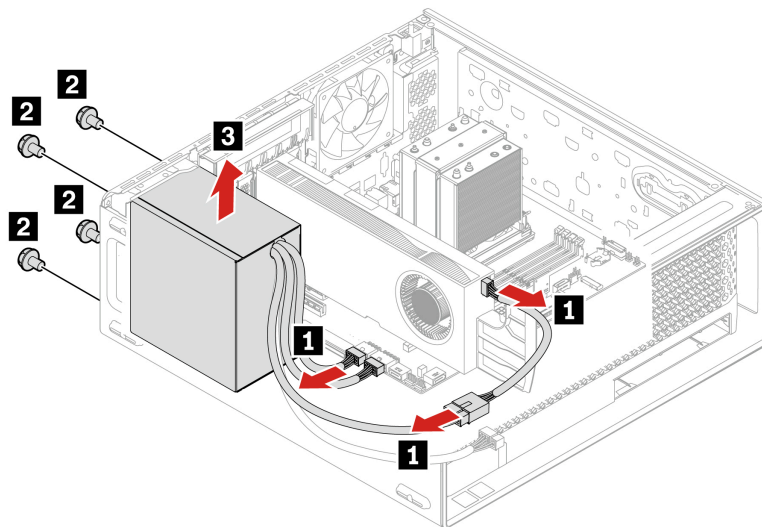
Step 1. Remove the “Side cover” on page 44.

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

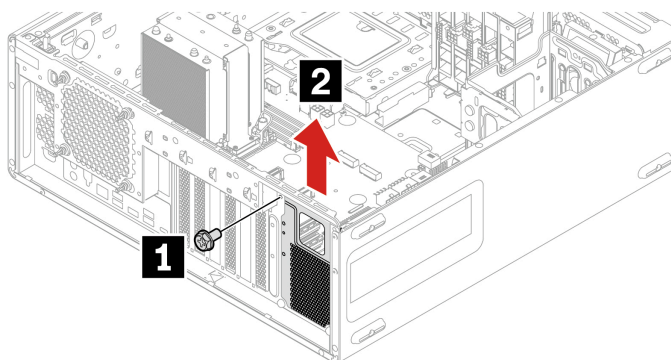
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

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

- “Side cover” on page 44
- “Power supply unit assembly” on page 83

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

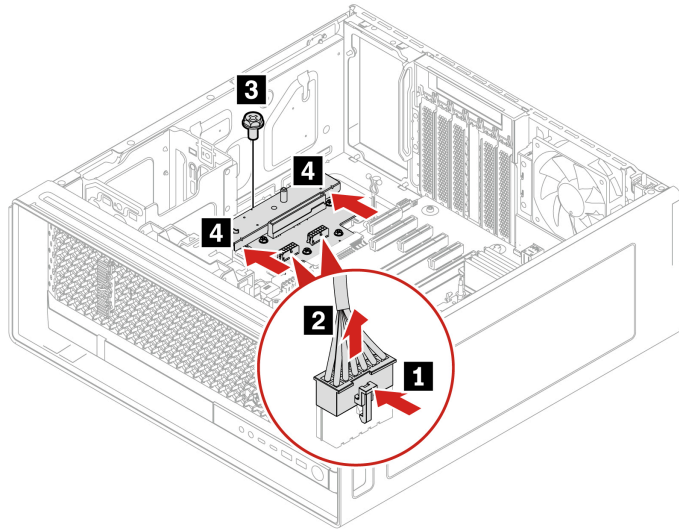
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

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

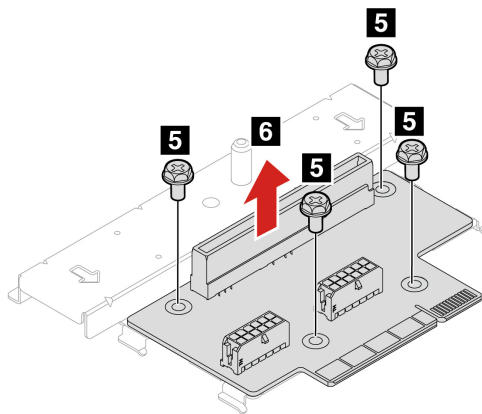
- “Side cover” on page 44
- “Power supply unit assembly” on page 83

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

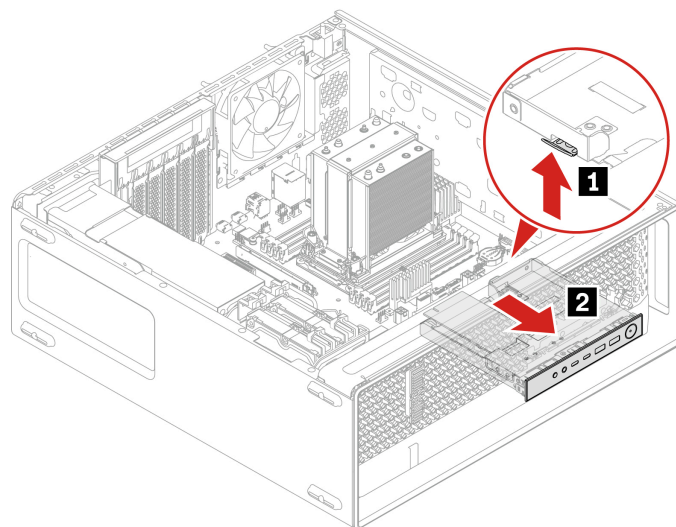
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

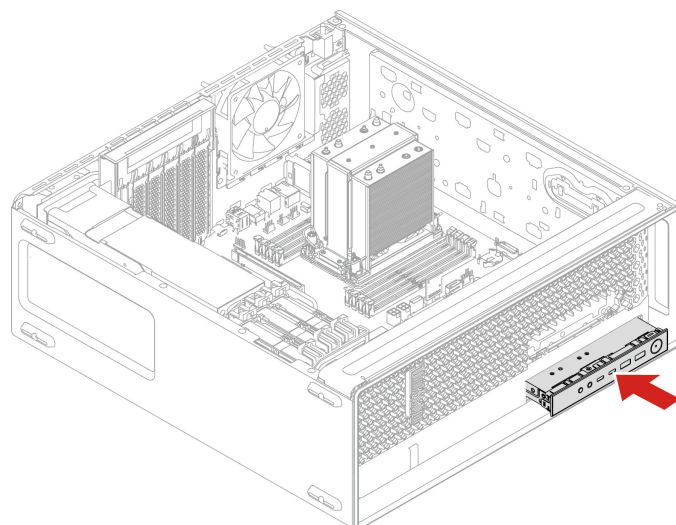
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 44
- “Optional HDD and its bracket” on page 59
- “Optional HDD cage” on page 60
- “Optional HDD cage holder” on page 61
- “Flex bay fan” on page 63
- “15-in-1 media card reader module” on page 63
- “M.2 SSD enclosure tray and cable” on page 67
- “M.2 SSD enclosure and SSD” on page 65
- “Flex bay cage” on page 68

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.



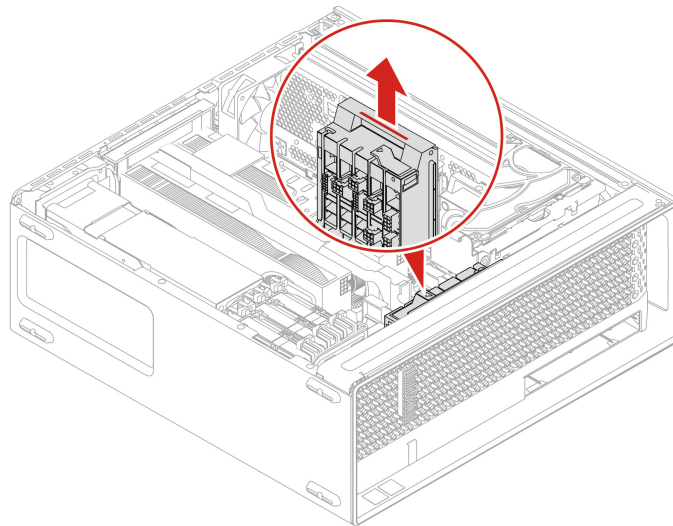
Step 4. Install other removed parts and cables in reverse order.

Front fan

Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

- Step 1. Remove the following parts, if any, in order.
- “Side cover” on page 44
 - “PCIe top retention holder and supercapacitor module” on page 49
 - “Half-length PCIe cards” on page 51
 - “Full-length PCIe card and extender” on page 52
- 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 40.
- Step 3. Lift the fan from the system using the handle with a red line.



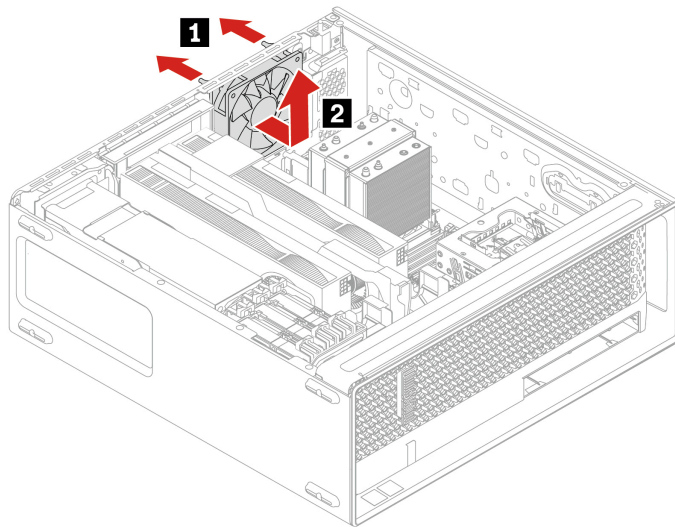
Step 4. Install the removed parts and cables in reverse order.

Rear fan

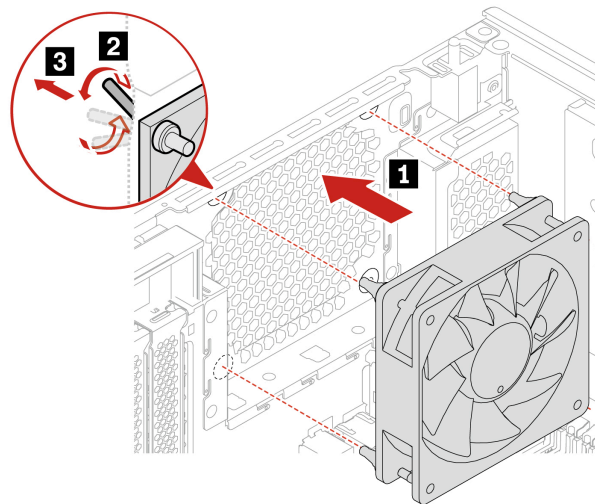
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

- Step 1. Remove the “Side cover” on page 44.
- Step 2. Disconnect the fan cable from the system board. For connector locations, see “System board illustration” on page 40.
- 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.

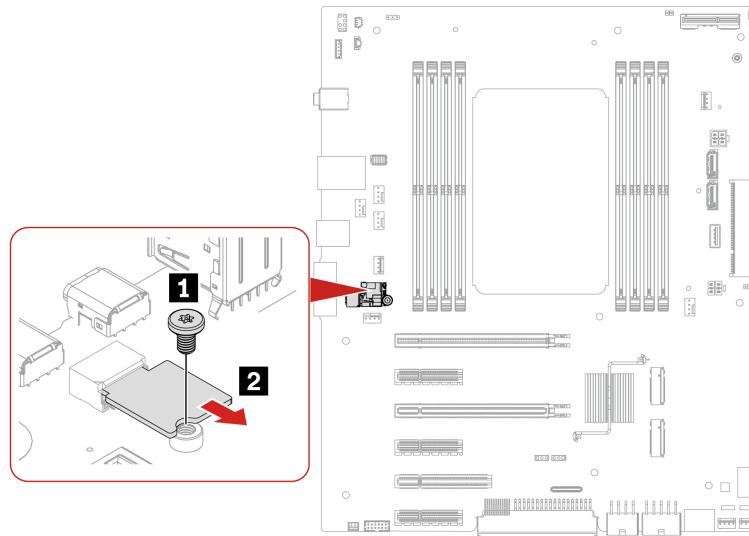
TCM card

Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

Step 1. Remove the “Side cover” on page 44.

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

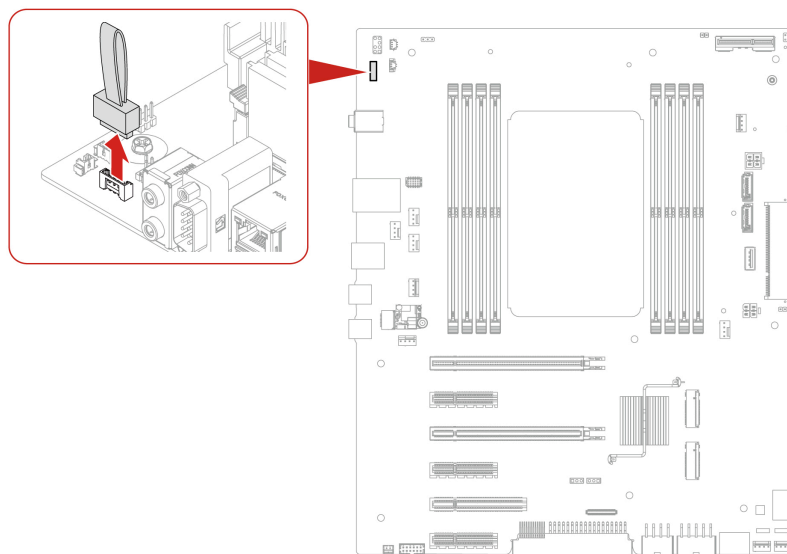
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

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

- “Side cover” on page 44
- “Memory fan duct” on page 79
- “Memory fans” on page 80

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

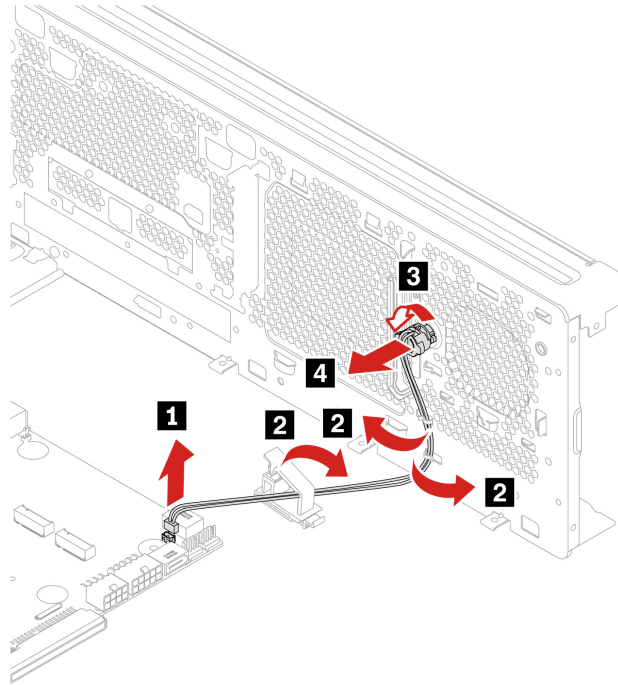
Before you start, read “Prerequisites for hardware replacement” on page 41.

Replacement steps

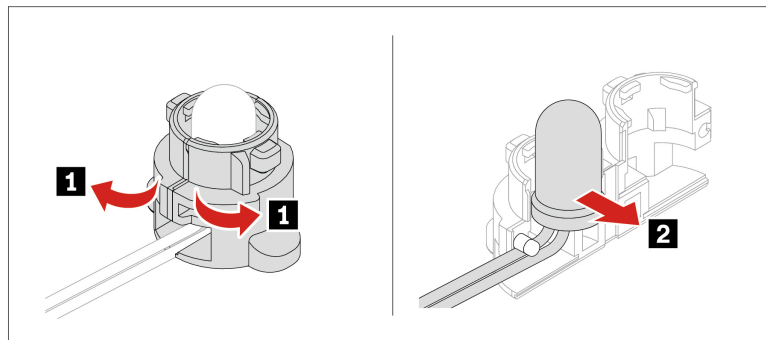
Step 1. Remove the following parts, if any, in order.

- “Side cover” on page 44
- “PCIe top retention holder and supercapacitor module” on page 49
- “Half-length PCIe cards” on page 51
- “Full-length PCIe card and extender” on page 52
- “Front fan” on page 87

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 41.

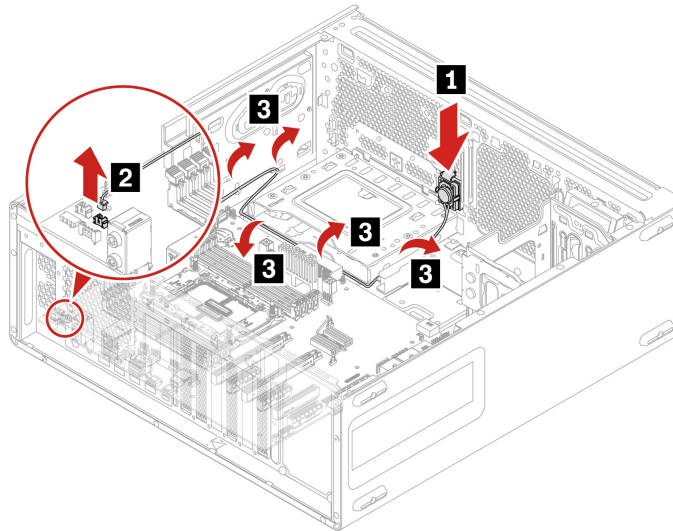
Replacement steps

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

- “Side cover” on page 44
- “Optional HDD and its bracket” on page 59
- “Optional HDD cage” on page 60
- “Optional HDD cage holder” on page 61

- “Flex bay fan” on page 63
- “15-in-1 media card reader module” on page 63
- “M.2 SSD enclosure tray and cable” on page 67
- “M.2 SSD enclosure and SSD” on page 65
- “Flex bay cage” on page 68
- “Front panel I/O assembly” on page 85

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.

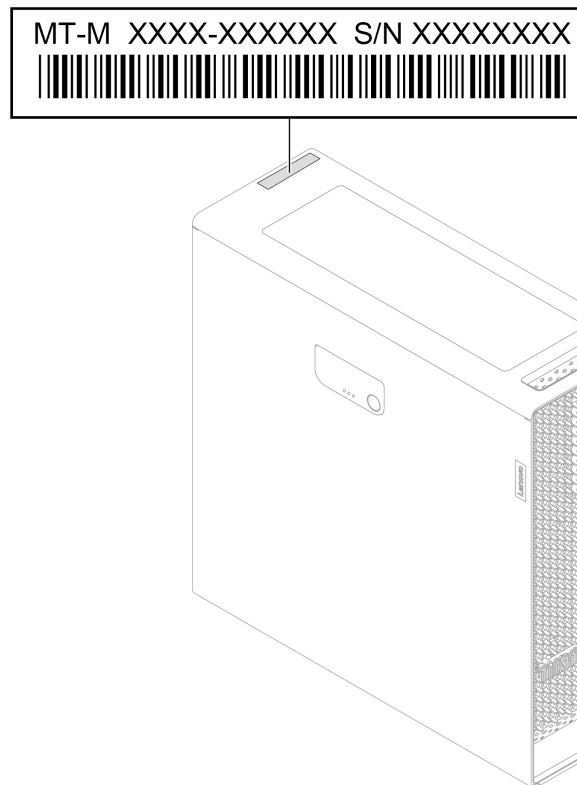
Chapter 6. Help and support

Find your serial number

This topic helps you find computer serial number.

You can find your serial number via:

- **Dashboard** or **Device** in the **Vantage** app
- Machine-type and serial-number label of your computer (shown as below illustration)



Diagnose and troubleshoot your computer

This section provides introduction to a set of diagnostics and troubleshooting tools at Lenovo Support Web site and the Vantage app. They can help you diagnose common software and hardware issues.

The following table lists these diagnostics tools and the recommended conditions for each tool.

Diagnostics tool	Recommended scenario
Troubleshoot and diagnose at Lenovo Support Web site	You want to have an online troubleshooting or scan of hardware and drivers on your computer.
Hardware scan	- Your computer is installed with the Vantage app. - You want to perform basic examinations of the hardware components.
Use ThinkStation diagnostic tool	You want to use diagnostic solutions to test hardware components and report operating-system-controlled settings that interfere with the correct operation of your computer.

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:

- 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.

Hardware scan

Hardware scan is an effective hardware testing tool to help you identify existing hardware issues.

To run the Hardware scan:

- Step 1. Type **Vantage** in the Windows search box and then press Enter.
- Step 2. Click **Hardware scan** or **Support → Hardware scan**.
- Step 3. Select **QUICK SCAN** or **CUSTOMIZE** and then follow the on-screen instructions to run the hardware scan.

Notes:

- The Quick Scan tool contains a pre-selected suite of tests that performs basic examinations of the hardware components found in the system. The Customize tool enables you to select one or several hardware components to perform the examinations.
- Before selecting **QUICK SCAN**, click **Refresh Modules** to ensure that the list of hardware components is the components currently available for the computer.

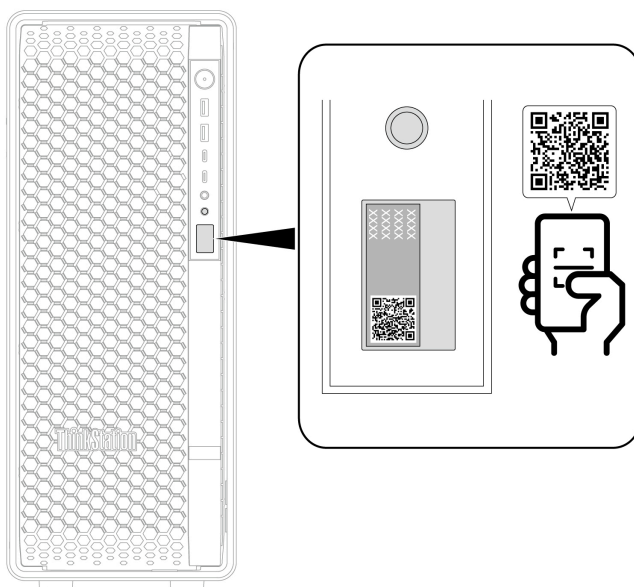
Step 4. If any hardware failure is detected, the result varies depending on the warranty status and varies by country or region. Follow the on-screen instructions to resolve the issue.

ThinkStation Diagnostics

The ThinkStation Diagnostics solution provides built-in hardware monitoring to track system components and alert you to hardware events in real time. It includes the physical diagnostic panel and button, supported across operating systems, and the Windows ThinkStation Diagnostics app, enabling instant notifications and quick troubleshooting.

Diagnostic panel

The diagnostic panel can automatically detect and display error codes even if Windows cannot start or the display is unavailable.



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

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

ThinkStation Diagnostics in Windows

When an error occurs, the app automatically displays a message in the Windows notification area and provides a complete hardware event log.

Note: You can download the app at: <https://pcsupport.lenovo.com/lenovodiagnosticsolutions/downloads>.

Steps to decode an error

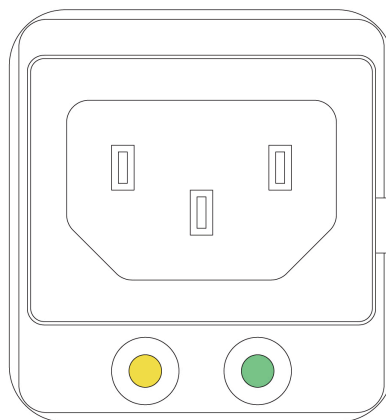
1. Launch the app from the system tray notification or the desktop icon.
2. Review error logs in the app and identify possible solutions. If none, proceed to the next step.
3. Record the four-digit error code in the app or on the diagnostic panel, then decode it at <https://www.thinkworkstationsoftware.com/?view=codes>.

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.

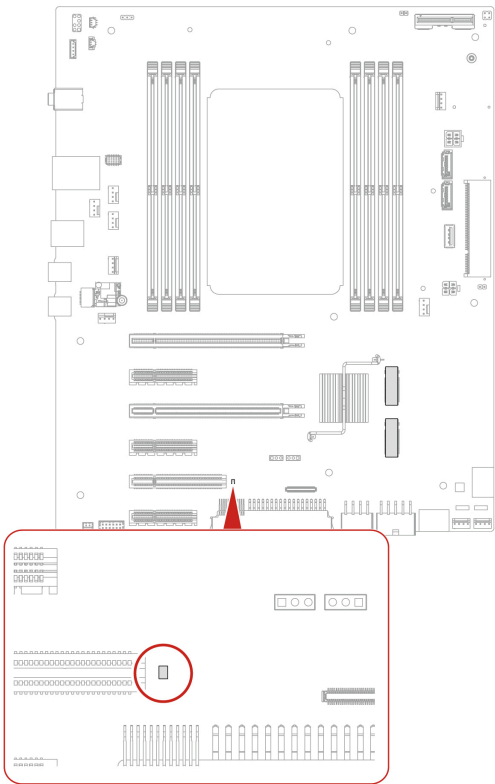
1000-watt power connector indicator



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.

Recover your Windows operating system

When you encounter some unexpected issues with your operating system, you can choose to recover your operating system by yourself or call Lenovo Customer Support Center.

Note: Microsoft constantly makes updates to the Windows operating system. Before installing a particular Windows version, check the compatibility list for the Windows version. For details, go to <https://support.lenovo.com/us/en/solutions/ht512575>.

For computers purchased in mainland China

Go to https://iknow.lenovo.com.cn/detail/199198_1.html.

For computers purchased outside mainland China

To recover your operating system to...	See.
Factory defaults	Refer to the instructions in https://support.lenovo.com/HowToCreateLenovoRecovery
A previous system point	Refer to the instructions in Popular Topics: https://support.lenovo.com/solutions/ht118590

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 93.

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/supportphonenumberlist>

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.

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	• For computers purchased in mainland China https://newsupport.lenovo.com.cn
	• For computers purchased outside mainland China https://pcsupport.lenovo.com
Tips	• For computers purchased in mainland China https://iknow.lenovo.com.cn
	• For computers purchased outside mainland China https://www.lenovo.com/tips

Resources	How to access?
Lenovo Community	- For computers purchased in mainland China https://iknow.lenovo.com.cn - For computers purchased outside mainland China https://forums.lenovo.com
Accessibility information (for computers purchased outside China)	https://www.lenovo.com/accessibility
Windows help information	- Open the Start menu and click Get Help or Tips. - Use Windows Search. - Microsoft support Web site: https://support.microsoft.com

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:

- For computers purchased in mainland China
<https://www.lenovo.com.cn>
- For computers purchased outside mainland China
<https://www.lenovo.com/accessories>

Additional services

During and after the warranty period, you can purchase additional services from Lenovo at:

- For computers purchased in mainland China
<https://newsupport.lenovo.com.cn>
- For computers purchased outside mainland China
<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.

Appendix A. Product manual overview

Your product may include some or all of the following manuals.

Product-specific manuals

These manuals contain information tailored to your specific product.

Name	Description
<i>Setup Guide or Setup, Safety, and Warranty Guide</i> (printed)	Provides a concise introduction to the initial setup process, key features, and essential safety or compliance information.
<i>User Guide</i>	Offers detailed information on product features and operation, including usage guidance, basic diagnostics and troubleshooting procedures, replacement steps for Customer Replaceable Units (CRUs), and available support resources.
<i>Hardware Maintenance Manual</i>	Primarily designed for trained service personnel yet also available for end-user reference. It includes safety requirements, advanced diagnostics and troubleshooting procedures, and replacement instructions for all CRUs and Field Replaceable Units (FRUs).

Common manuals

These manuals provide general information on safety, warranty, and regulatory compliance.

- *Safety and Warranty Guide* (printed)
- [Generic Safety and Compliance Notices](#)
- [Regulatory Notice](#)
- Global compliance website at <https://www.lenovo.com/compliance>

Access manuals

To find all available manuals, search for your product on the following website.

- For products purchased in mainland China: <https://iknow.lenovo.com.cn>
- For products purchased outside mainland China: <https://support.lenovo.com/documentation>

Note: Depending on the model, additional manuals may be available beyond those listed above. For the latest information, check the website above.

Appendix B. 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>.

Appendix C. 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

Appendix D. Notices and trademarks

Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service.

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Morrisville, NC 27560
U.S.A.
Attention: Lenovo Director of Licensing*

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HEVC Standard

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