

ThinkStation P620

User Guide

ThinkStation



Lenovo

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*

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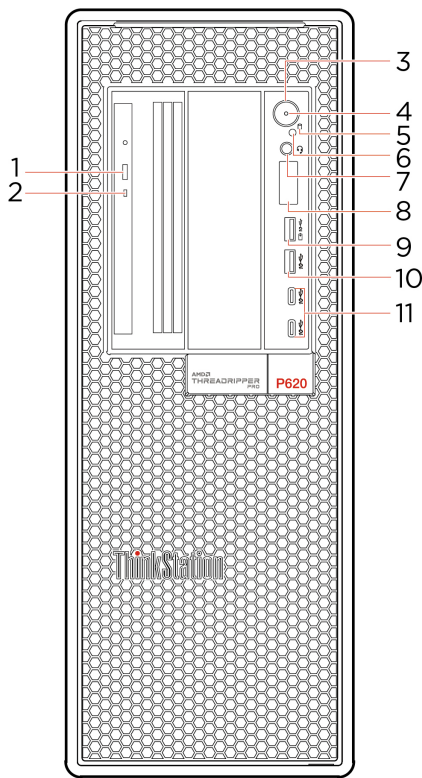
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About this documentation

- Illustrations in this documentation might look different from your product.
- Depending on the model, some optional accessories, features, and software programs might not be available on your computer.
- Depending on the version of operating systems and programs, some user interface instructions might not be applicable to your computer.
- Documentation content is subject to change without notice. Lenovo makes constant improvements on the documentation of your computer, including this *User Guide*. To get the latest documentation, go to: <https://pcsupport.lenovo.com>
- Canonical® makes periodic feature changes to the Ubuntu® operating system through Software Updates. As a result, some information in this documentation might become outdated. Refer to Ubuntu resources for the latest information.

Chapter 1. Meet your computer

Front

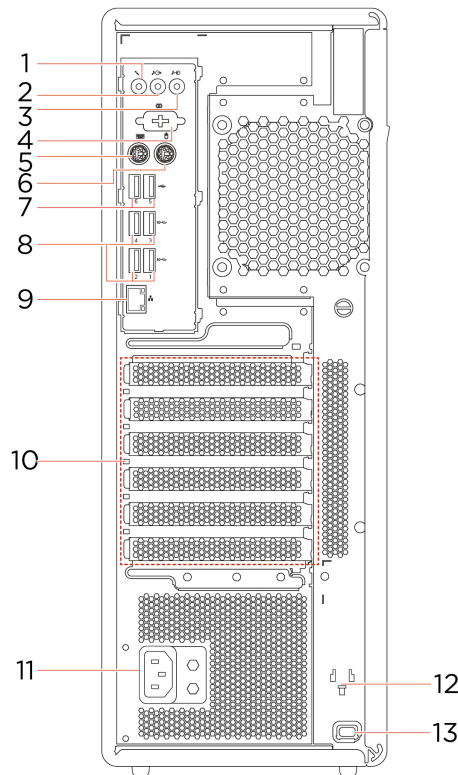


1. Optical drive eject button*	Eject the optical drive tray.
2. Optical drive activity indicator*	This indicator is on when the optical drive is in use.
3. Power button	Press to turn on the computer. To turn off the computer, open the system menu, click the power icon , and then select Power Off. The indicator in the power button shows the system status of your computer. • Blinking for three times: The computer is initially connected to power. • On: The computer is on. • Off: The computer is off or in hibernation mode. • Blinking rapidly: The computer is entering sleep or hibernation mode. • Blinking slowly: The computer is in sleep mode.
4. Power indicator	This indicator is on when the computer is turned on.
5. Storage drive activity indicator	This indicator is on when the storage drive is in use.
6. Photoelectric sensor*	This sensor receives the flash light sent by the Lenovo PC Diagnostics application installed in the smartphone. Then, the photoelectric sensor triggers the computer to send the tune of the detected error to the smartphone for users to decode the error.

7. Headset connector	Connect a headset or headphones to your computer.
8. Four-digit diagnostic display	Display a four-digit error code when an issue or error is detected. You can check the error code at https://www.thinkworkstationsoftware.com/diags .
9. USB 3.2 connector Gen 2 (with charging function)	• Charge USB- compatible devices with the output voltage and current of 5 V and 2.1 A. • Enable you to experience higher data transfer rate when you connect USB-compatible devices, such as a USB keyboard, USB mouse, USB storage device, or USB printer.
10. USB 3.2 connector Gen 2	Enable you to experience higher data transfer rate when you connect USB-compatible devices, such as a USB keyboard, USB mouse, USB storage device, or USB printer.
11. USB-C™ (3.2 Gen 2) connector	• Charge USB-C compatible devices with the output voltage and current of 5 V and 3 A. • Transfer data at USB 3.2 speed, up to 10 Gbps.

* for selected models

Rear



1. Microphone connector	Connect a microphone to your computer when you want to record sound or interact with the computer using speech recognition software.
2. Audio line-out connector	Send audio signals from the computer to external devices, such as powered stereo speakers, headphones, or multimedia keyboards. To connect a stereo system or other external recording device, connect a cable between the audio line-in connector of the device and the audio line-out connector of the computer. Note: If your computer has both an audio line-out connector and a headset or headphone connector, always use the headset or headphone connector for earphones, headphones, or a headset. The headphone connector does not support headset microphones.
3. Audio line-in connector	Receive audio signals from an external audio device, such as a stereo system. To connect an external audio device, connect a cable between the audio line-out connector of the device and the audio line-in connector of the computer.
4. Serial connector*	Connect an external modem, a serial printer, or other devices that use a serial connector.
5. PS/2 keyboard connector*	Connect a keyboard that uses a Personal System/2 (PS/2) keyboard connector.
6. PS/2 mouse connector*	Connect a mouse, a trackball, or other pointing devices that use a PS/2 mouse connector.
7. USB 2.0 connectors	Connect USB-compatible devices, such as a USB keyboard, USB mouse, USB storage device, or USB printer.
8. USB 3.2 connectors Gen 2	Enable you to experience higher data transfer rate when you connect USB-compatible devices, such as a USB keyboard, USB mouse, USB storage device, or USB printer.

9. Ethernet connector	Connect to a local area network (LAN). When the green indicator is on, the computer is connected to a LAN. When the yellow indicator blinks, data is being transmitted.
10. PCI-Express card area	Install PCI-Express cards into this area to improve the operating performance of the computer. Depending on the computer model, the connectors in this area vary.
11. Power cord connector	Connect the power cord to your computer for power supply.
12. Key-nest slots	Install the key holder that comes with the computer-cover-lock key to the key-nest slots.
13. Security-lock slot	Lock your computer to a desk, table, or other fixtures through a Kensington-style cable lock.

* for selected models

System board

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

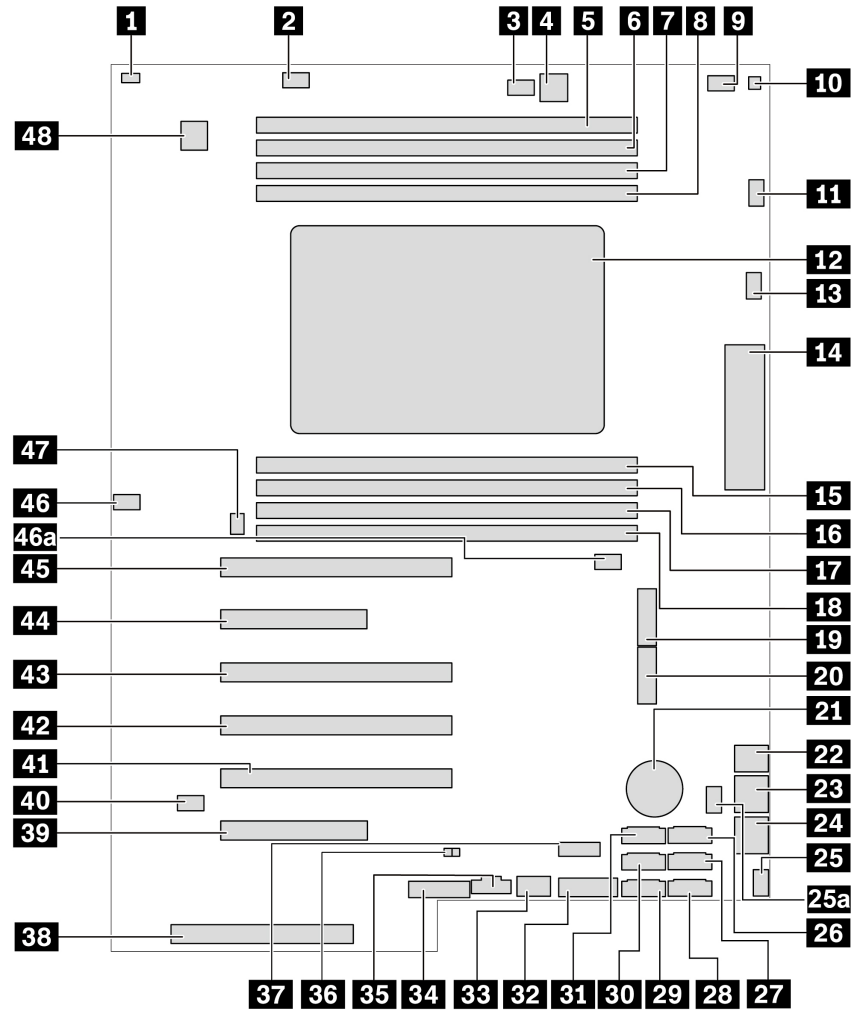


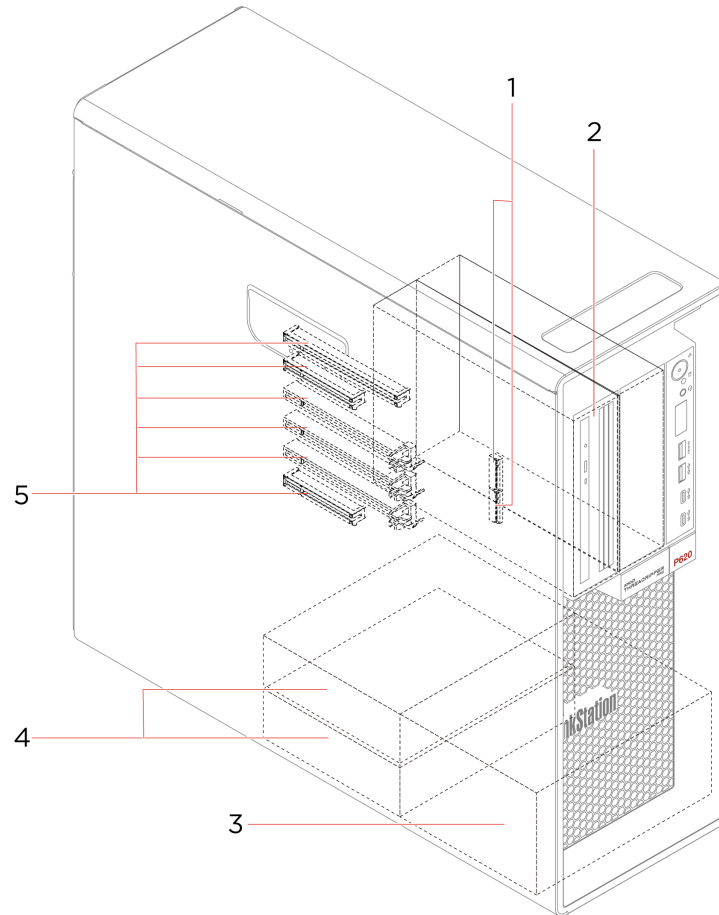
Figure 1. System board part locations

1 Cover presence switch connector (intrusion switch connector)	2 Memory fan connector 1
3 Optical-drive fan connector 2	4 4-pin power connector (for optical drive)
5 Memory slot 1	6 Memory slot 2
7 Memory slot 3	8 Memory slot 4
9 Optical-drive fan connector	10 Thermal-sensor connector
11 Microprocessor fan connector 1	12 Microprocessor
13 Microprocessor fan connector 2	14 Front input/output connector
15 Memory slot 5	16 Memory slot 6
17 Memory slot 7	18 Memory slot 8
19 M.2 solid-state drive slot 1	20 M.2 solid-state drive slot 2
21 Coin-cell battery	22 4-pin power connector (for storage drive)

23 8-pin power connector (for graphics card)	24 8-pin power connector (for graphics card)
25 / 25a Front-fan-assembly connector	26 eSATA / SATA 6 connector
27 SATA 4 connector	28 SATA 2 connector
29 SATA 1 connector	30 SATA 3 connector
31 SATA 5 connector	32 Media card reader (MCR) header
33 Internal USB 3.2 Gen 2 connector	34 Alternative Trusted Platform Module (TPM) header
35 Thunderbolt™ control connector	36 Internal-storage-drive activity indicator connector
37 Internal USB 2.0 connector	38 Power supply connector
39 PCIe 4.0 x8 card slot 6	40 Clear CMOS / Recovery jumper
41 PCIe 4.0 x16 card slot 5	42 PCIe 4.0 x16 card slot 4
43 PCIe 4.0 x16 card slot 3	44 PCIe 4.0 x8 card slot 2
45 PCIe 4.0 x 16 card slot 1	46 / 46a Memory fan connector 2
47 Rear-fan-assembly connector	48 Serial port (COM) connector

Internal storage drives

Internal storage drives are devices that your computer uses to read and store data. You can add drives to your computer to increase storage capacity and enable your computer to read other types of media.



1. M.2 solid-state drive slots

One or two M.2 solid-state drives are installed in selected models.

Depending on your computer model, the following devices might be installed in the flex bay:

- Flex module

Depending on your computer model, the following parts might be installed in the flex module:

- 15-in-1 card reader
- Slim optical drive

2. Flex bay

- Front-access storage enclosure
- Multi-drive conversion kit

Depending on your computer model, the following parts might be installed in the multi-drive conversion kit:

- Internal storage drive
 - Slim optical drive
 - Slim-optical-drive adapter
-

3. Storage drive bays*	You can install hard disk drives in the storage drive bays. Note: If you want to install storage drives into the optional-storage-drive bays, contact the Lenovo Customer Support Center for help.
4. Storage drive bays	You can install hard disk drives in the storage drive bays.
5. PCIe slots	You can install compatible PCIe cards and PCIe solid-state drives in the PCIe card slots.

* for selected models

Features and specifications

Dimensions	• Width: 165 mm (6.5 inches) • Height: 446 mm (17.6 inches) • Depth: 455 mm (17.9 inches)
Weight (without the packaging)	Maximum configuration as shipped: 24 kg (52.91 lb)
Hardware configuration	1. Open the system menu from the top-right corner and click Settings. 2. Click About.
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
Microprocessor	To view the microprocessor information of your computer, enter Settings and click About .
Memory	Up to eight double data rate 4 (DDR4) error correction code (ECC) registered dual inline memory modules (RDIMMs)
Storage device	• Hard disk drive • M.2 solid-state drive* • U.2 or U.3 solid-state drive* • Slim optical drive* • 15-in-1 media card* To view the storage drive capacity of your computer, use the Disks application. Note: The storage drive capacity indicated by the system is less than the nominal capacity.
Video features	• PCIe x16 card slots on the system board for a discrete graphics card • Video connectors on a discrete graphics card: – DVI connector – DisplayPort connector – Mini DisplayPort connector
Audio features	The integrated audio card supports the following: • Audio line-in connector • Audio line-out connector • Headset connector • Internal speaker • Microphone connector

Expansion	• Flex bays • Storage drive bays • M.2 solid-state drive slots • Memory slots • PCI Express slots
Network features	• Bluetooth* • Ethernet LAN • Wireless LAN*

* 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.

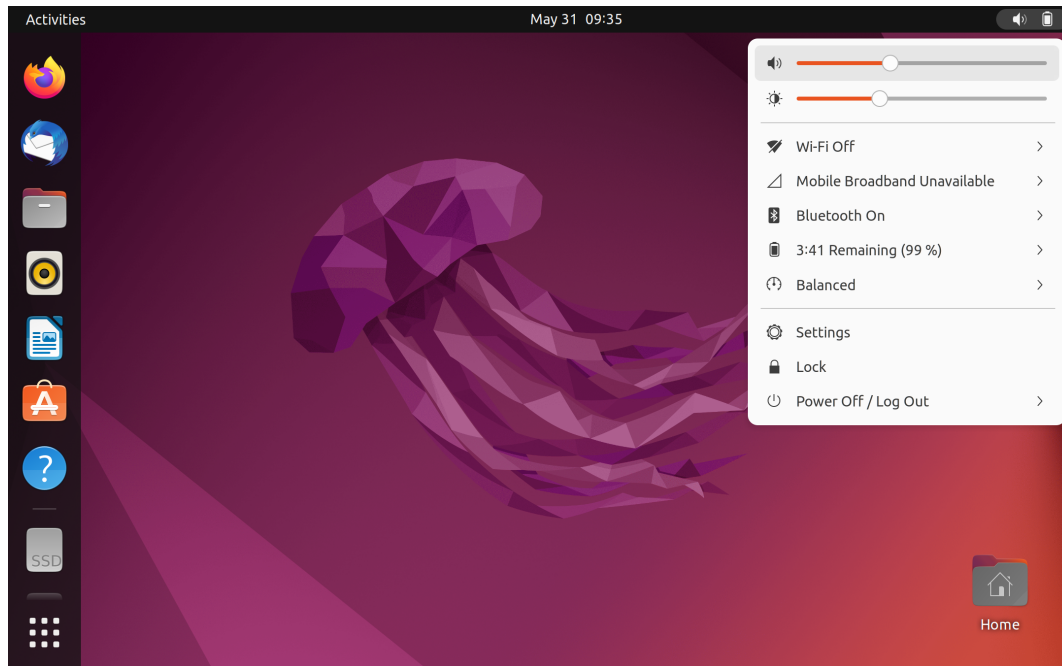
USB device	Data rate (Gbit/s)
3.2 Gen 1	5
3.2 Gen 2	10
3.2 Gen 2 × 2	20
Thunderbolt 3	40
Thunderbolt 4	40

Chapter 2. Get started with your computer

Get started with Ubuntu Desktop

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

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



Launch an app

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

Launch settings

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

Connect to networks

Your computer helps you connect to the world through a wired or wireless network.

Connect to the wired Ethernet

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

Connect to Wi-Fi networks (for selected models)

If your computer includes a wireless LAN module, you can connect your computer to Wi-Fi® networks. The wireless LAN module on your computer may support different standards. For some countries or regions, use of 802.11ax may be disabled according to local regulations.

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

Use multimedia

Use your computer for business or entertainment with the devices (such as a camera, a monitor, or speakers).

Use audio

To enhance the audio experience, connect speakers, headphones, or a headset to the audio connector.

Change the sound settings

1. Open the system menu from the top-right corner and click **Settings**.
2. Click **Sound**.
3. Change the settings as you prefer.

Connect to an external display

Connect to a wired display

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

Display mode

Go to **Settings → Devices → Displays**. Then, select a display mode of your preference.

- **Join Displays**: Extend the video output from your primary display to the secondary display. You can drag and move items between two displays.
- **Mirror**: Display the same video output on both the primary display and the secondary display.
- **Single Display**: Display the video output on only one display attached.

Display arrangement

Go to **Settings → Devices → Displays**. Then, click **Primary Display** and select one of the displays as the primary display.

Change display settings

Go to **Settings → Devices → Displays**. Then, you can change the settings for both the primary display and other displays. You can change the resolution, orientation and refresh rate.

Chapter 3. Explore your computer

Manage power

Use the information in this section to achieve the best balance between performance and power efficiency.

Set power button behaviors

You can define what the power button does according to your preference. For example, by pressing the power button, you can turn off the computer or put the computer to sleep or hibernation mode.

To change what the power button does:

1. Open the system menu from the top-right corner and click **Settings**.
2. Click **Power**.
3. In the **Suspend & Power Button** section choose the power button action as you prefer.

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:

Table 1. Default power plan (when plugged into ac power)

- | |
|---|
| <ul style="list-style-type: none">• Turn off the display: After 5 minutes• Put the computer to sleep: After 20 minutes |
|---|

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

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

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

Transfer data

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

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

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

1. Turn on Bluetooth on the computer.
 - a. Open the system menu from the top-right corner and then click **Settings → Bluetooth**.
 - b. In the Bluetooth section enable Bluetooth with the toggle button at the top.
2. Any discoverable devices will be shown in the **Devices** list.

3. Select a Bluetooth device, and then follow the on-screen instructions.

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

Use the optical drive (for selected models)

If your computer has an optical drive, read the following information.

Install or remove a disc

1. With the computer on, press the eject button on the optical drive. The tray slides out of the drive.
2. Insert a disc into the tray or remove a disc from the tray, and then push the tray back into the drive.

Note: If the tray does not slide out of the drive when you press the eject button, turn off the computer. Then, insert a straightened paper clip into the emergency-eject hole adjacent to the eject button. Use the emergency eject only in an emergency.

Record a disc

1. Insert a recordable disc into the optical drive that supports recording.
2. In the **Blank CD/DVD-R Disc** notification that pops up at the bottom of the screen, select **Open with CD/DVD Creator**.
3. 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 a media card, unmount the card from the operating system first. Otherwise, data on the card might get corrupted or lost.

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

Purchase accessories

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

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

Chapter 4. Secure your computer information

Use passwords

Password types

You can set the following passwords in UEFI (Unified Extensible Firmware Interface) BIOS (Basic Input/Output System) 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. The computer cannot be used until the valid password is entered.

- 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, you can contact a Lenovo-authorized service provider to have the passwords removed.

Notes:

- If the supervisor password is forgotten, it might not be removed by clearing CMOS depending on your BIOS settings.
- If the hard disk password is forgotten, Lenovo cannot remove the password or recover data from the storage drive.

Use Computrace Agent software embedded in firmware (for selected models)

The Computrace Agent software is an IT asset management and computer theft recovery solution. The software detects if changes have been made on the computer, such as hardware, software, or the computer call-in location. You might have to purchase a subscription to activate the Computrace Agent software.

Use BIOS security solutions

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

Erase all storage drive data

It is recommended that you erase all storage drive data before recycling a storage drive or the computer.

To erase all storage drive data:

1. Set a hard disk password for the storage drive you will recycle. See “Use passwords” on page 15.
2. Restart the computer. When the logo screen is displayed, press F1 or Fn+F1.
3. Select **Security → Hard Disk Password → Security Erase HDD Data** and press Enter.
4. Select the storage drive you will recycle and press Enter.
5. A message is displayed, prompting you to confirm the operation. Select **Yes** and press Enter. The erasing process begins.

Note: During the erasing process, the power button and the keyboard are disabled.

6. After the erasing process is completed, a message is displayed, prompting you to reset the system. Select **Continue**.

Note: Depending on the storage drive capacity, the erasing process will take half an hour to three hours.

7. After the resetting process is completed, one of the following will happen:
 - If the data on the system storage drive is erased, you will be prompted that no operating system is available.
 - If the data on the non-system storage drive is erased, the computer restarts automatically.

Use the 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.

When the cover presence switch connector on the system board is enabled, if the cover presence switch detects that 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.

Use Intel BIOS guard

The BIOS guard module cryptographically verifies all the BIOS updates to the system BIOS flash. Therefore, the malware is blocked from attacking the BIOS.

Use 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 or modify data on the USB storage devices.
- **No Access**: You cannot access the USB storage devices from the computer.

To configure the Smart USB Protection function:

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

Chapter 5. UEFI BIOS

This chapter provides information about configuring and updating UEFI BIOS, and clearing CMOS.

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:

F1 or Fn+F1	Display the General Help screen.
Esc or Fn+Esc	Exit the submenu and return to the parent menu.
↑ ↓ or Fn+↑ ↓	Locate an item.
← → or Fn+← →	Select a tab.
+/- or Fn++/-	Change to a higher or lower value.
Enter	Enter the selected tab or submenu.
F9 or Fn+F9	Restore to the default settings.
F10 or Fn+F10	Save your configuration 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

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

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 startup sequence

If the computer does not start up from a device as expected, you can change the startup device sequence permanently or select a temporary startup device.

Change the startup device sequence 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**, and then follow the on-screen instructions to change the startup sequence.
4. Press F10 or Fn+F10 to save the changes and exit.

Select a temporary startup 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 startup device sequence permanently, select **Enter Setup** on Startup Device Menu and press Enter to enter the BIOS menu.

Change BIOS settings before installing a new operating system

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

To change the BIOS settings:

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

Update UEFI BIOS

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

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

- Using the built-in software update service:

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

Chapter 6. CRU replacement

What are CRUs

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

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

Refer to the following CRU list for your computer.

Self-service CRUs

- Computer cover
- Cover presence switch
- Flex module*
- Front-access storage enclosure*
- Front fan assembly
- Front panel I/O cage
- Graphics card dongle*
- Hard disk drive
- ID badge
- Keyboard*
- Multi-drive conversion kit*
- Memory module
- Memory module active cooler and duct
- Mouse*
- Power cord
- Power supply assembly
- Rear fan assembly
- Slim optical drive*
- Slim-optical-drive bracket*
- Slim-optical-drive adapter*

- Storage drive cage*
- Super capacitor module*
- Wi-Fi antenna*

Optional-service CRUs

- Graphics card*
- M.2 solid-state drive*
- M.2 solid-state drive heat sink*
- PCIe card*

* for selected models

Replace a CRU

Follow the replacement procedure to replace a CRU.

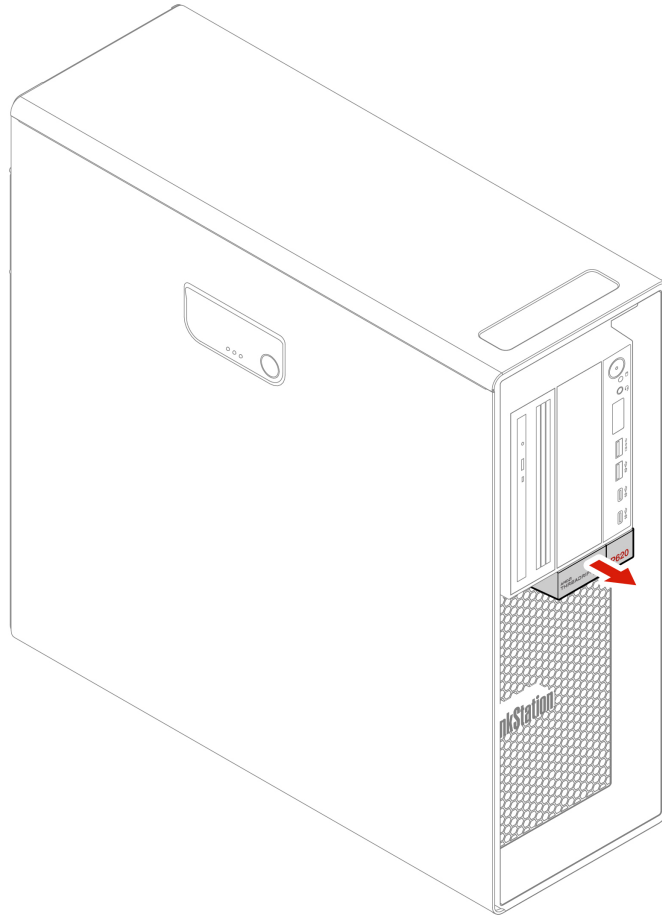
ID badge

Prerequisite

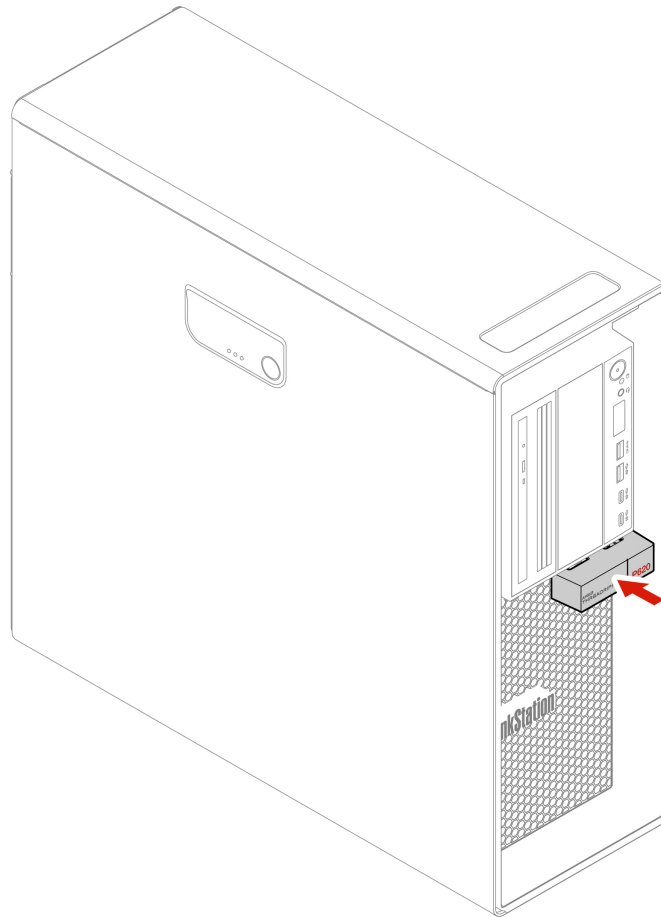
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Replacement procedure

1. Remove the ID badge.



2. Install the ID badge.



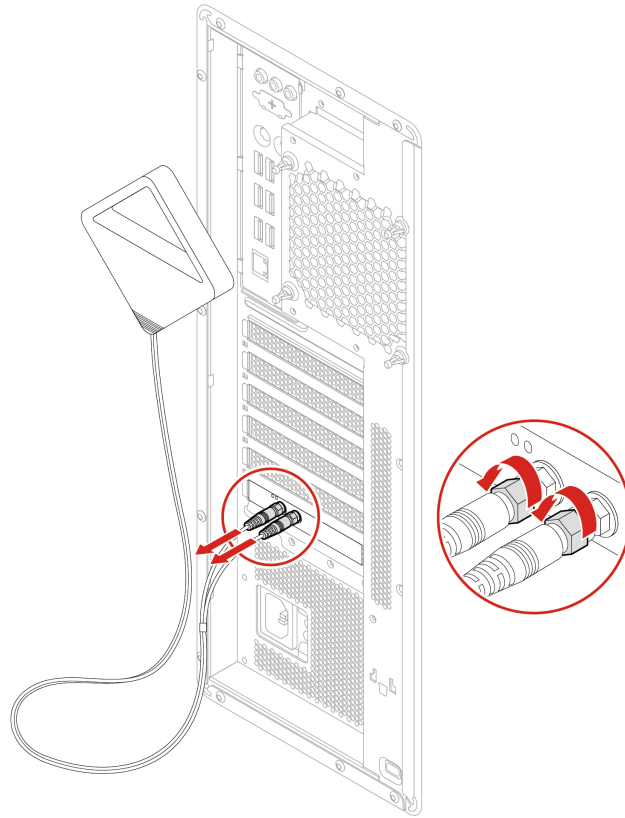
Wi-Fi antenna

Prerequisite

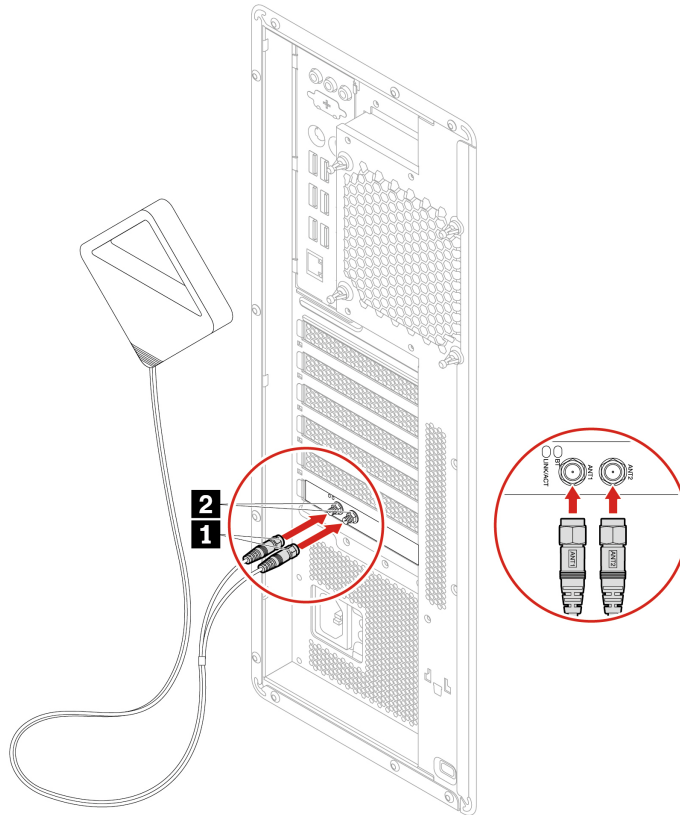
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Replacement procedure

1. Remove the Wi-Fi antenna.



2. Install the Wi-Fi antenna.



3. Tighten the Wi-Fi antenna cable connectors to secure them to the rear of the computer.

Computer cover

Prerequisite

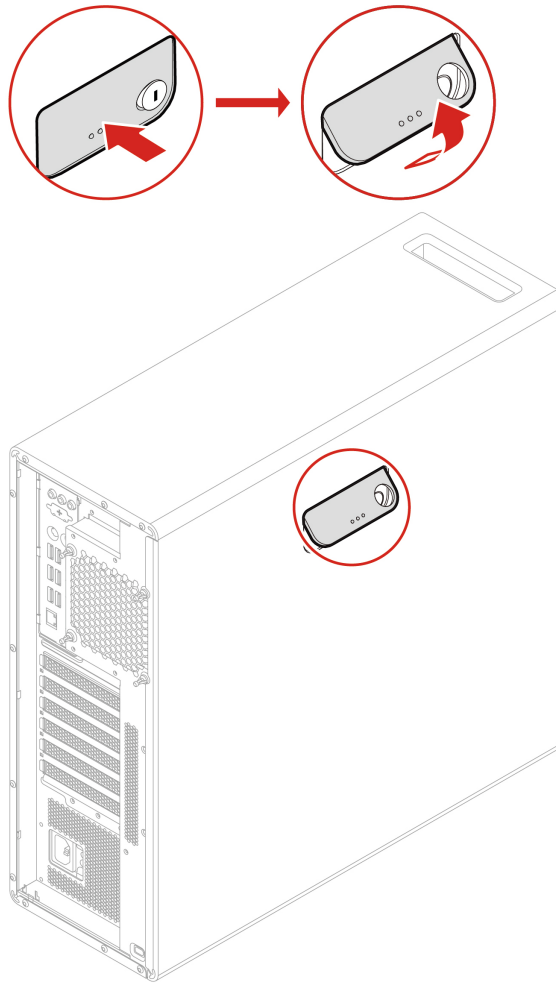
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

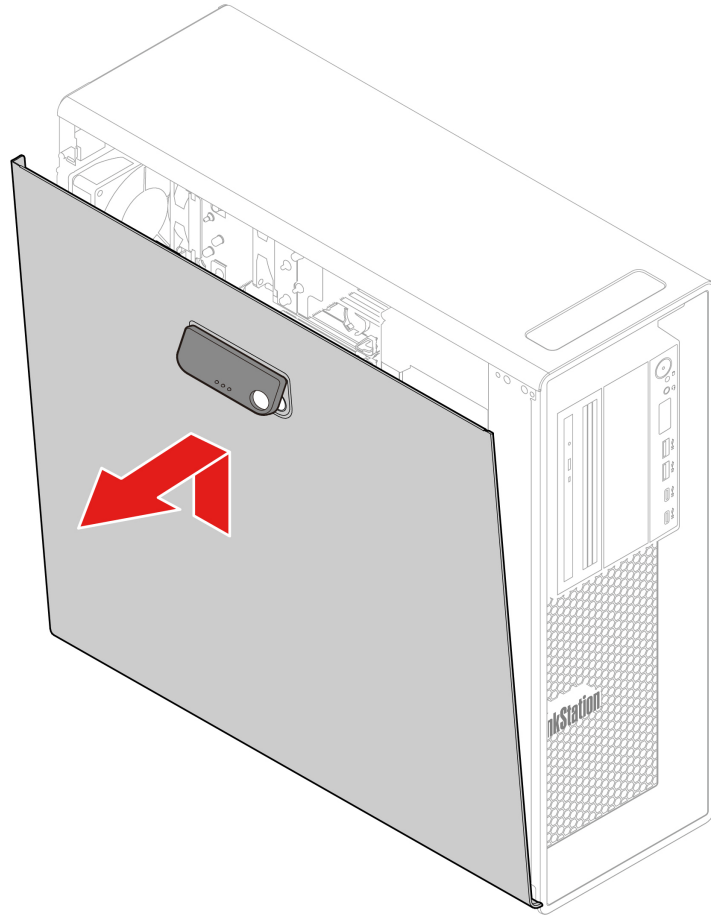


Before you open the computer cover, turn off the computer and wait several minutes until the computer is cool.

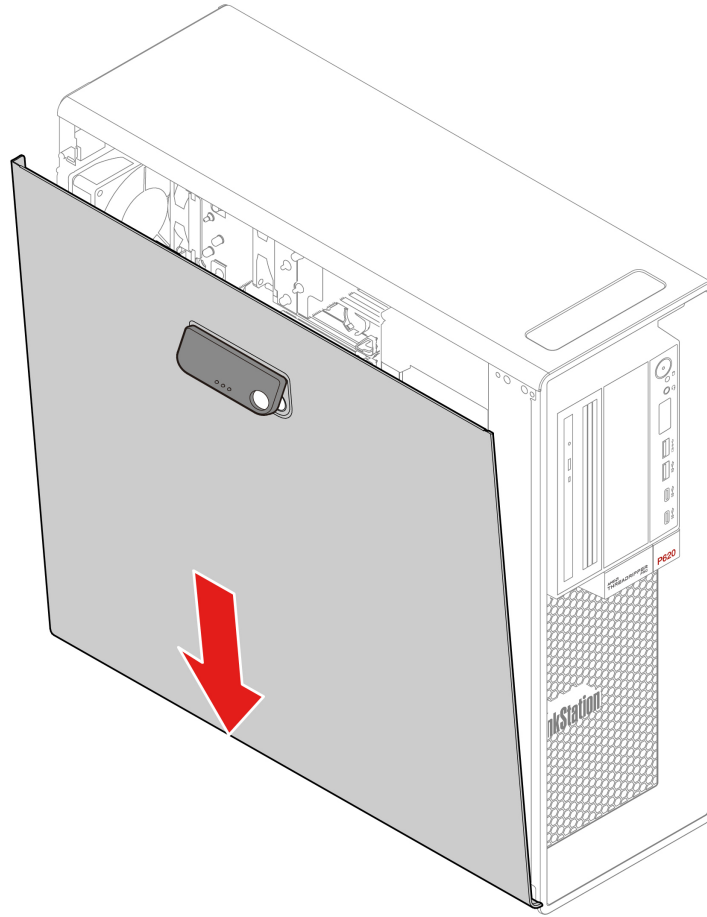
Replacement procedure

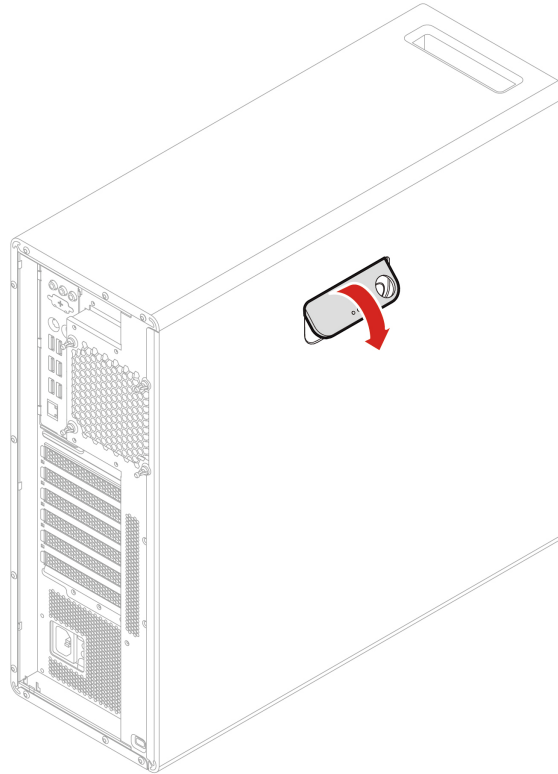
1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Unlock any locking device that secures the computer cover.
4. Remove the computer cover.





5. Install the computer cover.





6. Reconnect the power cord and all disconnected cables to the computer.

Note: If a locking device is available, use it to lock the computer.

Device in the flex bay

Prerequisite

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

The flex bay of your computer supports the following devices:

- Flex module
- Front-access storage enclosure
- Multi-drive conversion kit
- Slim-optical-drive adapter

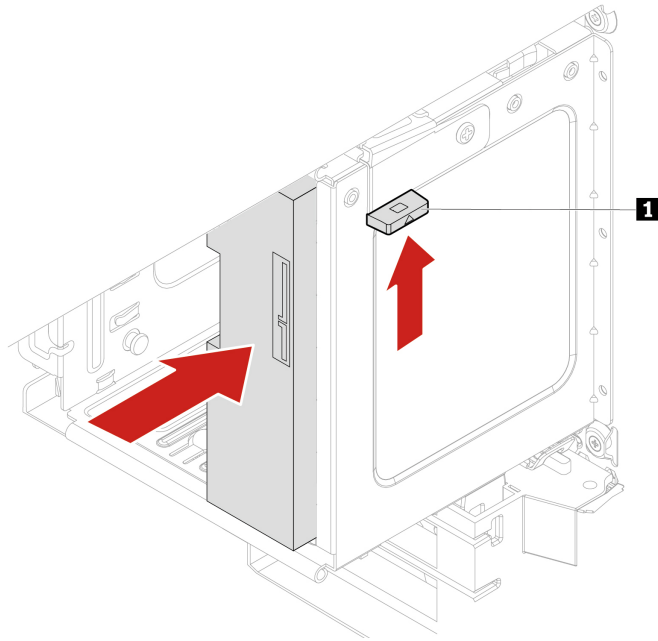
Note: The following instructions on how to remove or install a slim-optical-drive adapter also apply to other supported devices in the flex bay.

Replacement procedure

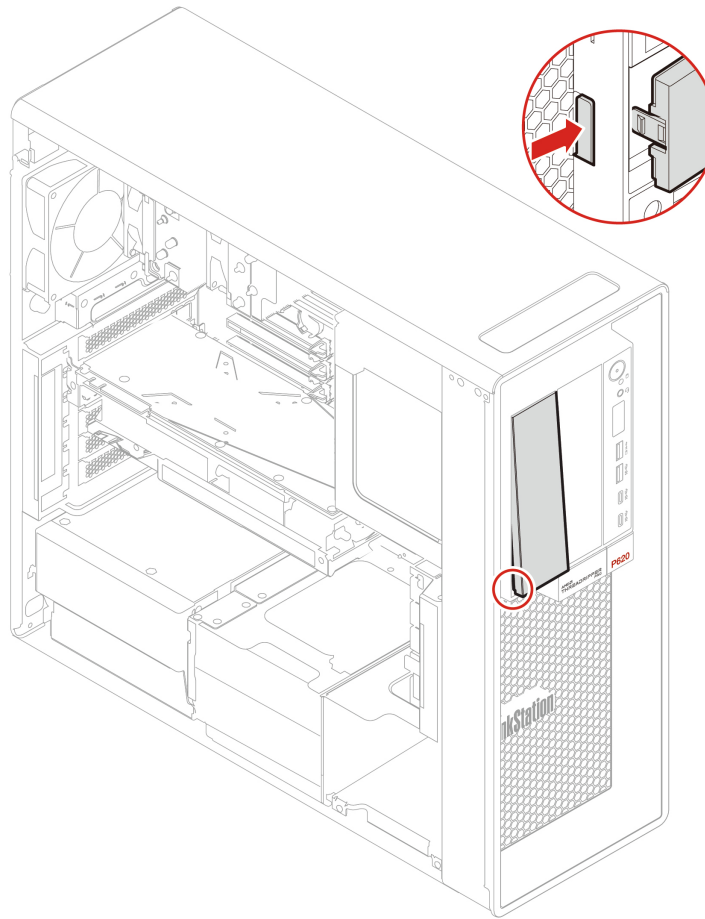
1. Remove the computer cover. See “Computer cover” on page 28.
2. Locate the flex bay. See “Internal storage drives” on page 7.
3. Disconnect the signal cable and the power cable from the rear of the slim optical drive.

Note: If you are removing other supported devices from the flex bay, disconnect any additional cables first.

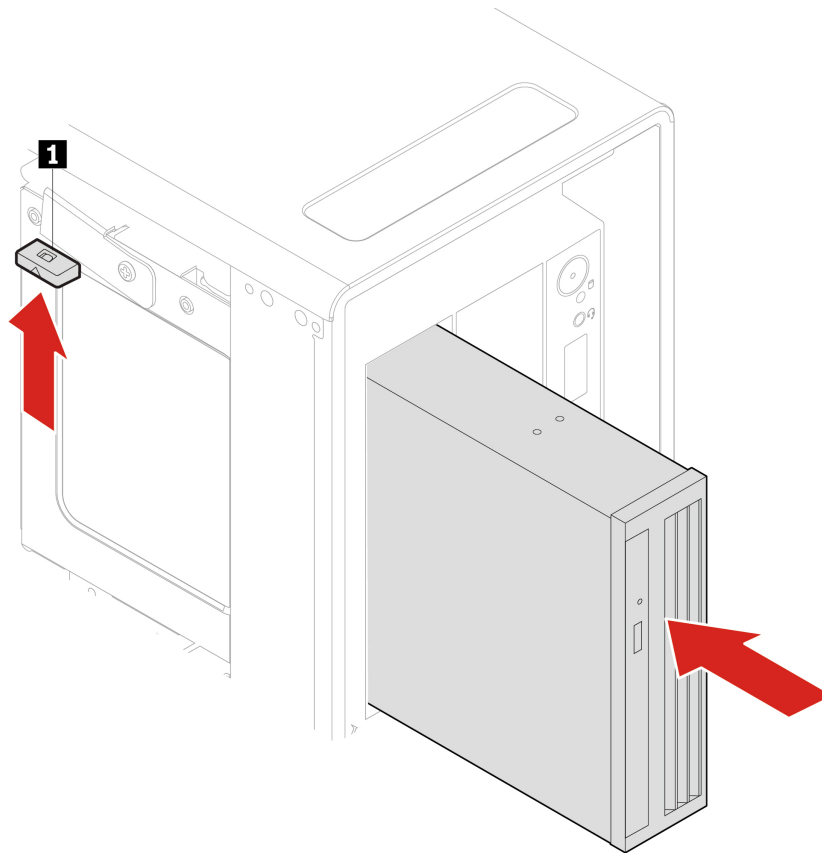
4. Remove the slim-optical-drive adapter.



5. Remove the slim optical drive from the failing adapter and install the slim optical drive into the new adapter. See “Device in the multi-drive conversion kit” on page 38.
6. If you are installing a slim-optical-drive adapter into the flex bay with a plastic shield installed, press the clip as shown to remove the plastic shield. If there is a metal static shield installed in the flex bay, remove the metal static shield.



7. Install the slim-optical-drive adapter.



8. Connect the signal cable and the power cable to the slim optical drive.

Note: Reconnect any cables removed from other supported devices.

9. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

Storage drive in the front-access storage enclosure

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

You can install or replace a storage drive in the front-access storage enclosure. The storage drive also can be hot-swappable, which means that you can install or replace the drive without even turning off your

computer. Therefore, lock the enclosure cover to prevent the unexpected removal. The keys are attached at the rear of the computer. Store the keys in a secure place.

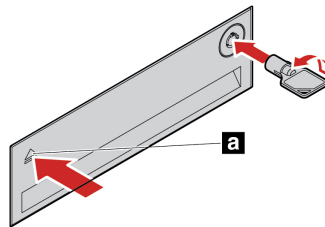
The storage drive in the front-access storage enclosure is hot-swappable only when the following requirements are met:

- The SATA cable of the front-access storage enclosure is connected to the eSATA connector on the system board. To verify the cable connection, see “System board” on page 4 for more information.
- The operating system of your computer does not reside on the storage drive installed in the front-access storage enclosure.

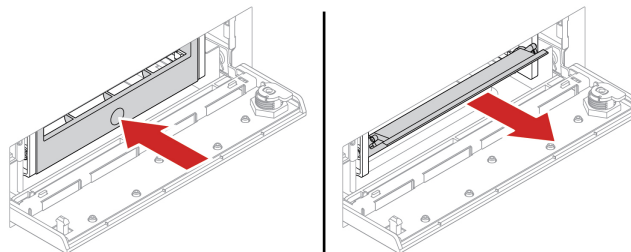
Attention: If any of the above requirements are not met, do not remove or install the storage drive when the computer is turned on. Otherwise, data on the storage drive might get damaged.

Replacement procedure

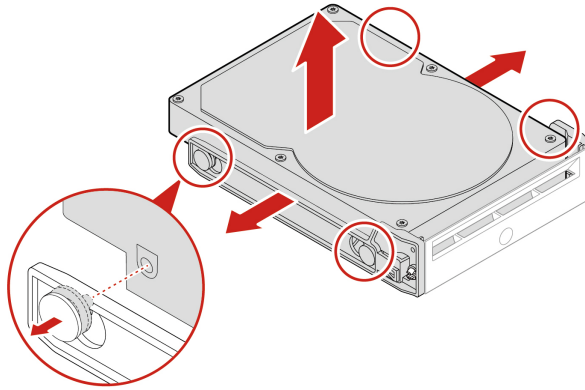
1. Remove the computer cover. See “Computer cover” on page 28.
2. Locate the flex bay. See “Internal storage drives” on page 7.
3. Before removing an old 3.5-inch storage drive, safely eject the old storage drive from the operating system first. For more information, see the Windows help system.
4. Unlock the enclosure cover with the provided key as shown. Press the notch **a** to open the enclosure cover.



5. Remove the bracket out of the front-access storage enclosure.



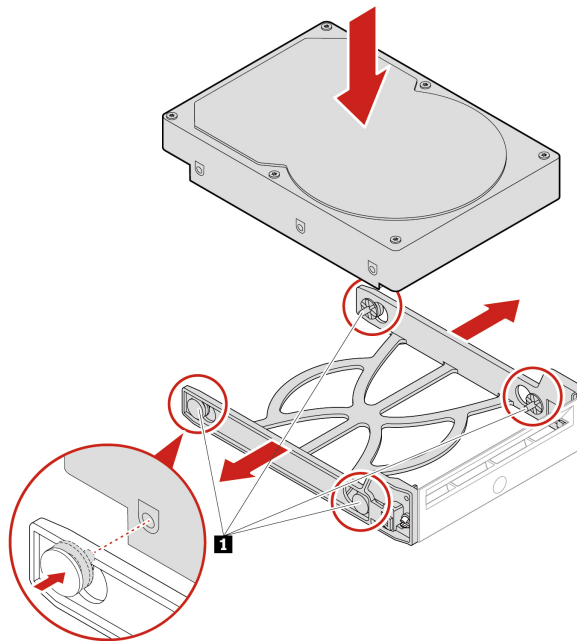
6. Remove the 3.5-inch storage drive from the bracket.



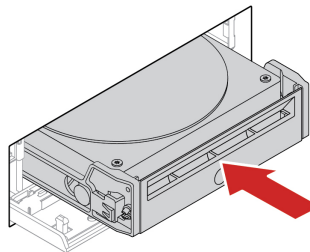
7. Install a new 3.5-inch storage drive.

Notes:

- Ensure that the circuit board faces downward and the connectors face toward the rear of the bracket.
- Do not touch the circuit board on the storage drive during operation.



8. Install the new 3.5-inch storage drive into the front-access storage enclosure. Press the notch to secure the enclosure cover and lock the enclosure cover with the key.



9. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

Device in the multi-drive conversion kit

Prerequisite

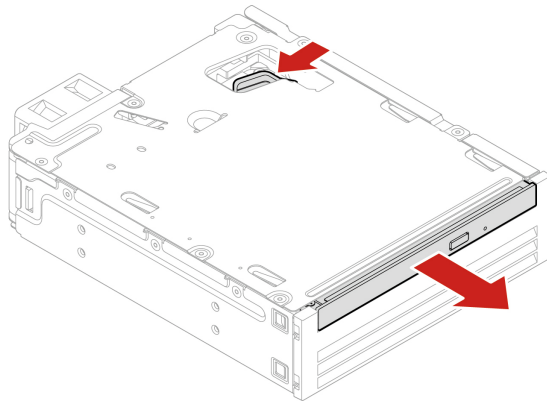
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

The multi-drive conversion kit (hereafter referred to as kit) might be equipped with either one or both of the following components:

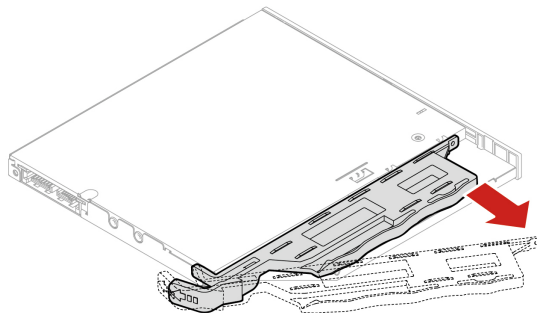
- Slim optical drive
- Storage drive

Slim optical drive

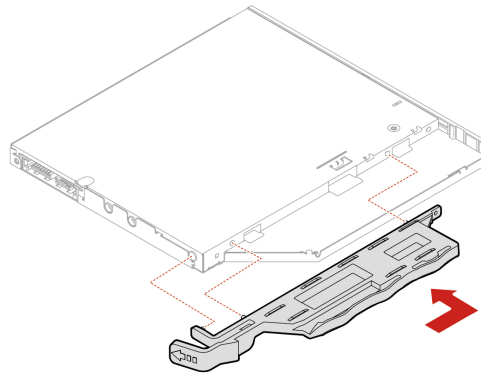
1. Remove the computer cover. See “Computer cover” on page 28.
2. Ensure that all the cables are disconnected from the kit. Remove the kit from the front of the computer.
3. Remove the slim optical drive with the bracket from the kit.



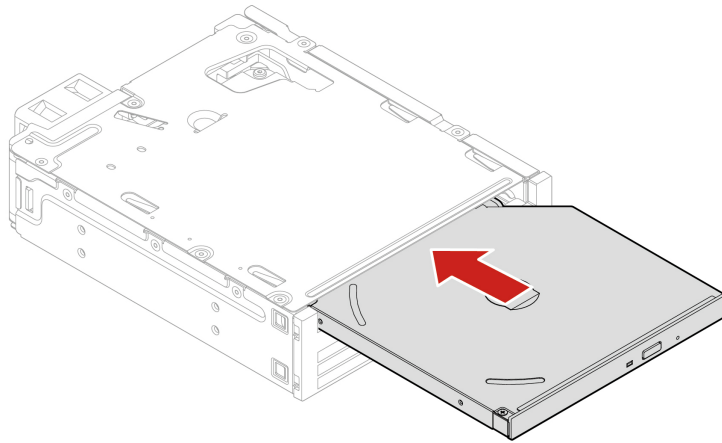
4. Remove the bracket from the slim optical drive.



5. Install the bracket to the new slim optical drive.



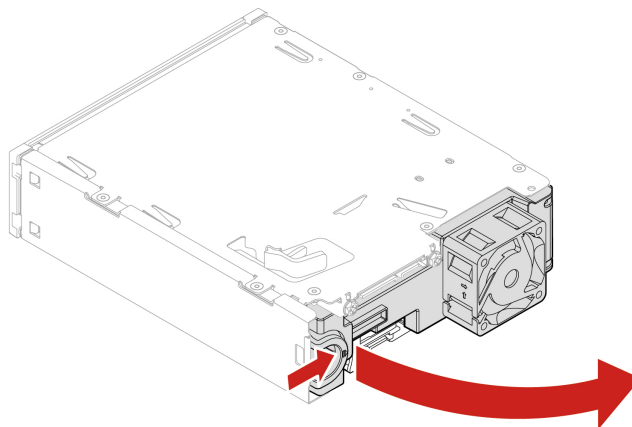
6. Install the slim optical drive with the bracket into the kit.



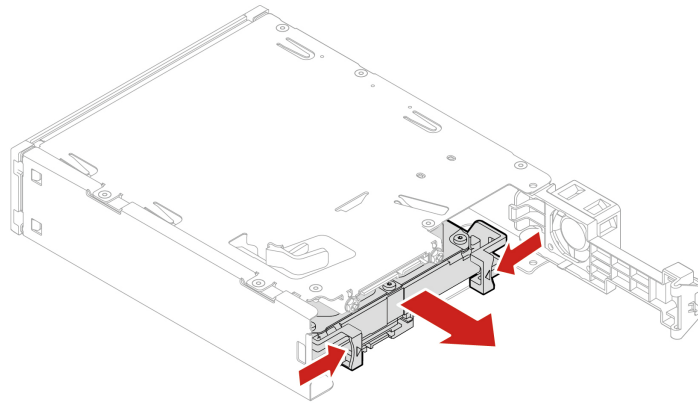
7. Slide the kit into the flex bay and reconnect the disconnected cables to the kit.
8. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

3.5-inch storage drive

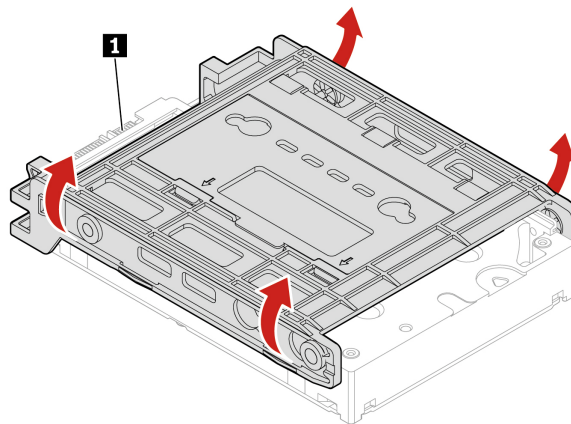
1. Remove the computer cover. See “Computer cover” on page 28.
2. Ensure that all the cables are disconnected from the kit. Remove the kit from the front of the computer.
3. Open the rear cover of the kit.



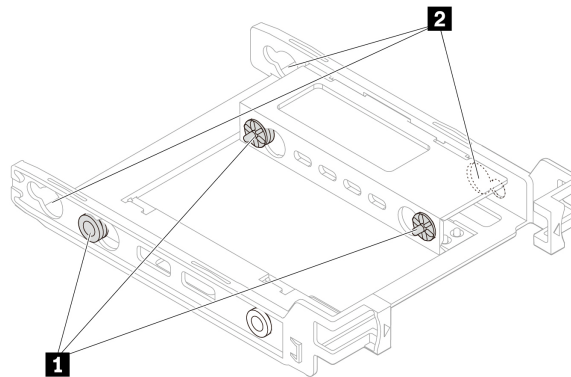
4. Remove the conversion bracket from the kit.



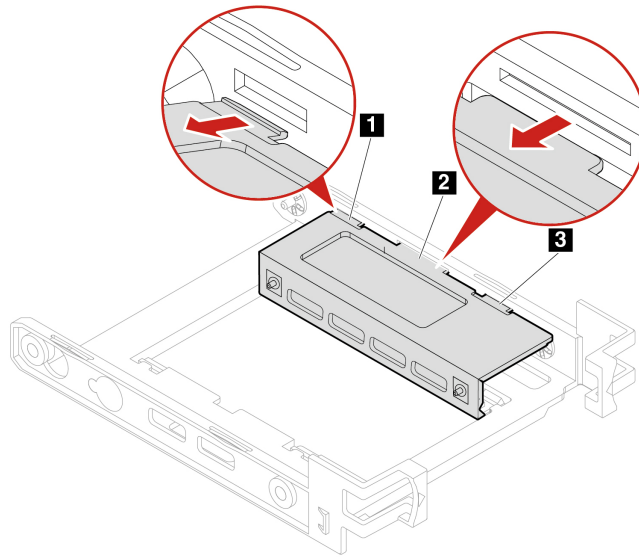
5. Remove the 3.5-inch storage drive from the conversion bracket. Do not touch the circuit board **1** on the drive.



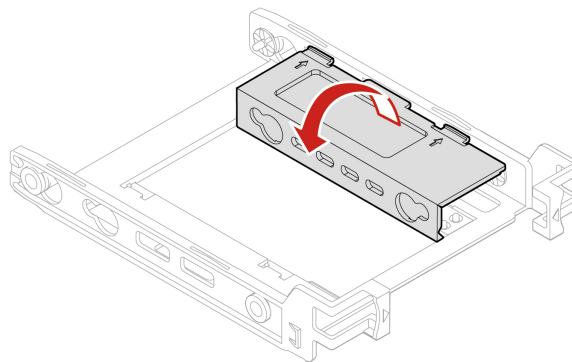
6. To install a 3.5-inch storage drive, ensure that the conversion bracket is unfolded. To unfold the bracket:
 - a. Remove pins **1** and install them into slots **2**.



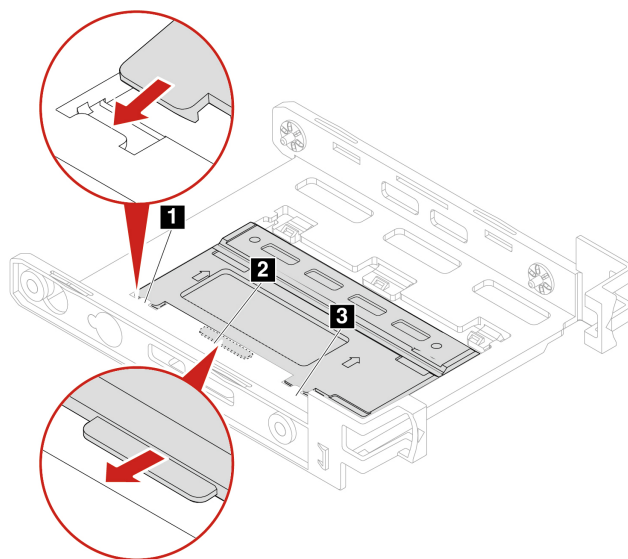
- b. Release tabs **1**, **2**, and **3** from the corresponding slots.



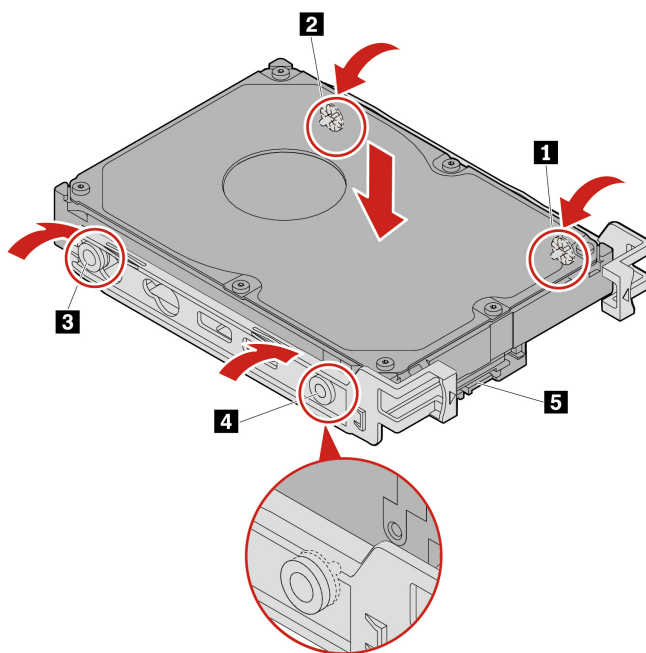
c. Unfold the bracket as shown.



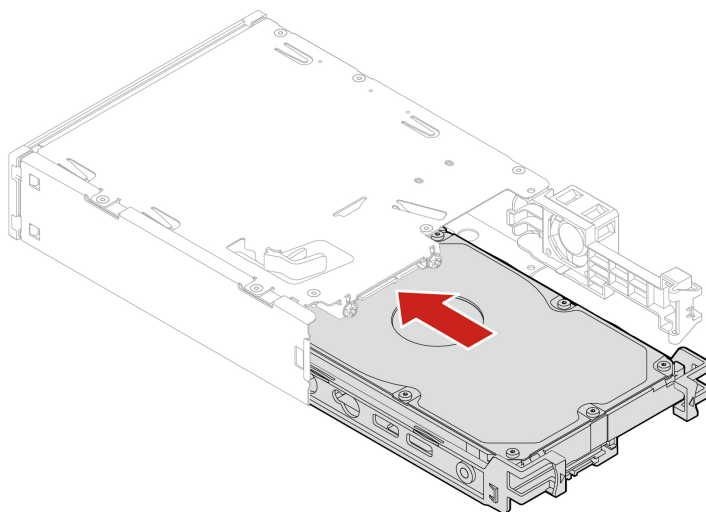
d. Insert tabs **1**, **2**, and **3** into the corresponding slots. Ensure that the tabs are secured in place.



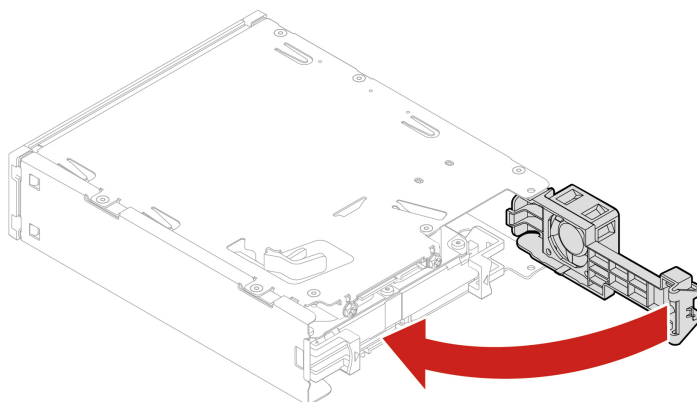
7. Install the new 3.5-inch storage drive into the bracket. Do not touch the circuit board **5** on the drive.



8. Install the new 3.5-inch storage drive with the bracket into the kit.



9. Close the rear cover of the kit.



10. Slide the kit into the flex bay and reconnect the disconnected cables to the kit.
11. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

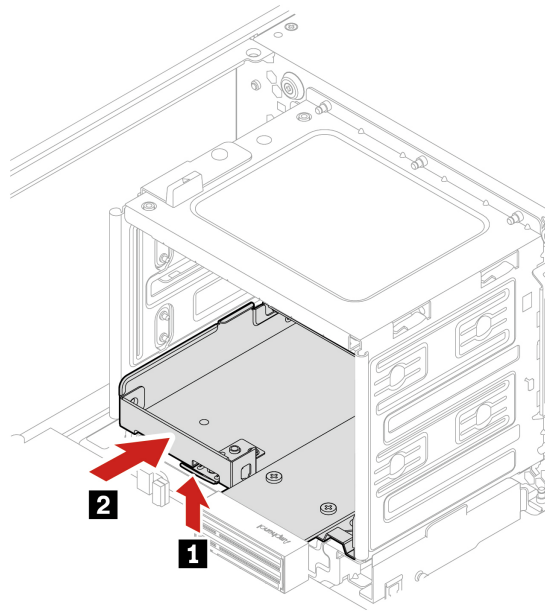
Front panel I/O cage

Prerequisite

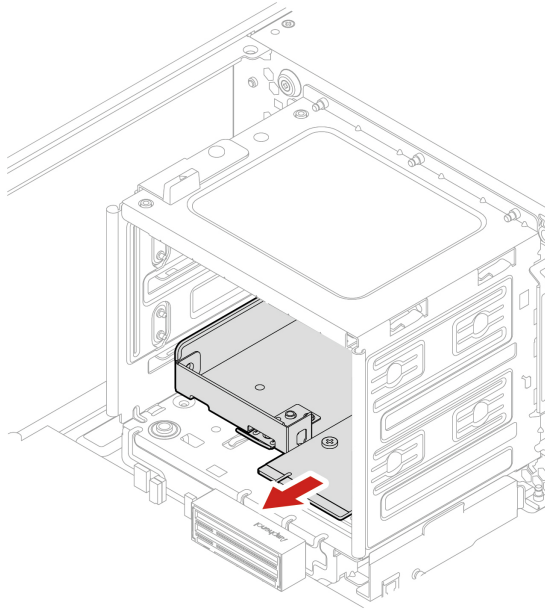
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Replacement steps

1. Remove the computer cover. See “Computer cover” on page 28.
2. Lay the computer on its side for easier access to the front panel I/O cage.
3. Remove the front panel I/O cage.



4. Install the front panel I/O cage.



5. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

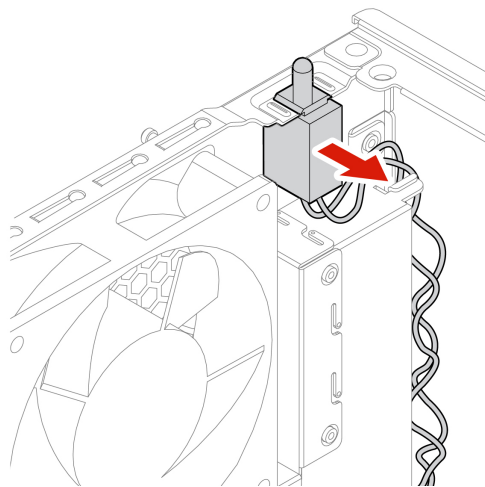
Cover presence switch

Prerequisite

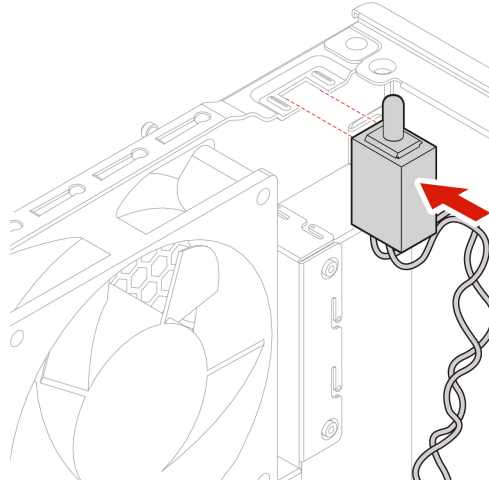
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Replacement procedure

1. Remove the computer cover. See “Computer cover” on page 28.
2. Disconnect the cover presence switch cable from the system board. See “System board” on page 4.
3. Remove the cover presence switch.



4. Install a new cover presence switch.



5. Connect the cable of the new cover presence switch to the cover presence switch connector on the system board.
6. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

Storage drive in a storage drive bay

Prerequisite

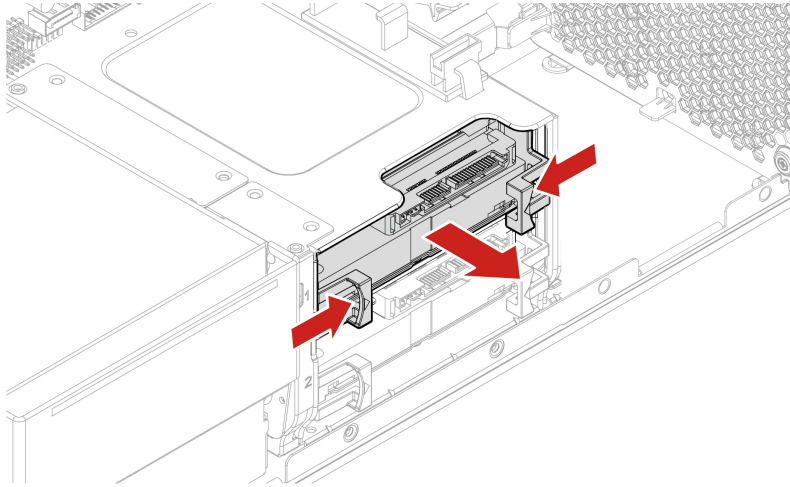
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

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

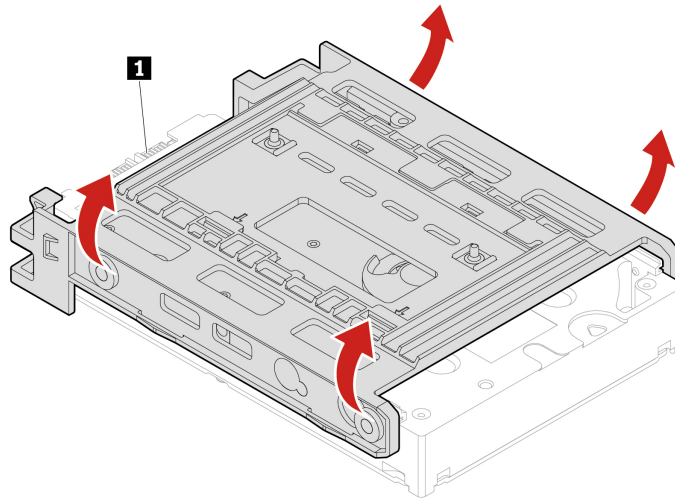
- Replace the internal storage drive only for upgrade or repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage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

Replacement procedure

1. Remove the computer cover. See “Computer cover” on page 28.
2. Locate the storage drive bay. See “Internal storage drives” on page 7.
3. Disconnect all the cables from the storage drive.
4. Remove the conversion bracket out of the storage drive bay.

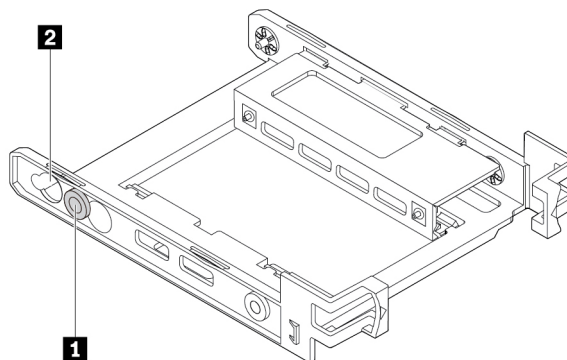


5. Remove the 3.5-inch storage drive from the bracket. Do not touch the circuit board **1** on the drive.

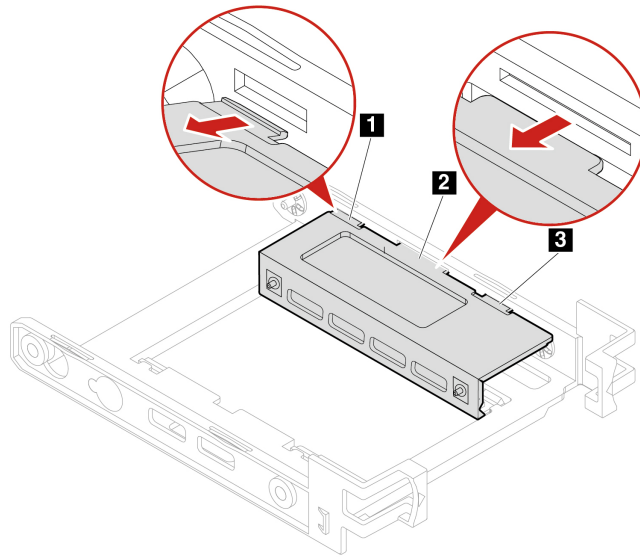


6. To install a 3.5-inch storage drive, ensure that the conversion bracket is unfolded. To unfold the bracket:

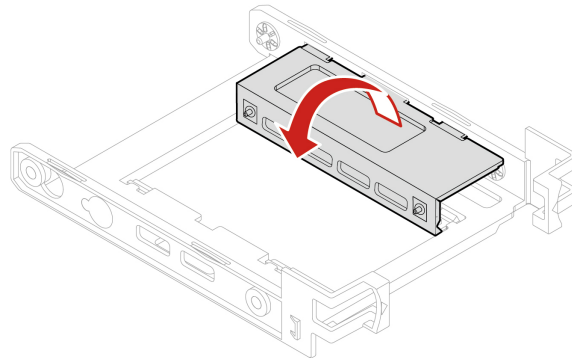
- Remove the pin **1** and install it into the slot **2**.



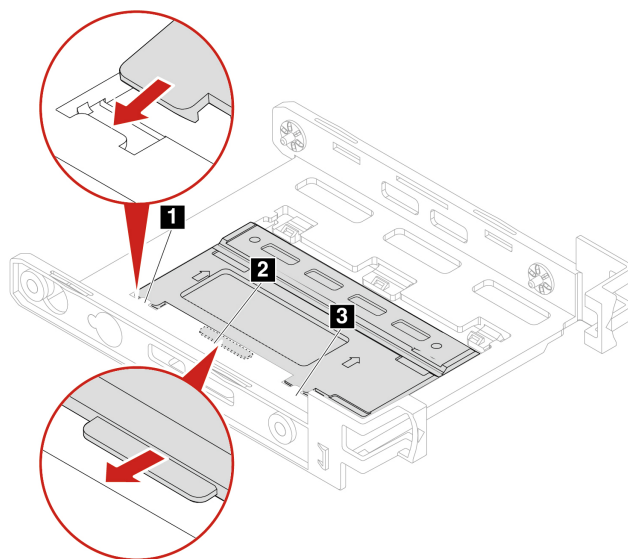
- Release tabs **1**, **2**, and **3** from the corresponding slots.



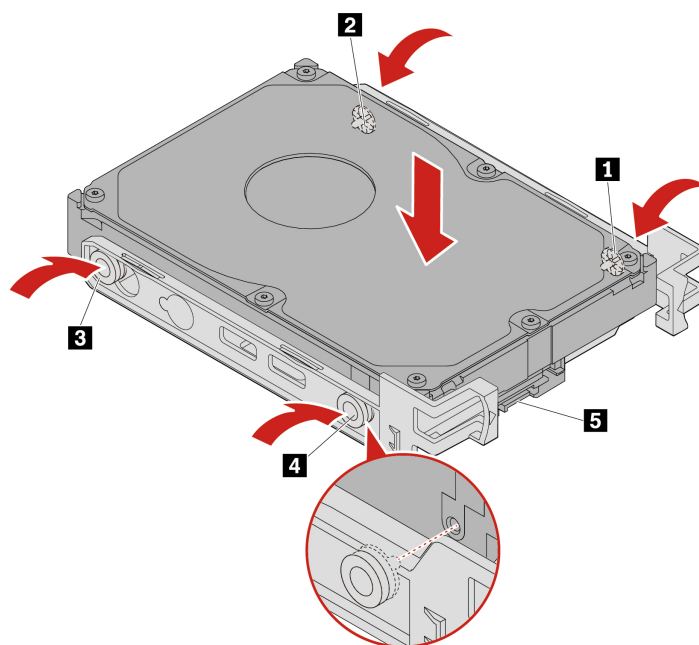
c. Unfold the bracket as shown.



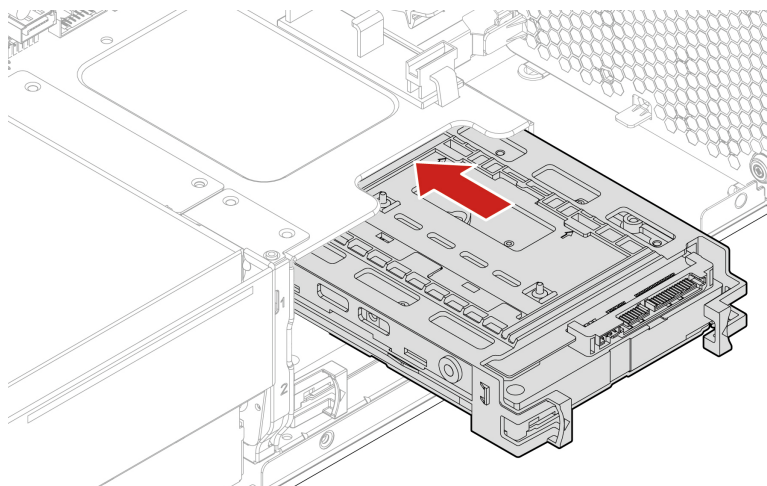
d. Insert tabs **1**, **2**, and **3** into the corresponding slots. Ensure that the tabs are secured in place.



7. Install the new 3.5-inch storage drive into the bracket. Do not touch the circuit board **5** on the drive.



8. Install the new 3.5-inch storage drive with the conversion bracket into the storage drive bay.



9. Connect the signal cable and the power cable to the new storage drive.

10. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

Storage drive cage

Prerequisite

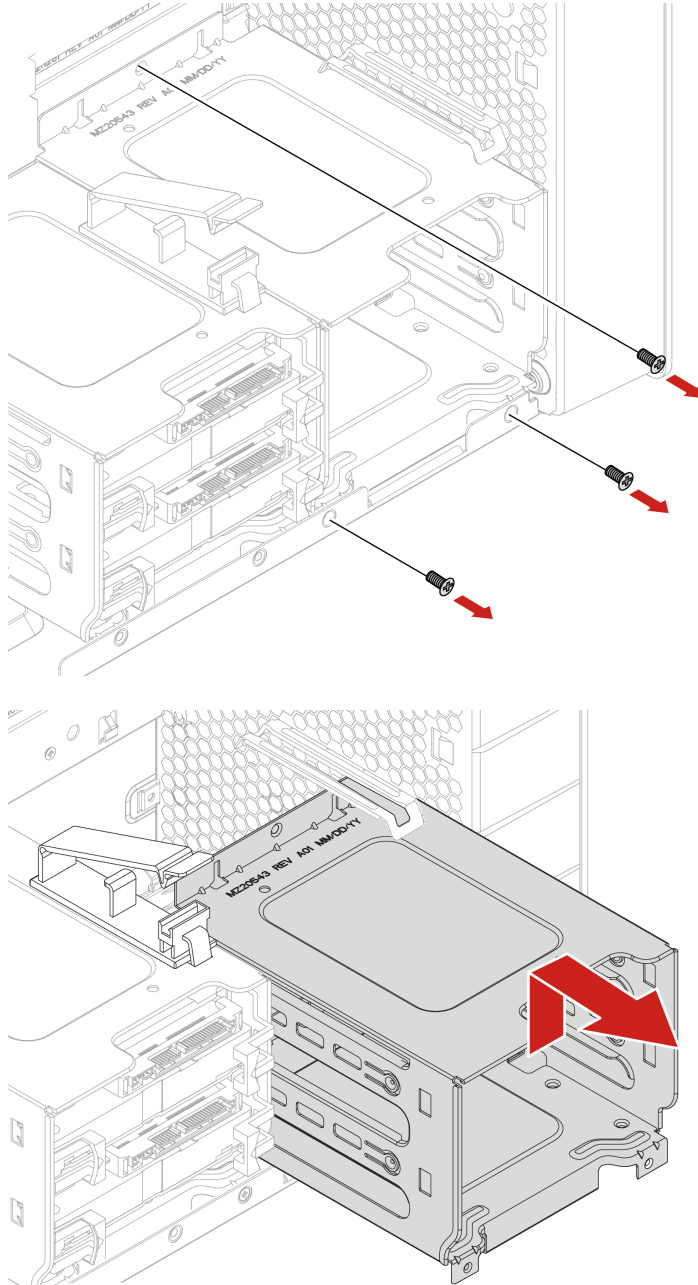
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Your computer might come with an optional storage drive cage.

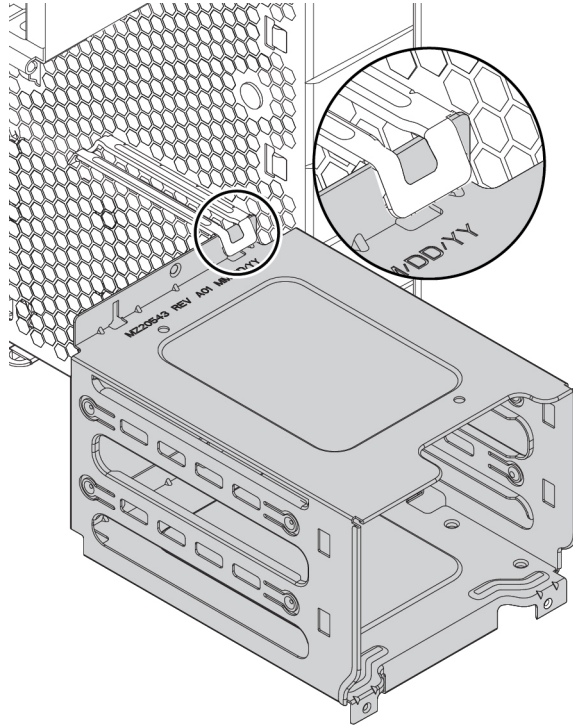
Replacement procedure

1. Remove the computer cover. See “Computer cover” on page 28.
2. Remove the front fan assembly. See “Front fan assembly” on page 73.

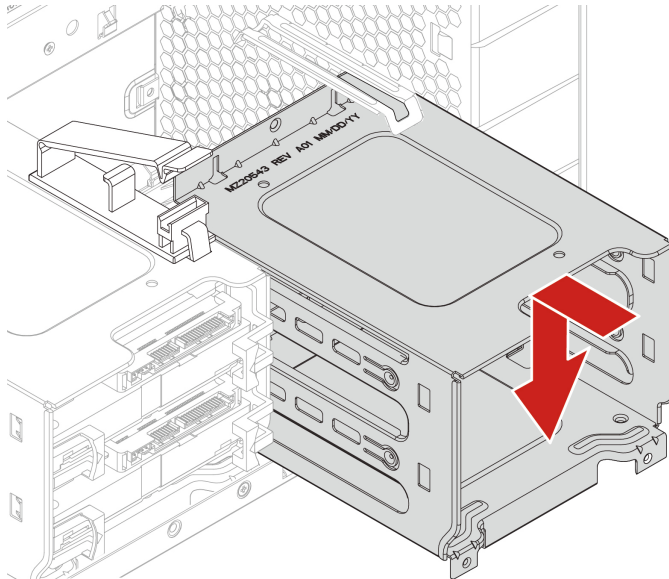
3. Locate the storage drive cage. See “Internal storage drives” on page 7..
4. Disconnect all the cables from the storage drive.
5. Remove the storage drives out of the storage drive cage. See “Storage drive in a storage drive bay” on page 45.
6. Remove the storage drive cage.



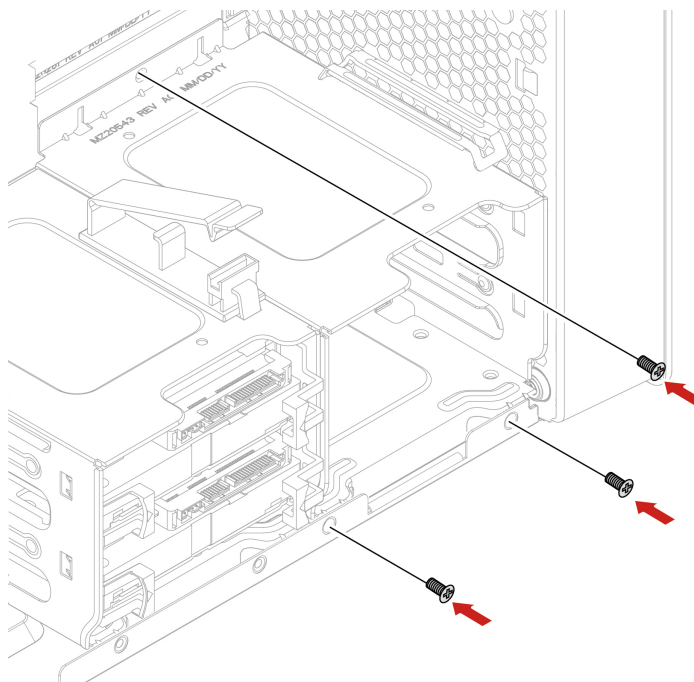
7. Install a storage drive cage:
 - a. Place the upper edge of the storage drive cage under the front-fan-assembly retainer as shown.



- b. Gently push the storage drive cage inward until it cannot be pushed any further. Then press the drive cage downward.



- c. Secure the storage drive cage with three screws.



8. Slide the storage drives into the storage drive cage. Reconnect the removed cables to the storage drives. See “Storage drive in a storage drive bay” on page 45.
9. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

M.2 solid-state drive

Prerequisite

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

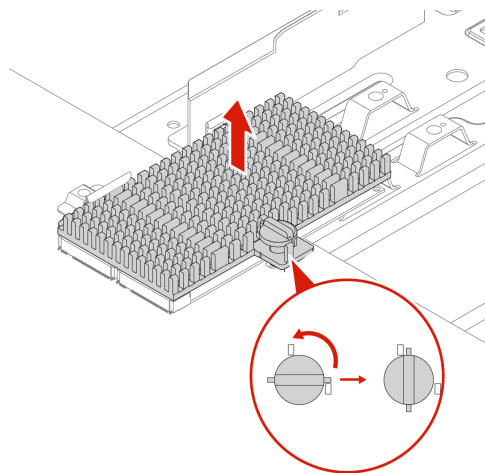
Attention: The internal storage drive is sensitive. Inappropriate handling might cause damage and permanent loss of data. When handling the internal storage drive, observe the following guidelines:

- Replace the internal storage drive only for upgrade or 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.

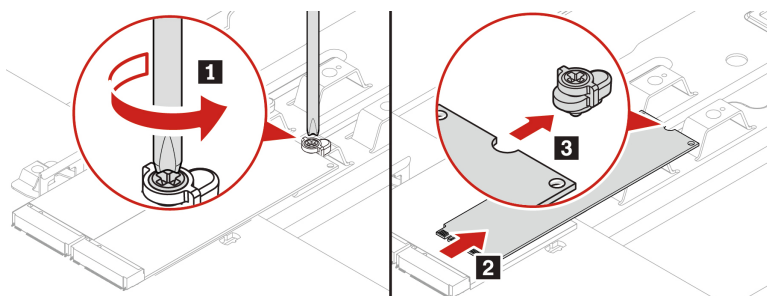
An M.2 solid-state drive can be installed on the system board or on an M.2 solid-state drive PCIe adapter.

M.2 solid-state drive on the system board

1. Remove the computer cover. See “Computer cover” on page 28.
2. Lay the computer on its side for easier access to the M.2 solid-state drive slots.
3. Locate the M.2 solid-state drive. See “Internal storage drives” on page 7.
4. Remove the memory cooler and duct. See “Internal storage drives” on page 7.
5. Remove the heat sink for the M.2 solid-state drive.



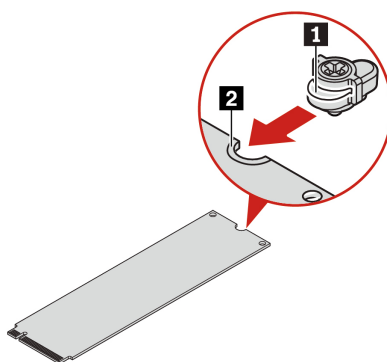
6. Remove the M.2 solid-state drive.

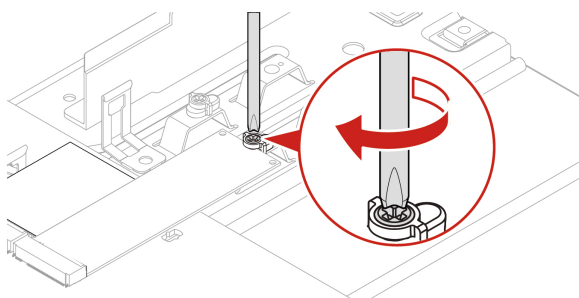
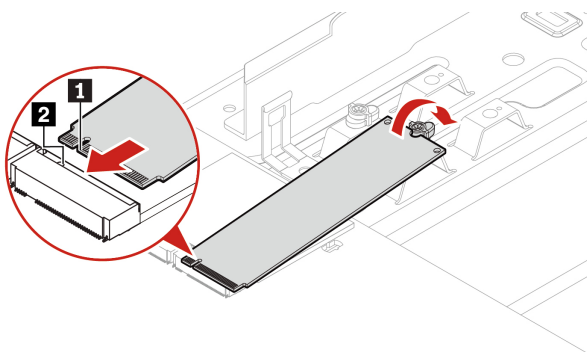


7. Install an M.2 solid-state drive.

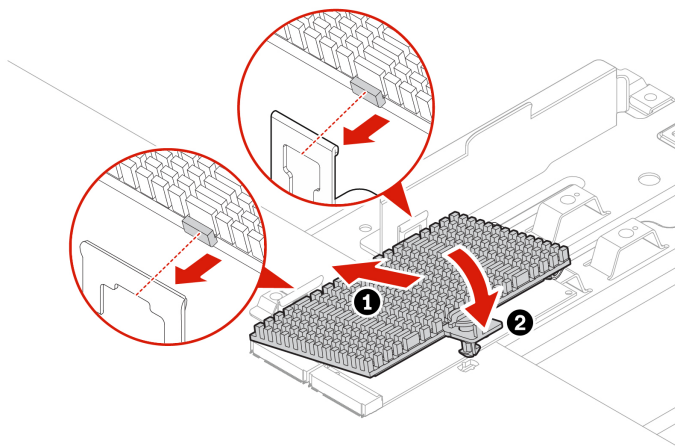
Notes:

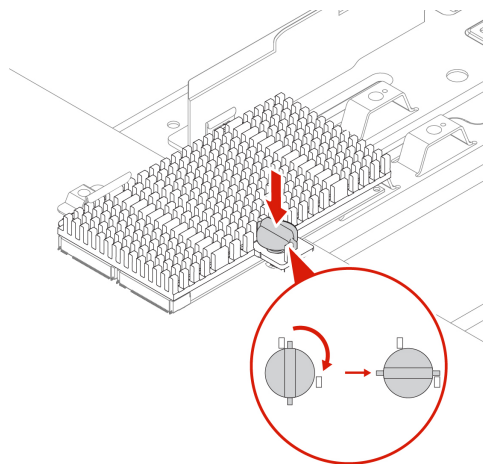
- Do not touch the circuit board of the M.2 solid-state drive.
- If only one M.2 solid-state drive is installed, ensure that the drive is installed in the M.2 solid-state drive slot 1 (19). See “System board” on page 4.





8. Install and secure the heat sink for the M.2 solid-state drive.



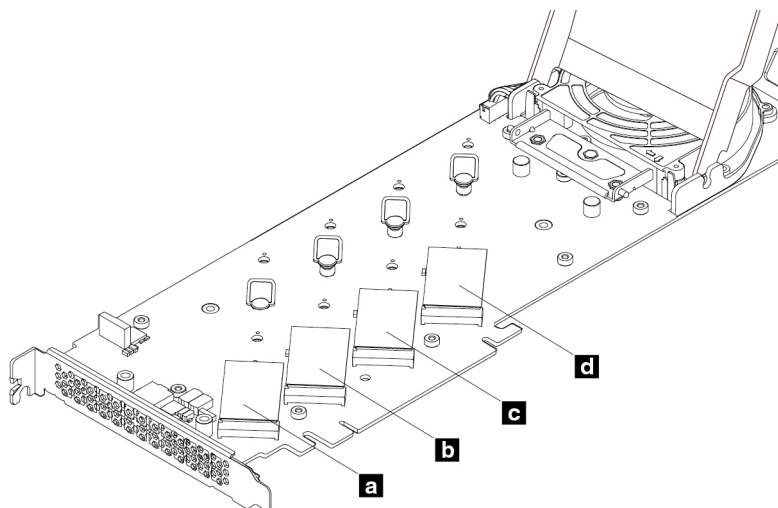


9. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

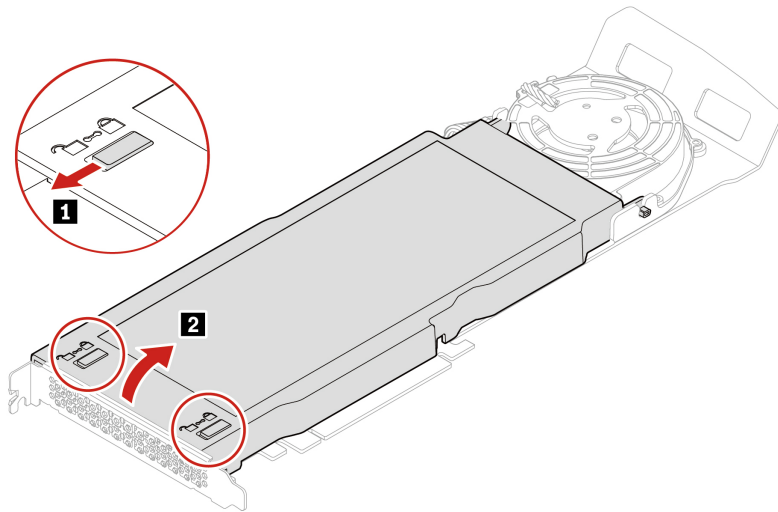
M.2 solid-state drive in an M.2 solid-state drive PCIe adapter

- Type 1

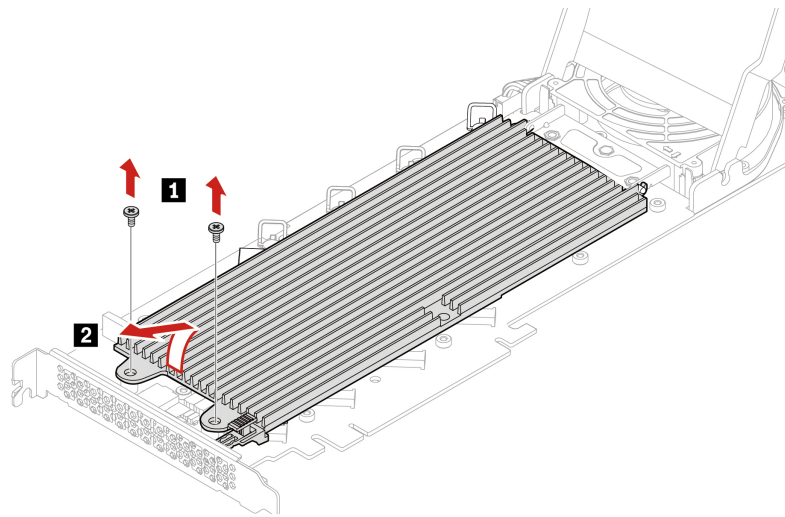
Install M.2 solid-state drives in the alphabetic order as shown.



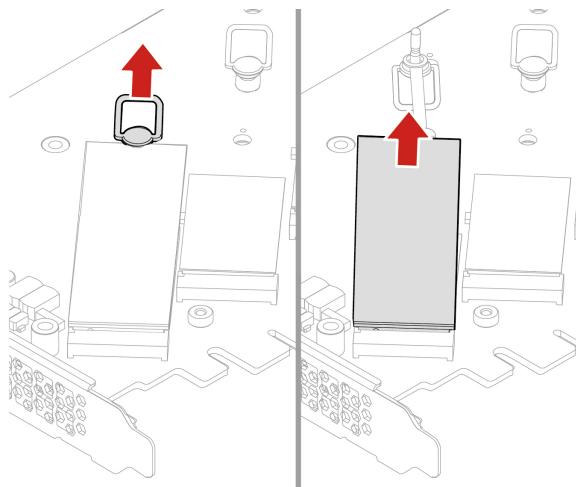
1. Remove the computer cover. See “Computer cover” on page 28.
2. Remove the M.2 solid-state drive PCIe adapter from the PCIe card slot. See “Full-length PCIe card” on page 68.
3. Open the cover.



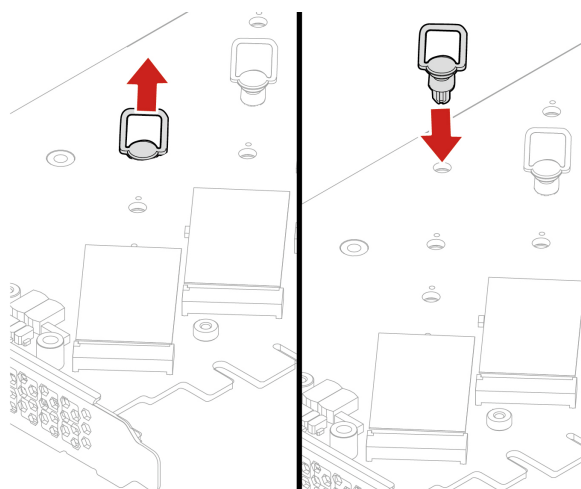
4. Remove the M.2 solid-state drive heat sink.



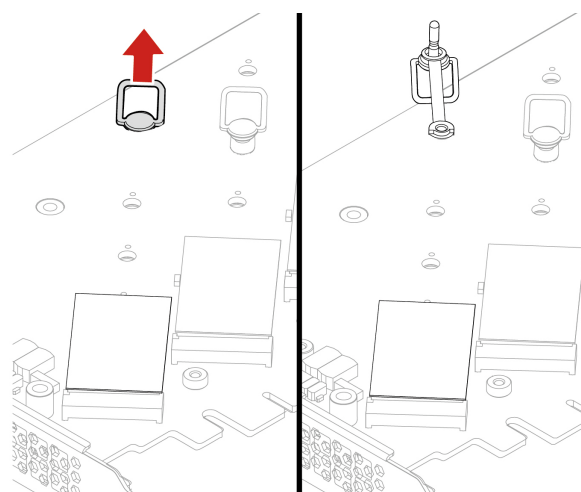
5. Pull the handle of the retention latch outward to release the M.2 solid-state drive. Then, remove the M.2 solid-state drive from the PCIe adapter.



6. If necessary, move the retention latch to an appropriate location to suit the length of the new M.2 solid-state drive.

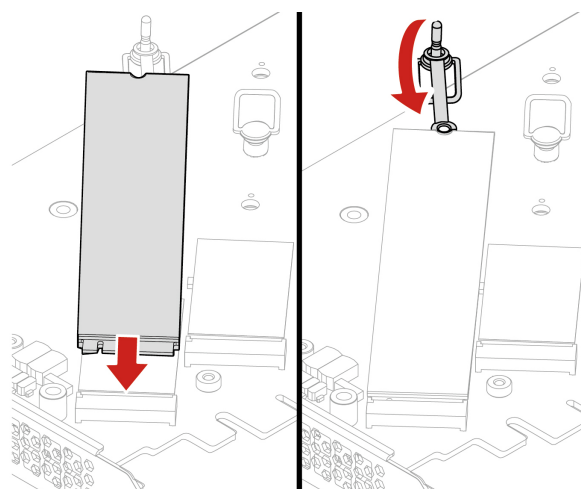


7. If necessary, remove the film on the thermal pad on which you want to install the M.2 solid-state drive. Pull the handle of the retention latch outward to the open position.

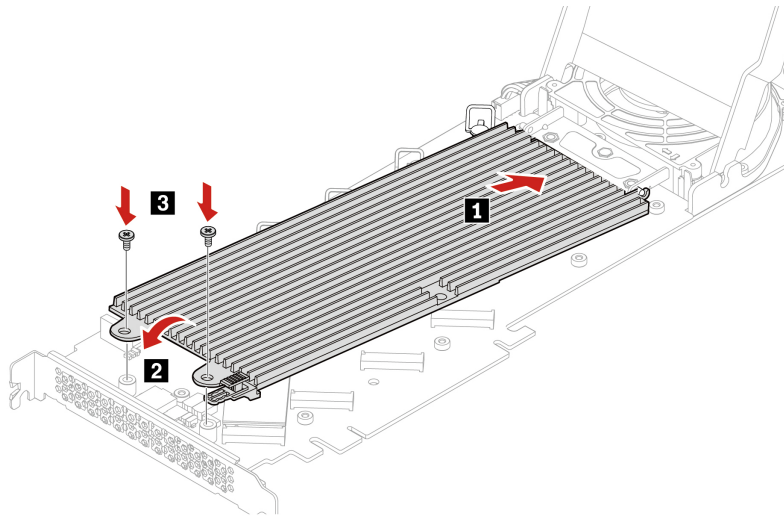


8. Install the M.2 solid-state drive. Then, insert the plug of the retention latch into the hole to secure the new drive.

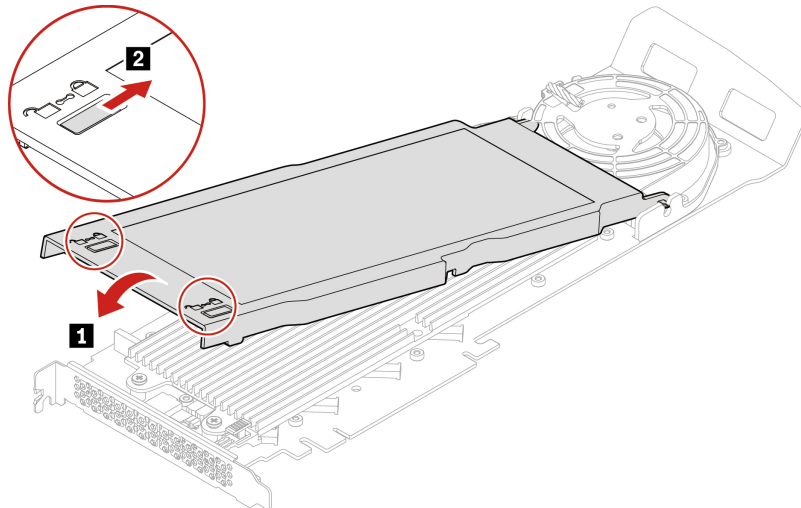
Note: Do not touch the circuit board of the M.2 solid-state drive.



9. Install the heat sink for the M.2 solid-state drive.



10. Close the cover.

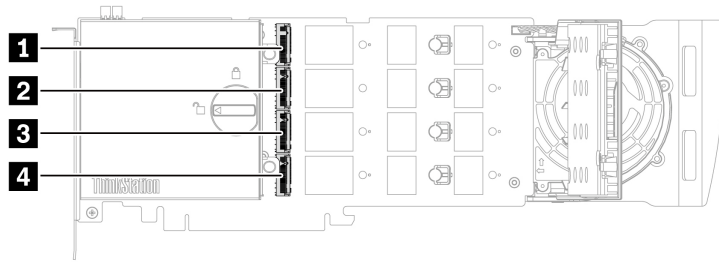


11. Install the M.2 solid-state drive PCIe adapter in a PCIe x16 card slot on the system board. See “System board” on page 4.

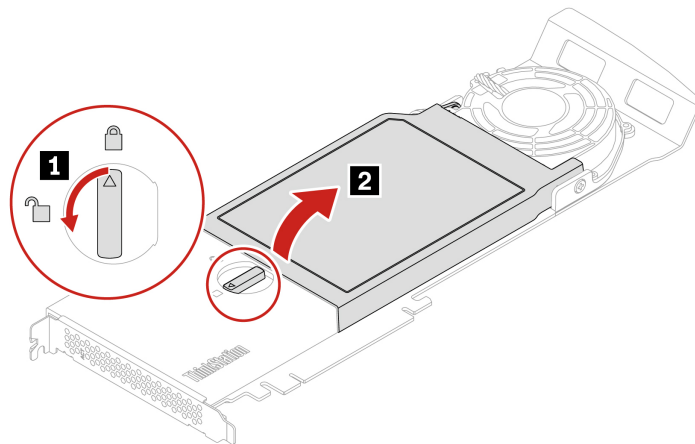
12. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

- Type 2

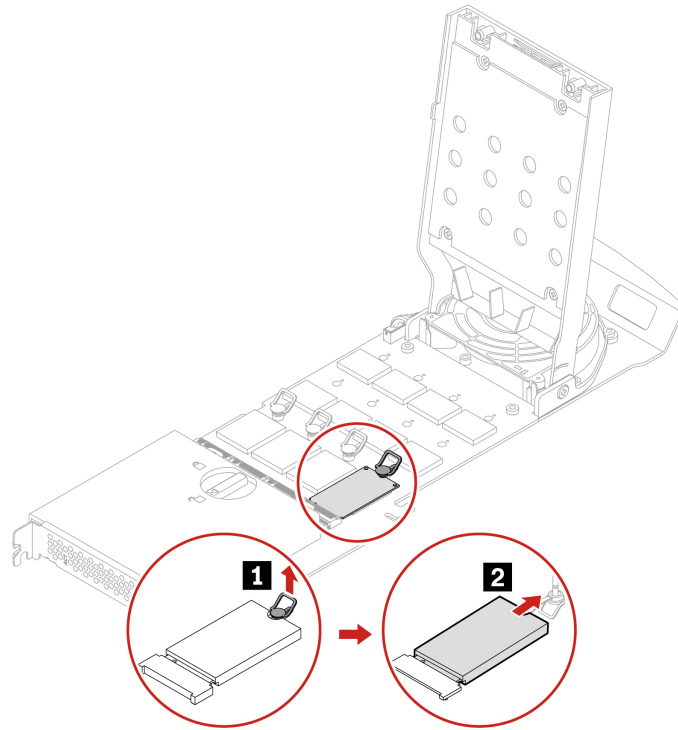
Install M.2 solid-state drives in the following order.



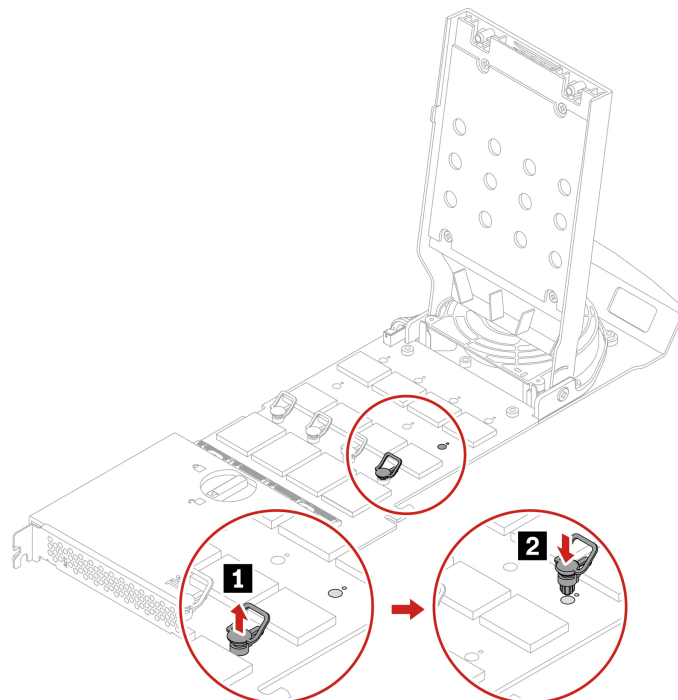
1. Remove the computer cover. See “Computer cover” on page 28.
2. Remove the M.2 solid-state drive PCIe adapter from the PCIe card slot. See “Full-length PCIe card” on page 68.
3. Open the cover.



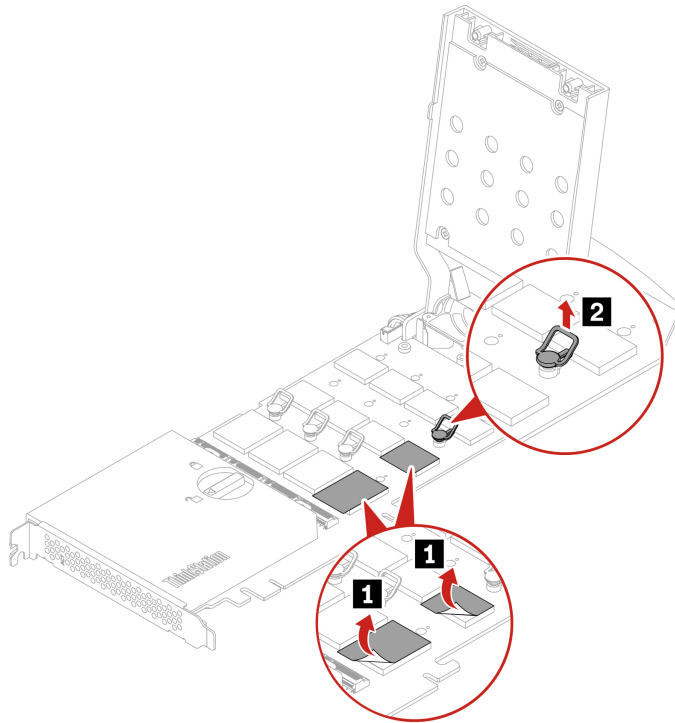
4. Pull the handle of the retention latch outward to release the M.2 solid-state drive. Then, remove the M.2 solid-state drive from the PCIe adapter.



5. If necessary, move the retention latch to an appropriate location to suit the length of the new M.2 solid-state drive.

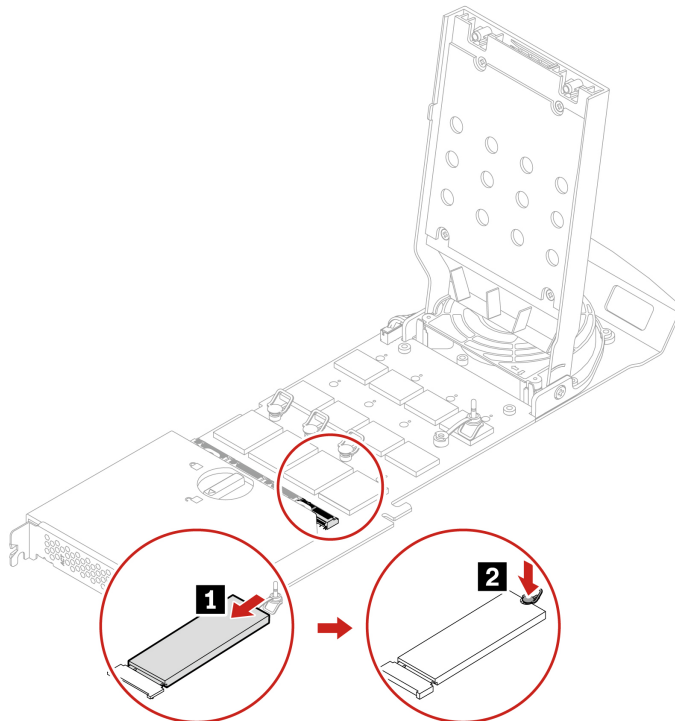


6. If necessary, remove the film on the thermal pad on which you want to install the M.2 solid-state drive. Pull the handle of the retention latch outward to the open position.

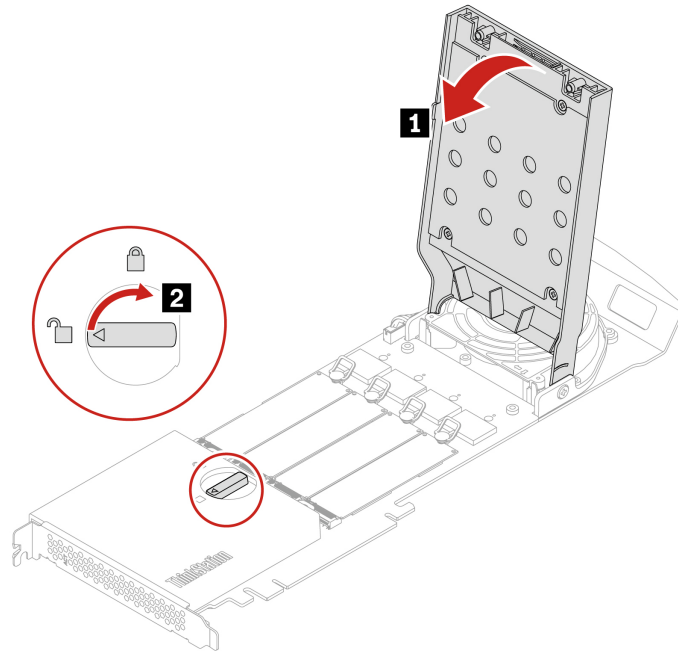


7. Install the M.2 solid-state drive. Then, insert the plug of the retention latch into the hole to secure the new drive.

Note: Do not touch the circuit board of the M.2 solid-state drive.



8. Close the cover.



9. Install the M.2 solid-state drive PCIe adapter in a PCIe x16 card slot on the system board. See “System board” on page 4.
10. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

U.2 or U.3 solid-state drive in an U.2 or U.3 solid-state drive PCIe adapter

Prerequisite

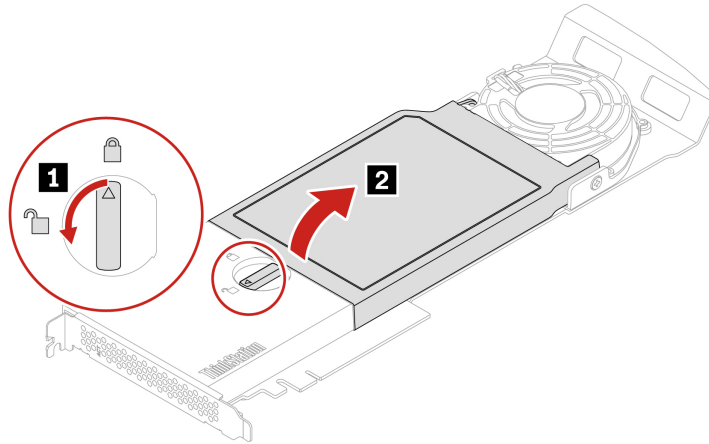
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

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:

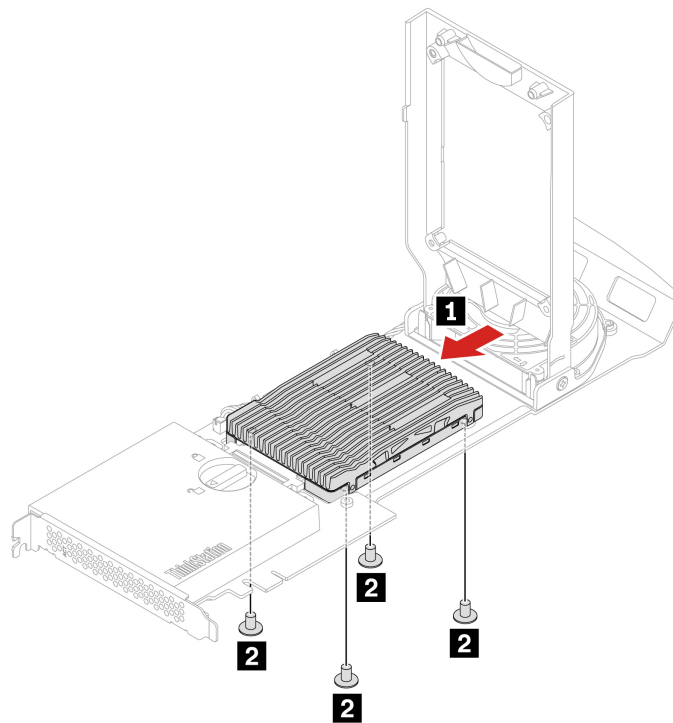
- Replace the internal storage drive only for upgrade or repair. The internal storage drive is not designed for frequent changes or replacement.
- Before replacing the internal storage drive, make a backup copy of all the data that you want to keep.
- Do not touch the contact edge of the internal storage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

Replacement procedure

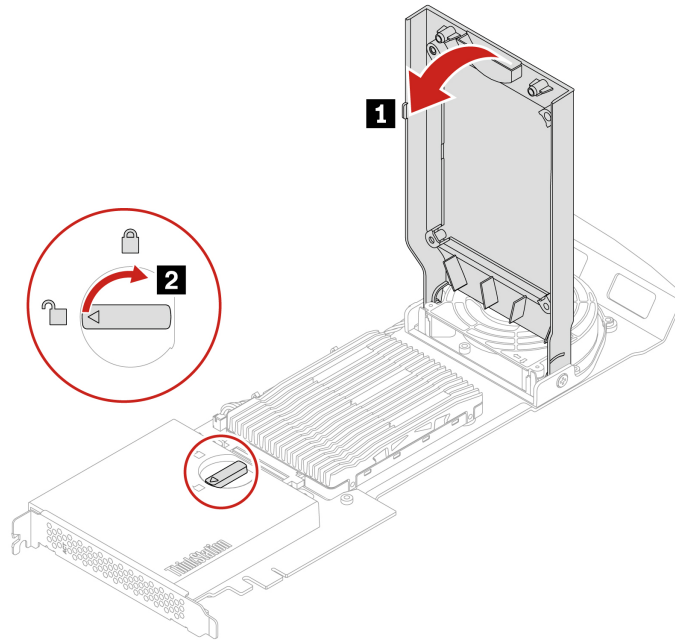
1. Remove the computer cover. See “Computer cover” on page 28.
2. Remove the U.2 or U.3 solid-state drive PCIe adapter from the PCIe card slot. See “Full-length PCIe card” on page 68.
3. Open the cover.



4. Install the U.2 or U.3 solid-state drive.



5. Close the cover.



6. Install the U.2 or U.3 solid-state drive PCIe adapter in a PCIe x16 card slot on the system board. See “System board” on page 4.
7. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

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.



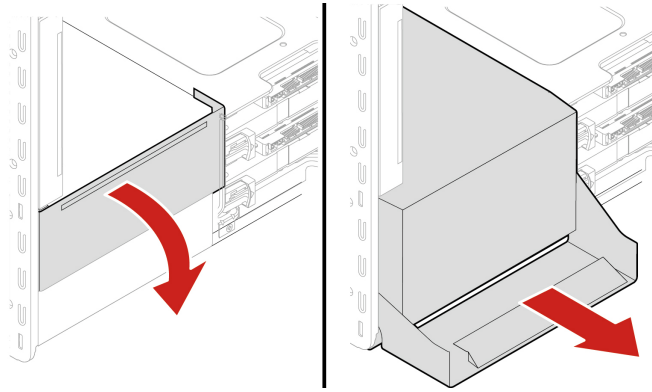
Keep fingers and other parts of your body away from hazardous, moving parts. If you suffer an injury, seek medical care immediately. Never remove the cover on a power supply or any part that has the following label attached.



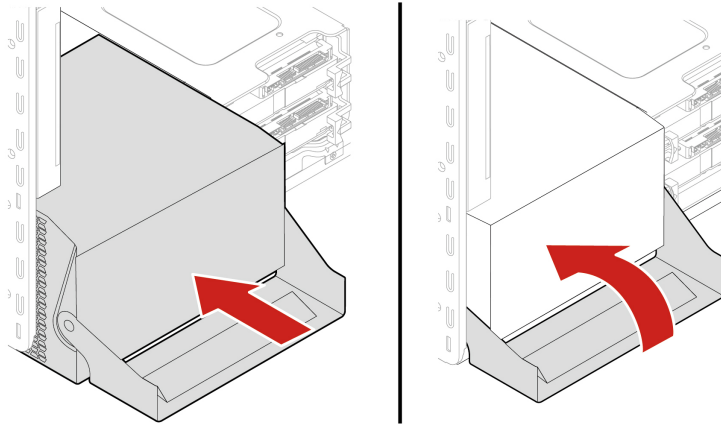
Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Replacement procedure

1. Remove the computer cover. See “Computer cover” on page 28.
2. Remove the power supply assembly.



3. Install the power supply assembly.



4. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

PCIe card

Prerequisite

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

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

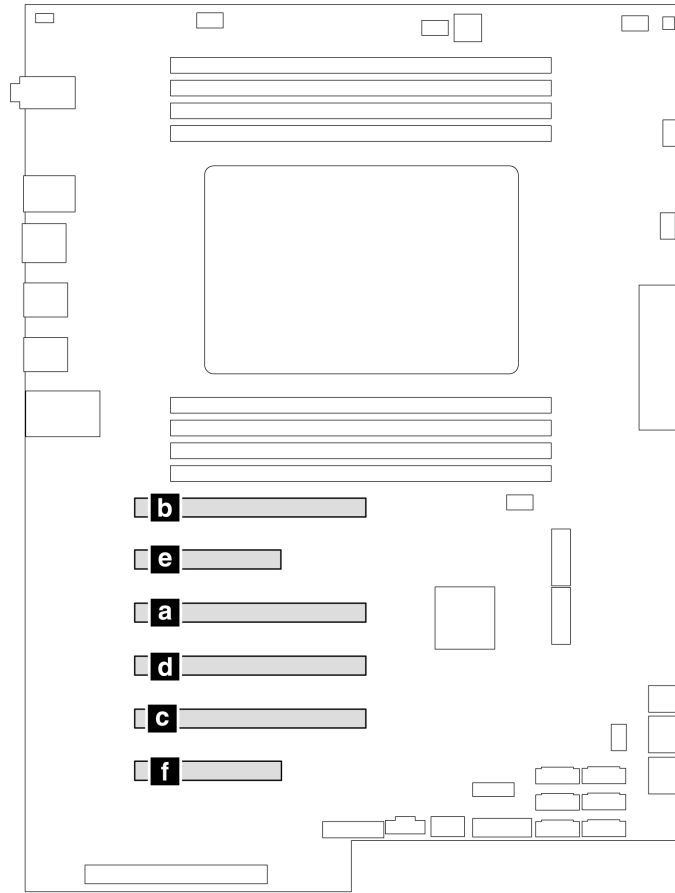
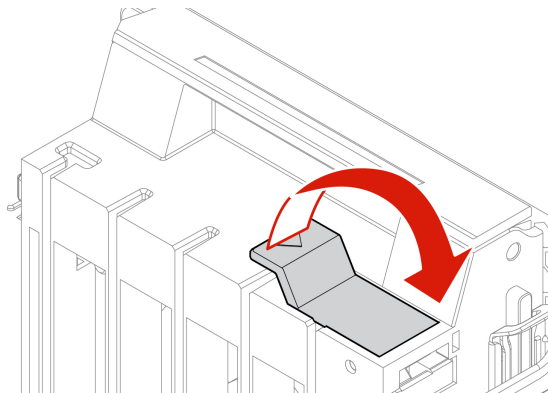


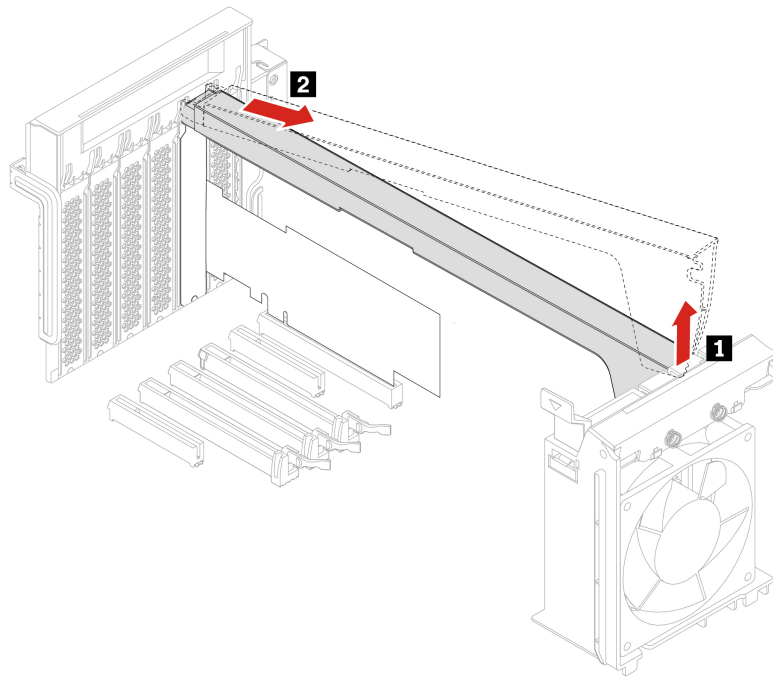
Figure 2. PCIe card installation order

Replacement procedure

1. Remove the computer cover. See “Computer cover” on page 28.
2. Lay the computer on its side for easier access to the system board.
3. Open the latch in the front fan assembly and remove the PCIe card retainer.

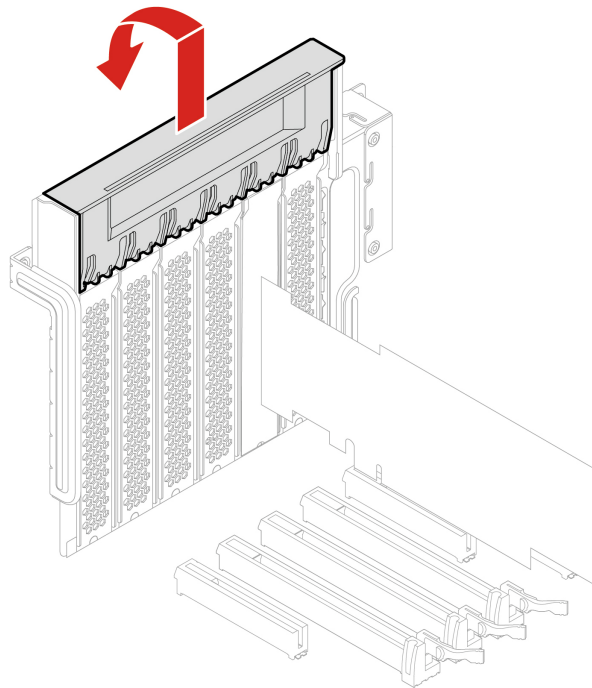
Note: The PCIe card retainer is only available on some models.

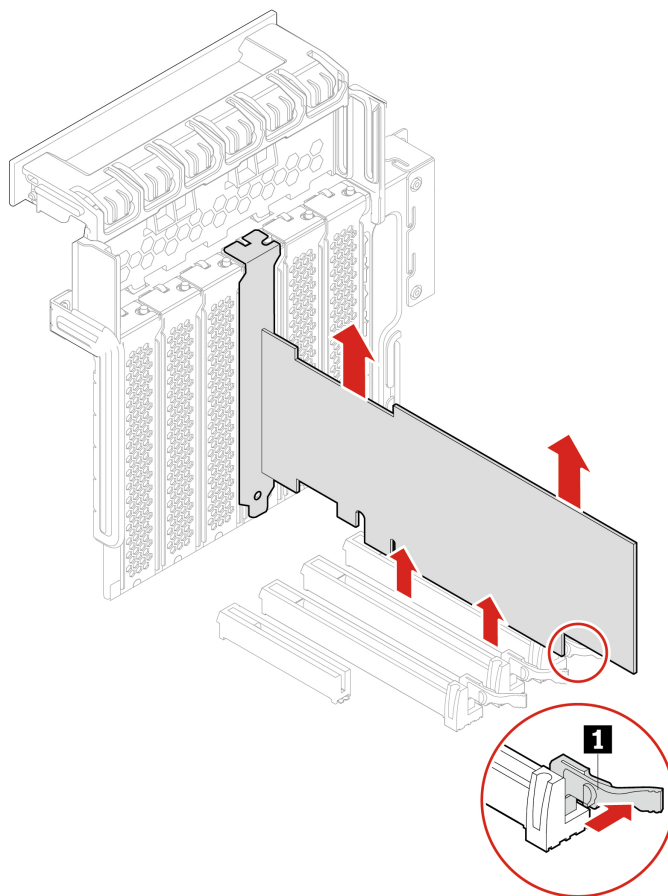




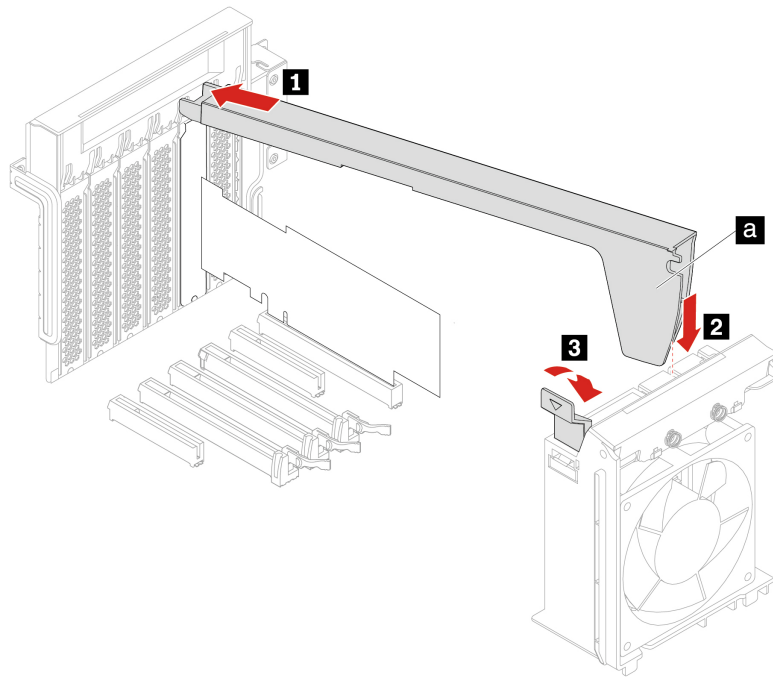
4. Remove the PCIe card.

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





5. To install a new PCIe card, pivot the PCIe card latch to the open position.
6. Remove the appropriate metal slot cover. Install the new card into the appropriate slot on the system board. See “System board” on page 4.
7. Pivot the PCIe card latch and push it back in until it snaps into position.
8. Install a PCIe card retainer, if any.



Full-length PCIe card

Prerequisite

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

Install PCIe cards (except GeForceRTX 40xx) according to the corresponding slot types and the following illustrated installation order:

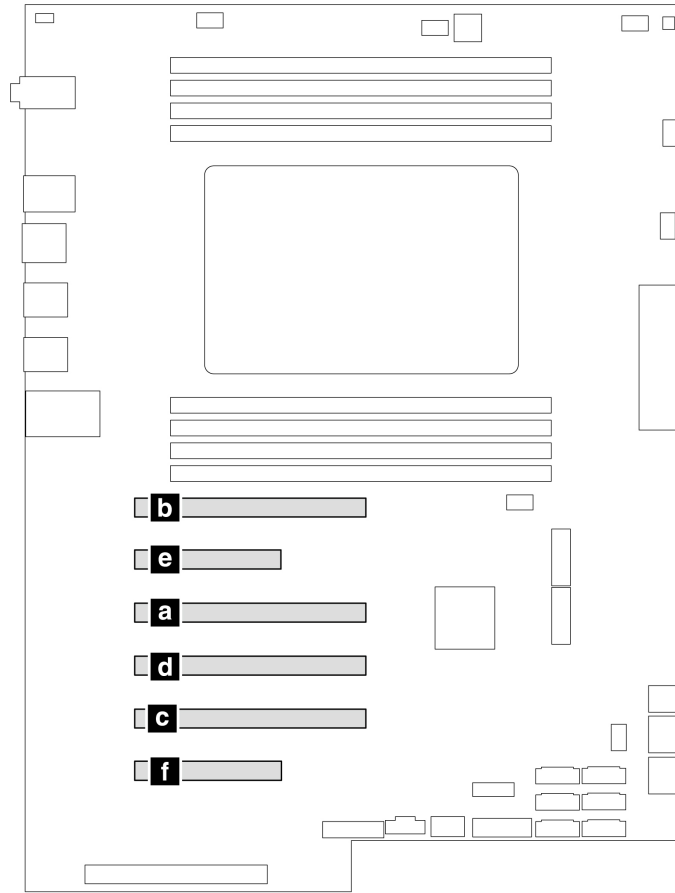


Figure 3. PCIe cards (except GeforceRTX 40xx) installation order

Install the graphics card GeforceRTX 40xx according to the corresponding slot types and the following illustrated installation order:

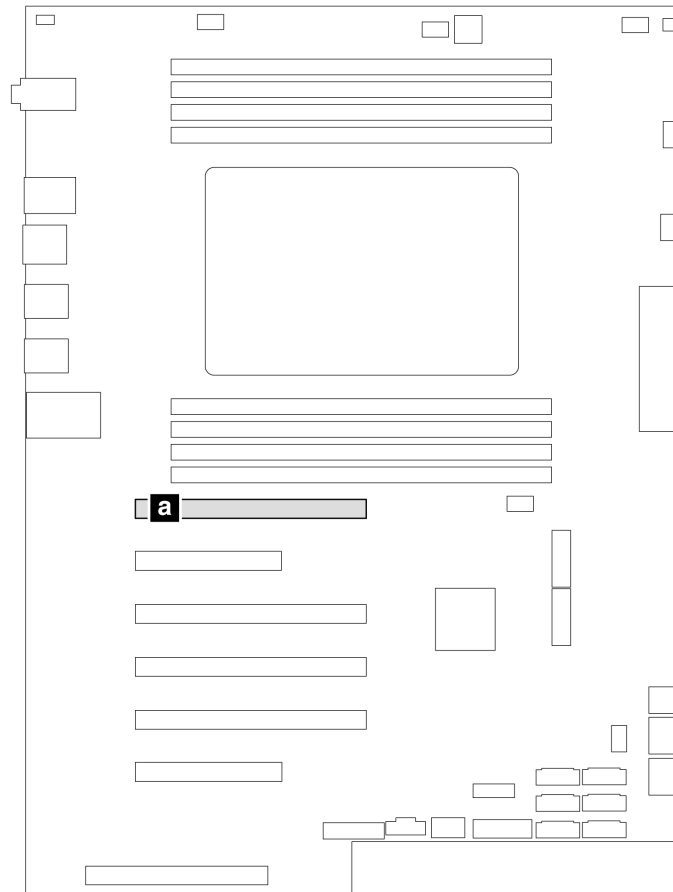
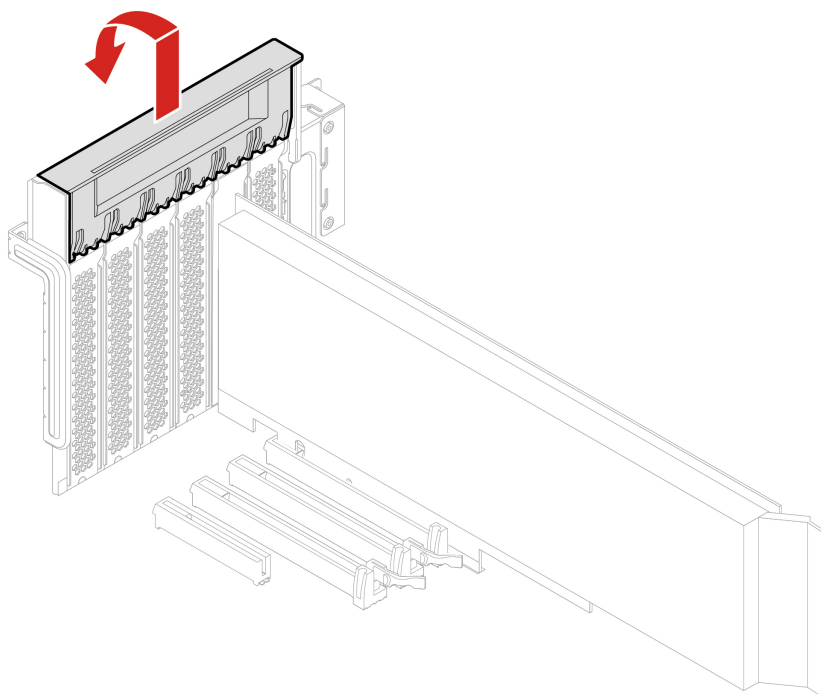


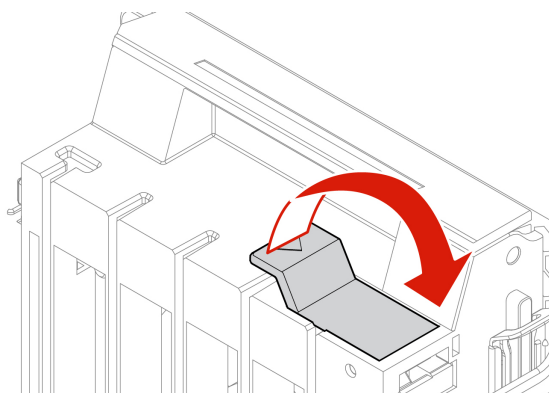
Figure 4. GeForceRTX 40xx installation order

Replacement procedure

1. Remove the computer cover. See “Computer cover” on page 28.
2. Lay the computer on its side for easier access to the system board.
3. Open the PCIe card latch.

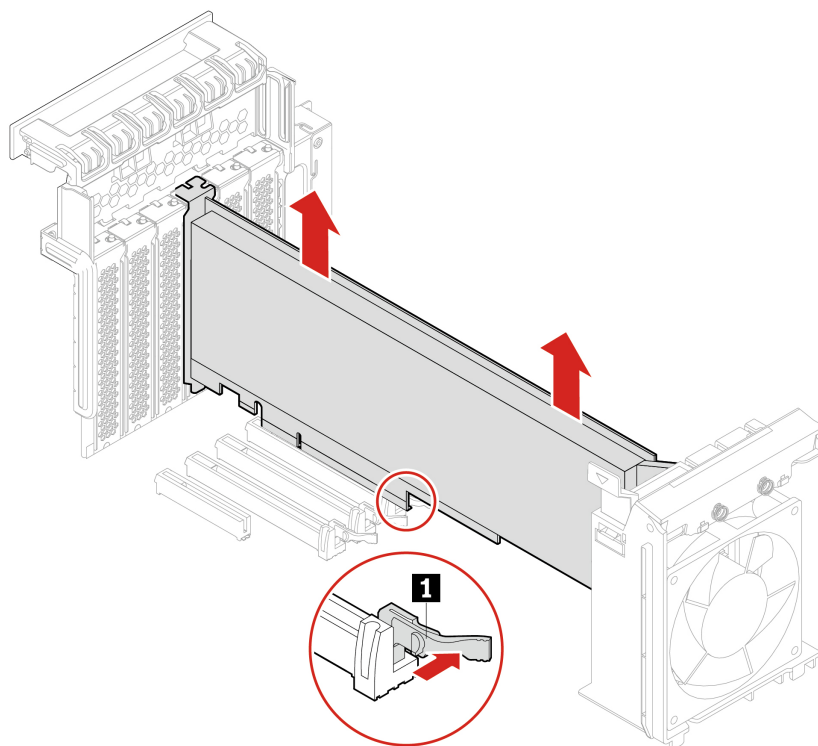


4. Open the latch in the front fan assembly.



5. Disconnect the power cable from the full-length PCIe card. Then, remove the card.

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



6. To install a full-length PCIe card:

- a. If you are installing a new full-length PCIe card, open PCIe card latch and remove the appropriate metal slot cover.
- b. Align the extender on the new full-length PCIe card with the corresponding slot in the front fan assembly. Then, install the new card into the appropriate slot on the system board. See “System board” on page 4.

Note: It is recommended that you install the full-length PCIe card into a PCIe x16 card slot for best performance.

7. Pivot the PCIe card latch and push it back in until it snaps into position. Then, pivot the tab on the front fan assembly to close the latch inside.
8. Connect one end of the power cable to the new full-length PCIe card and the other end to the appropriate power connector on the system board. See “System board” on page 4.
9. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

Super capacitor module

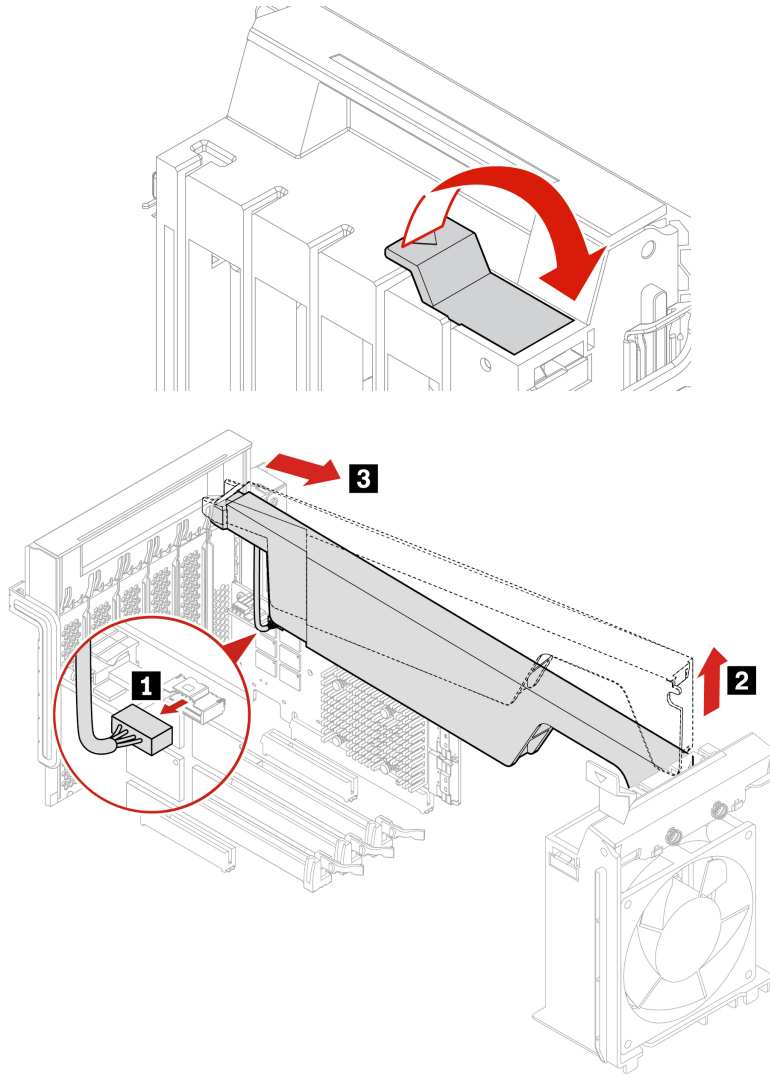
Prerequisite

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

For access, do the following:

1. Remove the computer cover. See “Computer cover” on page 28.
2. Lay the computer on its side for easier access to the system board.

Removal steps



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

Front fan assembly

Prerequisite

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

CAUTION:



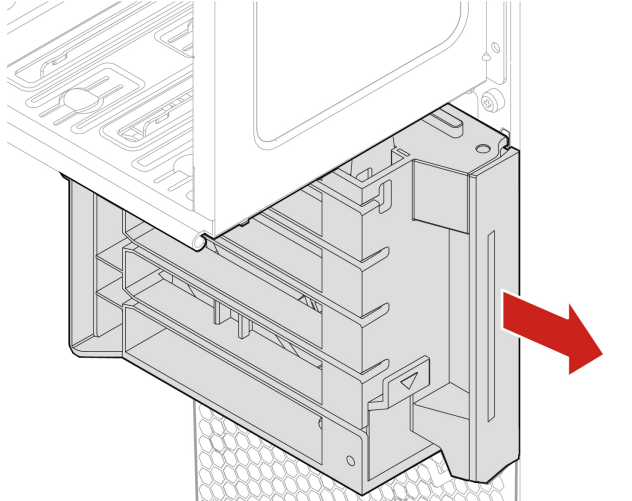
Keep fingers and other parts of your body away from hazardous, moving parts. If you suffer an injury, seek medical care immediately.

Replacement procedure

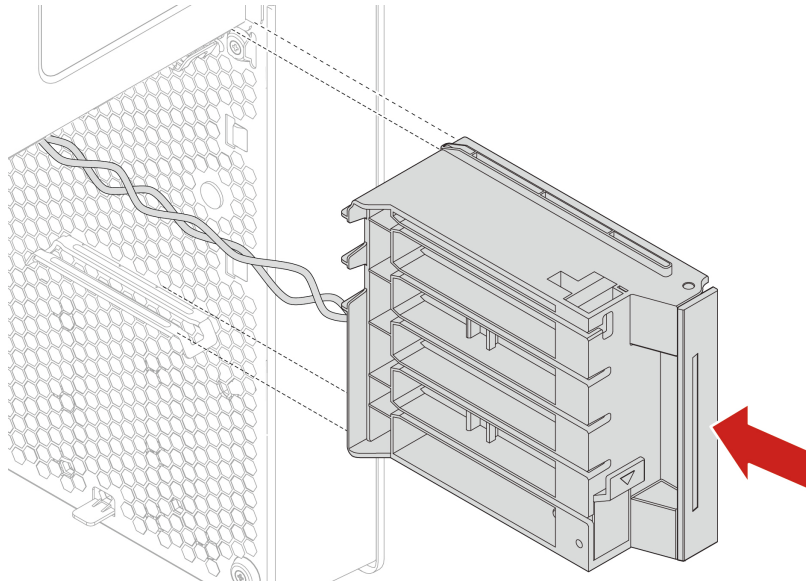
1. Remove the computer cover. See “Computer cover” on page 28.
2. Remove the following devices if any:

- Full-length PCIe cards, see “Full-length PCIe card” on page 68
 - PCIe card retainer, see “PCIe card” on page 64
3. Remove the front fan assembly.

Note: When you slide out the front fan assembly, avoid pulling the front-fan-assembly cable.



4. Disconnect the front-fan-assembly cable from the front-fan-assembly connector on the system board.
5. Connect the cable of the new front fan assembly to the front-fan-assembly connector on the system board. See “System board” on page 4.
6. Install a new front fan assembly.



7. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

Rear fan assembly

Prerequisite

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

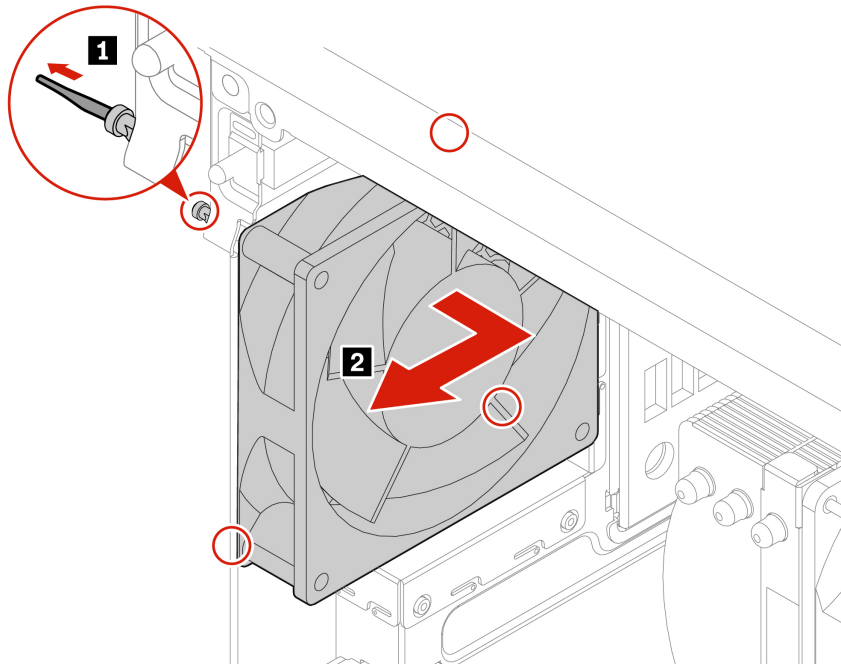
CAUTION:



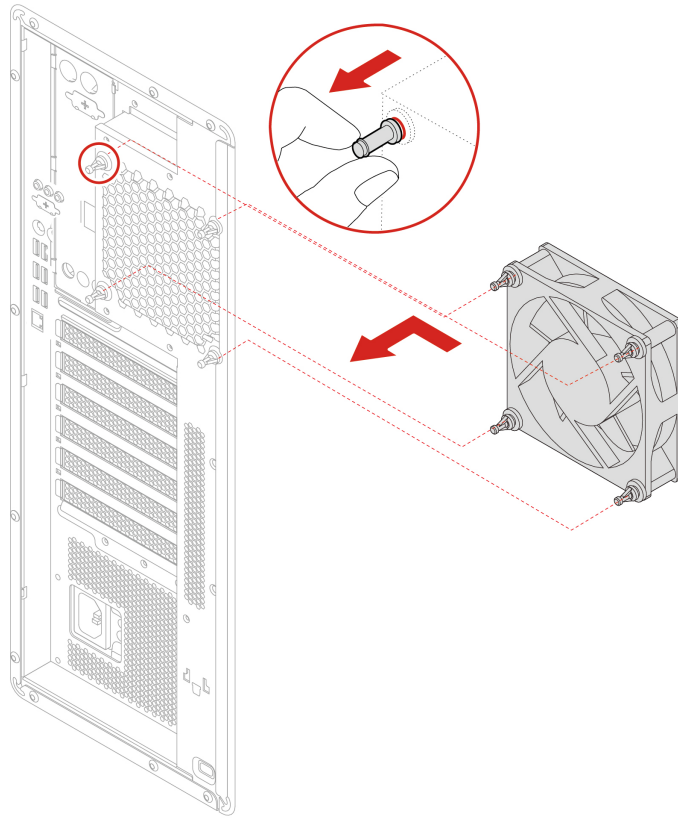
Keep fingers and other parts of your body away from hazardous, moving parts. If you suffer an injury, seek medical care immediately.

Replacement procedure

1. Remove the computer cover. See “Computer cover” on page 28.
2. Disconnect the rear-fan-assembly cable from the rear-fan-assembly connector on the system board.
3. Remove the rear fan assembly.



4. Install a new rear fan assembly.



5. Connect the rear-fan-assembly cable to the rear-fan-assembly connector on the system board. See “System board” on page 4.
6. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

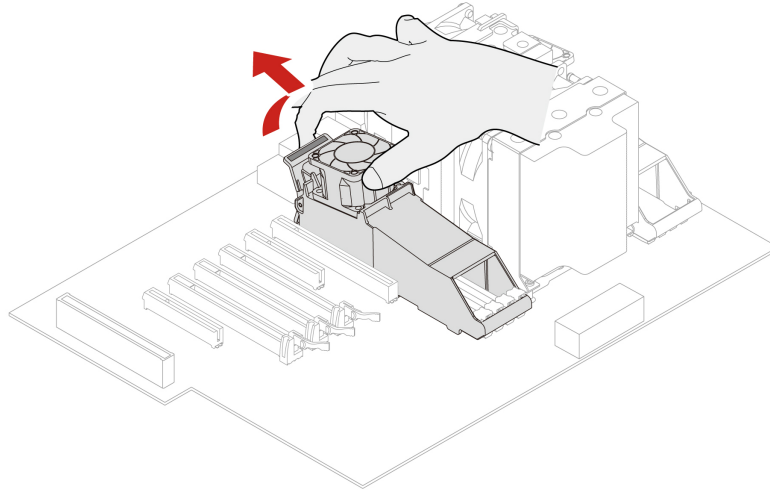
Memory module active cooler and duct

Prerequisite

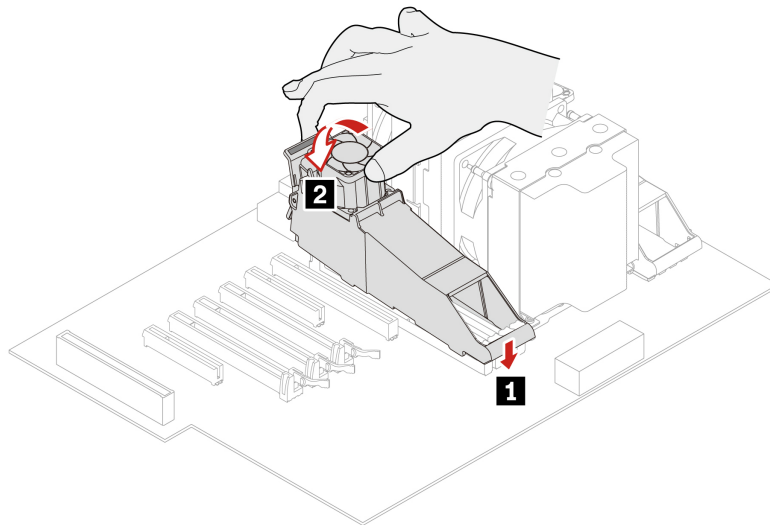
Before you start, read *Generic Safety and Compliance Notices*, and print the following instructions.

Replacement procedure

1. Remove the computer cover. See “Computer cover” on page 28.
2. Lay the computer on its side for easier access to the system board.
3. Remove the memory module active cooler and duct.



4. Install a memory module active cooler and duct.



5. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

Memory module

Prerequisite

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

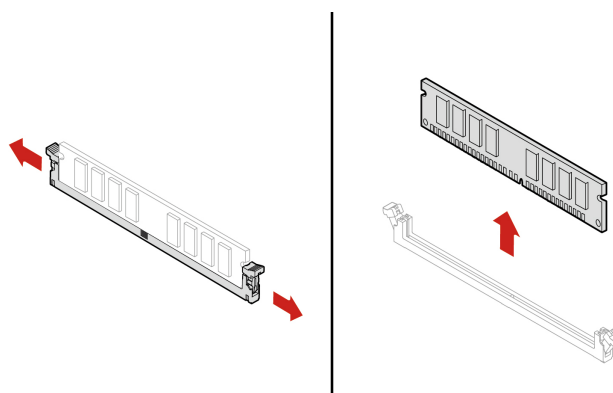
Your computer has eight slots for installing DDR4 RDIMMs that provide up to a maximum of 512 GB system memory. When removing or installing a memory module, use the following guidelines:

- Use 16 GB, 32 GB, or 64 GB DDR4 ECC RDIMMs in any combination up to a maximum of 512 GB.
- Ensure that you follow the installation order for memory modules shown in the following table.

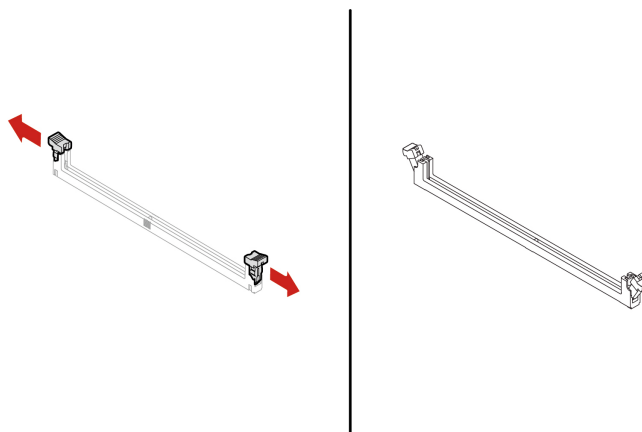
Memory modules	Installation order
one	Slot 7
two	Slot 7 and slot 8
Four	Slot 7, slot 8, slot 2, and slot 1
Eight	Slot 1 to slot 8

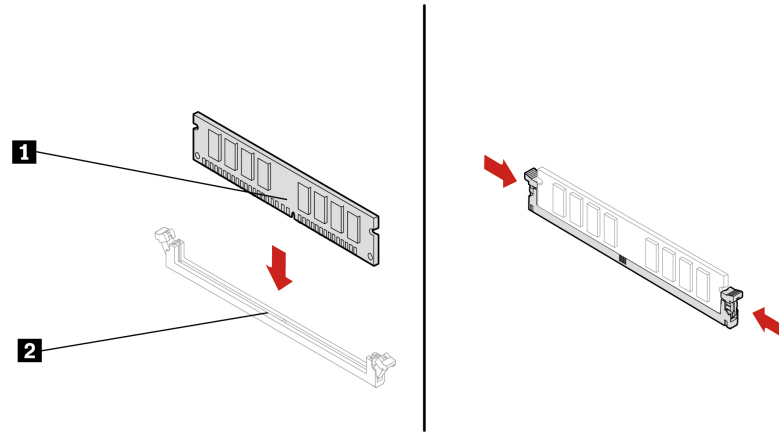
Replacement procedure

1. Remove the computer cover. See “Computer cover” on page 28.
2. Lay the computer on its side for easier access to the system board.
3. Remove the memory cooler and duct. See “Memory module active cooler and duct” on page 76.
4. Remove the memory module.



5. Install a memory module.





6. Reinstall all removed parts. Then, reconnect the power cord and all disconnected cables to the computer.

Chapter 7. Help and support

Self-help resources

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

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

Call Lenovo

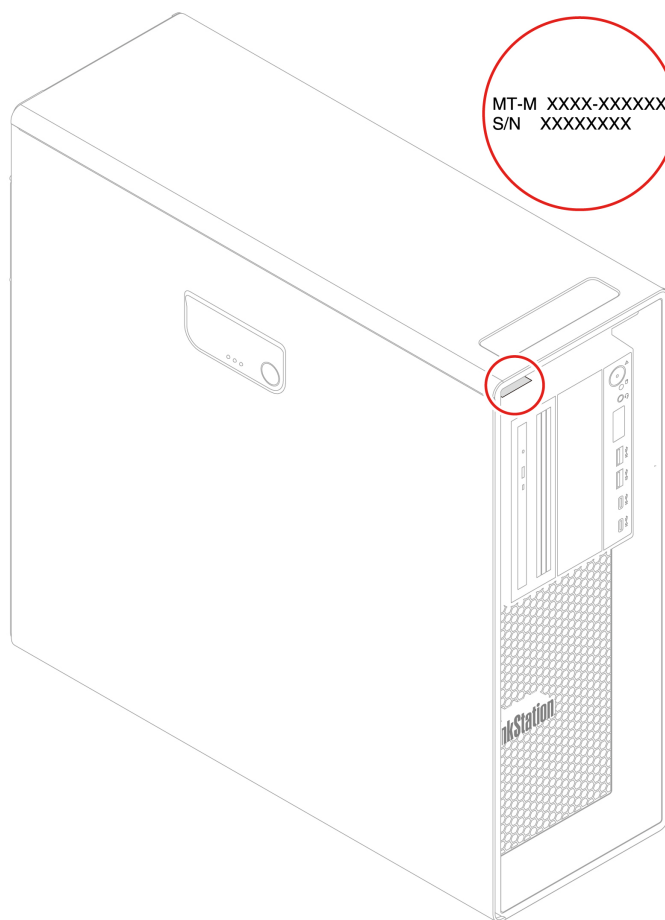
If you have tried to correct the problem yourself and still need help, you can call Lenovo Customer Support Center.

Before you contact Lenovo

Prepare the following before you contact Lenovo:

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

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



Lenovo Customer Support Center

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

Telephone numbers

For a list of the Lenovo Support phone numbers for your country or region, go to:

<https://pcsupport.lenovo.com/supportphonenumberlist>

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

Services available during the warranty period

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

Services not covered

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

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

Purchase additional services

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

<https://www.lenovo.com/services>

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

Appendix A. System memory speed

The AMD Threadripper Pro microprocessor families compatible with this ThinkStation computer feature an integrated memory controller, which provides the microprocessor with direct access to the system memory. Because of this design, the system memory speed will be determined by a number of factors, including the microprocessor model and the type, speed, size (capacity), and number of DIMMs installed.

Notes:

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

Appendix B. Supplemental information about the Ubuntu operating system

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

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

Access the Lenovo Limited Warranty

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

https://www.lenovo.com/warranty/llw_02

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

`/opt/lenovo`

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

Access the Ubuntu help system

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

To learn more about the Ubuntu operating system, go to:

<https://www.ubuntu.com>

Get support information

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

To access the latest *User Guide* and *Safety and Warranty Guide*, go to:

<https://pcsupport.lenovo.com>

Open source information

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

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

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

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

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To view additional information regarding licenses, acknowledgments and required copyright notices for the open source software shipped on your Device, go to `/usr/share/doc/*/copyright`.

Appendix C. 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.

Certification-related information

Product name: ThinkStation P620

Machine types: 30E0 and 30E1

Operating environment

Maximum altitude (without pressurization)

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

Temperature

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

Relative humidity

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

Appendix D. Notices and trademarks

Notices

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