User Guide

Lenovo
ThinkStation

Lenovo

ThinkStation P5

Read this first

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

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

Contents

Discover your Lenovo computer

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

Before starting your tour, please read the following information:

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

Chapter 1. Overview

Front
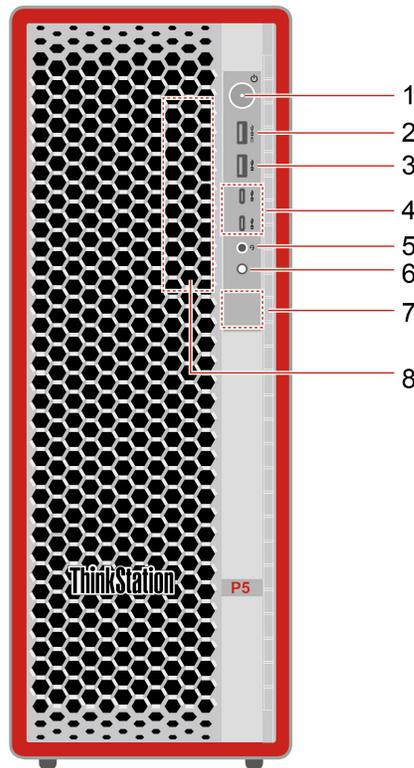
Item	Description	Item	Description
1	Power button with power indicator	2	Always on USB-A 3.2 Gen 2 connector*
3	USB-A 3.2 Gen 2 connector*	4	USB-C (3.2 Gen 2) connectors*
5	Combo audio jack	6	Diagnostic LCD switch
7	Diagnostic LCD	8	Flex bay*

* for selected models

Statement on USB transfer rate

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

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

Power indicator

Show the system status of your computer.

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

Diagnostic LCD switch

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

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

Related topics

- "Diagnostics" on page 32.
- "USB specifications" on page 6.

Rear
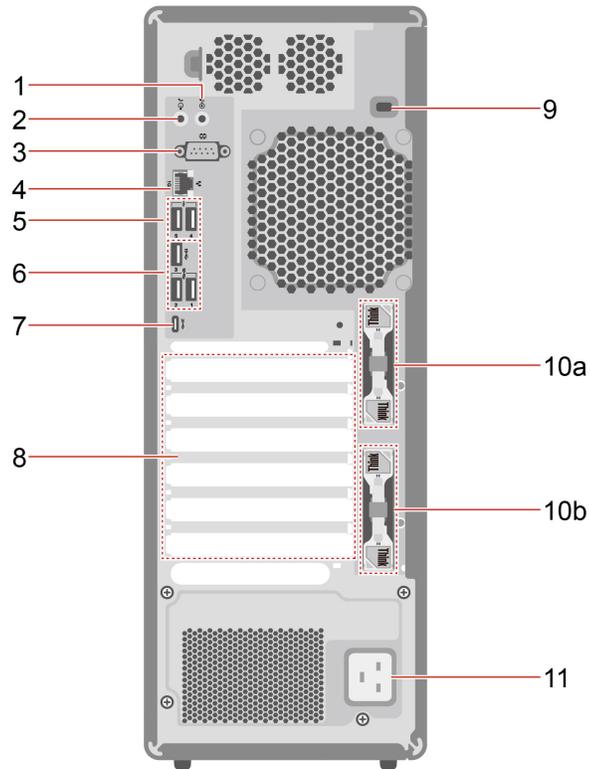
Item	Description	Item	Description
1	Audio line-in connector	2	Audio line-out connector
3	Serial connector*	4	Ethernet connector (1G)
5	USB-A 2.0 connectors	6	USB-A 3.2 Gen 2 connectors
7	USB-C (3.2 Gen 2x2) connector	8	PCI-Express card area
9	Security-lock slot	10a	Key-nest for the side cover*
10b	Key-nest for the M.2 solid-state drive in flex module*	11	Power connector

* for selected models

USB-C (3.2 Gen 2x2) connector

Do not connect your external display to the USB-C connector on the rear panel. Otherwise, the external display will not work and the USB-C connector may get damaged.
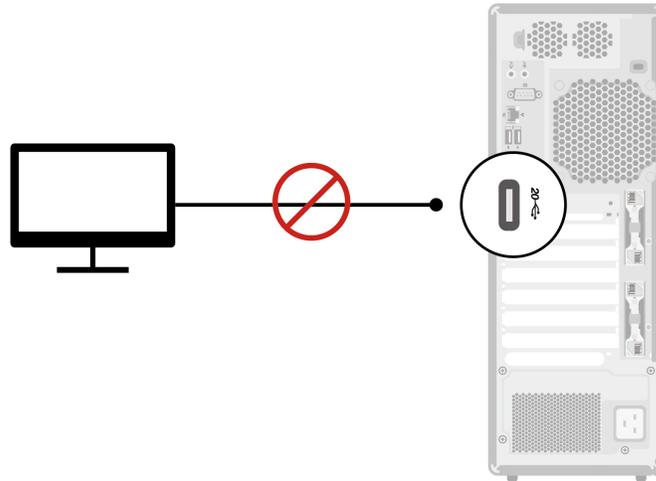
Serial connector

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

Related topics

- "Lock the computer" on page 12.
- "Connect an external display" on page 9.
- "USB specifications" on page 6.

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
Adaptability for power supply	• Mainland China: 220 V±22 V, 50 Hz±1 Hz • Adaptive voltage positioning: 90 V to 264 V, 50/60 Hz • With voltage selection switch: 90 V to 264 V, 50 Hz±1 Hz

Specification	Description
Memory	Double data rate 5 (DDR5) error correction code (ECC) registered dual in-line memory module (RDIMMs)
	Maximum memory capacity: Up to 512 GB (8 x 64 GB if available)
Storage device	• 3.5-inch hard disk drive (HDD) • 2280 Gen 4 M.2 solid-state drive (SSD) in flex module • 2280 Gen 4 or Gen 5 M.2 SSD in onboard M.2 SSD slots 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	• Memory slots • Optional storage drive bay* • Flex bay* • Storage drive bay • Onboard M.2 SSD slots • PCI-Express slots
Network features	• Bluetooth* • Ethernet LAN • Wireless LAN*

* for selected models

Operating environment

Maximum altitude (without pressurization)

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

Temperature

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

Relative humidity

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

System memory speed

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

Notes:

- Your computer comes with 4800 MT/s memory modules and will run at lower speed due to platform limitations.
- The actual system memory speed of the memory modules varies depending on the microprocessor model. For example, your computer comes with 4800 MT/s memory modules, but the microprocessor only supports up to 4400 MT/s memory modules. Then the system memory speed will be no faster than 4400 MT/s.
- The microprocessor models supported in your computer might vary. For a list of supported microprocessor models, contact the Lenovo Customer Support Center.
- Ensure that you use the same type and capacity for memory modules and follow the installation order shown in the following illustration.
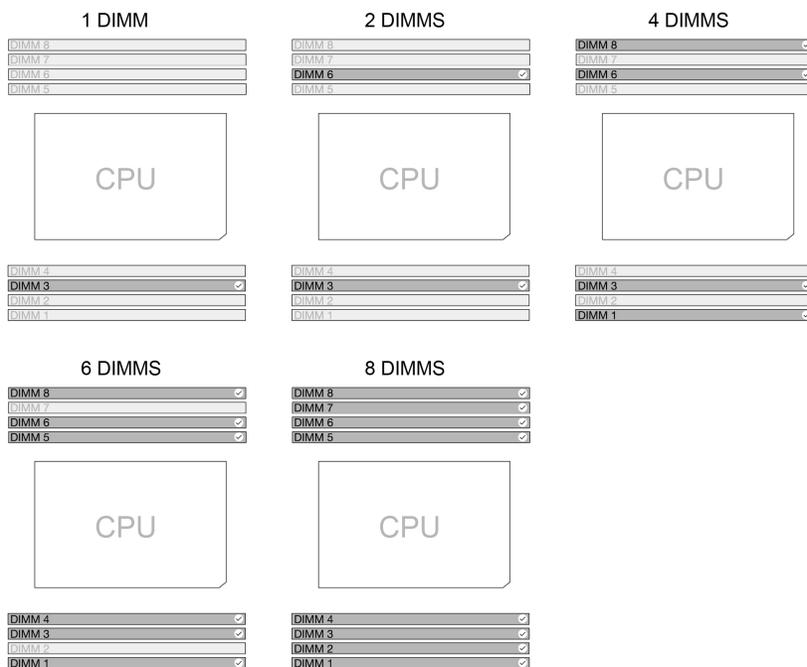
Figure 1. Memory module order

Refer to the following information about the system memory speed:

- **Memory module types:**
  - DDR5 ECC RDIMMs
- **Memory module speed:**
  - 1 x DIMM / 2 x DIMMs / 4 x DIMMs configurations run at DDR5-4800;
  - 6 x DIMMs / 8 x DIMMs configurations run at DDR5-4400.

USB specifications

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

Connector name	Description
• ⟵ USB-A 2.0 connector • 10⟵ USB-A 3.2 Gen 2 connector	Connect USB-A compatible devices, such as a USB-A keyboard, USB-A mouse, USB-A storage device, or USB-A printer.
• 10⟵ USB-C (3.2 Gen 2) connector • 20⟵ USB-C (3.2 Gen 2x2) connector	• Charge USB-C compatible devices with the 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.

Note: Do not connect your external display to the USB-C connector on the rear panel. Otherwise, the external display will not work and the USB-C connector may get damaged.

Chapter 2. Get started

Connect an external display

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

Note: Do not connect your external display to the USB-C connector on the rear panel. Otherwise, the external display will not work and the USB-C connector may get damaged.
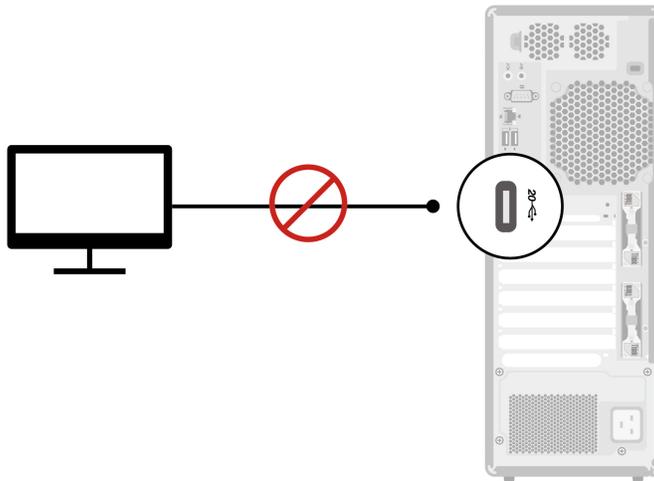
Connect a wireless display

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

Press Windows logo key + K and then select a wireless display to connect.

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 wired or wireless network.

Connect to the wired Ethernet

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

Note: For models with an Intel X710-T2L Ethernet adapter, it's recommended to prepare a Shielded Twisted Pair (STP) Category 6A Ethernet cable for Ethernet connection on the adapter.

Connect to Wi-Fi networks (for selected models)

Click the network icon in the Windows® notification area, and then select a network for connection. Provide required information, if needed.

- For models with Windows 10:
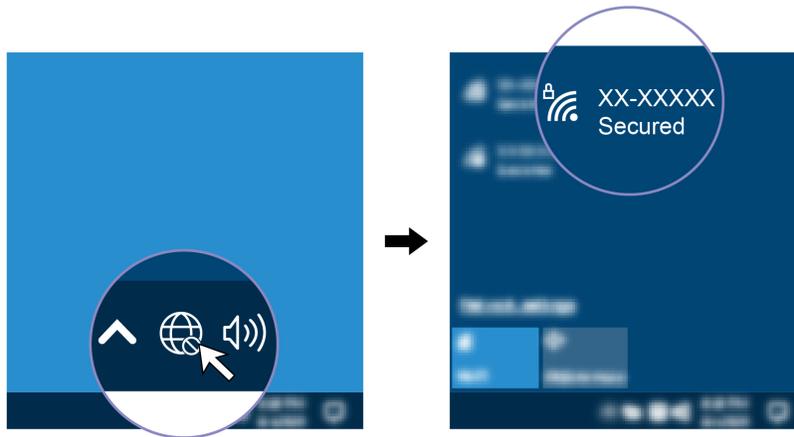
- For models with Windows 11:
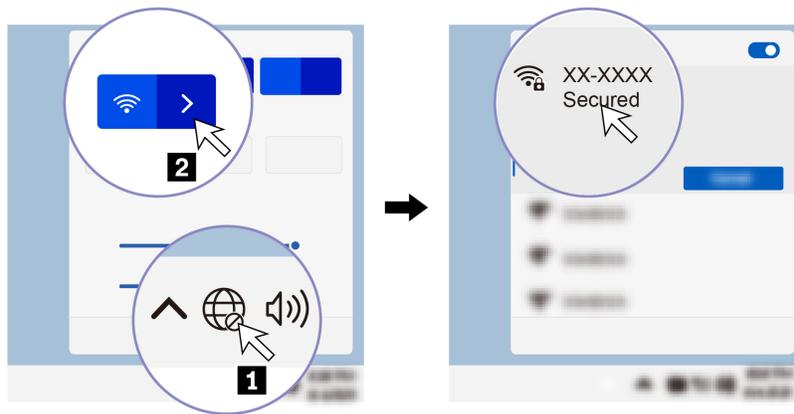
Transfer data

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

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

You can connect all types of Bluetooth-enabled devices to your computer, such as a keyboard, a mouse, a smartphone, or speakers. Place the device that you are attempting to connect to less than 10 meters (33 feet) from the computer.
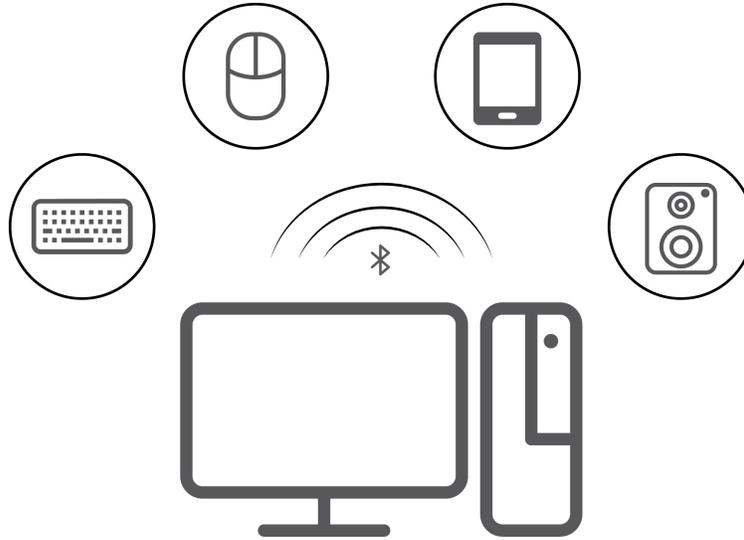
1. Type `Bluetooth` in the Windows search box and then press Enter.
2. Turn on Bluetooth, if it is off.
3. Select a Bluetooth device, and then follow the on-screen instructions.

Use a media card (for selected models)

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.

To set the power plan:

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

The Vantage app

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.

Lock the computer

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

Key lock
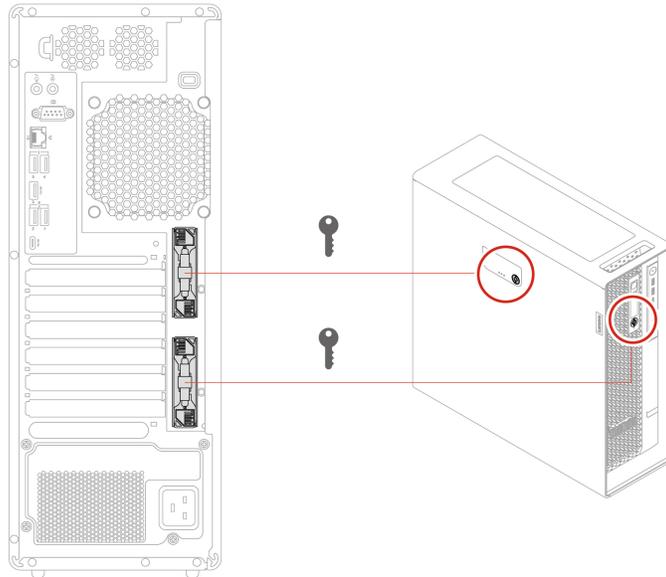
- Locks
  - Locks for side cover and flex module prevent unauthorized access to the inside of your computer chassis or storage drives.
  - The storage drive in the flex module can be hot-swappable, which means that you can install or replace the drive without even turning off your computer. Therefore, lock the flex module to prevent unexpected removal.
- Keys
  - The keys are attached to the rear of the machine. For security, store the keys in a secure place when you are not using them.
  - The keys can be carved with numbers, for example, **00**, **01**, **02**, and **03**. The key can unlock locks that are carved with the same number on the same computer or on other computers.

Security lock

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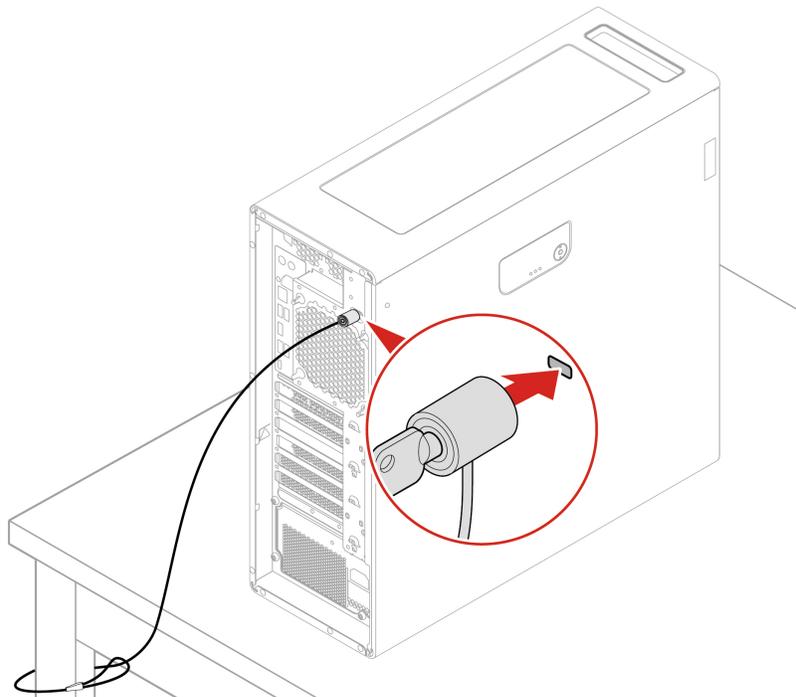
Use software security solutions

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**

  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 the cover presence switch connector on the system board:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.

2. Select **Security → Cover Tamper Detected** and press Enter.

3. Select **Enabled** and press Enter.

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

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

1. Properly install or close the computer cover.

2. Enter the BIOS menu, save and then exit.

Intel BIOS guard

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

Smart USB Protection

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

• **Disabled** (default setting): You can use the USB storage devices without limitation.

• **Read Only**: You cannot copy data from the computer to the USB storage devices. However, you can access data on the USB storage devices.

• **No Access**: You cannot access the USB storage devices from the computer.

To configure the Smart USB Protection function:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.

2. Select **Security → Smart USB Protection** and press Enter.

3. Select the desired setting and press Enter.

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

Chapter 3. Explore your computer

Expand your computer

You can enhance your computer capacity and performance by adding various devices according to the following rules:
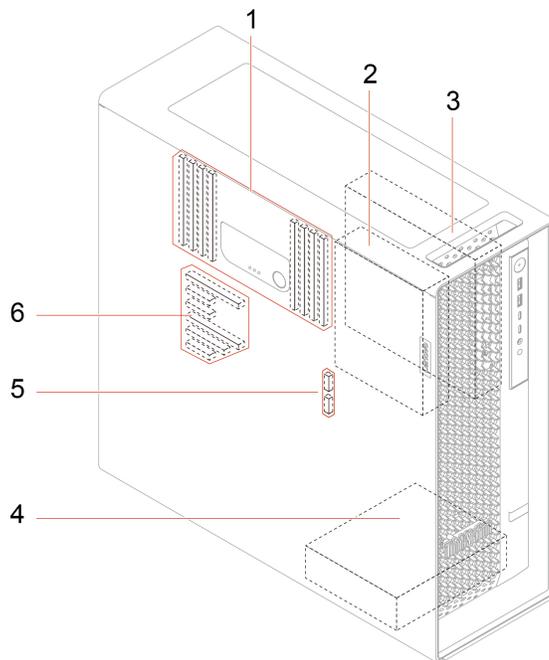
Item	Description
1. Memory slots	Depending on your computer model, you can install up to eight memory modules in the memory slots.
2. Optional storage drive bay	You can install a 3.5–inch HDD in the optional storage drive bay. **Note:** If you want to install a storage drive into the optional-storage-drive bay, contact the Lenovo Customer Support Center for help.
3. Flex bay	In flex bay, you can install one of the following devices: • One 15-in-1 media card reader • One flex module In the flex module, you can install a 2280 Gen 4 M.2 SSD (hot-swappable).
4. Storage drive bay	You can install one or two 3.5–inch HDDs in the storage drive bay.

Item	Description
5. Onboard M.2 SSD slots	This computer supports the following types of M.2 SSD: • 2280 Gen 4 M.2 SSD • 2280 Gen 5 M.2 SSD You can install one or two M.2 SSDs in onboard M.2 SSD slots. For better performance, it's recommended that you install M.2 SSDs of the same generation.
6. PCI-Express slot	You can install compatible PCIe cards (up to six) in the PCIe card slots.

* for selected models

Related topics

- "Memory module" on page 49.
- "Optional HDD and its cage" on page 57.
- "Flex module" on page 59.
- "Flex bay cage" on page 58.
- "15–in-1 media card reader" on page 58.
- "M.2 SSD in flex module" on page 60.
- "Onboard M.2 SSD and its heatsink kit" on page 62.
- "PCIe card" on page 77.

UEFI BIOS

UEFI BIOS is the first program that the computer runs. When the computer turns on, the UEFI BIOS performs a self test to make sure that various devices in the computer are functioning properly.

UEFI BIOS passwords

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

Password types

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

- Power-on password

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

- Supervisor password

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

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

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

- Hard disk password

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

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

- System management password (for selected models)

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

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

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

Set, change, and remove a password

Before you start, print these instructions.

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

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

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

What is UEFI BIOS

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

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

Enter the BIOS menu

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

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

Navigate in the BIOS interface

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

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

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

Change the display language of UEFI BIOS

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

To change the display language of UEFI BIOS:
1. Select **Main ➙ Language** and press Enter.
2. Set the display language as desired.

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

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

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

To change the display mode of UEFI BIOS:
1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Main ➙ Setup Mode Select** and press Enter.
3. Set the display mode as desired.

Set the system date and time

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

Change the priority boot order

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

Change the priority boot order permanently
1. Depending on the type of the storage device, do one of the following:

- If the storage device is internal, go to step 2.
- If the storage device is a disc, ensure that the computer is on or turn on the computer. Then, insert the disc into the optical drive.
- If the storage device is an external device other than a disc, connect the storage device to the computer.

2. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.

3. Select **Startup ➙ Priority Boot Order**, and then follow the on-screen instructions to change the boot priority order.

4. You can also select the first priority device group by selecting **Startup ➙ First Boot Device**, and then follow the on-screen instructions to select the first boot device within this group. Your computer will boot from the first boot device before trying the boot priority order you set in the previous step.

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

Select a temporary boot device

Note: Not all discs and storage drives are bootable.

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

2. Restart the computer. When the logo screen is displayed, press F12 or Fn+F12.

3. Select the storage device as desired and press Enter.

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

Enable or disable the configuration change detection feature

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

To enable or disable the configuration change detection feature:

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

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

Enable or disable the automatic power-on feature

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

To enable or disable the automatic power-on feature:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.

2. Select **Power ➙ Automatic Power On** and press Enter.

3. Select the feature as desired and press Enter.

4. Enable or disable the feature as desired.

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

Enable or disable the ErP LPS compliance mode

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

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

To enable or disable the ErP LPS compliance mode:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.

2. Select **Power ➙ Enhanced Power Saving Mode** and press Enter.

3. Depending on whether you select **Enabled** or **Disabled**, do one of the following:

   - If you select **Enabled**, press Enter. Then, select **Power ➙ Automatic Power On** and press Enter. Check whether the Wake on LAN feature is disabled automatically. If no, disable it.

   - If you select **Disabled**, press Enter. Then, go to the next step.

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

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

- Press the power button.

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

To meet the off mode requirement of ErP compliance, you need to disable the Fast Startup function.

1. Go to **Control Panel** and view by large icons or small icons.

2. Click **Power Options ➙ Choose what the power buttons do ➙ Change settings that are currently unavailable**.

3. Clear the **Turn on fast startup (recommended)** option from the **Shutdown settings** list.

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:
https://support.lenovo.com/us/en/solutions/windows-support

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.

Update UEFI BIOS

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

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

- From the Vantage app:

  Open the Vantage app to check the available update packages. 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:

    1. Go to https://pcsupport.lenovo.com.
    2. Download the flash BIOS update driver for the operating system version or the ISO image version (used to create a flash update disc). Then, download the installation instructions for the flash BIOS update driver you have downloaded.
    3. Print the installation instructions and follow the instructions to update the BIOS.

Reset system to factory default

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

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

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

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

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

View UEFI BIOS Event logs

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

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

- PgUp / PgDn: Scroll page
- Enter: Select
- F3: Exit

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

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

RAID

What is RAID

Redundant Array of Independent Disks (RAID) is a technology that provides increased storage functions and reliability through redundancy. It also can improve data storage reliability and fault tolerance compared with single-drive storage systems. Data loss resulting from a drive failure can be prevented by reconstructing missing data from the remaining drives.

When a group of independent physical storage drives is set up to use RAID technology, they are in a RAID array. This array distributes data across multiple storage drives, but the array appears to the host computer

as one single storage unit. Creating and using RAID arrays provides high performance, such as the expedited I/O performance, because several drives can be accessed simultaneously.

Configure RAID with Intel RSTe

If your computer comes with the Intel RSTe configuration utility, you can follow the sections below to configure RAID with Intel RSTe.

Storage drive requirements for RAID levels

Your computer supports the following RAID levels:

- RAID 0: striped disk array
    - Consists of at least two SATA storage drives
    - Supported strip size: 4 KB, 8 KB, 16 KB, 32 KB, 64 KB, or 128 KB
    - Better performance without fault tolerance
- RAID 1: mirrored disk array
    - Consists of two SATA storage drives
    - Improved reading performance and 100% redundancy
- RAID 5: block-level striped disk array with distributed parity
    - Consists of at least three SATA storage drives
    - Supported strip size: 16 KB, 32 KB, 64 KB, or 128 KB
    - Better performance and fault tolerance

Create a RAID volume

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

To create a RAID volume:

1. Enable **RAID** by doing the following:
    a. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
    b. Select **Devices ➙ PCH SATA Configuration** and press Enter.
    c. Select **Configure SATA as** and press Enter. Then, select **RAID** and press Enter.
    d. Press F10 or Fn+F10 to save the changes and exit.
2. Enter the BIOS menu again.
3. Select **Advanced ➙ Intel RSTe SATA Controller** and press Enter.
4. Select **Create RAID Volume** and press Enter. The Create RAID Volume window is displayed.
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**
        - **RAID5**

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

     c. **Select Disks**: Select a storage drive and press Enter. Then, select **X** and press Enter to add it to a group.

     d. **Strip Size** (if applicable): Select a strip 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

To 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 RSTe SATA Controller** and press Enter.

3. Select **RAID Volumes** and press Enter.

4. Select a RAID volume and press Enter to view the detailed information.

5. 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.

To delete a RAID volume:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.

2. Select **Advanced** ➙ **Intel RSTe SATA Controller** and press Enter.

3. Under **RAID Volumes**, select the RAID volume that you want to delete and press Enter. The RAID VOLUME INFO window is displayed.

4. Select **Delete** under **Volume Actions** and press Enter. When prompted, select **Yes** and press Enter to confirm the deletion of the selected RAID volume.

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

Configure RAID with AVAGO MegaRAID Configuration Utility

To configure RAID with AVAGO MegaRAID Configuration Utility, ensure that:

- An AVAGO MegaRAID adapter is installed in your computer.

- The storage drives used for RAID configuration are connected to the installed AVAGO MegaRAID adapter instead of the system board.

Storage drive requirements for RAID levels

Your computer supports the following RAID levels:

- RAID 0: striped disk array

  - Consists of at least two SATA drives

  - Supported strip size: 64 KB, 128 KB, 256 KB, 512 KB, or 1 MB

  - Better performance without fault tolerance

  CAUTION:
  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 get it recovered.

- RAID 1: mirrored disk array

  - Consists of two or four SATA drives

– Improved read performance and 100% redundancy

Create a RAID volume

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

To create a RAID volume:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Advanced** ➙ **AVAGO 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**

      Note: Some of the RAID levels might not be displayed because the number of installed storage drives and the model of the AVAGO 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

To 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** ➙ **AVAGO 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.

To delete a RAID volume:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
2. Select **Advanced** ➙ **AVAGO 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.

Configure RAID with Intel Virtual RAID on CPU

To configure RAID with the Intel Virtual RAID on CPU configuration utility, ensure that:

- An upgrade key module is connected to the Virtual RAID on CPU (VROC) connector on the system board.
- M.2 solid-state drives are installed in your computer.

Storage drive requirements for RAID levels

Your computer supports the following RAID levels:

- RAID 0: striped disk array

  – Consists of at least two M.2 solid-state drives

  – Supported strip size: 4 KB, 8 KB, 16 KB, 32 KB, 64 KB, or 128 KB

  – Better performance without fault tolerance

- RAID 1: mirrored disk array

  – Consists of two M.2 solid-state drives

  – Improved reading performance and 100% redundancy

- RAID 10: striped and mirrored disk array (a combination of RAID 0 and RAID 1)

– Consists of four M.2 solid-state drives

– Supported strip size: 4 KB, 8 KB, 16 KB, 32 KB, or 64 KB

• RAID 5: block-level striped disk array with distributed parity

– Consists of at least three M.2 solid-state drives

– Supported strip size: 16 KB, 32 KB, 64 KB, or 128 KB

– Better performance and fault tolerance

– Available only on selected models of upgrade key modules

Create a RAID volume

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

To create a RAID volume:

1. Enable **VMD** for the selected M.2 solid-state drives by doing the following:

   a. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.

   b. Select **Devices ➔ Storage Setup ➔ Intel(R) VMD technology** and press Enter.

   c. Select each menu item and press Enter. Then, select **Enabled** and press Enter.

   d. Select an occupied M.2 solid-state drive slot as you need and press Enter. Then, select **VMD** and press Enter.

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

2. Enter the BIOS menu again.

3. Select **Advanced ➔ Intel Virtual RAID on CPU** and press Enter.

4. Select **All Intel VMD Controllers** and press Enter.

5. Select **Create Volumes** and press Enter.

6. 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.

7. Select **Create Volume** and press Enter to create a RAID volume.

8. Exit the BIOS menu.

View the information about a RAID volume

To 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. Select **RAID Volumes** and press Enter.

4. Select a RAID volume and press Enter to view the detailed information.

5. 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.

To delete 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. Select **Intel VROC Mananged 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.

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.

Functions of the BMC card

You can use the BMC card to manage your workstation through ThinkStation BMC remote management console, for example:

- 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.

For details of ThinkStation BMC remote management console, access the following Web site: https://support.lenovo.com/docs/bmc_web_guide.

Overview of the BMC card
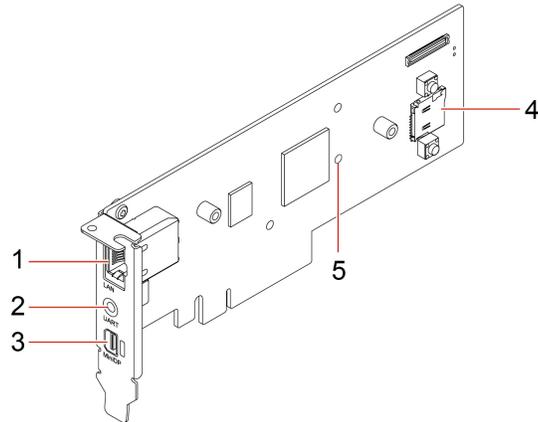
Item	Description	Item	Description
1	Ethernet connector	2	UART connector
3	Mini DisplayPort out connector	4	MicroSD slot
5	Firmware LED indicator		

Note: UART connector is disabled and reserved for future use.

Ethernet connector

Equipped with Ethernet controllers, the Ethernet connector (RJ-45) can transfer data at a speed of 10, 100, or 1000 Mbps.

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.
	The 100-Mbps Ethernet is transferring data.
	The 1000-Mbps Ethernet is connected, ready for transferring data.
	The 1000-Mbps Ethernet is transferring data.
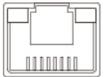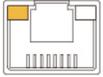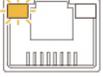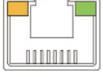
MicroSD slot

You can install a microSD card (capacity up to 2 TB) in the microSD slot as local media of BMC.

Firmware LED

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.

Set up the BMC card

Do the following to set up the BMC card.

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 power cables and turn on your computer. Wait at least 3 minutes for initial startup. You can view the startup process on the diagnostic LCD.

Step 3. Obtain the dynamic IP address (for example: `10.176.7.xxx`) from either client BIOS or router port management interface, and then log in to the BMC remote management console through a web browser (for example: `https://10.176.7.xxx/#login`).
   For initial access, input your username (default: `admin`) and password (default: `admin`). It is mandatory to change your password once you log in.

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.

Lenovo diagnostic tools

Use diagnostic solutions to test hardware components and report operating-system-controlled settings that interfere with the correct operation of your computer.

When an error message pops up in the Windows notification area, a four-digit error code is displayed on the diagnostic LCD (for selected models) on the front panel, or the diagnostic indicator on the front panel turns on, do one of the following:

- If ThinkStation Diagnostics can be launched properly:
  1. Click the error message or the ThinkStation Diagnostics icon to launch the program.
  2. All events are logged locally in the program. Locate the related event and view the event log to find possible solutions.
  3. Record the four-digit error code displayed on the diagnostic LCD (for selected models) or in ThinkStation Diagnostics, and then decode the error at https://www.thinkworkstationsoftware.com/codes.

  Note: You can download ThinkStation Diagnostics at https://pcsupport.lenovo.com/lenovodiagnosticsolutions/downloads.
- If your computer does not function:
  1. Use your smartphone to scan the QR code displayed on the diagnostic LCD to open https://www.thinkworkstationsoftware.com/codes.
  2. Decode the error according to the four-digit error code displayed on the diagnostic LCD.

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

The Vantage app

The Vantage app is preinstalled on your computer. To diagnose problems with the Vantage app:

1. Type `Vantage` in the Windows search box and press Enter.
2. Follow the on-screen instructions and run a hardware scan.

If you are unable to isolate and resolve the problem after running the Vantage app, save and print the log files created by the program. You might need the log files when you speak to a Lenovo technical support representative.

Troubleshooting and FAQs

This section lists online access to troubleshoot your computer and to frequently asked questions in Lenovo forums. For more information, go to: https://www.lenovo.com/tips, or https://forums.lenovo.com.

Recovery

Use the following recovery options to reset or restore your computer when your computer comes with issues.

- Use Lenovo recovery options.
  1. Go to https://support.lenovo.com/HowToCreateLenovoRecovery.
  2. Follow the on-screen instructions.
- Use Windows recovery options.
  1. Go to https://pcsupport.lenovo.com.
  2. Detect your computer or manually select your computer model.
  3. Navigate to the troubleshooting menu to diagnose the operating system for recovery instructions.

Chapter 4. CRU replacement

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

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

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

CRU list

The following is the CRU list of your computer.

Self-service CRUs

- Common lock kit for side cover*
- Customized PCIe extender*
- Fiber modules of some Ethernet adapter cards*
- Flex bay cage*
- Flex bay dummy cover*
- Flex bay fan*
- Flex module*
- Front fan
- HDD*
- HDD bracket*
- HDD fan*
- ID badge*
- Keyboard*
- M.2 SSD*
- M.2 SSD and box*
- M.2 SSD heatsink kit
- M.2 SSD holder
- Memory module
- Memory fan duct
- Memory fan

- Mouse*
- NVLINK retainer*
- Optional HDD cage*
- Optional HDD cage bracket*
- PCIe bracket
- PCIe card
- Power cord
- Power distribution board and bracket
- Power supply assembly*
- Power supply unit cover*
- Random lock kit for side cover*
- Rear fan
- Side cover
- Super capacitor module*
- Top cover
- Think LED holder
- Think LED cable
- ThinkStation logo badge

Optional-service CRUs
- PCBA of 15-in-1 media card reader*
- 15-in-1 media card reader bezel kit*
- Front panel I/O assembly
- Internal Speaker
- NVLINK Bridge*

* for selected models

System board illustration

Note: The system board might look slightly different from the illustration.
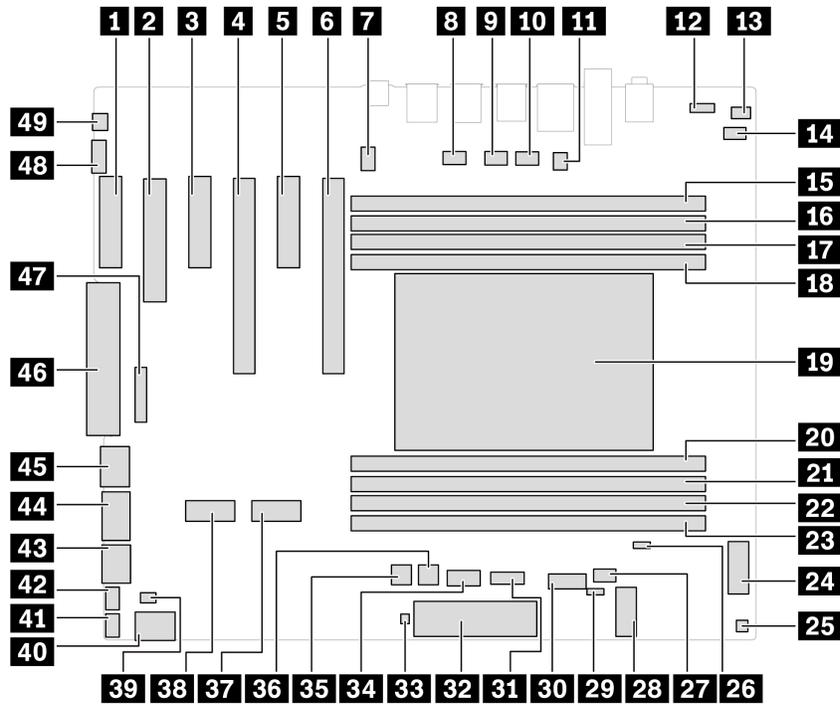
Figure 2. System board illustration

Item	Description	Item	Description
1	PCIe x4 card slot	**2**	PCIe x8 card slot
3	PCIe x4 card slot	**4**	PCIe x16 card slot
5	PCIe x4 card slot	**6**	PCIe x16 card slot
7	CPU fan connector	**8**	Rear fan connector
9	Memory duct fan connector 1	**10**	Memory duct fan connector 2
11	Serial port connector	**12**	VROC connector
13	Speaker connector	**14**	Cover presence switch connector
15	Memory slot 1	**16**	Memory slot 2
17	Memory slot 3	**18**	Memory slot 4
19	CPU socket	**20**	Memory slot 5
21	Memory slot 6	**22**	Memory slot 7
23	Memory slot 8	**24**	Flex bay connector
25	Thermal sensor connector	**26**	Clear CMOS connector
27	Flex bay fan connector	**28**	Wi-Fi card connector
29	Recovery jumper	**30**	SATA 3 connector
31	ALT_TPM slot	**32**	Front panel connector
33	Drive-act connector for RAID card	**34**	15-in-1 media card reader connector

Item	Description	Item	Description
35	HDD power connector 1	36	HDD power connector 2
37	M.2 card slot 1	38	M.2 card slot 2
39	Think LED logo connector	40	SATA 2 connector
41	Front fan connector	42	HDD Fan connector
43	SATA 1 connector	44	750–watt PSU power connector
45	CPU power connector	46	Auxiliary power connector
47	BMC connector	48	Thunderbolt cable connector
49	Thunderbolt power connector		

ID badge

Prerequisite

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

Removal steps

Remove the ID badge.
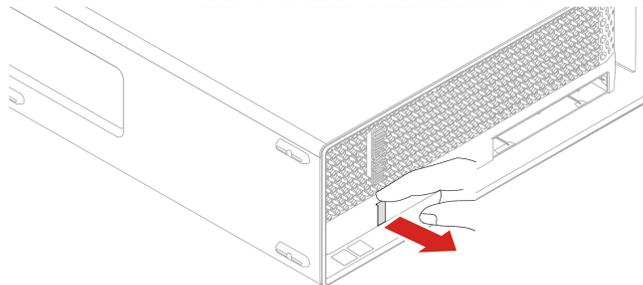
ThinkStation logo badge

Prerequisite

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

Removal steps

Remove the ThinkStation logo badge.
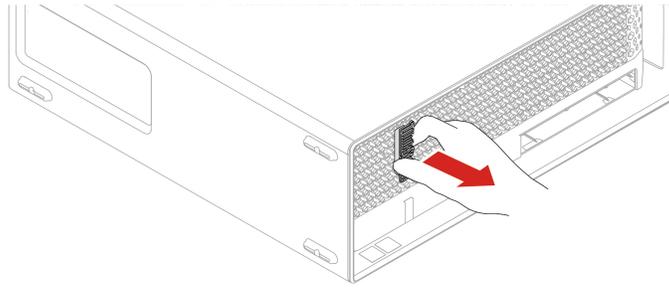
Side cover

Prerequisite

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

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

For access, do the following:

1. Turn off the computer and remove all connected devices and cables.
2. Unlock any locking device that secures the computer cover.
3. Place a soft, clean towel or cloth on the desk or surface. Hold the sides of your computer and gently lay it down so that the screen is against the surface and the computer cover is facing up.
4. Press the handle of the side cover so that the handle is lifted.

Removal steps

Remove the side cover.
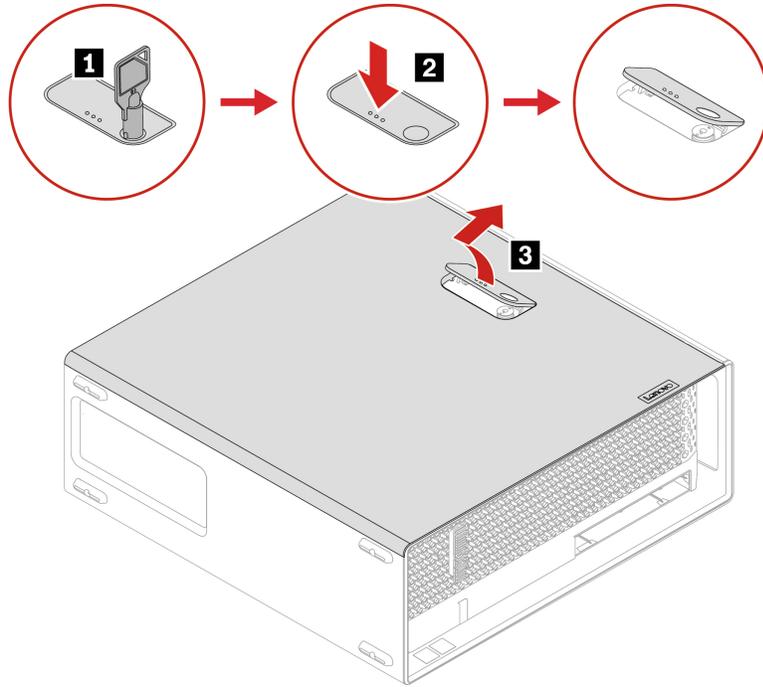
Installation steps

Install the side cover.
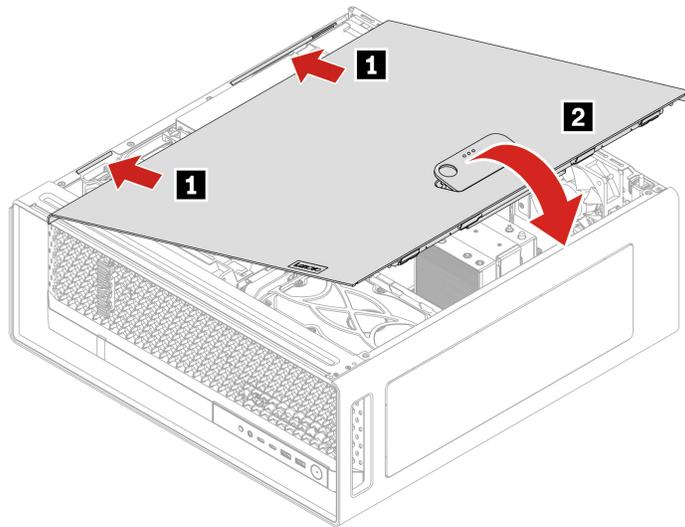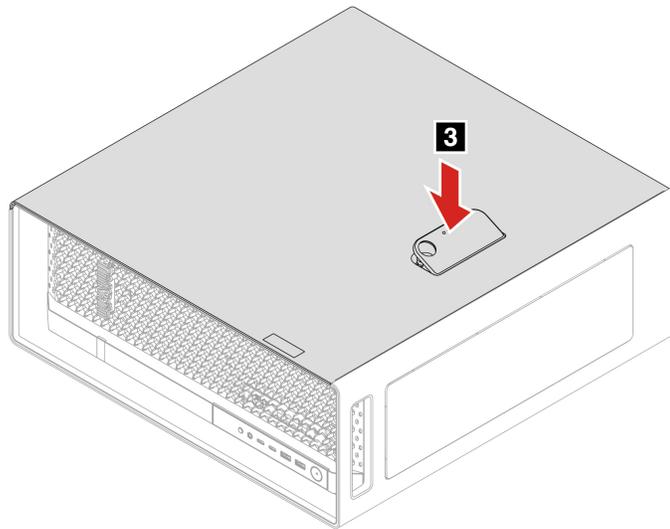
Notes:

- If a locking device is available, use it to lock the computer after installing the computer cover.
- Depending on your computer model, some of the hardware parts in the replacing section might not be available.

Top cover

Prerequisite

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

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

For access, remove the "Side cover" on page 39.

Removal steps

Remove the top cover.
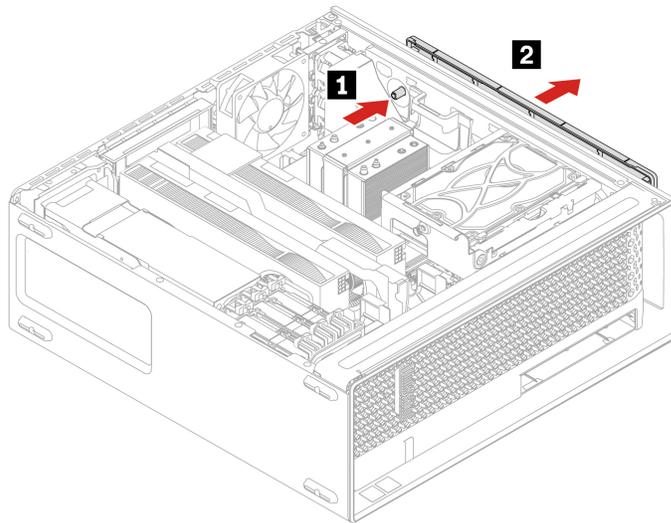
Front panel I/O assembly

Prerequisite

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

For access, do the following:
1. Remove the "Side cover" on page 39.
2. Remove the "Optional HDD and its cage" on page 57.
3. Remove the "Flex bay fan" on page 54.

Removal steps

Remove the front panel I/O assembly.
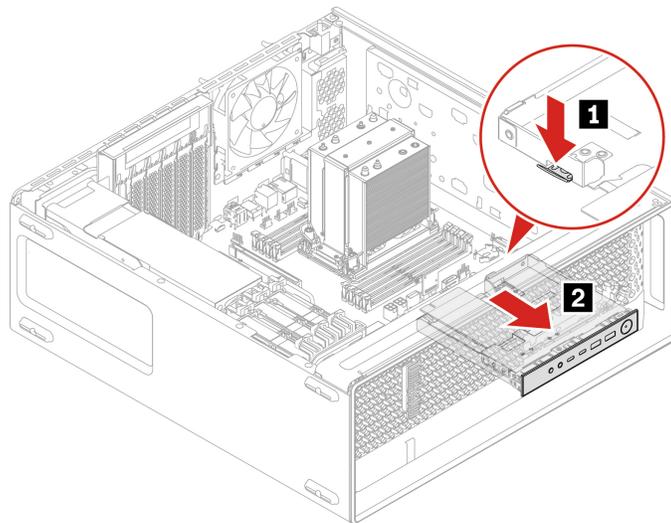
Installation steps

Install the front panel I/O assembly.
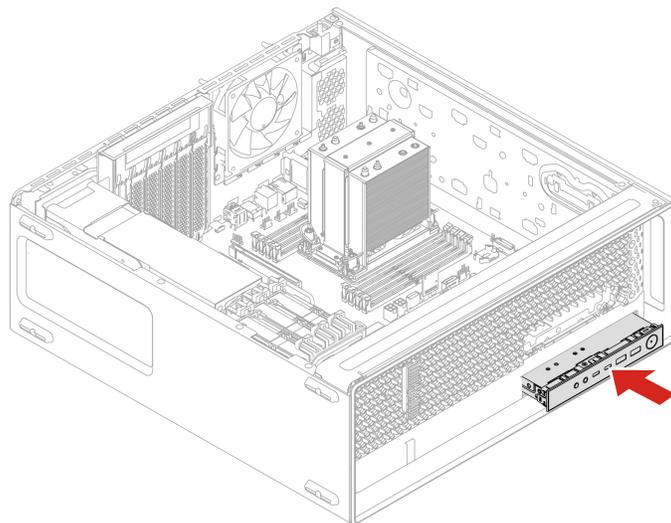
Internal speaker

Prerequisite

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

For access, do the following:

1. Remove the "Side cover" on page 39.
2. Remove the "Rear fan" on page 52.

Removal steps

Remove the internal speaker.
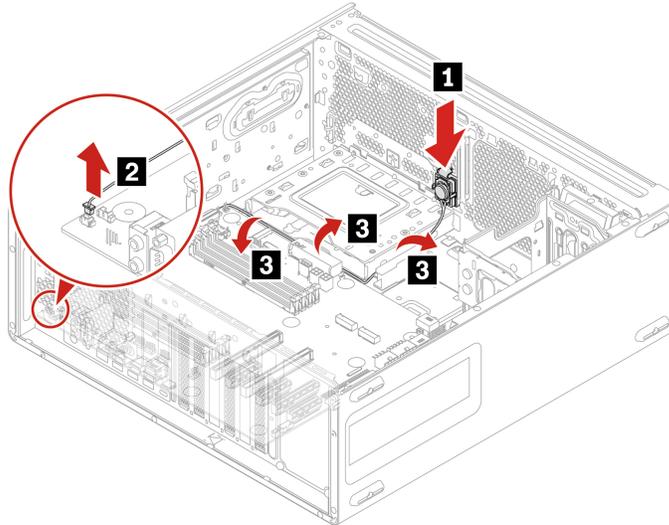

Think LED cable

**Prerequisite**

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

For access, do the following:

1. Remove the "Side cover" on page 39.
2. Remove the "Front fan" on page 51.

Removal steps

Remove the Think LED cable.
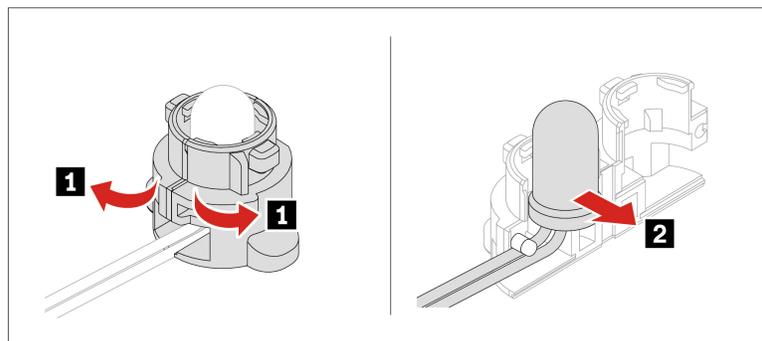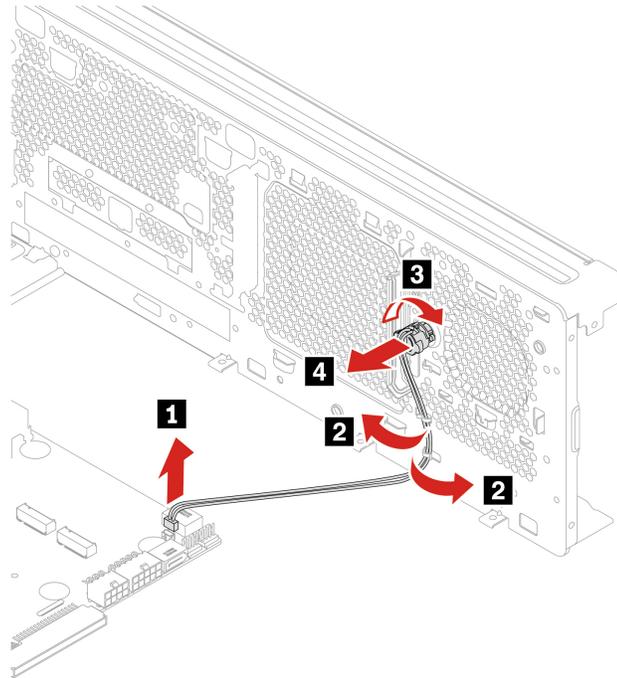
Power supply assembly

Prerequisite

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

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

⚠️

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

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

For access, remove the "Side cover" on page 39.

Removal steps

- For 1000–watt power supply assembly:
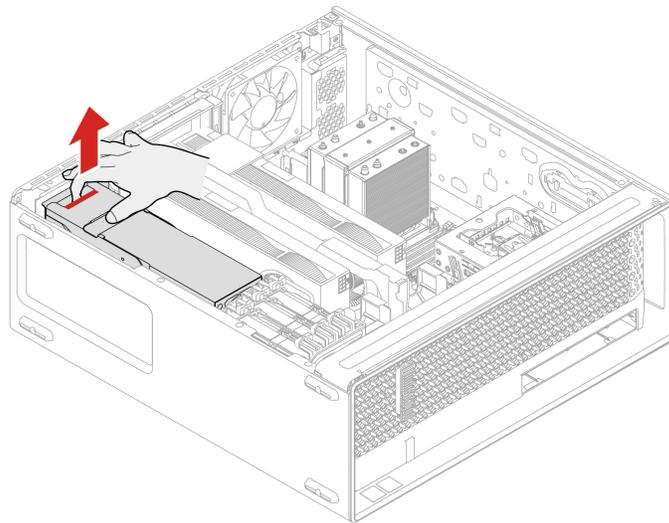
- For 750–Watt power supply assembly:
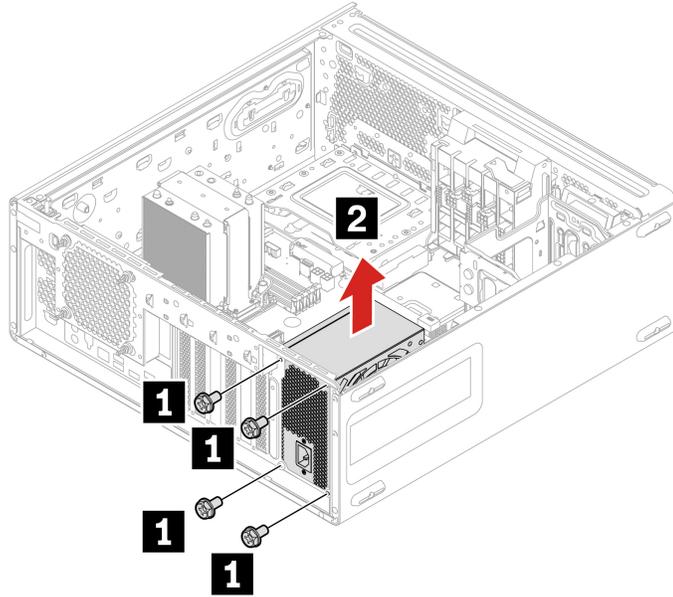
Screw (quantity)	Color	Torque
M3 x 5 mm, Nickel coated (4)	Black	5.0 ± 0.5 lb/in

Power supply unit cover

Prerequisite

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

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

For access, do the following:

1. Remove the "Side cover" on page 39.
2. Remove the "Power supply assembly" on page 45.

Removal steps

Remove the power supply unit cover.

Note: Depending on your computer model, the power supply unit cover only comes with 1000–watt power supply assembly.
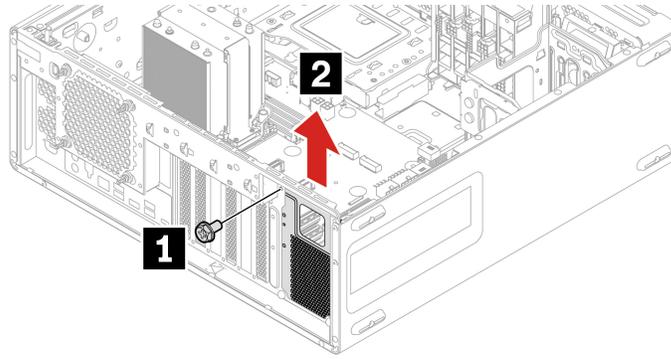
| Screw (quantity)	Color	Torque
M3 x 5 mm, Nickel coated (1)	Black	5.0 ± 0.5 lb/in

Power distribution board and bracket

**Prerequisite**

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

For access, do the following:

1. Remove the "Side cover" on page 39.
2. Remove the "Power supply assembly" on page 45.

Removal steps

Remove the power distribution board and bracket.
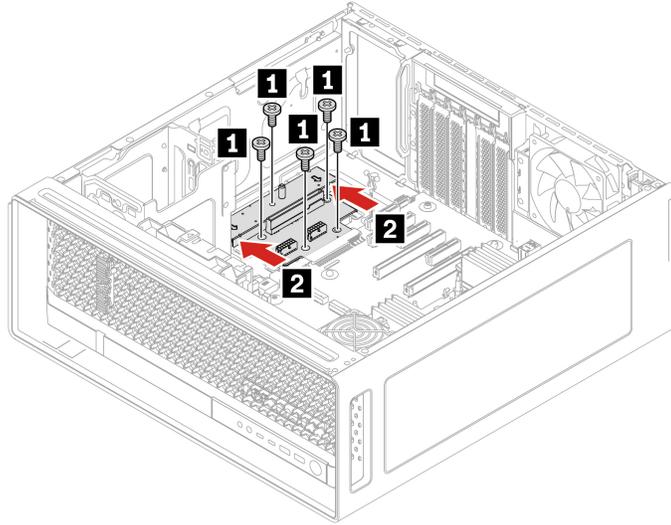
Screw (quantity)	Color	Torque
M3 x 5 mm, Nickel coated (4)	Black	5.0 ± 0.5 lb/in

Memory module

Prerequisite

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

Notes:

- To remove or install the memory module, wait at least 20 seconds after disconnecting power cords from the system. It allows the system to be completely discharged of electricity.
- Ensure that you follow the installation order for memory modules shown in the following illustration.

1 DIMM			2 DIMMS			4 DIMMS	
DIMM 8			DIMM 8			DIMM 8	✓
DIMM 7			DIMM 7			DIMM 7	
DIMM 6			DIMM 6	✓		DIMM 6	✓
DIMM 5			DIMM 5			DIMM 5	

CPU   CPU   CPU

DIMM 4			DIMM 4			DIMM 4	
DIMM 3	✓		DIMM 3	✓		DIMM 3	✓
DIMM 2			DIMM 2			DIMM 2	
DIMM 1			DIMM 1			DIMM 1	✓

6 DIMMS			8 DIMMS	
DIMM 8	✓		DIMM 8	✓
DIMM 7			DIMM 7	✓
DIMM 6	✓		DIMM 6	✓
DIMM 5	✓		DIMM 5	✓

CPU   CPU

DIMM 4	✓		DIMM 4	✓
DIMM 3	✓		DIMM 3	✓
DIMM 2			DIMM 2	✓
DIMM 1	✓		DIMM 1	✓
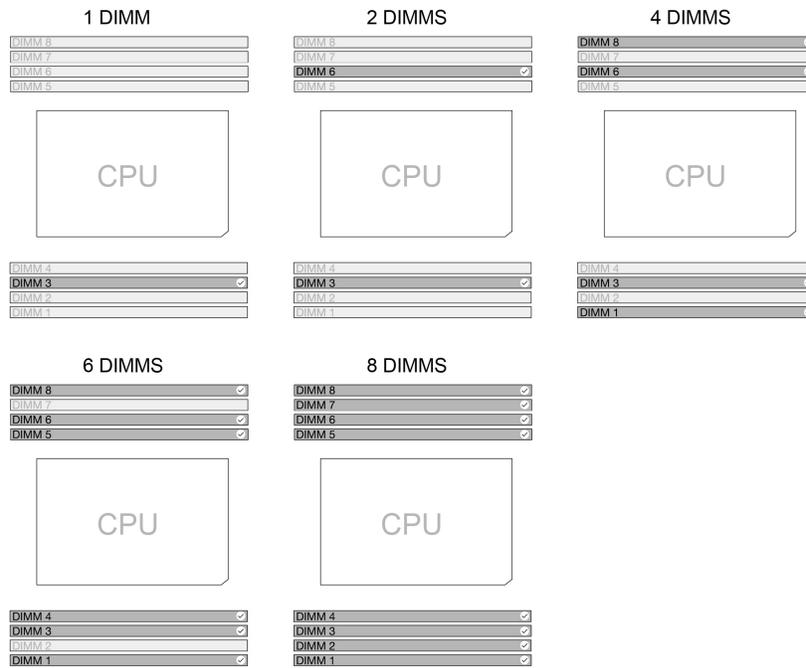
Figure 3. Memory module order

For access, do the following:

1. Remove the "Side cover" on page 39.
2. Remove the "Memory fan duct" on page 52.

Removal steps

Remove the memory module.
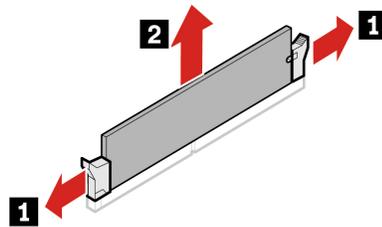
Installation steps

Install the memory module.
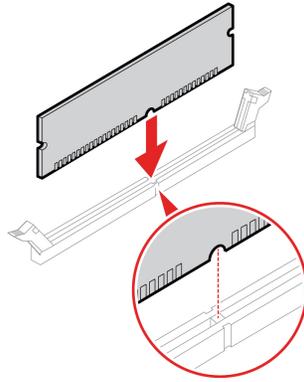
Fans

By reading this section, you will learn to replace the fans in your computer.

Front fan

Prerequisite

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

For access, do the following:

1. Remove the "Side cover" on page 39.
2. Remove the "Super capacitor module" on page 75.
3. Remove the "PCIe card" on page 77.

Removal steps

Remove the front fan.
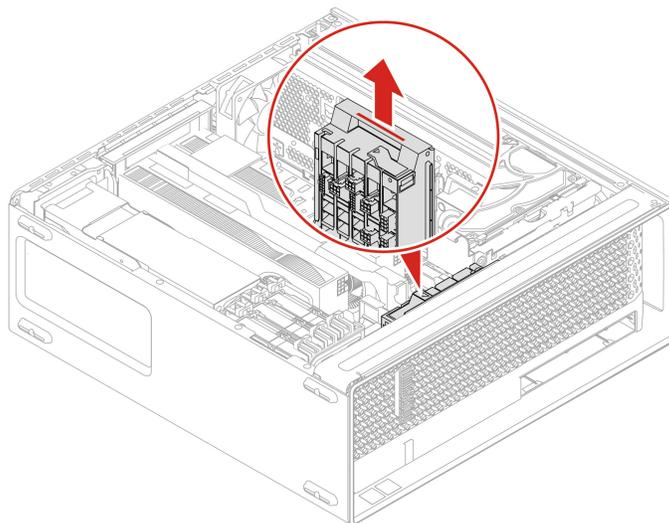
Rear fan

Prerequisite

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

For access, remove the "Side cover" on page 39.

Removal steps

Remove the rear fan.
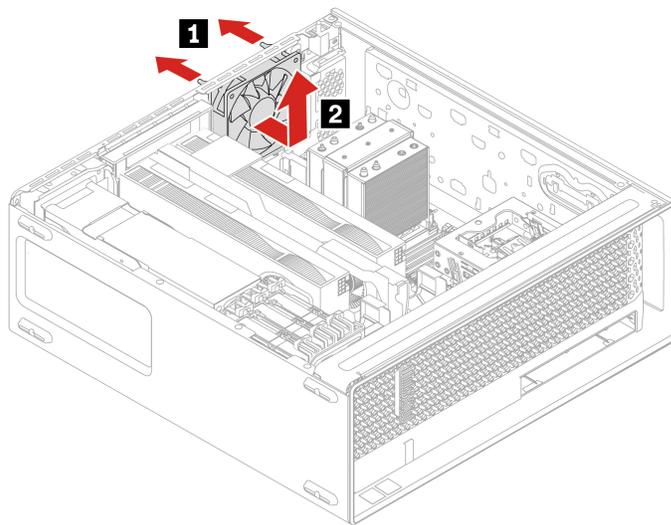
Memory fan duct

Prerequisite

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

⚠️

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

For access, remove the "Side cover" on page 39.

Removal steps

Remove the memory fan duct.
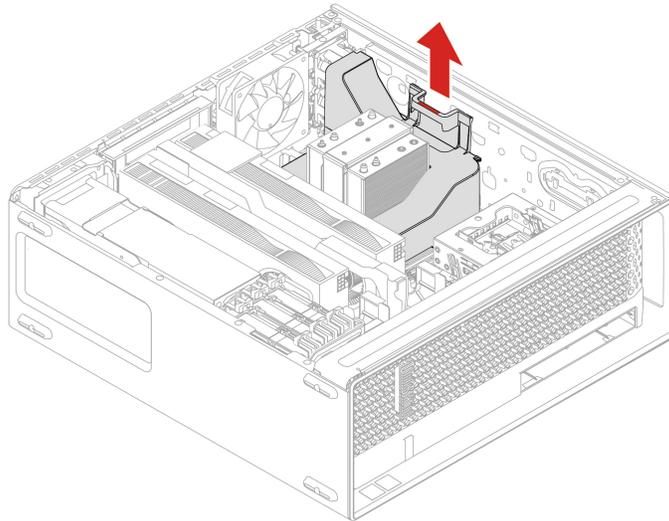
Memory fan

Prerequisite

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

For access, do the following:

1. Remove the "Side cover" on page 39.
2. Remove the "Memory fan duct" on page 52.

Removal steps

Remove the memory fan.
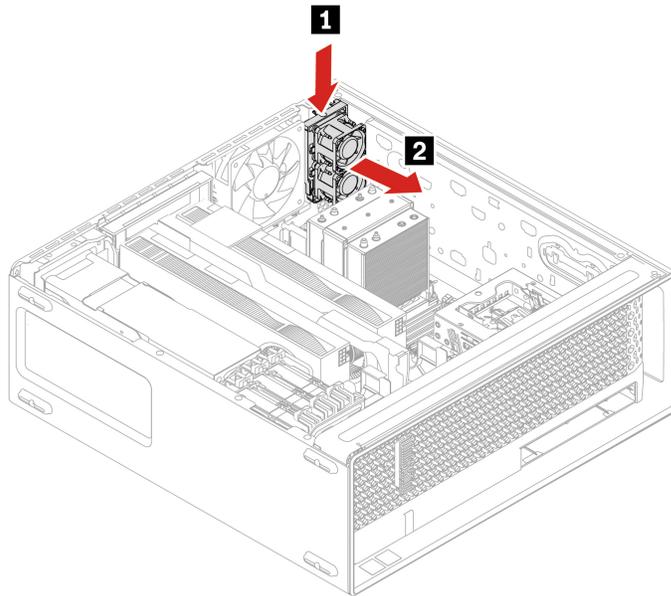
HDD fan

Prerequisite

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

For access, remove the "Side cover" on page 39.

Removal steps

Remove the HDD fan.
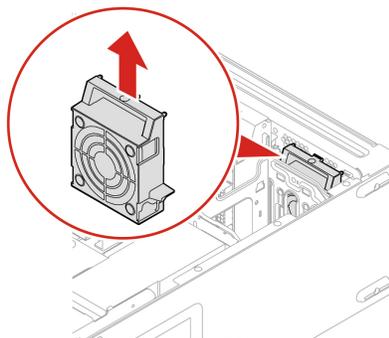
Flex bay fan

Prerequisite

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

For access, do the following:

1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Remove the "Side cover" on page 39.
4. Remove the "Optional HDD and its cage" on page 57.

**Removal steps**

Remove the flex bay fan.
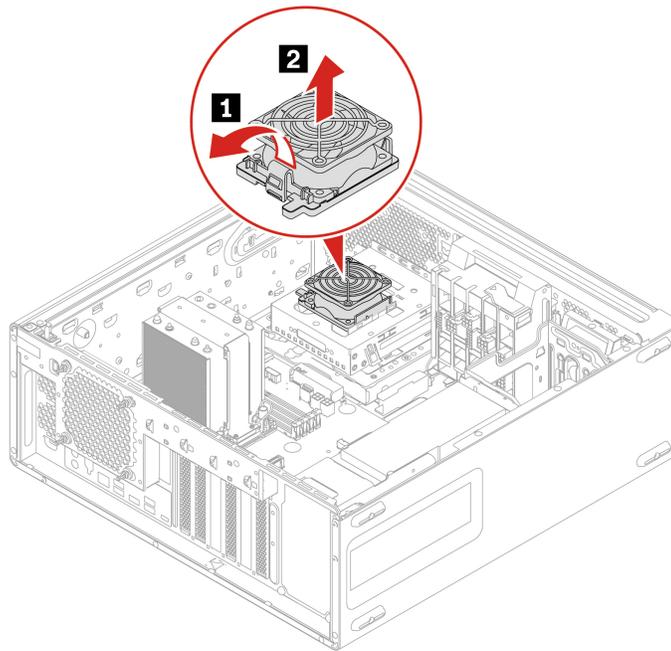
Storage drives

By reading this section, you will learn to replace storage drives in your computer.

HDD and its bracket

Prerequisite

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

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

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

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

For access, remove the "Side cover" on page 39.

Removal steps

Remove the HDD and its bracket.
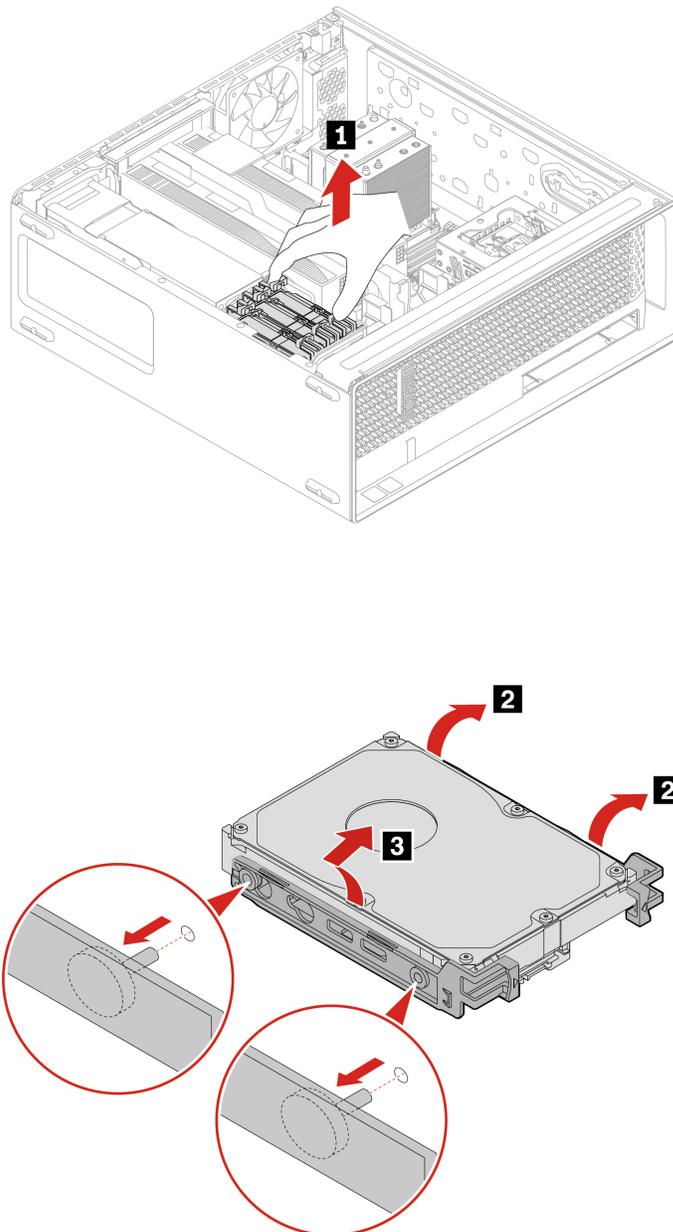
Optional HDD and its cage

Prerequisite

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

For access, do the following:

1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Remove the "Side cover" on page 39.

Removal steps

Remove the optional HDD.
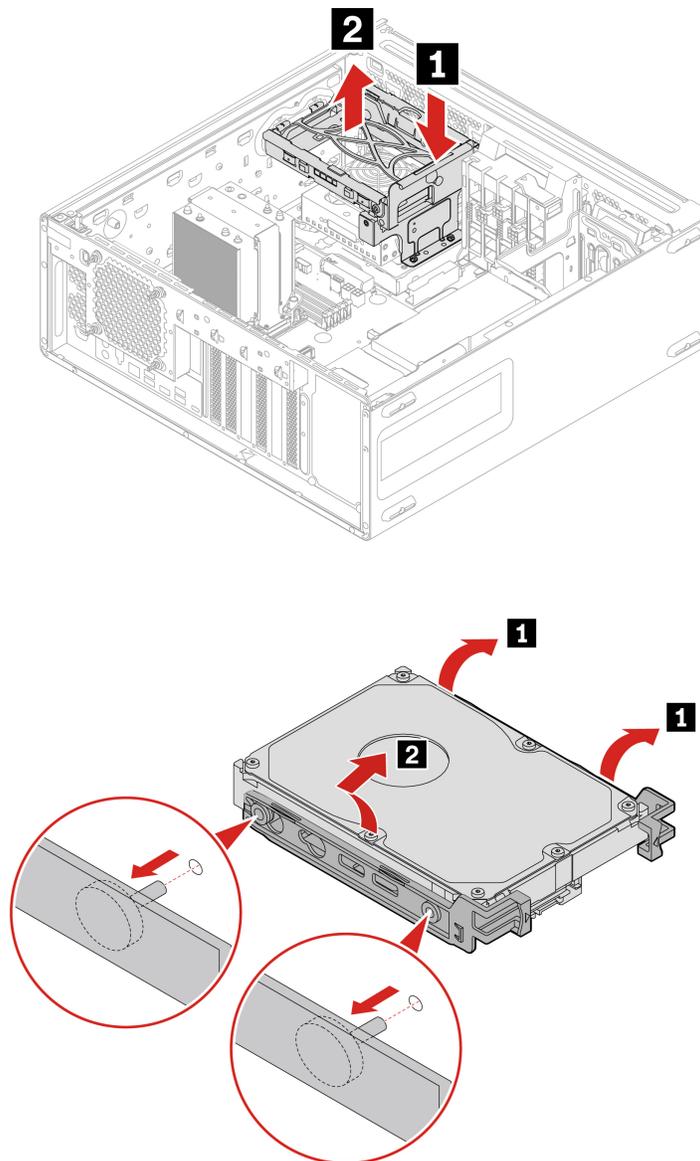
Flex bay cage

Prerequisite

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

For access, do the following:

1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Remove the "Side cover" on page 39.
4. Remove the "Optional HDD and its cage" on page 57.
5. Remove the "Flex bay fan" on page 54.
6. Remove the "Flex module" on page 59.
7. Remove the "15–in-1 media card reader" on page 58, if any.

Removal steps

Remove the flex bay cage.
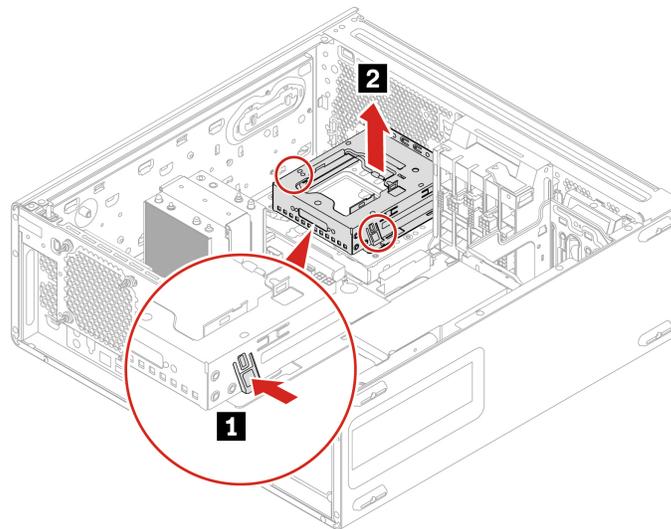
15–in-1 media card reader

Prerequisite

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

For access, do the following:

1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Remove the "Side cover" on page 39.
4. Remove the "Optional HDD and its cage" on page 57.
5. Remove the "Flex bay fan" on page 54.

Removal steps

Remove the 15–in-1 media card reader.
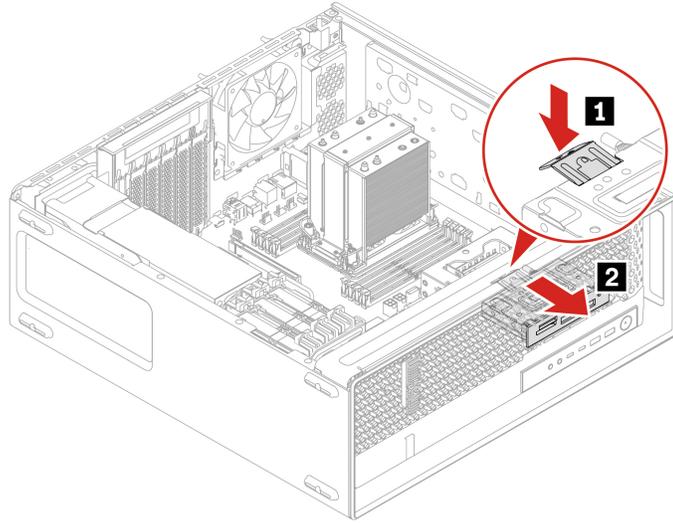
Installation steps

Install the 15–in-1 media card reader.
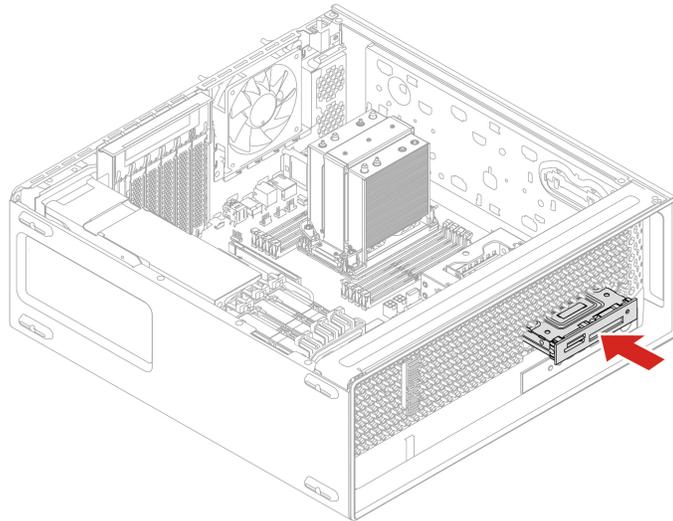
Flex module

Prerequisite

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

For access, do the following:
 1. Remove any media from the drives and turn off all connected devices and the computer.
 2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.

3. Remove the "Side cover" on page 39.

4. Remove the "Optional HDD and its cage" on page 57.

5. Remove the "Flex bay fan" on page 54.

Removal steps

Remove the flex module.
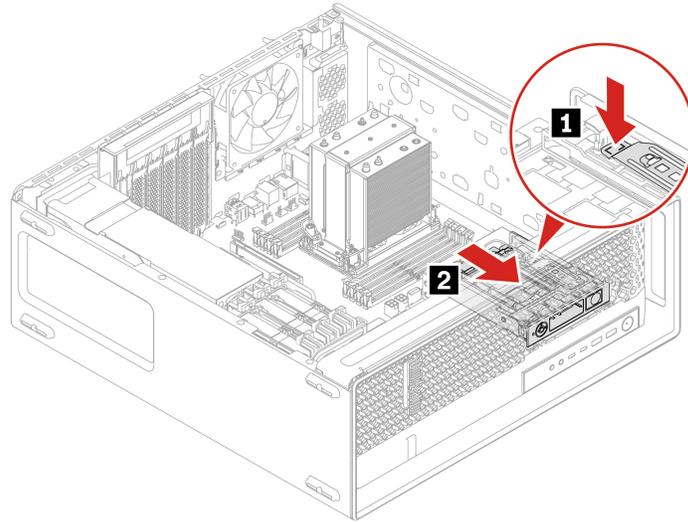
Installation steps

Install the flex module.
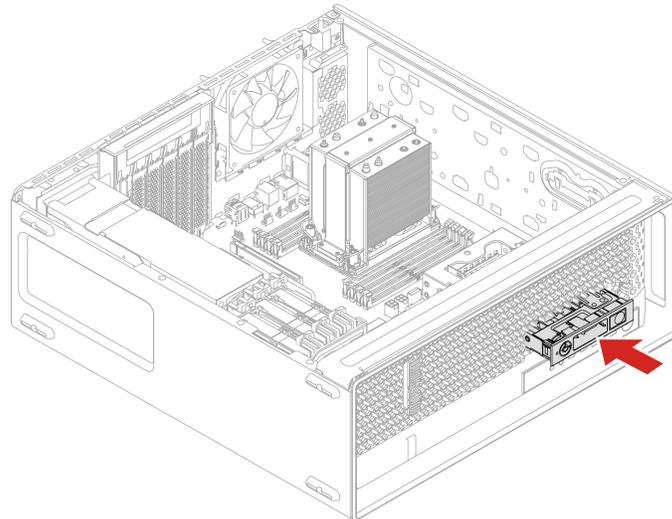
M.2 SSD in flex module

You can install or replace a M.2 SSD in the flex module. The flex module supports hot-swappable, which means that you can install or replace the M.2 SSD without even turning off your computer.

To enable hot-swappable function, you need to enable Intel VMD technology on MCIO slot first. Follow below steps:

1. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1 to enter the BIOS menu.
2. Click **Devices ➙ Storage Setup ➙ Intel(R) VMD Technology**.
3. Select **VMD** under **MCIO slot** configuration.

Notes:

- The storage drive in the flex module is hot-swappable only when the operating system of your computer does not reside on the storage drive installed in the flex module. If the requirements is not met, do not remove or install the storage drive when the computer is turned on. Otherwise, data on the storage drive might get damaged.
- Lock the flex module to prevent the unexpected removal. The keys are attached to the rear of the machine. For security, store the keys in a secure place when you are not using them.

Prerequisite

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

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

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

Removal steps

Remove the M.2 SSD.
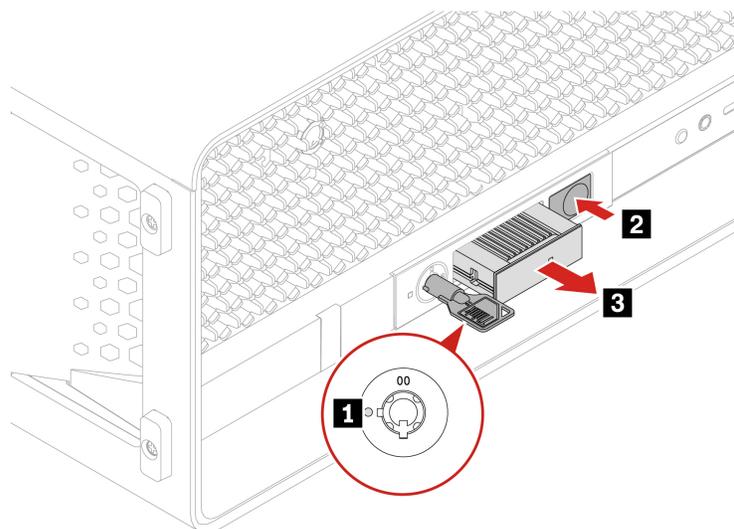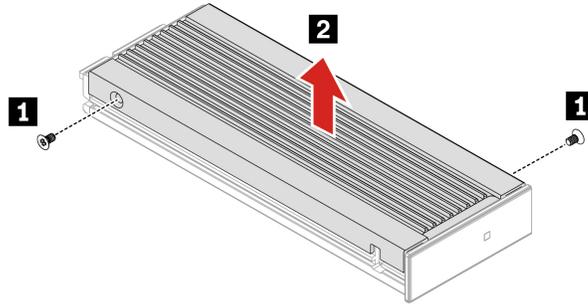
Screw (quantity)	Color	Torque
M2 x 3.6 mm, Zn coated(2)	Blue	1.5 ± 0.2 lb/in
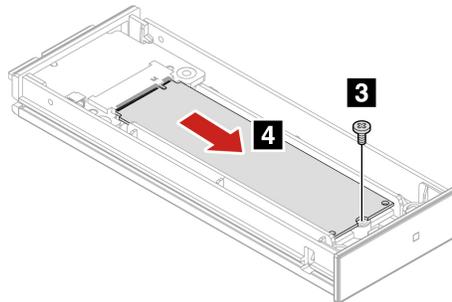
Screw (quantity)	Color	Torque
M2 x 4.5 mm, Zn coated(1)	Black	1.5 ± 0.2 lb/in

Onboard M.2 SSD and its heatsink kit

Prerequisite

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

The heat sink of M.2 SSD might be very hot. Before you open the computer cover, turn off the computer and wait several minutes until the component is cool.

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

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

For access, do the following:

1. Remove the "Side cover" on page 39.
2. Remove the "Super capacitor module" on page 75.
3. Remove the "PCIe card" on page 77.

Removal steps

1. Remove the M.2 SSD with its heatsink kit.
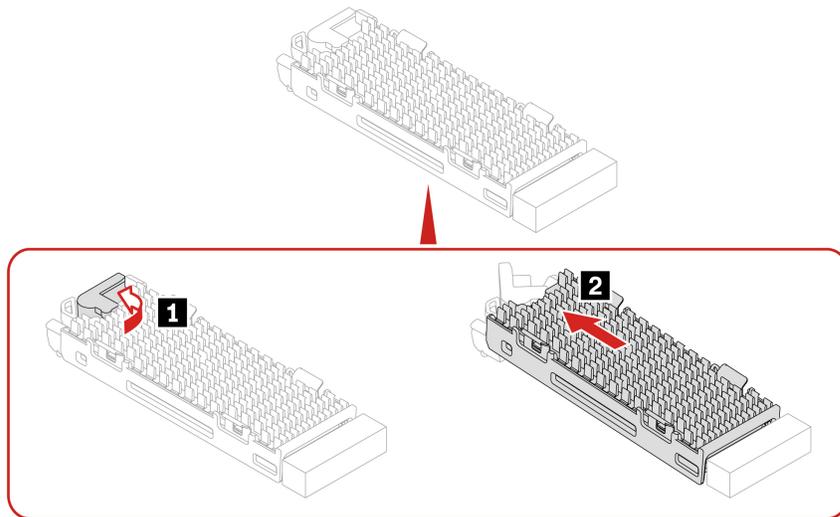
2. Remove the M.2 SSD from its heatsink kit.

   - Gen 4 M.2 SSD
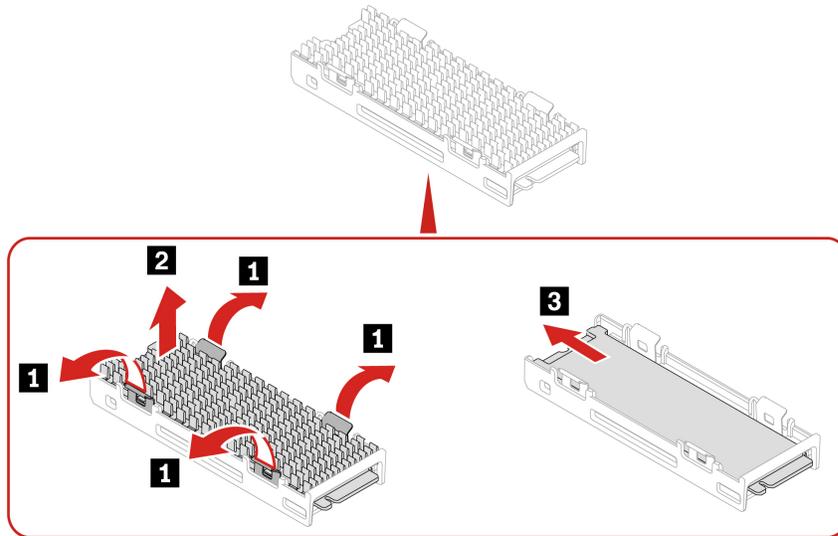
- Gen 5 M.2 SSD
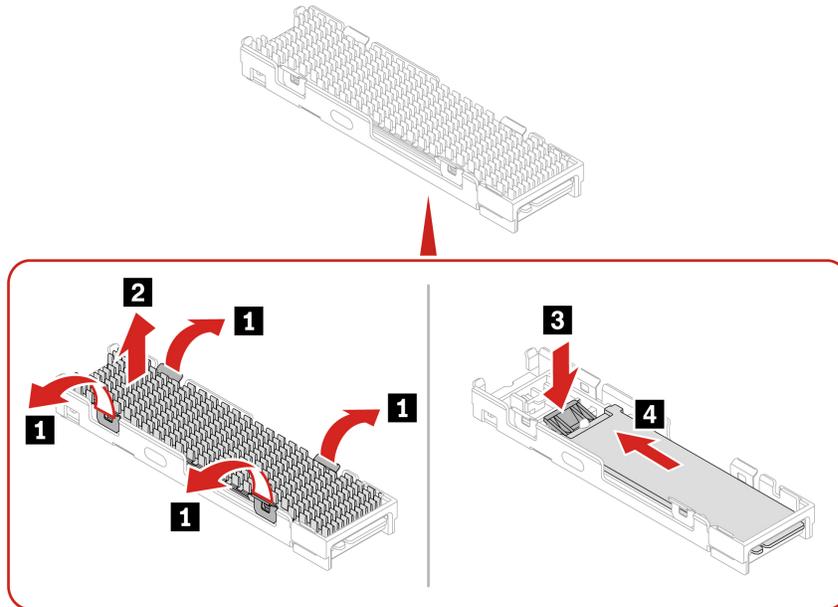
Note: Remove the film that covers the thermal pad (if any) when installing the M.2 SSD.

M.2 SSD holder

Prerequisite

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

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

For access, do the following:

1. Remove the "Side cover" on page 39.
2. Remove the "Super capacitor module" on page 75.
3. Remove the "PCIe card" on page 77.
4. Remove the "Onboard M.2 SSD and its heatsink kit" on page 62.

Removal steps

Remove the M.2 SSD holder.
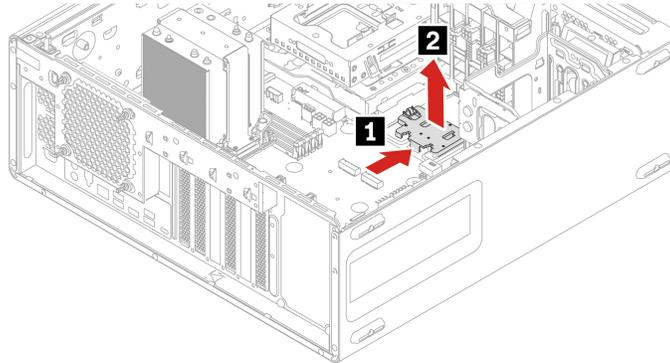
M.2 SSD on an M.2 SSD PCIe adapter

Prerequisite

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

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

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

For access, do the following:

1. Remove the "Side cover" on page 39.
2. Remove the "Super capacitor module" on page 75.
3. Remove the "NVLINK bridge" on page 74, if any.
4. Remove the M.2 SSD PCIe adapter. See "PCIe card" on page 77.

Removal steps of type 1 M.2 SSD on an M.2 SSD PCIe adapter

1. Open the cover.
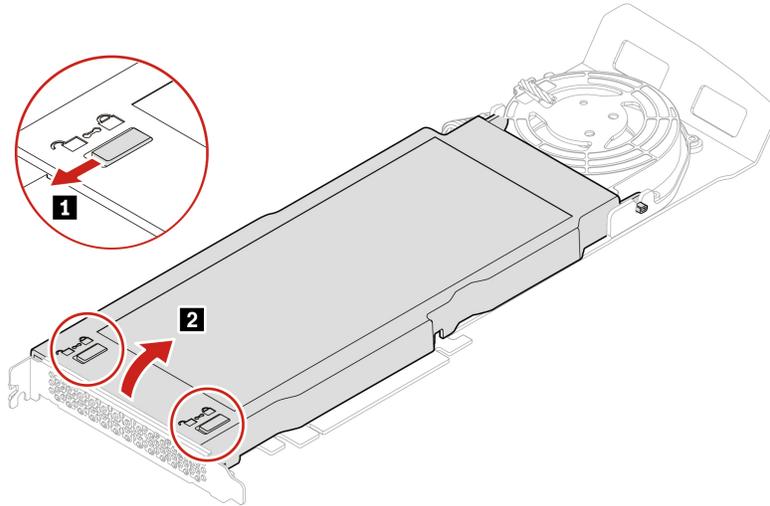
2. Remove the M.2 SSD heat sink.
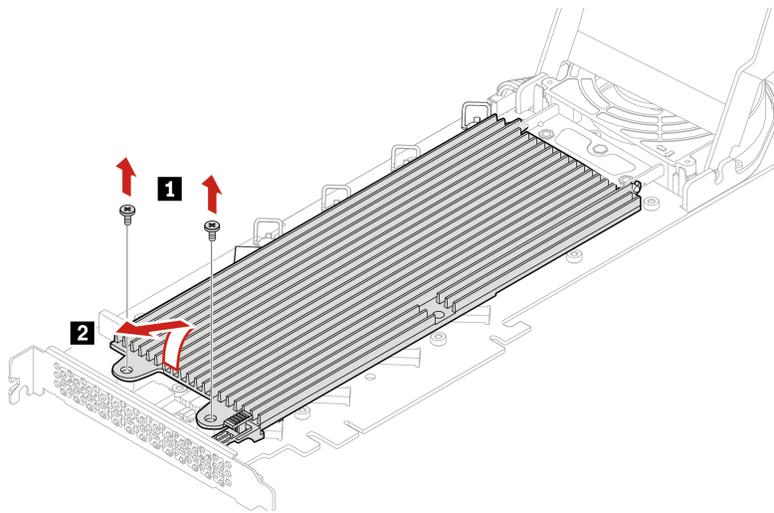
| Screw (quantity)	Color	Torque
M3_H5 Zn coated (2)	Black	3.0 ± 0.2 lb/in

3. Pull the handle of the retention latch outward to release the M.2 SSD. Then, remove the M.2 SSD from the PCIe adapter.
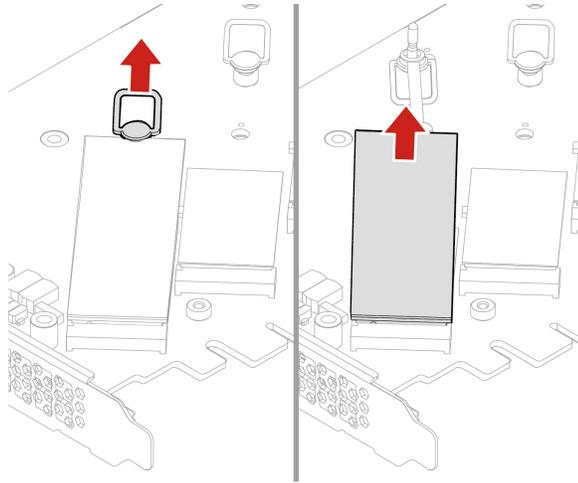
Installation steps of type 1 M.2 SSD on an M.2 SSD PCIe adapter

1. If necessary, move the retention latch to an appropriate location to suit the length of the new M.2 SSD.
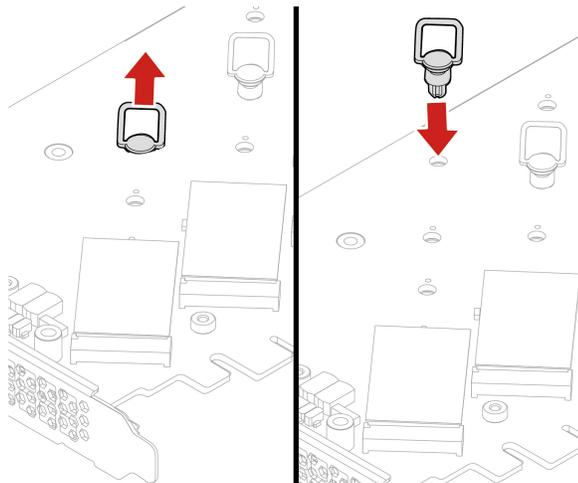
Remove the film on the thermal pad on which you want to install the M.2 SSD. Pull the handle of the retention latch outward to the open position.
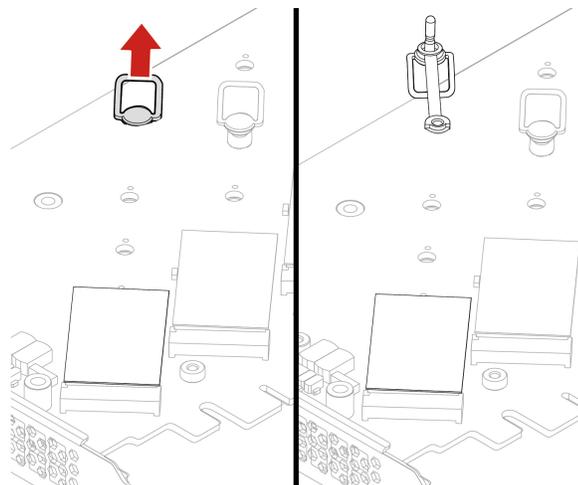
2. Install the M.2 SSD. Then, insert the plug of the retention latch into the hole to secure the new drive. Do not touch the circuit board of the M.2 SSD.

   Note: Install M.2 SSD in the alphabetic order as shown.
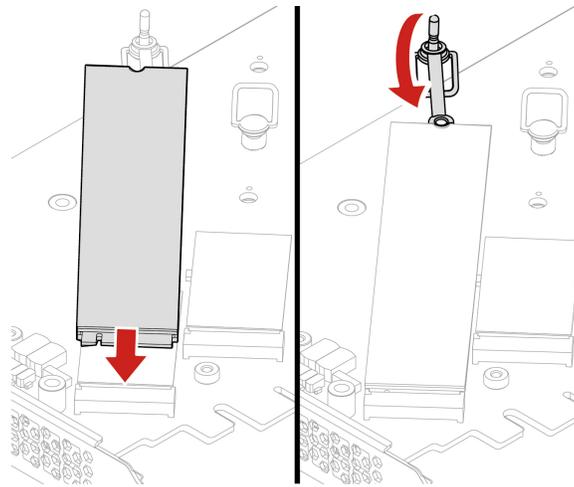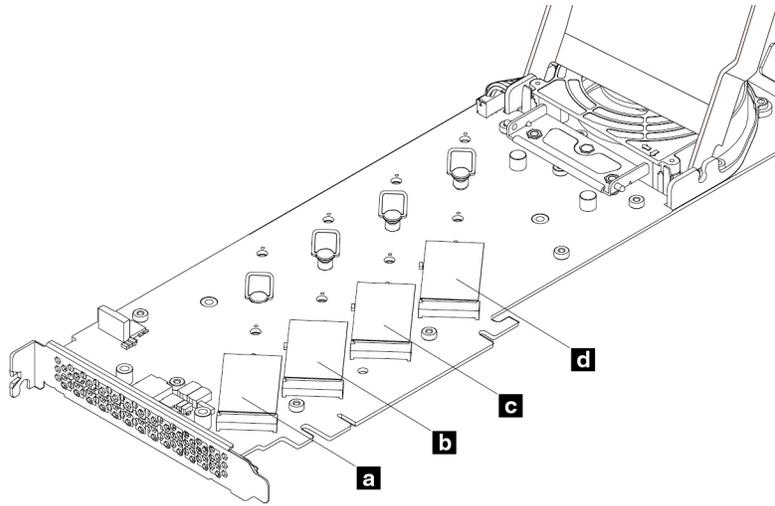
3. Install the M.2 SSD heat sink.
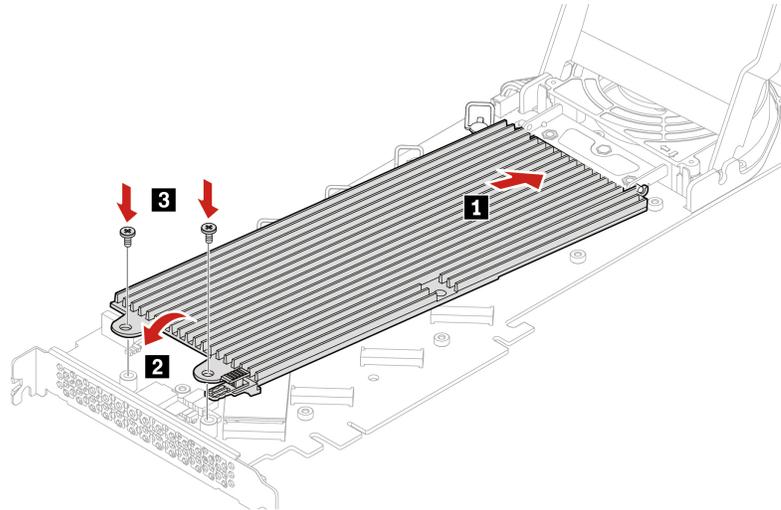
4. Close the cover and lock it.
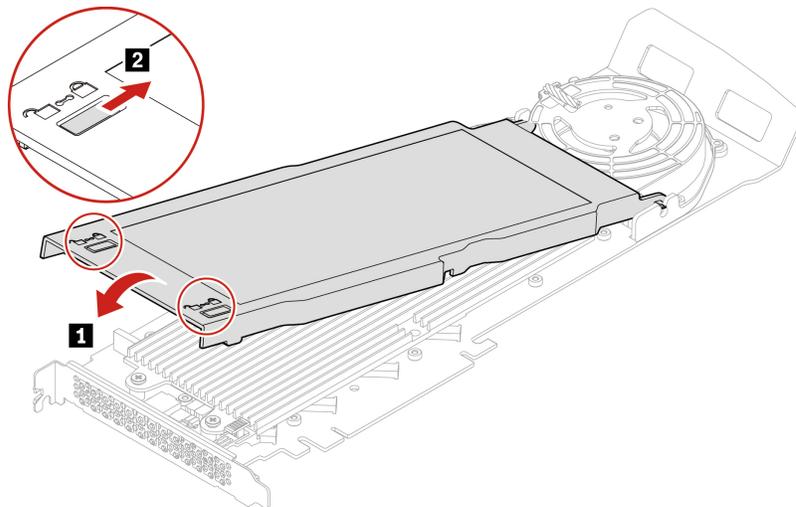
Note: Install the M.2 SSD PCIe adapter in a PCIe x16 card slot on the system board. See "PCIe card installation rule" on page 80.

Removal steps of type 2 M.2 SSD on an M.2 SSD PCIe adapter

1. Rotate the lock to the open position to open the cover.
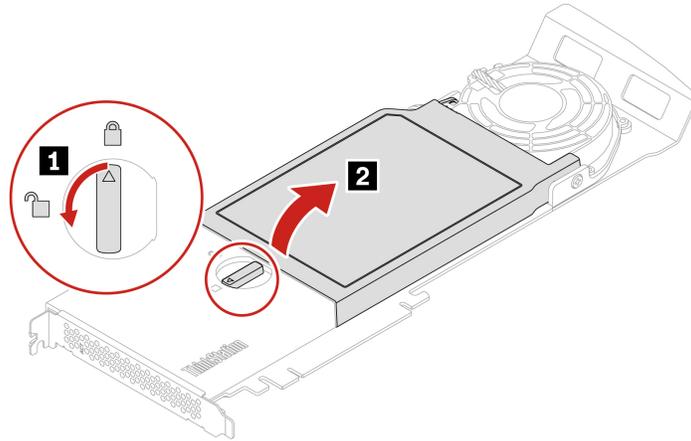
2. Pull the handle of the retention latch outward to release the M.2 SSD. Then, remove the M.2 SSD from the PCIe adapter.
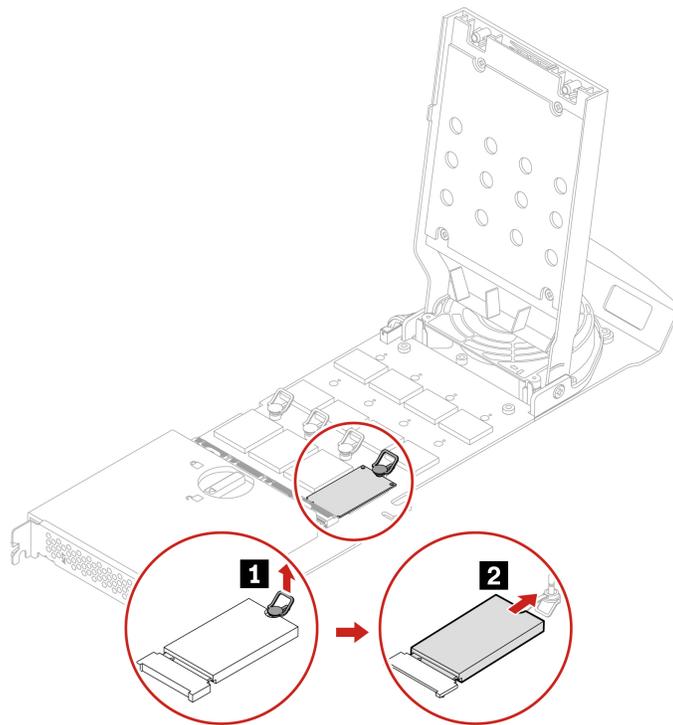
Installation steps of type 2 M.2 SSD on an M.2 SSD PCIe adapter

1. If necessary, move the retention latch to an appropriate location to suit the length of the new M.2 SSD.
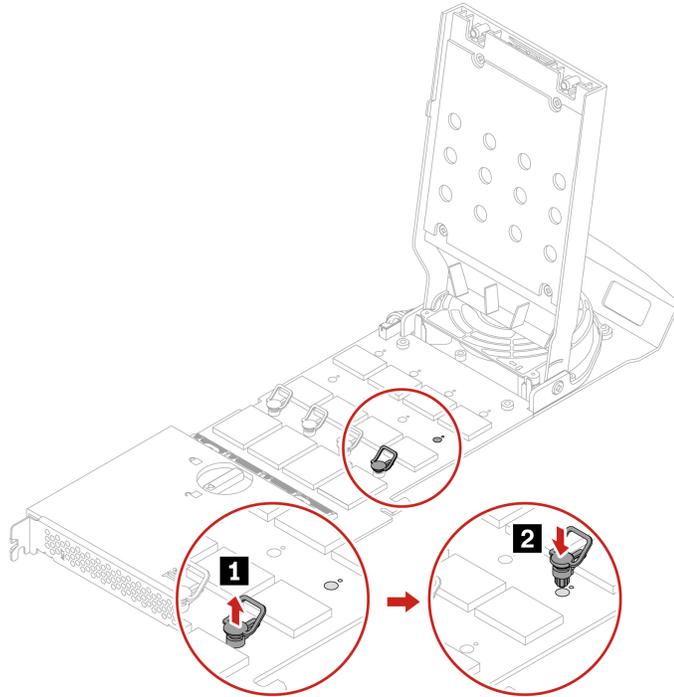
Remove the film on the thermal pad on which you want to install the M.2 SSD. Pull the handle of the retention latch outward to the open position.
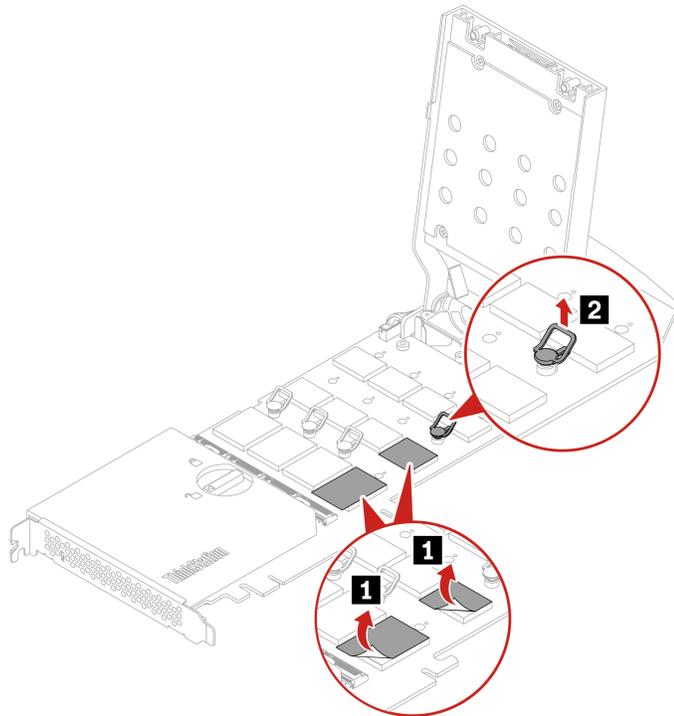
2. Install the M.2 SSD. Then, insert the plug of the retention latch into the hole to secure the new drive. Do not touch the circuit board of the M.2 SSD.

   Notes:

- Install M.2 SSDs in the following order as shown:
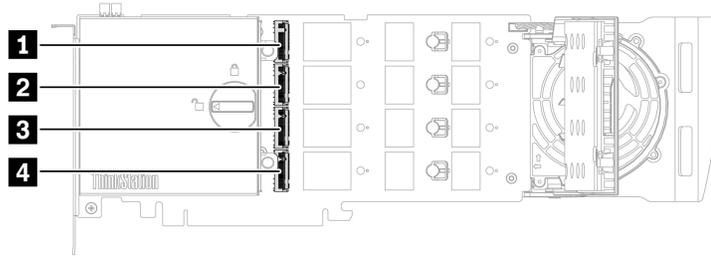
- For better performance, it's recommended that the generation of M.2 SSD match with the generation of M.2 SSD PCIe adapter. For example, install Gen 4 M.2 SSD on Gen 4 M.2 SSD PCIe adapter and install Gen 5 M.2 SSD on Gen 5 M.2 SSD PCIe adapter.
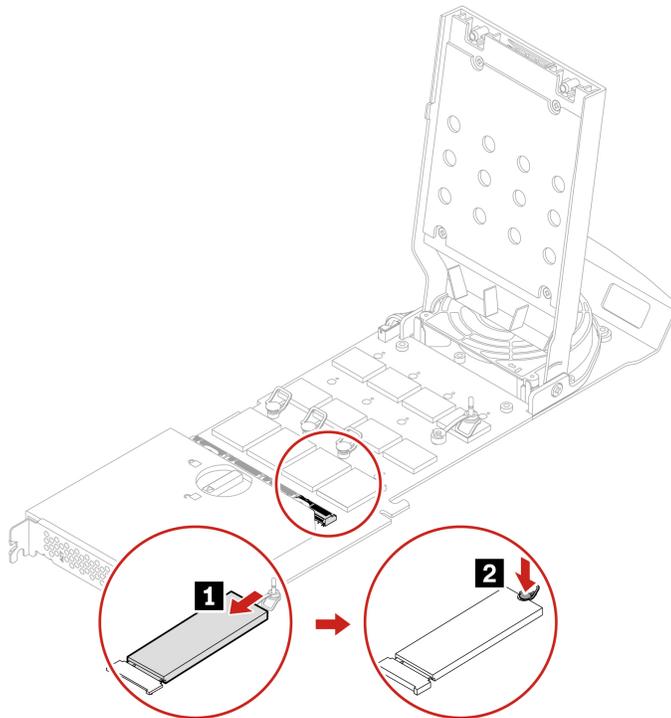
3. Rotate the lock to the close position to close the cover.
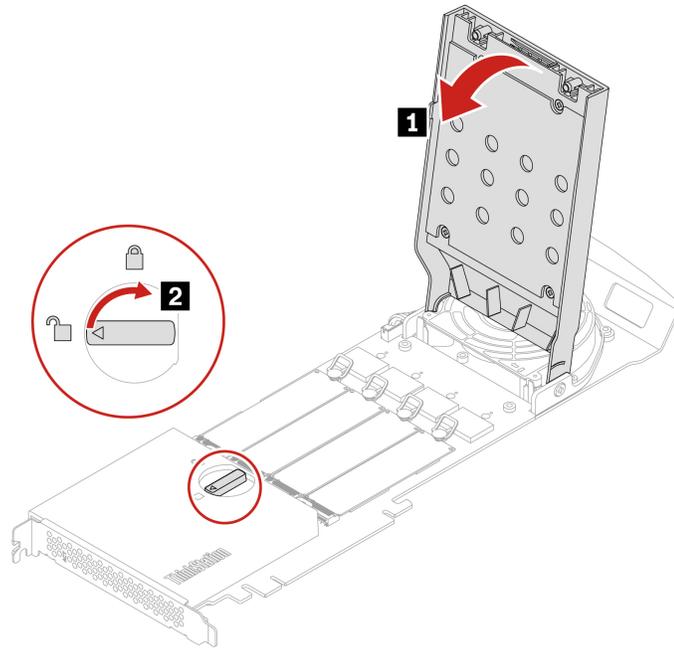
Note: Install the M.2 SSD PCIe adapter in a PCIe x16 card slot on the system board. See "PCIe card installation rule" on page 80.

PCIe cards

By reading this section, you will learn to replace PCIe cards, including graphics cards, in your computer.

NVLINK retainer

Prerequisite

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

⚠️

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

For access, remove the "Side cover" on page 39.

Removal steps

Remove the NVLINK retainer.

Note: The NVLINK retainer is only available on some Graphics cards.
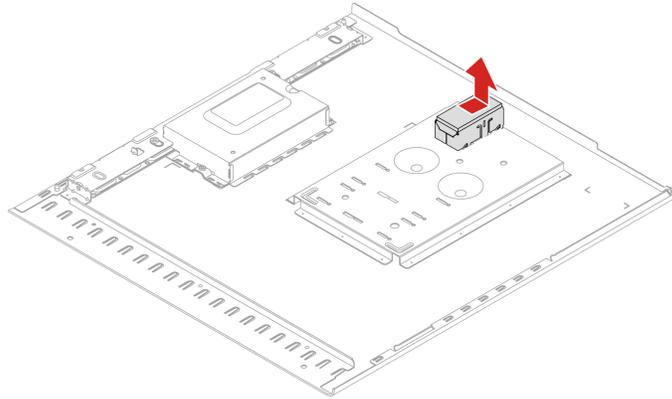
NVLINK bridge

Prerequisite

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

For access, remove the "Side cover" on page 39.

Removal steps

Remove the NVLINK bridge.
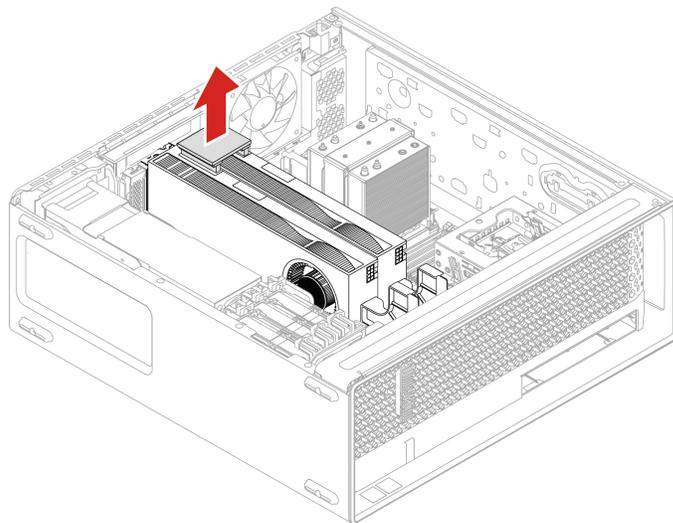
Installation steps

Install the NVLINK bridge.
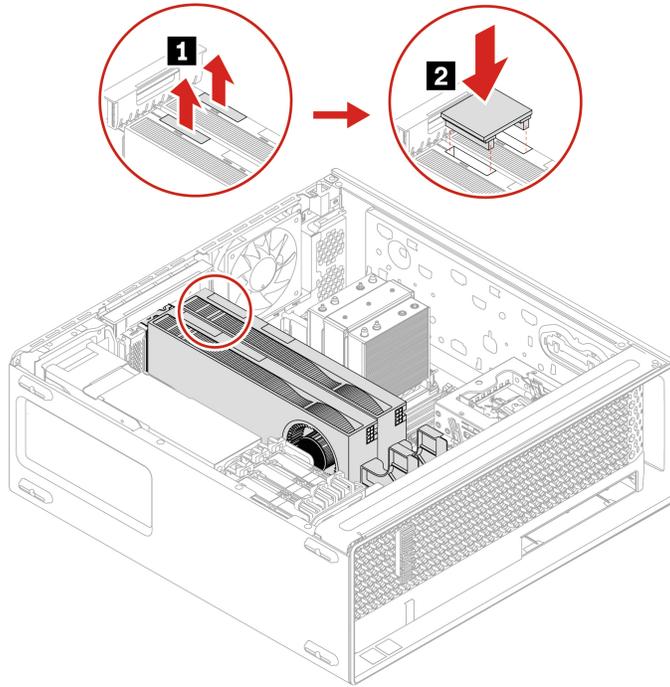
Note: To install NVLINK bridge, make sure you have installed NVLINK retainer.

Super capacitor module

Prerequisite

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

For access, remove the "Side cover" on page 39.

Removal steps

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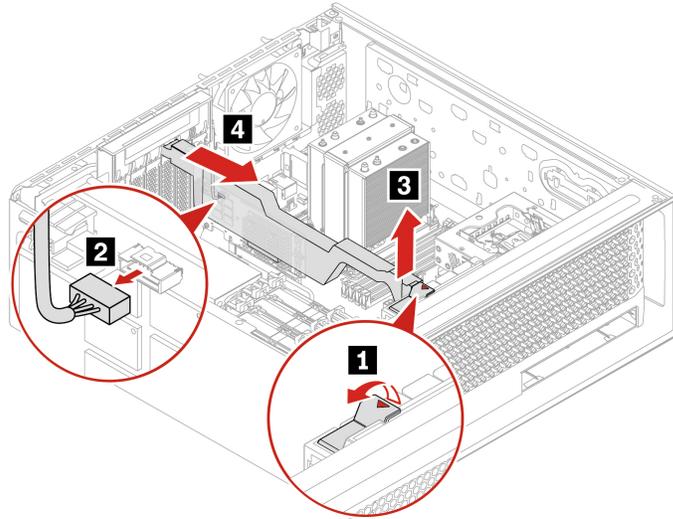
Note: When installing a new super capacitor module, connect the super capacitor module cable to the super capacitor module connector (J14) on the RAID card.

PCIe bracket

Prerequisite

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

For access, remove the "Side cover" on page 39.

Removal steps

Remove the PCIe bracket.
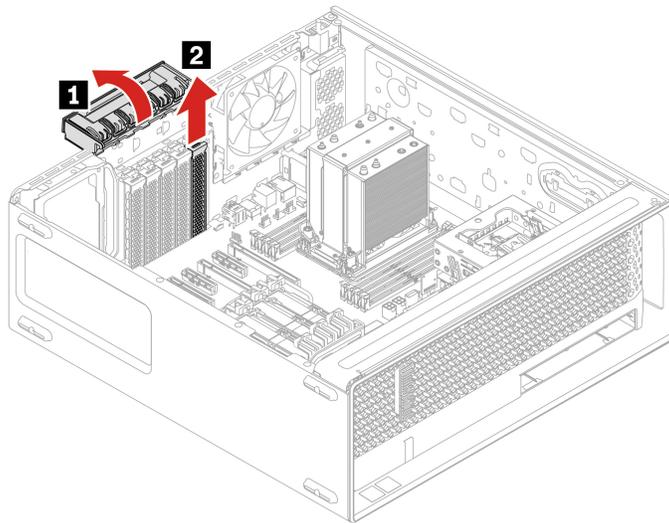
PCIe card

Prerequisite

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

For access, do the following:
1. Remove the "Side cover" on page 39.
2. Remove the "NVLINK bridge" on page 74, if any.

**Removal steps for half-length PCIe card**
1. Remove the PCIe card retainer. The PCIe card retainer is only available on some PCIe cards.
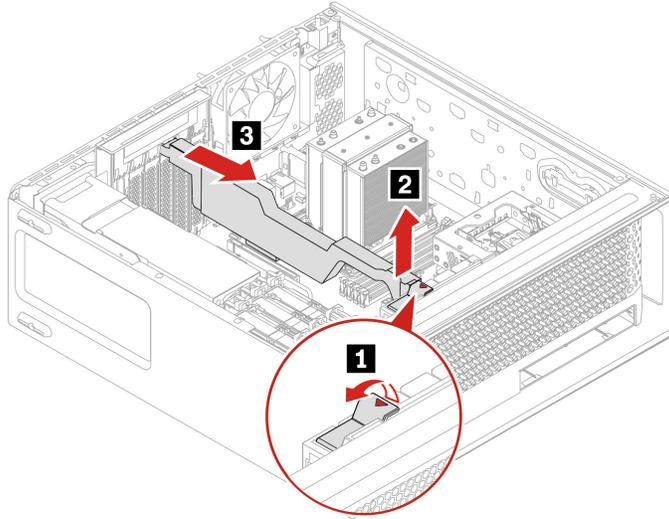
2. Remove the PCIe card. The card might fit tightly into the slot. If necessary, alternately move each side of the card a small amount until the card is removed from the slot.
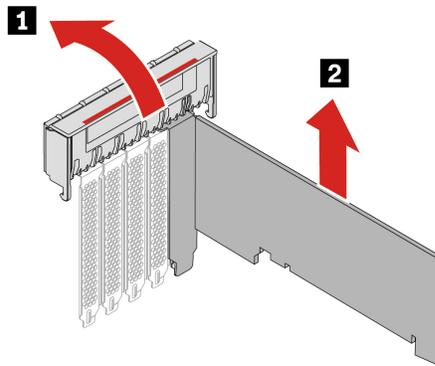
Note: For some Ethernet adapter cards, the following fiber modules can be removed.
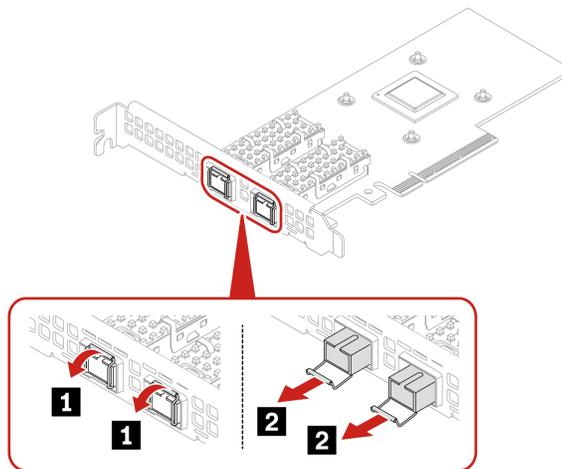
Removal steps for full-length PCIe card

1. Open the handle and remove the PCIe card. 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.
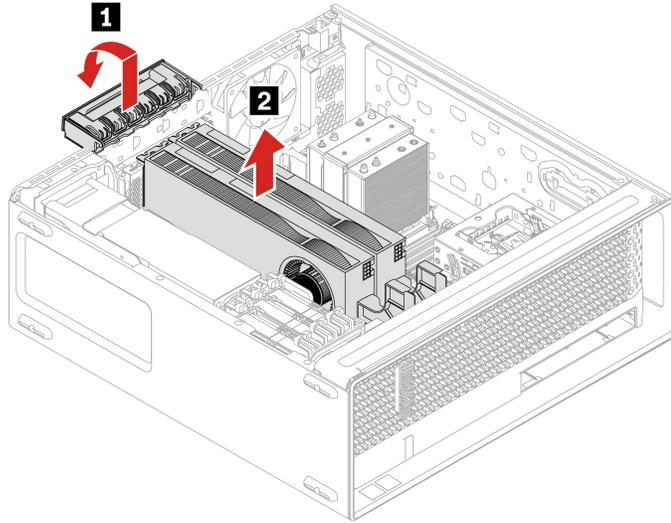
2. Remove the PCIe extender if needed.

   Notes:

   - For computer models with GFX RTX 4000 Ada, the graphics card and the PCIe card extender work as a CRU assembly. Do not try to remove the extender.

   - For computer models with double-width or wider graphics cards (such as NVIDIA RTX 6000 Ada and GeForce RTX 4080), the PCIe card extender is a customized CRU part. You can remove it according to the following illustration.

   - If you want to install a double-width or wider graphics card, install the customized PCIe card extender first.
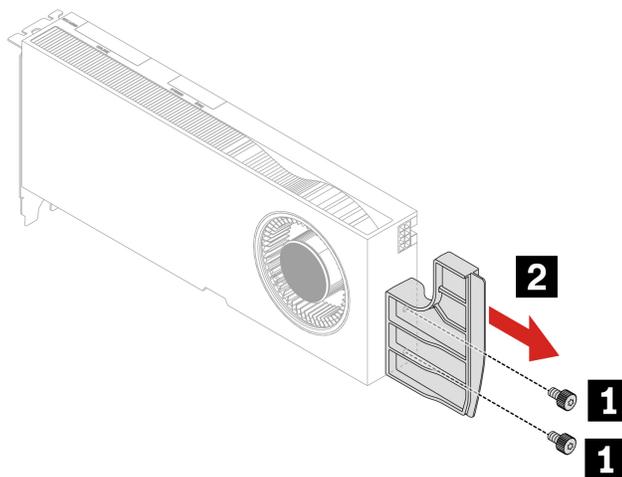
Screw (quantity)	Color	Torque
M3 x 5.5 mm, Nickel coated (2)	Black	3 ~ 3.5 lb/in

PCIe card installation rule

Install PCIe cards according to the following order and special rules for certain PCIe cards.

- **Installation order**
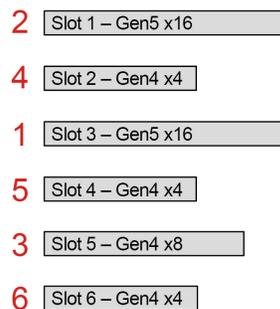

Figure 4. PCIe card installation order

- **Special installation rules for certain PCIe cards**

PCIe card	Installation rules
For all graphic cards	– Ensure that at least one graphic card is installed. – If more than two graphic cards is installed, ensure that they are the same.
Nvidia GeForce graphic cards	Install in slot 1.
Gen 3 M.2 SSD PCIe adapter (Medina I)	Install in slot 1.
Gen 4 M.2 SSD PCIe adapter (Medina II)	Install in slot 1.
Gen 5 M.2 SSD PCIe adapter (Medina Gen 5)	Install in slot 1.
NVIDIA ConnectX-6 Ethernet Adapter card	Install in slot 1.
Thunderbolt card	– Install in slot 6, slot 4, or slot 2 – Ensure that at least one graphic card with two DisplayPort connectors is installed.
BMC card (for selected models)	Install in slot 5.

Cable connection

When installing PCIe cards, follow the cable connection rule if need.

**Note:** The connectors on the cards or system board might look slightly different from the illustrations.
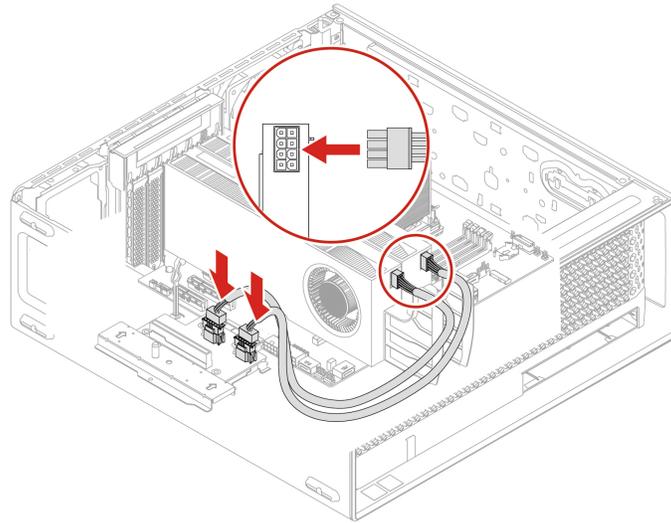
Figure 5. Cable connection for GFX RTX A4500/RTX A5500/RTX A6000/RTX 5880 with 1000–watt power supply assembly
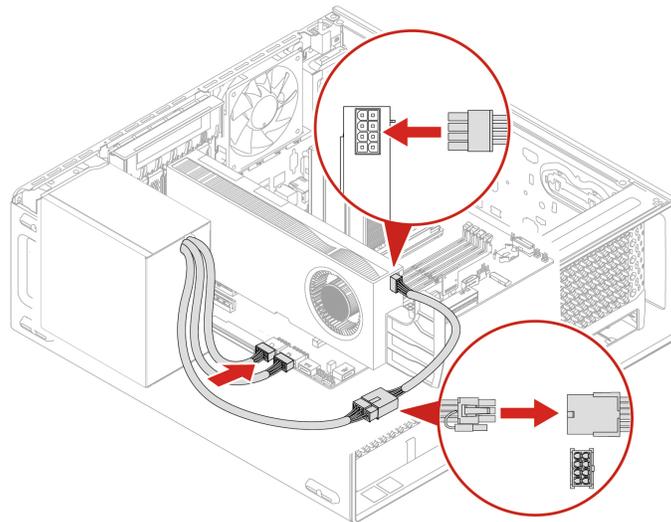

Figure 6. Cable connection for GFX RTX A4500/RTX A5500/RTX A6000/RTX 5880 with 750–watt power supply assembly
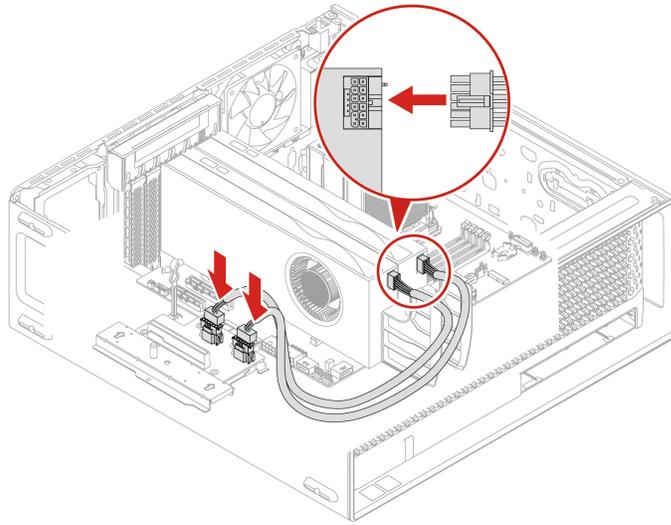
Figure 7. Cable connection for GFX RTX 4000 Ada /RTX 4500 Ada /RTX 5000 Ada with 1000–watt power supply assembly
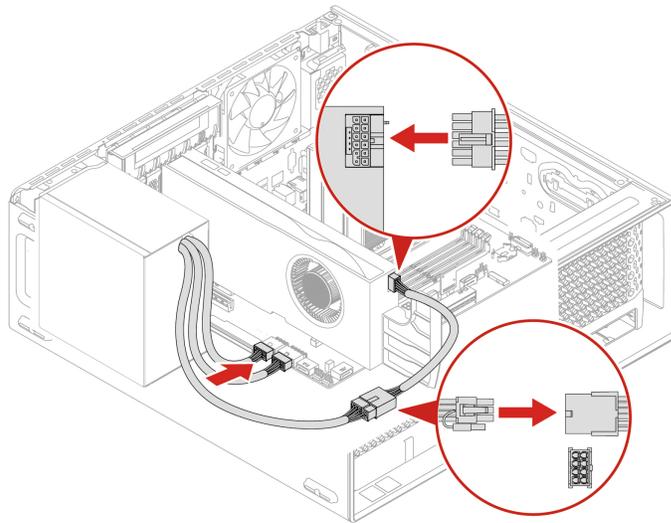

Figure 8. Cable connection for GFX RTX 4000 Ada /RTX 4500 Ada /RTX 5000 Ada with 750–watt power supply assembly
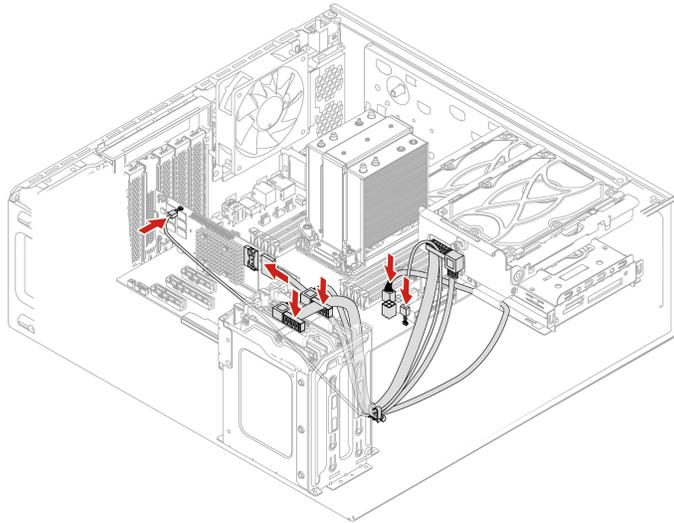
*Figure 9. Cable connection for Broadcom 9540-8i Raid card*
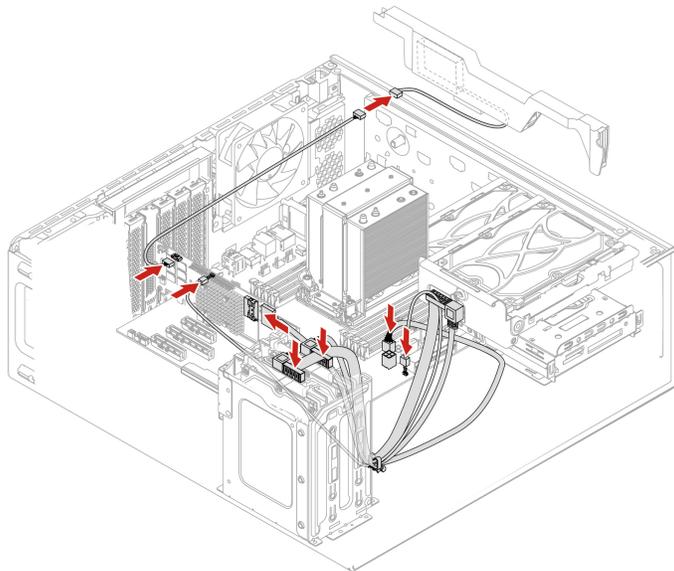
*Figure 10. Cable connection for Broadcom 940-8i Raid card*
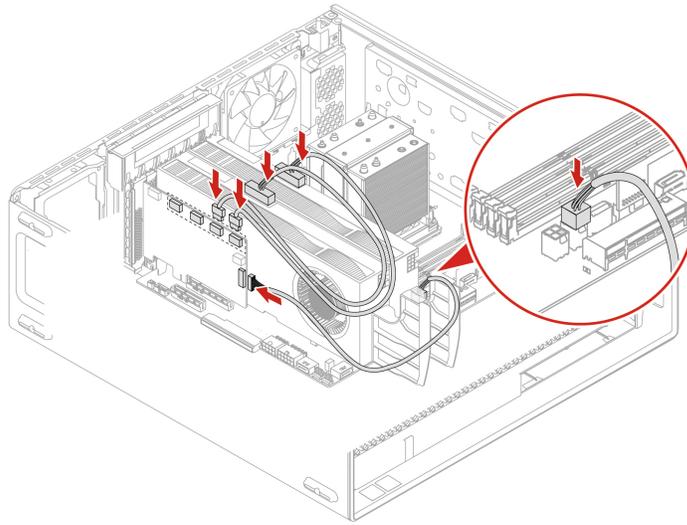
*Figure 11. Cable connection for NVIDIA Quadro SYNC II card*
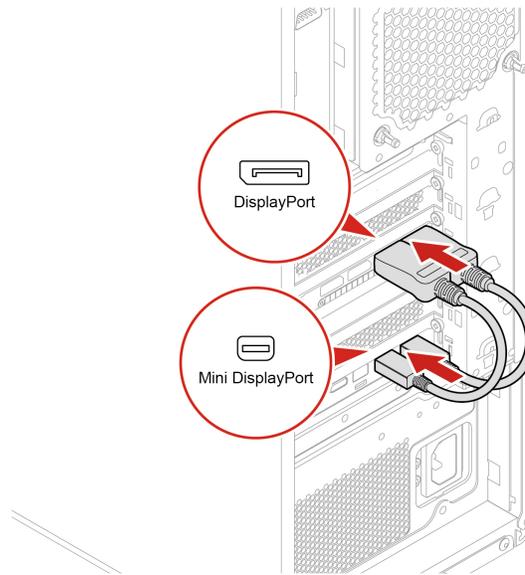
Figure 12. Cable connection for Thunderbolt card

Chapter 5.   Help and support

Self-help resources

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

Resources	How to access?
Troubleshooting and frequently asked questions	• https://www.lenovo.com/tips • https://forums.lenovo.com
Accessibility information	https://www.lenovo.com/accessibility

Reset or restore Windows	• Use Lenovo recovery options.
	  1. Go to https://support.lenovo.com/HowToCreateLenovoRecovery.
	  2. Follow the on-screen instructions.
	• Use Windows recovery options.
	  1. Go to https://pcsupport.lenovo.com.
	  2. Detect your computer or manually select your computer model.
	  3. Navigate to the troubleshooting menu to diagnose the operating system for recovery instructions.

Use the Vantage app to: • Configure device settings. • Download and install UEFI BIOS, drivers and firmware updates. • Secure you computer from outside threats. • Diagnose hardware problems. • Check the computer warranty status. • Access *User Guide* and helpful articles. **Note:** The available features vary depending on the computer model.	Type `Vantage` in the Windows search box.
Product documentation: • *Safety and Warranty Guide* • *Generic Safety and Compliance Notices* • *Setup Guide* • This *User Guide* • *Regulatory Notice*	Go to https://pcsupport.lenovo.com. Then, follow the on-screen instructions to filter out the documentation you want.

Resources	How to access?
Lenovo Support Web site with the latest support information of the following: • Drivers and software • Diagnostic solutions • Product and service warranty • Product and parts details • Knowledge base and frequently asked questions	https://pcsupport.lenovo.com
Windows help information	• Type `Get Help` or `Tips` in the Windows search box. • Use Windows Search. • Microsoft support Web site: https://support.microsoft.com

Call Lenovo

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

Before you contact Lenovo

Prepare the following before you contact Lenovo:

1. Record the problem symptoms and details:

    • What is the problem? Is it continuous or intermittent?
    • Any error message or error code?
    • What operating system are you using? Which version?
    • Which software applications were running at the time of the problem?
    • Can the problem be reproduced? If so, how?

2. Record the system information:

    • Product name
    • Machine type and serial number

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

MT-M XXXX-XXXXXX S/N XXXXXXXX
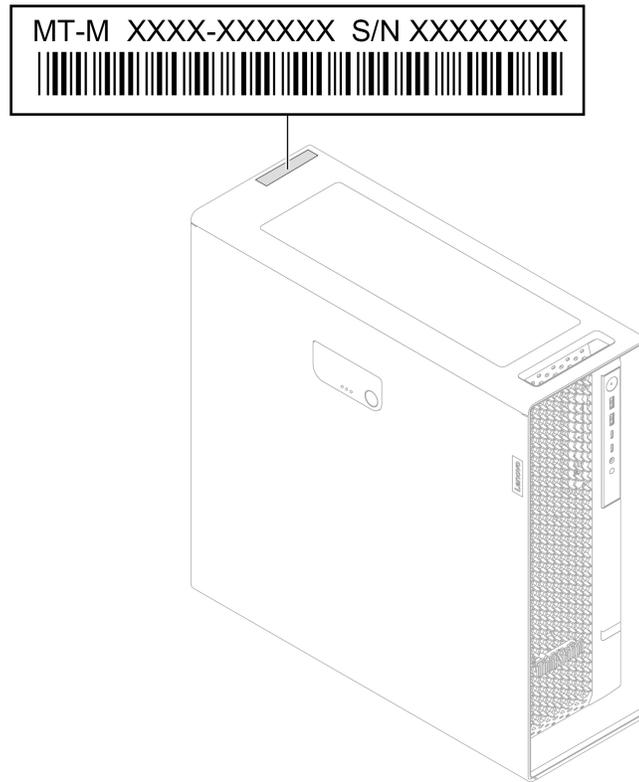
Lenovo Customer Support Center

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

Telephone numbers

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

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

Certification-related information

Product name: ThinkStation P5

Machine types: 30G9, 30GA, 30GB and 30GF

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

Compliance information

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

Purchase accessories

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

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

Purchase additional services

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

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

Appendix A. Notices and trademarks

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